



TOWN OF **NEWMARKET** NEW HAMPSHIRE

Planning Board Agenda

Tuesday, August 11, 2026 at 7:00 PM

Town Hall, Council Chambers

Agenda Item #1 - Pledge of Allegiance

Agenda Item #2 – Public Comments (Not related to items on the agenda)

Agenda Item #3 - Review & Approval of Minutes

- a. July 14, 2026

Agenda Item #4 – Regular Business

- a. Pursuant to RSA 676:4, Section 32 Zoning and Section 2.04 of Appendix B - Site Plans of the Municipal Code of the Town of Newmarket, New Hampshire, notice is hereby given that a public hearing for a minor site plan application, requested by applicant RKJ 37 Exeter LLC, will be held for a proposed development intending to disturb approximately of 4,769 square feet of area by seeking to demolish an existing single-family dwelling and replacing it with a three-unit townhouse with a paved driveway, new retaining walls, an on-site rain garden, a vegetative buffer adjacent to the on-site stream with no direct wetland fill proposed and the installation of other onsite utilities. The property is located at 37 Exeter Road, Tax Map U3, Lot 38, within the VC-C zoning district, and downtown commercial and wetland protecting overlay districts. The application is on file in the Department of Planning and Community Development office located in the Newmarket Town Hall.

The applicant has requested a continuance to the September 8, 2026, meeting.

- b. Pursuant to RSA 674:2-4 and Section 4.16 Town Master Plan of the Municipal Code of the Town of Newmarket, notice is hereby given that the Planning Board will hold a public hearing to review and adopt a new master plan comprising of the following chapters enumerated hereinbelow, or take any other action relative thereto.
 - 1. Vision | 2. Existing and Future Land Use | 3. Arts, Culture and Historic Resources | 4. Community Facilities and Utilities | 5. Downtown Riverfront | 6. Economic Development | 7. Energy | 8. Housing | 9. Land and Water Conversation | 10. Recreation | 11. Transportation

The proposed master plan chapter amendments can be viewed by visiting the following link below, or by visiting the Department of Planning and Community Development located in Town Hall.

- **Draft Master Plan PDFs:** <https://www.newmarketnh.gov/522/Draft-Master-Plan-2026-PDFs>
- **Draft Master Plan Website:** <https://straftordpcnh.gov/interactive-reports/newmarket-master-plan/>

Agenda Item #5 - New/Old Business

- a. Committee Reports
- b. Planner's Report
- c. Other Business

Agenda Item #6 - Adjourn



TOWN OF NEWMARKET NEW HAMPSHIRE

PLANNING BOARD

Tuesday, July 14, 2026 at 7:00 PM

Town Hall, Council Chambers

DRAFT MEETING MINUTES

Present: Val Shelton (Chair), Zachary Shollar (Vice Chair), Jane Ford, Bill Arcieri, Jeff Goldknopf, Justin Glazebrook (Town Council – Ex officio), Bart McDonough (Director of Planning & Community Development)

Absent: Jamie Bruton, Eric Botterman (Alternate)

The Chair called the regular meeting to order at 7:04 PM.

The voting members will be: **Val Shelton, Zach Shollar, Jane Ford, Bill Arcieri, Jeff Goldknopf, Justin Glazebrook.**

1. Pledge of Allegiance

2. Public Comments

The public comment was opened at 7:04 PM. There were no public comments for items not on the agenda. The public comment was closed at 7:05 PM.

3. Review & Approval of Minutes

a. June 9, 2026

Action

Motion: Jeff Goldknopf moved to approve the minutes of June 9, 2026.

Second: Jane Ford

Discussion: None

Vote: Approved 6-0-0

4. Regular Business

a. Pursuant to RSA 674:2-4 and Section 4.16 Town Master Plan of the Municipal Code of the Town of Newmarket, notice is hereby given that the Planning Board will hold a public hearing to review and adopt a new master plan comprising of the following chapters enumerated hereinbelow, or take any other action relative thereto.

- 1. Vision, 2. Existing and Future Land Use, 3. Arts, Culture and Historic Resources, 4. Community Facilities and Utilities, 5. Downtown Riverfront, 6. Economic Development, 7. Energy, 8. Housing, 9. Land and Water Conversation, 10. Recreation, 11. Transportation.

The proposed master plan chapter amendments can be viewed by visiting the following link below, or by visiting the Department of Planning and Community Development located in Town Hall. (<https://www.newmarketnh.gov/522/Draft-Master-Plan-2026-PDFs>)

The Chair read the above into the record, and gave an overview of the process thus far developing the Master Plan.

Kerrie Diers and **Rachel Dewey** with Strafford Regional Planning Commission introduced the Master Plan and the new draft public-facing website for the chapters and themes. With the

website interface, it was shown how each topic has a tile to navigate to specific chapters. The Arts, Culture and Historic Resources Chapter was presented as an example of a chapter landing page. The Implementation Plan page was also shown, having an interactive map that can organize information by chapter or theme, with it explained that the map can be updated as often as the Town wishes.

The Chair asked regarding if there is a link to a spreadsheet showing the implementation goals. It was confirmed that the spreadsheet can be added to the website.

Zach praised the heat map shown on the Implementation Plan page as a way for the public to be able to see where items are focused.

Bill asked regarding updating the map; **Rachel** explained that it can be easily updated, and it is tied to data through a spreadsheet on the back-end. Therefore, if an updated spreadsheet is provided, it can be uploaded for updating the map through coordination with SRPC and **Bart**.

Zach also noted that the Long-Range Planning Subcommittee could also assist with those updates.

It was recommended that prioritization should be added as a field for the map to be able to sort and filter by (short-term, long-range, etc.).

Public comment was opened at 7:10 PM.

Bob Daigle asked when public comment is going to be received; the Chair explained that they have been receiving comments throughout the process but that this is the first public hearing.

Mr. Daigle asked if there will be further public hearings.

Bill added that the Master Plan is a living document and can therefore be fluid and updated after the initial official adoption still as well.

The Chair reviewed how this is the first comprehensive update in about 20 years, and explained individual chapters have been updated since then and therefore they can continue to do amendments in a similar way moving forward. It was also explained that the Zoning Board of Adjustment and Capital Improvement Plan also are informed by the Master Plan.

Jeff agreed that it may be beneficial to have more time for the public to review the full draft. It was confirmed that the draft website interface will be made be accessible to the public and shared.

Bart confirmed that the regularly scheduled Planning Board meeting is August 11.

Kimberly Harris, 6 Lincoln Avenue, asked when the last rewrite was. It was confirmed to be in 2004, but reiterated there has been further updates and amendments to individual chapters. It was also confirmed that the previous Master Plan is on the website if people wished to compare.

Ms. Harris continued to ask what the larger things being changed in the Master Plan are when comparing the information.

The Chair further spoke to the past two years of work on the update, how each chapter had its own separate subcommittee, and items that no longer applied or were no longer relevant were removed. The draft for adoption includes editing for consistencies between chapters and creating cohesiveness throughout the document.

Bill commented that it depends on when an individual member of the public is interested in for what they overall may take away from the Master Plan.

Bart commented that links will be added to the department and Planning Board pages for people to be able to review the draft website, and that the PDF versions have been posted for review already. It was further explained that there are broad differences in chapters and contents between the previous comprehensive update and this one.

Zach confirmed that there could be a list formulated of old versus new chapter names and the different themes.

The Chair also noted that the Planning Board members and other board members will need to be updated, while also noting previous members, and the different chapter subcommittee members as well.

George Willant, 42 Schanda Drive, asked what the overall goal was for adopting the updated Master Plan; the Chair noted that the original goal was Spring 2026.

Bart recommended that it would be advisable to continue the hearing to August for comments, with the hope to adopt it at the next meeting.

Bill added that he would suggest the action items should be a prioritization for anyone in the public that is reviewing the Master Plan.

Zach added that the overall vision should be reviewed by the public as well, and that the board is otherwise comfortable with the document pending any public comments.

There was consensus that the August 11 continued hearing will guide when the final adoption would be.

Justin added that he does not foresee any major adjustments as well, therefore hoping for approval in August pending any minor changes.

Action

Motion: **Zach Shollar** motioned to continue the public comments for the Master Plan adoption to the regularly scheduled Planning Board meeting on August 11, 2026.

Second: **Bill Arcieri**

Discussion: None

Vote: **Approved 6-0-0**

- b. Pursuant to RSA 676:4 and Section 2.02 Design Review of Appendix B - Site Plans of the Municipal Code of the Town of Newmarket, New Hampshire, notice is hereby given that a design review application, requested by applicants Altus Engineering and Portsmouth Architects, representing Cheney East Company, will be reviewed by Planning Board to discuss and provide input on a development concept for a property located at 14 Elm Street, Tax Map U2, Lot 245 in the Village Corridor-Center District. The first concept proposes an apartment building with an 11,720 sf. footprint, comprising 20 dwelling units with 25 parking spaces with associated utilities and infrastructure. The application is on file in the Department of Planning and Community Development office located in the Newmarket Town Hall with an address of 186 Main Street.

The Chair read the above into the record, and explained that this is a design review with non-binding discussions. It will not be voted on, and is strictly a review meeting.

Jeff Goldknopf *recused himself from the discussion.*

Richard Desjardins, Portsmouth Architects, introduced himself with **Mark Gianniny**, Portsmouth Architects, and **Patrick Journeay**, Altus Engineering. The plan being presented can be found at: <https://newmarketnh.portal.civicclerk.com/event/2436/files/attachment/7909>.

Mr. Desjardins began by explaining that they were before the Board for a first design review in February for the redevelopment, and this plan is an addendum to that submittal. All dimensional reductions between the previous proposal and this proposal are provided in the documents submitted, including the reduction of about 2000 SF to the building footprint. The history of the site and neighborhood was reviewed with a previous two-story mill building extensively covering the site and surrounding land, drawing architectural and design inspiration from that. The design

includes a brick stair/elevator tower, and the building transitions to a mansard roof structure in the rear of the site toward Washington Street to break up the façade and have the building appear as separate multiple buildings. The revised design also preserves the largest and healthiest tree along Elm Street. It was explained that the lot is about 17000 SF, substantially larger than the minimum for the zone which is 3000 SF, which drives some of the relief requests. It was added that the lot size can accommodate and warrants a larger building for urban infill, with Nichols Avenue and Washington Street serving as the boundary to the R3 zoning district, which has also been identified in the proposed master plan as an area for zoning reevaluation to encourage a variety of housing affordability and diversity.

Mr. Desjardins continued to review key changes to the design, as follows: the Washington Street buildout request is eliminated; the parking garage is fully enclosed to conceal parking within the structure along with bikes, trash, tenant storage and mechanical space systems; 10' in building width has been removed to reduce the structure size; the pushing and pulling in the building has been increased so that no flat portions exceed the maximum 50' in length on Elm Street and 100' on Nichols Avenue; parking spaces have been reduced and provides one parking space per unit; setbacks have been increased to provide more landscaping; there will be a multi-functional bench to replace the current existing bus stop area; the project including diverse unit sizes ranging from 488 SF studio to a 1450 SF two-bedroom unit; community-based elements including a 1000 SF community rooftop deck for the building residents accessible by elevator, a sharable office space on the second floor, and a lounge area on the third floor; proposing a partial green roof to aid in stormwater retention and aid in the heat island effect; both the flat roof and mansard roof portions on the project being below the max building height of the neighboring zoning district to transition from the VC to R3 district; an overview that the site is a two minute walk to Main Street and four minute walk to central downtown areas, encouraging pedestrian activity of residents instead of vehicle traffic

Mr. Journeay further continued that since February, more survey information has been collected in regards to drainage and sidewalks. They also met with **Bart** and **Lyndsay** to discuss traffic, safety, and drainage elements. The current intent is to have vehicles enter the site on Elm Street and exit on Washington Street. The current design will also suggest relocation for crosswalks and rebuilding of ADA crosswalks, with landscaping proposed in between the building and sidewalk/crosswalk areas. Stormwater discharge would be redirected to the larger drainage pipe on Elm Street, and away from the current undersized pipe on Nichols Avenue and Washington Street. It was reiterated that the proposed green roof would also aid in slowing water flow. The utilities that will be proposed to connect in the site were also referenced.

Public comment opened at 8:05 PM.

Andrew Hart, 6 Lincoln Avenue, spoke to the property frontage on three streets; narrow streets with sidewalks only on Nichols Avenue; current challenges with Lincoln Avenue being a dead-end street as dump trucks have to back into the streets, and similar issue with plow trucks as well. Commented that the neighborhood is mainly a cluster of single family homes, duplexes, and colonial-type homes that have been converted into apartment units. Also commented on parking issues, as most homes have two cars. Continued that the neighborhood is of pedestrian streets with lots of activity. Regarding drainage, commented that Washington Avenue frequently floods, including in the winter when it floods and freezes. Disagrees with the proposed exit on Washington Street. Further described neighborhood; spoke to Master Plan, Transportation chapter calling for multi-modal streets which this development would go against, Disagrees that this would add affordable housing. In terms of the Resiliency chapter, it is a flood-prone area where this development would not help. Housing chapter highlights building in rural residential district, and disagreed that the VCC district definition and goals aligns with this proposal.

Jennifer Whitten, 16 Nichols Avenue, described that she lived in the neighborhood when she was in college and recently moved back. Spoke to the population density with about 40 dwelling units currently on Nichols Avenue, where this would add another 20 units. Overwhelmed by parking due to recreation activities, and especially when parking is full on Main Street. Trouble for emergency vehicles to pass as well. Concerned with visibility for sight distance. Appreciate historical information and details, but noted that there were not as many cars for cause of concern previously. Spoke to community in the neighborhood, lots of children, economic diversity, retirees, great range of different people. Concerned by the impact this will have on that community, addition of cars, pollution with stormwater and air pollution. Questions regarding impact to public safety, asked if four-plexes would be possible without impeding on sight-lines as much. Echoed concern regarding plows. Disagreed that it is consistent with neighborhood. Wondered what other proposal could support existing neighborhood instead of focusing on future tenants.

Bill Mitchell, 2 Lincoln Avenue, introduced how he has lived in the neighborhood for six years. Spoke to issues with trucks and maneuvering on the streets. Worried about only having one parking space per unit and how additional cars would be supported, causing issues for pedestrians and the police. Wants advancement and improvement, but believes this needs to be looked at more carefully.

Richie Reeves, 8 Lincoln Avenue, reviewed that he has lived in neighborhood since 2019. Spoke anecdotally regarding the neighborhood and the feeling of the town, worried about it becoming like Portsmouth and not bringing together community, changing Newmarket negatively.

Mike Mangan, owner of 10-12 Nichols Avenue, asked regarding the relief that would be needed for this proposal, and also regarding parking in the area and where/if it is allowed on the streets in the neighborhood.

Andrea McCurry, 13 ½ Nichols Avenue, spoke that she believes there is a more sensible way to approach the property and the development, and agreed with issues with parking and narrow roads, stating that the proposal does not fit in with the neighborhood and the area.

Alyssa Chase, 10 Nichols Avenue, agreed with the previous comments, spoke to previously living in Portsmouth and staying in Newmarket for the community and welcoming feeling. Does not like the design of the building, believes it would have a negative impact. Used to live on Spring Street where there was one parking space per unit which was very hard to manage.

John Carmichael, 44 Elm Street, asked regarding the bus station and the bench. It was confirmed that the bench would be covered. Spoke to how children wait at the bench for the school bus. Added that Nichols Avenue has been on the historic district for unique housing; commented that it would be a shame for the historicalness on the street to be overshadowed by this new building.

Donald Pelletier, 42 Elm Street, asked if the Master Plan would inform the new development, or if the development would have changes. It was clarified that the Master Plan is separate from the Zoning Ordinance; Master Plan is general visioning whereas developments are under the development regulations and zoning ordinance.

Brad Ritchie, 8 Washington Street, added the importance to carefully consider changes and how it impacts the greater neighborhood and town. Spoke to previous proposals that had previously been discussed.

Bob Daigle, 43 Elm Street, praised the plan but commented that if it could be reduced to therefore better fit the neighborhood.

Brian Michaelis, 41 Elm Street, introduced himself as a resident since 1984, commented on an environmental impact study for any proposal. Spoke to Rivermoor Landing history as well, sewage system and infrastructure, existing system is dilapidated and does not believe it could support this development. Commented on traffic in neighborhood as well and how this would add to it. Traffic study also urged.

Andrea McCurry, asked regarding the existing white house and how it was previously being renovated and why it is not being demolished.

Jennifer Whitten reiterated the question of what relief is being requested

Public comment closed at 8:45 PM.

Bart reviewed the relief being requested relative to the current zoning and design proposal. There will be Special Use Permits needed from the Planning Board, but no variances are needed from the Zoning Board of Adjustment based on the current design proposal. Explained that the building width maximum is 50' on Elm Street and 100' on Nichols Avenue, which the proposal exceeds and would require relief under the Special Use Permit. They are also proposing more than the maximum number of units per site, which is 16, therefore needing relief for that as well. The total units per building is also being exceeded. Building types are also listed in the zoning ordinance where this would be a different type than allowed, so relief can then also be requested through the Planning Board for that.

Bart continued to review the process. The proposal would next would go to the Technical Review Committee (TRC), which is open to the public but does not require notice and is not interactive with public comment. TRC will then submit a response letter to applicant after meeting, which is addressed in the formal submittal to Planning Board. The design is also reviewed by Town's consulting engineers at that stage.

The Chair also reiterated that maximum units per building is 8 units for this zone. Therefore it must meet the criteria of the Special Use Permit, which includes the building type. The Special Use Permit is an administrative decision of the Planning Board, which gives the Board authority to approve and modify.

Eric Weinrieb, Altus Engineering, commented regarding the design and the parking. State RSA only requires one space per dwelling unit, and more than the state minimum cannot be requested.

The Chair added that the zone also required no parking in the VCC zone, and therefore parking cannot be mandated.

Mr. Mangan asked on which streets parking is allowed. The Board referred to the Town parking ordinance for clarification.

Bart continued to review the staff report, which can be reviewed at: <https://newmarketnh.portal.civicclerk.com/event/2436/files/attachment/7933>. With the current proposal, the building length on Elm Street and Nichols Avenue would require relief. Relief would also be needed for

exceeding the 16-unit maximum units for a lot in the zone. The criteria for granting relief was reviewed under section 32-45 (f)(2).

Regarding section 32-45(f)(2), the Chair confirmed with the applicant that it is not a townhouse development.

Mr. Desjardins noted that a fiscal impact study and market analysis would be completed after this stage.

Discussion continued to the Special Use Permit requiring a community space as the focal point;

Mr. Desjardins pointed to the community rooftop deck, landscaping areas around street fronts, shared office spaces, and the development being direct walking distance to downtown.

Zach asked for clarification that it is focused on residents of development; this was confirmed.

Bart reviewed intent of district as written in ordinance. **Zach** commented how it is on boundary of the districts and also gateway to neighborhood, and that it could better meet the transition of the neighborhoods with that in mind.

Mr. Desjardins commented on the breaking up of the façade in order to try to meet that goal, that if the building were to be separated then it would meet the proposed lengths, and also that they are trying to meet the different abutting zoning areas with respect to the height.

Discussion ensued regarding if the lot could hypothetically be subdividable in order to meet the regulations, which would also require firewalls. The parking opening would not be allowed, therefore requiring more curb cuts and likely requiring a reduction in parking spaces for maneuverability. Overall, the same building would not be able to be achieved if it was subdivided, hypothetically.

Mr. Weinrieb added how additional stairs and elevators would also be needed in the hypothetical scenario, causing increased infrastructure costs.

Discussion continued to the previous proposal with three buildings; **Bill** confirmed that less relief would be needed for that proposal, as relief would not be needed for length of building.

Mr. Desjardins spoke to February meeting and the board not agreeing with the height of the buildings in that proposal, as well as that proposal having more impervious surfaces.

Zach spoke further to design and the amount of units, pointing to the courtyard style developments that the district envisioned. **Mr. Desjardins** also spoke to the minimum lot size and the property exceeding that, explaining that the lot lends to a building of the proposed size.

Bart referred back to special use permit for exceeding 16 units and the requirement for a focal point as a common/social space. Further discussion ensued regarding different scenarios and design context.

Zach commented further on location of lot and meeting the purpose of district, and mitigation of impacts that have been commented on tonight.

Jane also added concerns regarding the design, noting that the design does not fit the environment, being familiar with the neighborhood and having traffic concerns observationally.

Bill added concerns with density, and parking needs. The Chair reiterated that it could be built with no parking based on regulations. **Bill** continued to express issues with the proposed density and seeing an adverse impact, noting that he could agree if it was reduced to 16 units and did not exceed that maximum.

Justin noted that there is a market for people that rent without readily provided parking spaces. Noted concerns with flooding and driving in the neighborhood with the roads, and appreciates effort with incorporating parking.

Zach further commented on the sidewalk; advised extending sidewalk, and to have a drop off location and trash receptacles relocation. **Mr. Desjardins** agreed that it could be explored to relocate the trash. Commented on traffic, trying to keep traffic off of narrower streets. Items would help alleviate the relief request.

Mr. Desjardins concluded that the proposal is still a residential use in residential neighborhood. **Mr. Weinrieb** explained that formalizing crosswalks and sidewalks better through the proposal will increase safety and correct drainage, and that it is ADA accessible. They will be redirecting drainage to Elm Street to reduce public safety issue of flooding and icing in the winter as has been expressed. They will change the turning radius as well. Commented that they could explore adding a sidewalk along Nichols Avenue if it is preferred to add that for public safety benefit, but that this would take away some landscaping.

Bill asked for confirmation regarding stormwater; **Mr. Weinrieb** explained that they are only adding 2000 SF of additional impervious surface than what is currently on the site.

Discussion returned to the building type and if it is consistent with the zone. It was noted that the proposed type is more in line with a large Main Street building typology.

Zach agreed that it meets the VCC zone, and sees that they are trying to blend it in with neighborhood and typologies, but on a bigger scale. **Bill** agreed as well.

Discussion continued to review the setback and structure height consistency further. Sheet A9 was reviewed with it noted that the proposal is consistent as the building structure gets closer to the adjacent lots. It was noted that it is taller than adjacent lots by about 4-5' from peak to peak. It was also noted that providing the specific number will help clarify that further.

For the building length exceeding on Nichols Avenue and Elm Street, it was further explained that exceeding the length is due to trying to fit the parking.

Zach spoke to the impact of the size and building length relative to other impacts of the development.

The Board thanked the applicants and the public in conclusion of the discussion.

5. New/Old Business

a. Committee Reports

Consensus that there was nothing critical from committee reports at this time.

b. Planner's Report

Bart reported that the Town received a grant for Schanda Park planning. **Ivy Vann** will likely coming for presentation regarding HOP grant updates in September. A joint board and committee is trying to be planned to gather feedback and input for the wayfinding project, noting that members should keep an eye out for further communication. The CIP committee will start meeting in August. The Rosa-Folletts Brook project is on track for closing in October. The 200 New Road project is working through state process. A proposal for 37 Exeter Road will likely come before the Board soon, as well as one for 41 Exeter Road. A proposal at 3 North Main Street is pending. There will be a stormwater review for 5 Chapel Street likely in September.

Motion to extend the meeting close time past 10:00 PM made by Zach Shollar.

Motion seconded by Bill Arcieri.

Motion passed 6-0-0.

Bart continued that relief is going to be sought from the ZBA for 11 Creighton St, and then there will be a BLA request before the Planning Board. There will be a goal setting agenda for the Board planned soon as well.

c. Other Business

The Chair commented that members need to be careful posting anything on social media as active board members regarding any proposals before the Board.

6. Adjourn

Action

Motion: Jane Ford moved to adjourn the meeting at 10:02 PM.

Second: Justin Glazebrook

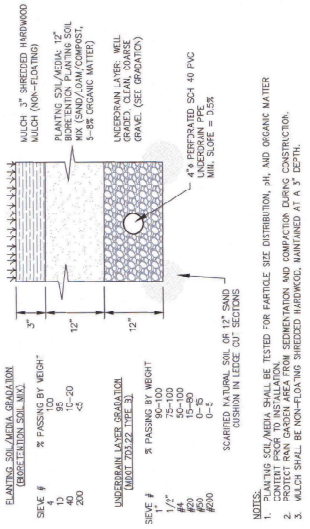
Discussion: None

Vote: Approved 6-0-0

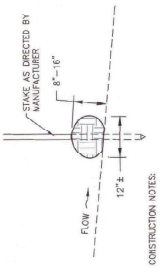
Respectfully submitted,
Bridgette Grotheer
Land Use Administrator

DCAT:

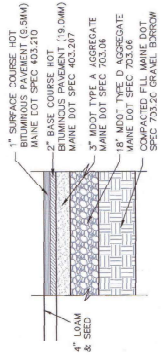
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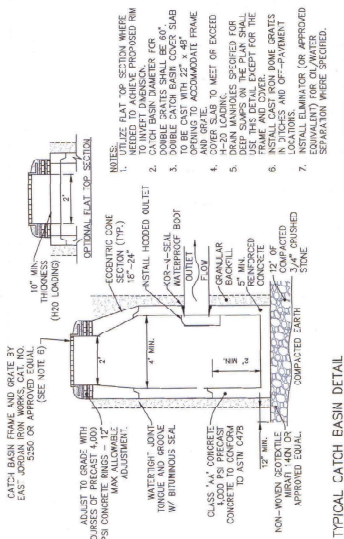
RAINGARDEN SECTION AND SOIL SPECIFICATIONS
NOT TO SCALE



TYPICAL CATCH BASIN DETAIL
NOT TO SCALE

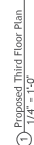


TYPICAL PAVEMENT SECTION
NOT TO SCALE



TYPICAL CATCH BASIN DETAIL
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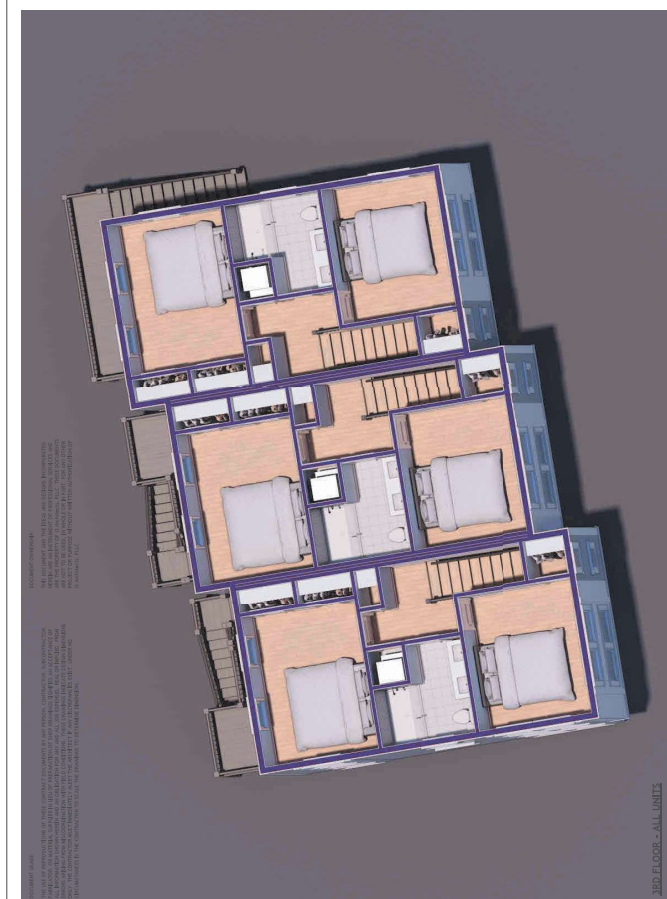






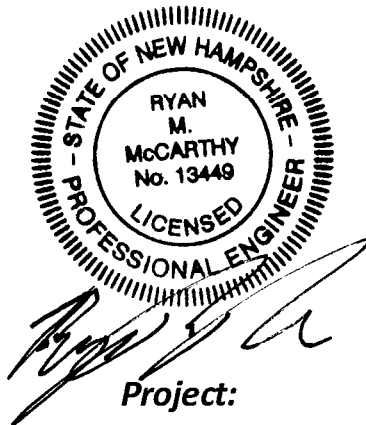






STORMWATER MANAGEMENT REPORT

July 21, 2026



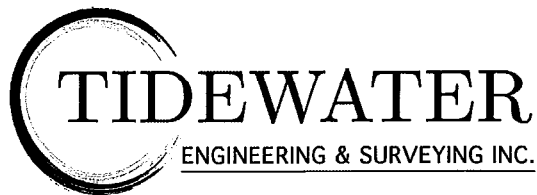
Project:

**37 Exeter Road Redevelopment
Tax Map U3 Lot 38
37 Exeter Road
Newmarket, NH 03857**

Prepared for:

**RKJ 37 Exeter LLC
3 Riverbend Road
Newmarket, NH 03857**

Prepared by:



**1021 Goodwin Road Unit 1
Eliot, Maine 03903**

Project No. 25-283

1. NARRATIVE

The purpose of this report is to evaluate the potential stormwater impacts associated with a proposed redevelopment on Tax Map U3, Lot 38 in Newmarket, New Hampshire. The applicant, RKJ 37 Exeter, LLC, seeks approval to construct three townhouse units. Site access will be provided from Exeter Road (NH Route 108).

The total lot size is approximately 4,450 square feet and is currently developed with a single-family residence and two driveways along NH Route 108. The remainder of the lot consists of previously disturbed lawn areas and retaining walls adjacent to an onsite stream. The proposed redevelopment will result in an additional 1,447 square feet of impervious surface.

Because the project will disturb more than 2,500 square feet within 100 feet of a stream, the Town of Newmarket requires a Stormwater Management Plan. The plan must demonstrate that post-development stormwater discharge will maintain existing drainage patterns and will not increase peak runoff rates during the 2-year, 10-year, 25-year, 50-year, and 100-year 24-hour storm events.

This report provides the calculations and documentation necessary to demonstrate compliance with these requirements.

2. SITE SOILS AND VEGETATIVE COVER

The York County Soil Survey, prepared by the USDA-NRCS, indicates the following soil types within the project subcatchment area:

Symbol	Soils Name, Type, & Slope	Hydrologic Soil Group
26B	Windsor loamy sand, 3 to 8 percent slopes	A
38B	Eldridge fine sandy loam, 0 to 3 percent slopes	C/D
43C	Canton fine sandy loam, 8 to 15 percent slopes, very stony	B
134	Maybid silt loam	C/D
140B	Chatfield-Hollis-Canton complex, 0 to 8 percent slopes, rocky	B
140C	Chatfield-Hollis-Canton complex, 8 to 15 percent slopes, rocky	B
140D	Chatfield-Hollis-Canton complex, 15 to 35 percent slope, rocky	B
510C	Hoosic gravelly fine sandy loam, 8 to 15 percent slopes	A
531B	Scio very fine sandy loam, 0 to 5 percent slopes	B/D
547B	Walpole very fine sandy loam, 3 to 8 percent slope, very stony	A/D
799	Urban land-Canton complex, 3 to 15 percent slopes	A

For purposes of this analysis, the conservative hydrologic soil group (HSG) value was used for all upland areas within the project drainage area. The Urban land–Canton complex consists primarily of well-drained soils with high infiltration capacity and low runoff potential; therefore, an HSG of A was assumed. See Appendix A for the Rockingham County Soil Survey data.

3. DESIGN METHODOLOGY

A computer-aided design software package, HydroCAD (v. 10.10), was used to model the pre-development and post-development hydrology of the stormwater runoff generated from the site. The model is based on the SCS TR-20 program and is subject to cumulative rainfall/volume dependent routing calculations. Hydrographs are prepared for each element of the watershed and routed through the storage-indication method to produce various time-based results.

Rainfall data for the various storm events was obtained from NOAA point precipitation frequency estimates for Newmarket, NH. (See Appendix H)

2-year 24-hour recurrence interval	3.28 inches
10-year 24-hour recurrence interval	5.25 inches
25-year 24-hour recurrence interval	6.48 inches
50-year 24-hour recurrence interval	7.38 inches
100-year 24-hour recurrence interval	8.37 inches

4. EXISTING DRAINAGE CONDITIONS

The analysis area for this report is shown on the Pre-Development Drainage Plan. The overall drainage area is divided into two existing subcatchments that establish the baseline pre-development flow conditions. These subcatchments are described below.

Subcatchment EX-1:

This subcatchment represents the watershed that drains to the onsite 30-inch HDPE culvert. The culvert conveys flow into the municipal drainage system, which ultimately outfalls to the Lamprey River. Portions of the subject property sheet-flow onto the adjacent parcel or directly into the onsite stream before entering the culvert. The culvert outlet was selected as the analysis point for this subcatchment (Node 1P).

Importantly, Subcatchment EX-1 captures runoff from a much larger contributing drainage area that includes multiple flow paths, surface conditions, and drainage features beyond the limits of the redevelopment footprint. Although these upstream systems influence how water reaches the culvert, the analysis focuses on the total flow reaching the culvert rather than attempting to model each upstream drainage component individually, consistent with Newmarket's stormwater standards.

Subcatchment EX-2:

This subcatchment includes the portion of the existing property that drains offsite toward Exeter Road (Route 108). This drainage area consists of portions of the existing driveways, roof runoff, and adjacent lawn areas.

Analysis Point Selection:

Because the site receives runoff from a large offsite contributing watershed in addition to onsite drainage, the hydrologic analysis separates flows into two distinct discharge points. Point 1P represents the combined runoff from the onsite watershed and the larger offsite drainage area that passes through the site and ultimately discharges toward the 30-inch HDPE culvert. Point 2P represents the portion of runoff that leaves the site in a different direction. For stormwater

compliance, the Analysis Point (AP) is defined as the combined total runoff from both 1P and 2P, representing all flow leaving the site under each storm event. Using the combined AP rather than the culvert alone ensures that the analysis provides an accurate baseline for comparing pre- and post-development flows and for determining whether the proposed increase in impervious area has the potential to affect culvert performance or downstream conveyance.

5. PROPOSED DRAINAGE CONDITIONS

The analysis area for the proposed conditions is shown on the Post-Development Drainage Plan. The overall drainage area is divided into four proposed subcatchments that reflect the updated grading, stormwater routing, and treatment systems associated with the redevelopment. These subcatchments are described below.

Subcatchment PR-1:

PR-1 represents the large upstream watershed that continues to drain toward the onsite stream and existing 30-inch HDPE culvert (Node 1P). Consistent with Newmarket's stormwater standards, PR-1 includes all offsite contributing drainage that passes through the property.

Under proposed conditions, PR-1 contains no new impervious area. The portions of roof and pavement that previously contributed to this drainage area have been reassigned to PR-3 and PR-4. PR-1 is therefore composed entirely of pervious onsite lawn area combined with the substantial upstream watershed. Because PR-1 is dominated by offsite flow, the reduction in onsite contributing area has only a minimal influence on peak discharge at the culvert.

Subcatchment PR-2:

PR-2 includes the portion of the site that continues to drain toward Exeter Road (Route 108). Proposed grading reduces the contributing area to PR-2, resulting in lower runoff to the roadway outlet (Node 2P).

Subcatchment PR-3:

PR-3 consists of a portion of roof runoff on the south side of the building, new pavement, and adjacent lawn area that is collected and directed to the proposed rain garden (Pond 3P). This subcatchment represents the treated portion of the site's new impervious area.

Subcatchment PR-4:

PR-4 represents the northerly portion of roof runoff collected by gutters and routed directly to the outlet control structure (OCS).

6. ANALYSIS AND RESULTS

The total contributing drainage area to the primary outlet (1P) remains substantially larger than the area draining toward the roadway outlet (2P), and the added impervious surface represents a very small percentage of the overall watershed area draining to 1P.

The reduction in contributing area to PR-1 and PR-2, combined with the detention and controlled release provided by PR-3 and PR-4, produces lower peak discharge rates at both analysis points. A slight increase in total runoff volume occurs due to the redistribution of

contributing areas; however, this increase is minor and is effectively mitigated by the attenuation provided through the rain garden and outlet control structure.

Pond 3P is a proposed rain garden designed to receive runoff from Subcatchment PR-3, which includes portions of roof area, new pavement, and adjacent lawn surfaces. Runoff from the roof and pavement is first directed to a catch basin equipped with a hooded outlet designed to limit oils and floatable pollutants from entering downstream systems. From the catch basin, collected runoff is routed to Pond 3P where it is temporarily stored, filtered, and released in a controlled manner. The rain garden provides approximately six inches of ponding depth prior to overflow and includes an underdrain system that conveys treated flow to an outlet control structure (OCS).

The OCS is equipped with an overflow grate and an outlet pipe that discharges to the onsite stream, which ultimately flows through the existing 30-inch culvert at Node 1P. Subcatchment PR-4, consisting solely of roof runoff, is routed directly to the OCS. This configuration ensures that pavement runoff, typically containing higher pollutant loads, receives water-quality treatment within Pond 3P through vegetation, root-zone filtration, and transpiration processes. An enhanced vegetated buffer is located between the rain garden and the stream, providing additional separation and protection for the receiving water.

Under existing conditions, runoff from the site sheet-flows directly toward the stream without pretreatment or storage. Routing a portion of the site's runoff through the raingarden (Pond 3P) significantly improves stormwater management by reducing unmanaged flow, enhancing water-quality treatment, and providing a more stable and protective discharge regime to the stream and downstream municipal system.

The tables below summarize the comparative results of the HydroCAD analysis for the 2-year, 10-year, 25-year, 50-year, 100-year 24-hour storm event.

Table 1: Pre- and Post- Development Peak Discharge Comparison (AP) (24-Hour Storms)

24-Hour Storm Event	PRE (cfs)	POST (cfs)	Change (+/-) (cfs)
2-year	40.67	40.62	-0.05
10-year	126.14	126.02	-0.12
25-year	189.34	189.16	-0.18
50-year	238.25	238.03	-0.22
100-year	293.85	293.58	-0.27

Table 2: Pre- and Post- Development Runoff Volume Comparison (AP) (24-Hour Storms)

24-Hour Storm Event	PRE (cf)	POST (cf)	Change (+/-) (cf)
2-year	562,701	562,747	+46 (0.008%)
10-year	1,540,564	1,540,640	+76 (0.005%)
25-year	2,261,495	2,261,585	+90 (0.004%)
50-year	2,823,415	2,823,513	+98 (0.0035%)
100-year	3,466,649	3,466,755	+106 (0.003%)



7. CONCLUSIONS

This stormwater report provides a comparative analysis of the peak stormwater runoff and runoff volume generated from the site under existing and proposed conditions. The analysis demonstrates that post-development peak discharges remain at or below existing levels for all evaluated storm events, and that the projected increase in runoff volume is de minimis.

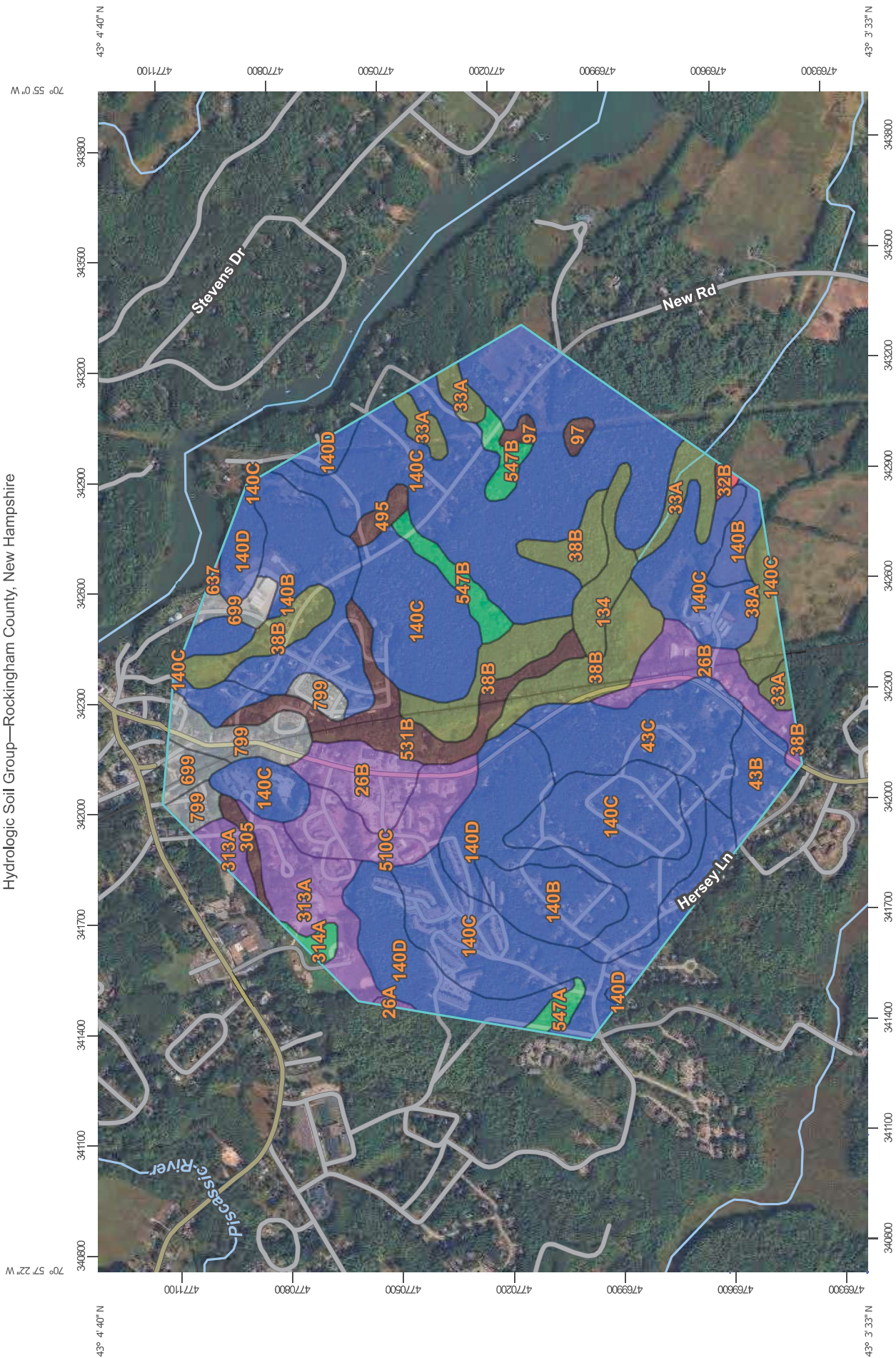
Based on this analysis, it is the opinion of Tidewater Engineering & Surveying, Inc. that the proposed development will not adversely impact or increase flooding on abutting properties. The proposed stormwater improvements will enhance the overall stormwater function of the site relative to existing conditions.

STORMWATER MANAGEMENT REPORT
PROJECT: 37 EXETER ROAD REDEVELOPMENT
LOCATION: 37 EXETER ROAD, NEWMARKET, NH



Appendix A

USDA-NRCS Soils Map



Map Scale: 1:14,700 if printed on A landscape (11" x 8.5") sheet.



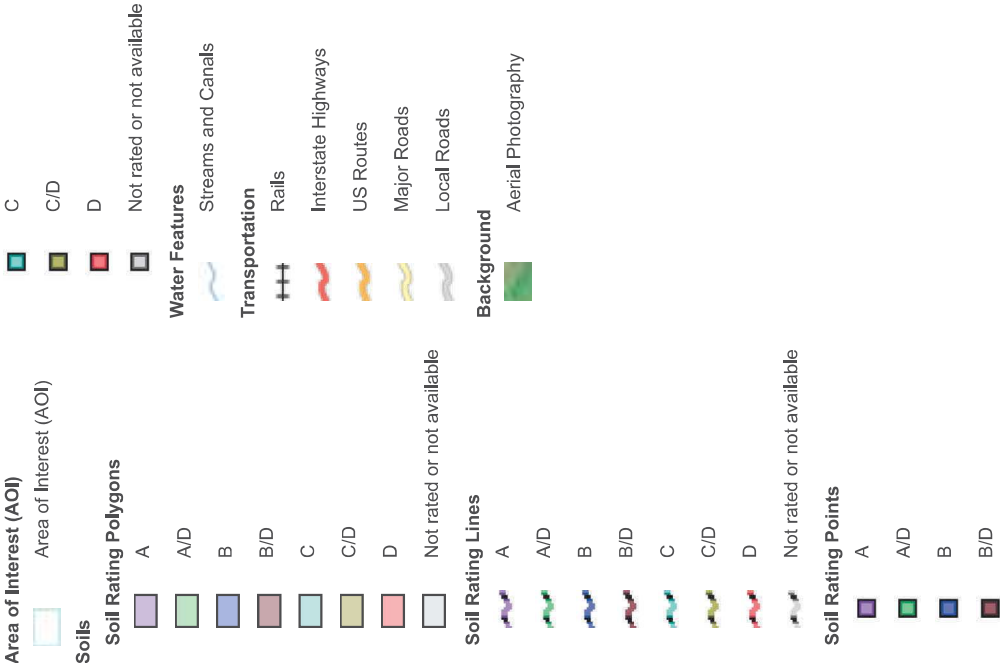
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84



Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

MAP LEGEND



MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL: <https://websoilsurvey.sc.egov.usda.gov/>

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Rockingham County, New Hampshire

Survey Area Data: Version 28, Sep 9, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 19, 2020—Sep 20, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
26A	Windsor loamy sand, 0 to 3 percent slopes	A	0.6	0.1%
26B	Windsor loamy sand, 3 to 8 percent slopes	A	26.8	4.6%
32B	Boxford silt loam, 3 to 8 percent slopes	D	0.9	0.2%
33A	Scitico silt loam, 0 to 5 percent slopes	C/D	14.6	2.5%
38A	Eldridge fine sandy loam, 0 to 3 percent slopes	C/D	6.9	1.2%
38B	Eldridge fine sandy loam, 3 to 8 percent slopes	C/D	42.2	7.2%
43B	Canton fine sandy loam, 0 to 8 percent slopes, very stony	B	9.3	1.6%
43C	Canton fine sandy loam, 8 to 15 percent slopes, very stony	B	29.8	5.1%
97	Freetown and Natchaug mucky peats, ponded, 0 to 2 percent slopes	B/D	2.8	0.5%
134	Maybid silt loam	C/D	8.7	1.5%
140B	Chatfield-Hollis-Canton complex, 0 to 8 percent slopes, rocky	B	50.6	8.7%
140C	Chatfield-Hollis-Canton complex, 8 to 15 percent slopes, rocky	B	217.2	37.3%
140D	Chatfield-Hollis-Canton complex, 15 to 35 percent slopes, rocky	B	65.9	11.3%
305	Lim-Pootatuck complex	B/D	2.7	0.5%
313A	Deerfield loamy fine sand, 0 to 3 percent slopes	A	21.8	3.7%
314A	Pipestone sand, 0 to 5 percent slopes	A/D	2.0	0.3%
495	Natchaug mucky peat, 0 to 2 percent slopes	B/D	2.9	0.5%
510C	Hoosic gravelly fine sandy loam, 8 to 15 percent slopes	A	18.6	3.2%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
531B	Scio very fine sandy loam, 0 to 5 percent slopes	B/D	20.6	3.5%
547A	Walpole very fine sandy loam, 0 to 3 percent slopes, very stony	A/D	2.5	0.4%
547B	Walpole very fine sandy loam, 3 to 8 percent slopes, very stony	A/D	9.9	1.7%
637	Great Bay silt loam, 0 to 1 meter water depth	D	0.4	0.1%
699	Urban land		8.2	1.4%
799	Urban land-Canton complex, 3 to 15 percent slopes		16.5	2.8%
Totals for Area of Interest			582.5	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Appendix B

NOAA Point Precipitation Frequency Estimates for Newmarket, NH



NOAA Atlas 14, Volume 10, Version 3
Location name: Newmarket, New Hampshire, USA*
Latitude: 43.0753°, Longitude: -70.9384°
Elevation: 22 ft**
 * source: ESRI Maps
 ** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

[PF_tabular](#) | [PF_graphical](#) | [Maps & aeriels](#)

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches) ¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.306 (0.241-0.389)	0.367 (0.289-0.468)	0.467 (0.367-0.598)	0.551 (0.430-0.709)	0.666 (0.502-0.894)	0.752 (0.556-1.03)	0.843 (0.604-1.20)	0.946 (0.640-1.37)	1.09 (0.710-1.64)	1.22 (0.770-1.86)
10-min	0.433 (0.342-0.552)	0.520 (0.410-0.663)	0.663 (0.520-0.847)	0.781 (0.610-1.00)	0.944 (0.712-1.27)	1.07 (0.787-1.46)	1.20 (0.855-1.70)	1.34 (0.906-1.94)	1.55 (1.01-2.32)	1.72 (1.09-2.63)
15-min	0.509 (0.402-0.649)	0.612 (0.482-0.781)	0.780 (0.612-0.998)	0.919 (0.717-1.18)	1.11 (0.837-1.49)	1.25 (0.926-1.72)	1.40 (1.01-2.00)	1.58 (1.06-2.29)	1.82 (1.18-2.73)	2.03 (1.28-3.10)
30-min	0.691 (0.545-0.881)	0.829 (0.654-1.06)	1.06 (0.828-1.35)	1.24 (0.970-1.60)	1.50 (1.13-2.02)	1.70 (1.25-2.33)	1.90 (1.36-2.71)	2.14 (1.44-3.10)	2.48 (1.61-3.71)	2.76 (1.75-4.22)
60-min	0.873 (0.689-1.11)	1.05 (0.825-1.34)	1.33 (1.05-1.70)	1.57 (1.22-2.02)	1.89 (1.43-2.55)	2.14 (1.58-2.94)	2.40 (1.72-3.41)	2.69 (1.82-3.91)	3.13 (2.03-4.69)	3.49 (2.21-5.34)
2-hr	1.15 (0.914-1.46)	1.39 (1.10-1.76)	1.78 (1.41-2.27)	2.11 (1.66-2.70)	2.56 (1.94-3.42)	2.89 (2.15-3.96)	3.25 (2.35-4.63)	3.68 (2.49-5.30)	4.32 (2.81-6.44)	4.87 (3.09-7.40)
3-hr	1.35 (1.08-1.70)	1.64 (1.30-2.07)	2.11 (1.67-2.67)	2.50 (1.97-3.18)	3.04 (2.32-4.05)	3.43 (2.57-4.69)	3.86 (2.81-5.50)	4.38 (2.98-6.30)	5.18 (3.37-7.69)	5.85 (3.72-8.86)
6-hr	1.75 (1.40-2.20)	2.14 (1.71-2.68)	2.77 (2.21-3.48)	3.29 (2.61-4.17)	4.01 (3.08-5.33)	4.54 (3.41-6.17)	5.12 (3.74-7.25)	5.82 (3.97-8.32)	6.90 (4.51-10.2)	7.82 (4.99-11.8)
12-hr	2.22 (1.79-2.76)	2.72 (2.19-3.40)	3.55 (2.85-4.44)	4.24 (3.38-5.33)	5.18 (4.00-6.84)	5.88 (4.44-7.94)	6.64 (4.88-9.34)	7.56 (5.17-10.7)	8.98 (5.89-13.2)	10.2 (6.52-15.2)
24-hr	2.63 (2.13-3.25)	3.28 (2.66-4.07)	4.36 (3.52-5.42)	5.25 (4.21-6.56)	6.48 (5.03-8.52)	7.38 (5.62-9.95)	8.37 (6.21-11.8)	9.62 (6.60-13.6)	11.6 (7.62-16.9)	13.3 (8.54-19.7)
2-day	2.92 (2.38-3.59)	3.75 (3.05-4.61)	5.10 (4.14-6.30)	6.22 (5.01-7.72)	7.76 (6.08-10.2)	8.88 (6.82-12.0)	10.1 (7.62-14.3)	11.8 (8.12-16.6)	14.5 (9.57-21.1)	16.9 (10.9-25.0)
3-day	3.16 (2.59-3.88)	4.06 (3.31-4.97)	5.51 (4.49-6.78)	6.72 (5.44-8.31)	8.38 (6.59-11.0)	9.59 (7.40-12.9)	11.0 (8.26-15.5)	12.8 (8.80-17.9)	15.8 (10.4-22.8)	18.5 (11.9-27.1)
4-day	3.41 (2.80-4.16)	4.33 (3.55-5.29)	5.84 (4.76-7.16)	7.08 (5.74-8.74)	8.80 (6.93-11.5)	10.1 (7.77-13.5)	11.5 (8.66-16.1)	13.3 (9.21-18.6)	16.5 (10.9-23.7)	19.3 (12.4-28.2)
7-day	4.13 (3.41-5.02)	5.09 (4.19-6.20)	6.67 (5.47-8.14)	7.97 (6.49-9.78)	9.77 (7.72-12.7)	11.1 (8.58-14.7)	12.5 (9.49-17.5)	14.5 (10.0-20.1)	17.7 (11.7-25.3)	20.6 (13.3-30.0)
10-day	4.82 (3.99-5.84)	5.82 (4.80-7.05)	7.44 (6.12-9.05)	8.79 (7.18-10.7)	10.6 (8.42-13.7)	12.0 (9.30-15.8)	13.5 (10.2-18.6)	15.5 (10.7-21.3)	18.6 (12.4-26.5)	21.4 (13.9-31.1)
20-day	6.82 (5.67-8.20)	7.92 (6.58-9.53)	9.72 (8.04-11.7)	11.2 (9.21-13.6)	13.3 (10.5-16.8)	14.8 (11.4-19.2)	16.4 (12.3-22.1)	18.3 (12.8-25.1)	21.2 (14.2-30.0)	23.6 (15.3-34.0)
30-day	8.42 (7.03-10.1)	9.61 (8.02-11.5)	11.6 (9.60-13.9)	13.2 (10.9-15.9)	15.4 (12.2-19.3)	17.1 (13.2-21.9)	18.8 (14.0-24.9)	20.7 (14.5-28.2)	23.3 (15.6-32.8)	25.3 (16.5-36.4)
45-day	10.4 (8.71-12.4)	11.7 (9.78-14.0)	13.8 (11.5-16.5)	15.5 (12.9-18.7)	17.9 (14.2-22.4)	19.8 (15.3-25.2)	21.7 (16.0-28.3)	23.5 (16.6-31.8)	25.9 (17.4-36.2)	27.6 (18.0-39.5)
60-day	12.0 (10.1-14.3)	13.4 (11.2-16.0)	15.6 (13.1-18.7)	17.5 (14.5-21.0)	20.0 (15.9-24.9)	22.0 (17.0-27.8)	24.0 (17.7-31.1)	25.8 (18.2-34.8)	28.0 (18.9-39.1)	29.6 (19.3-42.2)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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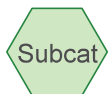
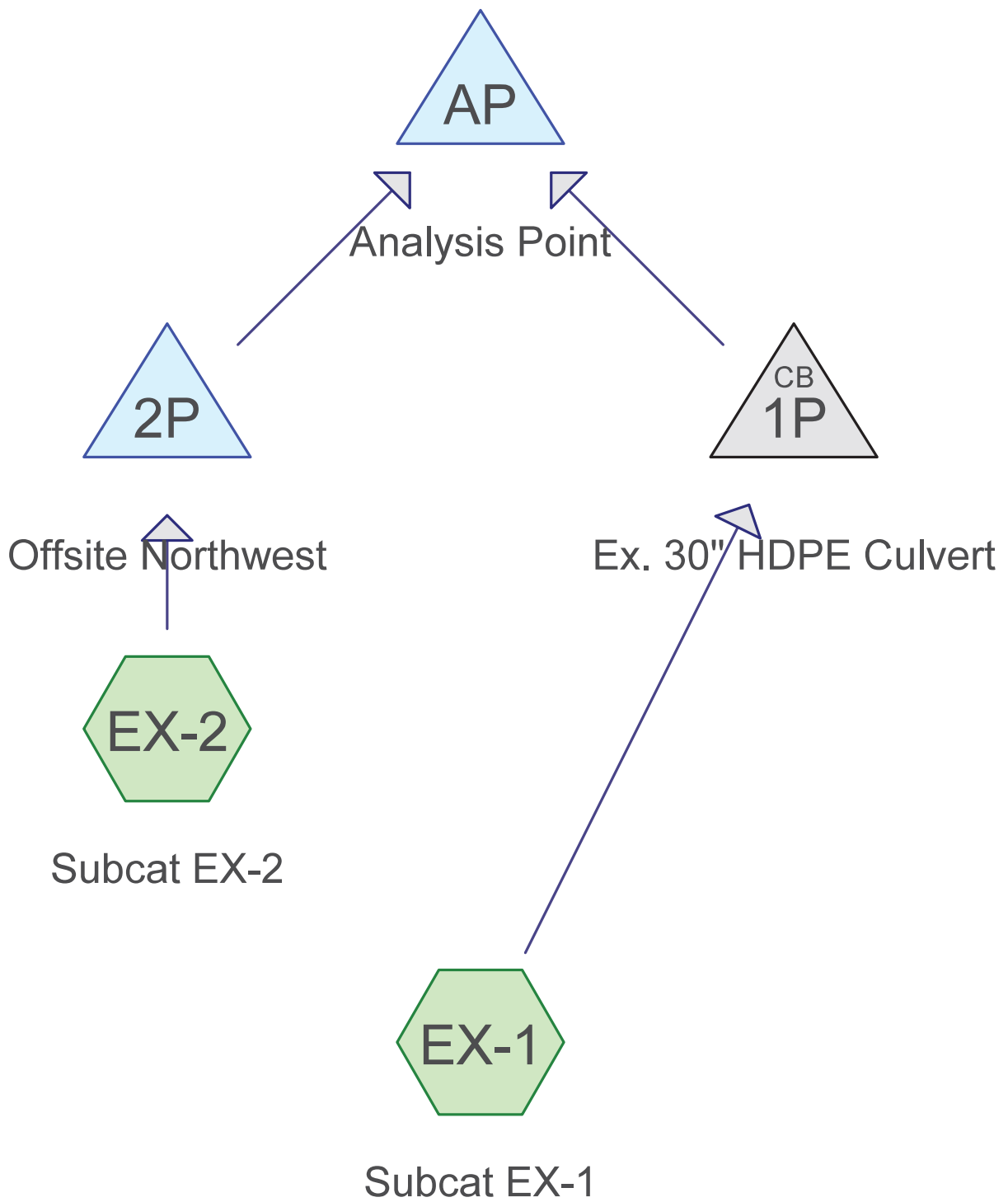
PF graphical

STORMWATER MANAGEMENT REPORT
PROJECT: 37 EXETER ROAD REDEVELOPMENT
LOCATION: 37 EXETER ROAD, NEWMARKET, NH



Appendix C

Pre-Development HydroCAD Results



Subcat



Reach



Pond



Link

Routing Diagram for HyroCAD Transfer_Existing

Prepared by Tidewater Engineering & Survey, Printed 7/21/2026
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HydroCAD_Transfer_Existing

Type III 24-hr 2-Year Rainfall=3.28"

Prepared by Tidewater Engineering & Survey

Printed 7/21/2026

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EX-1: Subcat EX-1 Runoff Area=9,652,091 sf 19.01% Impervious Runoff Depth>0.70"
Flow Length=3,647' Tc=116.5 min CN=67 Runoff=40.62 cfs 562,543 cf

Subcatchment EX-2: Subcat EX-2 Runoff Area=0.036 ac 40.03% Impervious Runoff Depth>1.21"
Tc=6.0 min CN=76 Runoff=0.05 cfs 158 cf

Pond 1P: Ex. 30" HDPE Culvert Peak Elev=16.12' Inflow=40.62 cfs 562,543 cf
30.0" Round Culvert n=0.013 L=86.0' S=0.0160 ' ' Outflow=40.62 cfs 562,543 cf

Pond 2P: Offsite Northwest Inflow=0.05 cfs 158 cf
Primary=0.05 cfs 158 cf

Pond AP: Analysis Point Inflow=40.62 cfs 562,702 cf
Primary=40.62 cfs 562,702 cf

Total Runoff Area = 9,653,664 sf Runoff Volume = 562,702 cf Average Runoff Depth = 0.70"
80.99% Pervious = 7,818,294 sf 19.01% Impervious = 1,835,370 sf

HydroCAD_Transfer_Existing

Type III 24-hr 2-Year Rainfall=3.28"

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Summary for Subcatchment EX-1: Subcat EX-1

Runoff = 40.62 cfs @ 13.77 hrs, Volume= 562,543 cf, Depth> 0.70"
Routed to Pond 1P : Ex. 30" HDPE Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.28"

HydroCAD_Transfer_Existing

Type III 24-hr 2-Year Rainfall=3.28"

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Area (sf)	CN	Description
437	98	Roofs, HSG B
13,211	98	Roofs, HSG B
8,596	98	Roofs, HSG B
1,186	61	>75% Grass cover, Good, HSG B
600	61	>75% Grass cover, Good, HSG B
39,154	68	1 acre lots, 20% imp, HSG B
88,435	68	1 acre lots, 20% imp, HSG B
74,087	68	1 acre lots, 20% imp, HSG B
690	55	Woods, Good, HSG B
10,761	55	Woods, Good, HSG B
93	55	Woods, Good, HSG B
10,389	98	Paved roads w/curbs & sewers, HSG B
1,915	68	1 acre lots, 20% imp, HSG B
1,667	55	Woods, Good, HSG B
488,623	55	Woods, Good, HSG B
36,722	68	1 acre lots, 20% imp, HSG B
72,394	68	1 acre lots, 20% imp, HSG B
42,303	68	1 acre lots, 20% imp, HSG B
7,954	98	Paved roads w/curbs & sewers, HSG B
4,350	98	Paved roads w/curbs & sewers, HSG B
2,815	98	Paved roads w/curbs & sewers, HSG B
9,429	98	Paved roads w/curbs & sewers, HSG B
51,724	98	Paved roads w/curbs & sewers, HSG B
5,639	98	Roofs, HSG B
1,092	55	Woods, Good, HSG B
15,566	98	Paved roads w/curbs & sewers, HSG B
10,532	55	Woods, Good, HSG B
712	55	Woods, Good, HSG B
20,047	84	1 acre lots, 20% imp, HSG D
155,579	77	Woods, Good, HSG D
4,541	98	Paved roads w/curbs & sewers, HSG D
7,022	84	1 acre lots, 20% imp, HSG D
8,723	98	Roofs, HSG B
576	98	Roofs, HSG B
14,042	98	Roofs, HSG B
4,034	98	Roofs, HSG B
16,403	98	Roofs, HSG B
9,511	98	Roofs, HSG B
1,877	98	Roofs, HSG B
4,717	98	Roofs, HSG B
13,129	98	Roofs, HSG B
7,317	98	Roofs, HSG B
11,285	98	Roofs, HSG B
582	61	>75% Grass cover, Good, HSG B
25,528	61	>75% Grass cover, Good, HSG B
54,038	61	>75% Grass cover, Good, HSG B
36,696	68	1 acre lots, 20% imp, HSG B
42,920	68	1 acre lots, 20% imp, HSG B
98,325	55	Woods, Good, HSG B
57,352	55	Woods, Good, HSG B
110,966	55	Woods, Good, HSG B

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Type III 24-hr 2-Year Rainfall=3.28"

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51	98	Paved roads w/curbs & sewers, HSG B
13,662	98	Paved roads w/curbs & sewers, HSG B
182,904	98	Paved roads w/curbs & sewers, HSG B
57	61	>75% Grass cover, Good, HSG B
62,503	55	Woods, Good, HSG B
2,710	68	1 acre lots, 20% imp, HSG B
8,636	98	Paved roads w/curbs & sewers, HSG B
1,673	98	Paved roads w/curbs & sewers, HSG B
6,338	98	Paved roads w/curbs & sewers, HSG B
12,602	98	Paved roads w/curbs & sewers, HSG B
17,167	68	1 acre lots, 20% imp, HSG B
2,389	68	1 acre lots, 20% imp, HSG B
88,957	68	1 acre lots, 20% imp, HSG B
151,346	68	1 acre lots, 20% imp, HSG B
148,516	68	1 acre lots, 20% imp, HSG B
63,026	68	1 acre lots, 20% imp, HSG B
122,963	55	Woods, Good, HSG B
93,469	55	Woods, Good, HSG B
83,227	68	1 acre lots, 20% imp, HSG B
40,984	68	1 acre lots, 20% imp, HSG B
26,764	68	1 acre lots, 20% imp, HSG B
0	55	Woods, Good, HSG B
7,639	98	Paved roads w/curbs & sewers, HSG B
240,621	55	Woods, Good, HSG B
432	55	Woods, Good, HSG B
9,356	68	1 acre lots, 20% imp, HSG B
28,682	68	1 acre lots, 20% imp, HSG B
77,538	68	1 acre lots, 20% imp, HSG B
72,866	55	Woods, Good, HSG B
1	55	Woods, Good, HSG B
25,054	55	Woods, Good, HSG B
10,579	98	Paved roads w/curbs & sewers, HSG B
1,871	98	Paved roads w/curbs & sewers, HSG B
228,105	55	Woods, Good, HSG B
10,612	98	Roofs, HSG A
2,814	98	Roofs, HSG A
4,636	98	Roofs, HSG A
4,484	98	Roofs, HSG A
3,906	98	Roofs, HSG A
4,863	98	Roofs, HSG A
3,009	98	Roofs, HSG A
6,117	98	Roofs, HSG A
1,488	98	Roofs, HSG A
6,760	98	Roofs, HSG A
2,404	39	>75% Grass cover, Good, HSG A
3,772	39	>75% Grass cover, Good, HSG A
14,346	39	>75% Grass cover, Good, HSG A
5,038	39	>75% Grass cover, Good, HSG A
2,099	39	>75% Grass cover, Good, HSG A
12,640	39	>75% Grass cover, Good, HSG A
5,858	39	>75% Grass cover, Good, HSG A
12,157	39	>75% Grass cover, Good, HSG A

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1,549	39	>75% Grass cover, Good, HSG A
4,123	39	>75% Grass cover, Good, HSG A
2,558	39	>75% Grass cover, Good, HSG A
7,360	39	>75% Grass cover, Good, HSG A
14	51	1 acre lots, 20% imp, HSG A
37,651	51	1 acre lots, 20% imp, HSG A
39,967	51	1 acre lots, 20% imp, HSG A
2,959	30	Woods, Good, HSG A
585	30	Woods, Good, HSG A
2	30	Woods, Good, HSG A
16,384	30	Woods, Good, HSG A
13,607	30	Woods, Good, HSG A
1,576	30	Woods, Good, HSG A
424	39	>75% Grass cover, Good, HSG A
56	39	>75% Grass cover, Good, HSG A
2,604	39	>75% Grass cover, Good, HSG A
1,995	39	>75% Grass cover, Good, HSG A
677	39	>75% Grass cover, Good, HSG A
48,051	30	Woods, Good, HSG A
9,600	30	Woods, Good, HSG A
8,066	30	Woods, Good, HSG A
253,052	98	Paved roads w/curbs & sewers, HSG A
1,260	84	1 acre lots, 20% imp, HSG D
4,120	84	1 acre lots, 20% imp, HSG D
21,593	84	1 acre lots, 20% imp, HSG D
2,295	84	1 acre lots, 20% imp, HSG D
28,307	84	1 acre lots, 20% imp, HSG D
64,402	84	1 acre lots, 20% imp, HSG D
5,614	84	1 acre lots, 20% imp, HSG D
53	84	1 acre lots, 20% imp, HSG D
7,502	84	1 acre lots, 20% imp, HSG D
322	84	1 acre lots, 20% imp, HSG D
16	84	1 acre lots, 20% imp, HSG D
2,454	98	Paved roads w/curbs & sewers, HSG D
809	84	1 acre lots, 20% imp, HSG D
30,622	84	1 acre lots, 20% imp, HSG D
9,979	84	1 acre lots, 20% imp, HSG D
3,867	77	Woods, Good, HSG D
9,461	98	Paved roads w/curbs & sewers, HSG B
254	98	Paved roads w/curbs & sewers, HSG B
6,306	98	Paved roads w/curbs & sewers, HSG D
234	98	Paved roads w/curbs & sewers, HSG D
35,895	98	Paved roads w/curbs & sewers, HSG B
8,154	98	Paved roads w/curbs & sewers, HSG B
8,906	98	Paved roads w/curbs & sewers, HSG D
9,293	98	Paved roads w/curbs & sewers, HSG D
1,920	98	Paved roads w/curbs & sewers, HSG D
60,038	77	Woods, Good, HSG D
509	55	Woods, Good, HSG B
54,291	55	Woods, Good, HSG B
557,510	77	Woods, Good, HSG D
5,727	61	>75% Grass cover, Good, HSG B

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Type III 24-hr 2-Year Rainfall=3.28"

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4,242	68	1 acre lots, 20% imp, HSG B
43,411	68	1 acre lots, 20% imp, HSG B
4,608	68	1 acre lots, 20% imp, HSG B
56,607	68	1 acre lots, 20% imp, HSG B
17,779	55	Woods, Good, HSG B
6	55	Woods, Good, HSG B
61	55	Woods, Good, HSG B
187,750	55	Woods, Good, HSG B
1,002,408	55	Woods, Good, HSG B
12,536	98	Paved roads w/curbs & sewers, HSG B
3,415	98	Paved roads w/curbs & sewers, HSG B
2,284	98	Paved roads w/curbs & sewers, HSG B
11,562	98	Paved roads w/curbs & sewers, HSG B
2,273	68	1 acre lots, 20% imp, HSG B
3,550	98	Roofs, HSG A
2,631	98	Roofs, HSG A
861	98	Roofs, HSG A
13,650	98	Roofs, HSG A
7,476	98	Roofs, HSG A
537	98	Roofs, HSG A
3,465	98	Roofs, HSG A
15,193	98	Roofs, HSG A
2,952	98	Roofs, HSG A
3,464	98	Roofs, HSG A
4,080	98	Roofs, HSG A
93	98	Roofs, HSG A
1,116	98	Roofs, HSG A
6,583	98	Roofs, HSG A
9,239	39	>75% Grass cover, Good, HSG A
3,977	39	>75% Grass cover, Good, HSG A
38,172	39	>75% Grass cover, Good, HSG A
1,736	39	>75% Grass cover, Good, HSG A
53	39	>75% Grass cover, Good, HSG A
1,105	39	>75% Grass cover, Good, HSG A
4,186	39	>75% Grass cover, Good, HSG A
12,418	51	1 acre lots, 20% imp, HSG A
16,668	51	1 acre lots, 20% imp, HSG A
3,821	30	Woods, Good, HSG A
57,181	30	Woods, Good, HSG A
133,510	30	Woods, Good, HSG A
4,993	30	Woods, Good, HSG A
18,270	30	Woods, Good, HSG A
32,716	30	Woods, Good, HSG A
178,233	98	Paved roads w/curbs & sewers, HSG A
432,430	77	Woods, Good, HSG D
35,854	51	1 acre lots, 20% imp, HSG A
41,562	51	1 acre lots, 20% imp, HSG A
9,365	51	1 acre lots, 20% imp, HSG A
7,853	51	1 acre lots, 20% imp, HSG A
2,030	30	Woods, Good, HSG A
22,235	98	Paved roads w/curbs & sewers, HSG A
16,573	51	1 acre lots, 20% imp, HSG A

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Type III 24-hr 2-Year Rainfall=3.28"

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48,142	84	1 acre lots, 20% imp, HSG D
82,862	84	1 acre lots, 20% imp, HSG D
107,107	55	Woods, Good, HSG B
64,489	55	Woods, Good, HSG B
161,213	77	Woods, Good, HSG D
11	77	Woods, Good, HSG D
9	77	Woods, Good, HSG D
7,658	77	Woods, Good, HSG D
10,130	77	Woods, Good, HSG D
9,432	77	Woods, Good, HSG D
10,637	84	1 acre lots, 20% imp, HSG D
24,993	84	1 acre lots, 20% imp, HSG D
16,376	98	Paved roads w/curbs & sewers, HSG D
36,187	68	1 acre lots, 20% imp, HSG B
2,087	68	1 acre lots, 20% imp, HSG B
168,797	68	1 acre lots, 20% imp, HSG B
685	68	1 acre lots, 20% imp, HSG B
64,239	98	Paved roads w/curbs & sewers, HSG B
1,661	68	1 acre lots, 20% imp, HSG B
17,363	68	1 acre lots, 20% imp, HSG B
10,929	68	1 acre lots, 20% imp, HSG B
14,136	68	1 acre lots, 20% imp, HSG B
4,514	68	1 acre lots, 20% imp, HSG B
36,441	68	1 acre lots, 20% imp, HSG B
77,643	68	1 acre lots, 20% imp, HSG B
39,968	68	1 acre lots, 20% imp, HSG B
43,173	68	1 acre lots, 20% imp, HSG B
71,299	68	1 acre lots, 20% imp, HSG B
7,700	55	Woods, Good, HSG B
3,535	55	Woods, Good, HSG B
209,319	55	Woods, Good, HSG B
117,840	55	Woods, Good, HSG B
17	55	Woods, Good, HSG B
4,089	98	Roofs, HSG B
7,799	98	Roofs, HSG B
190	98	Roofs, HSG B
39,268	98	Paved roads w/curbs & sewers, HSG B
6,377	68	1 acre lots, 20% imp, HSG B
8,138	68	1 acre lots, 20% imp, HSG B
1,606	55	Woods, Good, HSG B
9,576	55	Woods, Good, HSG B
80,241	55	Woods, Good, HSG B
0	55	Woods, Good, HSG B
11	55	Woods, Good, HSG B
0	55	Woods, Good, HSG B
148,448	55	Woods, Good, HSG B
2,056	61	>75% Grass cover, Good, HSG B
191	68	1 acre lots, 20% imp, HSG B
137,438	68	1 acre lots, 20% imp, HSG B
28,368	68	1 acre lots, 20% imp, HSG B
29,743	68	1 acre lots, 20% imp, HSG B
25,401	68	1 acre lots, 20% imp, HSG B

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Type III 24-hr 2-Year Rainfall=3.28"

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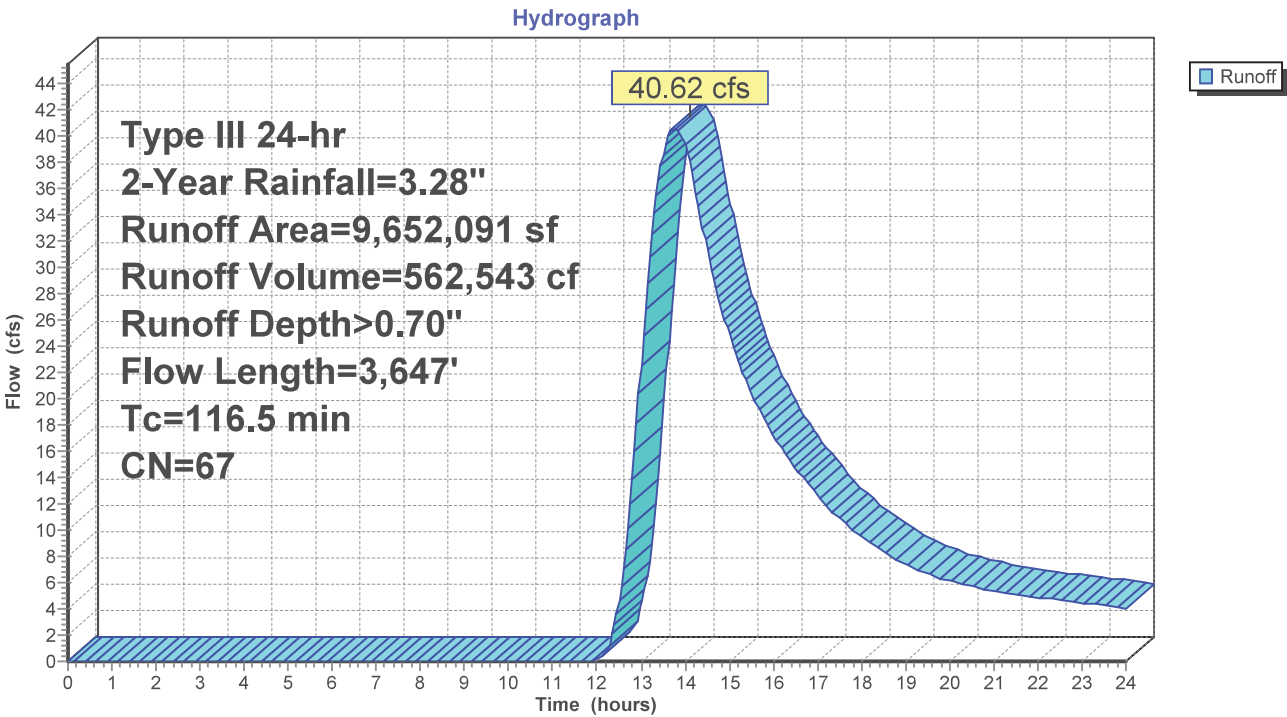
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34,695	68	1 acre lots, 20% imp, HSG B
151	68	1 acre lots, 20% imp, HSG B
2,028	68	1 acre lots, 20% imp, HSG B
4,562	68	1 acre lots, 20% imp, HSG B
683	68	1 acre lots, 20% imp, HSG B
15,767	68	1 acre lots, 20% imp, HSG B
13,153	68	1 acre lots, 20% imp, HSG B
301	68	1 acre lots, 20% imp, HSG B
38,195	68	1 acre lots, 20% imp, HSG B
2,684	61	>75% Grass cover, Good, HSG B
117	98	Paved roads w/curbs & sewers, HSG B
906	98	Roofs, HSG B
9,652,091	67	Weighted Average
7,817,350		80.99% Pervious Area
1,834,740		19.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.0	100	0.0100	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.28"
15.1	700	0.0240	0.77		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
30.0	623	0.0048	0.35		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
33.2	961	0.0093	0.48		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
10.2	1,263	0.0190	2.07		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
116.5	3,647	Total			

Subcatchment EX-1: Subcat EX-1



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Type III 24-hr 2-Year Rainfall=3.28"

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Summary for Subcatchment EX-2: Subcat EX-2

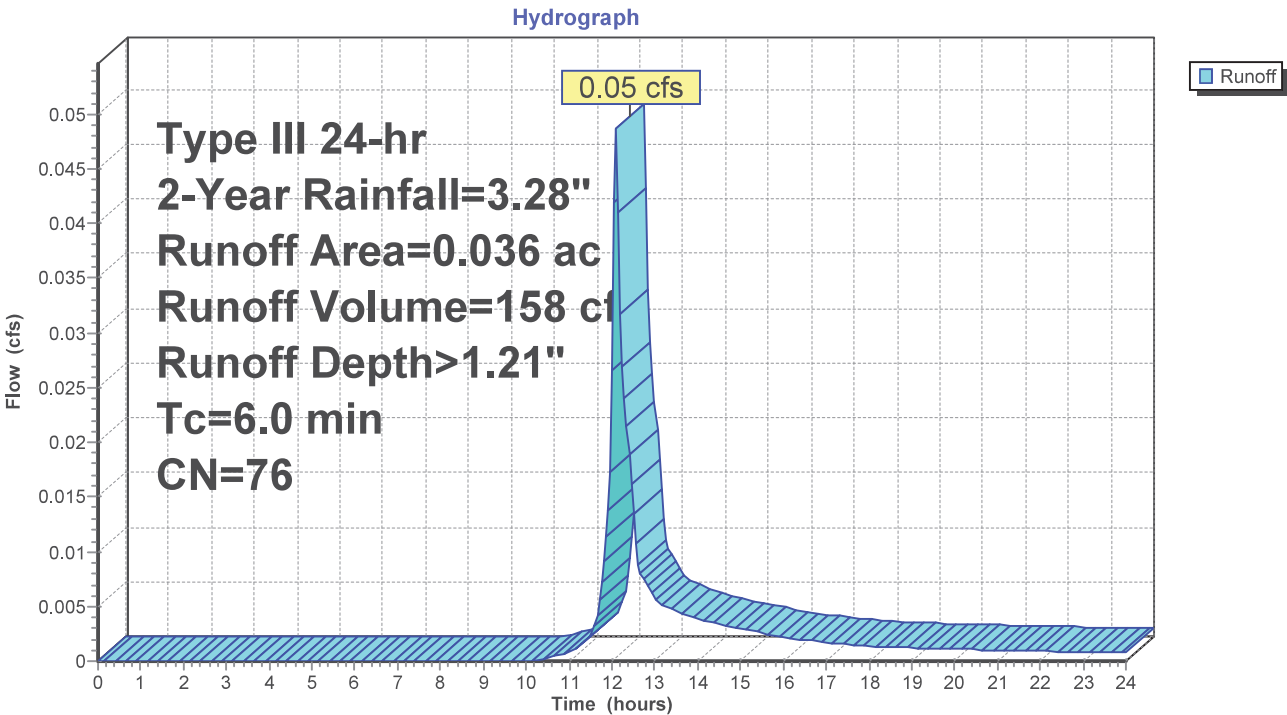
Runoff = 0.05 cfs @ 12.10 hrs, Volume= 158 cf, Depth> 1.21"
Routed to Pond 2P : Offsite Northwest

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.28"

Area (ac)	CN	Description
0.022	61	>75% Grass cover, Good, HSG B
0.000	68	1 acre lots, 20% imp, HSG B
0.006	98	Paved roads w/curbs & sewers, HSG B
0.009	98	Roofs, HSG B
0.036	76	Weighted Average
0.022		59.97% Pervious Area
0.014		40.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment EX-2: Subcat EX-2



Summary for Pond 1P: Ex. 30" HDPE Culvert

[57] Hint: Peaked at 16.12' (Flood elevation advised)

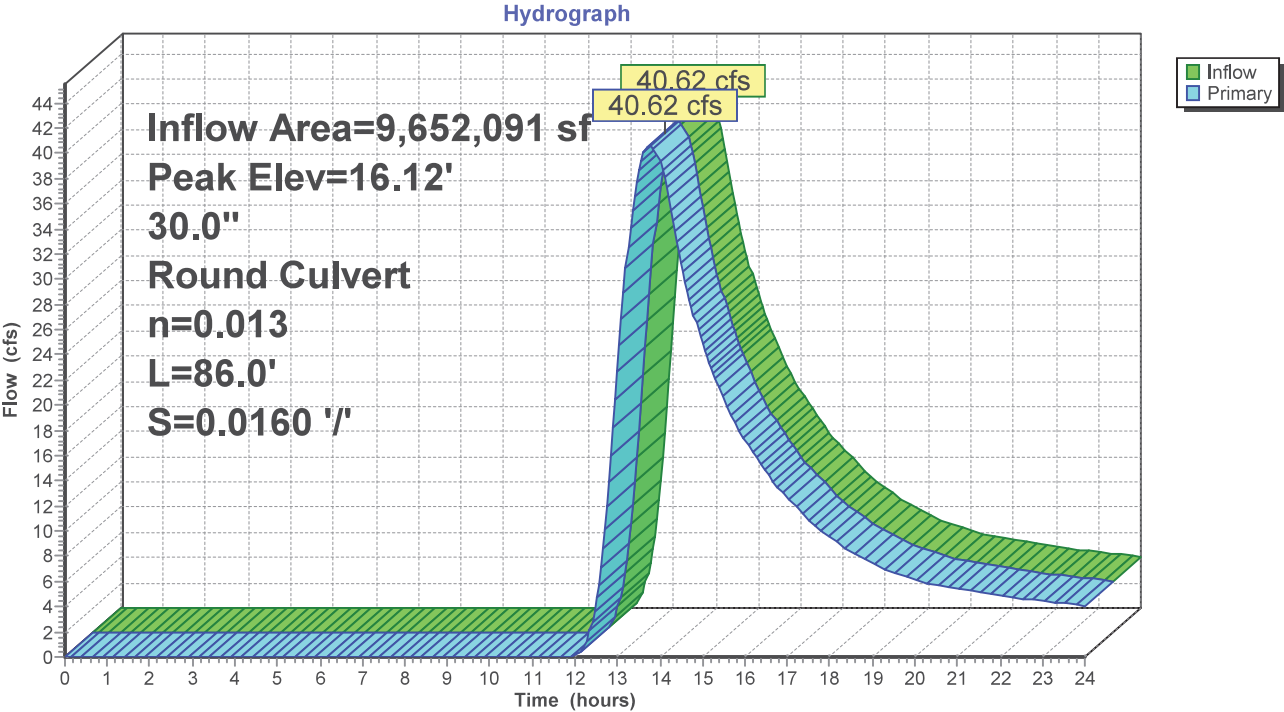
Inflow Area = 9,652,091 sf, 19.01% Impervious, Inflow Depth > 0.70" for 2-Year event
Inflow = 40.62 cfs @ 13.77 hrs, Volume= 562,543 cf
Outflow = 40.62 cfs @ 13.77 hrs, Volume= 562,543 cf, Atten= 0%, Lag= 0.0 min
Primary = 40.62 cfs @ 13.77 hrs, Volume= 562,543 cf
Routed to Pond AP : Analysis Point

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 16.12' @ 13.77 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	11.92'	30.0" Round Culvert L= 86.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 11.92' / 10.54' S= 0.0160 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=40.61 cfs @ 13.77 hrs HW=16.12' (Free Discharge)
↑1=Culvert (Inlet Controls 40.61 cfs @ 8.27 fps)

Pond 1P: Ex. 30" HDPE Culvert



Summary for Pond 2P: Offsite Northwest

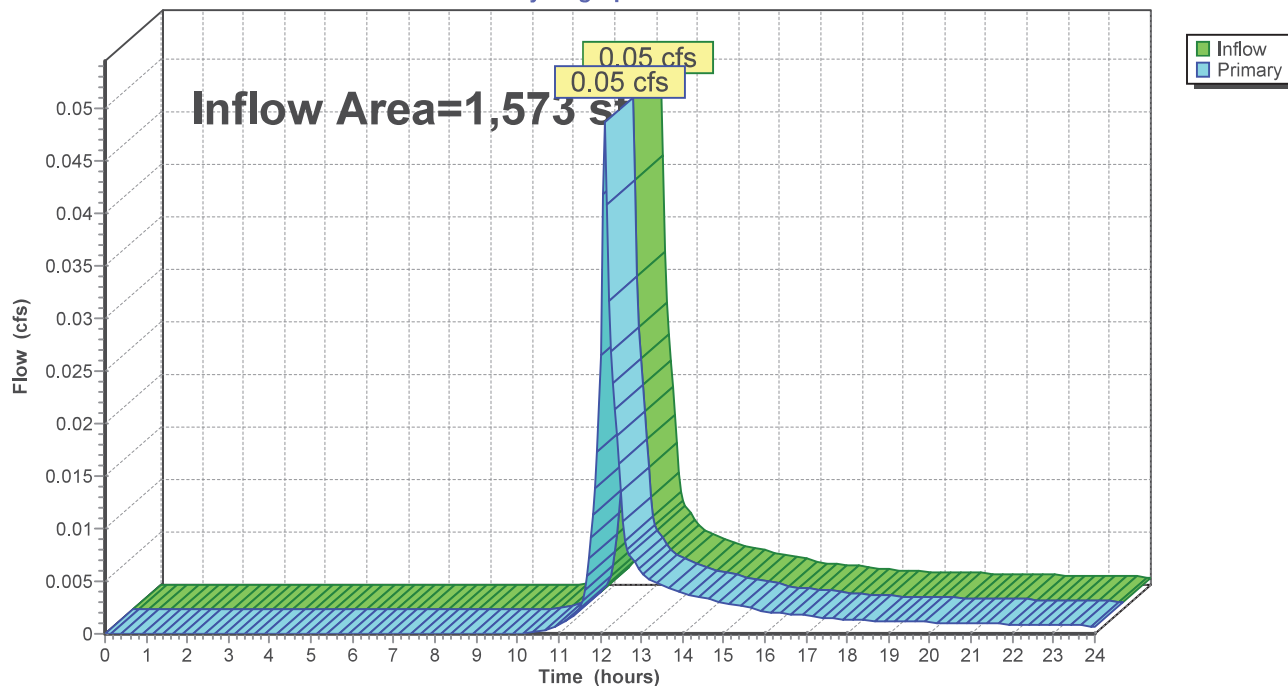
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1,573 sf, 40.03% Impervious, Inflow Depth > 1.21" for 2-Year event
 Inflow = 0.05 cfs @ 12.10 hrs, Volume= 158 cf
 Primary = 0.05 cfs @ 12.10 hrs, Volume= 158 cf, Atten= 0%, Lag= 0.0 min
 Routed to Pond AP : Analysis Point

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 2P: Offsite Northwest

Hydrograph

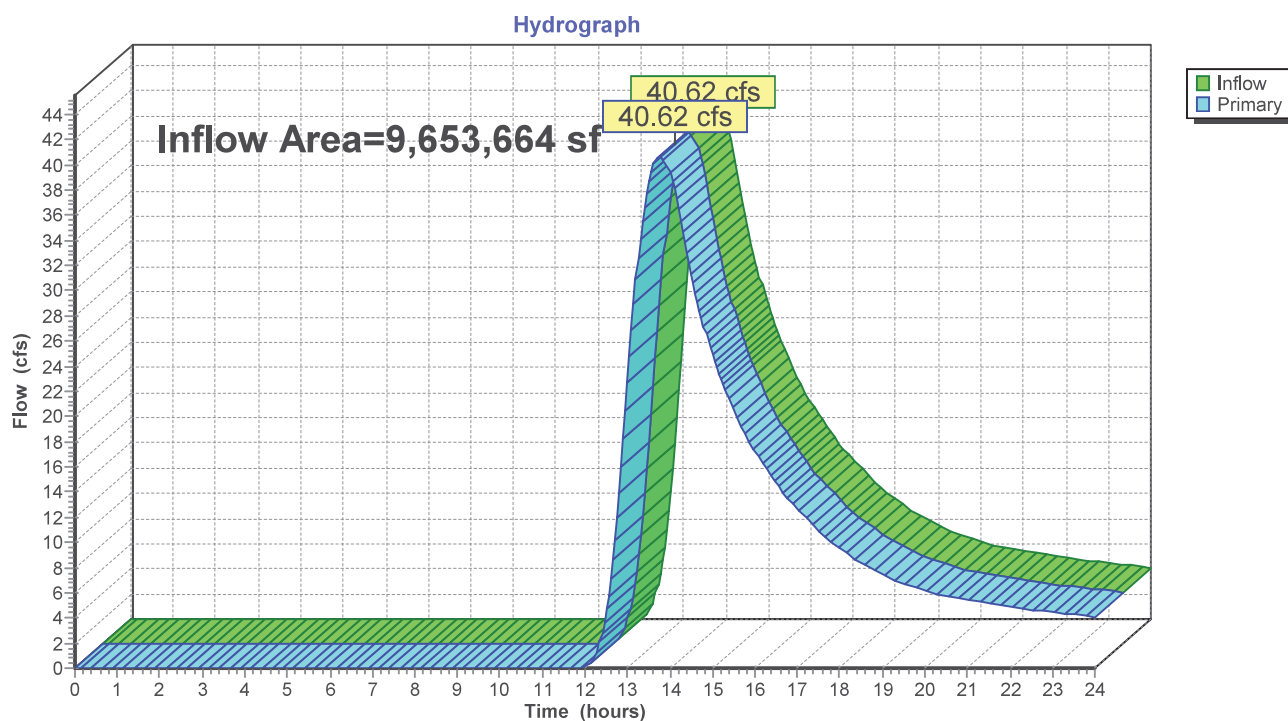


Summary for Pond AP: Analysis Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 9,653,664 sf, 19.01% Impervious, Inflow Depth > 0.70" for 2-Year event
Inflow = 40.62 cfs @ 13.77 hrs, Volume= 562,702 cf
Primary = 40.62 cfs @ 13.77 hrs, Volume= 562,702 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond AP: Analysis Point

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Type III 24-hr 10-Year Rainfall=5.25"

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EX-1: Subcat EX-1 Runoff Area=9,652,091 sf 19.01% Impervious Runoff Depth>1.91"
Flow Length=3,647' Tc=116.5 min CN=67 Runoff=126.03 cfs 1,540,205 cf

Subcatchment EX-2: Subcat EX-2 Runoff Area=0.036 ac 40.03% Impervious Runoff Depth>2.74"
Tc=6.0 min CN=76 Runoff=0.11 cfs 359 cf

Pond 1P: Ex. 30" HDPE Culvert Peak Elev=41.60' Inflow=126.03 cfs 1,540,205 cf
30.0" Round Culvert n=0.013 L=86.0' S=0.0160 '/' Outflow=126.03 cfs 1,540,205 cf

Pond 2P: Offsite Northwest Inflow=0.11 cfs 359 cf
Primary=0.11 cfs 359 cf

Pond AP: Analysis Point Inflow=126.04 cfs 1,540,564 cf
Primary=126.04 cfs 1,540,564 cf

Total Runoff Area = 9,653,664 sf Runoff Volume = 1,540,564 cf Average Runoff Depth = 1.92"
80.99% Pervious = 7,818,294 sf 19.01% Impervious = 1,835,370 sf

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Type III 24-hr 10-Year Rainfall=5.25"

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Summary for Subcatchment EX-1: Subcat EX-1

Runoff = 126.03 cfs @ 13.61 hrs, Volume= 1,540,205 cf, Depth> 1.91"
Routed to Pond 1P : Ex. 30" HDPE Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.25"

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Type III 24-hr 10-Year Rainfall=5.25"

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Area (sf)	CN	Description
437	98	Roofs, HSG B
13,211	98	Roofs, HSG B
8,596	98	Roofs, HSG B
1,186	61	>75% Grass cover, Good, HSG B
600	61	>75% Grass cover, Good, HSG B
39,154	68	1 acre lots, 20% imp, HSG B
88,435	68	1 acre lots, 20% imp, HSG B
74,087	68	1 acre lots, 20% imp, HSG B
690	55	Woods, Good, HSG B
10,761	55	Woods, Good, HSG B
93	55	Woods, Good, HSG B
10,389	98	Paved roads w/curbs & sewers, HSG B
1,915	68	1 acre lots, 20% imp, HSG B
1,667	55	Woods, Good, HSG B
488,623	55	Woods, Good, HSG B
36,722	68	1 acre lots, 20% imp, HSG B
72,394	68	1 acre lots, 20% imp, HSG B
42,303	68	1 acre lots, 20% imp, HSG B
7,954	98	Paved roads w/curbs & sewers, HSG B
4,350	98	Paved roads w/curbs & sewers, HSG B
2,815	98	Paved roads w/curbs & sewers, HSG B
9,429	98	Paved roads w/curbs & sewers, HSG B
51,724	98	Paved roads w/curbs & sewers, HSG B
5,639	98	Roofs, HSG B
1,092	55	Woods, Good, HSG B
15,566	98	Paved roads w/curbs & sewers, HSG B
10,532	55	Woods, Good, HSG B
712	55	Woods, Good, HSG B
20,047	84	1 acre lots, 20% imp, HSG D
155,579	77	Woods, Good, HSG D
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576	98	Roofs, HSG B
14,042	98	Roofs, HSG B
4,034	98	Roofs, HSG B
16,403	98	Roofs, HSG B
9,511	98	Roofs, HSG B
1,877	98	Roofs, HSG B
4,717	98	Roofs, HSG B
13,129	98	Roofs, HSG B
7,317	98	Roofs, HSG B
11,285	98	Roofs, HSG B
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25,528	61	>75% Grass cover, Good, HSG B
54,038	61	>75% Grass cover, Good, HSG B
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42,920	68	1 acre lots, 20% imp, HSG B
98,325	55	Woods, Good, HSG B
57,352	55	Woods, Good, HSG B
110,966	55	Woods, Good, HSG B

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51	98	Paved roads w/curbs & sewers, HSG B
13,662	98	Paved roads w/curbs & sewers, HSG B
182,904	98	Paved roads w/curbs & sewers, HSG B
57	61	>75% Grass cover, Good, HSG B
62,503	55	Woods, Good, HSG B
2,710	68	1 acre lots, 20% imp, HSG B
8,636	98	Paved roads w/curbs & sewers, HSG B
1,673	98	Paved roads w/curbs & sewers, HSG B
6,338	98	Paved roads w/curbs & sewers, HSG B
12,602	98	Paved roads w/curbs & sewers, HSG B
17,167	68	1 acre lots, 20% imp, HSG B
2,389	68	1 acre lots, 20% imp, HSG B
88,957	68	1 acre lots, 20% imp, HSG B
151,346	68	1 acre lots, 20% imp, HSG B
148,516	68	1 acre lots, 20% imp, HSG B
63,026	68	1 acre lots, 20% imp, HSG B
122,963	55	Woods, Good, HSG B
93,469	55	Woods, Good, HSG B
83,227	68	1 acre lots, 20% imp, HSG B
40,984	68	1 acre lots, 20% imp, HSG B
26,764	68	1 acre lots, 20% imp, HSG B
0	55	Woods, Good, HSG B
7,639	98	Paved roads w/curbs & sewers, HSG B
240,621	55	Woods, Good, HSG B
432	55	Woods, Good, HSG B
9,356	68	1 acre lots, 20% imp, HSG B
28,682	68	1 acre lots, 20% imp, HSG B
77,538	68	1 acre lots, 20% imp, HSG B
72,866	55	Woods, Good, HSG B
1	55	Woods, Good, HSG B
25,054	55	Woods, Good, HSG B
10,579	98	Paved roads w/curbs & sewers, HSG B
1,871	98	Paved roads w/curbs & sewers, HSG B
228,105	55	Woods, Good, HSG B
10,612	98	Roofs, HSG A
2,814	98	Roofs, HSG A
4,636	98	Roofs, HSG A
4,484	98	Roofs, HSG A
3,906	98	Roofs, HSG A
4,863	98	Roofs, HSG A
3,009	98	Roofs, HSG A
6,117	98	Roofs, HSG A
1,488	98	Roofs, HSG A
6,760	98	Roofs, HSG A
2,404	39	>75% Grass cover, Good, HSG A
3,772	39	>75% Grass cover, Good, HSG A
14,346	39	>75% Grass cover, Good, HSG A
5,038	39	>75% Grass cover, Good, HSG A
2,099	39	>75% Grass cover, Good, HSG A
12,640	39	>75% Grass cover, Good, HSG A
5,858	39	>75% Grass cover, Good, HSG A
12,157	39	>75% Grass cover, Good, HSG A

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1,549	39	>75% Grass cover, Good, HSG A
4,123	39	>75% Grass cover, Good, HSG A
2,558	39	>75% Grass cover, Good, HSG A
7,360	39	>75% Grass cover, Good, HSG A
14	51	1 acre lots, 20% imp, HSG A
37,651	51	1 acre lots, 20% imp, HSG A
39,967	51	1 acre lots, 20% imp, HSG A
2,959	30	Woods, Good, HSG A
585	30	Woods, Good, HSG A
2	30	Woods, Good, HSG A
16,384	30	Woods, Good, HSG A
13,607	30	Woods, Good, HSG A
1,576	30	Woods, Good, HSG A
424	39	>75% Grass cover, Good, HSG A
56	39	>75% Grass cover, Good, HSG A
2,604	39	>75% Grass cover, Good, HSG A
1,995	39	>75% Grass cover, Good, HSG A
677	39	>75% Grass cover, Good, HSG A
48,051	30	Woods, Good, HSG A
9,600	30	Woods, Good, HSG A
8,066	30	Woods, Good, HSG A
253,052	98	Paved roads w/curbs & sewers, HSG A
1,260	84	1 acre lots, 20% imp, HSG D
4,120	84	1 acre lots, 20% imp, HSG D
21,593	84	1 acre lots, 20% imp, HSG D
2,295	84	1 acre lots, 20% imp, HSG D
28,307	84	1 acre lots, 20% imp, HSG D
64,402	84	1 acre lots, 20% imp, HSG D
5,614	84	1 acre lots, 20% imp, HSG D
53	84	1 acre lots, 20% imp, HSG D
7,502	84	1 acre lots, 20% imp, HSG D
322	84	1 acre lots, 20% imp, HSG D
16	84	1 acre lots, 20% imp, HSG D
2,454	98	Paved roads w/curbs & sewers, HSG D
809	84	1 acre lots, 20% imp, HSG D
30,622	84	1 acre lots, 20% imp, HSG D
9,979	84	1 acre lots, 20% imp, HSG D
3,867	77	Woods, Good, HSG D
9,461	98	Paved roads w/curbs & sewers, HSG B
254	98	Paved roads w/curbs & sewers, HSG B
6,306	98	Paved roads w/curbs & sewers, HSG D
234	98	Paved roads w/curbs & sewers, HSG D
35,895	98	Paved roads w/curbs & sewers, HSG B
8,154	98	Paved roads w/curbs & sewers, HSG B
8,906	98	Paved roads w/curbs & sewers, HSG D
9,293	98	Paved roads w/curbs & sewers, HSG D
1,920	98	Paved roads w/curbs & sewers, HSG D
60,038	77	Woods, Good, HSG D
509	55	Woods, Good, HSG B
54,291	55	Woods, Good, HSG B
557,510	77	Woods, Good, HSG D
5,727	61	>75% Grass cover, Good, HSG B

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4,242	68	1 acre lots, 20% imp, HSG B
43,411	68	1 acre lots, 20% imp, HSG B
4,608	68	1 acre lots, 20% imp, HSG B
56,607	68	1 acre lots, 20% imp, HSG B
17,779	55	Woods, Good, HSG B
6	55	Woods, Good, HSG B
61	55	Woods, Good, HSG B
187,750	55	Woods, Good, HSG B
1,002,408	55	Woods, Good, HSG B
12,536	98	Paved roads w/curbs & sewers, HSG B
3,415	98	Paved roads w/curbs & sewers, HSG B
2,284	98	Paved roads w/curbs & sewers, HSG B
11,562	98	Paved roads w/curbs & sewers, HSG B
2,273	68	1 acre lots, 20% imp, HSG B
3,550	98	Roofs, HSG A
2,631	98	Roofs, HSG A
861	98	Roofs, HSG A
13,650	98	Roofs, HSG A
7,476	98	Roofs, HSG A
537	98	Roofs, HSG A
3,465	98	Roofs, HSG A
15,193	98	Roofs, HSG A
2,952	98	Roofs, HSG A
3,464	98	Roofs, HSG A
4,080	98	Roofs, HSG A
93	98	Roofs, HSG A
1,116	98	Roofs, HSG A
6,583	98	Roofs, HSG A
9,239	39	>75% Grass cover, Good, HSG A
3,977	39	>75% Grass cover, Good, HSG A
38,172	39	>75% Grass cover, Good, HSG A
1,736	39	>75% Grass cover, Good, HSG A
53	39	>75% Grass cover, Good, HSG A
1,105	39	>75% Grass cover, Good, HSG A
4,186	39	>75% Grass cover, Good, HSG A
12,418	51	1 acre lots, 20% imp, HSG A
16,668	51	1 acre lots, 20% imp, HSG A
3,821	30	Woods, Good, HSG A
57,181	30	Woods, Good, HSG A
133,510	30	Woods, Good, HSG A
4,993	30	Woods, Good, HSG A
18,270	30	Woods, Good, HSG A
32,716	30	Woods, Good, HSG A
178,233	98	Paved roads w/curbs & sewers, HSG A
432,430	77	Woods, Good, HSG D
35,854	51	1 acre lots, 20% imp, HSG A
41,562	51	1 acre lots, 20% imp, HSG A
9,365	51	1 acre lots, 20% imp, HSG A
7,853	51	1 acre lots, 20% imp, HSG A
2,030	30	Woods, Good, HSG A
22,235	98	Paved roads w/curbs & sewers, HSG A
16,573	51	1 acre lots, 20% imp, HSG A

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48,142	84	1 acre lots, 20% imp, HSG D
82,862	84	1 acre lots, 20% imp, HSG D
107,107	55	Woods, Good, HSG B
64,489	55	Woods, Good, HSG B
161,213	77	Woods, Good, HSG D
11	77	Woods, Good, HSG D
9	77	Woods, Good, HSG D
7,658	77	Woods, Good, HSG D
10,130	77	Woods, Good, HSG D
9,432	77	Woods, Good, HSG D
10,637	84	1 acre lots, 20% imp, HSG D
24,993	84	1 acre lots, 20% imp, HSG D
16,376	98	Paved roads w/curbs & sewers, HSG D
36,187	68	1 acre lots, 20% imp, HSG B
2,087	68	1 acre lots, 20% imp, HSG B
168,797	68	1 acre lots, 20% imp, HSG B
685	68	1 acre lots, 20% imp, HSG B
64,239	98	Paved roads w/curbs & sewers, HSG B
1,661	68	1 acre lots, 20% imp, HSG B
17,363	68	1 acre lots, 20% imp, HSG B
10,929	68	1 acre lots, 20% imp, HSG B
14,136	68	1 acre lots, 20% imp, HSG B
4,514	68	1 acre lots, 20% imp, HSG B
36,441	68	1 acre lots, 20% imp, HSG B
77,643	68	1 acre lots, 20% imp, HSG B
39,968	68	1 acre lots, 20% imp, HSG B
43,173	68	1 acre lots, 20% imp, HSG B
71,299	68	1 acre lots, 20% imp, HSG B
7,700	55	Woods, Good, HSG B
3,535	55	Woods, Good, HSG B
209,319	55	Woods, Good, HSG B
117,840	55	Woods, Good, HSG B
17	55	Woods, Good, HSG B
4,089	98	Roofs, HSG B
7,799	98	Roofs, HSG B
190	98	Roofs, HSG B
39,268	98	Paved roads w/curbs & sewers, HSG B
6,377	68	1 acre lots, 20% imp, HSG B
8,138	68	1 acre lots, 20% imp, HSG B
1,606	55	Woods, Good, HSG B
9,576	55	Woods, Good, HSG B
80,241	55	Woods, Good, HSG B
0	55	Woods, Good, HSG B
11	55	Woods, Good, HSG B
0	55	Woods, Good, HSG B
148,448	55	Woods, Good, HSG B
2,056	61	>75% Grass cover, Good, HSG B
191	68	1 acre lots, 20% imp, HSG B
137,438	68	1 acre lots, 20% imp, HSG B
28,368	68	1 acre lots, 20% imp, HSG B
29,743	68	1 acre lots, 20% imp, HSG B
25,401	68	1 acre lots, 20% imp, HSG B

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Type III 24-hr 10-Year Rainfall=5.25"

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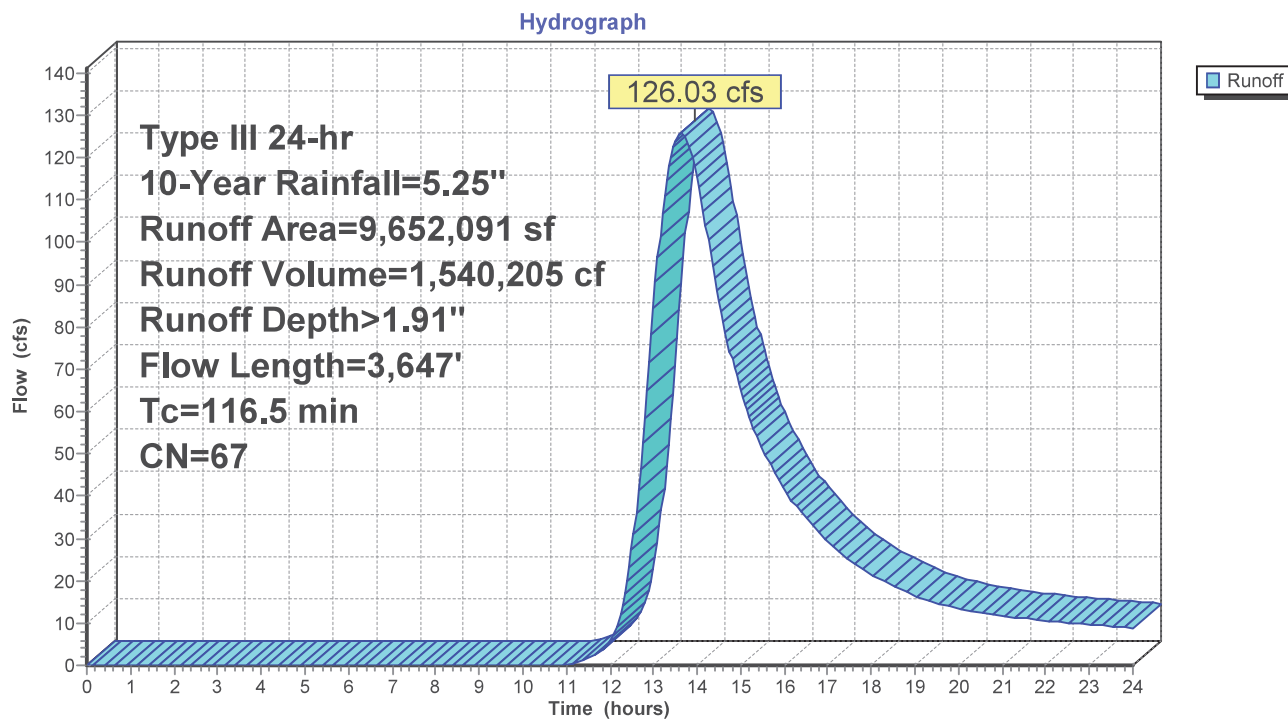
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34,695	68	1 acre lots, 20% imp, HSG B
151	68	1 acre lots, 20% imp, HSG B
2,028	68	1 acre lots, 20% imp, HSG B
4,562	68	1 acre lots, 20% imp, HSG B
683	68	1 acre lots, 20% imp, HSG B
15,767	68	1 acre lots, 20% imp, HSG B
13,153	68	1 acre lots, 20% imp, HSG B
301	68	1 acre lots, 20% imp, HSG B
38,195	68	1 acre lots, 20% imp, HSG B
2,684	61	>75% Grass cover, Good, HSG B
117	98	Paved roads w/curbs & sewers, HSG B
906	98	Roofs, HSG B
9,652,091	67	Weighted Average
7,817,350		80.99% Pervious Area
1,834,740		19.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.0	100	0.0100	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.28"
15.1	700	0.0240	0.77		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
30.0	623	0.0048	0.35		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
33.2	961	0.0093	0.48		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
10.2	1,263	0.0190	2.07		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
116.5	3,647	Total			

Subcatchment EX-1: Subcat EX-1



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Summary for Subcatchment EX-2: Subcat EX-2

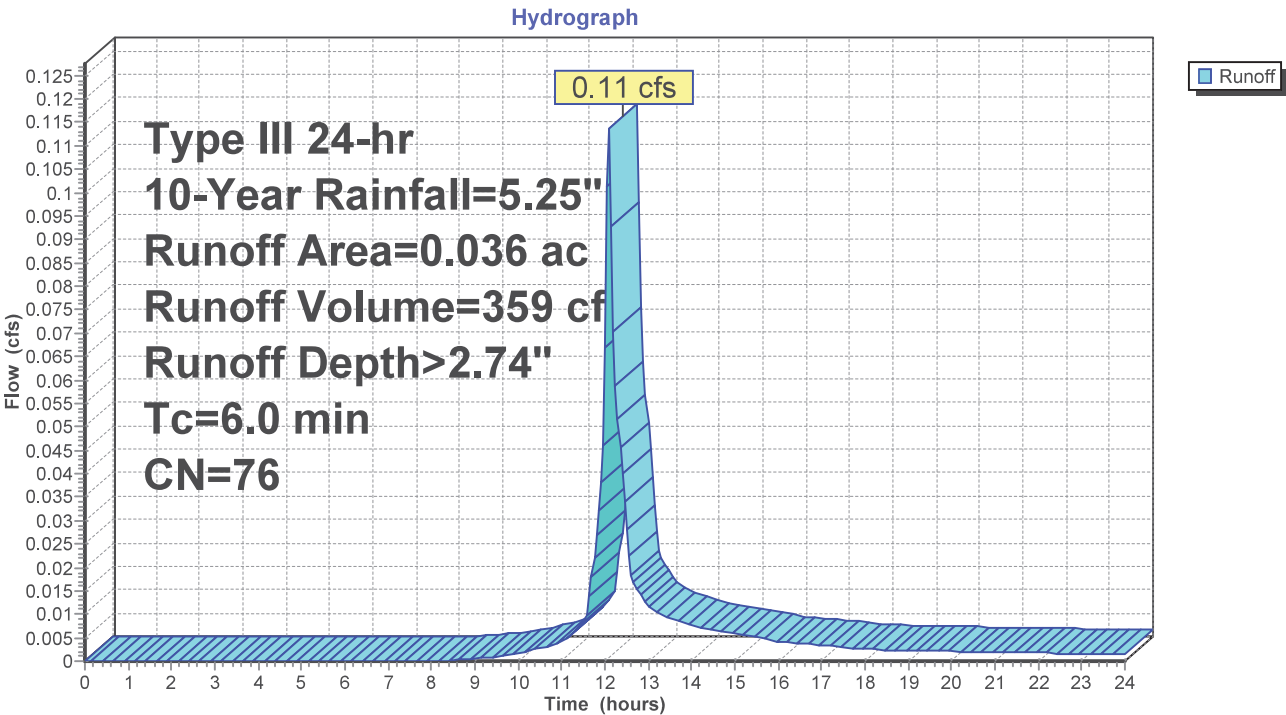
Runoff = 0.11 cfs @ 12.09 hrs, Volume= 359 cf, Depth> 2.74"
Routed to Pond 2P : Offsite Northwest

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.25"

Area (ac)	CN	Description
0.022	61	>75% Grass cover, Good, HSG B
0.000	68	1 acre lots, 20% imp, HSG B
0.006	98	Paved roads w/curbs & sewers, HSG B
0.009	98	Roofs, HSG B
0.036	76	Weighted Average
0.022		59.97% Pervious Area
0.014		40.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment EX-2: Subcat EX-2



Summary for Pond 1P: Ex. 30" HDPE Culvert

[57] Hint: Peaked at 41.60' (Flood elevation advised)

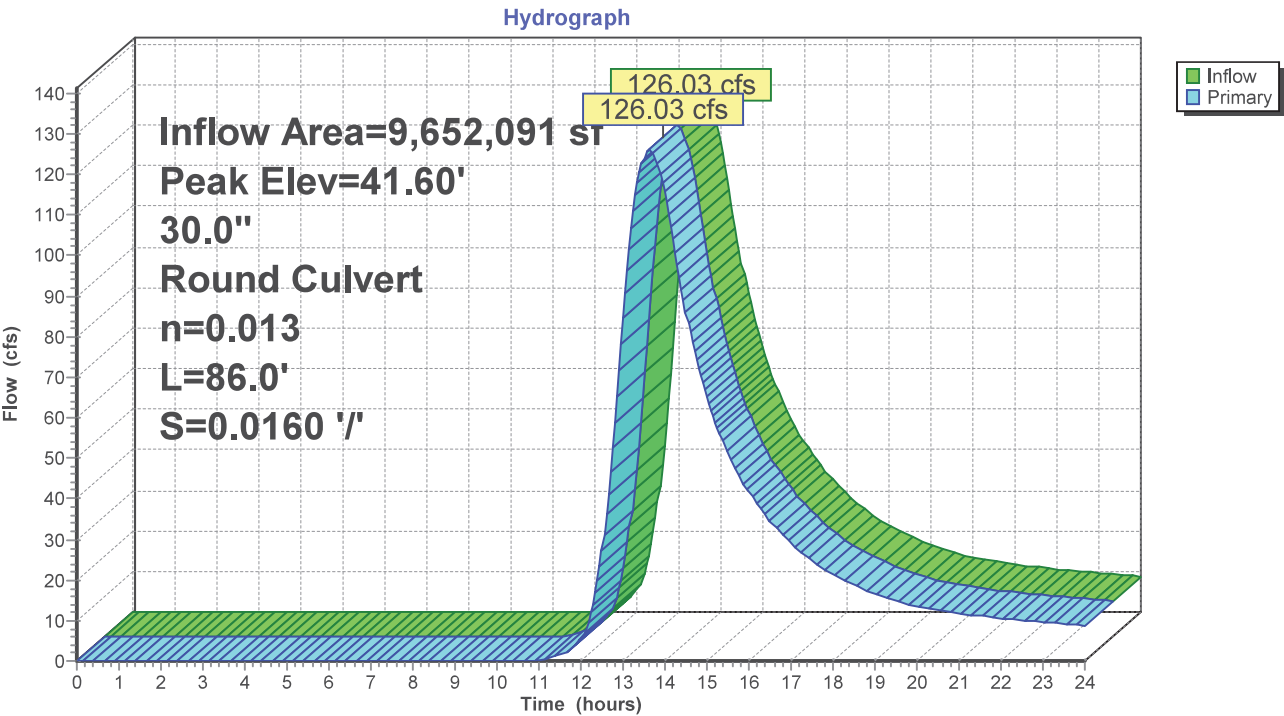
Inflow Area = 9,652,091 sf, 19.01% Impervious, Inflow Depth > 1.91" for 10-Year event
Inflow = 126.03 cfs @ 13.61 hrs, Volume= 1,540,205 cf
Outflow = 126.03 cfs @ 13.61 hrs, Volume= 1,540,205 cf, Atten= 0%, Lag= 0.0 min
Primary = 126.03 cfs @ 13.61 hrs, Volume= 1,540,205 cf
Routed to Pond AP : Analysis Point

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 41.60' @ 13.61 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	11.92'	30.0" Round Culvert L= 86.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 11.92' / 10.54' S= 0.0160 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=125.93 cfs @ 13.61 hrs HW=41.56' (Free Discharge)
↑1=Culvert (Inlet Controls 125.93 cfs @ 25.66 fps)

Pond 1P: Ex. 30" HDPE Culvert

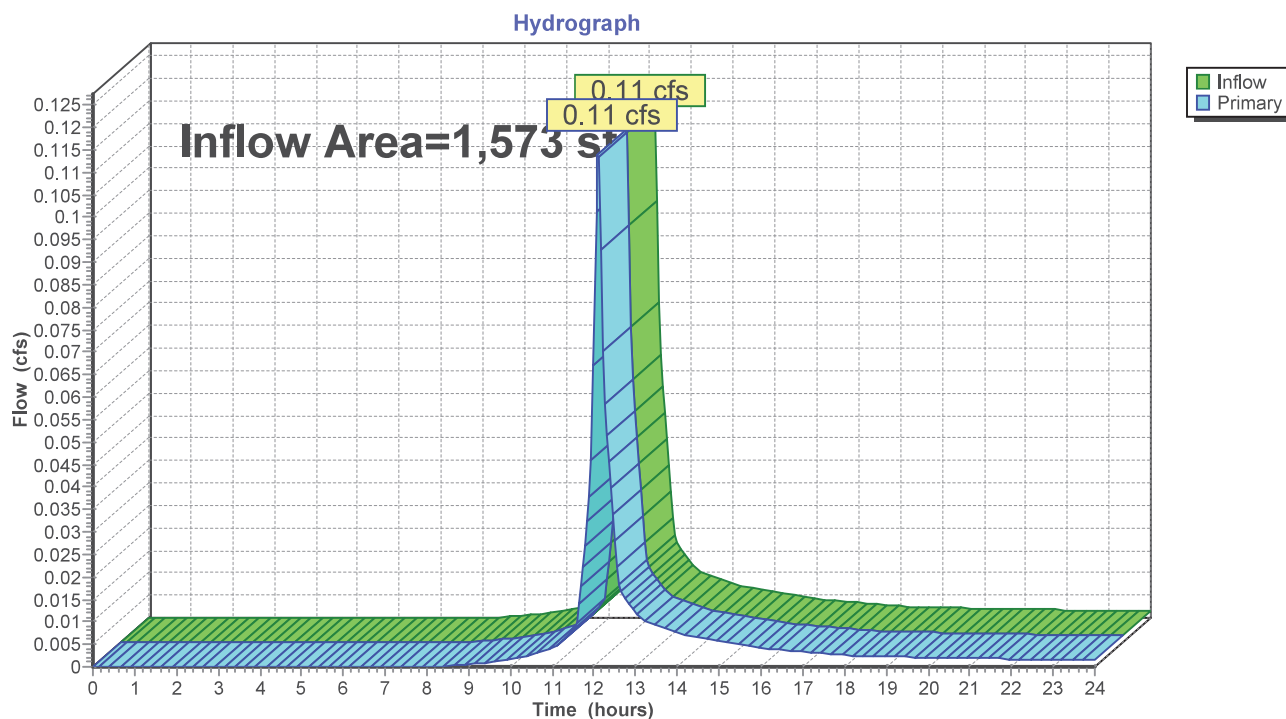


Summary for Pond 2P: Offsite Northwest

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1,573 sf, 40.03% Impervious, Inflow Depth > 2.74" for 10-Year event
Inflow = 0.11 cfs @ 12.09 hrs, Volume= 359 cf
Primary = 0.11 cfs @ 12.09 hrs, Volume= 359 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond AP : Analysis Point

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 2P: Offsite Northwest

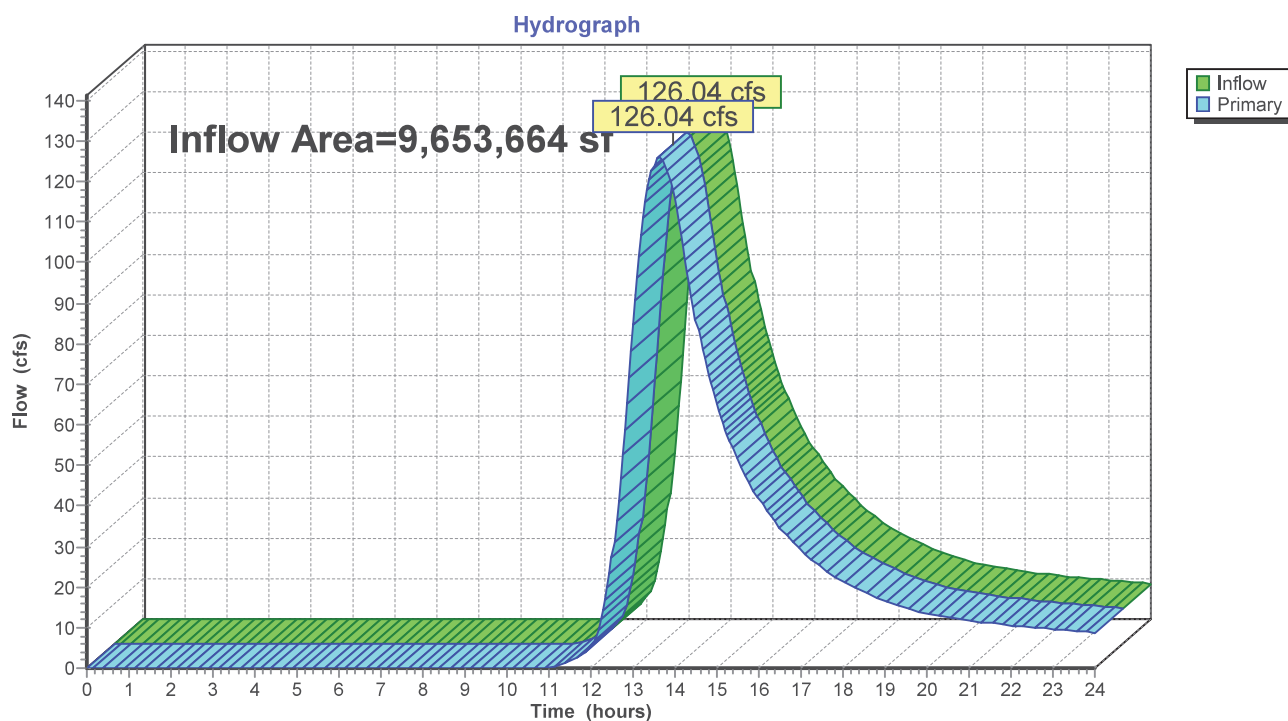
Summary for Pond AP: Analysis Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 9,653,664 sf, 19.01% Impervious, Inflow Depth > 1.92" for 10-Year event
 Inflow = 126.04 cfs @ 13.61 hrs, Volume= 1,540,564 cf
 Primary = 126.04 cfs @ 13.61 hrs, Volume= 1,540,564 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond AP: Analysis Point



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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EX-1: Subcat EX-1 Runoff Area=9,652,091 sf 19.01% Impervious Runoff Depth>2.81"
Flow Length=3,647' Tc=116.5 min CN=67 Runoff=189.18 cfs 2,260,998 cf

Subcatchment EX-2: Subcat EX-2 Runoff Area=0.036 ac 40.03% Impervious Runoff Depth>3.79"
Tc=6.0 min CN=76 Runoff=0.16 cfs 497 cf

Pond 1P: Ex. 30" HDPE Culvert Peak Elev=77.24' Inflow=189.18 cfs 2,260,998 cf
30.0" Round Culvert n=0.013 L=86.0' S=0.0160 '/' Outflow=189.18 cfs 2,260,998 cf

Pond 2P: Offsite Northwest Inflow=0.16 cfs 497 cf
Primary=0.16 cfs 497 cf

Pond AP: Analysis Point Inflow=189.19 cfs 2,261,495 cf
Primary=189.19 cfs 2,261,495 cf

Total Runoff Area = 9,653,664 sf Runoff Volume = 2,261,495 cf Average Runoff Depth = 2.81"
80.99% Pervious = 7,818,294 sf 19.01% Impervious = 1,835,370 sf

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Summary for Subcatchment EX-1: Subcat EX-1

Runoff = 189.18 cfs @ 13.60 hrs, Volume= 2,260,998 cf, Depth> 2.81"
Routed to Pond 1P : Ex. 30" HDPE Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.48"

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Area (sf)	CN	Description
437	98	Roofs, HSG B
13,211	98	Roofs, HSG B
8,596	98	Roofs, HSG B
1,186	61	>75% Grass cover, Good, HSG B
600	61	>75% Grass cover, Good, HSG B
39,154	68	1 acre lots, 20% imp, HSG B
88,435	68	1 acre lots, 20% imp, HSG B
74,087	68	1 acre lots, 20% imp, HSG B
690	55	Woods, Good, HSG B
10,761	55	Woods, Good, HSG B
93	55	Woods, Good, HSG B
10,389	98	Paved roads w/curbs & sewers, HSG B
1,915	68	1 acre lots, 20% imp, HSG B
1,667	55	Woods, Good, HSG B
488,623	55	Woods, Good, HSG B
36,722	68	1 acre lots, 20% imp, HSG B
72,394	68	1 acre lots, 20% imp, HSG B
42,303	68	1 acre lots, 20% imp, HSG B
7,954	98	Paved roads w/curbs & sewers, HSG B
4,350	98	Paved roads w/curbs & sewers, HSG B
2,815	98	Paved roads w/curbs & sewers, HSG B
9,429	98	Paved roads w/curbs & sewers, HSG B
51,724	98	Paved roads w/curbs & sewers, HSG B
5,639	98	Roofs, HSG B
1,092	55	Woods, Good, HSG B
15,566	98	Paved roads w/curbs & sewers, HSG B
10,532	55	Woods, Good, HSG B
712	55	Woods, Good, HSG B
20,047	84	1 acre lots, 20% imp, HSG D
155,579	77	Woods, Good, HSG D
4,541	98	Paved roads w/curbs & sewers, HSG D
7,022	84	1 acre lots, 20% imp, HSG D
8,723	98	Roofs, HSG B
576	98	Roofs, HSG B
14,042	98	Roofs, HSG B
4,034	98	Roofs, HSG B
16,403	98	Roofs, HSG B
9,511	98	Roofs, HSG B
1,877	98	Roofs, HSG B
4,717	98	Roofs, HSG B
13,129	98	Roofs, HSG B
7,317	98	Roofs, HSG B
11,285	98	Roofs, HSG B
582	61	>75% Grass cover, Good, HSG B
25,528	61	>75% Grass cover, Good, HSG B
54,038	61	>75% Grass cover, Good, HSG B
36,696	68	1 acre lots, 20% imp, HSG B
42,920	68	1 acre lots, 20% imp, HSG B
98,325	55	Woods, Good, HSG B
57,352	55	Woods, Good, HSG B
110,966	55	Woods, Good, HSG B

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51	98	Paved roads w/curbs & sewers, HSG B
13,662	98	Paved roads w/curbs & sewers, HSG B
182,904	98	Paved roads w/curbs & sewers, HSG B
57	61	>75% Grass cover, Good, HSG B
62,503	55	Woods, Good, HSG B
2,710	68	1 acre lots, 20% imp, HSG B
8,636	98	Paved roads w/curbs & sewers, HSG B
1,673	98	Paved roads w/curbs & sewers, HSG B
6,338	98	Paved roads w/curbs & sewers, HSG B
12,602	98	Paved roads w/curbs & sewers, HSG B
17,167	68	1 acre lots, 20% imp, HSG B
2,389	68	1 acre lots, 20% imp, HSG B
88,957	68	1 acre lots, 20% imp, HSG B
151,346	68	1 acre lots, 20% imp, HSG B
148,516	68	1 acre lots, 20% imp, HSG B
63,026	68	1 acre lots, 20% imp, HSG B
122,963	55	Woods, Good, HSG B
93,469	55	Woods, Good, HSG B
83,227	68	1 acre lots, 20% imp, HSG B
40,984	68	1 acre lots, 20% imp, HSG B
26,764	68	1 acre lots, 20% imp, HSG B
0	55	Woods, Good, HSG B
7,639	98	Paved roads w/curbs & sewers, HSG B
240,621	55	Woods, Good, HSG B
432	55	Woods, Good, HSG B
9,356	68	1 acre lots, 20% imp, HSG B
28,682	68	1 acre lots, 20% imp, HSG B
77,538	68	1 acre lots, 20% imp, HSG B
72,866	55	Woods, Good, HSG B
1	55	Woods, Good, HSG B
25,054	55	Woods, Good, HSG B
10,579	98	Paved roads w/curbs & sewers, HSG B
1,871	98	Paved roads w/curbs & sewers, HSG B
228,105	55	Woods, Good, HSG B
10,612	98	Roofs, HSG A
2,814	98	Roofs, HSG A
4,636	98	Roofs, HSG A
4,484	98	Roofs, HSG A
3,906	98	Roofs, HSG A
4,863	98	Roofs, HSG A
3,009	98	Roofs, HSG A
6,117	98	Roofs, HSG A
1,488	98	Roofs, HSG A
6,760	98	Roofs, HSG A
2,404	39	>75% Grass cover, Good, HSG A
3,772	39	>75% Grass cover, Good, HSG A
14,346	39	>75% Grass cover, Good, HSG A
5,038	39	>75% Grass cover, Good, HSG A
2,099	39	>75% Grass cover, Good, HSG A
12,640	39	>75% Grass cover, Good, HSG A
5,858	39	>75% Grass cover, Good, HSG A
12,157	39	>75% Grass cover, Good, HSG A

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1,549	39	>75% Grass cover, Good, HSG A
4,123	39	>75% Grass cover, Good, HSG A
2,558	39	>75% Grass cover, Good, HSG A
7,360	39	>75% Grass cover, Good, HSG A
14	51	1 acre lots, 20% imp, HSG A
37,651	51	1 acre lots, 20% imp, HSG A
39,967	51	1 acre lots, 20% imp, HSG A
2,959	30	Woods, Good, HSG A
585	30	Woods, Good, HSG A
2	30	Woods, Good, HSG A
16,384	30	Woods, Good, HSG A
13,607	30	Woods, Good, HSG A
1,576	30	Woods, Good, HSG A
424	39	>75% Grass cover, Good, HSG A
56	39	>75% Grass cover, Good, HSG A
2,604	39	>75% Grass cover, Good, HSG A
1,995	39	>75% Grass cover, Good, HSG A
677	39	>75% Grass cover, Good, HSG A
48,051	30	Woods, Good, HSG A
9,600	30	Woods, Good, HSG A
8,066	30	Woods, Good, HSG A
253,052	98	Paved roads w/curbs & sewers, HSG A
1,260	84	1 acre lots, 20% imp, HSG D
4,120	84	1 acre lots, 20% imp, HSG D
21,593	84	1 acre lots, 20% imp, HSG D
2,295	84	1 acre lots, 20% imp, HSG D
28,307	84	1 acre lots, 20% imp, HSG D
64,402	84	1 acre lots, 20% imp, HSG D
5,614	84	1 acre lots, 20% imp, HSG D
53	84	1 acre lots, 20% imp, HSG D
7,502	84	1 acre lots, 20% imp, HSG D
322	84	1 acre lots, 20% imp, HSG D
16	84	1 acre lots, 20% imp, HSG D
2,454	98	Paved roads w/curbs & sewers, HSG D
809	84	1 acre lots, 20% imp, HSG D
30,622	84	1 acre lots, 20% imp, HSG D
9,979	84	1 acre lots, 20% imp, HSG D
3,867	77	Woods, Good, HSG D
9,461	98	Paved roads w/curbs & sewers, HSG B
254	98	Paved roads w/curbs & sewers, HSG B
6,306	98	Paved roads w/curbs & sewers, HSG D
234	98	Paved roads w/curbs & sewers, HSG D
35,895	98	Paved roads w/curbs & sewers, HSG B
8,154	98	Paved roads w/curbs & sewers, HSG B
8,906	98	Paved roads w/curbs & sewers, HSG D
9,293	98	Paved roads w/curbs & sewers, HSG D
1,920	98	Paved roads w/curbs & sewers, HSG D
60,038	77	Woods, Good, HSG D
509	55	Woods, Good, HSG B
54,291	55	Woods, Good, HSG B
557,510	77	Woods, Good, HSG D
5,727	61	>75% Grass cover, Good, HSG B

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4,242	68	1 acre lots, 20% imp, HSG B
43,411	68	1 acre lots, 20% imp, HSG B
4,608	68	1 acre lots, 20% imp, HSG B
56,607	68	1 acre lots, 20% imp, HSG B
17,779	55	Woods, Good, HSG B
6	55	Woods, Good, HSG B
61	55	Woods, Good, HSG B
187,750	55	Woods, Good, HSG B
1,002,408	55	Woods, Good, HSG B
12,536	98	Paved roads w/curbs & sewers, HSG B
3,415	98	Paved roads w/curbs & sewers, HSG B
2,284	98	Paved roads w/curbs & sewers, HSG B
11,562	98	Paved roads w/curbs & sewers, HSG B
2,273	68	1 acre lots, 20% imp, HSG B
3,550	98	Roofs, HSG A
2,631	98	Roofs, HSG A
861	98	Roofs, HSG A
13,650	98	Roofs, HSG A
7,476	98	Roofs, HSG A
537	98	Roofs, HSG A
3,465	98	Roofs, HSG A
15,193	98	Roofs, HSG A
2,952	98	Roofs, HSG A
3,464	98	Roofs, HSG A
4,080	98	Roofs, HSG A
93	98	Roofs, HSG A
1,116	98	Roofs, HSG A
6,583	98	Roofs, HSG A
9,239	39	>75% Grass cover, Good, HSG A
3,977	39	>75% Grass cover, Good, HSG A
38,172	39	>75% Grass cover, Good, HSG A
1,736	39	>75% Grass cover, Good, HSG A
53	39	>75% Grass cover, Good, HSG A
1,105	39	>75% Grass cover, Good, HSG A
4,186	39	>75% Grass cover, Good, HSG A
12,418	51	1 acre lots, 20% imp, HSG A
16,668	51	1 acre lots, 20% imp, HSG A
3,821	30	Woods, Good, HSG A
57,181	30	Woods, Good, HSG A
133,510	30	Woods, Good, HSG A
4,993	30	Woods, Good, HSG A
18,270	30	Woods, Good, HSG A
32,716	30	Woods, Good, HSG A
178,233	98	Paved roads w/curbs & sewers, HSG A
432,430	77	Woods, Good, HSG D
35,854	51	1 acre lots, 20% imp, HSG A
41,562	51	1 acre lots, 20% imp, HSG A
9,365	51	1 acre lots, 20% imp, HSG A
7,853	51	1 acre lots, 20% imp, HSG A
2,030	30	Woods, Good, HSG A
22,235	98	Paved roads w/curbs & sewers, HSG A
16,573	51	1 acre lots, 20% imp, HSG A

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48,142	84	1 acre lots, 20% imp, HSG D
82,862	84	1 acre lots, 20% imp, HSG D
107,107	55	Woods, Good, HSG B
64,489	55	Woods, Good, HSG B
161,213	77	Woods, Good, HSG D
11	77	Woods, Good, HSG D
9	77	Woods, Good, HSG D
7,658	77	Woods, Good, HSG D
10,130	77	Woods, Good, HSG D
9,432	77	Woods, Good, HSG D
10,637	84	1 acre lots, 20% imp, HSG D
24,993	84	1 acre lots, 20% imp, HSG D
16,376	98	Paved roads w/curbs & sewers, HSG D
36,187	68	1 acre lots, 20% imp, HSG B
2,087	68	1 acre lots, 20% imp, HSG B
168,797	68	1 acre lots, 20% imp, HSG B
685	68	1 acre lots, 20% imp, HSG B
64,239	98	Paved roads w/curbs & sewers, HSG B
1,661	68	1 acre lots, 20% imp, HSG B
17,363	68	1 acre lots, 20% imp, HSG B
10,929	68	1 acre lots, 20% imp, HSG B
14,136	68	1 acre lots, 20% imp, HSG B
4,514	68	1 acre lots, 20% imp, HSG B
36,441	68	1 acre lots, 20% imp, HSG B
77,643	68	1 acre lots, 20% imp, HSG B
39,968	68	1 acre lots, 20% imp, HSG B
43,173	68	1 acre lots, 20% imp, HSG B
71,299	68	1 acre lots, 20% imp, HSG B
7,700	55	Woods, Good, HSG B
3,535	55	Woods, Good, HSG B
209,319	55	Woods, Good, HSG B
117,840	55	Woods, Good, HSG B
17	55	Woods, Good, HSG B
4,089	98	Roofs, HSG B
7,799	98	Roofs, HSG B
190	98	Roofs, HSG B
39,268	98	Paved roads w/curbs & sewers, HSG B
6,377	68	1 acre lots, 20% imp, HSG B
8,138	68	1 acre lots, 20% imp, HSG B
1,606	55	Woods, Good, HSG B
9,576	55	Woods, Good, HSG B
80,241	55	Woods, Good, HSG B
0	55	Woods, Good, HSG B
11	55	Woods, Good, HSG B
0	55	Woods, Good, HSG B
148,448	55	Woods, Good, HSG B
2,056	61	>75% Grass cover, Good, HSG B
191	68	1 acre lots, 20% imp, HSG B
137,438	68	1 acre lots, 20% imp, HSG B
28,368	68	1 acre lots, 20% imp, HSG B
29,743	68	1 acre lots, 20% imp, HSG B
25,401	68	1 acre lots, 20% imp, HSG B

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Type III 24-hr 25-Year Rainfall=6.48"

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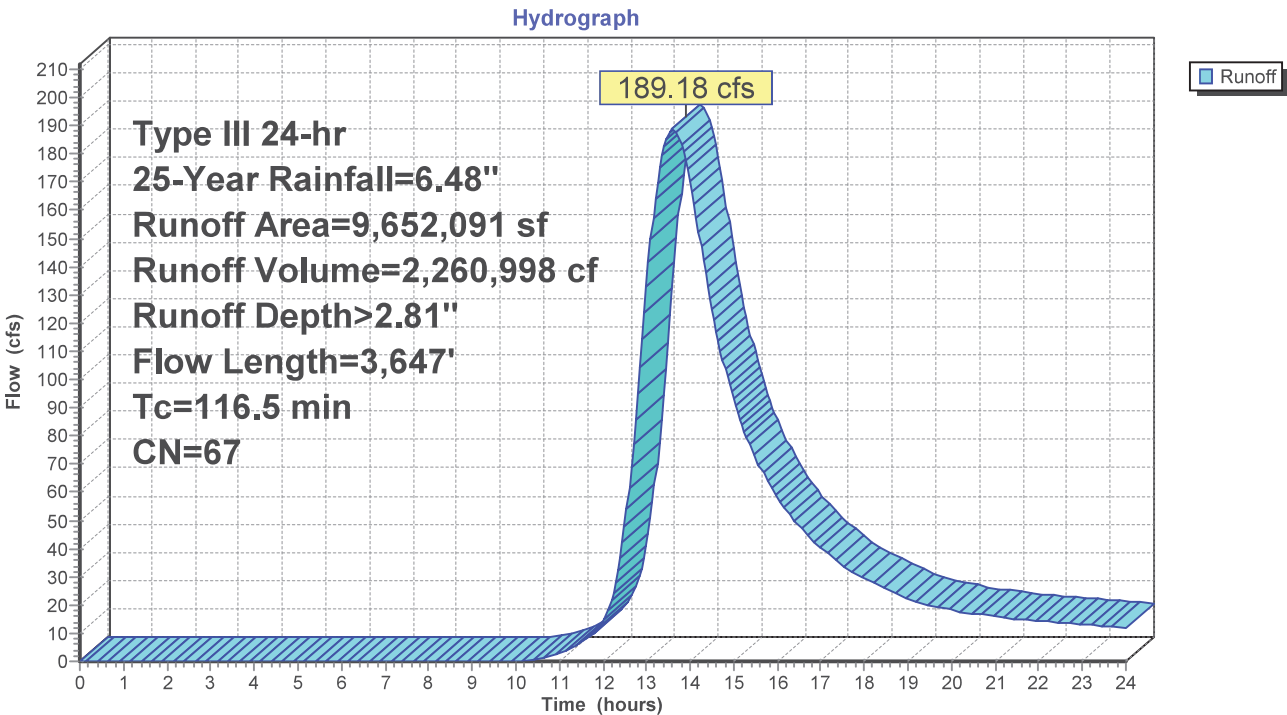
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34,695	68	1 acre lots, 20% imp, HSG B
151	68	1 acre lots, 20% imp, HSG B
2,028	68	1 acre lots, 20% imp, HSG B
4,562	68	1 acre lots, 20% imp, HSG B
683	68	1 acre lots, 20% imp, HSG B
15,767	68	1 acre lots, 20% imp, HSG B
13,153	68	1 acre lots, 20% imp, HSG B
301	68	1 acre lots, 20% imp, HSG B
38,195	68	1 acre lots, 20% imp, HSG B
2,684	61	>75% Grass cover, Good, HSG B
117	98	Paved roads w/curbs & sewers, HSG B
906	98	Roofs, HSG B

9,652,091	67	Weighted Average
7,817,350		80.99% Pervious Area
1,834,740		19.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.0	100	0.0100	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.28"
15.1	700	0.0240	0.77		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
30.0	623	0.0048	0.35		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
33.2	961	0.0093	0.48		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
10.2	1,263	0.0190	2.07		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
116.5	3,647	Total			

Subcatchment EX-1: Subcat EX-1



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Type III 24-hr 25-Year Rainfall=6.48"

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Summary for Subcatchment EX-2: Subcat EX-2

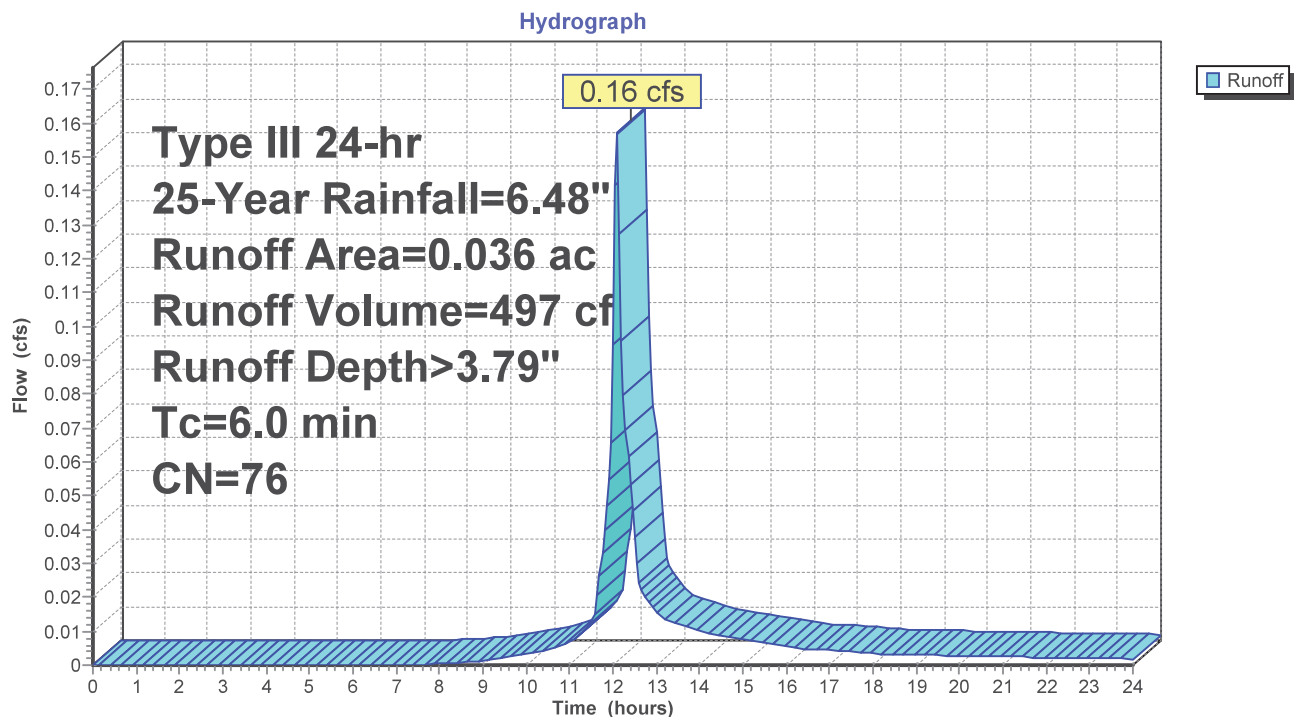
Runoff = 0.16 cfs @ 12.09 hrs, Volume= 497 cf, Depth> 3.79"
Routed to Pond 2P : Offsite Northwest

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.48"

Area (ac)	CN	Description
0.022	61	>75% Grass cover, Good, HSG B
0.000	68	1 acre lots, 20% imp, HSG B
0.006	98	Paved roads w/curbs & sewers, HSG B
0.009	98	Roofs, HSG B
0.036	76	Weighted Average
0.022		59.97% Pervious Area
0.014		40.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment EX-2: Subcat EX-2



Summary for Pond 1P: Ex. 30" HDPE Culvert

[57] Hint: Peaked at 77.24' (Flood elevation advised)

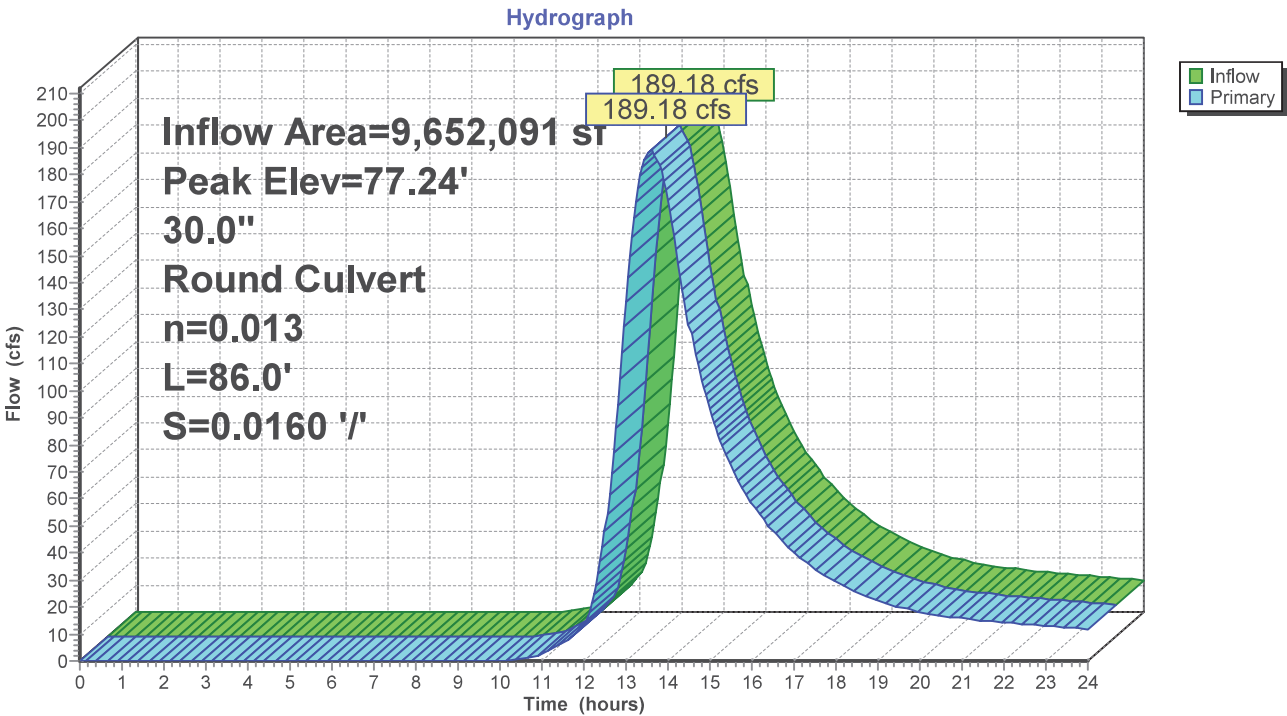
Inflow Area = 9,652,091 sf, 19.01% Impervious, Inflow Depth > 2.81" for 25-Year event
Inflow = 189.18 cfs @ 13.60 hrs, Volume= 2,260,998 cf
Outflow = 189.18 cfs @ 13.60 hrs, Volume= 2,260,998 cf, Atten= 0%, Lag= 0.0 min
Primary = 189.18 cfs @ 13.60 hrs, Volume= 2,260,998 cf
Routed to Pond AP : Analysis Point

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 77.24' @ 13.60 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	11.92'	30.0" Round Culvert L= 86.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 11.92' / 10.54' S= 0.0160 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=189.14 cfs @ 13.60 hrs HW=77.21' (Free Discharge)
1=Culvert (Inlet Controls 189.14 cfs @ 38.53 fps)

Pond 1P: Ex. 30" HDPE Culvert

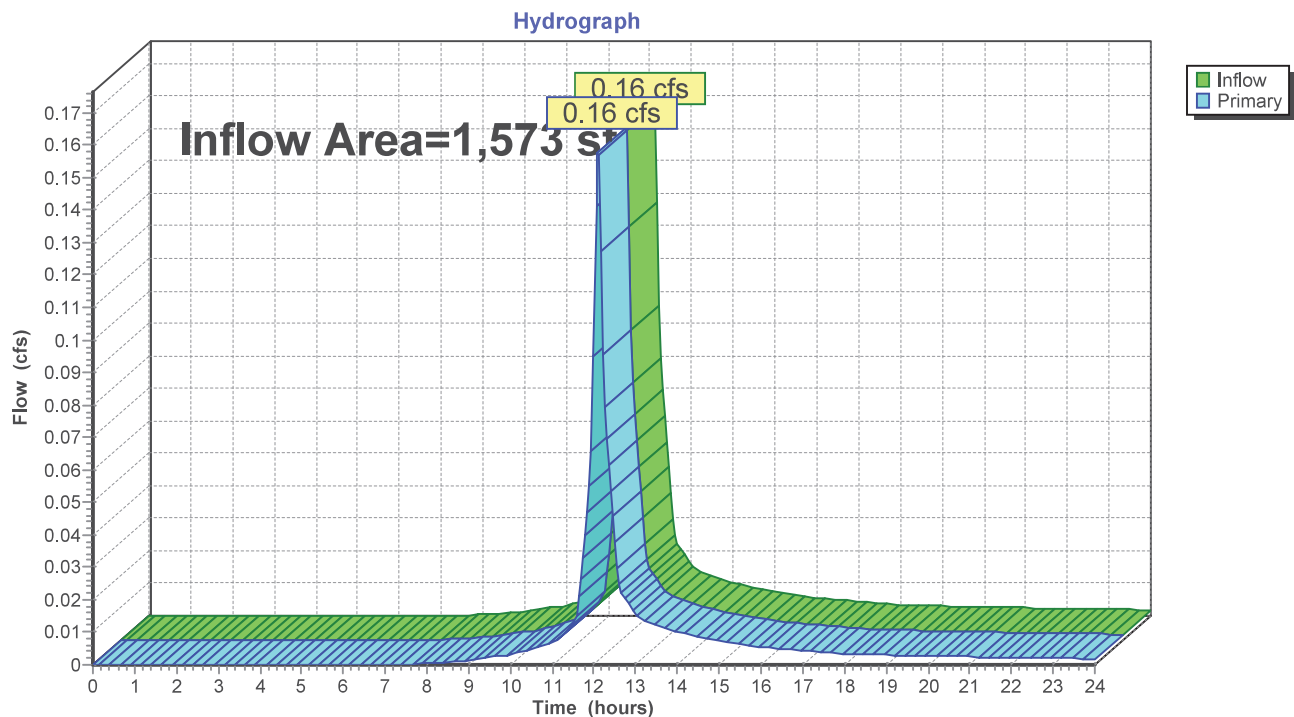


Summary for Pond 2P: Offsite Northwest

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1,573 sf, 40.03% Impervious, Inflow Depth > 3.79" for 25-Year event
Inflow = 0.16 cfs @ 12.09 hrs, Volume= 497 cf
Primary = 0.16 cfs @ 12.09 hrs, Volume= 497 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond AP : Analysis Point

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 2P: Offsite Northwest

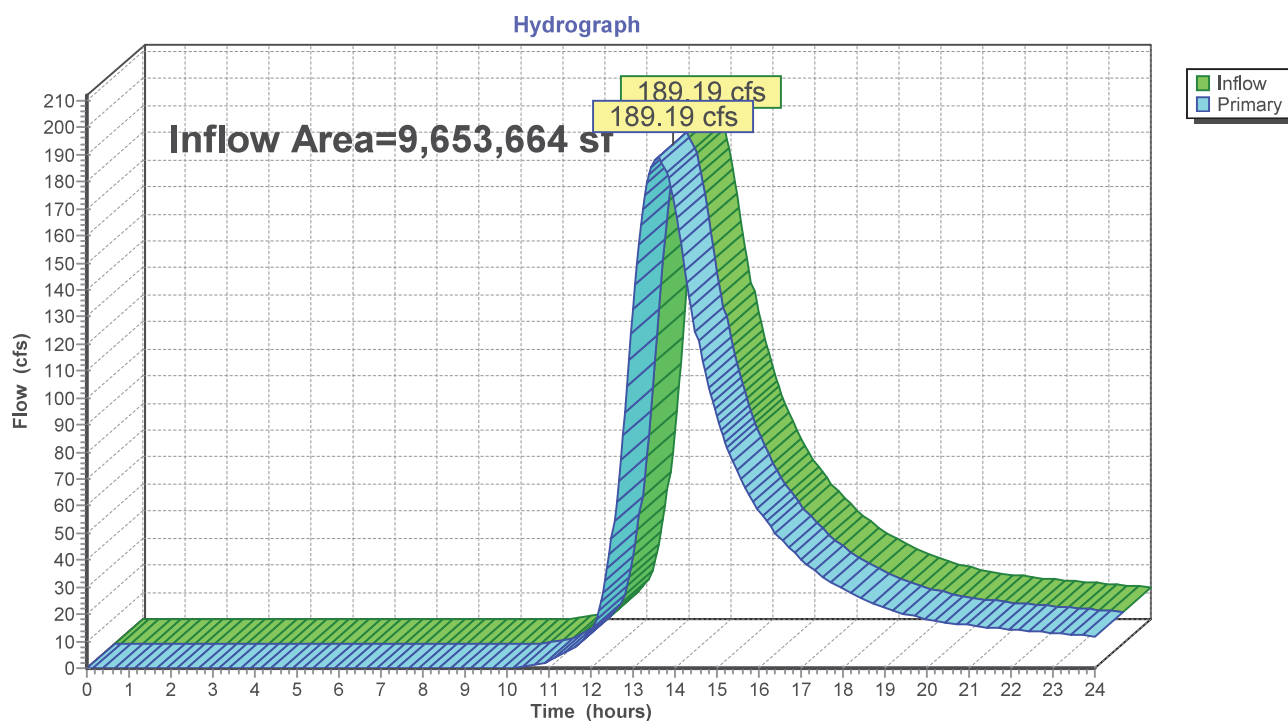
Summary for Pond AP: Analysis Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 9,653,664 sf, 19.01% Impervious, Inflow Depth > 2.81" for 25-Year event
 Inflow = 189.19 cfs @ 13.60 hrs, Volume= 2,261,495 cf
 Primary = 189.19 cfs @ 13.60 hrs, Volume= 2,261,495 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond AP: Analysis Point



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Type III 24-hr 50-Year Rainfall=7.38"

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EX-1: Subcat EX-1 Runoff Area=9,652,091 sf 19.01% Impervious Runoff Depth>3.51"
Flow Length=3,647' Tc=116.5 min CN=67 Runoff=238.06 cfs 2,822,813 cf

Subcatchment EX-2: Subcat EX-2 Runoff Area=0.036 ac 40.03% Impervious Runoff Depth>4.59"
Tc=6.0 min CN=76 Runoff=0.19 cfs 602 cf

Pond 1P: Ex. 30" HDPE Culvert Peak Elev=114.62' Inflow=238.06 cfs 2,822,813 cf
30.0" Round Culvert n=0.013 L=86.0' S=0.0160 '/' Outflow=238.06 cfs 2,822,813 cf

Pond 2P: Offsite Northwest Inflow=0.19 cfs 602 cf
Primary=0.19 cfs 602 cf

Pond AP: Analysis Point Inflow=238.07 cfs 2,823,415 cf
Primary=238.07 cfs 2,823,415 cf

Total Runoff Area = 9,653,664 sf Runoff Volume = 2,823,415 cf Average Runoff Depth = 3.51"
80.99% Pervious = 7,818,294 sf 19.01% Impervious = 1,835,370 sf

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Type III 24-hr 50-Year Rainfall=7.38"

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Summary for Subcatchment EX-1: Subcat EX-1

Runoff = 238.06 cfs @ 13.59 hrs, Volume= 2,822,813 cf, Depth> 3.51"
Routed to Pond 1P : Ex. 30" HDPE Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=7.38"

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Type III 24-hr 50-Year Rainfall=7.38"

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Area (sf)	CN	Description
437	98	Roofs, HSG B
13,211	98	Roofs, HSG B
8,596	98	Roofs, HSG B
1,186	61	>75% Grass cover, Good, HSG B
600	61	>75% Grass cover, Good, HSG B
39,154	68	1 acre lots, 20% imp, HSG B
88,435	68	1 acre lots, 20% imp, HSG B
74,087	68	1 acre lots, 20% imp, HSG B
690	55	Woods, Good, HSG B
10,761	55	Woods, Good, HSG B
93	55	Woods, Good, HSG B
10,389	98	Paved roads w/curbs & sewers, HSG B
1,915	68	1 acre lots, 20% imp, HSG B
1,667	55	Woods, Good, HSG B
488,623	55	Woods, Good, HSG B
36,722	68	1 acre lots, 20% imp, HSG B
72,394	68	1 acre lots, 20% imp, HSG B
42,303	68	1 acre lots, 20% imp, HSG B
7,954	98	Paved roads w/curbs & sewers, HSG B
4,350	98	Paved roads w/curbs & sewers, HSG B
2,815	98	Paved roads w/curbs & sewers, HSG B
9,429	98	Paved roads w/curbs & sewers, HSG B
51,724	98	Paved roads w/curbs & sewers, HSG B
5,639	98	Roofs, HSG B
1,092	55	Woods, Good, HSG B
15,566	98	Paved roads w/curbs & sewers, HSG B
10,532	55	Woods, Good, HSG B
712	55	Woods, Good, HSG B
20,047	84	1 acre lots, 20% imp, HSG D
155,579	77	Woods, Good, HSG D
4,541	98	Paved roads w/curbs & sewers, HSG D
7,022	84	1 acre lots, 20% imp, HSG D
8,723	98	Roofs, HSG B
576	98	Roofs, HSG B
14,042	98	Roofs, HSG B
4,034	98	Roofs, HSG B
16,403	98	Roofs, HSG B
9,511	98	Roofs, HSG B
1,877	98	Roofs, HSG B
4,717	98	Roofs, HSG B
13,129	98	Roofs, HSG B
7,317	98	Roofs, HSG B
11,285	98	Roofs, HSG B
582	61	>75% Grass cover, Good, HSG B
25,528	61	>75% Grass cover, Good, HSG B
54,038	61	>75% Grass cover, Good, HSG B
36,696	68	1 acre lots, 20% imp, HSG B
42,920	68	1 acre lots, 20% imp, HSG B
98,325	55	Woods, Good, HSG B
57,352	55	Woods, Good, HSG B
110,966	55	Woods, Good, HSG B

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51	98	Paved roads w/curbs & sewers, HSG B
13,662	98	Paved roads w/curbs & sewers, HSG B
182,904	98	Paved roads w/curbs & sewers, HSG B
57	61	>75% Grass cover, Good, HSG B
62,503	55	Woods, Good, HSG B
2,710	68	1 acre lots, 20% imp, HSG B
8,636	98	Paved roads w/curbs & sewers, HSG B
1,673	98	Paved roads w/curbs & sewers, HSG B
6,338	98	Paved roads w/curbs & sewers, HSG B
12,602	98	Paved roads w/curbs & sewers, HSG B
17,167	68	1 acre lots, 20% imp, HSG B
2,389	68	1 acre lots, 20% imp, HSG B
88,957	68	1 acre lots, 20% imp, HSG B
151,346	68	1 acre lots, 20% imp, HSG B
148,516	68	1 acre lots, 20% imp, HSG B
63,026	68	1 acre lots, 20% imp, HSG B
122,963	55	Woods, Good, HSG B
93,469	55	Woods, Good, HSG B
83,227	68	1 acre lots, 20% imp, HSG B
40,984	68	1 acre lots, 20% imp, HSG B
26,764	68	1 acre lots, 20% imp, HSG B
0	55	Woods, Good, HSG B
7,639	98	Paved roads w/curbs & sewers, HSG B
240,621	55	Woods, Good, HSG B
432	55	Woods, Good, HSG B
9,356	68	1 acre lots, 20% imp, HSG B
28,682	68	1 acre lots, 20% imp, HSG B
77,538	68	1 acre lots, 20% imp, HSG B
72,866	55	Woods, Good, HSG B
1	55	Woods, Good, HSG B
25,054	55	Woods, Good, HSG B
10,579	98	Paved roads w/curbs & sewers, HSG B
1,871	98	Paved roads w/curbs & sewers, HSG B
228,105	55	Woods, Good, HSG B
10,612	98	Roofs, HSG A
2,814	98	Roofs, HSG A
4,636	98	Roofs, HSG A
4,484	98	Roofs, HSG A
3,906	98	Roofs, HSG A
4,863	98	Roofs, HSG A
3,009	98	Roofs, HSG A
6,117	98	Roofs, HSG A
1,488	98	Roofs, HSG A
6,760	98	Roofs, HSG A
2,404	39	>75% Grass cover, Good, HSG A
3,772	39	>75% Grass cover, Good, HSG A
14,346	39	>75% Grass cover, Good, HSG A
5,038	39	>75% Grass cover, Good, HSG A
2,099	39	>75% Grass cover, Good, HSG A
12,640	39	>75% Grass cover, Good, HSG A
5,858	39	>75% Grass cover, Good, HSG A
12,157	39	>75% Grass cover, Good, HSG A

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1,549	39	>75% Grass cover, Good, HSG A
4,123	39	>75% Grass cover, Good, HSG A
2,558	39	>75% Grass cover, Good, HSG A
7,360	39	>75% Grass cover, Good, HSG A
14	51	1 acre lots, 20% imp, HSG A
37,651	51	1 acre lots, 20% imp, HSG A
39,967	51	1 acre lots, 20% imp, HSG A
2,959	30	Woods, Good, HSG A
585	30	Woods, Good, HSG A
2	30	Woods, Good, HSG A
16,384	30	Woods, Good, HSG A
13,607	30	Woods, Good, HSG A
1,576	30	Woods, Good, HSG A
424	39	>75% Grass cover, Good, HSG A
56	39	>75% Grass cover, Good, HSG A
2,604	39	>75% Grass cover, Good, HSG A
1,995	39	>75% Grass cover, Good, HSG A
677	39	>75% Grass cover, Good, HSG A
48,051	30	Woods, Good, HSG A
9,600	30	Woods, Good, HSG A
8,066	30	Woods, Good, HSG A
253,052	98	Paved roads w/curbs & sewers, HSG A
1,260	84	1 acre lots, 20% imp, HSG D
4,120	84	1 acre lots, 20% imp, HSG D
21,593	84	1 acre lots, 20% imp, HSG D
2,295	84	1 acre lots, 20% imp, HSG D
28,307	84	1 acre lots, 20% imp, HSG D
64,402	84	1 acre lots, 20% imp, HSG D
5,614	84	1 acre lots, 20% imp, HSG D
53	84	1 acre lots, 20% imp, HSG D
7,502	84	1 acre lots, 20% imp, HSG D
322	84	1 acre lots, 20% imp, HSG D
16	84	1 acre lots, 20% imp, HSG D
2,454	98	Paved roads w/curbs & sewers, HSG D
809	84	1 acre lots, 20% imp, HSG D
30,622	84	1 acre lots, 20% imp, HSG D
9,979	84	1 acre lots, 20% imp, HSG D
3,867	77	Woods, Good, HSG D
9,461	98	Paved roads w/curbs & sewers, HSG B
254	98	Paved roads w/curbs & sewers, HSG B
6,306	98	Paved roads w/curbs & sewers, HSG D
234	98	Paved roads w/curbs & sewers, HSG D
35,895	98	Paved roads w/curbs & sewers, HSG B
8,154	98	Paved roads w/curbs & sewers, HSG B
8,906	98	Paved roads w/curbs & sewers, HSG D
9,293	98	Paved roads w/curbs & sewers, HSG D
1,920	98	Paved roads w/curbs & sewers, HSG D
60,038	77	Woods, Good, HSG D
509	55	Woods, Good, HSG B
54,291	55	Woods, Good, HSG B
557,510	77	Woods, Good, HSG D
5,727	61	>75% Grass cover, Good, HSG B

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4,242	68	1 acre lots, 20% imp, HSG B
43,411	68	1 acre lots, 20% imp, HSG B
4,608	68	1 acre lots, 20% imp, HSG B
56,607	68	1 acre lots, 20% imp, HSG B
17,779	55	Woods, Good, HSG B
6	55	Woods, Good, HSG B
61	55	Woods, Good, HSG B
187,750	55	Woods, Good, HSG B
1,002,408	55	Woods, Good, HSG B
12,536	98	Paved roads w/curbs & sewers, HSG B
3,415	98	Paved roads w/curbs & sewers, HSG B
2,284	98	Paved roads w/curbs & sewers, HSG B
11,562	98	Paved roads w/curbs & sewers, HSG B
2,273	68	1 acre lots, 20% imp, HSG B
3,550	98	Roofs, HSG A
2,631	98	Roofs, HSG A
861	98	Roofs, HSG A
13,650	98	Roofs, HSG A
7,476	98	Roofs, HSG A
537	98	Roofs, HSG A
3,465	98	Roofs, HSG A
15,193	98	Roofs, HSG A
2,952	98	Roofs, HSG A
3,464	98	Roofs, HSG A
4,080	98	Roofs, HSG A
93	98	Roofs, HSG A
1,116	98	Roofs, HSG A
6,583	98	Roofs, HSG A
9,239	39	>75% Grass cover, Good, HSG A
3,977	39	>75% Grass cover, Good, HSG A
38,172	39	>75% Grass cover, Good, HSG A
1,736	39	>75% Grass cover, Good, HSG A
53	39	>75% Grass cover, Good, HSG A
1,105	39	>75% Grass cover, Good, HSG A
4,186	39	>75% Grass cover, Good, HSG A
12,418	51	1 acre lots, 20% imp, HSG A
16,668	51	1 acre lots, 20% imp, HSG A
3,821	30	Woods, Good, HSG A
57,181	30	Woods, Good, HSG A
133,510	30	Woods, Good, HSG A
4,993	30	Woods, Good, HSG A
18,270	30	Woods, Good, HSG A
32,716	30	Woods, Good, HSG A
178,233	98	Paved roads w/curbs & sewers, HSG A
432,430	77	Woods, Good, HSG D
35,854	51	1 acre lots, 20% imp, HSG A
41,562	51	1 acre lots, 20% imp, HSG A
9,365	51	1 acre lots, 20% imp, HSG A
7,853	51	1 acre lots, 20% imp, HSG A
2,030	30	Woods, Good, HSG A
22,235	98	Paved roads w/curbs & sewers, HSG A
16,573	51	1 acre lots, 20% imp, HSG A

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48,142	84	1 acre lots, 20% imp, HSG D
82,862	84	1 acre lots, 20% imp, HSG D
107,107	55	Woods, Good, HSG B
64,489	55	Woods, Good, HSG B
161,213	77	Woods, Good, HSG D
11	77	Woods, Good, HSG D
9	77	Woods, Good, HSG D
7,658	77	Woods, Good, HSG D
10,130	77	Woods, Good, HSG D
9,432	77	Woods, Good, HSG D
10,637	84	1 acre lots, 20% imp, HSG D
24,993	84	1 acre lots, 20% imp, HSG D
16,376	98	Paved roads w/curbs & sewers, HSG D
36,187	68	1 acre lots, 20% imp, HSG B
2,087	68	1 acre lots, 20% imp, HSG B
168,797	68	1 acre lots, 20% imp, HSG B
685	68	1 acre lots, 20% imp, HSG B
64,239	98	Paved roads w/curbs & sewers, HSG B
1,661	68	1 acre lots, 20% imp, HSG B
17,363	68	1 acre lots, 20% imp, HSG B
10,929	68	1 acre lots, 20% imp, HSG B
14,136	68	1 acre lots, 20% imp, HSG B
4,514	68	1 acre lots, 20% imp, HSG B
36,441	68	1 acre lots, 20% imp, HSG B
77,643	68	1 acre lots, 20% imp, HSG B
39,968	68	1 acre lots, 20% imp, HSG B
43,173	68	1 acre lots, 20% imp, HSG B
71,299	68	1 acre lots, 20% imp, HSG B
7,700	55	Woods, Good, HSG B
3,535	55	Woods, Good, HSG B
209,319	55	Woods, Good, HSG B
117,840	55	Woods, Good, HSG B
17	55	Woods, Good, HSG B
4,089	98	Roofs, HSG B
7,799	98	Roofs, HSG B
190	98	Roofs, HSG B
39,268	98	Paved roads w/curbs & sewers, HSG B
6,377	68	1 acre lots, 20% imp, HSG B
8,138	68	1 acre lots, 20% imp, HSG B
1,606	55	Woods, Good, HSG B
9,576	55	Woods, Good, HSG B
80,241	55	Woods, Good, HSG B
0	55	Woods, Good, HSG B
11	55	Woods, Good, HSG B
0	55	Woods, Good, HSG B
148,448	55	Woods, Good, HSG B
2,056	61	>75% Grass cover, Good, HSG B
191	68	1 acre lots, 20% imp, HSG B
137,438	68	1 acre lots, 20% imp, HSG B
28,368	68	1 acre lots, 20% imp, HSG B
29,743	68	1 acre lots, 20% imp, HSG B
25,401	68	1 acre lots, 20% imp, HSG B

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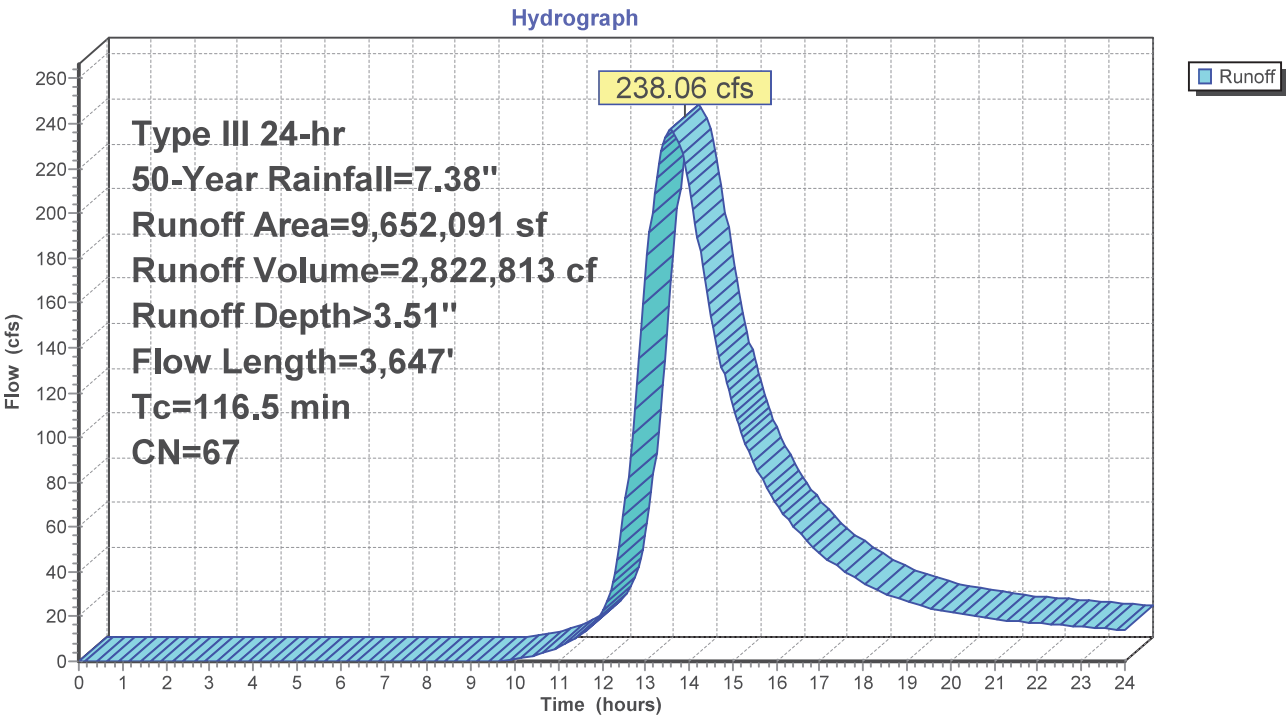
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34,695	68	1 acre lots, 20% imp, HSG B
151	68	1 acre lots, 20% imp, HSG B
2,028	68	1 acre lots, 20% imp, HSG B
4,562	68	1 acre lots, 20% imp, HSG B
683	68	1 acre lots, 20% imp, HSG B
15,767	68	1 acre lots, 20% imp, HSG B
13,153	68	1 acre lots, 20% imp, HSG B
301	68	1 acre lots, 20% imp, HSG B
38,195	68	1 acre lots, 20% imp, HSG B
2,684	61	>75% Grass cover, Good, HSG B
117	98	Paved roads w/curbs & sewers, HSG B
906	98	Roofs, HSG B

9,652,091	67	Weighted Average
7,817,350		80.99% Pervious Area
1,834,740		19.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.0	100	0.0100	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.28"
15.1	700	0.0240	0.77		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
30.0	623	0.0048	0.35		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
33.2	961	0.0093	0.48		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
10.2	1,263	0.0190	2.07		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
116.5	3,647	Total			

Subcatchment EX-1: Subcat EX-1



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Summary for Subcatchment EX-2: Subcat EX-2

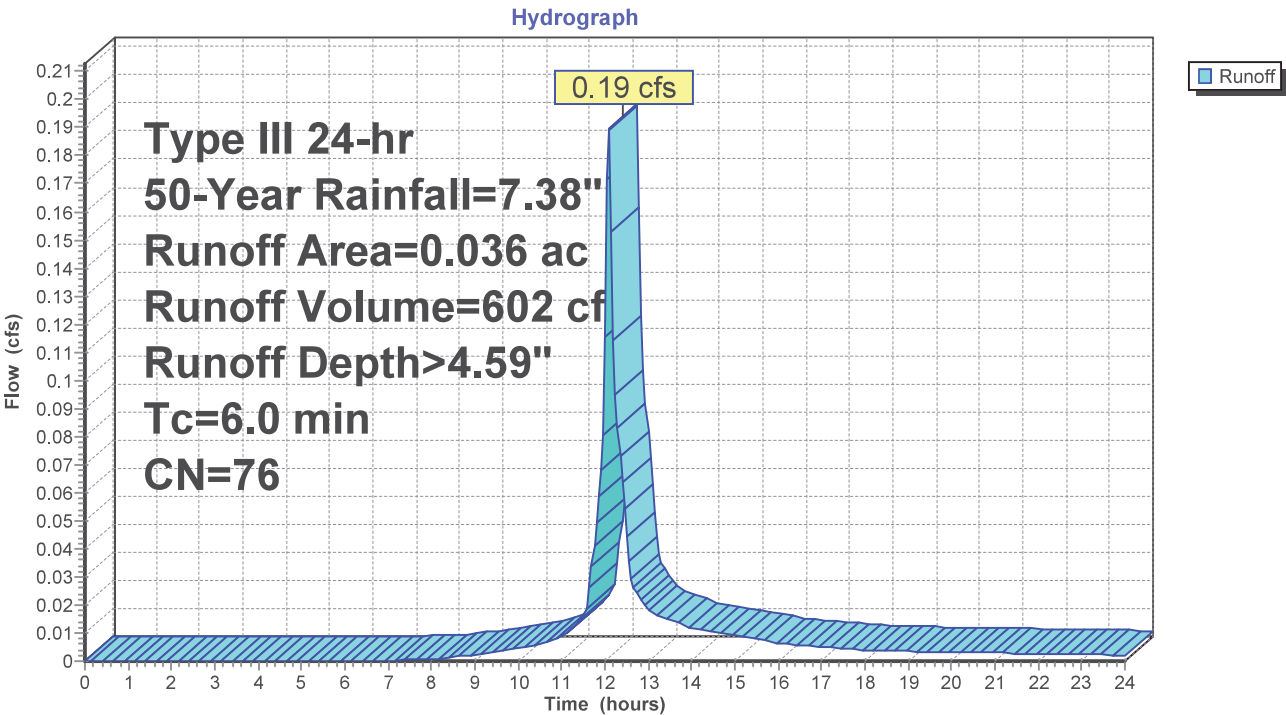
Runoff = 0.19 cfs @ 12.09 hrs, Volume= 602 cf, Depth> 4.59"
Routed to Pond 2P : Offsite Northwest

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=7.38"

Area (ac)	CN	Description
0.022	61	>75% Grass cover, Good, HSG B
0.000	68	1 acre lots, 20% imp, HSG B
0.006	98	Paved roads w/curbs & sewers, HSG B
0.009	98	Roofs, HSG B
0.036	76	Weighted Average
0.022		59.97% Pervious Area
0.014		40.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment EX-2: Subcat EX-2



Summary for Pond 1P: Ex. 30" HDPE Culvert

[57] Hint: Peaked at 114.62' (Flood elevation advised)

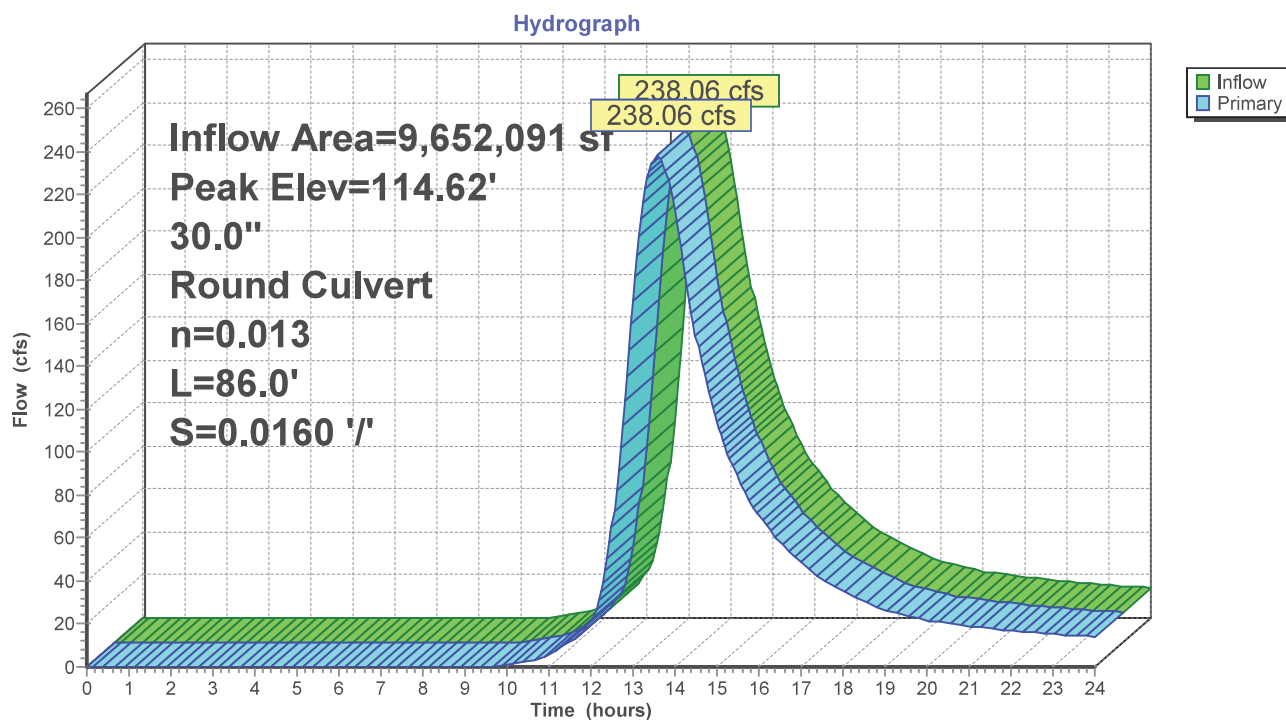
Inflow Area = 9,652,091 sf, 19.01% Impervious, Inflow Depth > 3.51" for 50-Year event
 Inflow = 238.06 cfs @ 13.59 hrs, Volume= 2,822,813 cf
 Outflow = 238.06 cfs @ 13.59 hrs, Volume= 2,822,813 cf, Atten= 0%, Lag= 0.0 min
 Primary = 238.06 cfs @ 13.59 hrs, Volume= 2,822,813 cf
 Routed to Pond AP : Analysis Point

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 114.62' @ 13.59 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	11.92'	30.0" Round Culvert L= 86.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 11.92' / 10.54' S= 0.0160 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=237.90 cfs @ 13.59 hrs HW=114.48' (Free Discharge)
 1=Culvert (Inlet Controls 237.90 cfs @ 48.46 fps)

Pond 1P: Ex. 30" HDPE Culvert

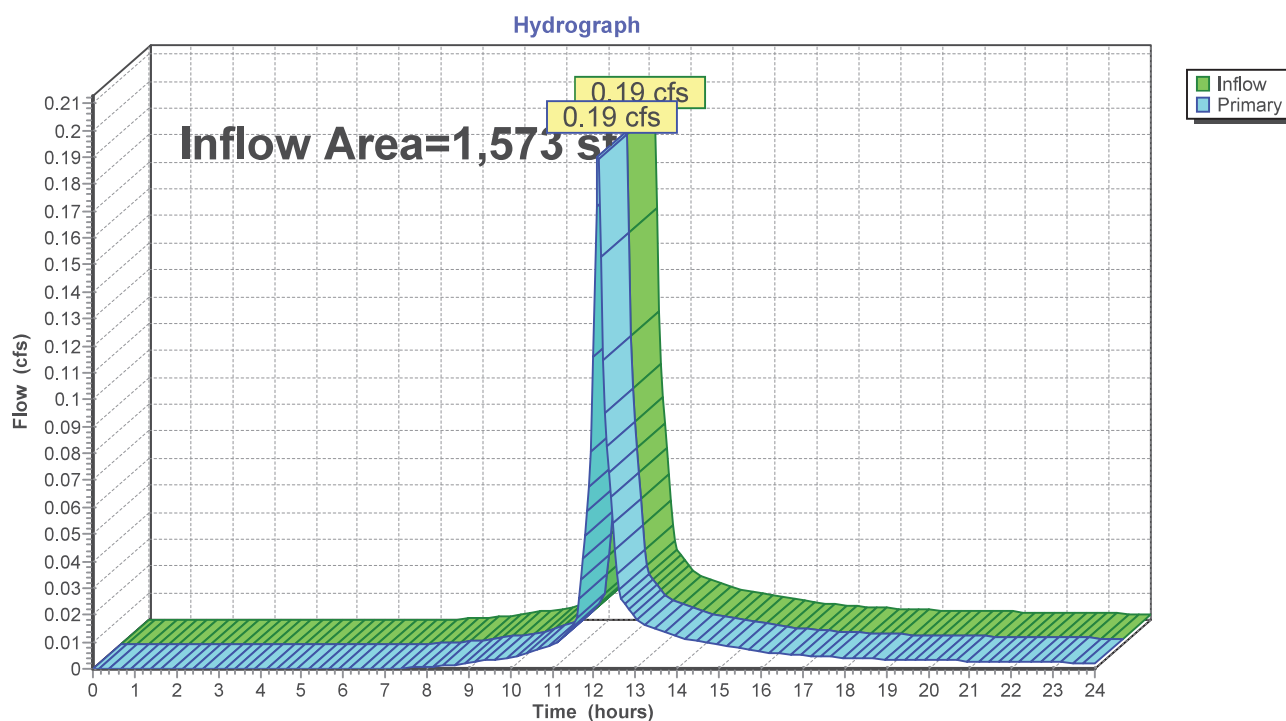


Summary for Pond 2P: Offsite Northwest

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1,573 sf, 40.03% Impervious, Inflow Depth > 4.59" for 50-Year event
Inflow = 0.19 cfs @ 12.09 hrs, Volume= 602 cf
Primary = 0.19 cfs @ 12.09 hrs, Volume= 602 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond AP : Analysis Point

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

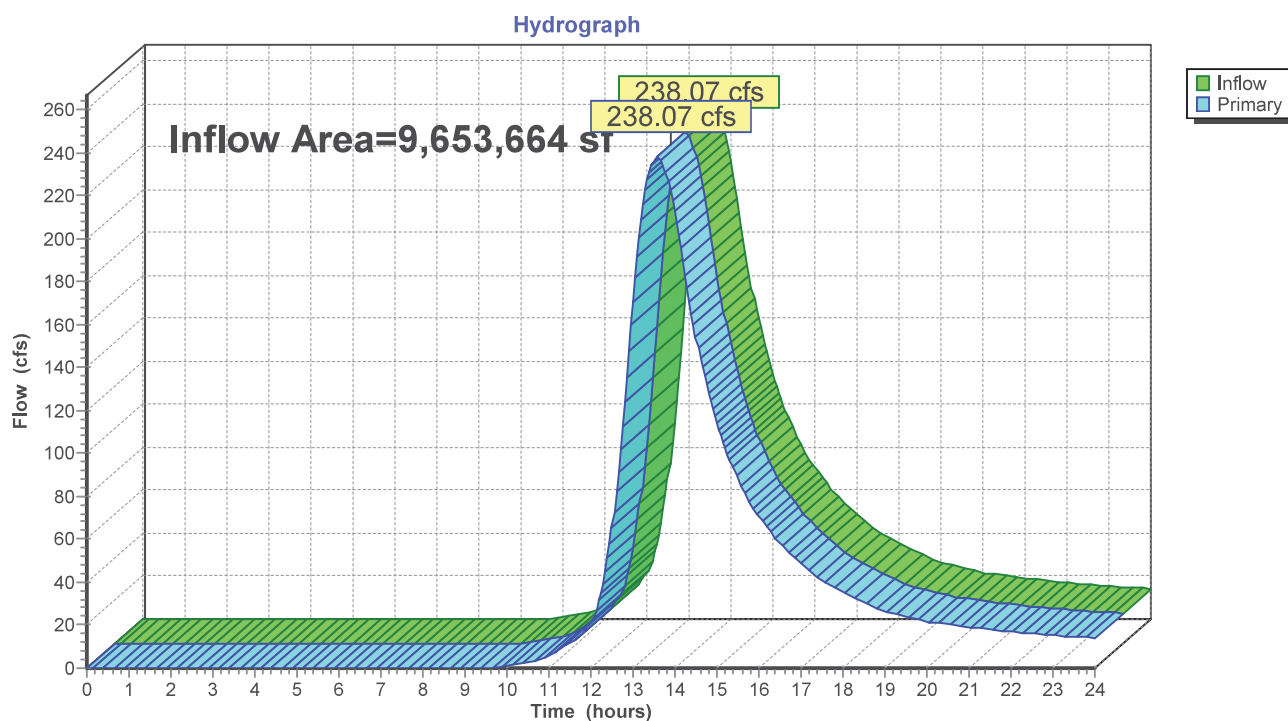
Pond 2P: Offsite Northwest

Summary for Pond AP: Analysis Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 9,653,664 sf, 19.01% Impervious, Inflow Depth > 3.51" for 50-Year event
Inflow = 238.07 cfs @ 13.59 hrs, Volume= 2,823,415 cf
Primary = 238.07 cfs @ 13.59 hrs, Volume= 2,823,415 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond AP: Analysis Point

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EX-1: Subcat EX-1 Runoff Area=9,652,091 sf 19.01% Impervious Runoff Depth>4.31"
Flow Length=3,647' Tc=116.5 min CN=67 Runoff=293.62 cfs 3,465,929 cf

Subcatchment EX-2: Subcat EX-2 Runoff Area=0.036 ac 40.03% Impervious Runoff Depth>5.49"
Tc=6.0 min CN=76 Runoff=0.23 cfs 720 cf

Pond 1P: Ex. 30" HDPE Culvert Peak Elev=167.50' Inflow=293.62 cfs 3,465,929 cf
30.0" Round Culvert n=0.013 L=86.0' S=0.0160 '/' Outflow=293.62 cfs 3,465,929 cf

Pond 2P: Offsite Northwest Inflow=0.23 cfs 720 cf
Primary=0.23 cfs 720 cf

Pond AP: Analysis Point Inflow=293.64 cfs 3,466,649 cf
Primary=293.64 cfs 3,466,649 cf

Total Runoff Area = 9,653,664 sf Runoff Volume = 3,466,649 cf Average Runoff Depth = 4.31"
80.99% Pervious = 7,818,294 sf 19.01% Impervious = 1,835,370 sf

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Summary for Subcatchment EX-1: Subcat EX-1

Runoff = 293.62 cfs @ 13.59 hrs, Volume= 3,465,929 cf, Depth> 4.31"
Routed to Pond 1P : Ex. 30" HDPE Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.37"

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Area (sf)	CN	Description
437	98	Roofs, HSG B
13,211	98	Roofs, HSG B
8,596	98	Roofs, HSG B
1,186	61	>75% Grass cover, Good, HSG B
600	61	>75% Grass cover, Good, HSG B
39,154	68	1 acre lots, 20% imp, HSG B
88,435	68	1 acre lots, 20% imp, HSG B
74,087	68	1 acre lots, 20% imp, HSG B
690	55	Woods, Good, HSG B
10,761	55	Woods, Good, HSG B
93	55	Woods, Good, HSG B
10,389	98	Paved roads w/curbs & sewers, HSG B
1,915	68	1 acre lots, 20% imp, HSG B
1,667	55	Woods, Good, HSG B
488,623	55	Woods, Good, HSG B
36,722	68	1 acre lots, 20% imp, HSG B
72,394	68	1 acre lots, 20% imp, HSG B
42,303	68	1 acre lots, 20% imp, HSG B
7,954	98	Paved roads w/curbs & sewers, HSG B
4,350	98	Paved roads w/curbs & sewers, HSG B
2,815	98	Paved roads w/curbs & sewers, HSG B
9,429	98	Paved roads w/curbs & sewers, HSG B
51,724	98	Paved roads w/curbs & sewers, HSG B
5,639	98	Roofs, HSG B
1,092	55	Woods, Good, HSG B
15,566	98	Paved roads w/curbs & sewers, HSG B
10,532	55	Woods, Good, HSG B
712	55	Woods, Good, HSG B
20,047	84	1 acre lots, 20% imp, HSG D
155,579	77	Woods, Good, HSG D
4,541	98	Paved roads w/curbs & sewers, HSG D
7,022	84	1 acre lots, 20% imp, HSG D
8,723	98	Roofs, HSG B
576	98	Roofs, HSG B
14,042	98	Roofs, HSG B
4,034	98	Roofs, HSG B
16,403	98	Roofs, HSG B
9,511	98	Roofs, HSG B
1,877	98	Roofs, HSG B
4,717	98	Roofs, HSG B
13,129	98	Roofs, HSG B
7,317	98	Roofs, HSG B
11,285	98	Roofs, HSG B
582	61	>75% Grass cover, Good, HSG B
25,528	61	>75% Grass cover, Good, HSG B
54,038	61	>75% Grass cover, Good, HSG B
36,696	68	1 acre lots, 20% imp, HSG B
42,920	68	1 acre lots, 20% imp, HSG B
98,325	55	Woods, Good, HSG B
57,352	55	Woods, Good, HSG B
110,966	55	Woods, Good, HSG B

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51	98	Paved roads w/curbs & sewers, HSG B
13,662	98	Paved roads w/curbs & sewers, HSG B
182,904	98	Paved roads w/curbs & sewers, HSG B
57	61	>75% Grass cover, Good, HSG B
62,503	55	Woods, Good, HSG B
2,710	68	1 acre lots, 20% imp, HSG B
8,636	98	Paved roads w/curbs & sewers, HSG B
1,673	98	Paved roads w/curbs & sewers, HSG B
6,338	98	Paved roads w/curbs & sewers, HSG B
12,602	98	Paved roads w/curbs & sewers, HSG B
17,167	68	1 acre lots, 20% imp, HSG B
2,389	68	1 acre lots, 20% imp, HSG B
88,957	68	1 acre lots, 20% imp, HSG B
151,346	68	1 acre lots, 20% imp, HSG B
148,516	68	1 acre lots, 20% imp, HSG B
63,026	68	1 acre lots, 20% imp, HSG B
122,963	55	Woods, Good, HSG B
93,469	55	Woods, Good, HSG B
83,227	68	1 acre lots, 20% imp, HSG B
40,984	68	1 acre lots, 20% imp, HSG B
26,764	68	1 acre lots, 20% imp, HSG B
0	55	Woods, Good, HSG B
7,639	98	Paved roads w/curbs & sewers, HSG B
240,621	55	Woods, Good, HSG B
432	55	Woods, Good, HSG B
9,356	68	1 acre lots, 20% imp, HSG B
28,682	68	1 acre lots, 20% imp, HSG B
77,538	68	1 acre lots, 20% imp, HSG B
72,866	55	Woods, Good, HSG B
1	55	Woods, Good, HSG B
25,054	55	Woods, Good, HSG B
10,579	98	Paved roads w/curbs & sewers, HSG B
1,871	98	Paved roads w/curbs & sewers, HSG B
228,105	55	Woods, Good, HSG B
10,612	98	Roofs, HSG A
2,814	98	Roofs, HSG A
4,636	98	Roofs, HSG A
4,484	98	Roofs, HSG A
3,906	98	Roofs, HSG A
4,863	98	Roofs, HSG A
3,009	98	Roofs, HSG A
6,117	98	Roofs, HSG A
1,488	98	Roofs, HSG A
6,760	98	Roofs, HSG A
2,404	39	>75% Grass cover, Good, HSG A
3,772	39	>75% Grass cover, Good, HSG A
14,346	39	>75% Grass cover, Good, HSG A
5,038	39	>75% Grass cover, Good, HSG A
2,099	39	>75% Grass cover, Good, HSG A
12,640	39	>75% Grass cover, Good, HSG A
5,858	39	>75% Grass cover, Good, HSG A
12,157	39	>75% Grass cover, Good, HSG A

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1,549	39	>75% Grass cover, Good, HSG A
4,123	39	>75% Grass cover, Good, HSG A
2,558	39	>75% Grass cover, Good, HSG A
7,360	39	>75% Grass cover, Good, HSG A
14	51	1 acre lots, 20% imp, HSG A
37,651	51	1 acre lots, 20% imp, HSG A
39,967	51	1 acre lots, 20% imp, HSG A
2,959	30	Woods, Good, HSG A
585	30	Woods, Good, HSG A
2	30	Woods, Good, HSG A
16,384	30	Woods, Good, HSG A
13,607	30	Woods, Good, HSG A
1,576	30	Woods, Good, HSG A
424	39	>75% Grass cover, Good, HSG A
56	39	>75% Grass cover, Good, HSG A
2,604	39	>75% Grass cover, Good, HSG A
1,995	39	>75% Grass cover, Good, HSG A
677	39	>75% Grass cover, Good, HSG A
48,051	30	Woods, Good, HSG A
9,600	30	Woods, Good, HSG A
8,066	30	Woods, Good, HSG A
253,052	98	Paved roads w/curbs & sewers, HSG A
1,260	84	1 acre lots, 20% imp, HSG D
4,120	84	1 acre lots, 20% imp, HSG D
21,593	84	1 acre lots, 20% imp, HSG D
2,295	84	1 acre lots, 20% imp, HSG D
28,307	84	1 acre lots, 20% imp, HSG D
64,402	84	1 acre lots, 20% imp, HSG D
5,614	84	1 acre lots, 20% imp, HSG D
53	84	1 acre lots, 20% imp, HSG D
7,502	84	1 acre lots, 20% imp, HSG D
322	84	1 acre lots, 20% imp, HSG D
16	84	1 acre lots, 20% imp, HSG D
2,454	98	Paved roads w/curbs & sewers, HSG D
809	84	1 acre lots, 20% imp, HSG D
30,622	84	1 acre lots, 20% imp, HSG D
9,979	84	1 acre lots, 20% imp, HSG D
3,867	77	Woods, Good, HSG D
9,461	98	Paved roads w/curbs & sewers, HSG B
254	98	Paved roads w/curbs & sewers, HSG B
6,306	98	Paved roads w/curbs & sewers, HSG D
234	98	Paved roads w/curbs & sewers, HSG D
35,895	98	Paved roads w/curbs & sewers, HSG B
8,154	98	Paved roads w/curbs & sewers, HSG B
8,906	98	Paved roads w/curbs & sewers, HSG D
9,293	98	Paved roads w/curbs & sewers, HSG D
1,920	98	Paved roads w/curbs & sewers, HSG D
60,038	77	Woods, Good, HSG D
509	55	Woods, Good, HSG B
54,291	55	Woods, Good, HSG B
557,510	77	Woods, Good, HSG D
5,727	61	>75% Grass cover, Good, HSG B

HydroCAD_Transfer_Existing

Type III 24-hr 100-Year Rainfall=8.37"

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4,242	68	1 acre lots, 20% imp, HSG B
43,411	68	1 acre lots, 20% imp, HSG B
4,608	68	1 acre lots, 20% imp, HSG B
56,607	68	1 acre lots, 20% imp, HSG B
17,779	55	Woods, Good, HSG B
6	55	Woods, Good, HSG B
61	55	Woods, Good, HSG B
187,750	55	Woods, Good, HSG B
1,002,408	55	Woods, Good, HSG B
12,536	98	Paved roads w/curbs & sewers, HSG B
3,415	98	Paved roads w/curbs & sewers, HSG B
2,284	98	Paved roads w/curbs & sewers, HSG B
11,562	98	Paved roads w/curbs & sewers, HSG B
2,273	68	1 acre lots, 20% imp, HSG B
3,550	98	Roofs, HSG A
2,631	98	Roofs, HSG A
861	98	Roofs, HSG A
13,650	98	Roofs, HSG A
7,476	98	Roofs, HSG A
537	98	Roofs, HSG A
3,465	98	Roofs, HSG A
15,193	98	Roofs, HSG A
2,952	98	Roofs, HSG A
3,464	98	Roofs, HSG A
4,080	98	Roofs, HSG A
93	98	Roofs, HSG A
1,116	98	Roofs, HSG A
6,583	98	Roofs, HSG A
9,239	39	>75% Grass cover, Good, HSG A
3,977	39	>75% Grass cover, Good, HSG A
38,172	39	>75% Grass cover, Good, HSG A
1,736	39	>75% Grass cover, Good, HSG A
53	39	>75% Grass cover, Good, HSG A
1,105	39	>75% Grass cover, Good, HSG A
4,186	39	>75% Grass cover, Good, HSG A
12,418	51	1 acre lots, 20% imp, HSG A
16,668	51	1 acre lots, 20% imp, HSG A
3,821	30	Woods, Good, HSG A
57,181	30	Woods, Good, HSG A
133,510	30	Woods, Good, HSG A
4,993	30	Woods, Good, HSG A
18,270	30	Woods, Good, HSG A
32,716	30	Woods, Good, HSG A
178,233	98	Paved roads w/curbs & sewers, HSG A
432,430	77	Woods, Good, HSG D
35,854	51	1 acre lots, 20% imp, HSG A
41,562	51	1 acre lots, 20% imp, HSG A
9,365	51	1 acre lots, 20% imp, HSG A
7,853	51	1 acre lots, 20% imp, HSG A
2,030	30	Woods, Good, HSG A
22,235	98	Paved roads w/curbs & sewers, HSG A
16,573	51	1 acre lots, 20% imp, HSG A

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48,142	84	1 acre lots, 20% imp, HSG D
82,862	84	1 acre lots, 20% imp, HSG D
107,107	55	Woods, Good, HSG B
64,489	55	Woods, Good, HSG B
161,213	77	Woods, Good, HSG D
11	77	Woods, Good, HSG D
9	77	Woods, Good, HSG D
7,658	77	Woods, Good, HSG D
10,130	77	Woods, Good, HSG D
9,432	77	Woods, Good, HSG D
10,637	84	1 acre lots, 20% imp, HSG D
24,993	84	1 acre lots, 20% imp, HSG D
16,376	98	Paved roads w/curbs & sewers, HSG D
36,187	68	1 acre lots, 20% imp, HSG B
2,087	68	1 acre lots, 20% imp, HSG B
168,797	68	1 acre lots, 20% imp, HSG B
685	68	1 acre lots, 20% imp, HSG B
64,239	98	Paved roads w/curbs & sewers, HSG B
1,661	68	1 acre lots, 20% imp, HSG B
17,363	68	1 acre lots, 20% imp, HSG B
10,929	68	1 acre lots, 20% imp, HSG B
14,136	68	1 acre lots, 20% imp, HSG B
4,514	68	1 acre lots, 20% imp, HSG B
36,441	68	1 acre lots, 20% imp, HSG B
77,643	68	1 acre lots, 20% imp, HSG B
39,968	68	1 acre lots, 20% imp, HSG B
43,173	68	1 acre lots, 20% imp, HSG B
71,299	68	1 acre lots, 20% imp, HSG B
7,700	55	Woods, Good, HSG B
3,535	55	Woods, Good, HSG B
209,319	55	Woods, Good, HSG B
117,840	55	Woods, Good, HSG B
17	55	Woods, Good, HSG B
4,089	98	Roofs, HSG B
7,799	98	Roofs, HSG B
190	98	Roofs, HSG B
39,268	98	Paved roads w/curbs & sewers, HSG B
6,377	68	1 acre lots, 20% imp, HSG B
8,138	68	1 acre lots, 20% imp, HSG B
1,606	55	Woods, Good, HSG B
9,576	55	Woods, Good, HSG B
80,241	55	Woods, Good, HSG B
0	55	Woods, Good, HSG B
11	55	Woods, Good, HSG B
0	55	Woods, Good, HSG B
148,448	55	Woods, Good, HSG B
2,056	61	>75% Grass cover, Good, HSG B
191	68	1 acre lots, 20% imp, HSG B
137,438	68	1 acre lots, 20% imp, HSG B
28,368	68	1 acre lots, 20% imp, HSG B
29,743	68	1 acre lots, 20% imp, HSG B
25,401	68	1 acre lots, 20% imp, HSG B

HydroCAD_Transfer_Existing

Type III 24-hr 100-Year Rainfall=8.37"

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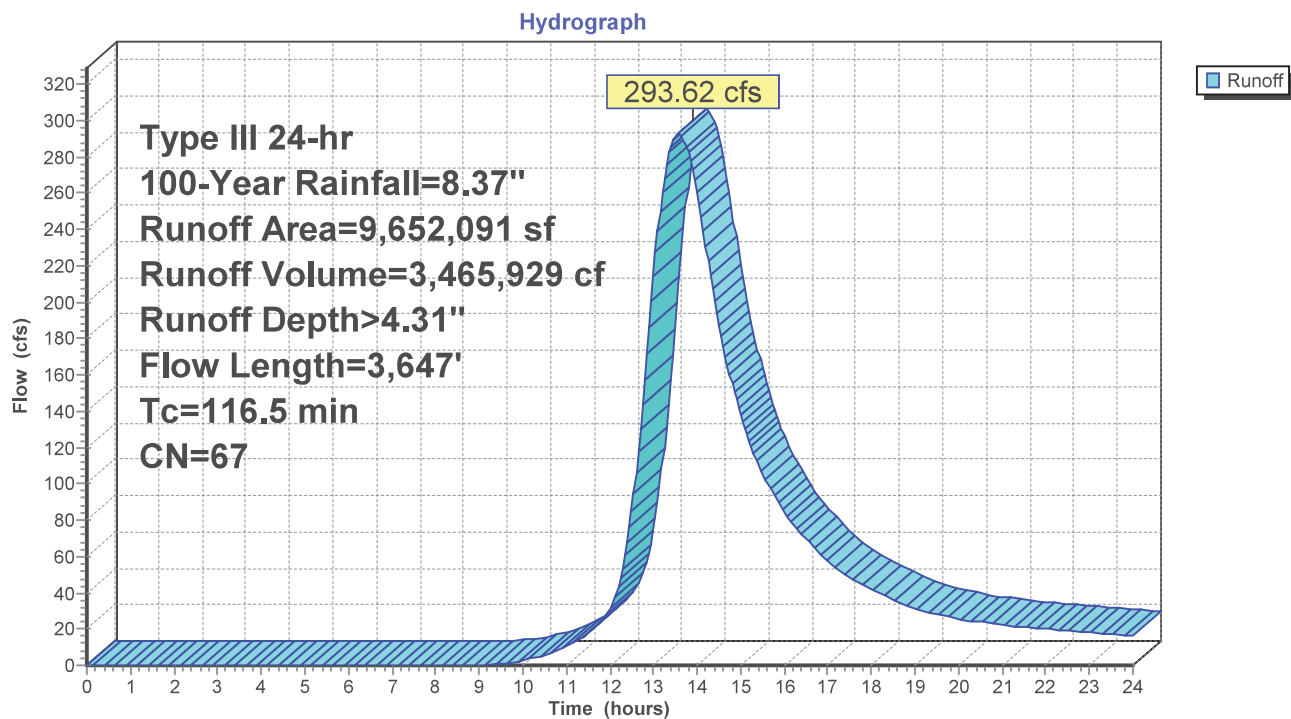
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34,695	68	1 acre lots, 20% imp, HSG B
151	68	1 acre lots, 20% imp, HSG B
2,028	68	1 acre lots, 20% imp, HSG B
4,562	68	1 acre lots, 20% imp, HSG B
683	68	1 acre lots, 20% imp, HSG B
15,767	68	1 acre lots, 20% imp, HSG B
13,153	68	1 acre lots, 20% imp, HSG B
301	68	1 acre lots, 20% imp, HSG B
38,195	68	1 acre lots, 20% imp, HSG B
2,684	61	>75% Grass cover, Good, HSG B
117	98	Paved roads w/curbs & sewers, HSG B
906	98	Roofs, HSG B

9,652,091	67	Weighted Average
7,817,350		80.99% Pervious Area
1,834,740		19.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.0	100	0.0100	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.28"
15.1	700	0.0240	0.77		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
30.0	623	0.0048	0.35		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
33.2	961	0.0093	0.48		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
10.2	1,263	0.0190	2.07		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
116.5	3,647	Total			

Subcatchment EX-1: Subcat EX-1



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Type III 24-hr 100-Year Rainfall=8.37"

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Summary for Subcatchment EX-2: Subcat EX-2

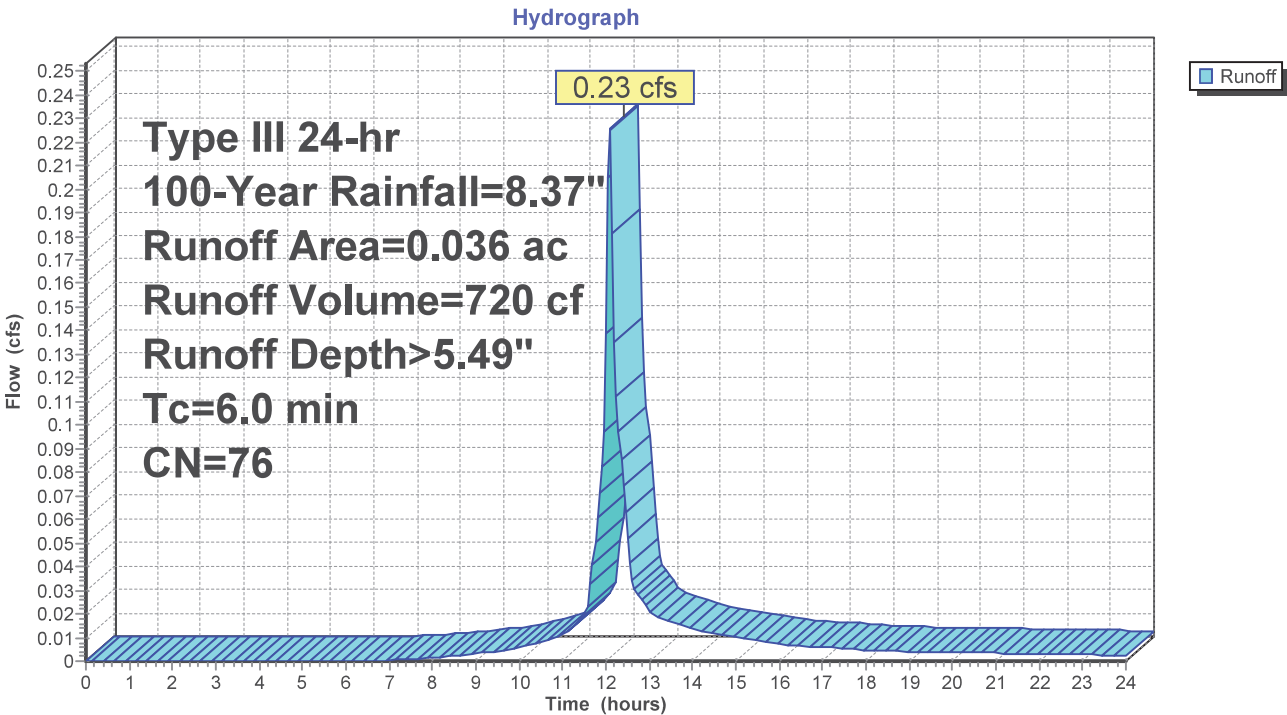
Runoff = 0.23 cfs @ 12.09 hrs, Volume= 720 cf, Depth> 5.49"
Routed to Pond 2P : Offsite Northwest

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.37"

Area (ac)	CN	Description
0.022	61	>75% Grass cover, Good, HSG B
0.000	68	1 acre lots, 20% imp, HSG B
0.006	98	Paved roads w/curbs & sewers, HSG B
0.009	98	Roofs, HSG B
0.036	76	Weighted Average
0.022		59.97% Pervious Area
0.014		40.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment EX-2: Subcat EX-2



Summary for Pond 1P: Ex. 30" HDPE Culvert

[57] Hint: Peaked at 167.50' (Flood elevation advised)

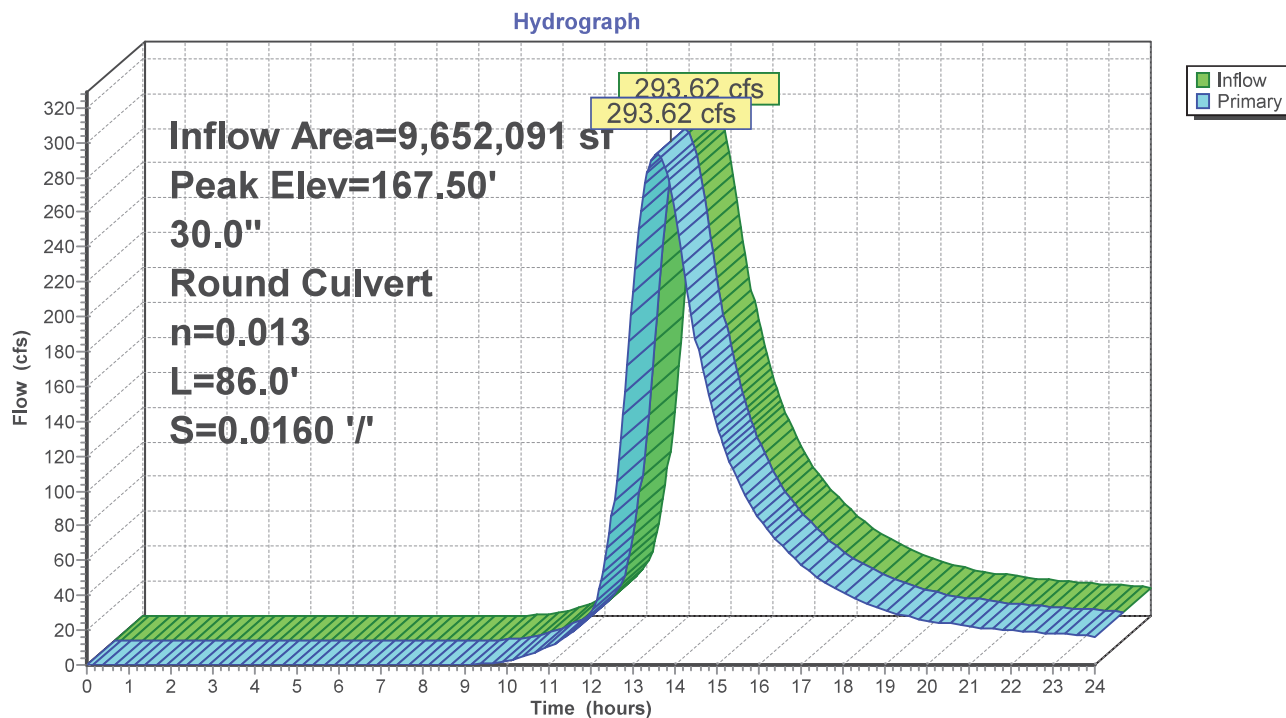
Inflow Area = 9,652,091 sf, 19.01% Impervious, Inflow Depth > 4.31" for 100-Year event
 Inflow = 293.62 cfs @ 13.59 hrs, Volume= 3,465,929 cf
 Outflow = 293.62 cfs @ 13.59 hrs, Volume= 3,465,929 cf, Atten= 0%, Lag= 0.0 min
 Primary = 293.62 cfs @ 13.59 hrs, Volume= 3,465,929 cf
 Routed to Pond AP : Analysis Point

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 167.50' @ 13.59 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	11.92'	30.0" Round Culvert L= 86.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 11.92' / 10.54' S= 0.0160 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=293.35 cfs @ 13.59 hrs HW=167.21' (Free Discharge)
 1=Culvert (Inlet Controls 293.35 cfs @ 59.76 fps)

Pond 1P: Ex. 30" HDPE Culvert

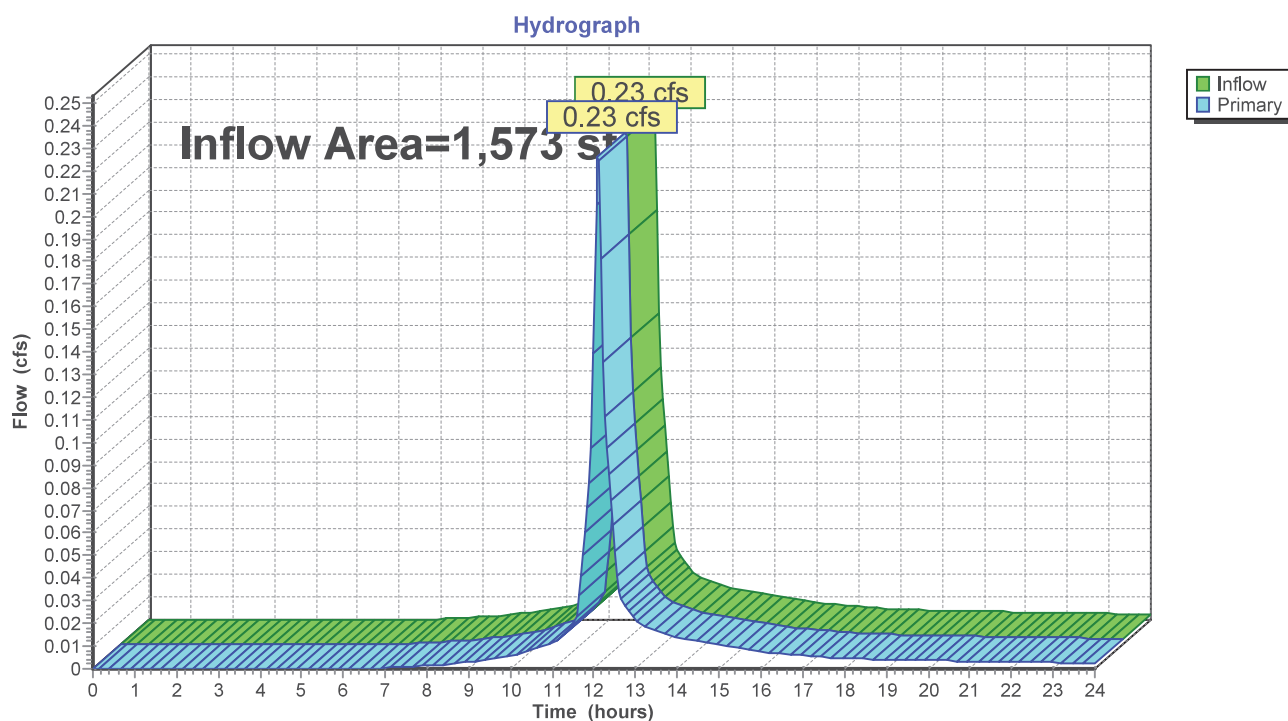


Summary for Pond 2P: Offsite Northwest

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1,573 sf, 40.03% Impervious, Inflow Depth > 5.49" for 100-Year event
Inflow = 0.23 cfs @ 12.09 hrs, Volume= 720 cf
Primary = 0.23 cfs @ 12.09 hrs, Volume= 720 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond AP : Analysis Point

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 2P: Offsite Northwest

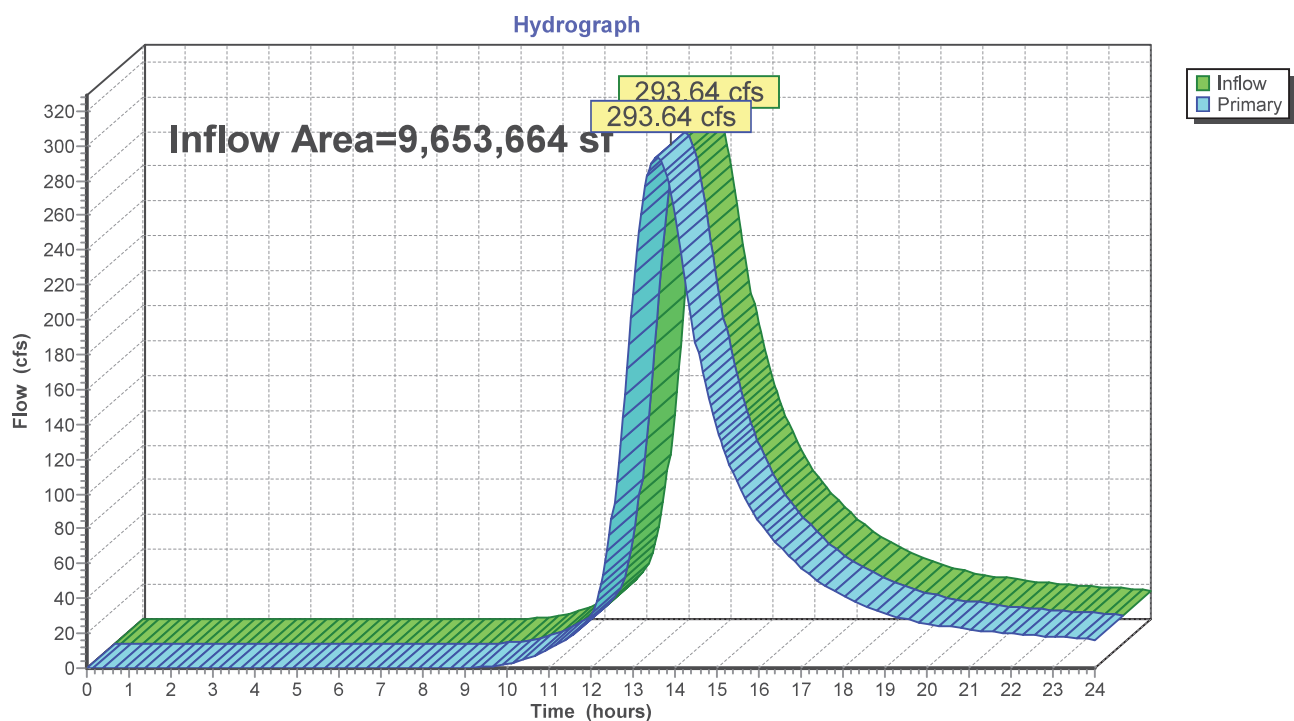
Summary for Pond AP: Analysis Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 9,653,664 sf, 19.01% Impervious, Inflow Depth > 4.31" for 100-Year event
 Inflow = 293.64 cfs @ 13.59 hrs, Volume= 3,466,649 cf
 Primary = 293.64 cfs @ 13.59 hrs, Volume= 3,466,649 cf, Atten= 0%, Lag= 0.0 min

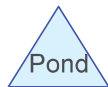
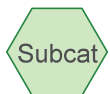
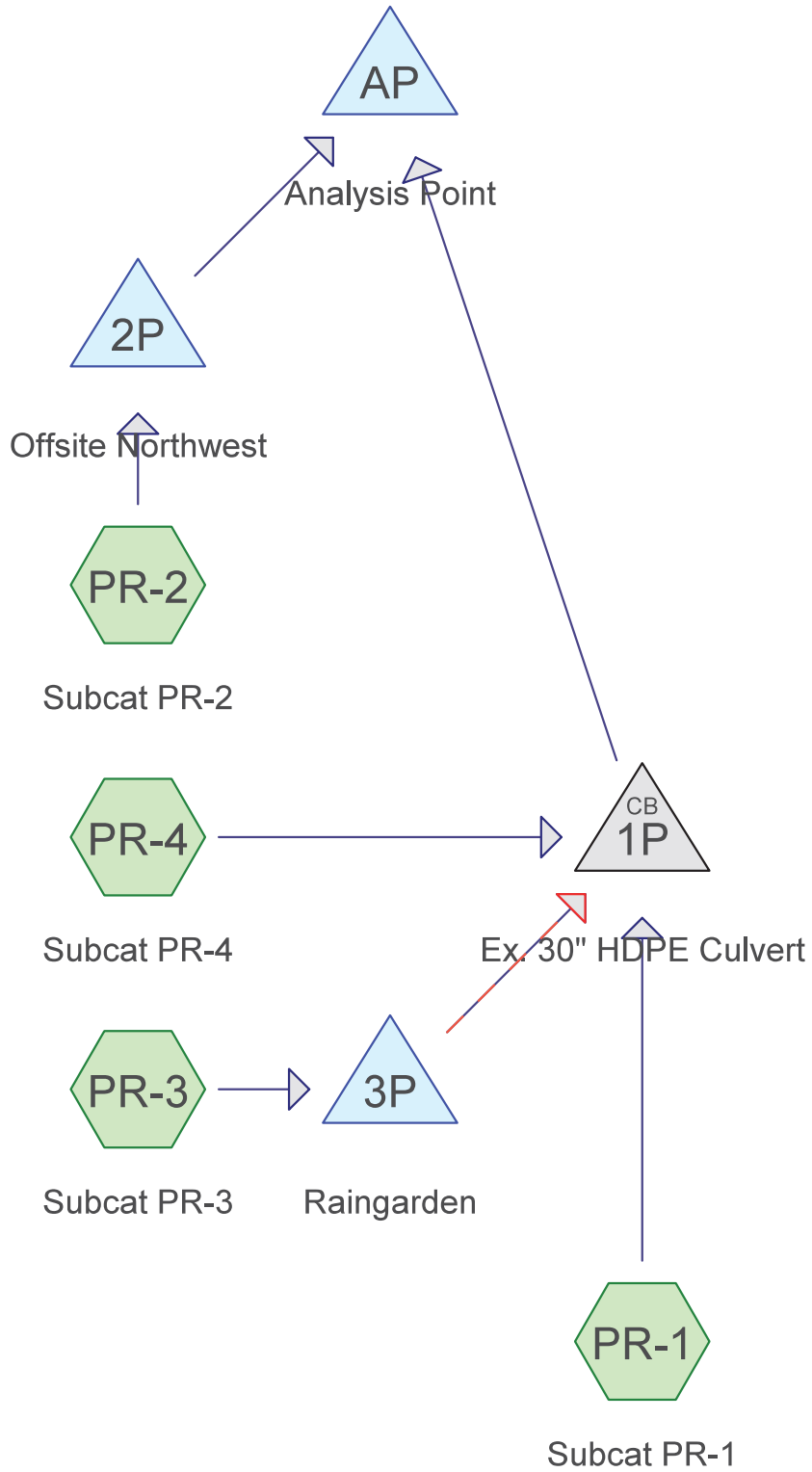
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond AP: Analysis Point



Appendix D

Post-Development HydroCAD Results



Routing Diagram for HydroCAD_Transfer_Proposed_RG
 Prepared by Tidewater Engineering & Survey, Printed 7/21/2026
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HydroCAD_Transfer_Proposed_RG

Prepared by Tidewater Engineering & Survey

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Type III 24-hr 2-Year Rainfall=3.28"

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PR-1: Subcat PR-1 Runoff Area=9,649,290 sf 19.00% Impervious Runoff Depth>0.70"
Flow Length=3,647' Tc=116.5 min CN=67 Runoff=40.61 cfs 562,380 cf

Subcatchment PR-2: Subcat PR-2 Runoff Area=891 sf 42.84% Impervious Runoff Depth>1.27"
Tc=6.0 min CN=77 Runoff=0.03 cfs 94 cf

Subcatchment PR-3: Subcat PR-3 Runoff Area=2,727 sf 20.60% Impervious Runoff Depth>0.68"
Tc=6.0 min CN=66 Runoff=0.04 cfs 155 cf

Subcatchment PR-4: Subcat PR-4 Runoff Area=755 sf 100.00% Impervious Runoff Depth>3.05"
Tc=6.0 min CN=98 Runoff=0.05 cfs 192 cf

Pond 1P: Ex. 30" HDPE Culvert Peak Elev=16.12' Inflow=40.62 cfs 562,653 cf
30.0" Round Culvert n=0.013 L=86.0' S=0.0160 ' ' Outflow=40.62 cfs 562,653 cf

Pond 2P: Offsite Northwest Inflow=0.03 cfs 94 cf
Primary=0.03 cfs 94 cf

Pond 3P: Raingarden Peak Elev=16.26' Storage=76 cf Inflow=0.04 cfs 155 cf
Primary=0.00 cfs 81 cf Secondary=0.00 cfs 0 cf Outflow=0.00 cfs 81 cf

Pond AP: Analysis Point Inflow=40.62 cfs 562,747 cf
Primary=40.62 cfs 562,747 cf

Total Runoff Area = 9,653,664 sf Runoff Volume = 562,821 cf Average Runoff Depth = 0.70"
80.99% Pervious = 7,818,248 sf 19.01% Impervious = 1,835,416 sf

HyroCAD_Transfer_Proposed_RG

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Type III 24-hr 2-Year Rainfall=3.28"

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Summary for Subcatchment PR-1: Subcat PR-1

Runoff = 40.61 cfs @ 13.77 hrs, Volume= 562,380 cf, Depth> 0.70"
Routed to Pond 1P : Ex. 30" HDPE Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.28"

HydroCAD_Transfer_Proposed_RG

Type III 24-hr 2-Year Rainfall=3.28"

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Area (sf)	CN	Description
437	98	Roofs, HSG B
13,211	98	Roofs, HSG B
8,596	98	Roofs, HSG B
1,186	61	>75% Grass cover, Good, HSG B
600	61	>75% Grass cover, Good, HSG B
39,154	68	1 acre lots, 20% imp, HSG B
88,435	68	1 acre lots, 20% imp, HSG B
74,087	68	1 acre lots, 20% imp, HSG B
690	55	Woods, Good, HSG B
10,761	55	Woods, Good, HSG B
93	55	Woods, Good, HSG B
10,389	98	Paved roads w/curbs & sewers, HSG B
1,915	68	1 acre lots, 20% imp, HSG B
1,667	55	Woods, Good, HSG B
488,623	55	Woods, Good, HSG B
36,722	68	1 acre lots, 20% imp, HSG B
72,394	68	1 acre lots, 20% imp, HSG B
42,303	68	1 acre lots, 20% imp, HSG B
7,954	98	Paved roads w/curbs & sewers, HSG B
4,350	98	Paved roads w/curbs & sewers, HSG B
2,815	98	Paved roads w/curbs & sewers, HSG B
9,429	98	Paved roads w/curbs & sewers, HSG B
51,724	98	Paved roads w/curbs & sewers, HSG B
5,639	98	Roofs, HSG B
1,092	55	Woods, Good, HSG B
15,566	98	Paved roads w/curbs & sewers, HSG B
712	55	Woods, Good, HSG B
10,532	55	Woods, Good, HSG B
20,047	84	1 acre lots, 20% imp, HSG D
155,579	77	Woods, Good, HSG D
4,541	98	Paved roads w/curbs & sewers, HSG D
7,022	84	1 acre lots, 20% imp, HSG D
8,723	98	Roofs, HSG B
576	98	Roofs, HSG B
14,042	98	Roofs, HSG B
4,034	98	Roofs, HSG B
16,403	98	Roofs, HSG B
9,511	98	Roofs, HSG B
1,877	98	Roofs, HSG B
4,717	98	Roofs, HSG B
13,129	98	Roofs, HSG B
7,317	98	Roofs, HSG B
11,285	98	Roofs, HSG B
582	61	>75% Grass cover, Good, HSG B
25,528	61	>75% Grass cover, Good, HSG B
54,038	61	>75% Grass cover, Good, HSG B
36,696	68	1 acre lots, 20% imp, HSG B
42,920	68	1 acre lots, 20% imp, HSG B
110,966	55	Woods, Good, HSG B
57,352	55	Woods, Good, HSG B
98,325	55	Woods, Good, HSG B

HydroCAD_Transfer_Proposed_RG

Type III 24-hr 2-Year Rainfall=3.28"

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51	98	Paved roads w/curbs & sewers, HSG B
13,662	98	Paved roads w/curbs & sewers, HSG B
182,904	98	Paved roads w/curbs & sewers, HSG B
57	61	>75% Grass cover, Good, HSG B
62,503	55	Woods, Good, HSG B
2,710	68	1 acre lots, 20% imp, HSG B
8,636	98	Paved roads w/curbs & sewers, HSG B
1,673	98	Paved roads w/curbs & sewers, HSG B
6,338	98	Paved roads w/curbs & sewers, HSG B
12,602	98	Paved roads w/curbs & sewers, HSG B
17,167	68	1 acre lots, 20% imp, HSG B
2,389	68	1 acre lots, 20% imp, HSG B
88,957	68	1 acre lots, 20% imp, HSG B
151,346	68	1 acre lots, 20% imp, HSG B
148,516	68	1 acre lots, 20% imp, HSG B
63,026	68	1 acre lots, 20% imp, HSG B
122,963	55	Woods, Good, HSG B
93,469	55	Woods, Good, HSG B
83,227	68	1 acre lots, 20% imp, HSG B
40,984	68	1 acre lots, 20% imp, HSG B
26,764	68	1 acre lots, 20% imp, HSG B
0	55	Woods, Good, HSG B
7,639	98	Paved roads w/curbs & sewers, HSG B
240,621	55	Woods, Good, HSG B
432	55	Woods, Good, HSG B
9,356	68	1 acre lots, 20% imp, HSG B
28,682	68	1 acre lots, 20% imp, HSG B
77,538	68	1 acre lots, 20% imp, HSG B
1	55	Woods, Good, HSG B
72,866	55	Woods, Good, HSG B
25,054	55	Woods, Good, HSG B
10,579	98	Paved roads w/curbs & sewers, HSG B
1,871	98	Paved roads w/curbs & sewers, HSG B
228,105	55	Woods, Good, HSG B
10,612	98	Roofs, HSG A
2,814	98	Roofs, HSG A
4,636	98	Roofs, HSG A
4,484	98	Roofs, HSG A
3,906	98	Roofs, HSG A
4,863	98	Roofs, HSG A
3,009	98	Roofs, HSG A
6,117	98	Roofs, HSG A
1,488	98	Roofs, HSG A
6,760	98	Roofs, HSG A
2,404	39	>75% Grass cover, Good, HSG A
3,772	39	>75% Grass cover, Good, HSG A
14,346	39	>75% Grass cover, Good, HSG A
5,038	39	>75% Grass cover, Good, HSG A
2,099	39	>75% Grass cover, Good, HSG A
12,640	39	>75% Grass cover, Good, HSG A
5,858	39	>75% Grass cover, Good, HSG A
12,157	39	>75% Grass cover, Good, HSG A

HydroCAD_Transfer_Proposed_RG

Type III 24-hr 2-Year Rainfall=3.28"

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1,549	39	>75% Grass cover, Good, HSG A
4,123	39	>75% Grass cover, Good, HSG A
2,558	39	>75% Grass cover, Good, HSG A
7,360	39	>75% Grass cover, Good, HSG A
14	51	1 acre lots, 20% imp, HSG A
37,651	51	1 acre lots, 20% imp, HSG A
39,967	51	1 acre lots, 20% imp, HSG A
2,959	30	Woods, Good, HSG A
585	30	Woods, Good, HSG A
13,607	30	Woods, Good, HSG A
1,576	30	Woods, Good, HSG A
2	30	Woods, Good, HSG A
16,384	30	Woods, Good, HSG A
424	39	>75% Grass cover, Good, HSG A
56	39	>75% Grass cover, Good, HSG A
2,604	39	>75% Grass cover, Good, HSG A
1,995	39	>75% Grass cover, Good, HSG A
677	39	>75% Grass cover, Good, HSG A
48,051	30	Woods, Good, HSG A
9,600	30	Woods, Good, HSG A
8,066	30	Woods, Good, HSG A
253,052	98	Paved roads w/curbs & sewers, HSG A
1,260	84	1 acre lots, 20% imp, HSG D
4,120	84	1 acre lots, 20% imp, HSG D
21,593	84	1 acre lots, 20% imp, HSG D
2,295	84	1 acre lots, 20% imp, HSG D
28,307	84	1 acre lots, 20% imp, HSG D
64,402	84	1 acre lots, 20% imp, HSG D
5,614	84	1 acre lots, 20% imp, HSG D
53	84	1 acre lots, 20% imp, HSG D
7,502	84	1 acre lots, 20% imp, HSG D
322	84	1 acre lots, 20% imp, HSG D
16	84	1 acre lots, 20% imp, HSG D
2,454	98	Paved roads w/curbs & sewers, HSG D
809	84	1 acre lots, 20% imp, HSG D
30,622	84	1 acre lots, 20% imp, HSG D
9,979	84	1 acre lots, 20% imp, HSG D
3,867	77	Woods, Good, HSG D
9,461	98	Paved roads w/curbs & sewers, HSG B
254	98	Paved roads w/curbs & sewers, HSG B
6,306	98	Paved roads w/curbs & sewers, HSG D
234	98	Paved roads w/curbs & sewers, HSG D
35,895	98	Paved roads w/curbs & sewers, HSG B
8,154	98	Paved roads w/curbs & sewers, HSG B
8,906	98	Paved roads w/curbs & sewers, HSG D
9,293	98	Paved roads w/curbs & sewers, HSG D
1,920	98	Paved roads w/curbs & sewers, HSG D
60,038	77	Woods, Good, HSG D
509	55	Woods, Good, HSG B
54,291	55	Woods, Good, HSG B
557,510	77	Woods, Good, HSG D
5,727	61	>75% Grass cover, Good, HSG B

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Type III 24-hr 2-Year Rainfall=3.28"

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4,242	68	1 acre lots, 20% imp, HSG B
43,411	68	1 acre lots, 20% imp, HSG B
4,608	68	1 acre lots, 20% imp, HSG B
56,607	68	1 acre lots, 20% imp, HSG B
6	55	Woods, Good, HSG B
17,779	55	Woods, Good, HSG B
61	55	Woods, Good, HSG B
187,750	55	Woods, Good, HSG B
1,002,408	55	Woods, Good, HSG B
12,536	98	Paved roads w/curbs & sewers, HSG B
3,415	98	Paved roads w/curbs & sewers, HSG B
2,284	98	Paved roads w/curbs & sewers, HSG B
11,562	98	Paved roads w/curbs & sewers, HSG B
2,273	68	1 acre lots, 20% imp, HSG B
3,550	98	Roofs, HSG A
2,631	98	Roofs, HSG A
861	98	Roofs, HSG A
13,650	98	Roofs, HSG A
7,476	98	Roofs, HSG A
537	98	Roofs, HSG A
3,465	98	Roofs, HSG A
15,193	98	Roofs, HSG A
2,952	98	Roofs, HSG A
3,464	98	Roofs, HSG A
4,080	98	Roofs, HSG A
93	98	Roofs, HSG A
1,116	98	Roofs, HSG A
6,583	98	Roofs, HSG A
9,239	39	>75% Grass cover, Good, HSG A
3,977	39	>75% Grass cover, Good, HSG A
38,172	39	>75% Grass cover, Good, HSG A
1,736	39	>75% Grass cover, Good, HSG A
53	39	>75% Grass cover, Good, HSG A
1,105	39	>75% Grass cover, Good, HSG A
4,186	39	>75% Grass cover, Good, HSG A
12,418	51	1 acre lots, 20% imp, HSG A
16,668	51	1 acre lots, 20% imp, HSG A
4,993	30	Woods, Good, HSG A
133,510	30	Woods, Good, HSG A
57,181	30	Woods, Good, HSG A
3,821	30	Woods, Good, HSG A
18,270	30	Woods, Good, HSG A
32,716	30	Woods, Good, HSG A
178,233	98	Paved roads w/curbs & sewers, HSG A
432,430	77	Woods, Good, HSG D
35,854	51	1 acre lots, 20% imp, HSG A
41,562	51	1 acre lots, 20% imp, HSG A
9,365	51	1 acre lots, 20% imp, HSG A
7,853	51	1 acre lots, 20% imp, HSG A
2,030	30	Woods, Good, HSG A
22,235	98	Paved roads w/curbs & sewers, HSG A
16,573	51	1 acre lots, 20% imp, HSG A

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Type III 24-hr 2-Year Rainfall=3.28"

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48,142	84	1 acre lots, 20% imp, HSG D
82,862	84	1 acre lots, 20% imp, HSG D
9	77	Woods, Good, HSG D
107,107	55	Woods, Good, HSG B
64,489	55	Woods, Good, HSG B
161,213	77	Woods, Good, HSG D
11	77	Woods, Good, HSG D
10,130	77	Woods, Good, HSG D
9,432	77	Woods, Good, HSG D
7,658	77	Woods, Good, HSG D
10,637	84	1 acre lots, 20% imp, HSG D
24,993	84	1 acre lots, 20% imp, HSG D
16,376	98	Paved roads w/curbs & sewers, HSG D
36,187	68	1 acre lots, 20% imp, HSG B
2,087	68	1 acre lots, 20% imp, HSG B
168,797	68	1 acre lots, 20% imp, HSG B
685	68	1 acre lots, 20% imp, HSG B
64,239	98	Paved roads w/curbs & sewers, HSG B
1,661	68	1 acre lots, 20% imp, HSG B
17,363	68	1 acre lots, 20% imp, HSG B
10,929	68	1 acre lots, 20% imp, HSG B
14,136	68	1 acre lots, 20% imp, HSG B
4,514	68	1 acre lots, 20% imp, HSG B
36,441	68	1 acre lots, 20% imp, HSG B
77,643	68	1 acre lots, 20% imp, HSG B
39,968	68	1 acre lots, 20% imp, HSG B
43,173	68	1 acre lots, 20% imp, HSG B
71,299	68	1 acre lots, 20% imp, HSG B
17	55	Woods, Good, HSG B
117,840	55	Woods, Good, HSG B
3,535	55	Woods, Good, HSG B
209,319	55	Woods, Good, HSG B
7,700	55	Woods, Good, HSG B
4,089	98	Roofs, HSG B
7,799	98	Roofs, HSG B
190	98	Roofs, HSG B
39,268	98	Paved roads w/curbs & sewers, HSG B
6,377	68	1 acre lots, 20% imp, HSG B
8,138	68	1 acre lots, 20% imp, HSG B
1,606	55	Woods, Good, HSG B
9,576	55	Woods, Good, HSG B
80,241	55	Woods, Good, HSG B
148,448	55	Woods, Good, HSG B
0	55	Woods, Good, HSG B
11	55	Woods, Good, HSG B
0	55	Woods, Good, HSG B
202	61	>75% Grass cover, Good, HSG B
75	61	>75% Grass cover, Good, HSG B
191	68	1 acre lots, 20% imp, HSG B
137,438	68	1 acre lots, 20% imp, HSG B
28,368	68	1 acre lots, 20% imp, HSG B
29,743	68	1 acre lots, 20% imp, HSG B

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Type III 24-hr 2-Year Rainfall=3.28"

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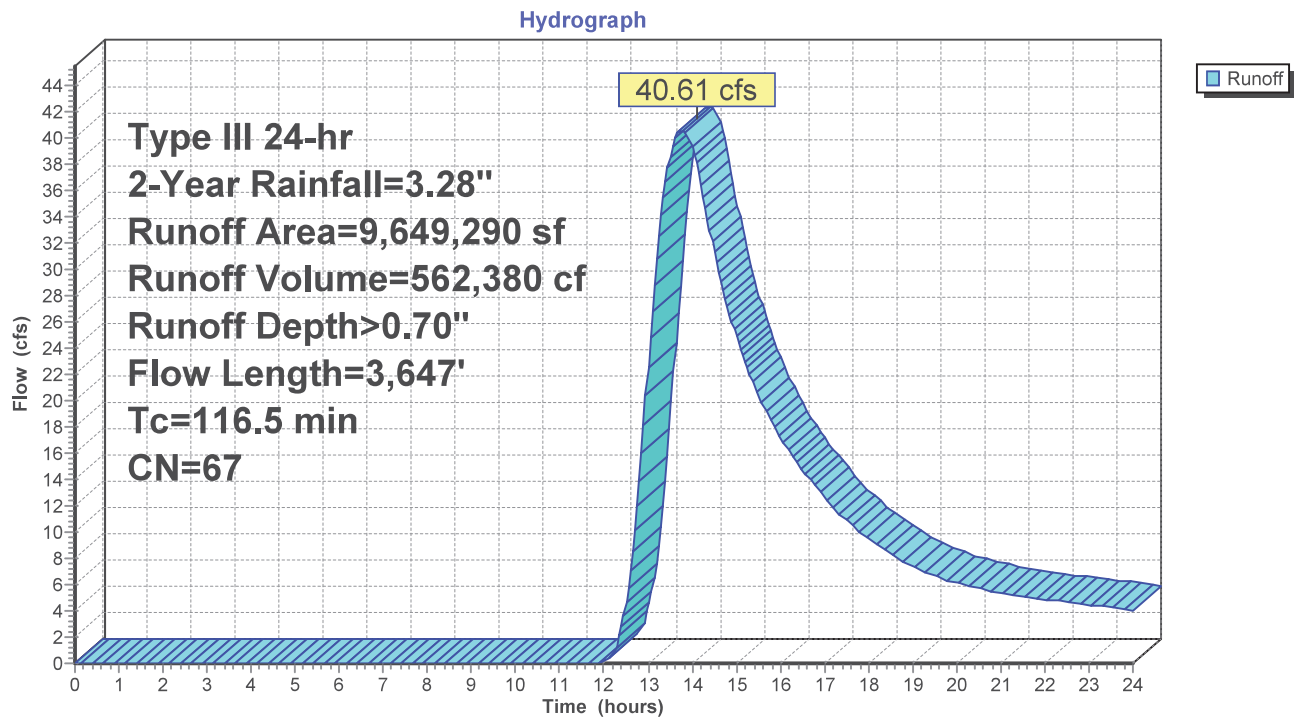
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25,401	68	1 acre lots, 20% imp, HSG B
34,695	68	1 acre lots, 20% imp, HSG B
151	68	1 acre lots, 20% imp, HSG B
2,028	68	1 acre lots, 20% imp, HSG B
4,562	68	1 acre lots, 20% imp, HSG B
683	68	1 acre lots, 20% imp, HSG B
15,767	68	1 acre lots, 20% imp, HSG B
13,154	68	1 acre lots, 20% imp, HSG B
301	68	1 acre lots, 20% imp, HSG B
38,195	68	1 acre lots, 20% imp, HSG B
2,684	61	>75% Grass cover, Good, HSG B

9,649,290	67	Weighted Average
7,815,573		81.00% Pervious Area
1,833,718		19.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.0	100	0.0100	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.28"
15.1	700	0.0240	0.77		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
30.0	623	0.0048	0.35		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
33.2	961	0.0093	0.48		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
10.2	1,263	0.0190	2.07		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
116.5	3,647	Total			

Subcatchment PR-1: Subcat PR-1



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Type III 24-hr 2-Year Rainfall=3.28"

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Summary for Subcatchment PR-2: Subcat PR-2

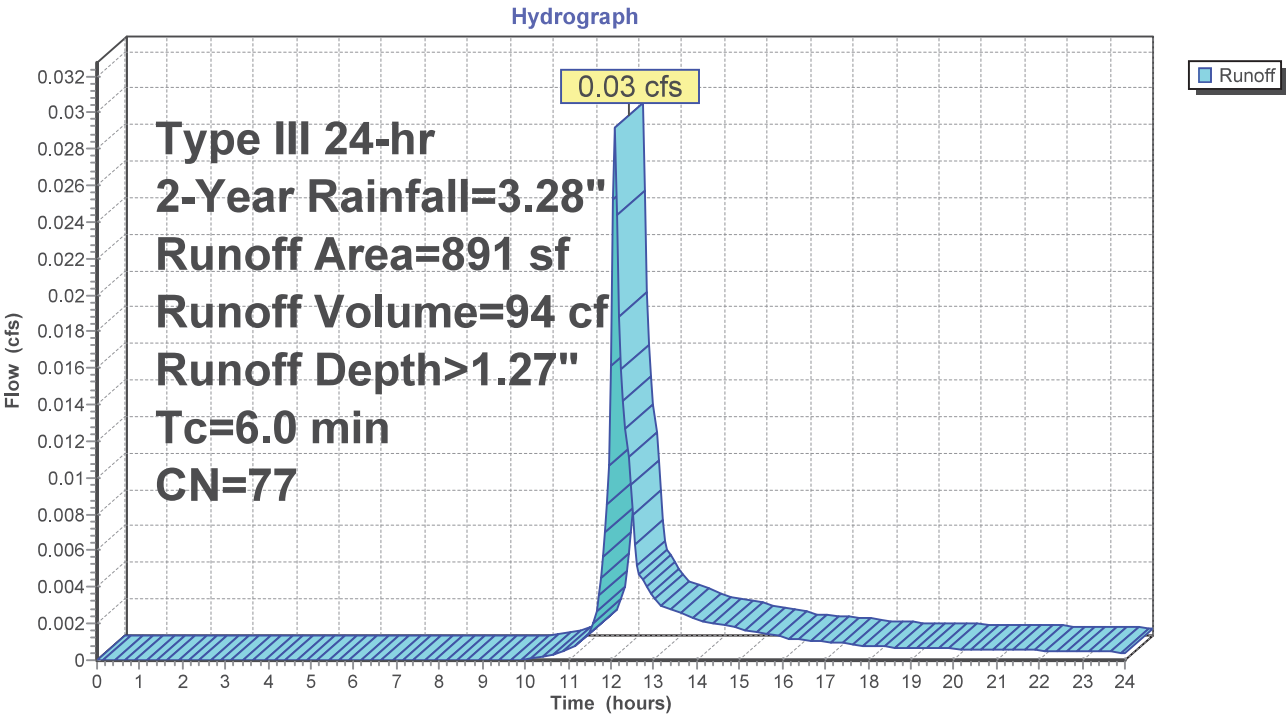
Runoff = 0.03 cfs @ 12.10 hrs, Volume= 94 cf, Depth> 1.27"
Routed to Pond 2P : Offsite Northwest

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.28"

Area (sf)	CN	Description
114	61	>75% Grass cover, Good, HSG B
395	61	>75% Grass cover, Good, HSG B
124	98	Roofs, HSG B
90	98	Roofs, HSG B
90	98	Roofs, HSG B
78	98	Roofs, HSG B
891	77	Weighted Average
510		57.16% Pervious Area
382		42.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-2: Subcat PR-2



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Type III 24-hr 2-Year Rainfall=3.28"

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Summary for Subcatchment PR-3: Subcat PR-3

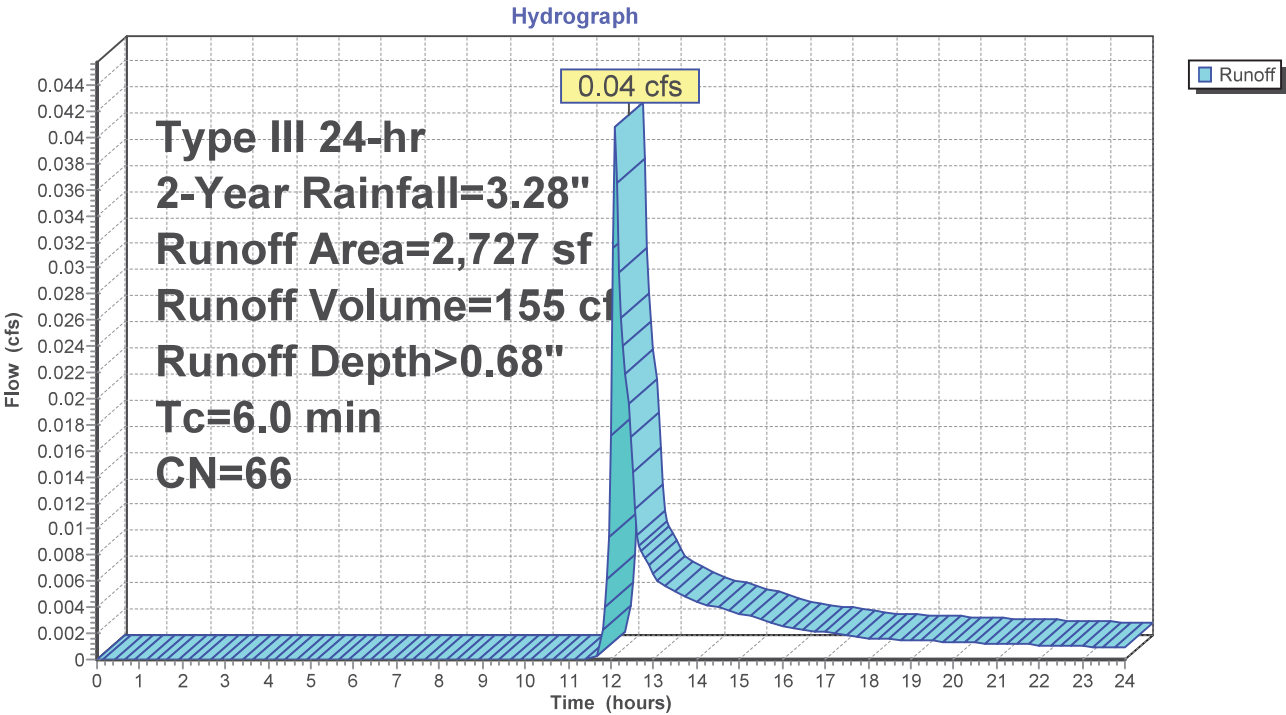
Runoff = 0.04 cfs @ 12.11 hrs, Volume= 155 cf, Depth> 0.68"
Routed to Pond 3P : Raingarden

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.28"

Area (sf)	CN	Description
759	61	>75% Grass cover, Good, HSG B
5	61	>75% Grass cover, Good, HSG B
533	98	Roofs, HSG B
29	98	Roofs, HSG B
1,401	55	Woods, Good, HSG B
2,727	66	Weighted Average
2,166		79.40% Pervious Area
562		20.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-3: Subcat PR-3



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Type III 24-hr 2-Year Rainfall=3.28"

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Summary for Subcatchment PR-4: Subcat PR-4

Runoff = 0.05 cfs @ 12.09 hrs, Volume= 192 cf, Depth> 3.05"
Routed to Pond 1P : Ex. 30" HDPE Culvert

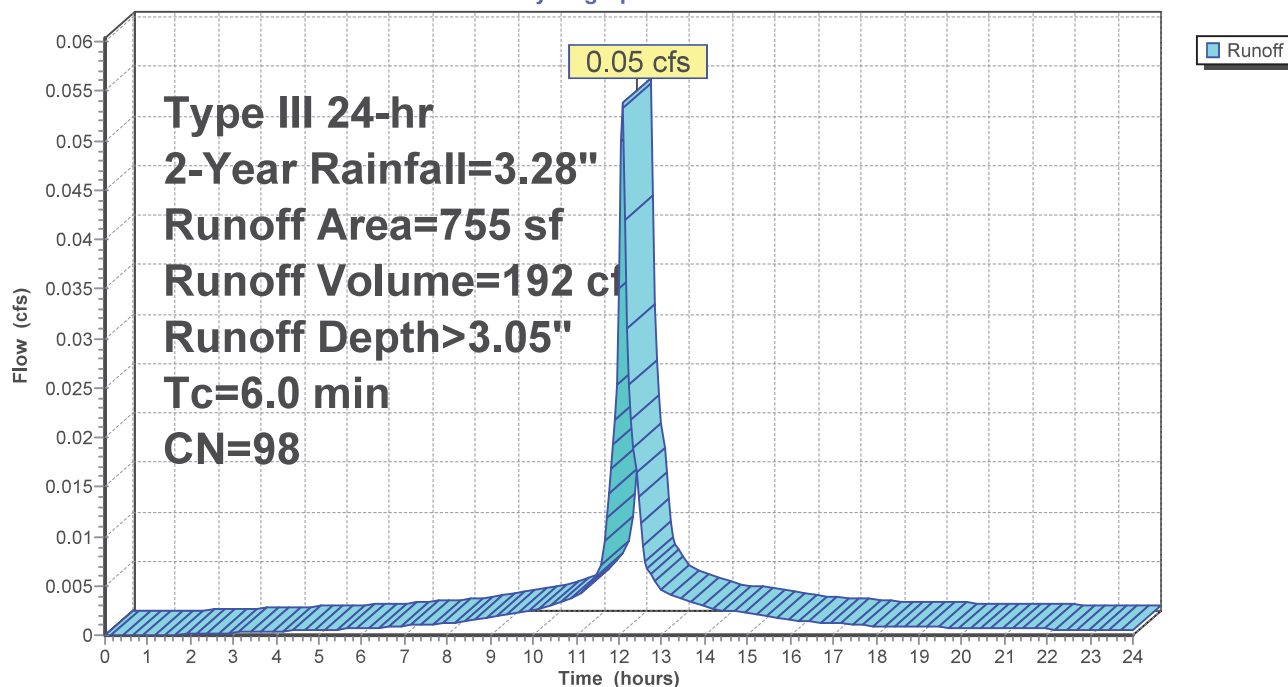
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.28"

Area (sf)	CN	Description
0	61	>75% Grass cover, Good, HSG B
755	98	Roofs, HSG B
755	98	Weighted Average
0		0.00% Pervious Area
755		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-4: Subcat PR-4

Hydrograph



Summary for Pond 1P: Ex. 30" HDPE Culvert

[57] Hint: Peaked at 16.12' (Flood elevation advised)

[79] Warning: Submerged Pond 3P Primary device # 1 INLET by 1.72'

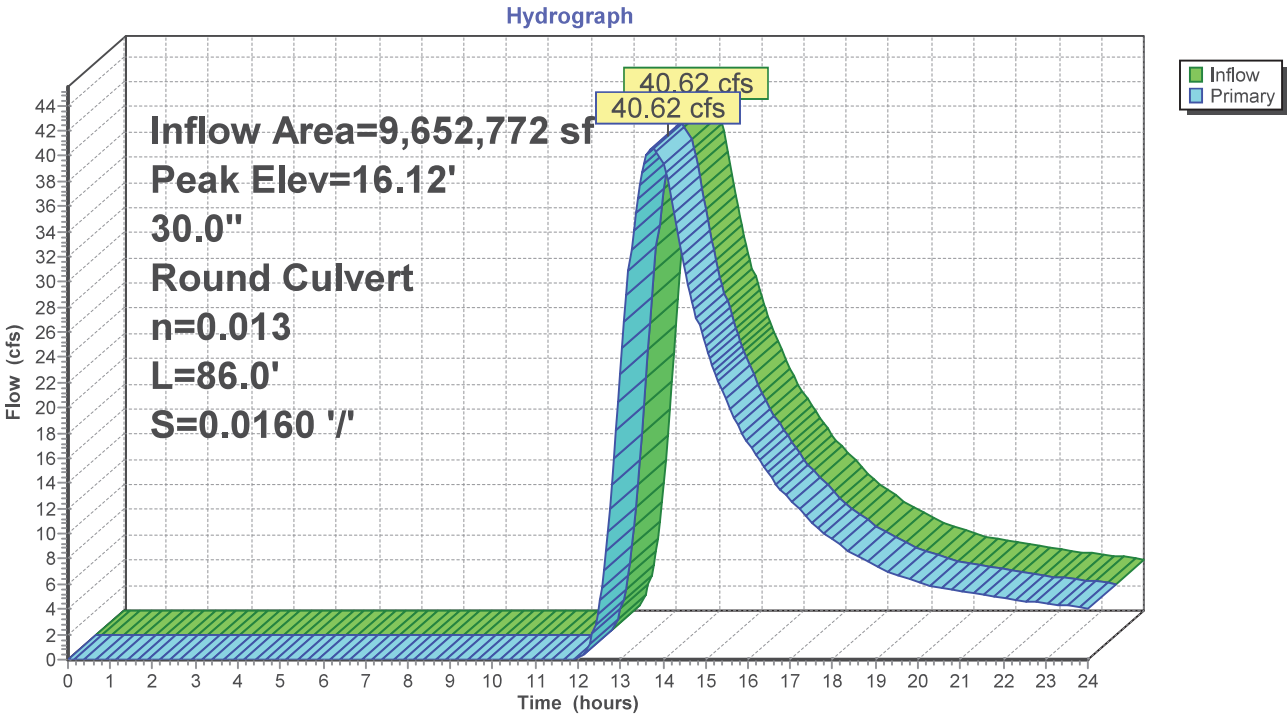
Inflow Area = 9,652,772 sf, 19.01% Impervious, Inflow Depth > 0.70" for 2-Year event
Inflow = 40.62 cfs @ 13.77 hrs, Volume= 562,653 cf
Outflow = 40.62 cfs @ 13.77 hrs, Volume= 562,653 cf, Atten= 0%, Lag= 0.0 min
Primary = 40.62 cfs @ 13.77 hrs, Volume= 562,653 cf
Routed to Pond AP : Analysis Point

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 16.12' @ 13.77 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	11.92'	30.0" Round Culvert L= 86.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 11.92' / 10.54' S= 0.0160 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=40.60 cfs @ 13.77 hrs HW=16.12' (Free Discharge)
↑1=Culvert (Inlet Controls 40.60 cfs @ 8.27 fps)

Pond 1P: Ex. 30" HDPE Culvert



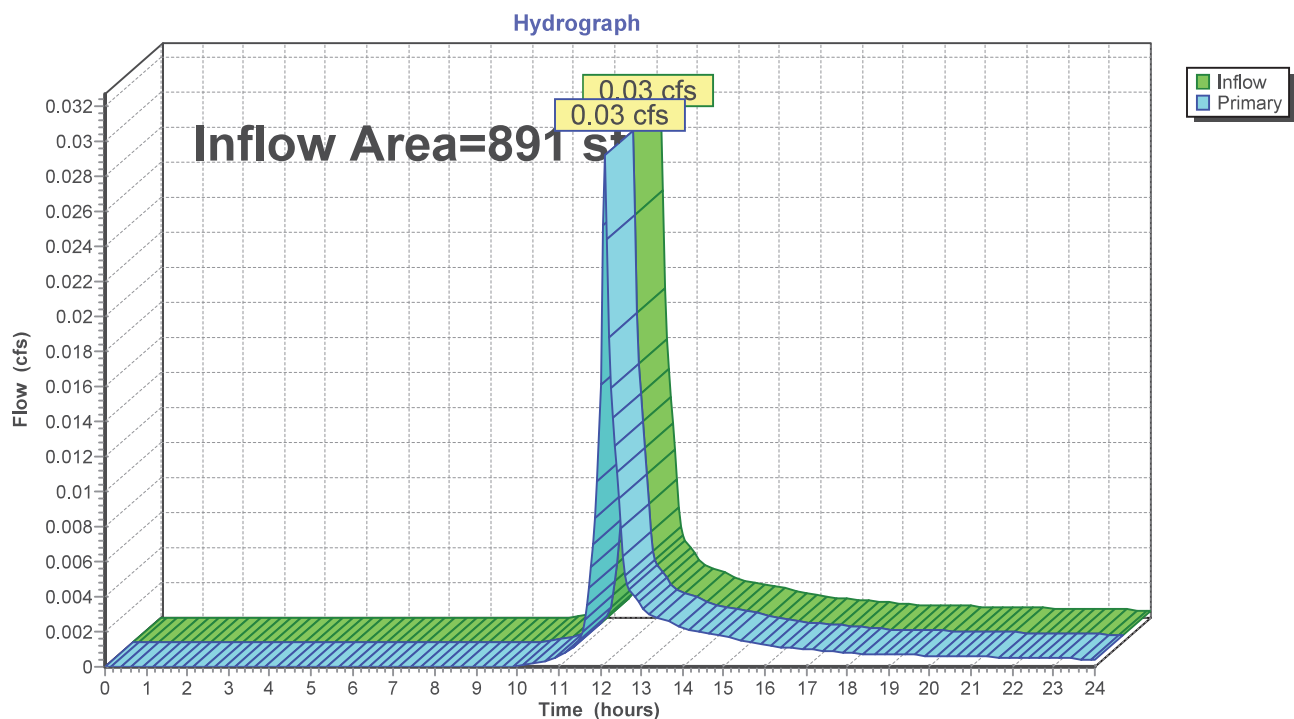
Summary for Pond 2P: Offsite Northwest

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 891 sf, 42.84% Impervious, Inflow Depth > 1.27" for 2-Year event
 Inflow = 0.03 cfs @ 12.10 hrs, Volume= 94 cf
 Primary = 0.03 cfs @ 12.10 hrs, Volume= 94 cf, Atten= 0%, Lag= 0.0 min
 Routed to Pond AP : Analysis Point

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 2P: Offsite Northwest



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Type III 24-hr 2-Year Rainfall=3.28"

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Summary for Pond 3P: Raingarden

Inflow Area = 2,727 sf, 20.60% Impervious, Inflow Depth > 0.68" for 2-Year event
Inflow = 0.04 cfs @ 12.11 hrs, Volume= 155 cf
Outflow = 0.00 cfs @ 13.89 hrs, Volume= 81 cf, Atten= 89%, Lag= 106.9 min
Primary = 0.00 cfs @ 13.89 hrs, Volume= 81 cf
Routed to Pond 1P : Ex. 30" HDPE Culvert
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond 1P : Ex. 30" HDPE Culvert

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 16.26' @ 13.89 hrs Surf.Area= 190 sf Storage= 76 cf

Plug-Flow detention time= 275.9 min calculated for 81 cf (52% of inflow)
Center-of-Mass det. time= 135.6 min (1,023.6 - 888.0)

Volume	Invert	Avail.Storage	Storage Description
#1	15.75'	189 cf	RainGarden (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.75	108	0	0
16.00	148	32	32
16.25	188	42	74
16.50	230	52	126
16.75	273	63	189

Device	Routing	Invert	Outlet Devices
#1	Primary	14.40'	4.0" Round Culvert Out L= 7.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 14.40' / 14.00' S= 0.0571 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#2	Device 1	16.25'	4.0" Horiz. Top Grate C= 0.600 Limited to weir flow at low heads
#3	Secondary	16.50'	5.0' long + 2.0 '/' SideZ x 4.0' breadth Emergency Spillway Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#4	Device 5	15.75'	0.200 in/hr Exfiltration over Surface area
#5	Device 1	14.35'	4.0" Round Underdrain L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 14.20' / 14.35' S= -0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf

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Type III 24-hr 2-Year Rainfall=3.28"

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Primary OutFlow Max=0.00 cfs @ 13.89 hrs HW=16.26' (Free Discharge)

↑ **1=Culvert Out** (Passes 0.00 cfs of 0.55 cfs potential flow)

↑ **2=Top Grate** (Weir Controls 0.00 cfs @ 0.34 fps)

↑ **5=Underdrain** (Passes 0.00 cfs of 0.39 cfs potential flow)

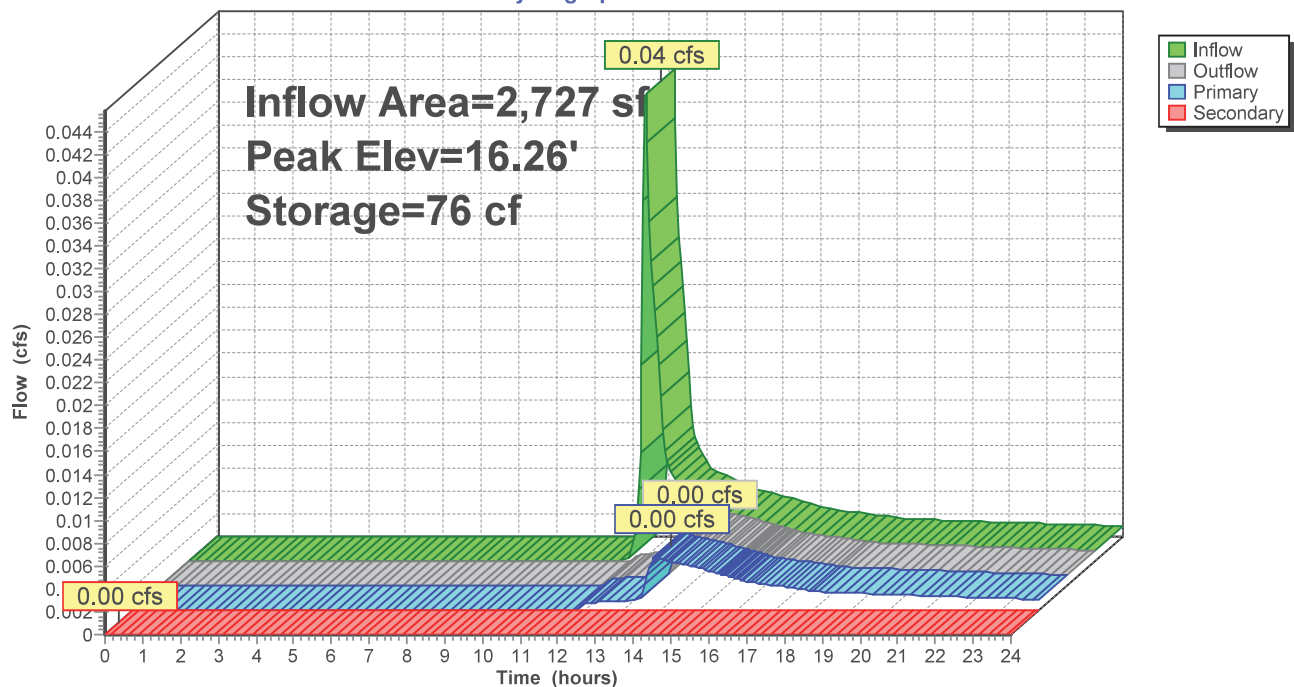
↑ **4=Exfiltration** (Exfiltration Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=15.75' (Free Discharge)

↑ **3=Emergency Spillway** (Controls 0.00 cfs)

Pond 3P: Raingarden

Hydrograph

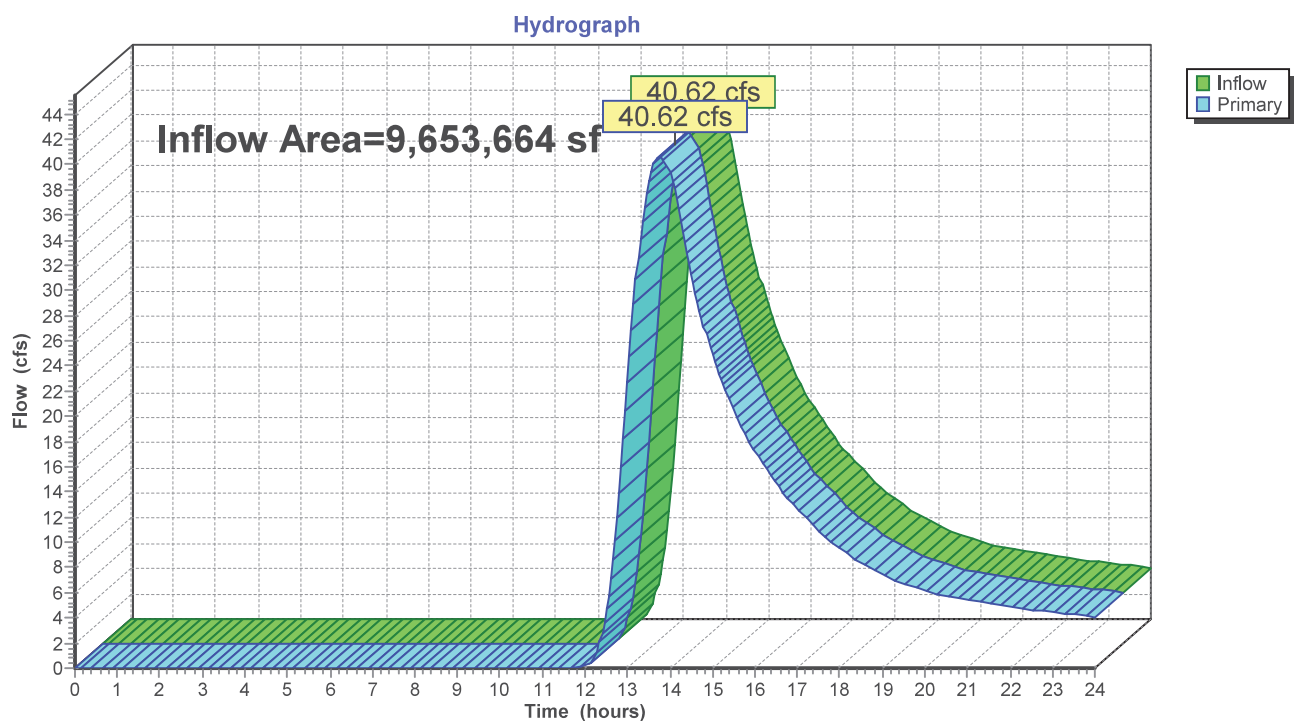


Summary for Pond AP: Analysis Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 9,653,664 sf, 19.01% Impervious, Inflow Depth > 0.70" for 2-Year event
Inflow = 40.62 cfs @ 13.77 hrs, Volume= 562,747 cf
Primary = 40.62 cfs @ 13.77 hrs, Volume= 562,747 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond AP: Analysis Point

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Type III 24-hr 10-Year Rainfall=5.25"

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PR-1: Subcat PR-1 Runoff Area=9,649,290 sf 19.00% Impervious Runoff Depth>1.91"
Flow Length=3,647' Tc=116.5 min CN=67 Runoff=126.00 cfs 1,539,758 cf

Subcatchment PR-2: Subcat PR-2 Runoff Area=891 sf 42.84% Impervious Runoff Depth>2.83"
Tc=6.0 min CN=77 Runoff=0.07 cfs 210 cf

Subcatchment PR-3: Subcat PR-3 Runoff Area=2,727 sf 20.60% Impervious Runoff Depth>1.90"
Tc=6.0 min CN=66 Runoff=0.13 cfs 431 cf

Subcatchment PR-4: Subcat PR-4 Runoff Area=755 sf 100.00% Impervious Runoff Depth>5.01"
Tc=6.0 min CN=98 Runoff=0.09 cfs 315 cf

Pond 1P: Ex. 30" HDPE Culvert Peak Elev=41.60' Inflow=126.01 cfs 1,540,430 cf
30.0" Round Culvert n=0.013 L=86.0' S=0.0160 ' Outflow=126.01 cfs 1,540,430 cf

Pond 2P: Offsite Northwest Inflow=0.07 cfs 210 cf
Primary=0.07 cfs 210 cf

Pond 3P: Raingarden Peak Elev=16.35' Storage=94 cf Inflow=0.13 cfs 431 cf
Primary=0.11 cfs 357 cf Secondary=0.00 cfs 0 cf Outflow=0.11 cfs 357 cf

Pond AP: Analysis Point Inflow=126.02 cfs 1,540,640 cf
Primary=126.02 cfs 1,540,640 cf

Total Runoff Area = 9,653,664 sf Runoff Volume = 1,540,715 cf Average Runoff Depth = 1.92"
80.99% Pervious = 7,818,248 sf 19.01% Impervious = 1,835,416 sf

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Type III 24-hr 10-Year Rainfall=5.25"

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Summary for Subcatchment PR-1: Subcat PR-1

Runoff = 126.00 cfs @ 13.61 hrs, Volume= 1,539,758 cf, Depth> 1.91"
Routed to Pond 1P : Ex. 30" HDPE Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.25"

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Type III 24-hr 10-Year Rainfall=5.25"

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Area (sf)	CN	Description
437	98	Roofs, HSG B
13,211	98	Roofs, HSG B
8,596	98	Roofs, HSG B
1,186	61	>75% Grass cover, Good, HSG B
600	61	>75% Grass cover, Good, HSG B
39,154	68	1 acre lots, 20% imp, HSG B
88,435	68	1 acre lots, 20% imp, HSG B
74,087	68	1 acre lots, 20% imp, HSG B
690	55	Woods, Good, HSG B
10,761	55	Woods, Good, HSG B
93	55	Woods, Good, HSG B
10,389	98	Paved roads w/curbs & sewers, HSG B
1,915	68	1 acre lots, 20% imp, HSG B
1,667	55	Woods, Good, HSG B
488,623	55	Woods, Good, HSG B
36,722	68	1 acre lots, 20% imp, HSG B
72,394	68	1 acre lots, 20% imp, HSG B
42,303	68	1 acre lots, 20% imp, HSG B
7,954	98	Paved roads w/curbs & sewers, HSG B
4,350	98	Paved roads w/curbs & sewers, HSG B
2,815	98	Paved roads w/curbs & sewers, HSG B
9,429	98	Paved roads w/curbs & sewers, HSG B
51,724	98	Paved roads w/curbs & sewers, HSG B
5,639	98	Roofs, HSG B
1,092	55	Woods, Good, HSG B
15,566	98	Paved roads w/curbs & sewers, HSG B
712	55	Woods, Good, HSG B
10,532	55	Woods, Good, HSG B
20,047	84	1 acre lots, 20% imp, HSG D
155,579	77	Woods, Good, HSG D
4,541	98	Paved roads w/curbs & sewers, HSG D
7,022	84	1 acre lots, 20% imp, HSG D
8,723	98	Roofs, HSG B
576	98	Roofs, HSG B
14,042	98	Roofs, HSG B
4,034	98	Roofs, HSG B
16,403	98	Roofs, HSG B
9,511	98	Roofs, HSG B
1,877	98	Roofs, HSG B
4,717	98	Roofs, HSG B
13,129	98	Roofs, HSG B
7,317	98	Roofs, HSG B
11,285	98	Roofs, HSG B
582	61	>75% Grass cover, Good, HSG B
25,528	61	>75% Grass cover, Good, HSG B
54,038	61	>75% Grass cover, Good, HSG B
36,696	68	1 acre lots, 20% imp, HSG B
42,920	68	1 acre lots, 20% imp, HSG B
110,966	55	Woods, Good, HSG B
57,352	55	Woods, Good, HSG B
98,325	55	Woods, Good, HSG B

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51	98	Paved roads w/curbs & sewers, HSG B
13,662	98	Paved roads w/curbs & sewers, HSG B
182,904	98	Paved roads w/curbs & sewers, HSG B
57	61	>75% Grass cover, Good, HSG B
62,503	55	Woods, Good, HSG B
2,710	68	1 acre lots, 20% imp, HSG B
8,636	98	Paved roads w/curbs & sewers, HSG B
1,673	98	Paved roads w/curbs & sewers, HSG B
6,338	98	Paved roads w/curbs & sewers, HSG B
12,602	98	Paved roads w/curbs & sewers, HSG B
17,167	68	1 acre lots, 20% imp, HSG B
2,389	68	1 acre lots, 20% imp, HSG B
88,957	68	1 acre lots, 20% imp, HSG B
151,346	68	1 acre lots, 20% imp, HSG B
148,516	68	1 acre lots, 20% imp, HSG B
63,026	68	1 acre lots, 20% imp, HSG B
122,963	55	Woods, Good, HSG B
93,469	55	Woods, Good, HSG B
83,227	68	1 acre lots, 20% imp, HSG B
40,984	68	1 acre lots, 20% imp, HSG B
26,764	68	1 acre lots, 20% imp, HSG B
0	55	Woods, Good, HSG B
7,639	98	Paved roads w/curbs & sewers, HSG B
240,621	55	Woods, Good, HSG B
432	55	Woods, Good, HSG B
9,356	68	1 acre lots, 20% imp, HSG B
28,682	68	1 acre lots, 20% imp, HSG B
77,538	68	1 acre lots, 20% imp, HSG B
1	55	Woods, Good, HSG B
72,866	55	Woods, Good, HSG B
25,054	55	Woods, Good, HSG B
10,579	98	Paved roads w/curbs & sewers, HSG B
1,871	98	Paved roads w/curbs & sewers, HSG B
228,105	55	Woods, Good, HSG B
10,612	98	Roofs, HSG A
2,814	98	Roofs, HSG A
4,636	98	Roofs, HSG A
4,484	98	Roofs, HSG A
3,906	98	Roofs, HSG A
4,863	98	Roofs, HSG A
3,009	98	Roofs, HSG A
6,117	98	Roofs, HSG A
1,488	98	Roofs, HSG A
6,760	98	Roofs, HSG A
2,404	39	>75% Grass cover, Good, HSG A
3,772	39	>75% Grass cover, Good, HSG A
14,346	39	>75% Grass cover, Good, HSG A
5,038	39	>75% Grass cover, Good, HSG A
2,099	39	>75% Grass cover, Good, HSG A
12,640	39	>75% Grass cover, Good, HSG A
5,858	39	>75% Grass cover, Good, HSG A
12,157	39	>75% Grass cover, Good, HSG A

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1,549	39	>75% Grass cover, Good, HSG A
4,123	39	>75% Grass cover, Good, HSG A
2,558	39	>75% Grass cover, Good, HSG A
7,360	39	>75% Grass cover, Good, HSG A
14	51	1 acre lots, 20% imp, HSG A
37,651	51	1 acre lots, 20% imp, HSG A
39,967	51	1 acre lots, 20% imp, HSG A
2,959	30	Woods, Good, HSG A
585	30	Woods, Good, HSG A
13,607	30	Woods, Good, HSG A
1,576	30	Woods, Good, HSG A
2	30	Woods, Good, HSG A
16,384	30	Woods, Good, HSG A
424	39	>75% Grass cover, Good, HSG A
56	39	>75% Grass cover, Good, HSG A
2,604	39	>75% Grass cover, Good, HSG A
1,995	39	>75% Grass cover, Good, HSG A
677	39	>75% Grass cover, Good, HSG A
48,051	30	Woods, Good, HSG A
9,600	30	Woods, Good, HSG A
8,066	30	Woods, Good, HSG A
253,052	98	Paved roads w/curbs & sewers, HSG A
1,260	84	1 acre lots, 20% imp, HSG D
4,120	84	1 acre lots, 20% imp, HSG D
21,593	84	1 acre lots, 20% imp, HSG D
2,295	84	1 acre lots, 20% imp, HSG D
28,307	84	1 acre lots, 20% imp, HSG D
64,402	84	1 acre lots, 20% imp, HSG D
5,614	84	1 acre lots, 20% imp, HSG D
53	84	1 acre lots, 20% imp, HSG D
7,502	84	1 acre lots, 20% imp, HSG D
322	84	1 acre lots, 20% imp, HSG D
16	84	1 acre lots, 20% imp, HSG D
2,454	98	Paved roads w/curbs & sewers, HSG D
809	84	1 acre lots, 20% imp, HSG D
30,622	84	1 acre lots, 20% imp, HSG D
9,979	84	1 acre lots, 20% imp, HSG D
3,867	77	Woods, Good, HSG D
9,461	98	Paved roads w/curbs & sewers, HSG B
254	98	Paved roads w/curbs & sewers, HSG B
6,306	98	Paved roads w/curbs & sewers, HSG D
234	98	Paved roads w/curbs & sewers, HSG D
35,895	98	Paved roads w/curbs & sewers, HSG B
8,154	98	Paved roads w/curbs & sewers, HSG B
8,906	98	Paved roads w/curbs & sewers, HSG D
9,293	98	Paved roads w/curbs & sewers, HSG D
1,920	98	Paved roads w/curbs & sewers, HSG D
60,038	77	Woods, Good, HSG D
509	55	Woods, Good, HSG B
54,291	55	Woods, Good, HSG B
557,510	77	Woods, Good, HSG D
5,727	61	>75% Grass cover, Good, HSG B

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4,242	68	1 acre lots, 20% imp, HSG B
43,411	68	1 acre lots, 20% imp, HSG B
4,608	68	1 acre lots, 20% imp, HSG B
56,607	68	1 acre lots, 20% imp, HSG B
6	55	Woods, Good, HSG B
17,779	55	Woods, Good, HSG B
61	55	Woods, Good, HSG B
187,750	55	Woods, Good, HSG B
1,002,408	55	Woods, Good, HSG B
12,536	98	Paved roads w/curbs & sewers, HSG B
3,415	98	Paved roads w/curbs & sewers, HSG B
2,284	98	Paved roads w/curbs & sewers, HSG B
11,562	98	Paved roads w/curbs & sewers, HSG B
2,273	68	1 acre lots, 20% imp, HSG B
3,550	98	Roofs, HSG A
2,631	98	Roofs, HSG A
861	98	Roofs, HSG A
13,650	98	Roofs, HSG A
7,476	98	Roofs, HSG A
537	98	Roofs, HSG A
3,465	98	Roofs, HSG A
15,193	98	Roofs, HSG A
2,952	98	Roofs, HSG A
3,464	98	Roofs, HSG A
4,080	98	Roofs, HSG A
93	98	Roofs, HSG A
1,116	98	Roofs, HSG A
6,583	98	Roofs, HSG A
9,239	39	>75% Grass cover, Good, HSG A
3,977	39	>75% Grass cover, Good, HSG A
38,172	39	>75% Grass cover, Good, HSG A
1,736	39	>75% Grass cover, Good, HSG A
53	39	>75% Grass cover, Good, HSG A
1,105	39	>75% Grass cover, Good, HSG A
4,186	39	>75% Grass cover, Good, HSG A
12,418	51	1 acre lots, 20% imp, HSG A
16,668	51	1 acre lots, 20% imp, HSG A
4,993	30	Woods, Good, HSG A
133,510	30	Woods, Good, HSG A
57,181	30	Woods, Good, HSG A
3,821	30	Woods, Good, HSG A
18,270	30	Woods, Good, HSG A
32,716	30	Woods, Good, HSG A
178,233	98	Paved roads w/curbs & sewers, HSG A
432,430	77	Woods, Good, HSG D
35,854	51	1 acre lots, 20% imp, HSG A
41,562	51	1 acre lots, 20% imp, HSG A
9,365	51	1 acre lots, 20% imp, HSG A
7,853	51	1 acre lots, 20% imp, HSG A
2,030	30	Woods, Good, HSG A
22,235	98	Paved roads w/curbs & sewers, HSG A
16,573	51	1 acre lots, 20% imp, HSG A

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48,142	84	1 acre lots, 20% imp, HSG D
82,862	84	1 acre lots, 20% imp, HSG D
9	77	Woods, Good, HSG D
107,107	55	Woods, Good, HSG B
64,489	55	Woods, Good, HSG B
161,213	77	Woods, Good, HSG D
11	77	Woods, Good, HSG D
10,130	77	Woods, Good, HSG D
9,432	77	Woods, Good, HSG D
7,658	77	Woods, Good, HSG D
10,637	84	1 acre lots, 20% imp, HSG D
24,993	84	1 acre lots, 20% imp, HSG D
16,376	98	Paved roads w/curbs & sewers, HSG D
36,187	68	1 acre lots, 20% imp, HSG B
2,087	68	1 acre lots, 20% imp, HSG B
168,797	68	1 acre lots, 20% imp, HSG B
685	68	1 acre lots, 20% imp, HSG B
64,239	98	Paved roads w/curbs & sewers, HSG B
1,661	68	1 acre lots, 20% imp, HSG B
17,363	68	1 acre lots, 20% imp, HSG B
10,929	68	1 acre lots, 20% imp, HSG B
14,136	68	1 acre lots, 20% imp, HSG B
4,514	68	1 acre lots, 20% imp, HSG B
36,441	68	1 acre lots, 20% imp, HSG B
77,643	68	1 acre lots, 20% imp, HSG B
39,968	68	1 acre lots, 20% imp, HSG B
43,173	68	1 acre lots, 20% imp, HSG B
71,299	68	1 acre lots, 20% imp, HSG B
17	55	Woods, Good, HSG B
117,840	55	Woods, Good, HSG B
3,535	55	Woods, Good, HSG B
209,319	55	Woods, Good, HSG B
7,700	55	Woods, Good, HSG B
4,089	98	Roofs, HSG B
7,799	98	Roofs, HSG B
190	98	Roofs, HSG B
39,268	98	Paved roads w/curbs & sewers, HSG B
6,377	68	1 acre lots, 20% imp, HSG B
8,138	68	1 acre lots, 20% imp, HSG B
1,606	55	Woods, Good, HSG B
9,576	55	Woods, Good, HSG B
80,241	55	Woods, Good, HSG B
148,448	55	Woods, Good, HSG B
0	55	Woods, Good, HSG B
11	55	Woods, Good, HSG B
0	55	Woods, Good, HSG B
202	61	>75% Grass cover, Good, HSG B
75	61	>75% Grass cover, Good, HSG B
191	68	1 acre lots, 20% imp, HSG B
137,438	68	1 acre lots, 20% imp, HSG B
28,368	68	1 acre lots, 20% imp, HSG B
29,743	68	1 acre lots, 20% imp, HSG B

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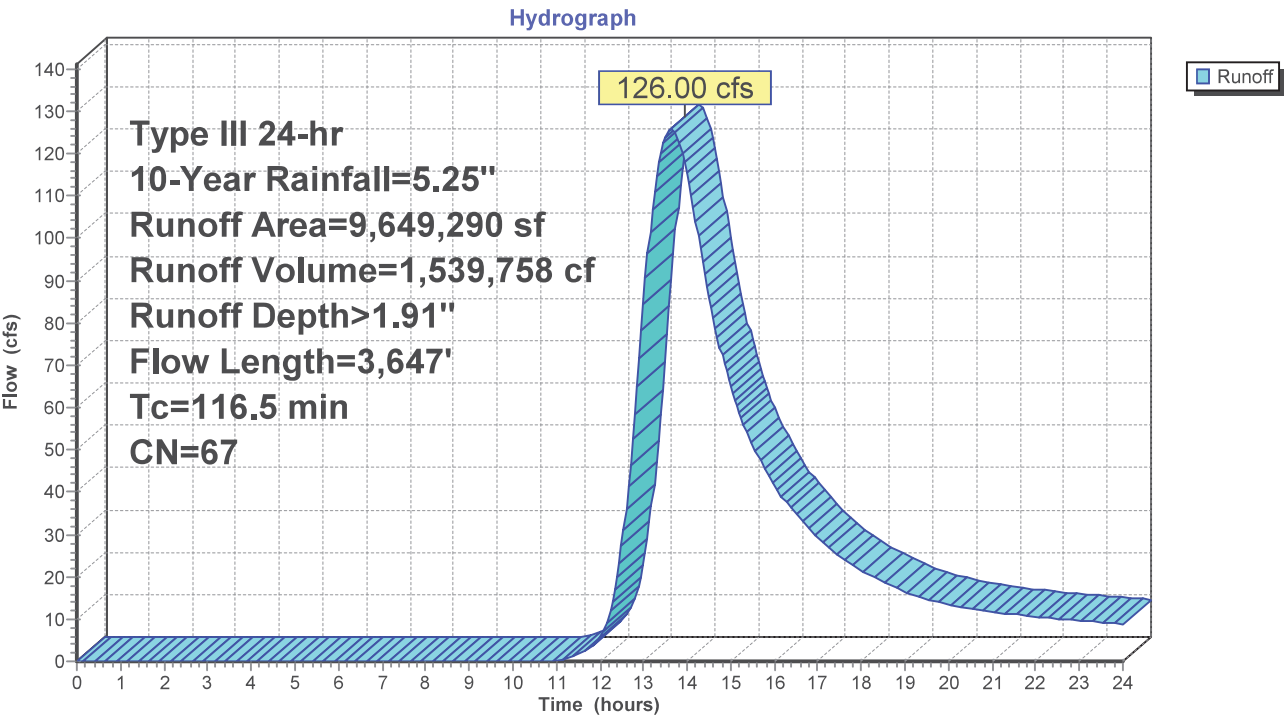
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25,401	68	1 acre lots, 20% imp, HSG B
34,695	68	1 acre lots, 20% imp, HSG B
151	68	1 acre lots, 20% imp, HSG B
2,028	68	1 acre lots, 20% imp, HSG B
4,562	68	1 acre lots, 20% imp, HSG B
683	68	1 acre lots, 20% imp, HSG B
15,767	68	1 acre lots, 20% imp, HSG B
13,154	68	1 acre lots, 20% imp, HSG B
301	68	1 acre lots, 20% imp, HSG B
38,195	68	1 acre lots, 20% imp, HSG B
2,684	61	>75% Grass cover, Good, HSG B

9,649,290	67	Weighted Average
7,815,573		81.00% Pervious Area
1,833,718		19.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.0	100	0.0100	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.28"
15.1	700	0.0240	0.77		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
30.0	623	0.0048	0.35		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
33.2	961	0.0093	0.48		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
10.2	1,263	0.0190	2.07		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
116.5	3,647	Total			

Subcatchment PR-1: Subcat PR-1



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Summary for Subcatchment PR-2: Subcat PR-2

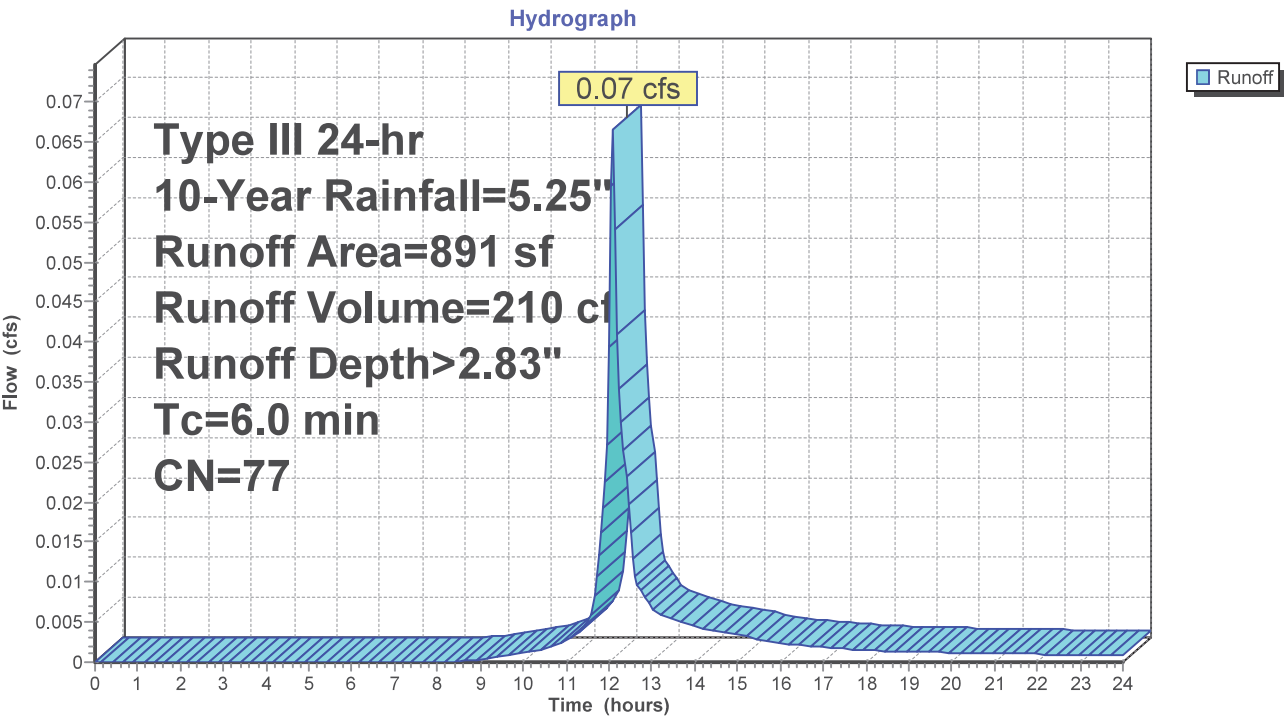
Runoff = 0.07 cfs @ 12.09 hrs, Volume= 210 cf, Depth> 2.83"
Routed to Pond 2P : Offsite Northwest

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.25"

Area (sf)	CN	Description
114	61	>75% Grass cover, Good, HSG B
395	61	>75% Grass cover, Good, HSG B
124	98	Roofs, HSG B
90	98	Roofs, HSG B
90	98	Roofs, HSG B
78	98	Roofs, HSG B
891	77	Weighted Average
510		57.16% Pervious Area
382		42.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-2: Subcat PR-2



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Summary for Subcatchment PR-3: Subcat PR-3

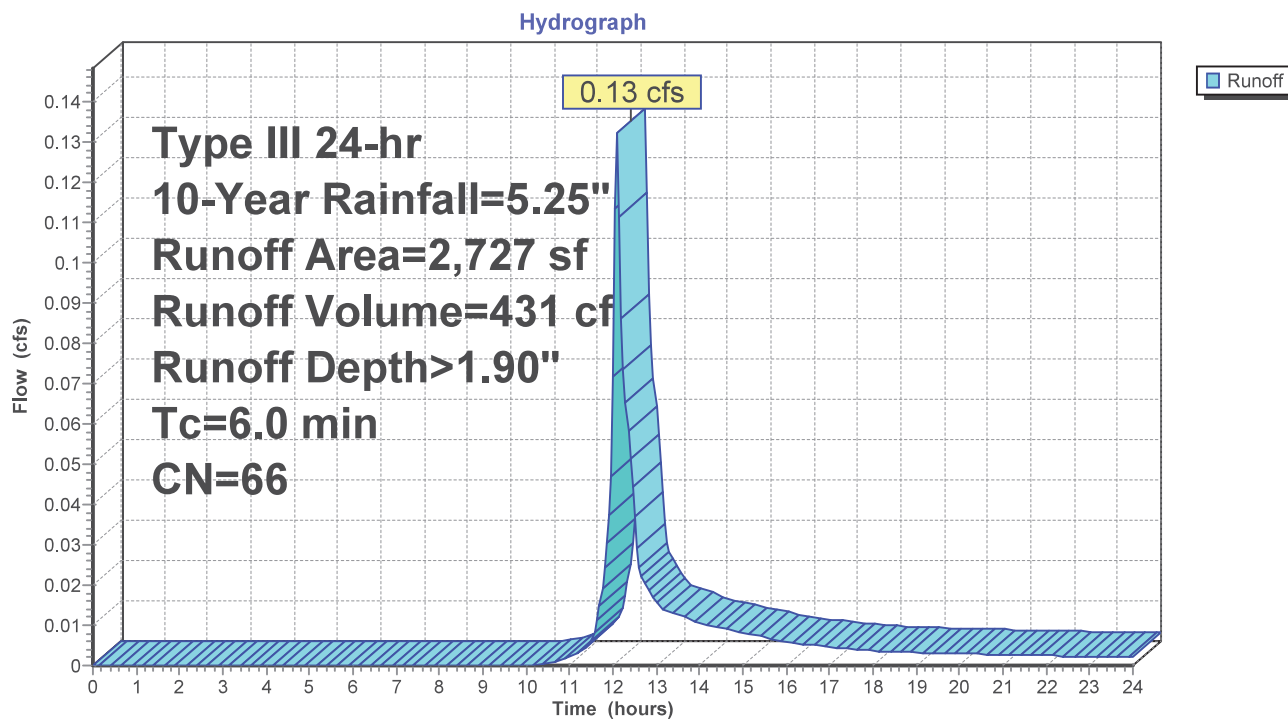
Runoff = 0.13 cfs @ 12.10 hrs, Volume= 431 cf, Depth> 1.90"
Routed to Pond 3P : Raingarden

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.25"

Area (sf)	CN	Description
759	61	>75% Grass cover, Good, HSG B
5	61	>75% Grass cover, Good, HSG B
533	98	Roofs, HSG B
29	98	Roofs, HSG B
1,401	55	Woods, Good, HSG B
2,727	66	Weighted Average
2,166		79.40% Pervious Area
562		20.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-3: Subcat PR-3



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Summary for Subcatchment PR-4: Subcat PR-4

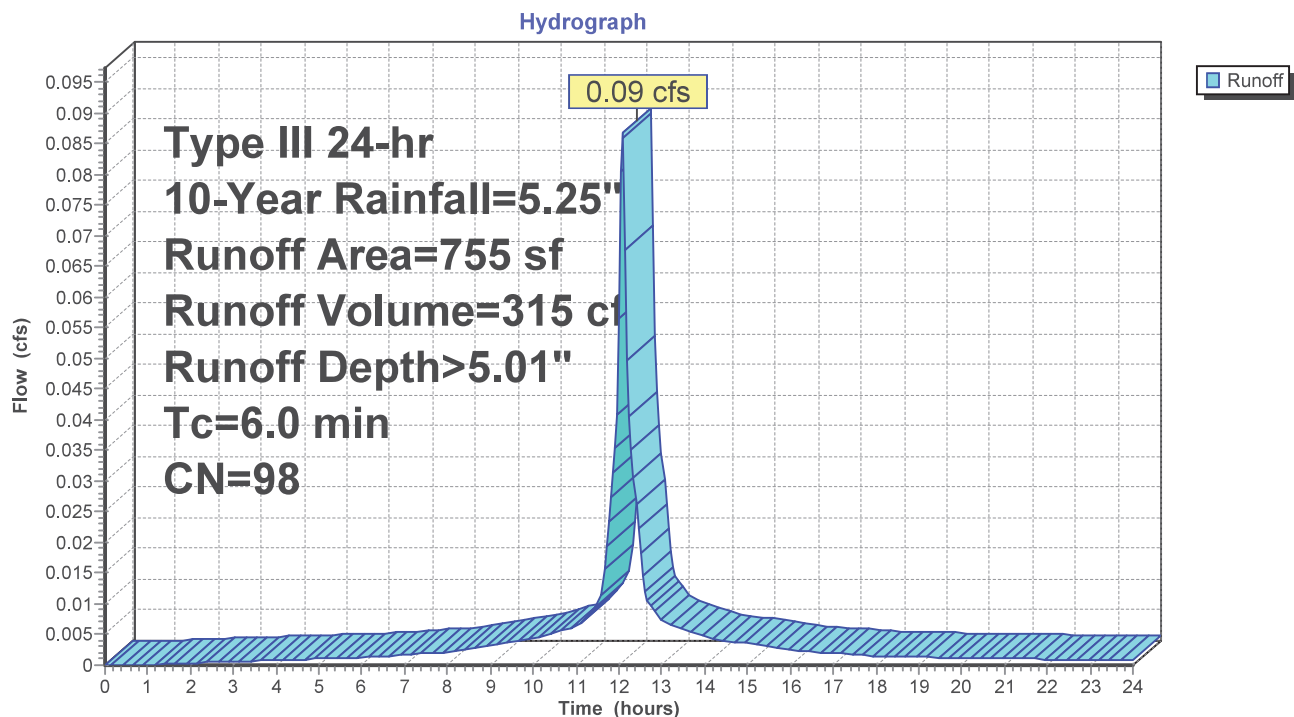
Runoff = 0.09 cfs @ 12.09 hrs, Volume= 315 cf, Depth> 5.01"
Routed to Pond 1P : Ex. 30" HDPE Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.25"

Area (sf)	CN	Description
0	61	>75% Grass cover, Good, HSG B
755	98	Roofs, HSG B
755	98	Weighted Average
0		0.00% Pervious Area
755		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-4: Subcat PR-4



Summary for Pond 1P: Ex. 30" HDPE Culvert

[57] Hint: Peaked at 41.60' (Flood elevation advised)

[81] Warning: Exceeded Pond 3P by 25.31' @ 13.60 hrs

[81] Warning: Exceeded Pond 3P by 25.31' @ 13.60 hrs

Inflow Area = 9,652,772 sf, 19.01% Impervious, Inflow Depth > 1.92" for 10-Year event
 Inflow = 126.01 cfs @ 13.61 hrs, Volume= 1,540,430 cf
 Outflow = 126.01 cfs @ 13.61 hrs, Volume= 1,540,430 cf, Atten= 0%, Lag= 0.0 min
 Primary = 126.01 cfs @ 13.61 hrs, Volume= 1,540,430 cf
 Routed to Pond AP : Analysis Point

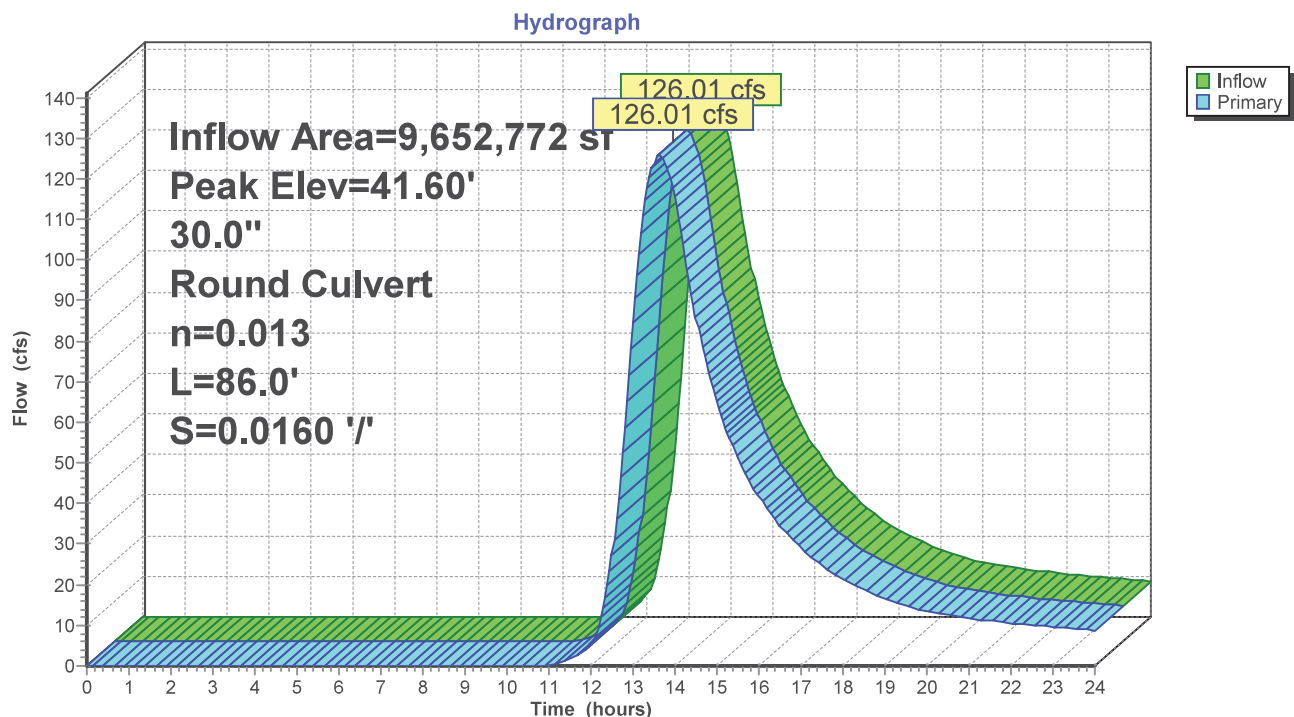
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 41.60' @ 13.61 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	11.92'	30.0" Round Culvert L= 86.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 11.92' / 10.54' S= 0.0160 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=125.92 cfs @ 13.61 hrs HW=41.55' (Free Discharge)

↑1=Culvert (Inlet Controls 125.92 cfs @ 25.65 fps)

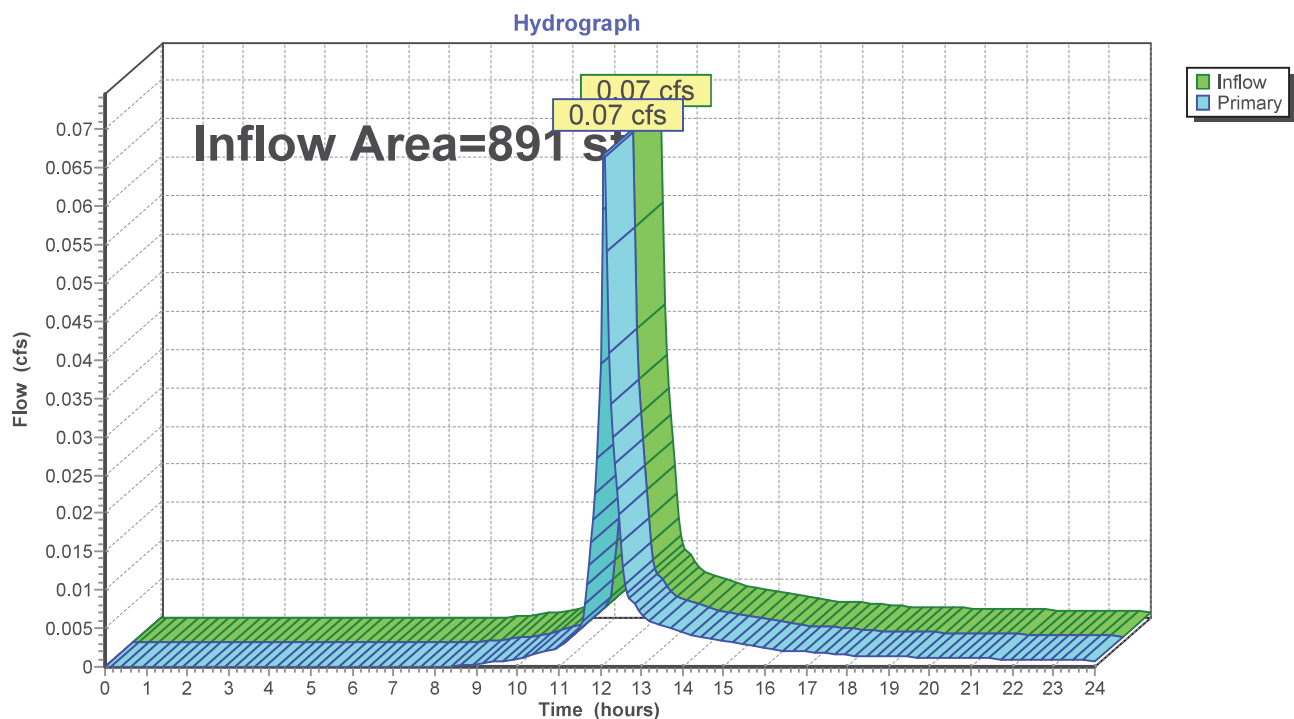
Pond 1P: Ex. 30" HDPE Culvert

Summary for Pond 2P: Offsite Northwest

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 891 sf, 42.84% Impervious, Inflow Depth > 2.83" for 10-Year event
Inflow = 0.07 cfs @ 12.09 hrs, Volume= 210 cf
Primary = 0.07 cfs @ 12.09 hrs, Volume= 210 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond AP : Analysis Point

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 2P: Offsite Northwest

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Summary for Pond 3P: Raingarden

Inflow Area = 2,727 sf, 20.60% Impervious, Inflow Depth > 1.90" for 10-Year event
Inflow = 0.13 cfs @ 12.10 hrs, Volume= 431 cf
Outflow = 0.11 cfs @ 12.17 hrs, Volume= 357 cf, Atten= 17%, Lag= 4.4 min
Primary = 0.11 cfs @ 12.17 hrs, Volume= 357 cf
Routed to Pond 1P : Ex. 30" HDPE Culvert
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond 1P : Ex. 30" HDPE Culvert

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 16.35' @ 12.17 hrs Surf.Area= 205 sf Storage= 94 cf

Plug-Flow detention time= 106.5 min calculated for 356 cf (83% of inflow)
Center-of-Mass det. time= 34.0 min (888.6 - 854.6)

Volume	Invert	Avail.Storage	Storage Description
#1	15.75'	189 cf	RainGarden (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.75	108	0	0
16.00	148	32	32
16.25	188	42	74
16.50	230	52	126
16.75	273	63	189

Device	Routing	Invert	Outlet Devices
#1	Primary	14.40'	4.0" Round Culvert Out L= 7.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 14.40' / 14.00' S= 0.0571 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#2	Device 1	16.25'	4.0" Horiz. Top Grate C= 0.600 Limited to weir flow at low heads
#3	Secondary	16.50'	5.0' long + 2.0 '/' SideZ x 4.0' breadth Emergency Spillway Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#4	Device 5	15.75'	0.200 in/hr Exfiltration over Surface area
#5	Device 1	14.35'	4.0" Round Underdrain L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 14.20' / 14.35' S= -0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf

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Type III 24-hr 10-Year Rainfall=5.25"

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Primary OutFlow Max=0.10 cfs @ 12.17 hrs HW=16.35' (Free Discharge)

↑ **1=Culvert Out** (Passes 0.10 cfs of 0.56 cfs potential flow)

↑ **2=Top Grate** (Weir Controls 0.10 cfs @ 1.01 fps)

↑ **5=Underdrain** (Passes 0.00 cfs of 0.40 cfs potential flow)

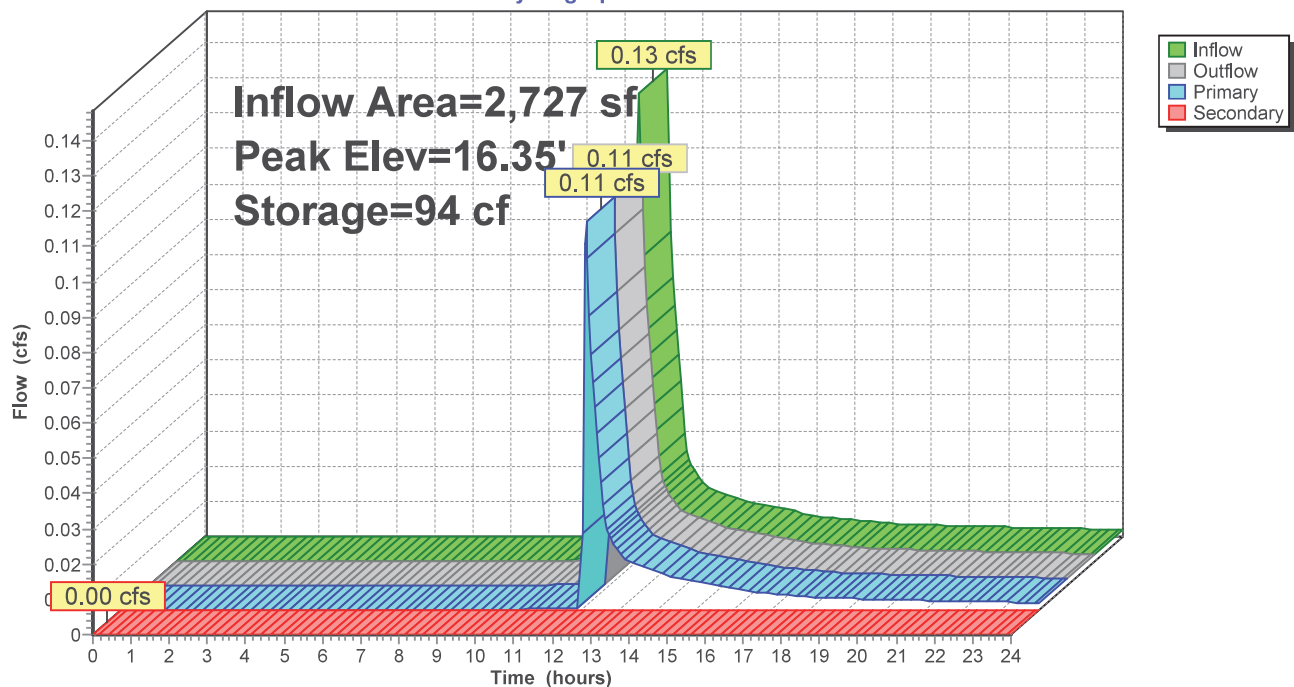
↑ **4=Exfiltration** (Exfiltration Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=15.75' (Free Discharge)

↑ **3=Emergency Spillway** (Controls 0.00 cfs)

Pond 3P: Raingarden

Hydrograph

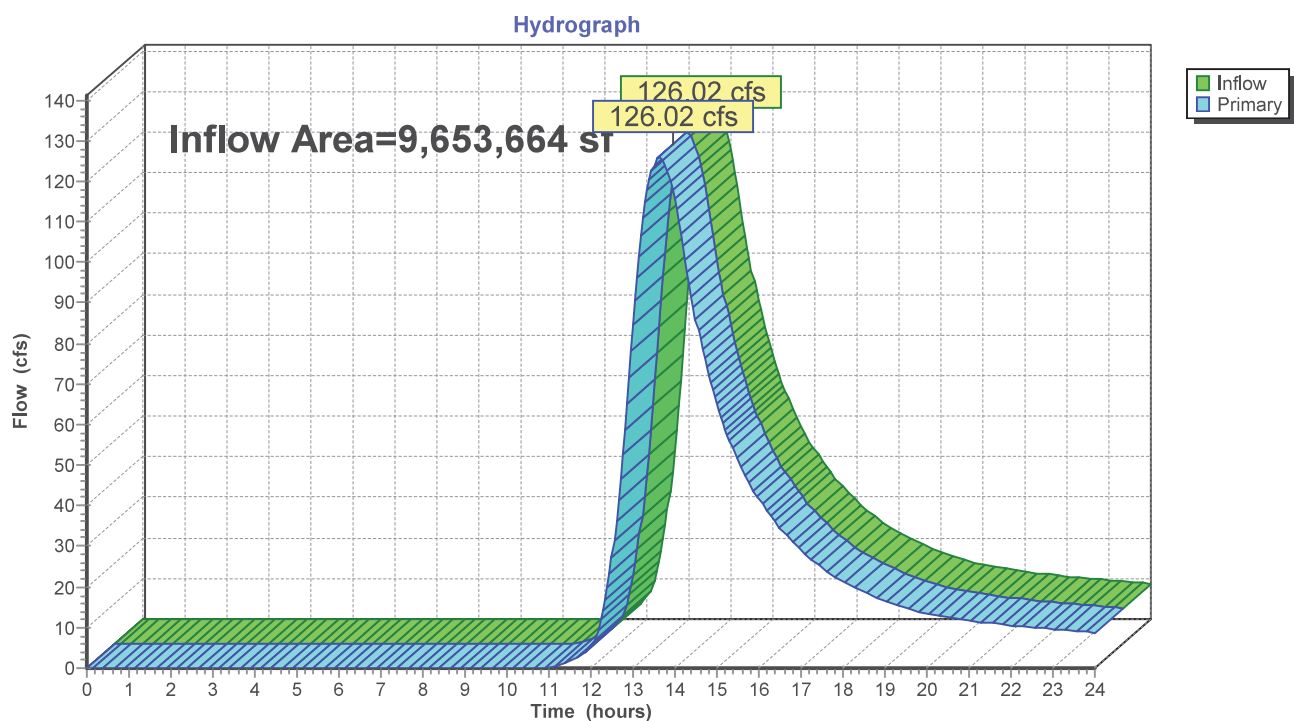


Summary for Pond AP: Analysis Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 9,653,664 sf, 19.01% Impervious, Inflow Depth > 1.92" for 10-Year event
Inflow = 126.02 cfs @ 13.61 hrs, Volume= 1,540,640 cf
Primary = 126.02 cfs @ 13.61 hrs, Volume= 1,540,640 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond AP: Analysis Point

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Type III 24-hr 25-Year Rainfall=6.48"

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PR-1: Subcat PR-1 Runoff Area=9,649,290 sf 19.00% Impervious Runoff Depth>2.81"
Flow Length=3,647' Tc=116.5 min CN=67 Runoff=189.13 cfs 2,260,342 cf

Subcatchment PR-2: Subcat PR-2 Runoff Area=891 sf 42.84% Impervious Runoff Depth>3.90"
Tc=6.0 min CN=77 Runoff=0.09 cfs 290 cf

Subcatchment PR-3: Subcat PR-3 Runoff Area=2,727 sf 20.60% Impervious Runoff Depth>2.80"
Tc=6.0 min CN=66 Runoff=0.20 cfs 636 cf

Subcatchment PR-4: Subcat PR-4 Runoff Area=755 sf 100.00% Impervious Runoff Depth>6.24"
Tc=6.0 min CN=98 Runoff=0.11 cfs 392 cf

Pond 1P: Ex. 30" HDPE Culvert Peak Elev=77.22' Inflow=189.15 cfs 2,261,295 cf
30.0" Round Culvert n=0.013 L=86.0' S=0.0160 '/' Outflow=189.15 cfs 2,261,295 cf

Pond 2P: Offsite Northwest Inflow=0.09 cfs 290 cf
Primary=0.09 cfs 290 cf

Pond 3P: Raingarden Peak Elev=16.41' Storage=106 cf Inflow=0.20 cfs 636 cf
Primary=0.17 cfs 561 cf Secondary=0.00 cfs 0 cf Outflow=0.17 cfs 561 cf

Pond AP: Analysis Point Inflow=189.16 cfs 2,261,585 cf
Primary=189.16 cfs 2,261,585 cf

Total Runoff Area = 9,653,664 sf Runoff Volume = 2,261,660 cf Average Runoff Depth = 2.81"
80.99% Pervious = 7,818,248 sf 19.01% Impervious = 1,835,416 sf

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Type III 24-hr 25-Year Rainfall=6.48"

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Summary for Subcatchment PR-1: Subcat PR-1

Runoff = 189.13 cfs @ 13.60 hrs, Volume= 2,260,342 cf, Depth> 2.81"

Routed to Pond 1P : Ex. 30" HDPE Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Type III 24-hr 25-Year Rainfall=6.48"

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Type III 24-hr 25-Year Rainfall=6.48"

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Area (sf)	CN	Description
437	98	Roofs, HSG B
13,211	98	Roofs, HSG B
8,596	98	Roofs, HSG B
1,186	61	>75% Grass cover, Good, HSG B
600	61	>75% Grass cover, Good, HSG B
39,154	68	1 acre lots, 20% imp, HSG B
88,435	68	1 acre lots, 20% imp, HSG B
74,087	68	1 acre lots, 20% imp, HSG B
690	55	Woods, Good, HSG B
10,761	55	Woods, Good, HSG B
93	55	Woods, Good, HSG B
10,389	98	Paved roads w/curbs & sewers, HSG B
1,915	68	1 acre lots, 20% imp, HSG B
1,667	55	Woods, Good, HSG B
488,623	55	Woods, Good, HSG B
36,722	68	1 acre lots, 20% imp, HSG B
72,394	68	1 acre lots, 20% imp, HSG B
42,303	68	1 acre lots, 20% imp, HSG B
7,954	98	Paved roads w/curbs & sewers, HSG B
4,350	98	Paved roads w/curbs & sewers, HSG B
2,815	98	Paved roads w/curbs & sewers, HSG B
9,429	98	Paved roads w/curbs & sewers, HSG B
51,724	98	Paved roads w/curbs & sewers, HSG B
5,639	98	Roofs, HSG B
1,092	55	Woods, Good, HSG B
15,566	98	Paved roads w/curbs & sewers, HSG B
712	55	Woods, Good, HSG B
10,532	55	Woods, Good, HSG B
20,047	84	1 acre lots, 20% imp, HSG D
155,579	77	Woods, Good, HSG D
4,541	98	Paved roads w/curbs & sewers, HSG D
7,022	84	1 acre lots, 20% imp, HSG D
8,723	98	Roofs, HSG B
576	98	Roofs, HSG B
14,042	98	Roofs, HSG B
4,034	98	Roofs, HSG B
16,403	98	Roofs, HSG B
9,511	98	Roofs, HSG B
1,877	98	Roofs, HSG B
4,717	98	Roofs, HSG B
13,129	98	Roofs, HSG B
7,317	98	Roofs, HSG B
11,285	98	Roofs, HSG B
582	61	>75% Grass cover, Good, HSG B
25,528	61	>75% Grass cover, Good, HSG B
54,038	61	>75% Grass cover, Good, HSG B
36,696	68	1 acre lots, 20% imp, HSG B
42,920	68	1 acre lots, 20% imp, HSG B
110,966	55	Woods, Good, HSG B
57,352	55	Woods, Good, HSG B
98,325	55	Woods, Good, HSG B

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Type III 24-hr 25-Year Rainfall=6.48"

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51	98	Paved roads w/curbs & sewers, HSG B
13,662	98	Paved roads w/curbs & sewers, HSG B
182,904	98	Paved roads w/curbs & sewers, HSG B
57	61	>75% Grass cover, Good, HSG B
62,503	55	Woods, Good, HSG B
2,710	68	1 acre lots, 20% imp, HSG B
8,636	98	Paved roads w/curbs & sewers, HSG B
1,673	98	Paved roads w/curbs & sewers, HSG B
6,338	98	Paved roads w/curbs & sewers, HSG B
12,602	98	Paved roads w/curbs & sewers, HSG B
17,167	68	1 acre lots, 20% imp, HSG B
2,389	68	1 acre lots, 20% imp, HSG B
88,957	68	1 acre lots, 20% imp, HSG B
151,346	68	1 acre lots, 20% imp, HSG B
148,516	68	1 acre lots, 20% imp, HSG B
63,026	68	1 acre lots, 20% imp, HSG B
122,963	55	Woods, Good, HSG B
93,469	55	Woods, Good, HSG B
83,227	68	1 acre lots, 20% imp, HSG B
40,984	68	1 acre lots, 20% imp, HSG B
26,764	68	1 acre lots, 20% imp, HSG B
0	55	Woods, Good, HSG B
7,639	98	Paved roads w/curbs & sewers, HSG B
240,621	55	Woods, Good, HSG B
432	55	Woods, Good, HSG B
9,356	68	1 acre lots, 20% imp, HSG B
28,682	68	1 acre lots, 20% imp, HSG B
77,538	68	1 acre lots, 20% imp, HSG B
1	55	Woods, Good, HSG B
72,866	55	Woods, Good, HSG B
25,054	55	Woods, Good, HSG B
10,579	98	Paved roads w/curbs & sewers, HSG B
1,871	98	Paved roads w/curbs & sewers, HSG B
228,105	55	Woods, Good, HSG B
10,612	98	Roofs, HSG A
2,814	98	Roofs, HSG A
4,636	98	Roofs, HSG A
4,484	98	Roofs, HSG A
3,906	98	Roofs, HSG A
4,863	98	Roofs, HSG A
3,009	98	Roofs, HSG A
6,117	98	Roofs, HSG A
1,488	98	Roofs, HSG A
6,760	98	Roofs, HSG A
2,404	39	>75% Grass cover, Good, HSG A
3,772	39	>75% Grass cover, Good, HSG A
14,346	39	>75% Grass cover, Good, HSG A
5,038	39	>75% Grass cover, Good, HSG A
2,099	39	>75% Grass cover, Good, HSG A
12,640	39	>75% Grass cover, Good, HSG A
5,858	39	>75% Grass cover, Good, HSG A
12,157	39	>75% Grass cover, Good, HSG A

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1,549	39	>75% Grass cover, Good, HSG A
4,123	39	>75% Grass cover, Good, HSG A
2,558	39	>75% Grass cover, Good, HSG A
7,360	39	>75% Grass cover, Good, HSG A
14	51	1 acre lots, 20% imp, HSG A
37,651	51	1 acre lots, 20% imp, HSG A
39,967	51	1 acre lots, 20% imp, HSG A
2,959	30	Woods, Good, HSG A
585	30	Woods, Good, HSG A
13,607	30	Woods, Good, HSG A
1,576	30	Woods, Good, HSG A
2	30	Woods, Good, HSG A
16,384	30	Woods, Good, HSG A
424	39	>75% Grass cover, Good, HSG A
56	39	>75% Grass cover, Good, HSG A
2,604	39	>75% Grass cover, Good, HSG A
1,995	39	>75% Grass cover, Good, HSG A
677	39	>75% Grass cover, Good, HSG A
48,051	30	Woods, Good, HSG A
9,600	30	Woods, Good, HSG A
8,066	30	Woods, Good, HSG A
253,052	98	Paved roads w/curbs & sewers, HSG A
1,260	84	1 acre lots, 20% imp, HSG D
4,120	84	1 acre lots, 20% imp, HSG D
21,593	84	1 acre lots, 20% imp, HSG D
2,295	84	1 acre lots, 20% imp, HSG D
28,307	84	1 acre lots, 20% imp, HSG D
64,402	84	1 acre lots, 20% imp, HSG D
5,614	84	1 acre lots, 20% imp, HSG D
53	84	1 acre lots, 20% imp, HSG D
7,502	84	1 acre lots, 20% imp, HSG D
322	84	1 acre lots, 20% imp, HSG D
16	84	1 acre lots, 20% imp, HSG D
2,454	98	Paved roads w/curbs & sewers, HSG D
809	84	1 acre lots, 20% imp, HSG D
30,622	84	1 acre lots, 20% imp, HSG D
9,979	84	1 acre lots, 20% imp, HSG D
3,867	77	Woods, Good, HSG D
9,461	98	Paved roads w/curbs & sewers, HSG B
254	98	Paved roads w/curbs & sewers, HSG B
6,306	98	Paved roads w/curbs & sewers, HSG D
234	98	Paved roads w/curbs & sewers, HSG D
35,895	98	Paved roads w/curbs & sewers, HSG B
8,154	98	Paved roads w/curbs & sewers, HSG B
8,906	98	Paved roads w/curbs & sewers, HSG D
9,293	98	Paved roads w/curbs & sewers, HSG D
1,920	98	Paved roads w/curbs & sewers, HSG D
60,038	77	Woods, Good, HSG D
509	55	Woods, Good, HSG B
54,291	55	Woods, Good, HSG B
557,510	77	Woods, Good, HSG D
5,727	61	>75% Grass cover, Good, HSG B

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4,242	68	1 acre lots, 20% imp, HSG B
43,411	68	1 acre lots, 20% imp, HSG B
4,608	68	1 acre lots, 20% imp, HSG B
56,607	68	1 acre lots, 20% imp, HSG B
6	55	Woods, Good, HSG B
17,779	55	Woods, Good, HSG B
61	55	Woods, Good, HSG B
187,750	55	Woods, Good, HSG B
1,002,408	55	Woods, Good, HSG B
12,536	98	Paved roads w/curbs & sewers, HSG B
3,415	98	Paved roads w/curbs & sewers, HSG B
2,284	98	Paved roads w/curbs & sewers, HSG B
11,562	98	Paved roads w/curbs & sewers, HSG B
2,273	68	1 acre lots, 20% imp, HSG B
3,550	98	Roofs, HSG A
2,631	98	Roofs, HSG A
861	98	Roofs, HSG A
13,650	98	Roofs, HSG A
7,476	98	Roofs, HSG A
537	98	Roofs, HSG A
3,465	98	Roofs, HSG A
15,193	98	Roofs, HSG A
2,952	98	Roofs, HSG A
3,464	98	Roofs, HSG A
4,080	98	Roofs, HSG A
93	98	Roofs, HSG A
1,116	98	Roofs, HSG A
6,583	98	Roofs, HSG A
9,239	39	>75% Grass cover, Good, HSG A
3,977	39	>75% Grass cover, Good, HSG A
38,172	39	>75% Grass cover, Good, HSG A
1,736	39	>75% Grass cover, Good, HSG A
53	39	>75% Grass cover, Good, HSG A
1,105	39	>75% Grass cover, Good, HSG A
4,186	39	>75% Grass cover, Good, HSG A
12,418	51	1 acre lots, 20% imp, HSG A
16,668	51	1 acre lots, 20% imp, HSG A
4,993	30	Woods, Good, HSG A
133,510	30	Woods, Good, HSG A
57,181	30	Woods, Good, HSG A
3,821	30	Woods, Good, HSG A
18,270	30	Woods, Good, HSG A
32,716	30	Woods, Good, HSG A
178,233	98	Paved roads w/curbs & sewers, HSG A
432,430	77	Woods, Good, HSG D
35,854	51	1 acre lots, 20% imp, HSG A
41,562	51	1 acre lots, 20% imp, HSG A
9,365	51	1 acre lots, 20% imp, HSG A
7,853	51	1 acre lots, 20% imp, HSG A
2,030	30	Woods, Good, HSG A
22,235	98	Paved roads w/curbs & sewers, HSG A
16,573	51	1 acre lots, 20% imp, HSG A

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48,142	84	1 acre lots, 20% imp, HSG D
82,862	84	1 acre lots, 20% imp, HSG D
9	77	Woods, Good, HSG D
107,107	55	Woods, Good, HSG B
64,489	55	Woods, Good, HSG B
161,213	77	Woods, Good, HSG D
11	77	Woods, Good, HSG D
10,130	77	Woods, Good, HSG D
9,432	77	Woods, Good, HSG D
7,658	77	Woods, Good, HSG D
10,637	84	1 acre lots, 20% imp, HSG D
24,993	84	1 acre lots, 20% imp, HSG D
16,376	98	Paved roads w/curbs & sewers, HSG D
36,187	68	1 acre lots, 20% imp, HSG B
2,087	68	1 acre lots, 20% imp, HSG B
168,797	68	1 acre lots, 20% imp, HSG B
685	68	1 acre lots, 20% imp, HSG B
64,239	98	Paved roads w/curbs & sewers, HSG B
1,661	68	1 acre lots, 20% imp, HSG B
17,363	68	1 acre lots, 20% imp, HSG B
10,929	68	1 acre lots, 20% imp, HSG B
14,136	68	1 acre lots, 20% imp, HSG B
4,514	68	1 acre lots, 20% imp, HSG B
36,441	68	1 acre lots, 20% imp, HSG B
77,643	68	1 acre lots, 20% imp, HSG B
39,968	68	1 acre lots, 20% imp, HSG B
43,173	68	1 acre lots, 20% imp, HSG B
71,299	68	1 acre lots, 20% imp, HSG B
17	55	Woods, Good, HSG B
117,840	55	Woods, Good, HSG B
3,535	55	Woods, Good, HSG B
209,319	55	Woods, Good, HSG B
7,700	55	Woods, Good, HSG B
4,089	98	Roofs, HSG B
7,799	98	Roofs, HSG B
190	98	Roofs, HSG B
39,268	98	Paved roads w/curbs & sewers, HSG B
6,377	68	1 acre lots, 20% imp, HSG B
8,138	68	1 acre lots, 20% imp, HSG B
1,606	55	Woods, Good, HSG B
9,576	55	Woods, Good, HSG B
80,241	55	Woods, Good, HSG B
148,448	55	Woods, Good, HSG B
0	55	Woods, Good, HSG B
11	55	Woods, Good, HSG B
0	55	Woods, Good, HSG B
202	61	>75% Grass cover, Good, HSG B
75	61	>75% Grass cover, Good, HSG B
191	68	1 acre lots, 20% imp, HSG B
137,438	68	1 acre lots, 20% imp, HSG B
28,368	68	1 acre lots, 20% imp, HSG B
29,743	68	1 acre lots, 20% imp, HSG B

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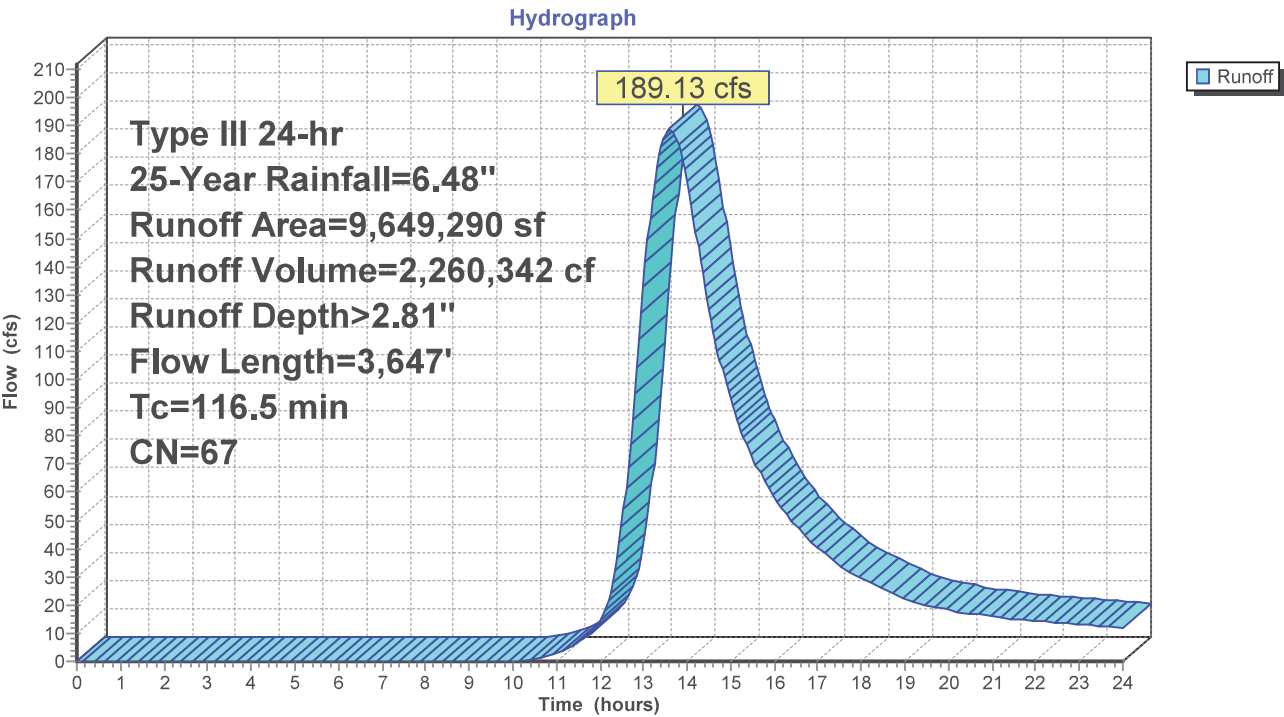
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25,401	68	1 acre lots, 20% imp, HSG B
34,695	68	1 acre lots, 20% imp, HSG B
151	68	1 acre lots, 20% imp, HSG B
2,028	68	1 acre lots, 20% imp, HSG B
4,562	68	1 acre lots, 20% imp, HSG B
683	68	1 acre lots, 20% imp, HSG B
15,767	68	1 acre lots, 20% imp, HSG B
13,154	68	1 acre lots, 20% imp, HSG B
301	68	1 acre lots, 20% imp, HSG B
38,195	68	1 acre lots, 20% imp, HSG B
2,684	61	>75% Grass cover, Good, HSG B

9,649,290	67	Weighted Average
7,815,573		81.00% Pervious Area
1,833,718		19.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.0	100	0.0100	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.28"
15.1	700	0.0240	0.77		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
30.0	623	0.0048	0.35		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
33.2	961	0.0093	0.48		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
10.2	1,263	0.0190	2.07		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
116.5	3,647	Total			

Subcatchment PR-1: Subcat PR-1



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Summary for Subcatchment PR-2: Subcat PR-2

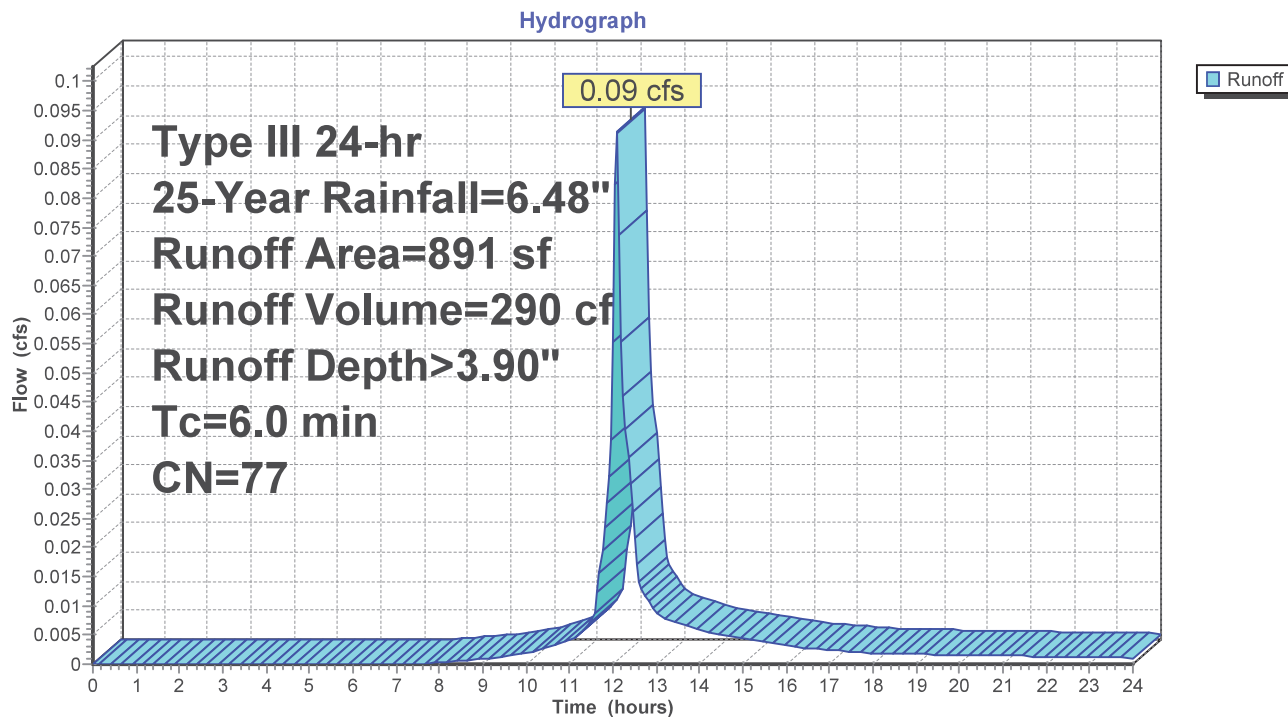
Runoff = 0.09 cfs @ 12.09 hrs, Volume= 290 cf, Depth> 3.90"
Routed to Pond 2P : Offsite Northwest

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.48"

Area (sf)	CN	Description
114	61	>75% Grass cover, Good, HSG B
395	61	>75% Grass cover, Good, HSG B
124	98	Roofs, HSG B
90	98	Roofs, HSG B
90	98	Roofs, HSG B
78	98	Roofs, HSG B
891	77	Weighted Average
510		57.16% Pervious Area
382		42.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-2: Subcat PR-2



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Summary for Subcatchment PR-3: Subcat PR-3

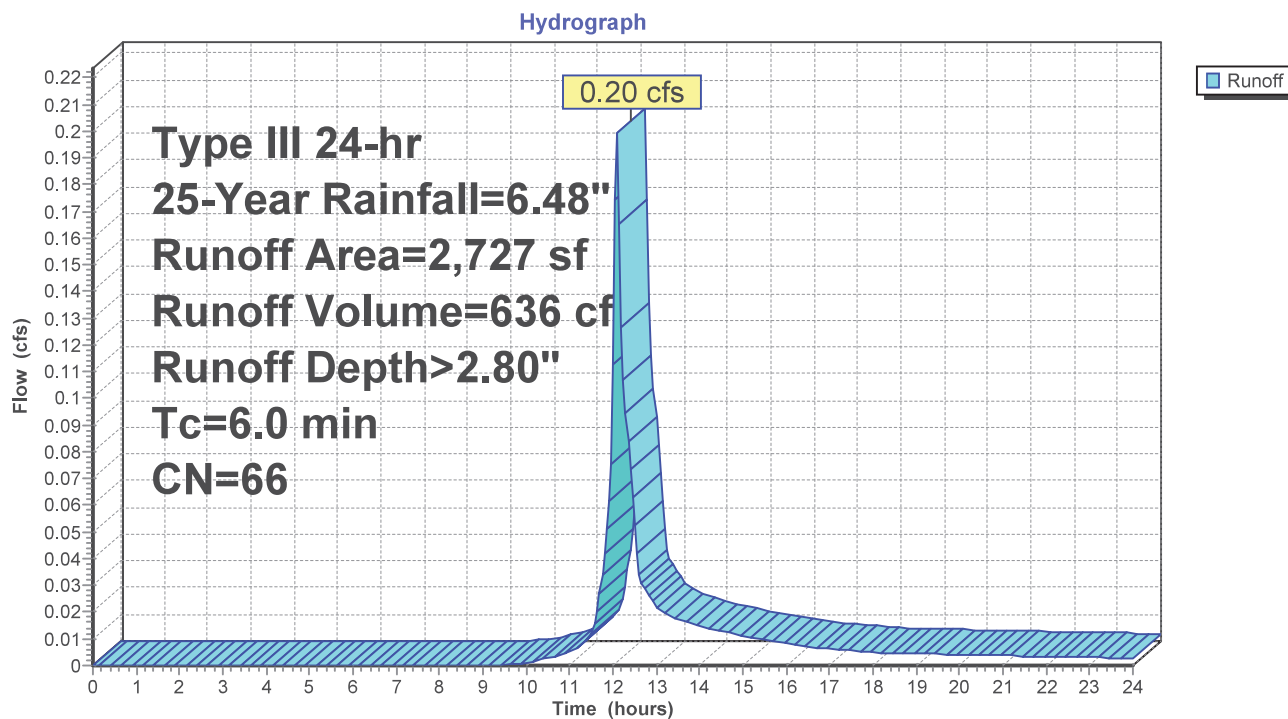
Runoff = 0.20 cfs @ 12.10 hrs, Volume= 636 cf, Depth> 2.80"
Routed to Pond 3P : Raingarden

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.48"

Area (sf)	CN	Description
759	61	>75% Grass cover, Good, HSG B
5	61	>75% Grass cover, Good, HSG B
533	98	Roofs, HSG B
29	98	Roofs, HSG B
1,401	55	Woods, Good, HSG B
2,727	66	Weighted Average
2,166		79.40% Pervious Area
562		20.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-3: Subcat PR-3



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Type III 24-hr 25-Year Rainfall=6.48"

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Summary for Subcatchment PR-4: Subcat PR-4

Runoff = 0.11 cfs @ 12.09 hrs, Volume= 392 cf, Depth> 6.24"
Routed to Pond 1P : Ex. 30" HDPE Culvert

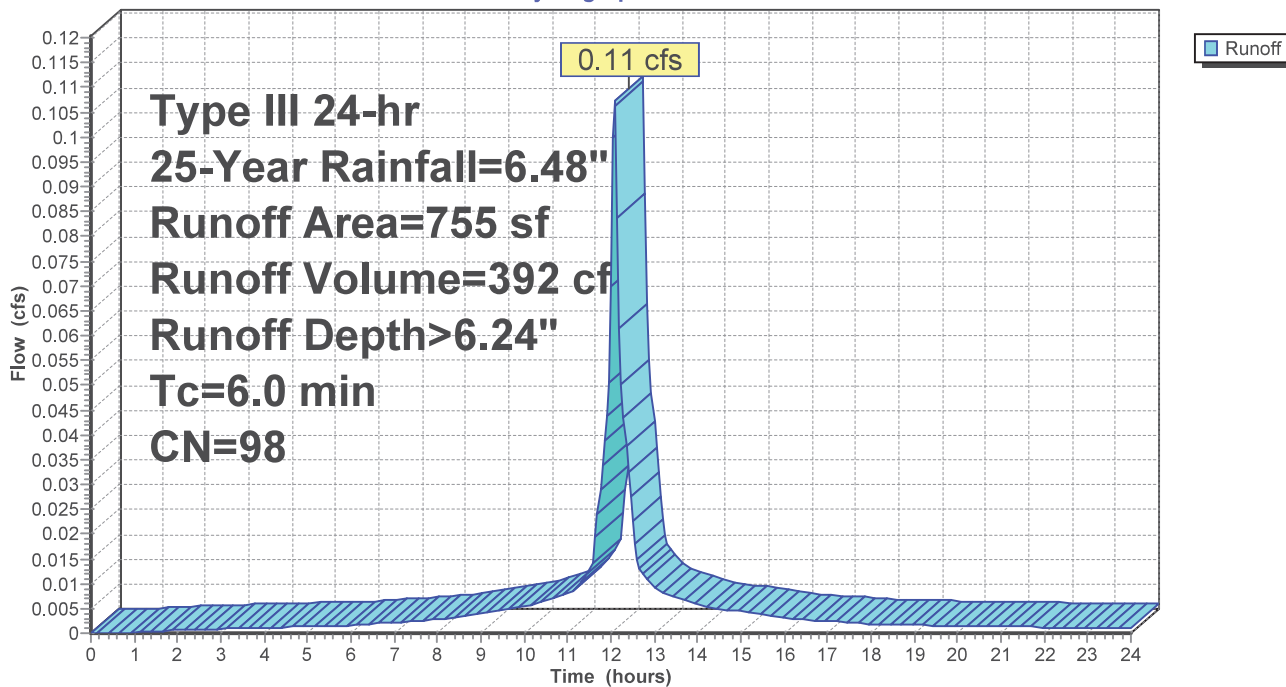
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.48"

Area (sf)	CN	Description
0	61	>75% Grass cover, Good, HSG B
755	98	Roofs, HSG B
755	98	Weighted Average
0		0.00% Pervious Area
755		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-4: Subcat PR-4

Hydrograph



Summary for Pond 1P: Ex. 30" HDPE Culvert

[57] Hint: Peaked at 77.22' (Flood elevation advised)
[81] Warning: Exceeded Pond 3P by 60.94' @ 13.60 hrs
[81] Warning: Exceeded Pond 3P by 60.94' @ 13.60 hrs

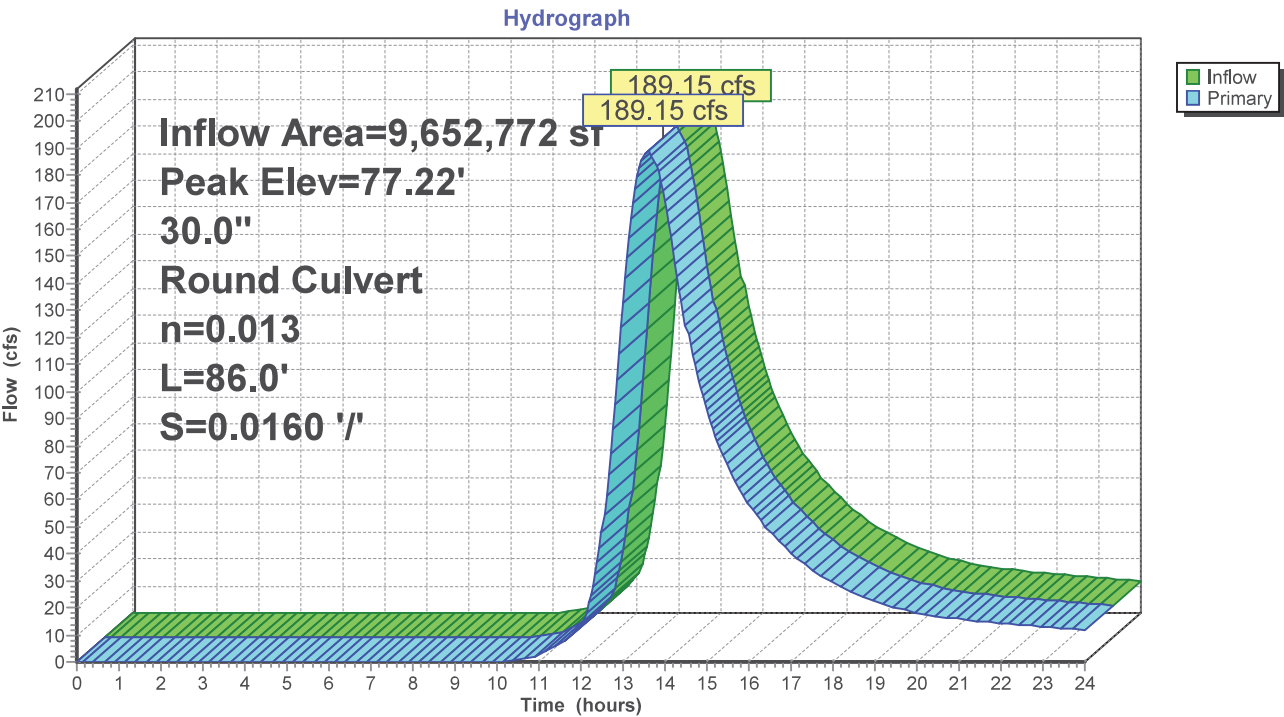
Inflow Area = 9,652,772 sf, 19.01% Impervious, Inflow Depth > 2.81" for 25-Year event
Inflow = 189.15 cfs @ 13.60 hrs, Volume= 2,261,295 cf
Outflow = 189.15 cfs @ 13.60 hrs, Volume= 2,261,295 cf, Atten= 0%, Lag= 0.0 min
Primary = 189.15 cfs @ 13.60 hrs, Volume= 2,261,295 cf
Routed to Pond AP : Analysis Point

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 77.22' @ 13.60 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	11.92'	30.0" Round Culvert L= 86.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 11.92' / 10.54' S= 0.0160 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=189.11 cfs @ 13.60 hrs HW=77.19' (Free Discharge)
1=Culvert (Inlet Controls 189.11 cfs @ 38.53 fps)

Pond 1P: Ex. 30" HDPE Culvert

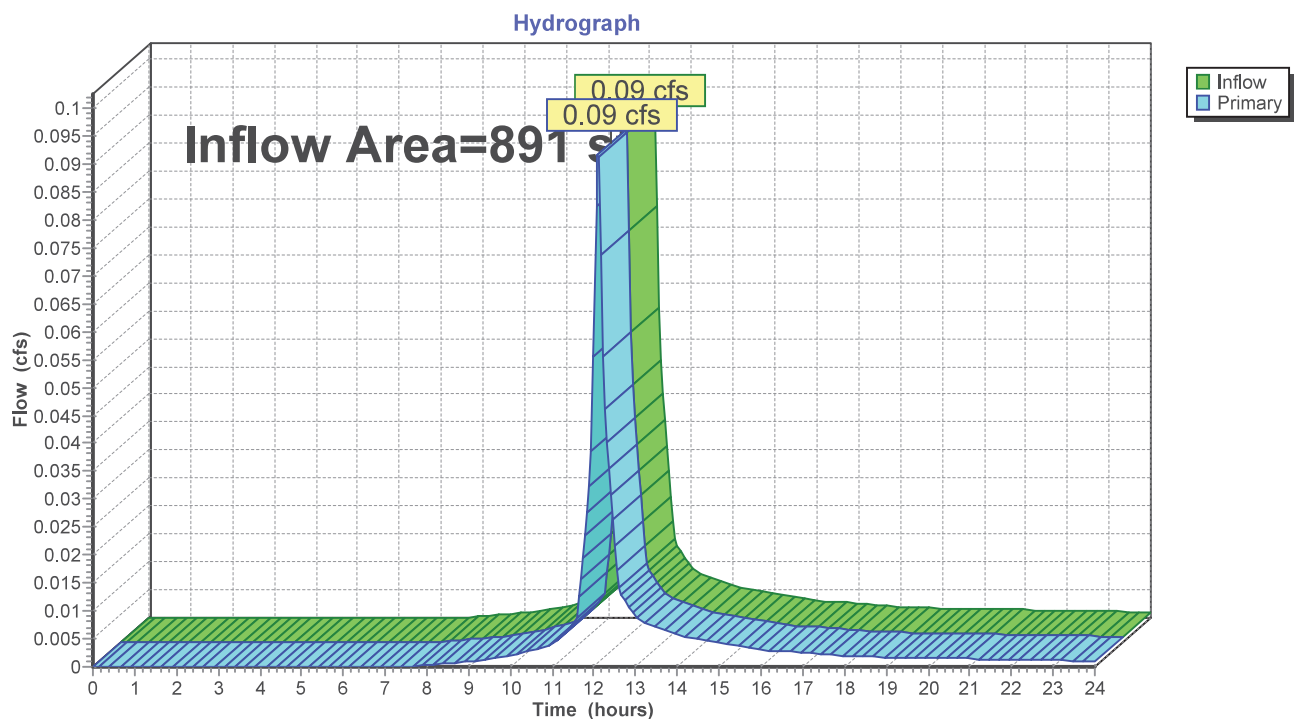


Summary for Pond 2P: Offsite Northwest

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 891 sf, 42.84% Impervious, Inflow Depth > 3.90" for 25-Year event
Inflow = 0.09 cfs @ 12.09 hrs, Volume= 290 cf
Primary = 0.09 cfs @ 12.09 hrs, Volume= 290 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond AP : Analysis Point

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 2P: Offsite Northwest

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Type III 24-hr 25-Year Rainfall=6.48"

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Summary for Pond 3P: Raingarden

Inflow Area = 2,727 sf, 20.60% Impervious, Inflow Depth > 2.80" for 25-Year event
Inflow = 0.20 cfs @ 12.10 hrs, Volume= 636 cf
Outflow = 0.17 cfs @ 12.15 hrs, Volume= 561 cf, Atten= 15%, Lag= 3.1 min
Primary = 0.17 cfs @ 12.15 hrs, Volume= 561 cf
Routed to Pond 1P : Ex. 30" HDPE Culvert
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond 1P : Ex. 30" HDPE Culvert

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 16.41' @ 12.15 hrs Surf.Area= 215 sf Storage= 106 cf

Plug-Flow detention time= 78.6 min calculated for 561 cf (88% of inflow)
Center-of-Mass det. time= 23.5 min (866.6 - 843.0)

Volume	Invert	Avail.Storage	Storage Description
#1	15.75'	189 cf	RainGarden (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.75	108	0	0
16.00	148	32	32
16.25	188	42	74
16.50	230	52	126
16.75	273	63	189

Device	Routing	Invert	Outlet Devices
#1	Primary	14.40'	4.0" Round Culvert Out L= 7.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 14.40' / 14.00' S= 0.0571 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#2	Device 1	16.25'	4.0" Horiz. Top Grate C= 0.600 Limited to weir flow at low heads
#3	Secondary	16.50'	5.0' long + 2.0 '/' SideZ x 4.0' breadth Emergency Spillway Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#4	Device 5	15.75'	0.200 in/hr Exfiltration over Surface area
#5	Device 1	14.35'	4.0" Round Underdrain L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 14.20' / 14.35' S= -0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf

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Primary OutFlow Max=0.17 cfs @ 12.15 hrs HW=16.41' (Free Discharge)

1=Culvert Out (Passes 0.17 cfs of 0.57 cfs potential flow)

2=Top Grate (Orifice Controls 0.17 cfs @ 1.93 fps)

5=Underdrain (Passes 0.00 cfs of 0.41 cfs potential flow)

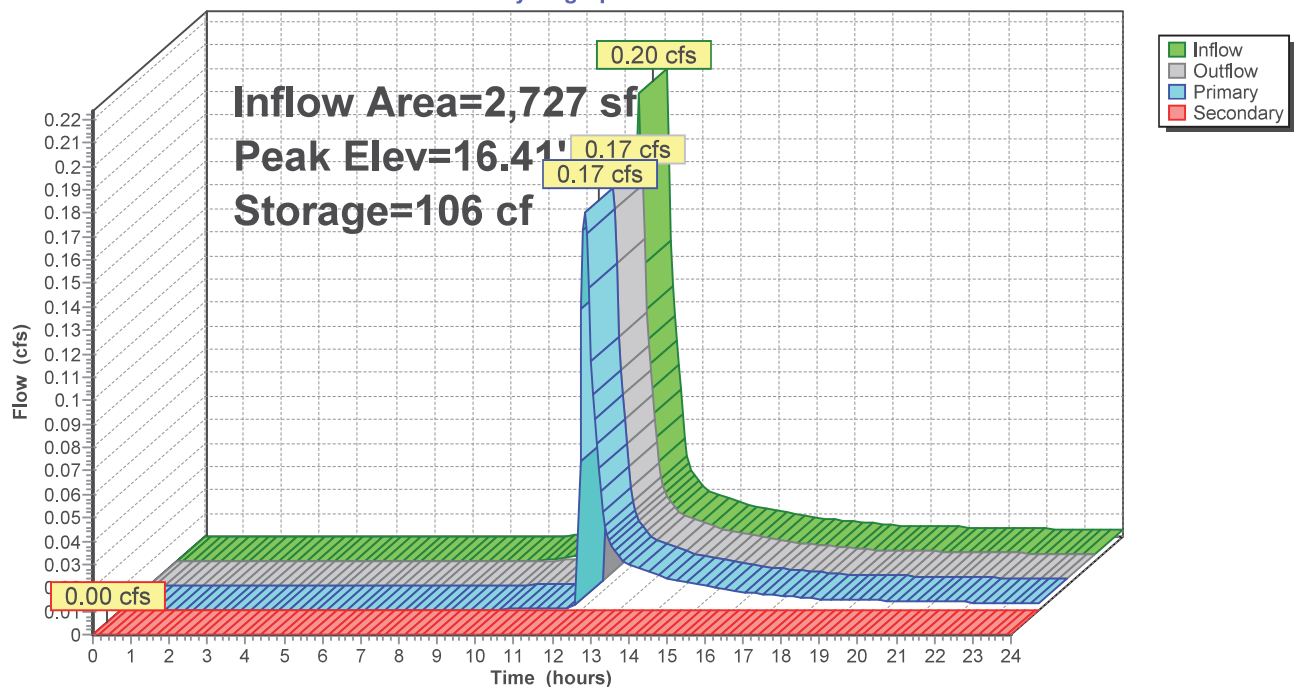
4=Exfiltration (Exfiltration Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=15.75' (Free Discharge)

3=Emergency Spillway (Controls 0.00 cfs)

Pond 3P: Raingarden

Hydrograph

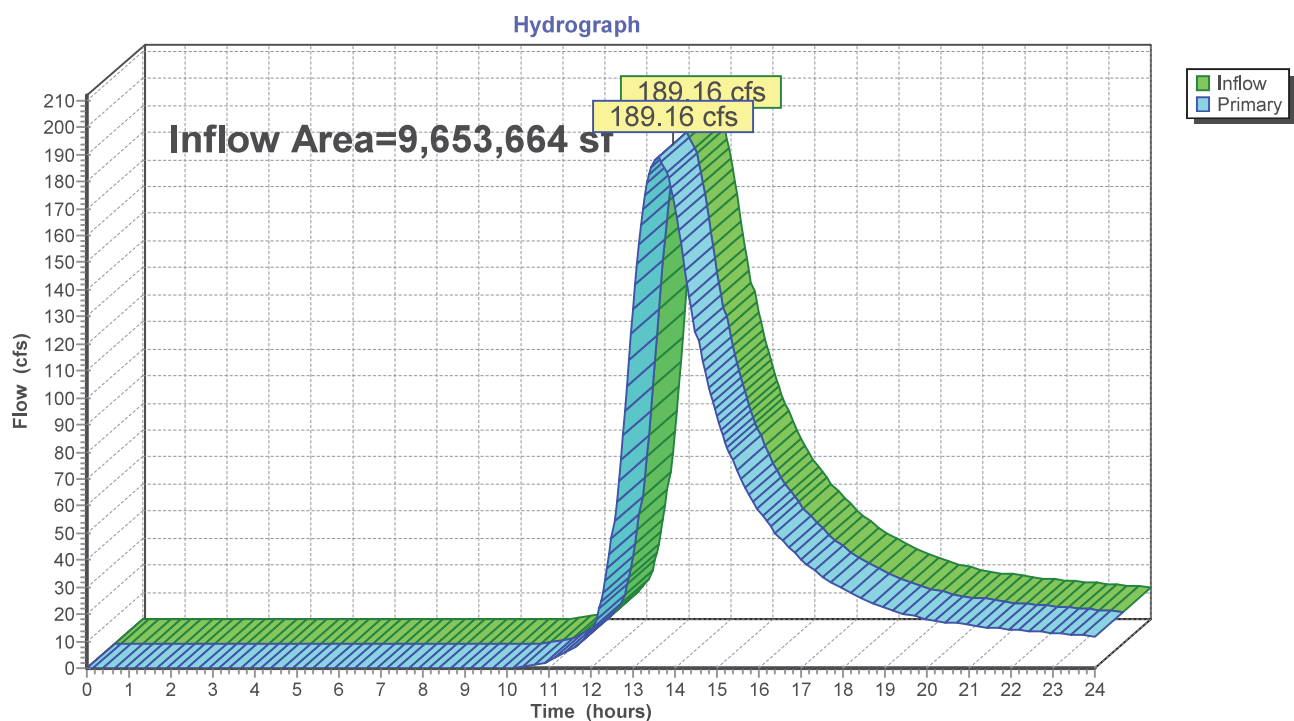


Summary for Pond AP: Analysis Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 9,653,664 sf, 19.01% Impervious, Inflow Depth > 2.81" for 25-Year event
Inflow = 189.16 cfs @ 13.60 hrs, Volume= 2,261,585 cf
Primary = 189.16 cfs @ 13.60 hrs, Volume= 2,261,585 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond AP: Analysis Point

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PR-1: Subcat PR-1 Runoff Area=9,649,290 sf 19.00% Impervious Runoff Depth>3.51"
Flow Length=3,647' Tc=116.5 min CN=67 Runoff=237.99 cfs 2,821,994 cf

Subcatchment PR-2: Subcat PR-2 Runoff Area=891 sf 42.84% Impervious Runoff Depth>4.70"
Tc=6.0 min CN=77 Runoff=0.11 cfs 350 cf

Subcatchment PR-3: Subcat PR-3 Runoff Area=2,727 sf 20.60% Impervious Runoff Depth>3.50"
Tc=6.0 min CN=66 Runoff=0.25 cfs 796 cf

Subcatchment PR-4: Subcat PR-4 Runoff Area=755 sf 100.00% Impervious Runoff Depth>7.14"
Tc=6.0 min CN=98 Runoff=0.12 cfs 449 cf

Pond 1P: Ex. 30" HDPE Culvert Peak Elev=114.58' Inflow=238.02 cfs 2,823,164 cf
30.0" Round Culvert n=0.013 L=86.0' S=0.0160 ' Outflow=238.02 cfs 2,823,164 cf

Pond 2P: Offsite Northwest Inflow=0.11 cfs 350 cf
Primary=0.11 cfs 350 cf

Pond 3P: Raingarden Peak Elev=16.47' Storage=121 cf Inflow=0.25 cfs 796 cf
Primary=0.20 cfs 721 cf Secondary=0.00 cfs 0 cf Outflow=0.20 cfs 721 cf

Pond AP: Analysis Point Inflow=238.03 cfs 2,823,513 cf
Primary=238.03 cfs 2,823,513 cf

Total Runoff Area = 9,653,664 sf Runoff Volume = 2,823,589 cf Average Runoff Depth = 3.51"
80.99% Pervious = 7,818,248 sf 19.01% Impervious = 1,835,416 sf

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Summary for Subcatchment PR-1: Subcat PR-1

Runoff = 237.99 cfs @ 13.59 hrs, Volume= 2,821,994 cf, Depth> 3.51"
Routed to Pond 1P : Ex. 30" HDPE Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=7.38"

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Area (sf)	CN	Description
437	98	Roofs, HSG B
13,211	98	Roofs, HSG B
8,596	98	Roofs, HSG B
1,186	61	>75% Grass cover, Good, HSG B
600	61	>75% Grass cover, Good, HSG B
39,154	68	1 acre lots, 20% imp, HSG B
88,435	68	1 acre lots, 20% imp, HSG B
74,087	68	1 acre lots, 20% imp, HSG B
690	55	Woods, Good, HSG B
10,761	55	Woods, Good, HSG B
93	55	Woods, Good, HSG B
10,389	98	Paved roads w/curbs & sewers, HSG B
1,915	68	1 acre lots, 20% imp, HSG B
1,667	55	Woods, Good, HSG B
488,623	55	Woods, Good, HSG B
36,722	68	1 acre lots, 20% imp, HSG B
72,394	68	1 acre lots, 20% imp, HSG B
42,303	68	1 acre lots, 20% imp, HSG B
7,954	98	Paved roads w/curbs & sewers, HSG B
4,350	98	Paved roads w/curbs & sewers, HSG B
2,815	98	Paved roads w/curbs & sewers, HSG B
9,429	98	Paved roads w/curbs & sewers, HSG B
51,724	98	Paved roads w/curbs & sewers, HSG B
5,639	98	Roofs, HSG B
1,092	55	Woods, Good, HSG B
15,566	98	Paved roads w/curbs & sewers, HSG B
712	55	Woods, Good, HSG B
10,532	55	Woods, Good, HSG B
20,047	84	1 acre lots, 20% imp, HSG D
155,579	77	Woods, Good, HSG D
4,541	98	Paved roads w/curbs & sewers, HSG D
7,022	84	1 acre lots, 20% imp, HSG D
8,723	98	Roofs, HSG B
576	98	Roofs, HSG B
14,042	98	Roofs, HSG B
4,034	98	Roofs, HSG B
16,403	98	Roofs, HSG B
9,511	98	Roofs, HSG B
1,877	98	Roofs, HSG B
4,717	98	Roofs, HSG B
13,129	98	Roofs, HSG B
7,317	98	Roofs, HSG B
11,285	98	Roofs, HSG B
582	61	>75% Grass cover, Good, HSG B
25,528	61	>75% Grass cover, Good, HSG B
54,038	61	>75% Grass cover, Good, HSG B
36,696	68	1 acre lots, 20% imp, HSG B
42,920	68	1 acre lots, 20% imp, HSG B
110,966	55	Woods, Good, HSG B
57,352	55	Woods, Good, HSG B
98,325	55	Woods, Good, HSG B

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51	98	Paved roads w/curbs & sewers, HSG B
13,662	98	Paved roads w/curbs & sewers, HSG B
182,904	98	Paved roads w/curbs & sewers, HSG B
57	61	>75% Grass cover, Good, HSG B
62,503	55	Woods, Good, HSG B
2,710	68	1 acre lots, 20% imp, HSG B
8,636	98	Paved roads w/curbs & sewers, HSG B
1,673	98	Paved roads w/curbs & sewers, HSG B
6,338	98	Paved roads w/curbs & sewers, HSG B
12,602	98	Paved roads w/curbs & sewers, HSG B
17,167	68	1 acre lots, 20% imp, HSG B
2,389	68	1 acre lots, 20% imp, HSG B
88,957	68	1 acre lots, 20% imp, HSG B
151,346	68	1 acre lots, 20% imp, HSG B
148,516	68	1 acre lots, 20% imp, HSG B
63,026	68	1 acre lots, 20% imp, HSG B
122,963	55	Woods, Good, HSG B
93,469	55	Woods, Good, HSG B
83,227	68	1 acre lots, 20% imp, HSG B
40,984	68	1 acre lots, 20% imp, HSG B
26,764	68	1 acre lots, 20% imp, HSG B
0	55	Woods, Good, HSG B
7,639	98	Paved roads w/curbs & sewers, HSG B
240,621	55	Woods, Good, HSG B
432	55	Woods, Good, HSG B
9,356	68	1 acre lots, 20% imp, HSG B
28,682	68	1 acre lots, 20% imp, HSG B
77,538	68	1 acre lots, 20% imp, HSG B
1	55	Woods, Good, HSG B
72,866	55	Woods, Good, HSG B
25,054	55	Woods, Good, HSG B
10,579	98	Paved roads w/curbs & sewers, HSG B
1,871	98	Paved roads w/curbs & sewers, HSG B
228,105	55	Woods, Good, HSG B
10,612	98	Roofs, HSG A
2,814	98	Roofs, HSG A
4,636	98	Roofs, HSG A
4,484	98	Roofs, HSG A
3,906	98	Roofs, HSG A
4,863	98	Roofs, HSG A
3,009	98	Roofs, HSG A
6,117	98	Roofs, HSG A
1,488	98	Roofs, HSG A
6,760	98	Roofs, HSG A
2,404	39	>75% Grass cover, Good, HSG A
3,772	39	>75% Grass cover, Good, HSG A
14,346	39	>75% Grass cover, Good, HSG A
5,038	39	>75% Grass cover, Good, HSG A
2,099	39	>75% Grass cover, Good, HSG A
12,640	39	>75% Grass cover, Good, HSG A
5,858	39	>75% Grass cover, Good, HSG A
12,157	39	>75% Grass cover, Good, HSG A

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1,549	39	>75% Grass cover, Good, HSG A
4,123	39	>75% Grass cover, Good, HSG A
2,558	39	>75% Grass cover, Good, HSG A
7,360	39	>75% Grass cover, Good, HSG A
14	51	1 acre lots, 20% imp, HSG A
37,651	51	1 acre lots, 20% imp, HSG A
39,967	51	1 acre lots, 20% imp, HSG A
2,959	30	Woods, Good, HSG A
585	30	Woods, Good, HSG A
13,607	30	Woods, Good, HSG A
1,576	30	Woods, Good, HSG A
2	30	Woods, Good, HSG A
16,384	30	Woods, Good, HSG A
424	39	>75% Grass cover, Good, HSG A
56	39	>75% Grass cover, Good, HSG A
2,604	39	>75% Grass cover, Good, HSG A
1,995	39	>75% Grass cover, Good, HSG A
677	39	>75% Grass cover, Good, HSG A
48,051	30	Woods, Good, HSG A
9,600	30	Woods, Good, HSG A
8,066	30	Woods, Good, HSG A
253,052	98	Paved roads w/curbs & sewers, HSG A
1,260	84	1 acre lots, 20% imp, HSG D
4,120	84	1 acre lots, 20% imp, HSG D
21,593	84	1 acre lots, 20% imp, HSG D
2,295	84	1 acre lots, 20% imp, HSG D
28,307	84	1 acre lots, 20% imp, HSG D
64,402	84	1 acre lots, 20% imp, HSG D
5,614	84	1 acre lots, 20% imp, HSG D
53	84	1 acre lots, 20% imp, HSG D
7,502	84	1 acre lots, 20% imp, HSG D
322	84	1 acre lots, 20% imp, HSG D
16	84	1 acre lots, 20% imp, HSG D
2,454	98	Paved roads w/curbs & sewers, HSG D
809	84	1 acre lots, 20% imp, HSG D
30,622	84	1 acre lots, 20% imp, HSG D
9,979	84	1 acre lots, 20% imp, HSG D
3,867	77	Woods, Good, HSG D
9,461	98	Paved roads w/curbs & sewers, HSG B
254	98	Paved roads w/curbs & sewers, HSG B
6,306	98	Paved roads w/curbs & sewers, HSG D
234	98	Paved roads w/curbs & sewers, HSG D
35,895	98	Paved roads w/curbs & sewers, HSG B
8,154	98	Paved roads w/curbs & sewers, HSG B
8,906	98	Paved roads w/curbs & sewers, HSG D
9,293	98	Paved roads w/curbs & sewers, HSG D
1,920	98	Paved roads w/curbs & sewers, HSG D
60,038	77	Woods, Good, HSG D
509	55	Woods, Good, HSG B
54,291	55	Woods, Good, HSG B
557,510	77	Woods, Good, HSG D
5,727	61	>75% Grass cover, Good, HSG B

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4,242	68	1 acre lots, 20% imp, HSG B
43,411	68	1 acre lots, 20% imp, HSG B
4,608	68	1 acre lots, 20% imp, HSG B
56,607	68	1 acre lots, 20% imp, HSG B
6	55	Woods, Good, HSG B
17,779	55	Woods, Good, HSG B
61	55	Woods, Good, HSG B
187,750	55	Woods, Good, HSG B
1,002,408	55	Woods, Good, HSG B
12,536	98	Paved roads w/curbs & sewers, HSG B
3,415	98	Paved roads w/curbs & sewers, HSG B
2,284	98	Paved roads w/curbs & sewers, HSG B
11,562	98	Paved roads w/curbs & sewers, HSG B
2,273	68	1 acre lots, 20% imp, HSG B
3,550	98	Roofs, HSG A
2,631	98	Roofs, HSG A
861	98	Roofs, HSG A
13,650	98	Roofs, HSG A
7,476	98	Roofs, HSG A
537	98	Roofs, HSG A
3,465	98	Roofs, HSG A
15,193	98	Roofs, HSG A
2,952	98	Roofs, HSG A
3,464	98	Roofs, HSG A
4,080	98	Roofs, HSG A
93	98	Roofs, HSG A
1,116	98	Roofs, HSG A
6,583	98	Roofs, HSG A
9,239	39	>75% Grass cover, Good, HSG A
3,977	39	>75% Grass cover, Good, HSG A
38,172	39	>75% Grass cover, Good, HSG A
1,736	39	>75% Grass cover, Good, HSG A
53	39	>75% Grass cover, Good, HSG A
1,105	39	>75% Grass cover, Good, HSG A
4,186	39	>75% Grass cover, Good, HSG A
12,418	51	1 acre lots, 20% imp, HSG A
16,668	51	1 acre lots, 20% imp, HSG A
4,993	30	Woods, Good, HSG A
133,510	30	Woods, Good, HSG A
57,181	30	Woods, Good, HSG A
3,821	30	Woods, Good, HSG A
18,270	30	Woods, Good, HSG A
32,716	30	Woods, Good, HSG A
178,233	98	Paved roads w/curbs & sewers, HSG A
432,430	77	Woods, Good, HSG D
35,854	51	1 acre lots, 20% imp, HSG A
41,562	51	1 acre lots, 20% imp, HSG A
9,365	51	1 acre lots, 20% imp, HSG A
7,853	51	1 acre lots, 20% imp, HSG A
2,030	30	Woods, Good, HSG A
22,235	98	Paved roads w/curbs & sewers, HSG A
16,573	51	1 acre lots, 20% imp, HSG A

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48,142	84	1 acre lots, 20% imp, HSG D
82,862	84	1 acre lots, 20% imp, HSG D
9	77	Woods, Good, HSG D
107,107	55	Woods, Good, HSG B
64,489	55	Woods, Good, HSG B
161,213	77	Woods, Good, HSG D
11	77	Woods, Good, HSG D
10,130	77	Woods, Good, HSG D
9,432	77	Woods, Good, HSG D
7,658	77	Woods, Good, HSG D
10,637	84	1 acre lots, 20% imp, HSG D
24,993	84	1 acre lots, 20% imp, HSG D
16,376	98	Paved roads w/curbs & sewers, HSG D
36,187	68	1 acre lots, 20% imp, HSG B
2,087	68	1 acre lots, 20% imp, HSG B
168,797	68	1 acre lots, 20% imp, HSG B
685	68	1 acre lots, 20% imp, HSG B
64,239	98	Paved roads w/curbs & sewers, HSG B
1,661	68	1 acre lots, 20% imp, HSG B
17,363	68	1 acre lots, 20% imp, HSG B
10,929	68	1 acre lots, 20% imp, HSG B
14,136	68	1 acre lots, 20% imp, HSG B
4,514	68	1 acre lots, 20% imp, HSG B
36,441	68	1 acre lots, 20% imp, HSG B
77,643	68	1 acre lots, 20% imp, HSG B
39,968	68	1 acre lots, 20% imp, HSG B
43,173	68	1 acre lots, 20% imp, HSG B
71,299	68	1 acre lots, 20% imp, HSG B
17	55	Woods, Good, HSG B
117,840	55	Woods, Good, HSG B
3,535	55	Woods, Good, HSG B
209,319	55	Woods, Good, HSG B
7,700	55	Woods, Good, HSG B
4,089	98	Roofs, HSG B
7,799	98	Roofs, HSG B
190	98	Roofs, HSG B
39,268	98	Paved roads w/curbs & sewers, HSG B
6,377	68	1 acre lots, 20% imp, HSG B
8,138	68	1 acre lots, 20% imp, HSG B
1,606	55	Woods, Good, HSG B
9,576	55	Woods, Good, HSG B
80,241	55	Woods, Good, HSG B
148,448	55	Woods, Good, HSG B
0	55	Woods, Good, HSG B
11	55	Woods, Good, HSG B
0	55	Woods, Good, HSG B
202	61	>75% Grass cover, Good, HSG B
75	61	>75% Grass cover, Good, HSG B
191	68	1 acre lots, 20% imp, HSG B
137,438	68	1 acre lots, 20% imp, HSG B
28,368	68	1 acre lots, 20% imp, HSG B
29,743	68	1 acre lots, 20% imp, HSG B

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Type III 24-hr 50-Year Rainfall=7.38"

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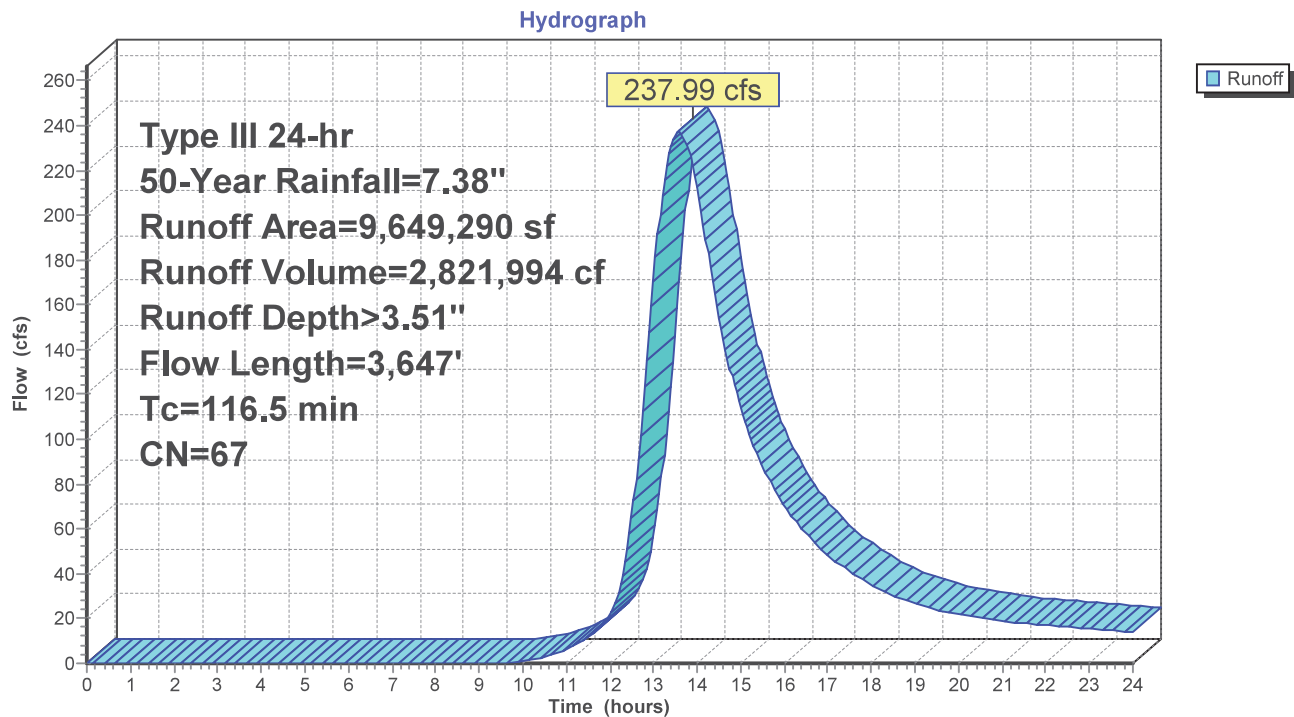
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25,401	68	1 acre lots, 20% imp, HSG B
34,695	68	1 acre lots, 20% imp, HSG B
151	68	1 acre lots, 20% imp, HSG B
2,028	68	1 acre lots, 20% imp, HSG B
4,562	68	1 acre lots, 20% imp, HSG B
683	68	1 acre lots, 20% imp, HSG B
15,767	68	1 acre lots, 20% imp, HSG B
13,154	68	1 acre lots, 20% imp, HSG B
301	68	1 acre lots, 20% imp, HSG B
38,195	68	1 acre lots, 20% imp, HSG B
2,684	61	>75% Grass cover, Good, HSG B

9,649,290	67	Weighted Average
7,815,573		81.00% Pervious Area
1,833,718		19.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.0	100	0.0100	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.28"
15.1	700	0.0240	0.77		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
30.0	623	0.0048	0.35		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
33.2	961	0.0093	0.48		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
10.2	1,263	0.0190	2.07		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
116.5	3,647	Total			

Subcatchment PR-1: Subcat PR-1



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Summary for Subcatchment PR-2: Subcat PR-2

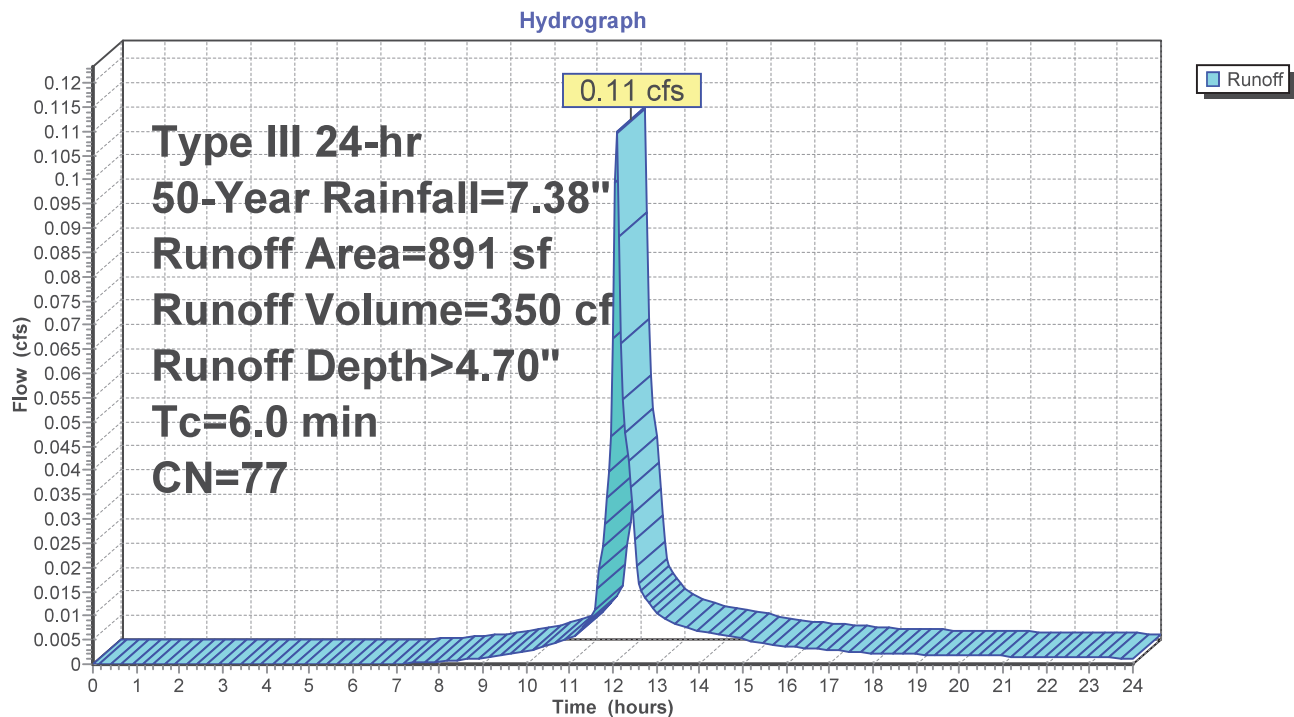
Runoff = 0.11 cfs @ 12.09 hrs, Volume= 350 cf, Depth> 4.70"
Routed to Pond 2P : Offsite Northwest

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=7.38"

Area (sf)	CN	Description
114	61	>75% Grass cover, Good, HSG B
395	61	>75% Grass cover, Good, HSG B
124	98	Roofs, HSG B
90	98	Roofs, HSG B
90	98	Roofs, HSG B
78	98	Roofs, HSG B
891	77	Weighted Average
510		57.16% Pervious Area
382		42.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-2: Subcat PR-2



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Summary for Subcatchment PR-3: Subcat PR-3

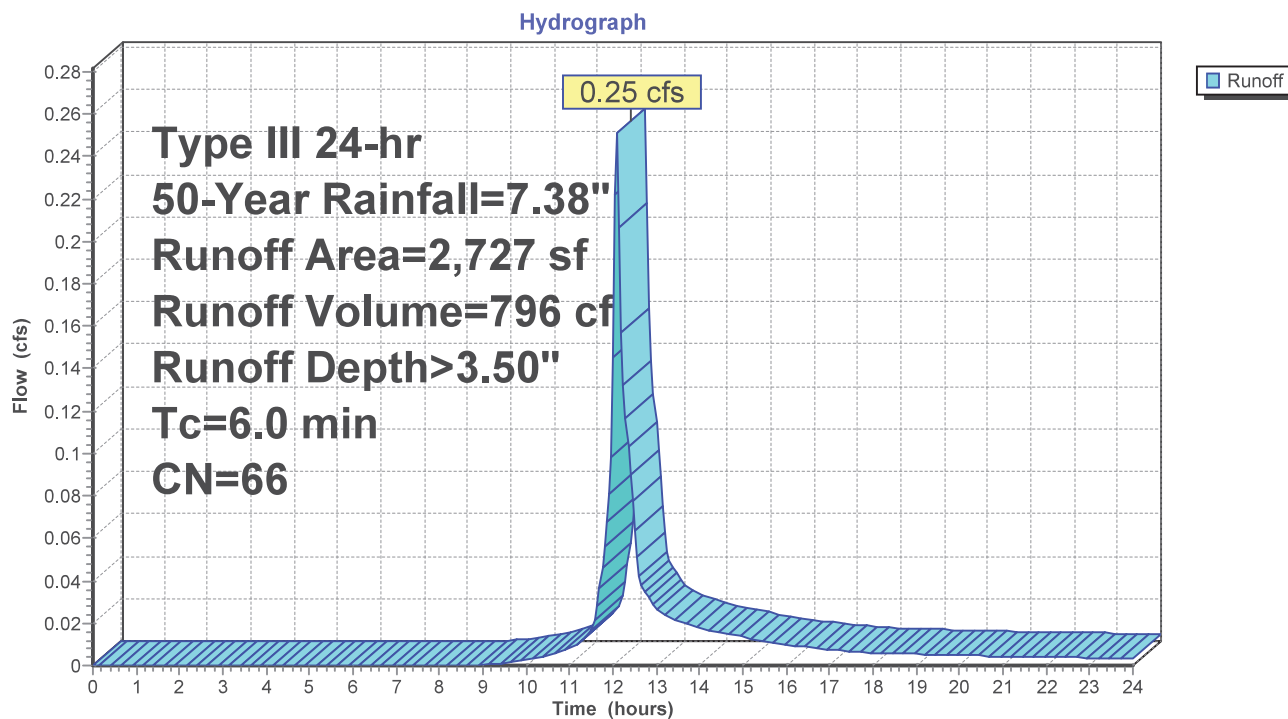
Runoff = 0.25 cfs @ 12.09 hrs, Volume= 796 cf, Depth> 3.50"
Routed to Pond 3P : Raingarden

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=7.38"

Area (sf)	CN	Description
759	61	>75% Grass cover, Good, HSG B
5	61	>75% Grass cover, Good, HSG B
533	98	Roofs, HSG B
29	98	Roofs, HSG B
1,401	55	Woods, Good, HSG B
2,727	66	Weighted Average
2,166		79.40% Pervious Area
562		20.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-3: Subcat PR-3



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Summary for Subcatchment PR-4: Subcat PR-4

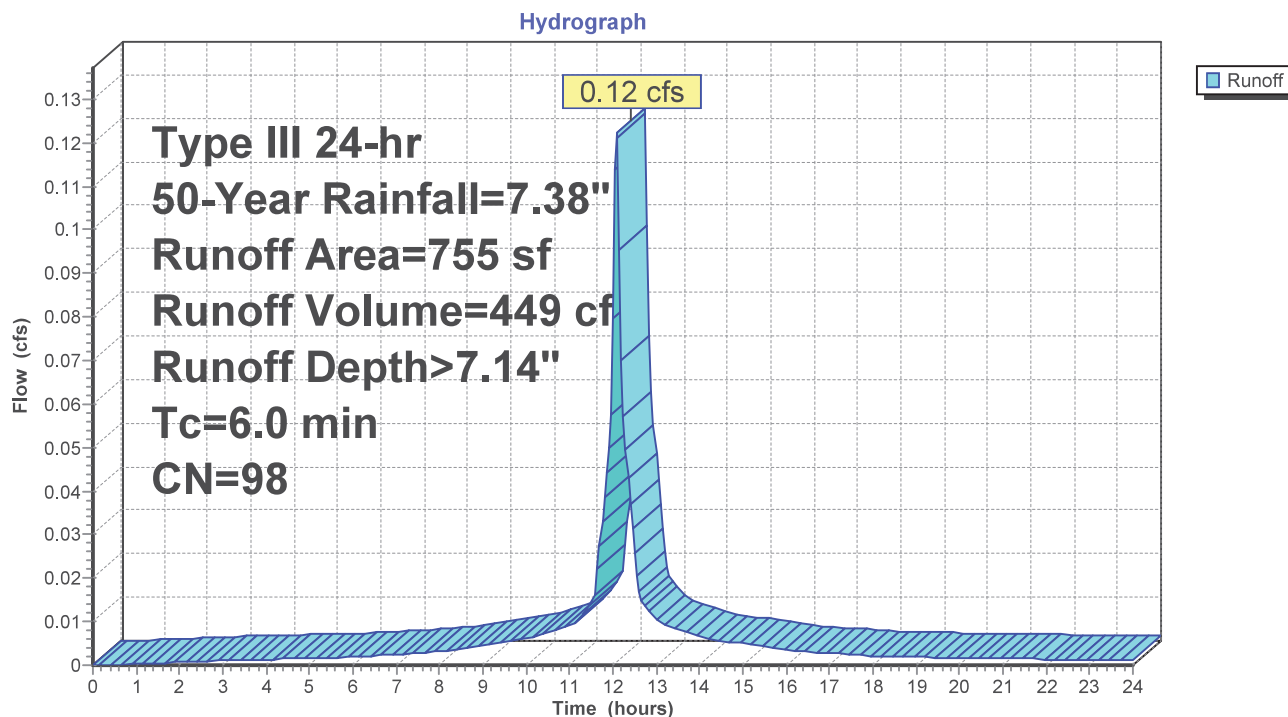
Runoff = 0.12 cfs @ 12.09 hrs, Volume= 449 cf, Depth> 7.14"
Routed to Pond 1P : Ex. 30" HDPE Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=7.38"

Area (sf)	CN	Description
0	61	>75% Grass cover, Good, HSG B
755	98	Roofs, HSG B
755	98	Weighted Average
0		0.00% Pervious Area
755		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-4: Subcat PR-4



Summary for Pond 1P: Ex. 30" HDPE Culvert

[57] Hint: Peaked at 114.58' (Flood elevation advised)

[81] Warning: Exceeded Pond 3P by 98.27' @ 13.60 hrs

[81] Warning: Exceeded Pond 3P by 98.27' @ 13.60 hrs

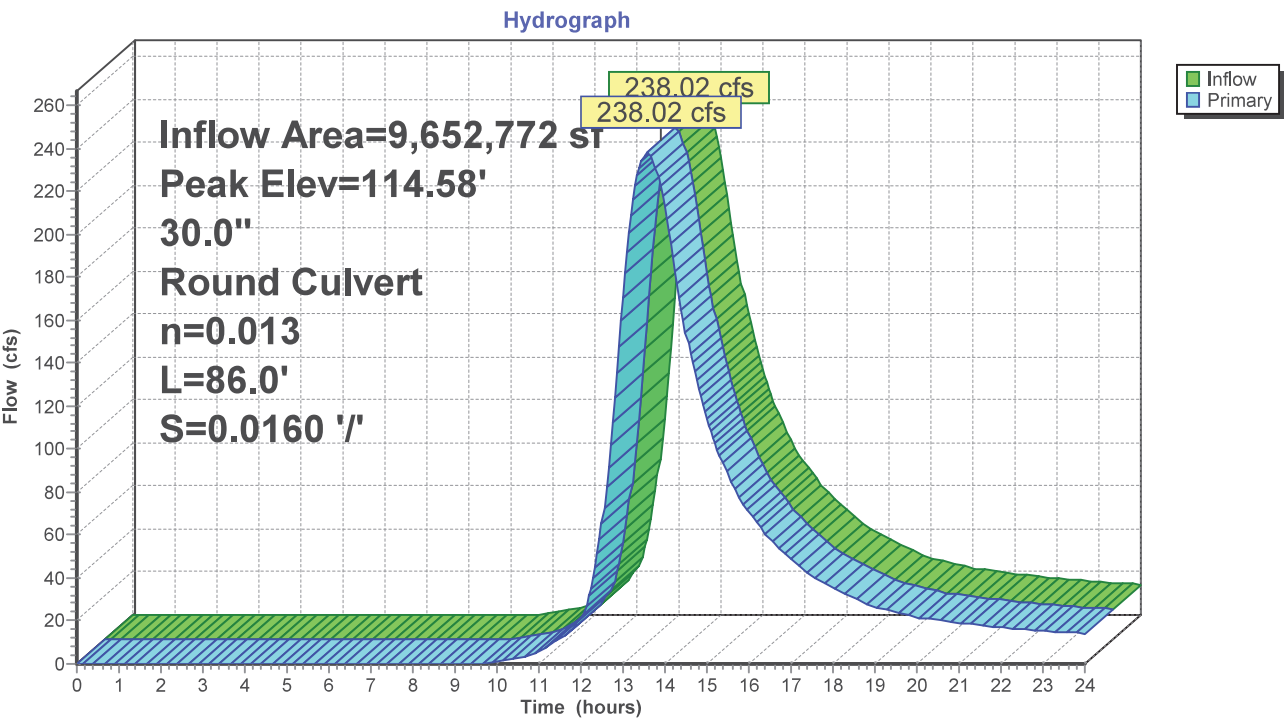
Inflow Area = 9,652,772 sf, 19.01% Impervious, Inflow Depth > 3.51" for 50-Year event
Inflow = 238.02 cfs @ 13.59 hrs, Volume= 2,823,164 cf
Outflow = 238.02 cfs @ 13.59 hrs, Volume= 2,823,164 cf, Atten= 0%, Lag= 0.0 min
Primary = 238.02 cfs @ 13.59 hrs, Volume= 2,823,164 cf
Routed to Pond AP : Analysis Point

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 114.58' @ 13.59 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	11.92'	30.0" Round Culvert L= 86.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 11.92' / 10.54' S= 0.0160 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=237.86 cfs @ 13.59 hrs HW=114.45' (Free Discharge)
1=Culvert (Inlet Controls 237.86 cfs @ 48.46 fps)

Pond 1P: Ex. 30" HDPE Culvert

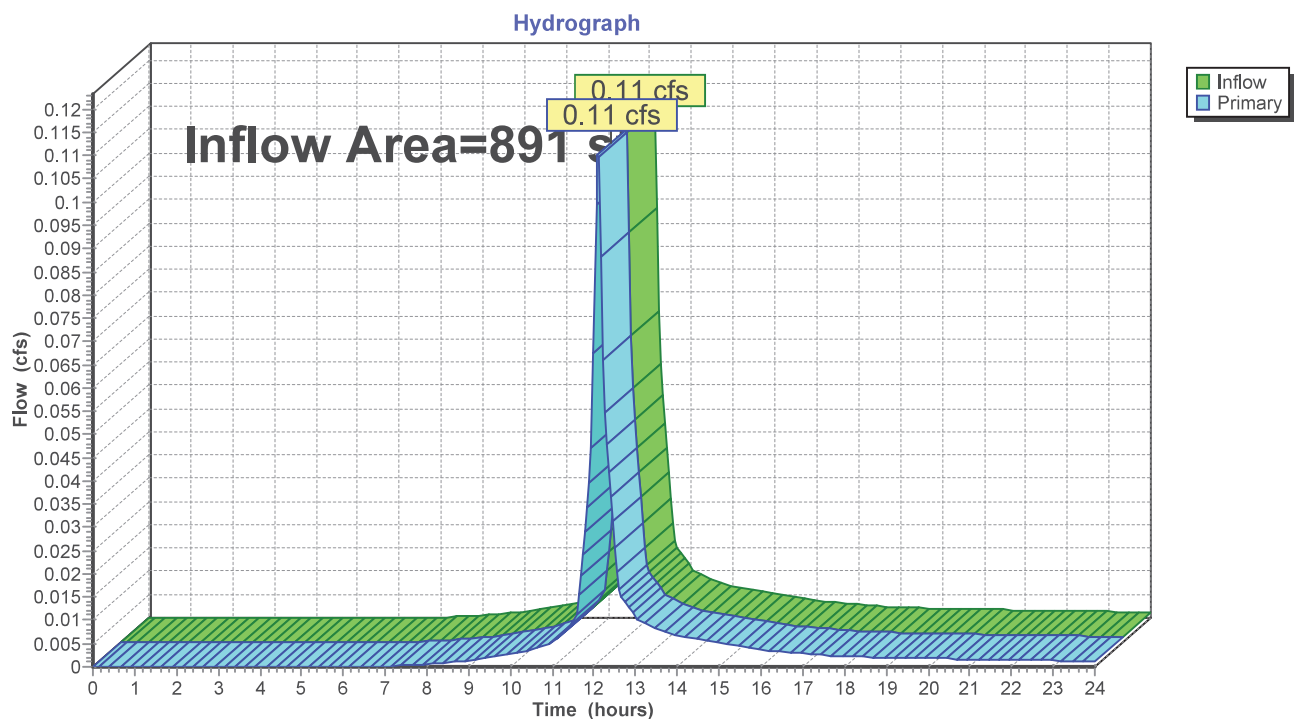


Summary for Pond 2P: Offsite Northwest

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 891 sf, 42.84% Impervious, Inflow Depth > 4.70" for 50-Year event
Inflow = 0.11 cfs @ 12.09 hrs, Volume= 350 cf
Primary = 0.11 cfs @ 12.09 hrs, Volume= 350 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond AP : Analysis Point

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 2P: Offsite Northwest

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Summary for Pond 3P: Raingarden

Inflow Area = 2,727 sf, 20.60% Impervious, Inflow Depth > 3.50" for 50-Year event
Inflow = 0.25 cfs @ 12.09 hrs, Volume= 796 cf
Outflow = 0.20 cfs @ 12.16 hrs, Volume= 721 cf, Atten= 20%, Lag= 3.9 min
Primary = 0.20 cfs @ 12.16 hrs, Volume= 721 cf
Routed to Pond 1P : Ex. 30" HDPE Culvert
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond 1P : Ex. 30" HDPE Culvert

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 16.47' @ 12.16 hrs Surf.Area= 226 sf Storage= 121 cf

Plug-Flow detention time= 66.4 min calculated for 721 cf (91% of inflow)
Center-of-Mass det. time= 20.0 min (856.5 - 836.5)

Volume	Invert	Avail.Storage	Storage Description
#1	15.75'	189 cf	RainGarden (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.75	108	0	0
16.00	148	32	32
16.25	188	42	74
16.50	230	52	126
16.75	273	63	189

Device	Routing	Invert	Outlet Devices
#1	Primary	14.40'	4.0" Round Culvert Out L= 7.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 14.40' / 14.00' S= 0.0571 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#2	Device 1	16.25'	4.0" Horiz. Top Grate C= 0.600 Limited to weir flow at low heads
#3	Secondary	16.50'	5.0' long + 2.0 '/' SideZ x 4.0' breadth Emergency Spillway Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#4	Device 5	15.75'	0.200 in/hr Exfiltration over Surface area
#5	Device 1	14.35'	4.0" Round Underdrain L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 14.20' / 14.35' S= -0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf

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Primary OutFlow Max=0.20 cfs @ 12.16 hrs HW=16.47' (Free Discharge)

↑ **1=Culvert Out** (Passes 0.20 cfs of 0.58 cfs potential flow)

↑ **2=Top Grate** (Orifice Controls 0.20 cfs @ 2.27 fps)

↑ **5=Underdrain** (Passes 0.00 cfs of 0.41 cfs potential flow)

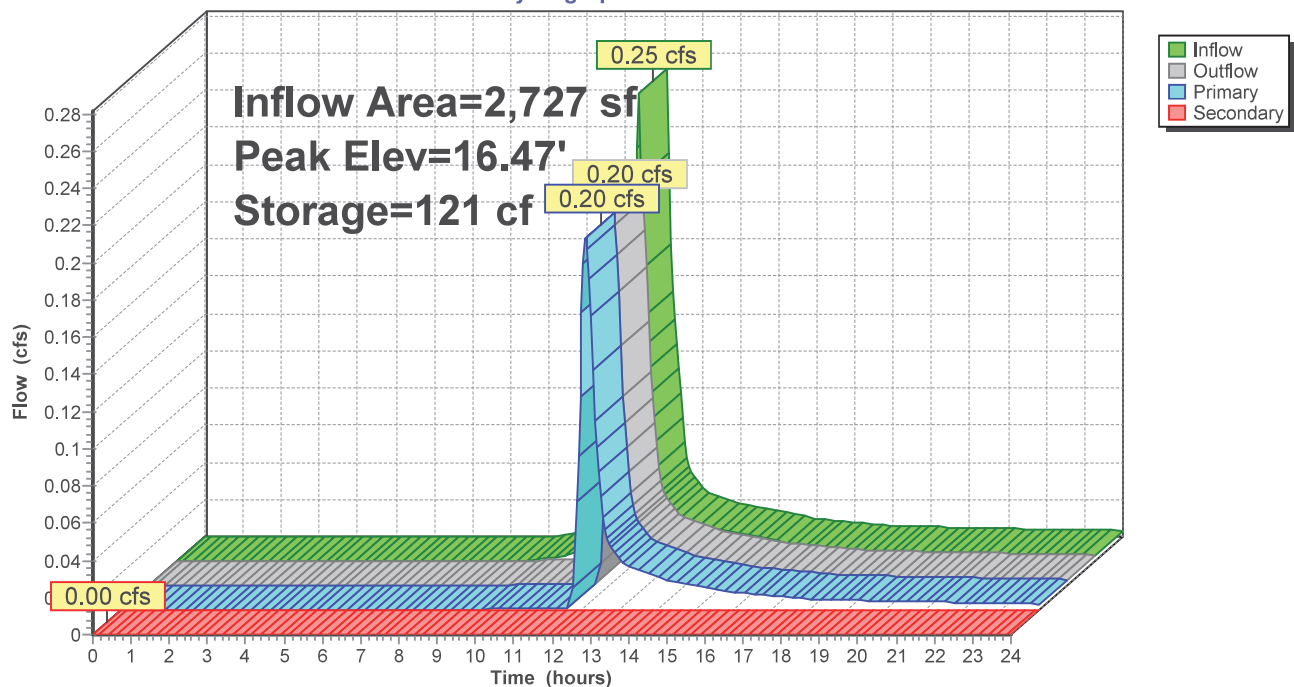
↑ **4=Exfiltration** (Exfiltration Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=15.75' (Free Discharge)

↑ **3=Emergency Spillway** (Controls 0.00 cfs)

Pond 3P: Raingarden

Hydrograph

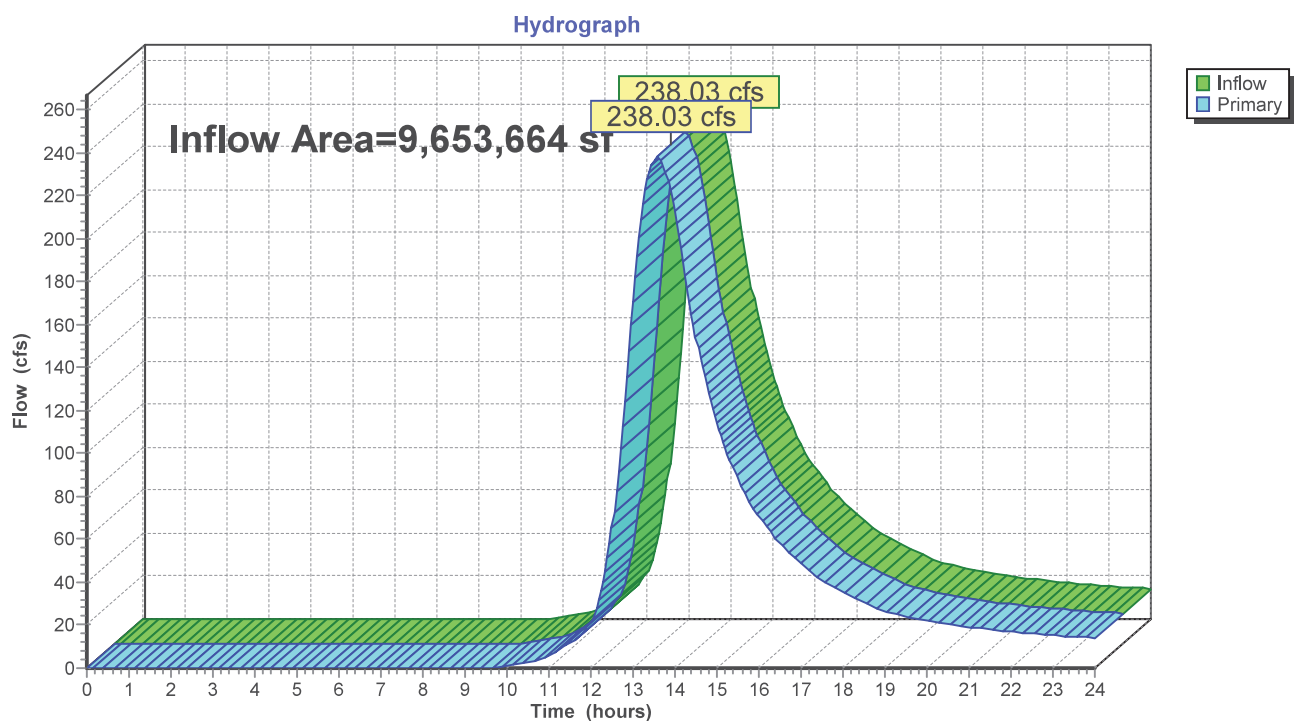


Summary for Pond AP: Analysis Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 9,653,664 sf, 19.01% Impervious, Inflow Depth > 3.51" for 50-Year event
Inflow = 238.03 cfs @ 13.59 hrs, Volume= 2,823,513 cf
Primary = 238.03 cfs @ 13.59 hrs, Volume= 2,823,513 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond AP: Analysis Point

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Type III 24-hr 100-Year Rainfall=8.37"

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PR-1: Subcat PR-1 Runoff Area=9,649,290 sf 19.00% Impervious Runoff Depth>4.31"
Flow Length=3,647' Tc=116.5 min CN=67 Runoff=293.54 cfs 3,464,923 cf

Subcatchment PR-2: Subcat PR-2 Runoff Area=891 sf 42.84% Impervious Runoff Depth>5.61"
Tc=6.0 min CN=77 Runoff=0.13 cfs 417 cf

Subcatchment PR-3: Subcat PR-3 Runoff Area=2,727 sf 20.60% Impervious Runoff Depth>4.31"
Tc=6.0 min CN=66 Runoff=0.31 cfs 979 cf

Subcatchment PR-4: Subcat PR-4 Runoff Area=755 sf 100.00% Impervious Runoff Depth>8.13"
Tc=6.0 min CN=98 Runoff=0.14 cfs 511 cf

Pond 1P: Ex. 30" HDPE Culvert Peak Elev=167.45' Inflow=293.57 cfs 3,466,338 cf
30.0" Round Culvert n=0.013 L=86.0' S=0.0160 ' Outflow=293.57 cfs 3,466,338 cf

Pond 2P: Offsite Northwest Inflow=0.13 cfs 417 cf
Primary=0.13 cfs 417 cf

Pond 3P: Raingarden Peak Elev=16.53' Storage=133 cf Inflow=0.31 cfs 979 cf
Primary=0.22 cfs 891 cf Secondary=0.06 cfs 13 cf Outflow=0.28 cfs 904 cf

Pond AP: Analysis Point Inflow=293.58 cfs 3,466,755 cf
Primary=293.58 cfs 3,466,755 cf

Total Runoff Area = 9,653,664 sf Runoff Volume = 3,466,830 cf Average Runoff Depth = 4.31"
80.99% Pervious = 7,818,248 sf 19.01% Impervious = 1,835,416 sf

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Type III 24-hr 100-Year Rainfall=8.37"

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Summary for Subcatchment PR-1: Subcat PR-1

Runoff = 293.54 cfs @ 13.59 hrs, Volume= 3,464,923 cf, Depth> 4.31"
Routed to Pond 1P : Ex. 30" HDPE Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.37"

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Area (sf)	CN	Description
437	98	Roofs, HSG B
13,211	98	Roofs, HSG B
8,596	98	Roofs, HSG B
1,186	61	>75% Grass cover, Good, HSG B
600	61	>75% Grass cover, Good, HSG B
39,154	68	1 acre lots, 20% imp, HSG B
88,435	68	1 acre lots, 20% imp, HSG B
74,087	68	1 acre lots, 20% imp, HSG B
690	55	Woods, Good, HSG B
10,761	55	Woods, Good, HSG B
93	55	Woods, Good, HSG B
10,389	98	Paved roads w/curbs & sewers, HSG B
1,915	68	1 acre lots, 20% imp, HSG B
1,667	55	Woods, Good, HSG B
488,623	55	Woods, Good, HSG B
36,722	68	1 acre lots, 20% imp, HSG B
72,394	68	1 acre lots, 20% imp, HSG B
42,303	68	1 acre lots, 20% imp, HSG B
7,954	98	Paved roads w/curbs & sewers, HSG B
4,350	98	Paved roads w/curbs & sewers, HSG B
2,815	98	Paved roads w/curbs & sewers, HSG B
9,429	98	Paved roads w/curbs & sewers, HSG B
51,724	98	Paved roads w/curbs & sewers, HSG B
5,639	98	Roofs, HSG B
1,092	55	Woods, Good, HSG B
15,566	98	Paved roads w/curbs & sewers, HSG B
712	55	Woods, Good, HSG B
10,532	55	Woods, Good, HSG B
20,047	84	1 acre lots, 20% imp, HSG D
155,579	77	Woods, Good, HSG D
4,541	98	Paved roads w/curbs & sewers, HSG D
7,022	84	1 acre lots, 20% imp, HSG D
8,723	98	Roofs, HSG B
576	98	Roofs, HSG B
14,042	98	Roofs, HSG B
4,034	98	Roofs, HSG B
16,403	98	Roofs, HSG B
9,511	98	Roofs, HSG B
1,877	98	Roofs, HSG B
4,717	98	Roofs, HSG B
13,129	98	Roofs, HSG B
7,317	98	Roofs, HSG B
11,285	98	Roofs, HSG B
582	61	>75% Grass cover, Good, HSG B
25,528	61	>75% Grass cover, Good, HSG B
54,038	61	>75% Grass cover, Good, HSG B
36,696	68	1 acre lots, 20% imp, HSG B
42,920	68	1 acre lots, 20% imp, HSG B
110,966	55	Woods, Good, HSG B
57,352	55	Woods, Good, HSG B
98,325	55	Woods, Good, HSG B

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51	98	Paved roads w/curbs & sewers, HSG B
13,662	98	Paved roads w/curbs & sewers, HSG B
182,904	98	Paved roads w/curbs & sewers, HSG B
57	61	>75% Grass cover, Good, HSG B
62,503	55	Woods, Good, HSG B
2,710	68	1 acre lots, 20% imp, HSG B
8,636	98	Paved roads w/curbs & sewers, HSG B
1,673	98	Paved roads w/curbs & sewers, HSG B
6,338	98	Paved roads w/curbs & sewers, HSG B
12,602	98	Paved roads w/curbs & sewers, HSG B
17,167	68	1 acre lots, 20% imp, HSG B
2,389	68	1 acre lots, 20% imp, HSG B
88,957	68	1 acre lots, 20% imp, HSG B
151,346	68	1 acre lots, 20% imp, HSG B
148,516	68	1 acre lots, 20% imp, HSG B
63,026	68	1 acre lots, 20% imp, HSG B
122,963	55	Woods, Good, HSG B
93,469	55	Woods, Good, HSG B
83,227	68	1 acre lots, 20% imp, HSG B
40,984	68	1 acre lots, 20% imp, HSG B
26,764	68	1 acre lots, 20% imp, HSG B
0	55	Woods, Good, HSG B
7,639	98	Paved roads w/curbs & sewers, HSG B
240,621	55	Woods, Good, HSG B
432	55	Woods, Good, HSG B
9,356	68	1 acre lots, 20% imp, HSG B
28,682	68	1 acre lots, 20% imp, HSG B
77,538	68	1 acre lots, 20% imp, HSG B
1	55	Woods, Good, HSG B
72,866	55	Woods, Good, HSG B
25,054	55	Woods, Good, HSG B
10,579	98	Paved roads w/curbs & sewers, HSG B
1,871	98	Paved roads w/curbs & sewers, HSG B
228,105	55	Woods, Good, HSG B
10,612	98	Roofs, HSG A
2,814	98	Roofs, HSG A
4,636	98	Roofs, HSG A
4,484	98	Roofs, HSG A
3,906	98	Roofs, HSG A
4,863	98	Roofs, HSG A
3,009	98	Roofs, HSG A
6,117	98	Roofs, HSG A
1,488	98	Roofs, HSG A
6,760	98	Roofs, HSG A
2,404	39	>75% Grass cover, Good, HSG A
3,772	39	>75% Grass cover, Good, HSG A
14,346	39	>75% Grass cover, Good, HSG A
5,038	39	>75% Grass cover, Good, HSG A
2,099	39	>75% Grass cover, Good, HSG A
12,640	39	>75% Grass cover, Good, HSG A
5,858	39	>75% Grass cover, Good, HSG A
12,157	39	>75% Grass cover, Good, HSG A

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1,549	39	>75% Grass cover, Good, HSG A
4,123	39	>75% Grass cover, Good, HSG A
2,558	39	>75% Grass cover, Good, HSG A
7,360	39	>75% Grass cover, Good, HSG A
14	51	1 acre lots, 20% imp, HSG A
37,651	51	1 acre lots, 20% imp, HSG A
39,967	51	1 acre lots, 20% imp, HSG A
2,959	30	Woods, Good, HSG A
585	30	Woods, Good, HSG A
13,607	30	Woods, Good, HSG A
1,576	30	Woods, Good, HSG A
2	30	Woods, Good, HSG A
16,384	30	Woods, Good, HSG A
424	39	>75% Grass cover, Good, HSG A
56	39	>75% Grass cover, Good, HSG A
2,604	39	>75% Grass cover, Good, HSG A
1,995	39	>75% Grass cover, Good, HSG A
677	39	>75% Grass cover, Good, HSG A
48,051	30	Woods, Good, HSG A
9,600	30	Woods, Good, HSG A
8,066	30	Woods, Good, HSG A
253,052	98	Paved roads w/curbs & sewers, HSG A
1,260	84	1 acre lots, 20% imp, HSG D
4,120	84	1 acre lots, 20% imp, HSG D
21,593	84	1 acre lots, 20% imp, HSG D
2,295	84	1 acre lots, 20% imp, HSG D
28,307	84	1 acre lots, 20% imp, HSG D
64,402	84	1 acre lots, 20% imp, HSG D
5,614	84	1 acre lots, 20% imp, HSG D
53	84	1 acre lots, 20% imp, HSG D
7,502	84	1 acre lots, 20% imp, HSG D
322	84	1 acre lots, 20% imp, HSG D
16	84	1 acre lots, 20% imp, HSG D
2,454	98	Paved roads w/curbs & sewers, HSG D
809	84	1 acre lots, 20% imp, HSG D
30,622	84	1 acre lots, 20% imp, HSG D
9,979	84	1 acre lots, 20% imp, HSG D
3,867	77	Woods, Good, HSG D
9,461	98	Paved roads w/curbs & sewers, HSG B
254	98	Paved roads w/curbs & sewers, HSG B
6,306	98	Paved roads w/curbs & sewers, HSG D
234	98	Paved roads w/curbs & sewers, HSG D
35,895	98	Paved roads w/curbs & sewers, HSG B
8,154	98	Paved roads w/curbs & sewers, HSG B
8,906	98	Paved roads w/curbs & sewers, HSG D
9,293	98	Paved roads w/curbs & sewers, HSG D
1,920	98	Paved roads w/curbs & sewers, HSG D
60,038	77	Woods, Good, HSG D
509	55	Woods, Good, HSG B
54,291	55	Woods, Good, HSG B
557,510	77	Woods, Good, HSG D
5,727	61	>75% Grass cover, Good, HSG B

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Type III 24-hr 100-Year Rainfall=8.37"

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4,242	68	1 acre lots, 20% imp, HSG B
43,411	68	1 acre lots, 20% imp, HSG B
4,608	68	1 acre lots, 20% imp, HSG B
56,607	68	1 acre lots, 20% imp, HSG B
6	55	Woods, Good, HSG B
17,779	55	Woods, Good, HSG B
61	55	Woods, Good, HSG B
187,750	55	Woods, Good, HSG B
1,002,408	55	Woods, Good, HSG B
12,536	98	Paved roads w/curbs & sewers, HSG B
3,415	98	Paved roads w/curbs & sewers, HSG B
2,284	98	Paved roads w/curbs & sewers, HSG B
11,562	98	Paved roads w/curbs & sewers, HSG B
2,273	68	1 acre lots, 20% imp, HSG B
3,550	98	Roofs, HSG A
2,631	98	Roofs, HSG A
861	98	Roofs, HSG A
13,650	98	Roofs, HSG A
7,476	98	Roofs, HSG A
537	98	Roofs, HSG A
3,465	98	Roofs, HSG A
15,193	98	Roofs, HSG A
2,952	98	Roofs, HSG A
3,464	98	Roofs, HSG A
4,080	98	Roofs, HSG A
93	98	Roofs, HSG A
1,116	98	Roofs, HSG A
6,583	98	Roofs, HSG A
9,239	39	>75% Grass cover, Good, HSG A
3,977	39	>75% Grass cover, Good, HSG A
38,172	39	>75% Grass cover, Good, HSG A
1,736	39	>75% Grass cover, Good, HSG A
53	39	>75% Grass cover, Good, HSG A
1,105	39	>75% Grass cover, Good, HSG A
4,186	39	>75% Grass cover, Good, HSG A
12,418	51	1 acre lots, 20% imp, HSG A
16,668	51	1 acre lots, 20% imp, HSG A
4,993	30	Woods, Good, HSG A
133,510	30	Woods, Good, HSG A
57,181	30	Woods, Good, HSG A
3,821	30	Woods, Good, HSG A
18,270	30	Woods, Good, HSG A
32,716	30	Woods, Good, HSG A
178,233	98	Paved roads w/curbs & sewers, HSG A
432,430	77	Woods, Good, HSG D
35,854	51	1 acre lots, 20% imp, HSG A
41,562	51	1 acre lots, 20% imp, HSG A
9,365	51	1 acre lots, 20% imp, HSG A
7,853	51	1 acre lots, 20% imp, HSG A
2,030	30	Woods, Good, HSG A
22,235	98	Paved roads w/curbs & sewers, HSG A
16,573	51	1 acre lots, 20% imp, HSG A

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48,142	84	1 acre lots, 20% imp, HSG D
82,862	84	1 acre lots, 20% imp, HSG D
9	77	Woods, Good, HSG D
107,107	55	Woods, Good, HSG B
64,489	55	Woods, Good, HSG B
161,213	77	Woods, Good, HSG D
11	77	Woods, Good, HSG D
10,130	77	Woods, Good, HSG D
9,432	77	Woods, Good, HSG D
7,658	77	Woods, Good, HSG D
10,637	84	1 acre lots, 20% imp, HSG D
24,993	84	1 acre lots, 20% imp, HSG D
16,376	98	Paved roads w/curbs & sewers, HSG D
36,187	68	1 acre lots, 20% imp, HSG B
2,087	68	1 acre lots, 20% imp, HSG B
168,797	68	1 acre lots, 20% imp, HSG B
685	68	1 acre lots, 20% imp, HSG B
64,239	98	Paved roads w/curbs & sewers, HSG B
1,661	68	1 acre lots, 20% imp, HSG B
17,363	68	1 acre lots, 20% imp, HSG B
10,929	68	1 acre lots, 20% imp, HSG B
14,136	68	1 acre lots, 20% imp, HSG B
4,514	68	1 acre lots, 20% imp, HSG B
36,441	68	1 acre lots, 20% imp, HSG B
77,643	68	1 acre lots, 20% imp, HSG B
39,968	68	1 acre lots, 20% imp, HSG B
43,173	68	1 acre lots, 20% imp, HSG B
71,299	68	1 acre lots, 20% imp, HSG B
17	55	Woods, Good, HSG B
117,840	55	Woods, Good, HSG B
3,535	55	Woods, Good, HSG B
209,319	55	Woods, Good, HSG B
7,700	55	Woods, Good, HSG B
4,089	98	Roofs, HSG B
7,799	98	Roofs, HSG B
190	98	Roofs, HSG B
39,268	98	Paved roads w/curbs & sewers, HSG B
6,377	68	1 acre lots, 20% imp, HSG B
8,138	68	1 acre lots, 20% imp, HSG B
1,606	55	Woods, Good, HSG B
9,576	55	Woods, Good, HSG B
80,241	55	Woods, Good, HSG B
148,448	55	Woods, Good, HSG B
0	55	Woods, Good, HSG B
11	55	Woods, Good, HSG B
0	55	Woods, Good, HSG B
202	61	>75% Grass cover, Good, HSG B
75	61	>75% Grass cover, Good, HSG B
191	68	1 acre lots, 20% imp, HSG B
137,438	68	1 acre lots, 20% imp, HSG B
28,368	68	1 acre lots, 20% imp, HSG B
29,743	68	1 acre lots, 20% imp, HSG B

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Type III 24-hr 100-Year Rainfall=8.37"

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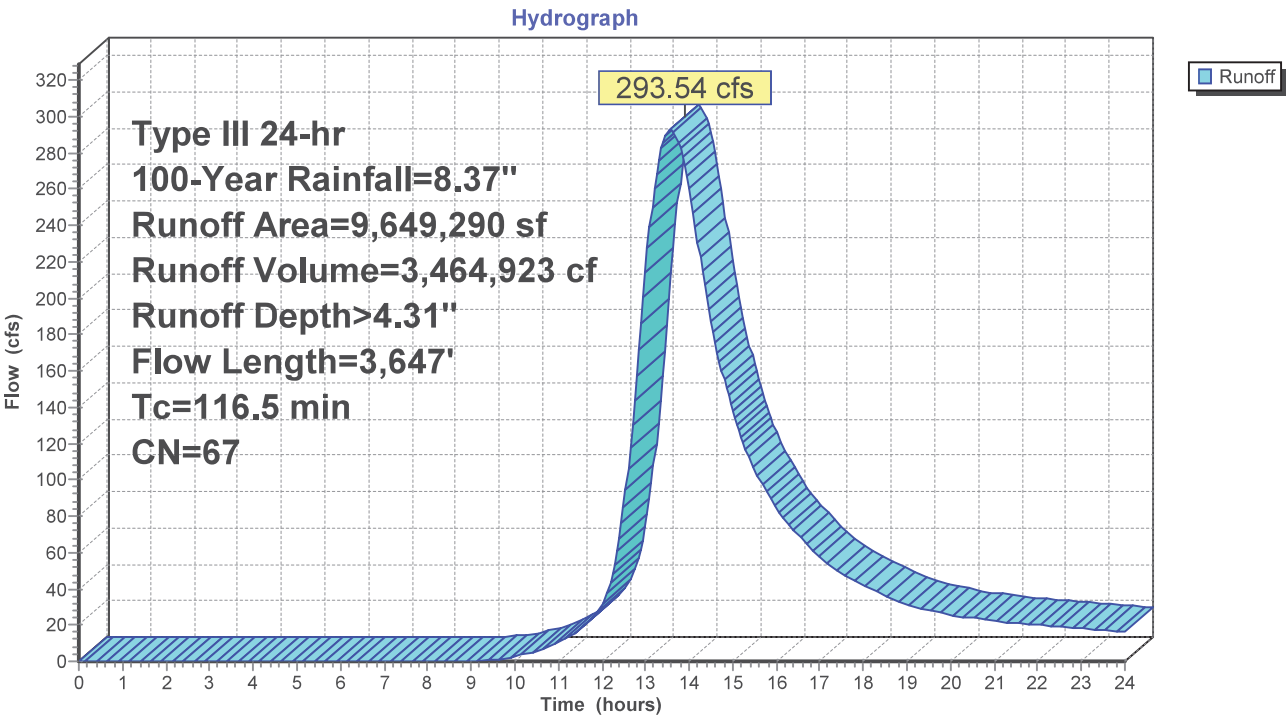
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25,401	68	1 acre lots, 20% imp, HSG B
34,695	68	1 acre lots, 20% imp, HSG B
151	68	1 acre lots, 20% imp, HSG B
2,028	68	1 acre lots, 20% imp, HSG B
4,562	68	1 acre lots, 20% imp, HSG B
683	68	1 acre lots, 20% imp, HSG B
15,767	68	1 acre lots, 20% imp, HSG B
13,154	68	1 acre lots, 20% imp, HSG B
301	68	1 acre lots, 20% imp, HSG B
38,195	68	1 acre lots, 20% imp, HSG B
2,684	61	>75% Grass cover, Good, HSG B

9,649,290	67	Weighted Average
7,815,573		81.00% Pervious Area
1,833,718		19.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.0	100	0.0100	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.28"
15.1	700	0.0240	0.77		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
30.0	623	0.0048	0.35		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
33.2	961	0.0093	0.48		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
10.2	1,263	0.0190	2.07		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
116.5	3,647	Total			

Subcatchment PR-1: Subcat PR-1



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Summary for Subcatchment PR-2: Subcat PR-2

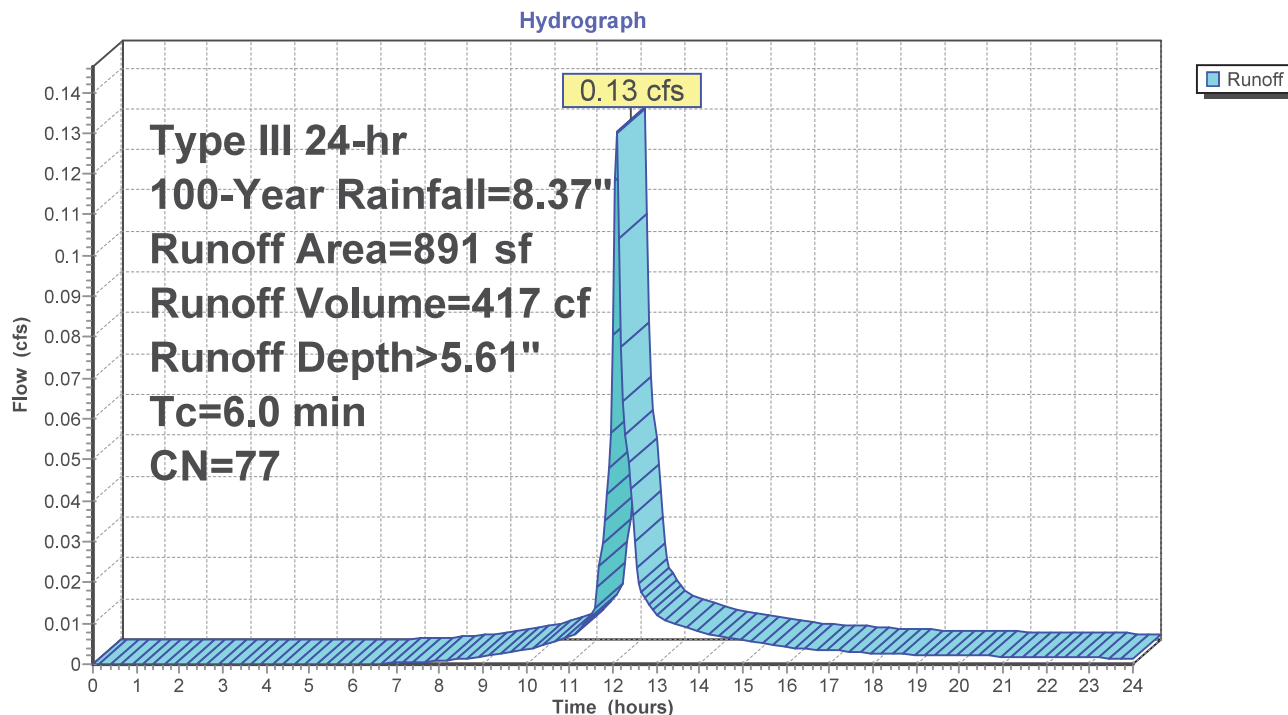
Runoff = 0.13 cfs @ 12.09 hrs, Volume= 417 cf, Depth> 5.61"
Routed to Pond 2P : Offsite Northwest

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.37"

Area (sf)	CN	Description
114	61	>75% Grass cover, Good, HSG B
395	61	>75% Grass cover, Good, HSG B
124	98	Roofs, HSG B
90	98	Roofs, HSG B
90	98	Roofs, HSG B
78	98	Roofs, HSG B
891	77	Weighted Average
510		57.16% Pervious Area
382		42.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-2: Subcat PR-2



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Type III 24-hr 100-Year Rainfall=8.37"

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Summary for Subcatchment PR-3: Subcat PR-3

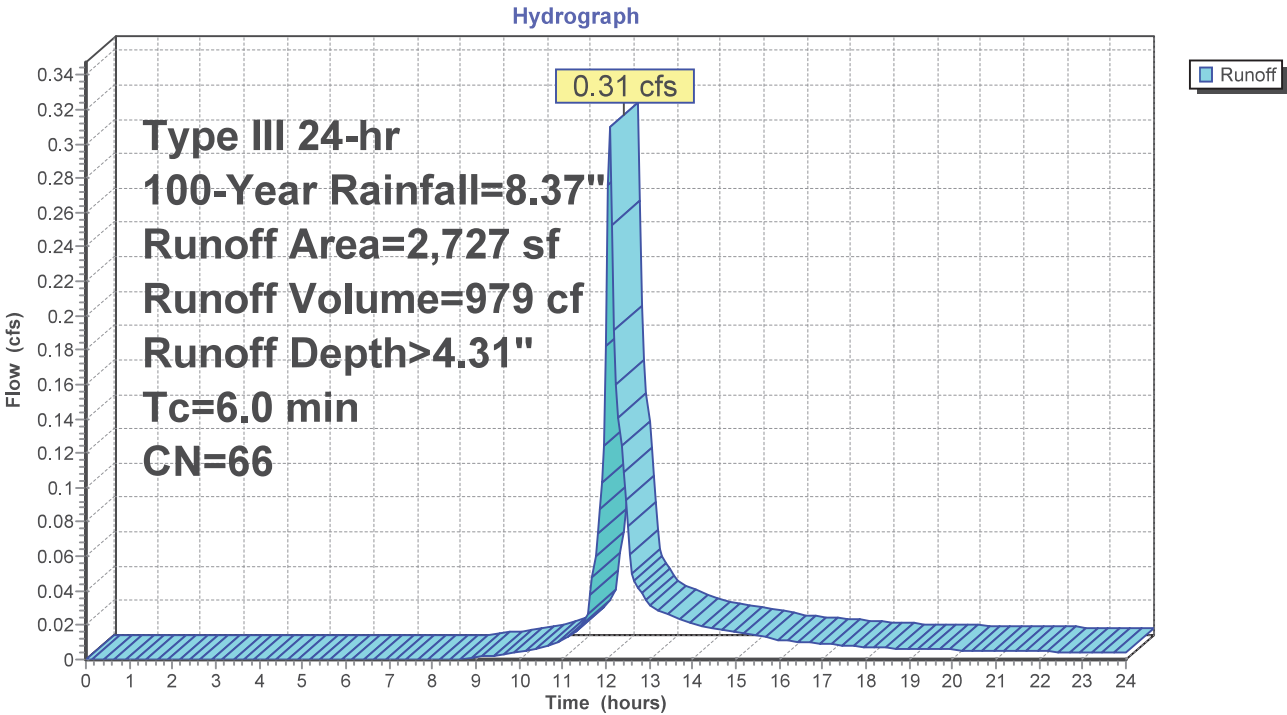
Runoff = 0.31 cfs @ 12.09 hrs, Volume= 979 cf, Depth> 4.31"
Routed to Pond 3P : Raingarden

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.37"

Area (sf)	CN	Description
759	61	>75% Grass cover, Good, HSG B
5	61	>75% Grass cover, Good, HSG B
533	98	Roofs, HSG B
29	98	Roofs, HSG B
1,401	55	Woods, Good, HSG B
2,727	66	Weighted Average
2,166		79.40% Pervious Area
562		20.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-3: Subcat PR-3



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Type III 24-hr 100-Year Rainfall=8.37"

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Summary for Subcatchment PR-4: Subcat PR-4

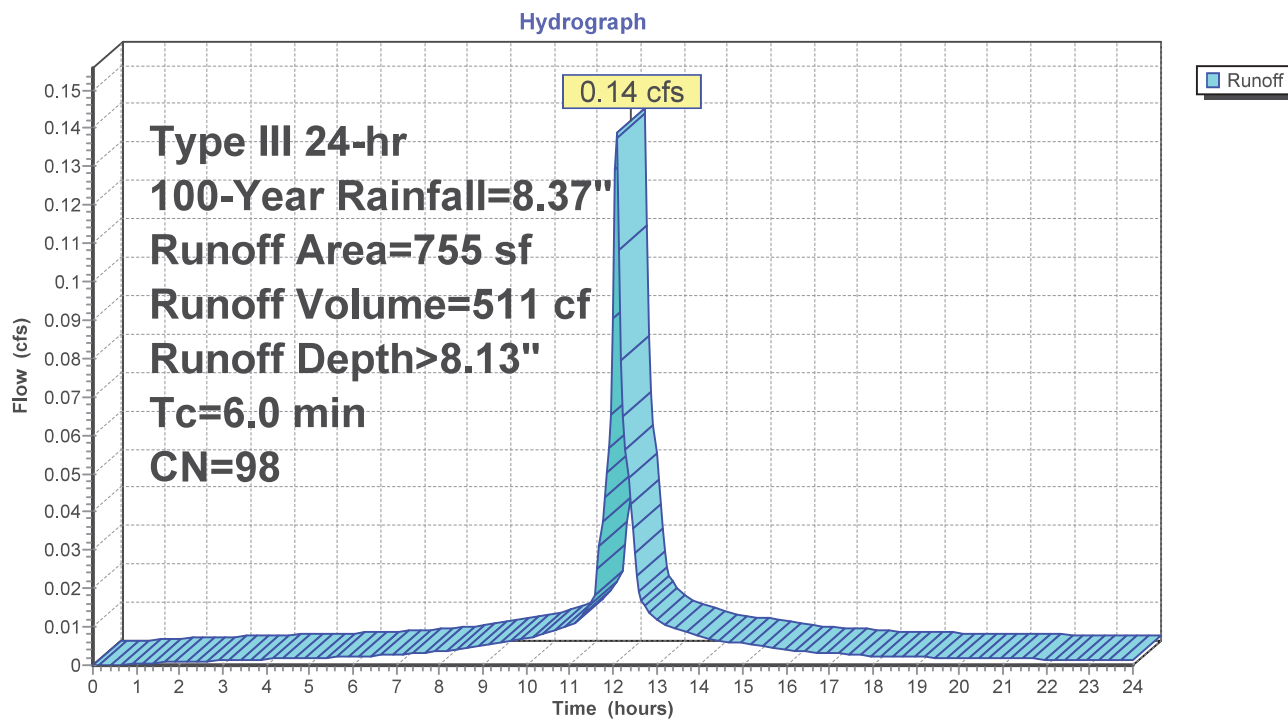
Runoff = 0.14 cfs @ 12.09 hrs, Volume= 511 cf, Depth> 8.13"
Routed to Pond 1P : Ex. 30" HDPE Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.37"

Area (sf)	CN	Description
0	61	>75% Grass cover, Good, HSG B
755	98	Roofs, HSG B
755	98	Weighted Average
0		0.00% Pervious Area
755		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-4: Subcat PR-4



Summary for Pond 1P: Ex. 30" HDPE Culvert

[57] Hint: Peaked at 167.45' (Flood elevation advised)

[81] Warning: Exceeded Pond 3P by 151.05' @ 13.60 hrs

[81] Warning: Exceeded Pond 3P by 151.05' @ 13.60 hrs

Inflow Area = 9,652,772 sf, 19.01% Impervious, Inflow Depth > 4.31" for 100-Year event

Inflow = 293.57 cfs @ 13.59 hrs, Volume= 3,466,338 cf

Outflow = 293.57 cfs @ 13.59 hrs, Volume= 3,466,338 cf, Atten= 0%, Lag= 0.0 min

Primary = 293.57 cfs @ 13.59 hrs, Volume= 3,466,338 cf

Routed to Pond AP : Analysis Point

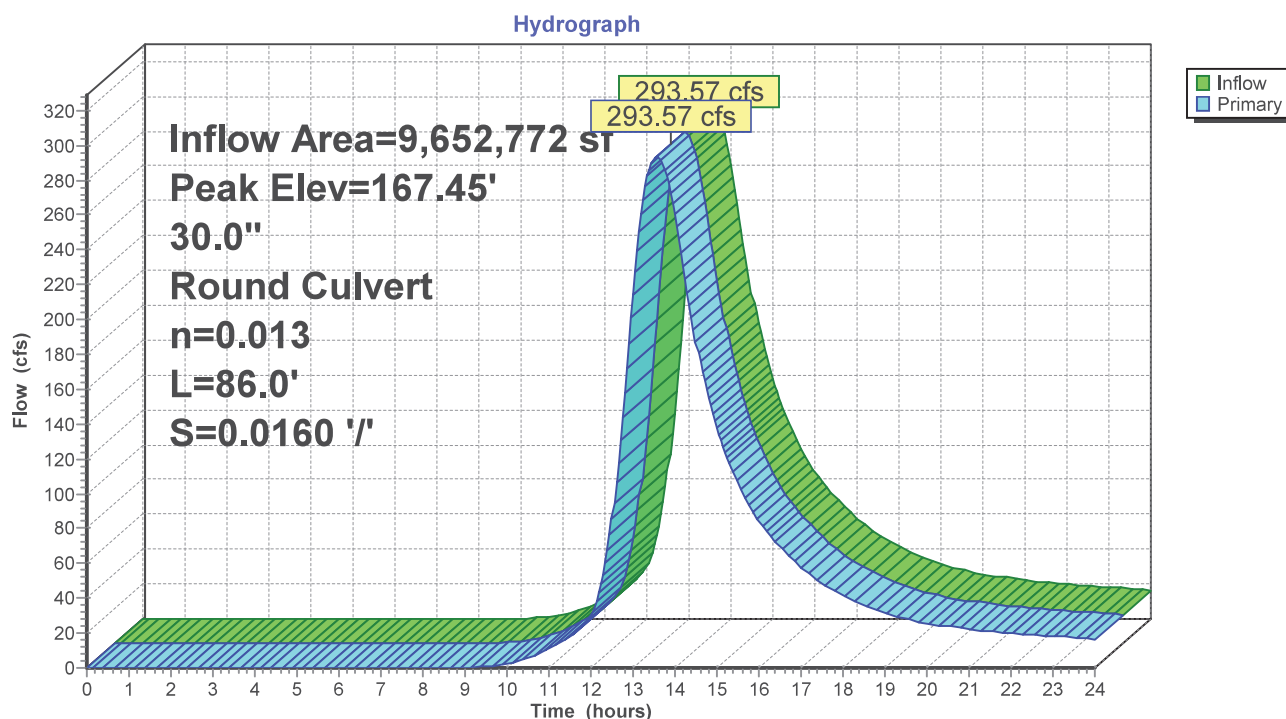
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 167.45' @ 13.59 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	11.92'	30.0" Round Culvert L= 86.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 11.92' / 10.54' S= 0.0160 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=293.30 cfs @ 13.59 hrs HW=167.16' (Free Discharge)

↑1=Culvert (Inlet Controls 293.30 cfs @ 59.75 fps)

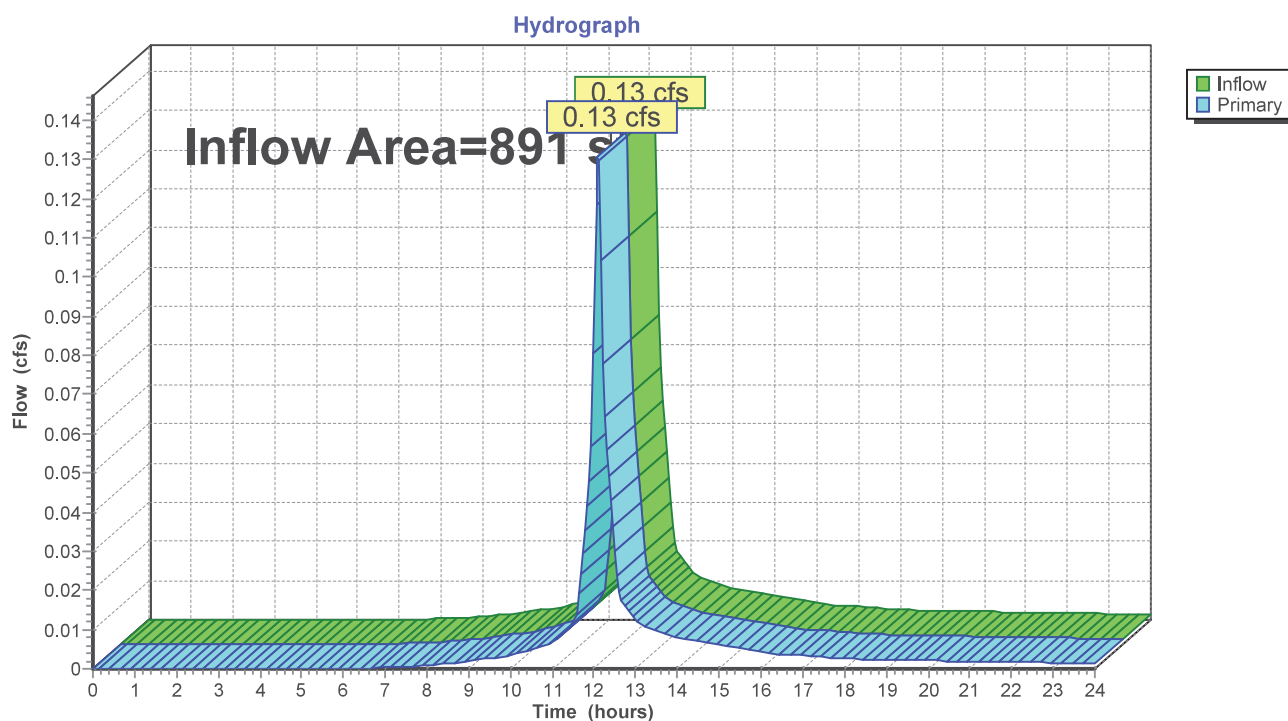
Pond 1P: Ex. 30" HDPE Culvert

Summary for Pond 2P: Offsite Northwest

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 891 sf, 42.84% Impervious, Inflow Depth > 5.61" for 100-Year event
Inflow = 0.13 cfs @ 12.09 hrs, Volume= 417 cf
Primary = 0.13 cfs @ 12.09 hrs, Volume= 417 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond AP : Analysis Point

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 2P: Offsite Northwest

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Type III 24-hr 100-Year Rainfall=8.37"

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Summary for Pond 3P: Raingarden

Inflow Area = 2,727 sf, 20.60% Impervious, Inflow Depth > 4.31" for 100-Year event
 Inflow = 0.31 cfs @ 12.09 hrs, Volume= 979 cf
 Outflow = 0.28 cfs @ 12.15 hrs, Volume= 904 cf, Atten= 9%, Lag= 3.4 min
 Primary = 0.22 cfs @ 12.15 hrs, Volume= 891 cf
 Routed to Pond 1P : Ex. 30" HDPE Culvert
 Secondary = 0.06 cfs @ 12.15 hrs, Volume= 13 cf
 Routed to Pond 1P : Ex. 30" HDPE Culvert

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 16.53' @ 12.15 hrs Surf.Area= 235 sf Storage= 133 cf

Plug-Flow detention time= 57.1 min calculated for 904 cf (92% of inflow)
 Center-of-Mass det. time= 17.8 min (848.3 - 830.5)

Volume	Invert	Avail.Storage	Storage Description
#1	15.75'	189 cf	RainGarden (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
15.75	108	0	0
16.00	148	32	32
16.25	188	42	74
16.50	230	52	126
16.75	273	63	189

Device	Routing	Invert	Outlet Devices
#1	Primary	14.40'	4.0" Round Culvert Out L= 7.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 14.40' / 14.00' S= 0.0571 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#2	Device 1	16.25'	4.0" Horiz. Top Grate C= 0.600 Limited to weir flow at low heads
#3	Secondary	16.50'	5.0' long + 2.0 '/' SideZ x 4.0' breadth Emergency Spillway Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#4	Device 5	15.75'	0.200 in/hr Exfiltration over Surface area
#5	Device 1	14.35'	4.0" Round Underdrain L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 14.20' / 14.35' S= -0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf

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Type III 24-hr 100-Year Rainfall=8.37"

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Primary OutFlow Max=0.22 cfs @ 12.15 hrs HW=16.53' (Free Discharge)

↑ **1=Culvert Out** (Passes 0.22 cfs of 0.59 cfs potential flow)

↑ **2=Top Grate** (Orifice Controls 0.22 cfs @ 2.54 fps)

↑ **5=Underdrain** (Passes 0.00 cfs of 0.42 cfs potential flow)

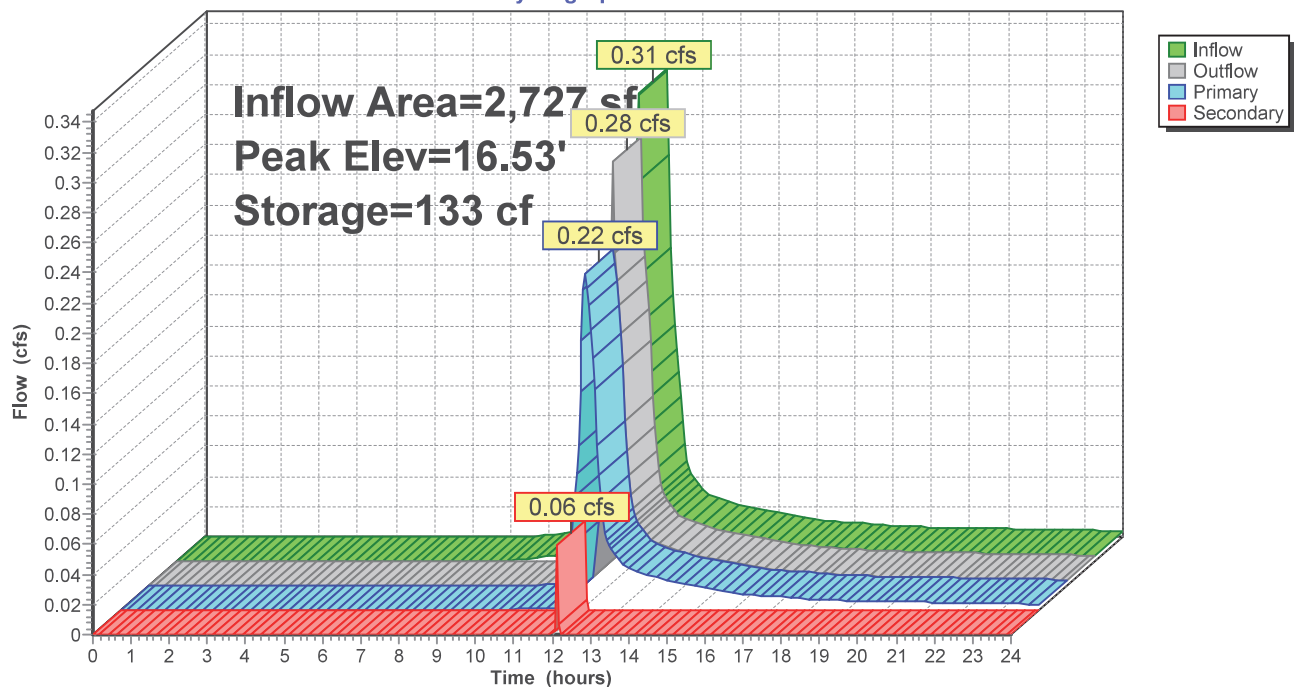
↑ **4=Exfiltration** (Exfiltration Controls 0.00 cfs)

Secondary OutFlow Max=0.06 cfs @ 12.15 hrs HW=16.53' (Free Discharge)

↑ **3=Emergency Spillway** (Weir Controls 0.06 cfs @ 0.40 fps)

Pond 3P: Raingarden

Hydrograph



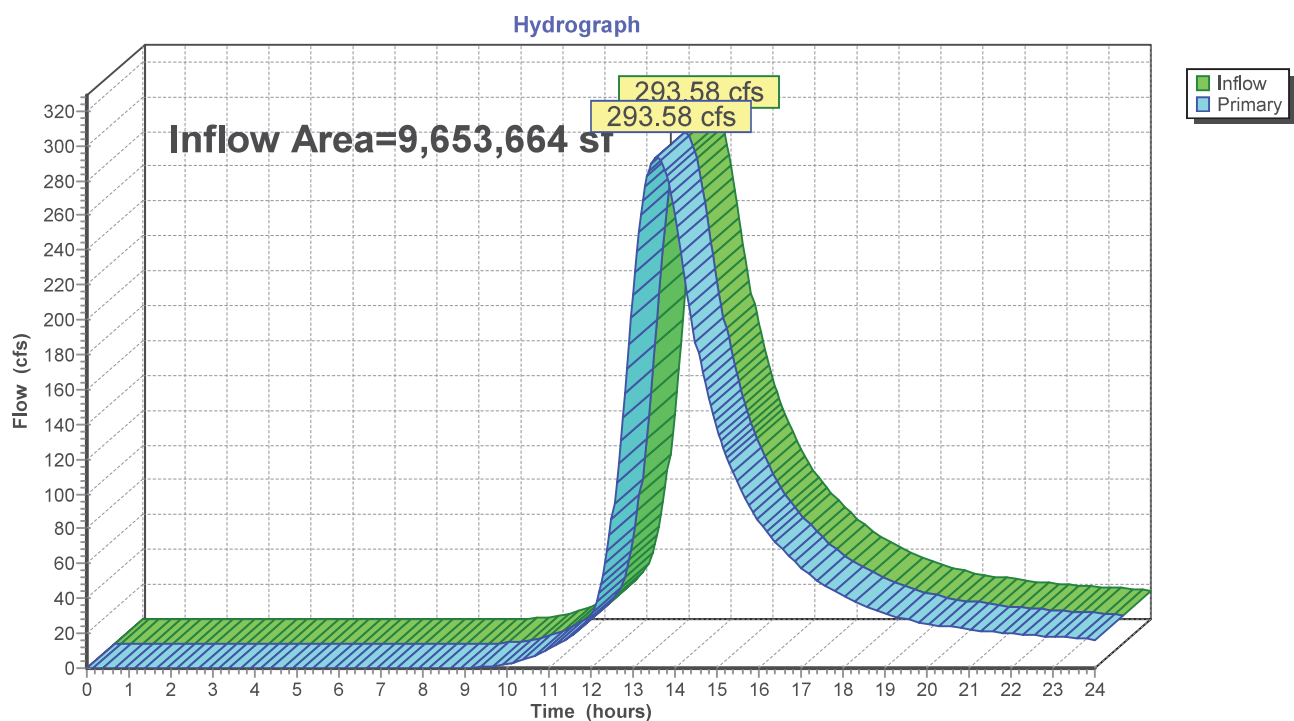
Summary for Pond AP: Analysis Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 9,653,664 sf, 19.01% Impervious, Inflow Depth > 4.31" for 100-Year event
 Inflow = 293.58 cfs @ 13.59 hrs, Volume= 3,466,755 cf
 Primary = 293.58 cfs @ 13.59 hrs, Volume= 3,466,755 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

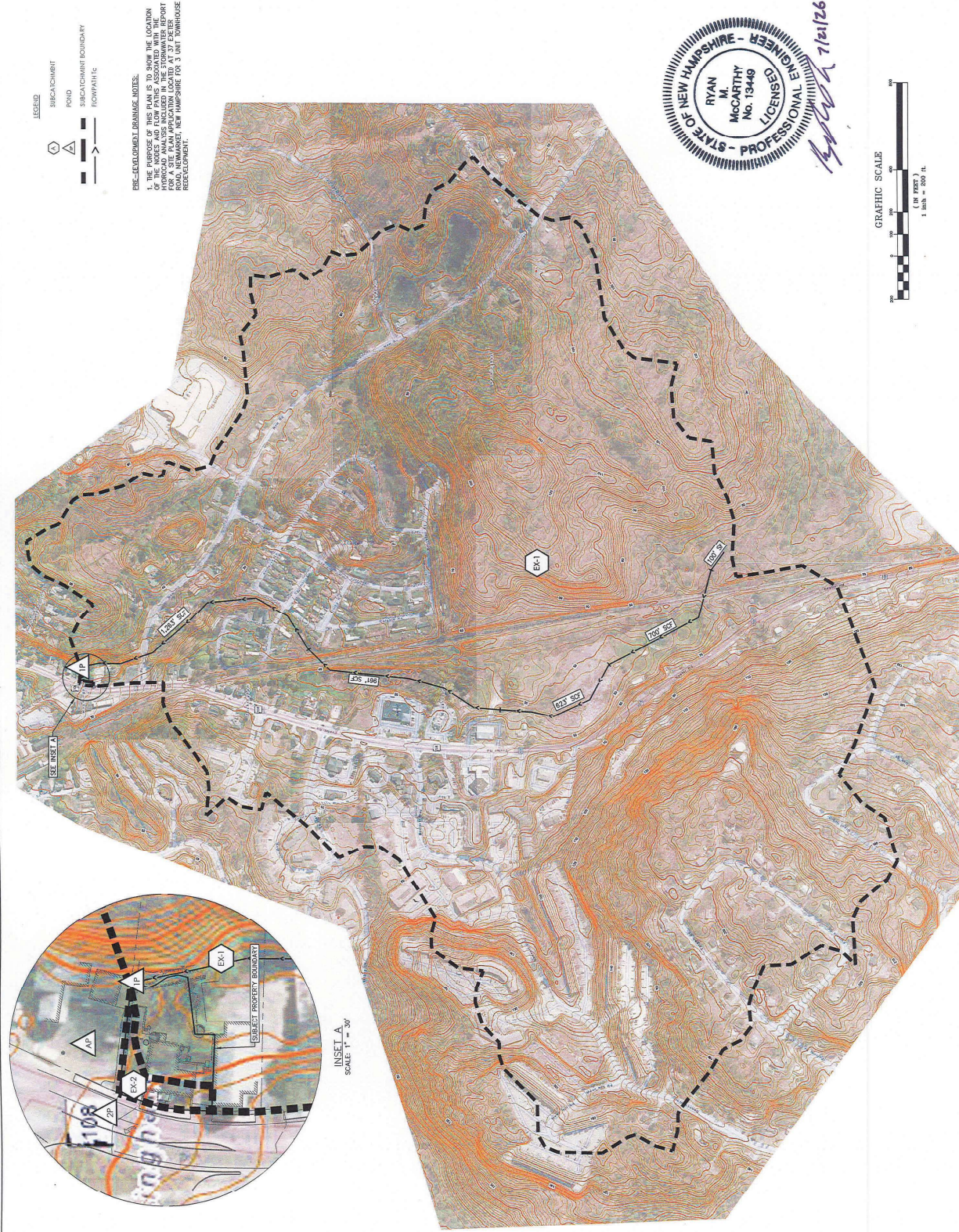
Pond AP: Analysis Point



Appendix E

Pre-Development & Post-Development Drainage Plans

CLIENT: RYAN JAROSZ 5 RIVERSIDE ROAD NEWMARSH, NEW HAMPSHIRE 03857		PROJECT: 37 EXETER ROAD REDEVELOPMENT 37 EXETER ROAD, NEWMARSH, NEW HAMPSHIRE		PRE-DEVELOPMENT DRAINAGE PLAN	
SHEET: 01 DATE: JULY 2008 SCALE: 1" = 200'		TIDEWATER ENGINEERING & SURVEYING, INC. 1021 GOSHAM RD UNIT 1, EXETER, ME 03833 (207) 939-2222 • www.tidewaterinc.com			
NO. DATE SUBMISSION/REVISION DESCRIPTION					
ANY OTHER NOTES, COMMENTS, AND DETAILED					



LEGEND

- ▲ SUBCATCHMENT
- △ POND
- SUBCATCHMENT BOUNDARY
- - - CONTAINING

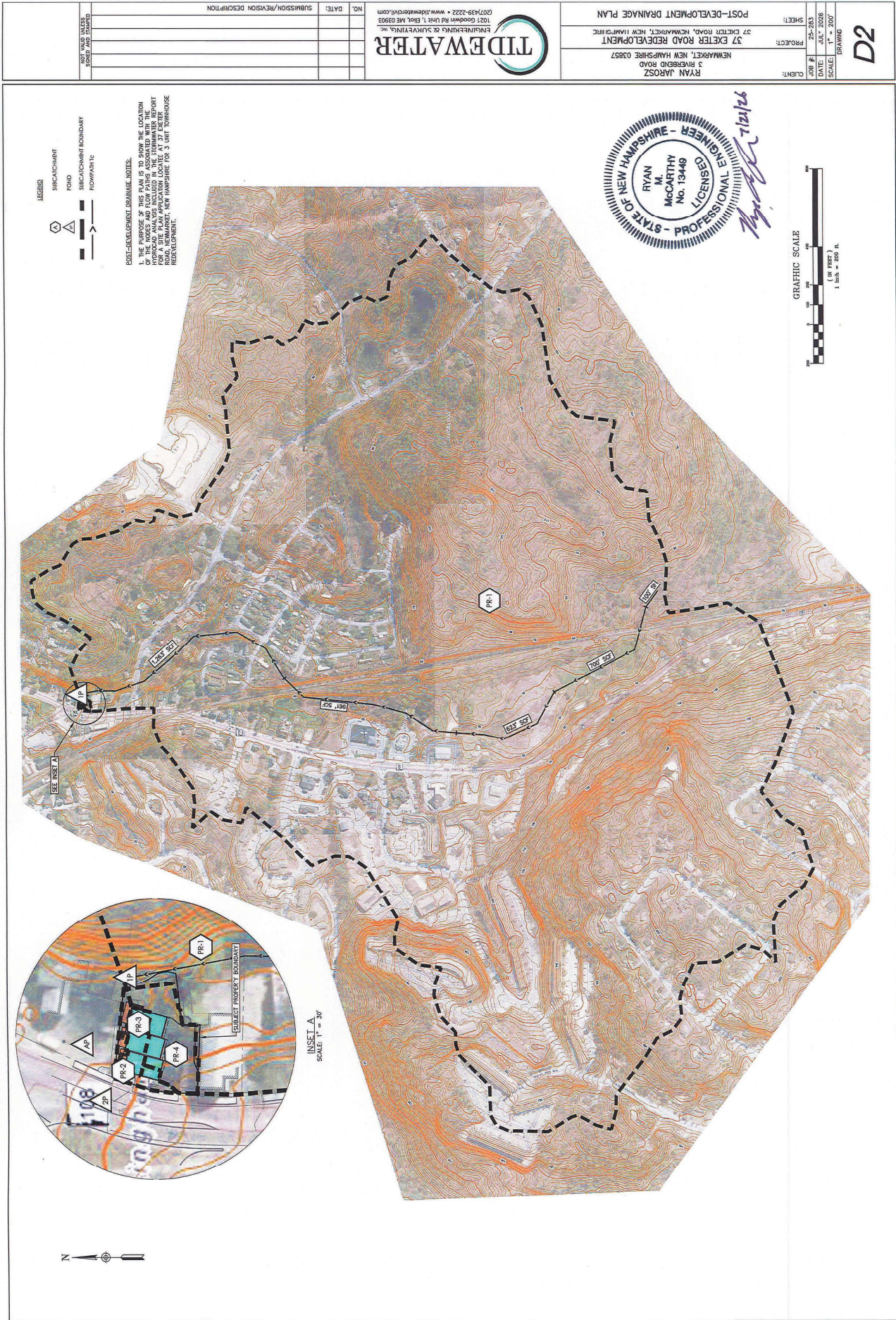
PRE-DEVELOPMENT DRAINAGE NOTES:

1. THE PURPOSE OF THIS PLAN IS TO SHOW THE LOCATION OF THE DRAINAGE AREAS AND THE DRAINAGE NETWORK FOR THE PROPOSED DEVELOPMENT. THE DRAINAGE AREAS AND NETWORK SHOWN ON THIS PLAN ARE BASED ON THE HYDROLOGIC ANALYSIS INCLUDED IN THE STORMWATER REPORT FOR THE PROPOSED DEVELOPMENT. THE DRAINAGE AREAS AND NETWORK SHOWN ON THIS PLAN ARE NOT TO BE USED FOR ANY OTHER PURPOSES.

921212
 RYAN M. MCCARTHY
 LICENSED PROFESSIONAL ENGINEER - STATE OF NEW HAMPSHIRE
 No. 13448



D1





TOWN OF
NEWMARKET
NEW HAMPSHIRE

Planning Board Public Hearing Notice

Tuesday, July 14, 2026 at 7:00 PM
Town Hall, Council Chambers
186 Main Street, Newmarket, NH

Pursuant to RSA 674:2-4 and Section 4.16 *Town Master Plan* of the Municipal Code of the Town of Newmarket, notice is hereby given that the Planning Board will hold a public hearing to review and adopt a new master plan comprising of the following chapters enumerated hereinbelow, or take any other action relative thereto.

1. Vision
2. Existing and Future Land Use
3. Arts, Culture and Historic Resources
4. Community Facilities and Utilities
5. Downtown Riverfront
6. Economic Development
7. Energy
8. Housing
9. Land and Water Conversation
10. Recreation
11. Transportation

The proposed master plan chapter amendments can be viewed by visiting the following link below, or by visiting the Department of Planning and Community Development located in Town Hall.

Master Plan Chapter Link

<https://www.newmarketnh.gov/522/Draft-Master-Plan-2026-PDFs>

VISION CHAPTER

Adopted xxx 2026



Vision Statement

Newmarket will exemplify a traditional New England coastal town that protects its natural resources and offers residents a high quality of life. The historic downtown is the heart of the community and supports a diverse business mix that helps sustain the local economy. The town's valuable natural resources and open spaces offer outdoor enthusiasts a variety of water and land-based recreational opportunities. The town will be shaped by the guiding principles of vibrancy, connectivity, accessibility, affordability, and resiliency.

The vision statements from each Master Plan Chapter create a framework for the key planning areas that influence Newmarket's quality of life. These statements provide an overall vision of what Newmarket aims to look like in 2036 and serve as a guideline that represents a variety of town interests.

Land Use

Newmarket will plan for future development using sustainable land use practices that protect the town's ecological, scenic, and recreational values, and improve economic prosperity. Strategic planning will be used to plan for multi-modal transportation, respond to housing and recreation needs, strengthen the economic base, and create clean energy options while providing opportunities for art, cultural, and historical enjoyment.

Housing

Newmarket will provide opportunities for owners and renters of all income levels and generations to live in accessible, attractive and affordable residences throughout town. The Town will strive to strategically connect housing developments to transportation options, existing neighborhoods, open spaces, and other amenities as a guiding principle to support the town's housing stock, foster a healthy tax base, and enrich community interactions. This will be accomplished in a thoughtful manner by ensuring future developments utilize existing infrastructure; harmonize with public spaces, neighborhoods, and existing building types; and reduce negative environmental impacts.

Transportation

Newmarket will be a vibrant community where development and multi-modal transportation infrastructure are planned together. Our evolving downtown and rural streetscape will encourage residents and visitors of all ages and abilities to walk and bike throughout town. Walking, biking, driving, and community transportation will feel like safe and convenient choices. Trails and walking routes will strengthen community bonds by interconnecting with neighborhoods and green spaces. Meanwhile, streets will be designed purposefully for all modes of travel in accordance with their geographic context to create a sense of place, improve safety, and facilitate travel. Ultimately, Newmarket residents will have more options on how to travel throughout town and will be able effortlessly to connect with neighboring municipalities and regional transportation hubs.

Energy

Newmarket is a community that supports and preserves its semi-rural character while simultaneously embracing effective emerging technology, environmentally progressive strategies, and local business opportunities. Newmarket will have clean energy that is affordable, reliable and sustainable and is used efficiently by the Town and residents. Newmarket's quality of life and public

health will be improved from clean and renewable energy generation. Newmarket's energy policies will play a significant role in achieving this vision.

Arts, Culture and Historic Resources

Newmarket will be a community where arts, culture and history are not just part of a storied past but are the heart of our contemporary identity - expressing who we have been, who we are, and who we hope to be. These values will be woven into the very fabric of living, where residents, workers, students and visitors participate and take pride in the vibrant cultural life to be found in every corner of Town. The Town's continued commitment to the arts, its culture, and historic preservation and restoration will significantly contribute to Newmarket's unique community character.

Land and Water Conservation

Our community will ensure a healthy and resilient future by preserving the natural environment in harmony with sustainable development and economic opportunities. Strategic planning will aim to strengthen critical infrastructure and promote land use practices that protect our valuable environmental assets – clean air; safe and abundant drinking water; freshwater wetlands, salt marshes, and floodplains; river corridors, shoreland buffers, and stream crossings; and critical wildlife habitats and intact forests – while supporting appropriate community growth.

Sustainable land use practices will protect ecological, scenic, and recreational values, as well as improve economic prosperity. Through strategic conservation and land management, we envision a network of interconnected open spaces, a robust trail network, and a revitalized downtown riverfront that enhances our community's character and well-being.

Downtown Riverfront

Newmarket's Downtown Riverfront will be recognized and celebrated as a place where the community enjoys the Lamprey River from the shoreline or from the water. The Downtown Riverfront will bolster local businesses and connect people with the beauty, serenity, and natural resources of this special place in the community. The area will offer diverse opportunities for the community to enjoy the Lamprey River. Existing publicly owned land will be reimagined to enhance public access to the riverfront. The Town will work thoughtfully and strategically with property owners and the community to identify creative solutions to create a cohesive riverwalk and pedestrian network, while respecting private property rights. Improvements and infrastructure projects will strive to maximize climate resiliency, integrate arts and culture, and protect natural resources and water quality.

Recreation

The Town of Newmarket is committed to enhancing the vibrancy of our community by fostering connectivity through accessible and affordable programs and events, and the opportunity to enjoy and connect with people in nature. The Town provides dynamic recreational experiences that promote well-being, resilience, and a sense of belonging for all. As we grow, the Town strives to expand opportunities for active engagement while ensuring an inclusive and sustainable recreation culture for future generations.

Community Facilities and Utilities

Newmarket will strategically invest in community services, educational institutions, and its facilities to improve the well-being of the community. Guided by innovative and solutions-driven approaches, town staff, elected officials, and volunteers seek to implement measures to ensure resiliency for community facilities through proactive land use planning and capital investment initiatives. The Town will prioritize these investments by employing a balanced approach that integrates thoughtful strategies for community growth and preservation.

Economic Development

The Town of Newmarket will work to retain and support its current businesses, while providing opportunities for economic growth and activities which will strengthen the Town's economic base, provide employment for residents, and enhance its position in the regional economy.

EXISTING AND FUTURE LAND USE CHAPTER

Adopted xxx 2026



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Vision

Newmarket will plan for future development using sustainable land use practices that protect the Town's ecological, scenic, and recreational values, and improve economic prosperity. Strategic planning will be used to plan for multi-modal transportation, respond to housing and recreation needs, strengthen the economic base, and create clean energy options while providing opportunities for art, cultural, and historical enjoyment.

Executive Summary

The Land Use Chapter is required by RSA 674:2 to take into account natural conditions, show existing conditions, and illustrate the proposed location, extent and intensity of future land uses. The natural conditions to be considered include such features as wetlands, steep slopes, aquifers, surface water bodies, and any other natural characteristics considered to be particularly significant. Existing conditions refer to the actual land uses found in town, such as residential development, commercial uses, industrial, conservation, recreation, government or other categories of uses. Both the built environment (location of buildings and infrastructure) and natural features (steep slopes, wetlands, forest, and other resources) impact the future development patterns in Town. The development of a future land use plan forms the basis of land use regulations, which include zoning ordinances, subdivision and site plan review regulations.

Existing land use patterns in Newmarket are the result of a variety of factors including history, location, topography, transportation and economics. Identification of historical land development gives insight into why structures and infrastructure were established in their locations. Using this information, along with current data and projections, assists in planning for future development and provides a framework to use as new development proposals are considered.



Figure 1 Spring 2024 Master Plan Workshop

Public engagement for the Master Plan consisted of two community workshops, held in April and September 2024, which helped to provide information about public sentiment about land use and future development. Two online community surveys were also conducted in the Spring and Fall of 2024 that provided additional public feedback pertinent to all chapters in this Master Plan.

Master Plan Themes and Goals

Five guiding themes for the Master Plan emerged from the public engagement process: Vibrancy, Connectivity, Accessibility, Affordability, and Resiliency. Each Master Plan chapter uses the themes to explore the subject matter from different perspectives, helping to focus community goals and actions.

Vibrancy

A vibrant community is one that exudes energy and is full of activity and life. It is welcoming and friendly to all ages, supports cultural diversity, and provides economic opportunities.

Newmarket has become a community of great diversity and is rapidly becoming the community that others look to for inspiration for their own communities. It has maintained the New England charm with an historic downtown Main Street while bringing in a compatible mix of new structures for economic development. Part of the success is due to an amicable understanding of what the community needs and wants are, and what the town leaders can do to address these needs and wants.

Through the outreach efforts noted above, several common land use themes were identified: more community space to relax and hold community events; additional recreation space; maintain New England downtown feeling; more parking (see also Recreation Chapter, Arts, Culture, and Historic Resources Chapter, and Downtown Riverfront Plan).

Vibrancy Goals

1. Increase opportunities to use the downtown as a park area for people to congregate, including well lit, seating, safety, and access to waterfront views.
2. Create additional opportunities where people can interact in community spaces.
3. Keep aging in place as a priority for residents when building new residences, transportation and infrastructure.
4. Support the development and retention of a diverse mix of businesses that reflect Newmarket's unique character and history, and contribute to a robust, year-round economy.
5. Encourage new subdivisions to be planned and built in a way that supports vibrant multi-generational neighborhoods.

Connectivity

The term “connectivity” has many meanings, but when using it in the context of community planning, it means that a connected community has efficient and safe links to daily wants and needs such as between home, jobs, shopping, school and services, and provides welcoming and inclusive public places for social interaction.

Making connections has both a social (non-structural) implication and a physical (structural) implication. The social interactions between residents and visitors vary depending on their interests and level of communication with others. Both non-structural and structural connections are needed to improve the quality of life that we so desire. Maintaining a diversity of “places” to connect with others is important to help people enjoy their free time, gain knowledge, and stay healthy and active. When planning for future needs, projects should aim to be inclusive, affordable, accessible, and well planned for budget efficiency. Some of this may be provided for by the Town budget, while some may be provided by private entities.

Connectivity Goals

1. Increase the amount of walkable and bike-able spaces, sidewalks, safe bike lanes, trails, and connections to increase and improve the accessibility to places without relying on automobiles.
2. Establish and utilize local and regional transportation solutions to reduce the reliance on vehicle traffic within and through downtown.
3. Facilitate neighborhood-based economic development opportunities in other locations to connect residents to their needs within walking/biking range to help reduce trips (vehicle) in the downtown area.
4. Install or improve wayfinding to encourage people to use the walkable and bikeable trails throughout Town and connections to places out of town.

Accessibility/Affordability

An accessible community has an environment that is meaningful and usable for as many people as possible. An affordable community is where people can live comfortably without financial difficulty.

Accessibility: How do we get there? This is a question that must be asked to look at accessibility needs. While many may view this as simply a road/transportation issue, it is much more. In planning, it also refers to how well someone can enter and move through buildings, trails, and programs. More recently, accessibility has been an important driver for businesses and potential home buyers when considering moving into Newmarket as it looks at internet access. The ability to access three-phase power is another consideration for businesses.

Building codes follow the Americans with Disabilities Act (ADA) requirements which are easier and more cost efficient if they are followed during construction rather than trying to retrofit them after the building is completed. This is also true during construction of sidewalks and parking lots. Ramps and

clear markings (signs and road paintings) not only make things easier and safer for people to access, but it is also the right thing to do.

Affordability: When planning for a diverse and vibrant community, the cost of living in a community is usually the number one priority. To make it more affordable, there must be a variety of housing choices to meet varied incomes and types of living units (see Housing Chapter). Affordability also applies to the cost of needs and wants including decent wages, transportation, entertainment, and nearby services.

Accessibility / Affordability Goals

1. Review and enable zoning changes that allow for more access to more diverse housing stock and appropriate scale residential and commercial development.
2. Encourage housing to be in closer proximity to community services.
3. Promote economic development to bring in new businesses to ease the burden of property taxes in Newmarket.

Resiliency

A resilient community can withstand, recover or adjust to adversity or change

Resiliency, in community planning, refers to the successful recovery of a community during economic shocks and environmental impacts. During the Covid-19 epidemic, Newmarket responded to the economic impact by switching to remote meetings and allowing temporary outdoor seating for restaurants.

Today, we have a more diverse workforce as some employers have shifted toward remote workers. It also changed shopping by adding home delivery services for groceries and household goods, and medical services by offering telehealth options.



Figure 2 Newmarket Flooding (source: SRPC)

Resiliency of natural disasters can be a challenge depending on the type and severity of weather events. For example, Newmarket's Hazard Mitigation Plan includes strategies such as replacement and upgrading of culverts and other stormwater management efforts to increase resilience to severe flooding. Finding ways in which the Town and residents react to these weather events saves lives, property, and infrastructure.

Economic resiliency is also important and can be successful by having a diverse economic base. Planning for economic resiliency can be done by making edits to the land use regulations and zoning where needed.

Resiliency Goals

1. Continue to refine zoning and land use regulations for sustainable growth: encourage denser development near public infrastructure while preserving open space and sensitive lands for wildlife habitat and flood areas.
2. Encourage and promote a diverse economic base by reviewing and refining zoning and land use policies.
3. Investigate the feasibility of developing municipal energy sources to maintain resiliency in municipal infrastructure.
4. Continue to assess and inventory public infrastructure that supports sustainable land use development and improve the capacity as needed.
5. Ensure institutional continuity to achieve Master Plan and other long-term planning and community development objectives.

Future Land Use

Existing Zoning

Land use policies, including zoning, are key mechanisms to implement the future land use vision. Newmarket's 13 zoning districts each establish granularity and neighborhood distinctions across four major zones: Mixed Use, Business, Residential, and Village Center Districts. As the Town works to amend its zoning through a series of Housing Opportunity Planning (HOP) Grants it continues to place neighborhoods as a central focus, organizing neighborhood conversations to drive change.

Overall, the Town is largely developed and much of the undeveloped land is either in more rural areas or constrained by natural resources. Under current zoning regulations, it is estimated that there are 568 undeveloped lots, and of these approximately 456 are potentially buildable. In terms of the Town's total acreage, 18,070 acres, 12,030 acres are either developed or constrained in a way that will not allow new development. Most of the potentially buildable land is located within the Rural Residential District.

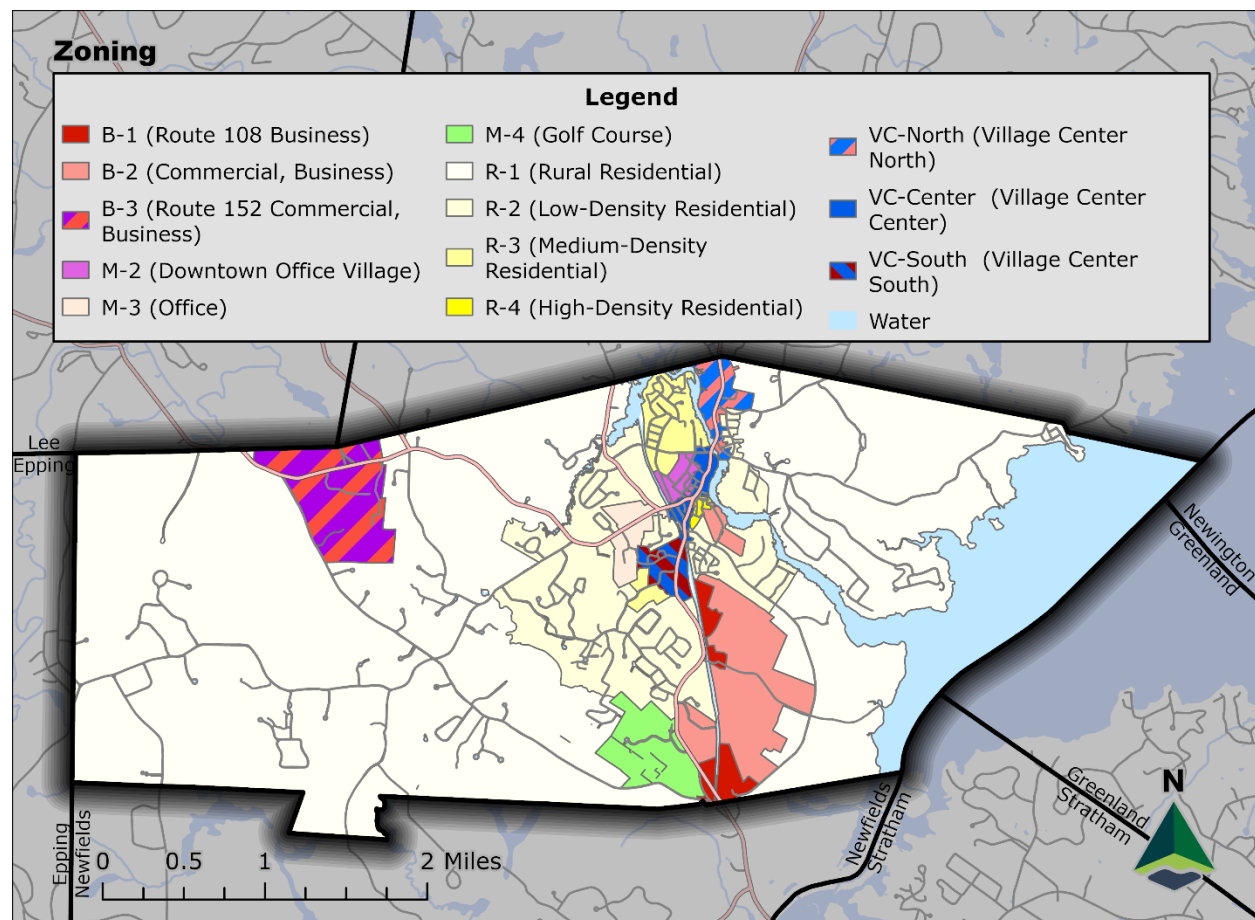


Figure 3 Newmarket Existing Zoning Map

The three **Mixed Use Districts** are each distinct in character and aim to provide for the ongoing use of the mill buildings, as well as provide for a mix of commercial, social, civic, and residential uses through redevelopment. Given the scarcity of land available and existing development patterns, the district focuses on the enhanced quality of the village, protection of important historic resources, and celebration of the downtown Lamprey River waterfront. While there is limited area for new development, these districts provide a range of redevelopment opportunities that closely align with the town's Land Use Goals – particularly vibrancy and connectivity goals.

Newmarket's three **Business Districts** each aim to create a variety of business, commercial and industrial uses and are the only zoning districts to exclude residential uses. Where the B-1 focuses more on smaller scale retail, office, and restaurants as the typical development type, the B-2 and B-3 allow larger scale development such as warehouses, manufacturing, or conference centers. The business districts aim to both connect residents with their needs and promote economic development to bring in new businesses to ease property taxes for residents. The B-3 district coincides with the proposed West Gateway node and enables the eventual redevelopment of the sand and gravel site.

Most of the buildable lots and acreage within Newmarket are within the **Residential Districts**. The four residential districts are distinguished by their permitted densities and housing typologies. These districts range from 2-acre minimum lot sizes in the R-1 Rural Residential to 0.25 acres in the R-4 District, with the R-2 and R-3 districts serving as transition zones (0.5-acre minimum lot sizes). Through its second HOP Grant, the town will be reevaluating the residential districts to encourage a variety of housing affordable to residents.

The **Village Corridor District** continues the traditional development pattern of Main Street on properties along NH Routes 108 and 152 and are divided into three zones: North, Central, and South. These three zones are the most recently established in Newmarket based upon feedback from community conversations. Each is established as a Form Based Code that emphasizes the character of development and is structured around building typologies. Within these zones future applicants are provided with building diagrams that illustrate allowable units, building form, and fenestration. The goal is to create pedestrian friendly redevelopment and infill development.

Refer to Appendix A for a detailed analysis of developable land area in each of the zoning districts.

Future Land Use

Planning for the growth and development of land use requires consideration of existing land use, development constraints, and infrastructure. It also requires a review of demographic trends and projections to ensure that future needs are considered. And finally, an understanding of public sentiment that will drive demand for community spaces, amenities, and services. Newmarket residents place a high value on the protection of conservation and recreation open spaces. While not as highly ranked as open space during the Master Plan Survey, residents also prioritized transportation and renewable energy infrastructure, as well as mixed use development opportunities.

Community feedback, the analysis of current zoning, combined with the articulated goals and objectives from all Master Plan chapters, were used to map a future land use vision for Newmarket. The mapped results reflect points of change or emphasis. These are locations where zoning should

Newmarket Existing and Future Land Use Chapter

be evaluated, land conservation efforts should be targeted, and infrastructure investments planned and implemented.

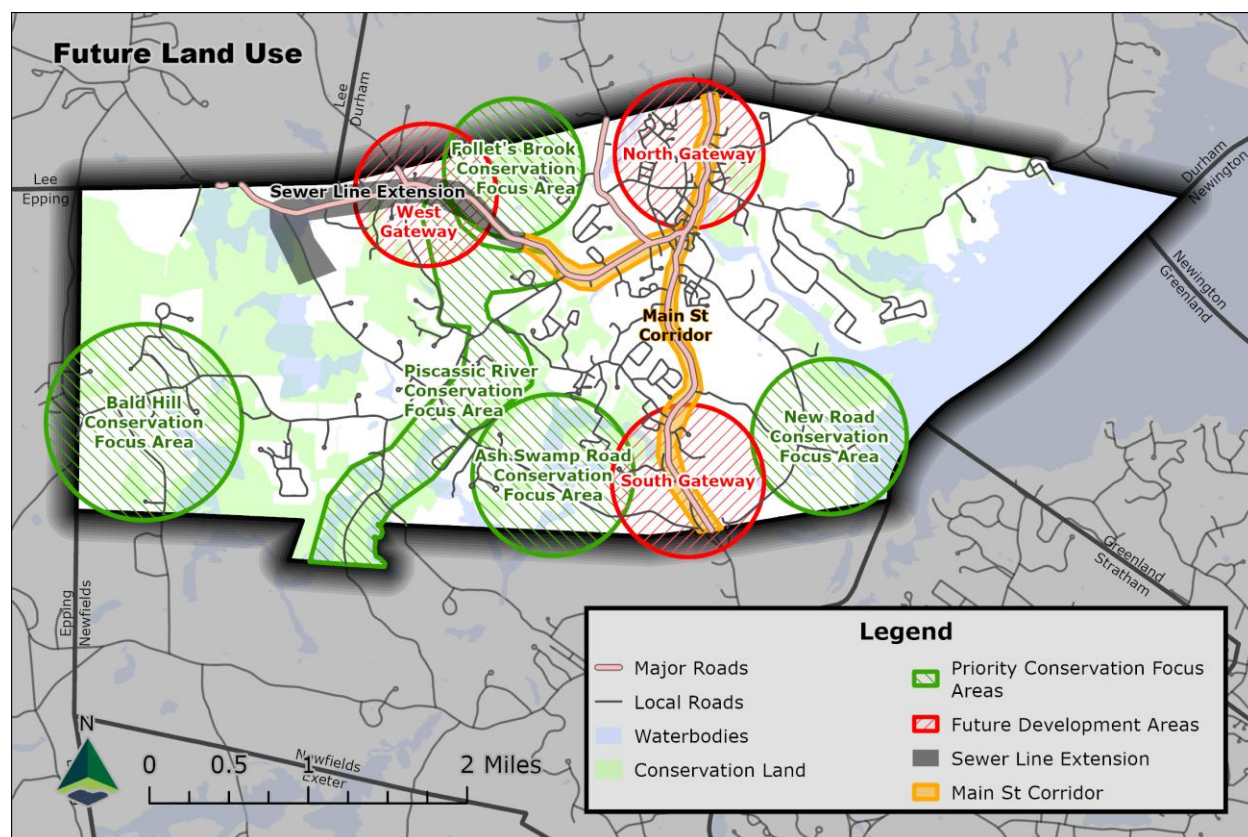


Figure 4 Future Land Use Map

Gateways: Identified as North, West, and South Gateways, these future development areas are situated at the main access points into Newmarket via state highways. The three gateways are envisioned to provide a mix of uses that will achieve the Town’s development priorities for each of the specific areas. The West Gateway provides significant mixed use development opportunities.

Conservation Focus Areas: Important environmentally sensitive and natural resource-rich areas for protection include Follett’s Brook, Bald Hill, Ash Swamp Road, Piscassic River, and New Road to Great Bay Focus Areas. These areas were identified through a data driven process that evaluated the cooccurrence of land and water resources as part of the town’s Open Space Plan.

Main Street Corridor: The Main Street Corridor connects the three Gateway nodes. Transportation infrastructure improvements are rendered more complex given portions of the road are managed by NH Department of Transportation and other segments by the Town and further exacerbated by the railroad crossing at the southern end of Route 108. Need to articulate goals for the Main Street Corridor. The western spur of the Main Street Corridor serves as an additional gateway to the village.

Sewer Line Extension and Infrastructure Investments: A Tax Increment Finance (TIF) District, adopted in conjunction with efforts to spur investment in the West Gateway could help finance the extension of sewer and infrastructure investments needed to make development viable.

HOUSING CHAPTER

Adopted xxx 2026



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Vision

Newmarket will provide opportunities for owners and renters of all income levels and generations to live in accessible, attractive and affordable residences throughout town. The Town will strive to strategically connect housing developments to transportation options, existing neighborhoods, open spaces, and other amenities as a guiding principle to support the Town's housing stock, foster a healthy tax base, and enrich community interactions. This will be accomplished in a thoughtful manner by ensuring future developments utilize existing infrastructure; harmonize with public spaces, neighborhoods, and existing building types; and reduce negative environmental impacts.

Executive Summary

The Town of Newmarket has captured hearts across many generations. This charming Great Bay town established its roots in industry and commerce, attracting people from all over the world seeking better economic opportunities. The influx of people over the generations has created a unique housing stock and population mosaic unlike those found in surrounding Seacoast communities. As the Town became less industrialized in the late-20th century, the community was compelled to reimagine its identity and leverage opportunities in its village, rural areas, and proximity to regional institutions. As a result, the Town has one of the most diverse housing portfolios in the Seacoast while producing award-winning greenspaces and an iconic downtown village environment. These planning decisions and efforts have increased the attractiveness of Newmarket for recent and lifelong Granite Staters alike, making it a sought-after community to reside in the greater Seacoast.

The Town of Newmarket's most attractive attribute and its greatest source of strength comes from its people and how tightly knitted and proud they are of their community. To preserve this fundamental element of the town, it is incumbent upon the community to ensure that there are multi-generational housing opportunities spanning the entire socio-economic range such that the decision to live in Newmarket becomes exclusively an individual choice, not one governed by external circumstances.

Since the 2015 Master Plan, the Town has continued to make strides toward implementing its goals of providing a range of housing opportunities to maintain the community fabric. The Town has revised site plan regulations to reduce permitting requirements for change of uses, while bolstering aesthetic regulations for redevelopment projects downtown. The Town permitted 249 housing units (goal was 190) over 10 years, including Accessory Dwelling Units (ADUs). Regulatory barriers for ADUs were reduced by allowing different configurations and making it a by-right development of single-family lots.

In 2024, the Town engaged the Strafford Regional Planning Commission (SRPC) to update the Housing Chapter under the direction and guidance from the Newmarket Master Plan Committee, the Housing Chapter team, and Town staff. The team held a series of community engagement activities for residents and other stakeholders to better understand what types of housing people would like to see in Town in the future. In addition to the community input, the team conducted interviews with developers experienced in Newmarket's planning and development process. Building on the community input from the survey and workshop, the team held a week-long series of Visioning Workshops with the Planning Board, Conservation Commission, Riverfront Committee, and Master

Plan Committee to develop the overarching themes for the Master Plan described in more detail below.

Master Plan Themes and Goals

Five guiding themes emerged from the public engagement process: Vibrancy, Connectivity, Accessibility, Affordability, and Resiliency. Each Master Plan chapter uses the themes to explore the subject matter from different perspectives, helping to focus community goals and actions.

Vibrancy

A vibrant community is one that exudes energy and is full of activity and life. It is welcoming and friendly to all ages, supports cultural diversity, and provides economic opportunities.

For housing in Newmarket, vibrancy means continuing to provide opportunities for the creation of a wide range of housing types and densities, that foster a sense of place and community.



Figure 1 Downtown Newmarket (source: Master Plan outreach)

The Town of Newmarket is distinctive in the region and state as it displays wide variation in the age range of residents when compared to other New Hampshire towns. Newmarket's total population was 9,430 in 2020 and is projected to increase to a population of about 10,488 by 2050. Refer to Appendix B for the background tables and data that are discussed in this chapter.

As of 2022, the largest age group in Newmarket was between 25 to 34, followed by 65 and over. With a median age of 38.5, Newmarket has one of the younger populations in the Seacoast

region. Despite this, between 2012 and 2022, the Town experienced a marked decline in the under 18 and college age populations and a notable increase in the 25-to-39 and over 65 adult populations. It is important for the Town to continue to provide opportunities for a variety of housing types that meet the needs of people in different phases of life, maintaining a population with a balanced age demographic.

The shift in Town's age demographics and population trends is reflected in the decrease in the number of people per household. A little over 40% of all households are made up of two people, while almost 30% only have one person. The average household size for owners is about 2.5 and for renters it is about 1.8. This is a regional and statewide trend caused by factors such as a declining birth rate and an aging population. It also indicates a need for smaller residences. Newly graduated young

professionals and older adults may similarly seek smaller homes or rentals for a transitional period, with the latter frequently requiring accessible arrangements such as single-story living.

There are a little over 4,200 households in Newmarket, and unlike most of the region, they are almost evenly split between owners and renters. Approximately 44% of homes are single-family detached homes and up to 45% of households rent, indicative of a diverse housing stock.



Figure 2 Rendering of small village setting (source: Ivy Vann Town Planning)

“...it would be nice if new infill development near downtown was encouraged and there were more good multi-family or townhouse options for those not looking to buy a home or only needing a smaller space.”

-Newmarket Housing and Open Space Survey

Newmarket’s current zoning allows for multi-family structures with higher densities in the urban and village sections of Town. This diversity in housing type lends to Newmarket’s vibrancy by attracting people from a wide swath of socioeconomic ranges. As a result, a diverse set of cultural and community events, such as fishing derbies, concerts in the park, community art gardens, and holiday celebrations, occur regularly. These events and gatherings are threads in the fabric that foster a sense of belonging and community. Newmarket is a desirable place where people want to be.

“Newmarket is home to a lot of thriving musicians and visual artists who need access to rehearsal space, communal makerspaces, and studio space for creating their work... If new or re-development in Newmarket for housing could include communal studio spaces for different types of creatives to contribute to the culture of Newmarket art/entertainment, I would never ever, ever leave Newmarket.”

-Newmarket Housing and Open Space Survey

To maintain and expand the Town’s vibrancy, it is important to understand the projected population growth over the next decade and beyond. Based on number of housing units needed to meet projected population and employment demand, the 2023 Strafford Regional Planning Commission Regional Housing Needs Assessment projected that Newmarket would need an additional 756 units by 2040 (506 owner occupied and 249 rental units) to have a balanced housing market. The Town currently has 175 units that have been approved but are not yet constructed, 30 of which will be elderly (62+) affordable housing. The Town does not have any owner-occupied units that have been approved and not constructed.

One analysis tool that the SRPC used to help the Town visualize current and future growth potential is CommunityViz, that models build-out scenarios using GIS. A build-out analysis is used to estimate and represent the amount and locations of future developments that could occur under a given set of regulations. Build-out analyses can be used to visually represent how land use regulations affect future development. CommunityViz takes inputs such as locations of existing buildings, minimum lot sizes, density requirements, set-back requirements, water and sewer availability, and zoning type allowances. The tool uses this data to model where future developments in the Town could occur. The map below shows the location of existing structures and expected growth based on 2024 zoning regulations. Based on this analysis, under the 2024 zoning and existing conditions, there will be limited space to build in the Town of Newmarket by 2027.

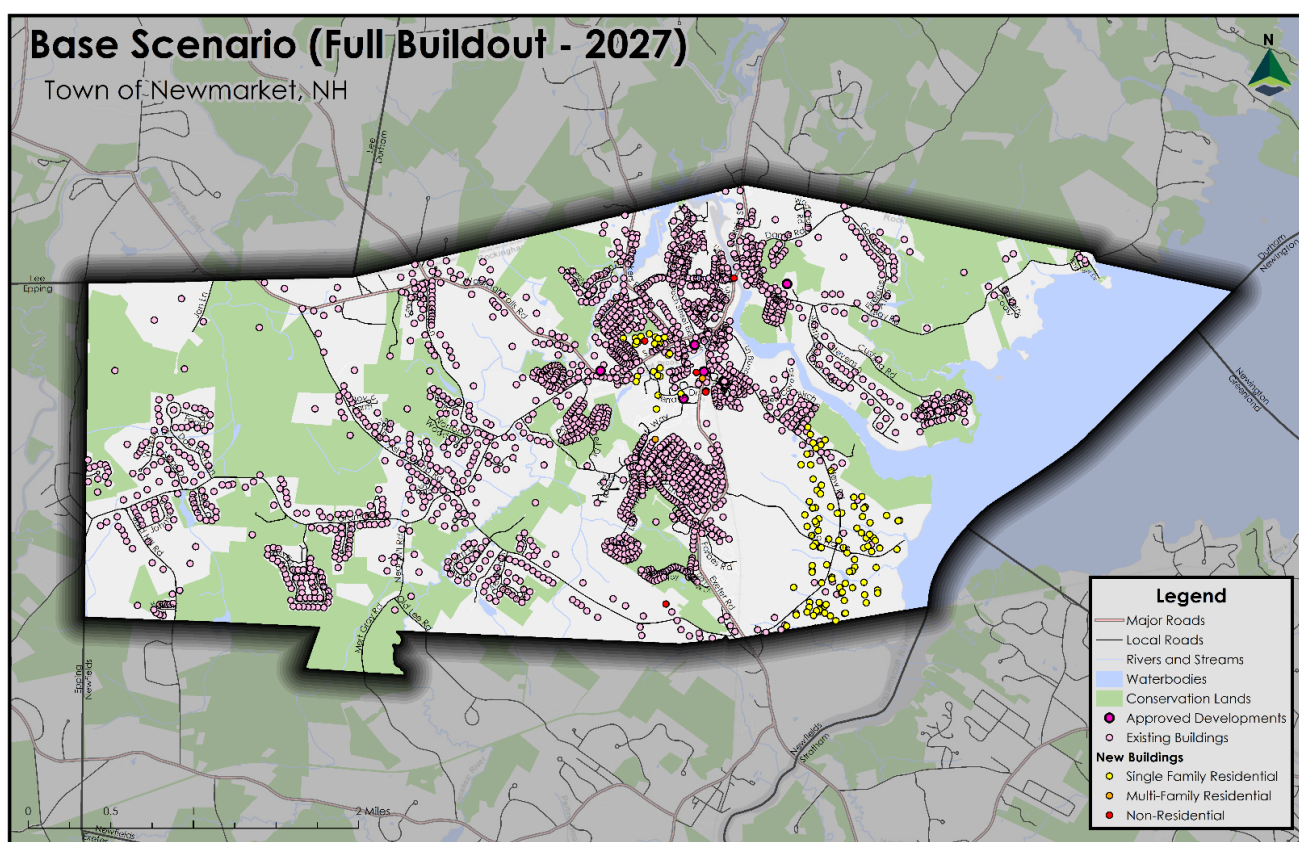


Figure 3 Build out based on current zoning (source: SRPC)

The Town should continue to look at opportunities to create housing that addresses a range of housing needs, particularly what is needed to meet projected demand and to foster the town's vibrancy.

Vibrancy Goals

1. Create and maintain housing stock that allows for ‘aging in place’ and ‘aging in community’
2. Continue to provide opportunities for access to attractive owner and renter housing stock
3. Continue to provide opportunities for improving the downtown area.

Connectivity

A connected community has efficient and safe links to daily needs such as between home, jobs, shopping, school, services, parks and open space, and provides welcoming and inclusive public places for social interaction.

Key takeaways from the public engagement process were that Newmarket should focus on being walkable and welcoming, connecting to public spaces, improving biking and walking trails, and bringing back public transportation. Seventy-four percent (74%) of respondents ranked quality of life, including proximity to amenities, as a high priority when choosing a neighborhood to live in.



Figure 4 Downtown Riverfront

“One of the things that makes Newmarket great is its walkable downtown and easy access to parks, the river, and trails. These public spaces should be protected and it’s a big reason I do not want to leave the town for somewhere else on the seacoast. Not many places you can easily kayak, fish, or go for a peaceful walk then walk to a restaurant or the post office or library.”

- Newmarket Housing and Open Space Survey

The Town has been forward-thinking about strategies to connect people and places. Newmarket’s Department of Planning and Community Development teamed with the Conservation Commission to develop an initiative, called *Pathways for People and Nature*. The initiative sets forth goals and objectives to protect water resources, habitat corridors and enhance the town’s trail system. These strategies will be important to reference and incorporate into regulations as the town continues to develop.

Connectivity is not only about physical locations. Where and how people live is important to wellbeing and the creation of social connections. Developments that start out as ‘residential units’ on a plan, become neighborhoods and public places become centers for building community. Over the past decade, Newmarket has attracted new residential development with the most building activity occurring between 2014 and 2019. Two Hundred eleven (211) residential units were added during that period (135 single family and 86 multi-family).

Considering all the elements that make a community more connected, it is important to ensure that plans for mindful growth are formulated in a manner that preserves the Town’s character by balancing densities, harmonizes with neighborhoods, and aligns with community expectations. Developments that are in proximity to public water and sewer infrastructure are prioritized as they can generally support more density than more rural areas without public infrastructure. To date, Newmarket has approximately 2,425 developable acres with proximity to public water and sewer, 491.5 acres with access to public water, and 297 with access to public sewer. Current zoning permits densities in these areas that range from 1 to 6 units per acre depending on infrastructure availability and dimensional control regulations.



Figure 5 Rendering of mixed-use structure (source: Ivy Vann Town Planning)

Innovative development regulations such as form-based code allow for more diverse development opportunities that can be tailored to specific areas of Town. Form-based code focuses more on how structures are placed on a lot and how they interact with surrounding properties and public spaces rather than primarily regulating specific uses. Wider development goals such as promoting mixed uses or preserving open spaces should also be incorporated into these types of regulations.



Figure 6 Rendering of 4-plex structure designed as a single-family home (source: Ivy Vann Town Planning)

The goal of form-based code is to achieve more harmonious and predictable development patterns by ensuring that community values, the preservation of natural lands (open spaces, lands with critical natural resources), the enhancement of public spaces (roads, sidewalks, parks, recreation trails), and structure aesthetics (types of buildings and how they interact with the public realm) are interconnected. Currently, the Town is exploring form-based regulations and has held resident forums to identify housing types that people would support.

Connectivity Goal

1. Attract and retain a diverse population by directing housing opportunities near existing utilities, pedestrian and road networks, public places, open spaces and areas of commerce.

Accessibility

An accessible community has an environment that is meaningful and usable for as many people as possible.

There is a need for access to appropriately supportive, accessible, and affordable housing in Newmarket for all people, regardless of age or ability. Housing that meets diverse needs is key to supporting current and future residents. Needs related to housing vary depending on many factors including a household's size and makeup, age of individuals, and any physical or mental impairments and disabilities that an individual may have. Individuals and families that include a diverse makeup of age (multi-generational households), older individuals, and individuals with disabilities all require housing that support their needs and allow them equitable opportunities to live meaningful lives and engage in their community.

Older individuals may be more likely to require more accessible housing types to meet their needs and may also be more likely to experience a disability. Additionally, regardless of age, individuals with a disability may require more accessible housing opportunities to meet their needs. Data from the U.S. Census Bureau show that the age of the population of Newmarket, the region, and the state, has trended upward. Data collected by the Census Bureau also estimates the number of individuals who identified themselves as having a disability. The types of disabilities captured by the Census Bureau are hearing difficulty; vision difficulty; cognitive difficulty; ambulatory; self-care difficulty; and independent living difficulty. The latest available estimates show that, in 2022, there were an estimated 766 people reporting disability in Newmarket.



Figure 7 Downtown pedestrian crossing

"I have had my older disabled mother living with me for the past 5+ years due to not being able to find suitable affordable housing. She has remained on many housing lists and finally reached the top of one for this month. It's honestly discouraging how long she has waited, and people wonder why we have such a homeless problem in this area. There is no reason for studio and 1-bedroom apartments to go for what they do."

--2024 Newmarket Housing and Open Space Survey

Common themes highlighted by respondents and participants in the Housing and Open Space Survey and visioning sessions held in early 2024 highlighted the importance of housing that is accessible and age-friendly, allows for community connectivity, and promotes social inclusion.

Homes within walking distance of downtown or close to transit become especially important for people who cannot drive or do not have a car. Mixed-use development patterns that bring the places where people live closer to the places where they can shop and work may allow for greater social inclusion and accessibility to allow for increased community engagement and social connectiveness/inclusion.

Locating future housing in strategic places that leverage new or existing connections to public transportation, trails, and sidewalks will provide greater connectivity, especially to those who cannot drive or do not have a personal vehicle. Additionally, adopting regulations or incentives for creating multigeneration housing and developing accessible housing that consider universal design principles will help ensure that housing opportunities are available to as many Newmarket residents as possible, regardless of age or ability.

“Is there any way to bring the Coast bus route back? It is essential for people with disabilities and without cars.”

-Newmarket Housing and Open Space Survey

Accessibility Goal

1. Promote new construction and redevelopment efforts that adhere to principles of universal design.

Affordability

An affordable community is where people can live comfortably without financial difficulty.

The [2023 Strafford Regional Planning Commission Housing Needs Assessment](#) (RHNA) identified that the Town is projected to need an additional 756 units by 2040 to support a balanced housing supply (the Region is projected to need 9,520 units by 2040), and another 205 units will need to be replaced due to poor condition or lacking plumbing and/or kitchen facilities. A healthy rental vacancy rate is considered 5%, and southeastern New Hampshire has not seen a vacancy rate above 1% since 2019, nor a 5% vacancy rate since 2015 according to the annual rental survey conducted by New Hampshire Housing. The RHNA identifies a ratio of 1:2 for rental to owner occupied homes for Newmarket. Newmarket's housing stock is diverse, comprising of single-family detached homes, multifamily housing, and many rental opportunities. Leveraging this unique housing makeup and allowing its continued trend may support future housing opportunities.

In Newmarket, 39% of renters and 32% of homeowners are cost-burdened or pay more than 30% of their monthly income on any housing related costs, including rent or mortgage, taxes, parking, association fees, and/or utilities. Since 2012, these figures have remained consistent for renters but increased for homeowners. Survey responses for this Master Plan found that 49% of all responses reporting a housing cost greater than 30% of income. Homeowners cited property taxes as a particularly burdensome component of housing cost. 64% of all survey respondents under the age of 35 indicated paying more than the recommended 30% of their monthly income on housing.

“The ability to be able to add ADUs to properties will help with adult children, in-laws or others who need affordable housing.”

--2024 Newmarket Housing and Open Space Survey

In 2023, the median monthly rental costs for a two-bedroom apartment in Newmarket was \$1,914. For a household to not be cost-burdened by the median rent, their income would need to be at least \$76,560 per year. Individuals in Newmarket earning median incomes in industries including retail, education, fire and safety, and construction are unable to afford these rental costs on their own without being considered cost burdened. Low levels of affordability likewise extend to the home purchase market. In 2023, the median price of a single-family home in Newmarket reached \$500,000, making home ownership significantly more than attainable for most occupations in Rockingham County.

Some municipalities elect to build their own housing. Newmarket and Berlin, with similar populations, are the smallest towns in New Hampshire that operate housing authorities. The [Newmarket Housing Authority](#) maintains 50 income-restricted units and administers the Town's Housing Choice Voucher program. According to the online application, wait times for these programs are between 5 to 10 years. While the Town could consider constructing affordable housing units by its own initiative, this scenario is unlikely as the proposition would yield high costs to permit, construct and administer. This leaves local market solutions to address the housing shortage.

Interviews with local and regional developers were conducted for this Master Plan to establish factors that make housing “pencil in” financially. Many expressed regret that despite a desire to build workforce and moderate-income housing, market forces such as construction costs and changing demographics are working against them. For both financing and public perception, larger developers indicated that developments that are intended to be mixed-income and mixed-age fare better than developments with a reserved number of income- or age-restricted units. A different developer reiterated that Newmarket and the greater Seacoast should provide more housing opportunities for young adults through the creation of a more diverse housing stock.

“My top priority is protecting long-term affordability. I moved to Newmarket because it was more affordable than many surrounding communities and I like the people here - I want it to stay that way! I'd hate to see Newmarket price working folks out the way Portsmouth has.”

-Newmarket Housing and Open Space Survey

Affordability Goals

1. Support property tax policies that help individuals to remain in the community.
2. Continue to build partnerships with local and regional housing organizations and entities.

Resiliency

A resilient community can withstand, recover or adjust to adversity or change.

Where housing is located and how it is constructed are important aspects of housing resiliency. In the face of increasingly extreme weather events such as flooding and coastal storm surge, and shifts in climate bringing high temperatures and drought, location and sustainable building practices matter.

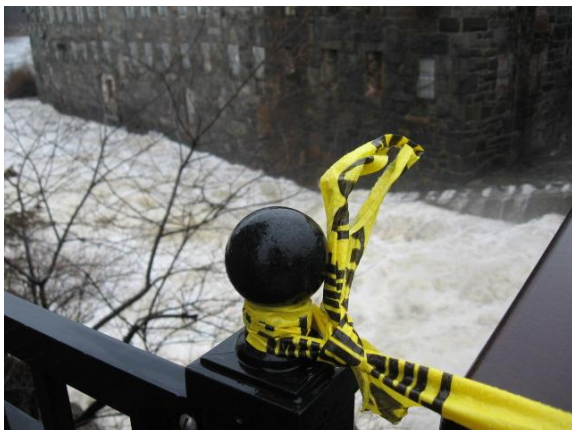


Figure 8 Lamprey River Flooding (source: SRPC)

The 2024 Newmarket Open Space Plan examines the Town's natural assets such as water resources, forests, agricultural lands and wildlife corridors and identifies areas where extreme weather events are expected to impact the Town. As a coastal community, Newmarket can expect to experience increased and extreme flooding, sea-level rise and storm surge events. Future development should be encouraged in areas less prone to these events. In addition, homeowners should be educated about adaptation strategies they may employ on their properties to help mitigate the impacts.

As an area that is targeted for redevelopment and infill development, it is important to encourage more sustainable building practices, from innovative techniques for insulation and passive cooling and heating, to incorporating more green roofs, cool roofs, trees, vegetation and other green spaces. Incorporating more sustainable housing design is supported by 67% of the respondents to the 2024 Housing and Open Space Survey who said it was very important to new development.

Resilient housing should be able to withstand changes in climate that bring extreme heat and drought. Newmarket will likely experience an increase in days over 90-degrees during the summer, especially impacting Newmarket's downtown and older housing stock. On these days, downtown Newmarket experiences the "urban heat island effect" which is an area of increased temperature due to more paved surfaces and less greenspace. Figure 9 below depicts the areas of Newmarket's urban heat islands.

Older housing stock may have little or no insulation to offer protection from outside heat. Of the 4,350 households in Newmarket in 2022, about 1,857 were built before 1980. Future increases in the frequency and intensity of heat waves may have an impact on people living in these structures and those without access to air conditioning. Opportunities for redeveloping these structures into more resilient housing include increasing energy efficiency, insulating and weatherproofing, incorporating

renewable energy, and utilizing passive design principles. Utility companies often offer incentive or rebate programs for energy efficiency including smart technologies, insulation and weatherproofing older homes.

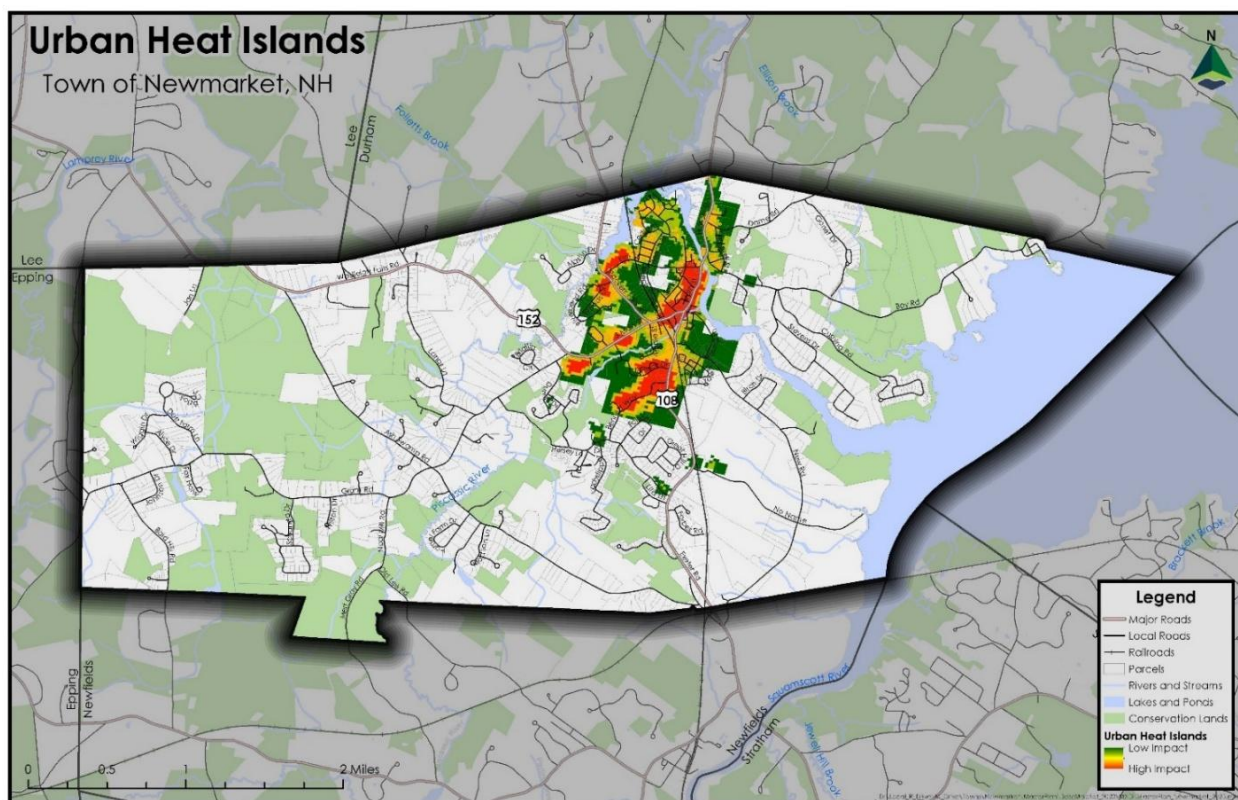


Figure 9 Urban Heat Islands (source: SRPC)

The Town should consider establishing a Housing Advisory Committee to keep conversations about housing at the forefront of public discussion. This committee could convene to conduct research into best practices, engage the community, and make recommendations to the Town Council about ways to keep Newmarket a vibrant and resilient community.

Resiliency Goals

1. Integrate smart growth and resilience principles into redevelopment and new construction housing projects.
2. Build institutional and community engagement capacity to create a space for community conversations, better understand housing issues and make more informed recommendations to decision-makers.

TRANSPORTATION CHAPTER

Adopted xxx 2026



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Vision

Newmarket will be a vibrant community where development and multi-modal transportation infrastructure are planned together. Our evolving downtown and rural streetscape will encourage residents and visitors of all ages and abilities to walk and bike throughout town. Walking, biking, driving, and community transportation will feel like safe and convenient choices. Trails and walking routes will strengthen community bonds by interconnecting with neighborhoods and green spaces. Meanwhile, streets will be designed purposefully for all modes of travel in accordance with their geographic context to create a sense of place, improve safety, and facilitate travel. Ultimately, Newmarket residents will have more options on how to travel throughout town and will be able effortlessly to connect with neighboring municipalities and regional transportation hubs.

Executive Summary

The Town of Newmarket has developed a set of goals and strategies to improve transportation infrastructure and services over the next ten years. This includes an organized road network that is safe for a variety of modes of transportation and enhances the vibrancy of the village core. From walking trails, to sidewalks, to roads, public transit, and rails, there are many opportunities to create new connections within Newmarket, and to neighboring communities and regions. Making roads safer for all users is a top priority, especially in areas near the village core where more people walk and bike. Public transportation presents opportunities to better connect residents with critical destinations and services; however, it will require local investment and collaboration with neighboring municipalities. Newmarket is one of many coastal communities investing in regional climate resilience, including transportation infrastructure.

Master Plan Themes and Goals

Five guiding themes emerged from the public engagement process: Vibrancy, Connectivity, Accessibility, Affordability, and Resiliency. Each Master Plan chapter uses the themes to explore the subject matter from different perspectives, helping to focus community goals and actions.

Vibrancy

A vibrant community is one that exudes energy and is full of activity and life. It is welcoming and friendly to all ages, supports cultural diversity, and provides economic opportunities.

Vibrancy is measured by how well humans interact with their physical and social environments. A transportation network in good condition that is safe to travel by multiple modes (driving, walking, biking, taking public transit, etc.) is essential for vibrancy. Newmarket's current village core is the epicenter of its vibrancy – historic buildings along well-lit streets that encourage safe vehicle speeds, wide sidewalks with trees, wide crosswalks with pedestrian-activated signals, space for socializing and outdoor dining. Those street design features should be replicated as the village core expands along North Main St (NH108), South Main St (NH152), and Exeter Rd (NH108). These state routes act as primary entry and exit corridors and draw most traffic to the village core.

Maintaining Newmarket's vibrancy will require a street network that is organized and designed to accommodate as many types of users as possible. This idea is embodied in the concept of "complete streets". A complete streets approach considers context: a downtown main street, a rural two-lane highway, and a neighborhood street should all be shaped by different design considerations that accommodate and safeguard the abutting land uses. Accessibility must be a primary consideration as new streets are designed or slated for improvement throughout Town. See Appendix C for more information about complete streets design.



Figure 1 Downtown Newmarket (source: Ryan Pham)

Vibrancy in the downtown core depends on a streetscape that is inviting to pedestrians with parking that is well signed and easily accessible.

Comprehensive wayfinding signage should be developed to guide residents and visitors through town and to the village core, identify important routes, and

designate specific sites like parking, attractions, trails, parks, and municipal facilities. The design should also require careful consideration of parking, as many survey respondents to the 2024 Master Plan survey stated that a lack of vehicle parking was the primary challenge to starting a business in Newmarket. With the increasing adoption of electric vehicles, Newmarket should also consider capacity for public electric vehicle charging when planning parking improvements. Strafford Regional Planning Commission conducted a parking study in Newmarket in 2025 that included a set of recommendations for improving parking and access to the village core. See Appendix C for a summary of findings.

Electric “micromobility” is a transportation technology quickly gaining popularity across the country. Small electric mobility devices such as electric bicycles and scooters are becoming powerful enough to provide an affordable way to conduct cross-town trips. Many can travel over 20 miles per hour and require careful safety considerations. Riders may be too vulnerable to mix with vehicles but may travel too fast to safely share a sidewalk with pedestrians. Newmarket should be prepared to address an increase in use of micromobility devices on the road network over the next five years, especially in the village core. The neighboring town of Durham is a useful resource to reference as they have seen a dramatic increase in use of micromobility devices due to their popularity with university students.

Vibrancy Goals

1. Maintain and expand walkability.
2. Intentionally incorporate public spaces and placemaking concepts into the streetscape that encourage social interactions.
3. Expand navigation and bolster community identity through wayfinding.

Connectivity

A connected community has efficient and safe links to daily needs such as between home, jobs, shopping, school, services, parks and open space, and provides welcoming and inclusive public places for social interaction.

The transportation network’s primary function is to safely connect people to the destinations they need to reach. Connectivity in the transportation network leads to community vibrancy by linking people, businesses, nature, and surrounding municipalities.

Newmarket’s existing village core is a key part of the community’s identity. Residents enjoy its walkability and regularly walk to the village core from their homes. Residents desire more walkable connections between neighborhoods, between destinations in town, and to neighboring towns. There are many existing trails in town with the potential to be linked. In the 2024 Master Plan survey, the top priorities for connectivity included: a connection between the Rockingham Recreation Trail to downtown Newmarket; an off-road connection between Newmarket and Durham; and an expansion of the existing sidewalk and trail network to close gaps between neighborhoods, parks, and open space.

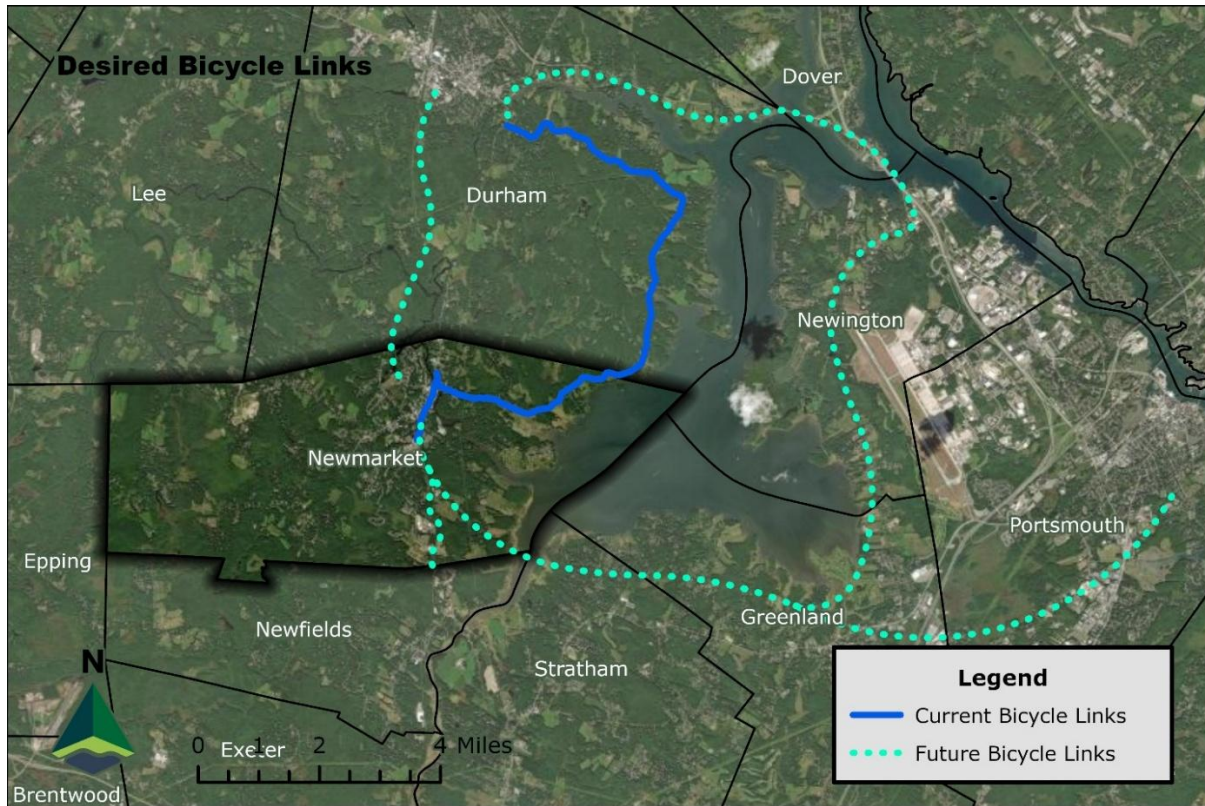


Figure 2 Desired Bicycle Connections (source: SRPC)

Roads connect people, but they also can be designed to create a sense of place and community. For example, roads should be designed to clearly announce transitions between types of road uses. NH108 and NH152 are the primary routes drawing travelers to town. As travelers near the village core, density and pedestrian activity increase along the road. Road design needs to focus on decreasing vehicle speeds as building density and pedestrian activity increase. This is known as “traffic calming.” There are numerous traffic calming techniques that can reduce traffic speeds at strategic locations along transportation corridors.

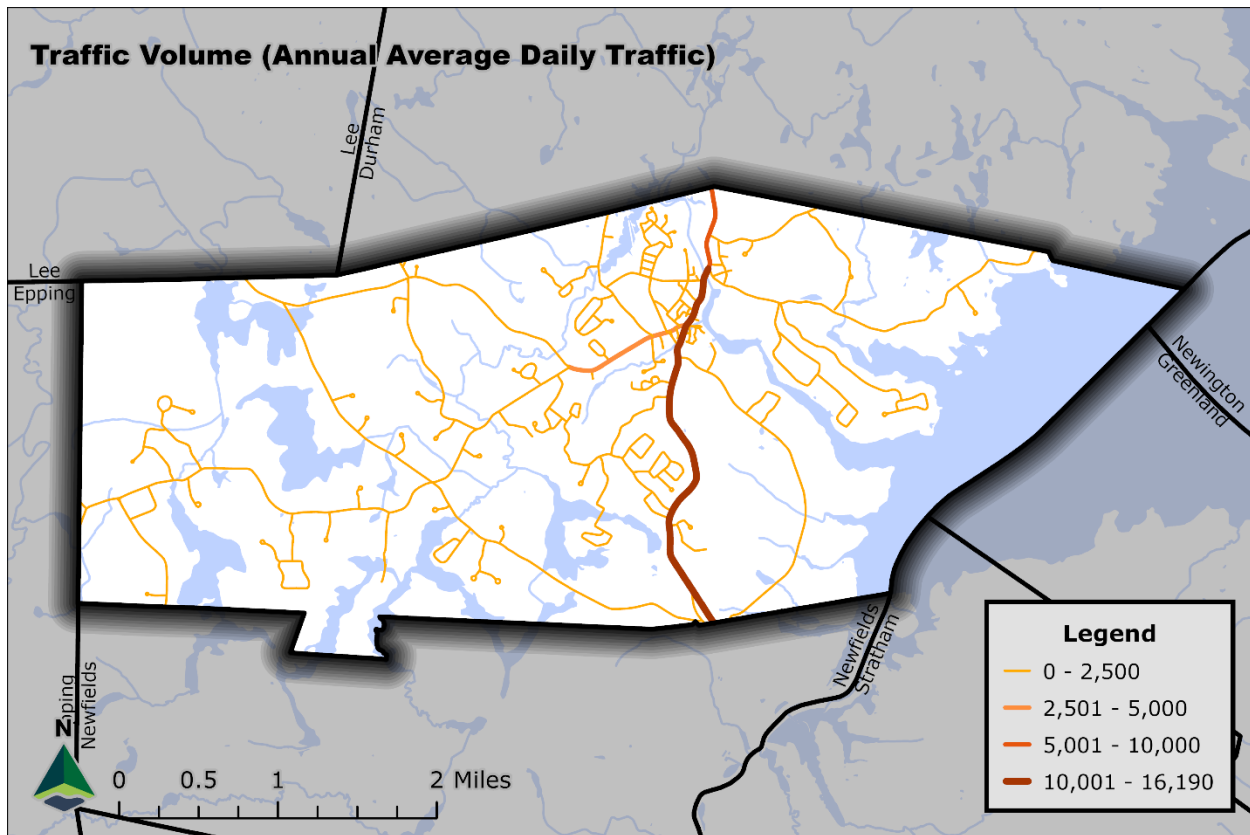


Figure 3 Average Daily Traffic Volume

Public transportation also connects people; however, Newmarket is currently isolated from the regional public transit network. The Cooperative Alliance for Seacoast Transportation (COAST) operates Route 7 On-Demand which provides service to Exeter and points between. Riders must reserve a ride and designate their destination. There is no longer any connection to the mainline COAST network. The 2024 Master Plan survey included questions about restoring public transit and possible destinations. Newmarket residents prioritized local connections to Portsmouth, Durham and UNH, Exeter, and Dover. Many residents said they would also use public transportation to reach urban areas like Boston, MA and Portland, ME.

Newmarket has an excellent location for a future passenger rail station along the Amtrak Downeaster route. Adding a stop on the Downeaster route will require increased capacity on the existing rails, which will require improvements to the rails outside Newmarket – such as upgrades in Rollinsford and Dover (projects identified by the Northern New England Passenger Rail Authority). A passenger rail stop in Newmarket will require significant levels of collaboration between residents, neighboring communities, and regional partners and CSX (owner of the rail lines) to achieve regional rail investment.

Connectivity Goals

1. Improve ability of residents to bike or walk safely within their neighborhoods and to village core from surrounding neighborhoods.
2. Ensure safe connectivity and access to destinations within and outside Newmarket.
3. Support regional improvements to public transit and community transportation.
4. Provide a zoning code and subdivision regulations that facilitate contextual road designs based on land use characteristics.

Accessibility

An accessible community has an environment that is meaningful and usable for as many people as possible.

People should be able to get from their homes to their daily destinations safely and efficiently, regardless of income, age, or physical ability. This concept was confirmed as a priority in the 2024 Master Plan survey, where respondents ranked pedestrian safety as the highest transportation priority in Newmarket. Sadly, since 2012, six crashes have occurred in Newmarket that resulted in fatalities (both pedestrians and people in vehicles as reported by the Fatal Accident Reporting System - National Highway Traffic Safety Administration). During the 2024 Master Plan workshop, attendees indicated a high need for additional lit crosswalks town wide.

Over the past 30 years, the Town has made great strides in creating a quaint downtown streetscape with a Main Street that complements the traditional New England mill town – while providing a pedestrian network that promotes a better walking, social, and commercial experience.

Nevertheless, conflicts still exist between pedestrians, cyclists and vehicular traffic in this section of town which have yielded calls for additional safety and infrastructure improvements. Specifically, the siting and circulation of parking along with conflicting interactions between vehicles and pedestrians are cited as a deterrent to both new businesses and for residents and tourists to enjoy and visit the downtown.

“Newmarket isn't easy to get to from elsewhere. I suspect many of the patrons are people who live here rather than people visiting from elsewhere. I think building up 108 between the train tracks and the car wash and making that area more vibrant and walkable could help Newmarket grow economically while also serving the hundreds of folks who live on Bennett, Ladyslipper, Sewell, Hersey, etc. An outdoor gathering space, traffic calming, sidewalks/pedestrian infrastructure, shade trees, etc. It's the faster route to downtown from that area, but less pleasant.”

“Bicycle and pedestrian access/safety for all of Newmarket. Focus on getting the people safely in to downtown and not have to share the road with cars. Grant [Road], Ash Swamp, and Wadleigh Falls Rd should have connectivity to downtown.”

-2024 Master Plan Survey Respondents

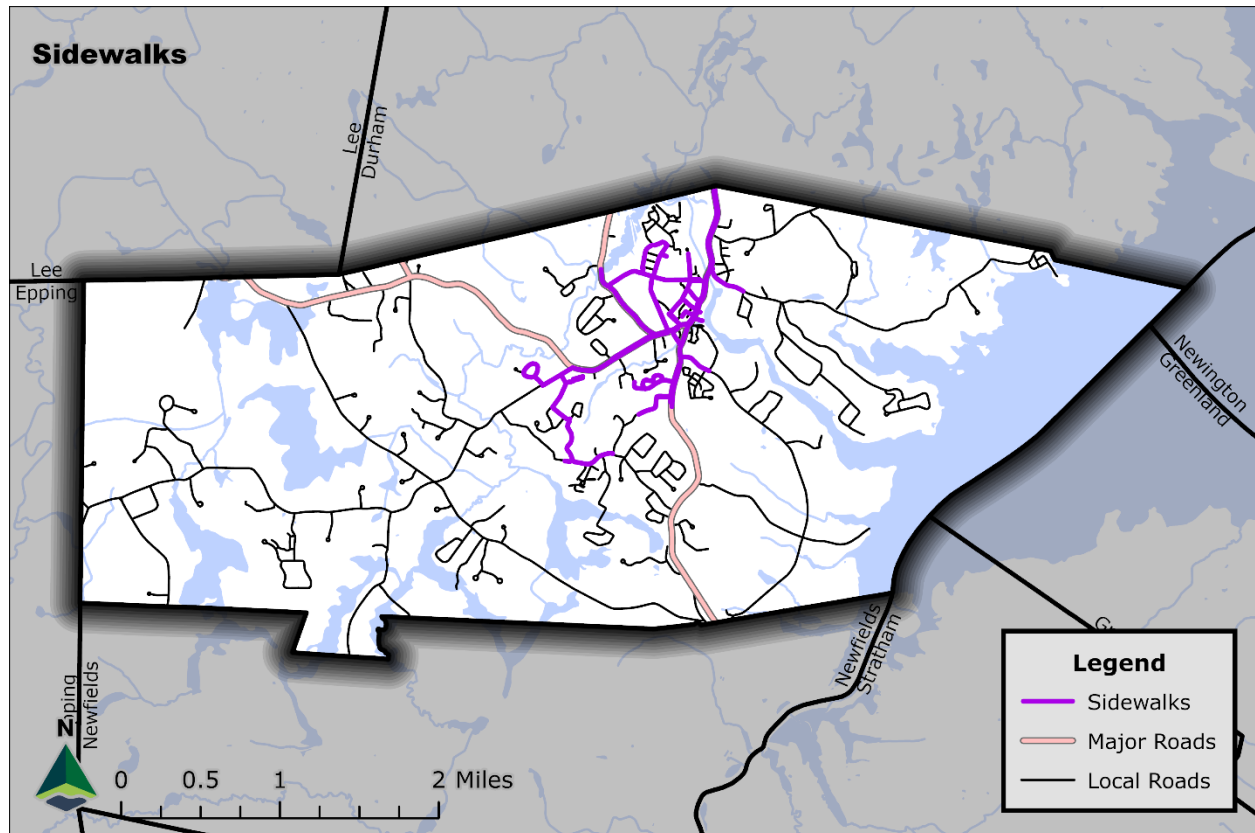


Figure 4 Newmarket Sidewalk Network (source: SRPC)

Fortunately, at the time of the drafting of this Master Plan, the Town of Newmarket and local transportation partners have several efforts underway that are aimed at universal design and safety improvements. Newmarket will be able to look to this effort in planning for its own sections of Route 108 at the “gateway” areas north and south of downtown and is already undergoing zoning changes that would encourage development that complements such transportation alternatives.

Pictured below is one “complete street” as implemented in a Washington, DC-area suburb. This downtown street features street art, a separated median, and a protected bike lane that retains on-street parking next to local businesses. The street in this example has a daily traffic volume of about 10,000 vehicles, similar to Newmarket’s own Main Street.

Ultimately, town staff and the Public Transportation Advisory Committee will use the Master Plan to develop local guidance for configuring Newmarket's roads. In tandem with the federal functional classification system and the State of New Hampshire's legislative and functional classification system, a community may elect to formalize its own road hierarchy. This local guidance will help implement the town's vision for local roadways by recommending road configurations in specific context.

Neighborhood streets, rural highways, and other travelways will have specific recommendations and will include specific considerations for cyclists, pedestrians, and community amenities such as public art and benches or lighting. The system would provide the town with a vision to refer to in regular maintenance of existing streets (for example, sidewalks or lighting) but also if funding becomes available for more intensive upgrades (for example, lane modifications, addition of bike lanes or transit stops, or implementation of traffic calming). The pedestrian level of stress analysis, regional Complete Streets efforts, and parking study will be used to inform a classification system that is accessible to all users and retains a local vision.



Figure 5 Washington, DC - One Complete Street (source: SRPC staff)

Accessibility Goals

1. Zero crashes that result in fatalities and serious injuries on roads in Newmarket.
2. Coordinate priority improvements to safety, streetscape, and parking with scheduled road maintenance.

Affordability

An affordable community is where people can live comfortably without financial difficulty.

Newmarket will suffer if the transportation system is biased toward people who can afford to own and maintain a personal motor vehicle. An affordable transportation system gives people the option to drive, bike, walk, or take public transit. Newmarket and the greater Seacoast's popularity has posed new cost-of-living challenges. As stated in the Housing Chapter, rents have risen dramatically and this has been identified as one reason both COAST and UNH Wildcat have reduced or cut services to Newmarket as ridership has shrunk. As stated in the Accessibility section above, pedestrian safety was identified as the highest transportation priority in the Master Plan survey.

However, for respondents of the 18-24 age group, public transit was ranked the highest priority. None of this group responded “No” to the question “If public transportation was restored in Newmarket, would you or members of your household use it?” However, more research and outreach is needed due to the small sample size of this age group in the survey.

Prior to Summer 2018, COAST’s Route 7 connected Newmarket with shopping and employment in Stratham and Exeter. Now an “on-demand” service, Route 7 remains available to all, and not just groups such as older adults or those experiencing a disability. COAST Route 7 on-demand has no restrictions on destination or reason for travel. However, travel times can be unpredictable, and some local volunteer and non-profit services offer door-to-door service for trips such as doctors’ appointments or are folded into existing services offered to older adults and those experiencing disabilities. In Newmarket, operations such as Ready Rides, Meals on Wheels of Rockingham County, and Community Rides are available via TripLink, the central call center for all or part of Strafford, Rockingham, and Carroll counties that is intended to fill the gaps public transit cannot fulfill. Future in Sight and Granite State Independent Living are options as well, but they are not within the TripLink network (see Appendix C).

Wildcat Transit, the off-campus component of UNH’s bus network, provided service to Newmarket on its Route 5 until May 2023. Ridership was declining even prior to the COVID-19 pandemic. In some months in the early 1990s and again in the mid-2010s, Route 5 carried 5,000 or more trips. March 2020 was the last month where Route 5 carried 1,000 or more trips (see Appendix C)

The ridership of Amtrak’s Downeaster line has shown improvement since the pandemic. The closest stations to Newmarket are the Durham-UNH station on the campus of UNH (a road distance of 5.3 miles from Newmarket Town Hall) or the Exeter station (a road distance of 8 miles, or available on the on-demand Route 7 COAST service). Many Newmarket residents use the Downeaster for leisure, commuting, and as a link to other transit hubs and it was a major topic referenced in the Master Plan survey. The Downeaster’s ridership usually peaks in the summer tourist season, having reached a new monthly high of over 60,000 riders in August 2019, and quickly returned to nearly 58,000 monthly riders in July 2024.

Affordability Goals

1. Expand public transportation options.
2. Expand electric vehicle charging infrastructure..

Resiliency

A resilient community can withstand, recover or adjust to adversity or change.

A resilient transportation system is critical for effective local response during an emergency, and the recovery from it. Climate change is increasing the likelihood of extreme and damaging weather events. Once-in-a-generation storms are happening more often. Other events also pose a rising threat to the transportation system - such as extended periods of extreme heat that degrade

pavement more rapidly. Sea level rise will change the landscape in the Great Bay and the tidal portion of the Lamprey River. Newmarket should identify parts of town where people could be cut off during a storm if part of the transportation network were to fail.

Staying active in the regional climate science and adaptation process is essential for local resiliency. Newmarket participated in the first New Hampshire Coastal Risk and Hazards Commission and should participate in the 2025 update to ensure local and regional climate concerns are represented through updated research and recommendations. In particular, Newmarket is highlighted in the state's 2016 sea level rise report "Preparing New Hampshire for Projected Storm Surge, Sea-Level Rise, and Extreme Precipitation: Final Report and Rise, and Extreme Precipitation: Final Report and Recommendations" scholars.unh.edu/cgi/viewcontent.cgi?article=1389&context=prep As a coastal community, the Town plays a critical role in a regional decision-making process around climate adaptation.

Newmarket should maintain an up-to-date inventory of local transportation infrastructure and systems that identifies vulnerabilities to various potential damage and disruption. The inventory should identify which culverts and bridges over streams and rivers are most vulnerable to flooding and damage during a heavy rainstorm. Replacing undersized culverts will improve road integrity and safety and build resilience in the local road network.

The transportation network can be used as a resilience asset. Rain needs to be quickly diverted off a road, and it can be diverted into vegetated basins. Transportation infrastructure that incorporates trees and plants can make the streetscape more attractive, safe, and resilient.

In addition to resilience in the built infrastructure, the transportation system should incorporate resilience in the services it provides for the community and those who live in it. A resilient road network should accommodate adaptation if one part of it is incapacitated: are there alternative routes for essential travel patterns? A Newmarket resident may temporarily or permanently lose the ability to drive independently. What transportation options are available for them to continue their daily lives?

Resiliency Goals

1. Invest in critical transportation to maintain functionality.
2. Increase transportation options for Newmarket residents.
3. Keep nature part of downtown experience.
4. Incorporate future climate projections into all infrastructure design.
5. Lead the energy transition away from fossil fuels.

ENERGY CHAPTER

Adopted xxx 2026



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Vision

Newmarket is a community that supports and preserves its semi-rural character while simultaneously embracing effective emerging technology, environmentally progressive strategies, and local business opportunities. Newmarket will have clean energy that is affordable, reliable and sustainable and is used efficiently by the Town and residents. Newmarket's quality of life and public health will be improved from clean and renewable energy generation. Newmarket's energy policies will play a significant role in achieving this vision.

Executive Summary

The use of energy influences many facets of life. Energy can affect municipal costs and operations, influence job growth and the regional economy, and impact natural resources and our quality of life. The Energy Chapter of the Newmarket Master Plan provides guidance on varying strategies to reduce dependence on non-renewable fuels, lower greenhouse gas emissions, reduce energy costs and provide opportunities to incorporate clean renewable energy sources.

In support of these objectives, on July 20, 2022, the Newmarket Town Council adopted Resolution 2021/2022-37 pertaining to Sustainable Energy Goals. The Resolution calls for aspiring to achieve one hundred percent reliance on renewable and carbon neutral sources of electricity by the year 2030; and one hundred percent reliance on renewable and carbon neutral sources of fuel for heating and transportation by the year 2050.

This chapter recommends some of the possible approaches the Town can take to achieve these objectives, such as amending land use regulations to encourage energy efficient land use development and sustainable construction practices. To reduce reliance on fossil fuel for transportation, the Town could expand the sidewalk and trail network and find other creative solutions to connect people and places. The Town could also encourage the development of electric vehicle charging stations by continuing to provide public charging stations as well as encouraging private businesses to install supporting infrastructure.

Energy efficiency and conservation are often the most affordable and accessible measures that can be undertaken to reduce energy consumption, energy costs, and environmental pollutants. The Town should continue to conduct audits of additional municipal operations and upgrade town operations to the most efficient methods, materials, and technologies, as well as create a standard of efficiency for Town operations.

To achieve the aspirational goals for renewable and carbon neutral sources of electricity, the Newmarket Community Power program provides residents and businesses with a choice to select cleaner electricity supply. Newmarket Community Power aims to increase its renewable portfolio by 11% each year. In addition, the Town could consider building municipally owned energy production including Town solar fields or retrofitting dams for hydroelectricity. The implementation guide to this chapter provides additional goals and actions that can help the Town realize a cleaner, more efficient energy future.

Master Plan Themes and Goals

Five guiding themes emerged from the public engagement process: Vibrancy, Connectivity, Accessibility, Affordability, and Resiliency. Each Master Plan chapter uses the themes to explore the subject matter from different perspectives, helping to focus community goals and actions.

Vibrancy

A vibrant community is one that exudes energy and is full of activity and life. It is welcoming and friendly to all ages, supports cultural diversity, and provides development and economic opportunities through environmentally progressive strategies.

Newmarket's historic development pattern consists of a vibrant downtown core surrounded by less dense, more rural areas. Respondents to the 2025 Master Plan survey placed a high priority on continuing this pattern: preserving Newmarket's natural landscapes while focusing density in the downtown core and in areas where it can be supported by public infrastructure. This traditional development pattern not only contributes to a vibrant community, but it is also sustainable, more energy efficient, and reduces the amount of energy consumed by a community.

The built environment has a profound impact on our natural environment, economy, health and productivity. Sustainable development is a pattern of resource use that aims to meet the needs of the community today and protect the needs of its future, while preserving the environment. Sustainable development ties together concern for the carrying capacity of natural systems with the social challenges facing individuals and communities. Communities can achieve sustainable development by integrating land use and resource-based strategies with economic development approaches that provide opportunities and benefit the local environment and quality of life.

Without proper attention, unmanaged growth puts communities at risk of exhausting their environment and what makes them unique and desirable places to live, work and visit. The Town should review development regulations to ensure that development is balanced - enhancing the Town's traditional development patterns with sustainable new growth.

In addition to maintaining Newmarket's traditional development pattern, respondents to the Master Plan survey placed a high value on improving renewable energy and resiliency infrastructure. The infrastructure for energy use and delivery can influence land use decisions about where growth occurs and where we live, work and recreate. NH State law encourages energy efficient patterns of development through zoning that does not unreasonably limit development of alternative and renewable sources of energy.

Energy efficient land use patterns and sustainable construction practices are important strategies to achieve a reduction in the Town's carbon footprint. According to the US Department of Energy, buildings use 74% of electricity in the United States and account for \$370 billion in annual energy costs (www.energy.gov/topics/buildings-energy-efficiency). With this in mind, sustainable policies and standards should be aimed at guiding how new development or redevelopment is constructed to attain ideal energy efficiency and conservation rates, while promoting the use of sustainable materials and energy sources. These reductions in energy consumption in conjunction with land conservation and

management measures, smart growth, and development of alternative transportation systems will put the Town in better standing to achieve its energy goals.

Vibrancy Goals

1. Complete an audit of the zoning ordinance and land development regulations to identify barriers and existing incentives that support implementation of energy efficiency measures.
2. Provide opportunities for outreach and education about environmentally responsible energy generation, building standards, land use patterns, and transportation, which are critical to Newmarket's long-term vibrancy and sustainability.

Connectivity

A connected community has efficient and safe links to daily needs such as between home, jobs, shopping, school and services, parks, open space, and provides welcoming and inclusive public places while encouraging environmentally friendly and energy efficient modes of transportation.

In New Hampshire, transportation consumes the most energy of any sector. It makes up nearly 34% of energy consumption (see Appendix D – Consumption by Sector), just slightly ahead of the residential sector. Gasoline and diesel are the dominant fuel sources for transportation in New Hampshire. To reduce reliance on fossil fuel, the Town should provide alternatives for residents and visitors including expanding the sidewalk and trail network and finding other creative solutions to connect people and places. The Transportation Chapter provides discussion and goals geared toward energy efficient modes of transportation including maintaining and expanding walkability, reviving public bus transport, and rail service to provide greater connectivity with the wider region.

The Town of Newmarket has a goal of reaching 100% reliance on renewable and carbon neutral sources of fuel for transportation by the year 2050. To lead by example and accomplish this goal, the Town would need to prioritize purchasing hybrid and electric vehicles whenever adding to the municipal fleet. As of 2024, the Town fleet has one hybrid vehicle.

In New Hampshire, the sales of electric vehicles (EV) have increased as supporting infrastructure has developed. The State saw a 32% increase in sales from 2022 to 2023, and in 2023, there were 9,861 EV registrations.¹ In Newmarket, the Town Clerk does not easily distinguish vehicle types such as electric, hybrids and internal combustion. The table below shows the known count of electric and hybrid vehicles registered in Town.

Table 1 - Newmarket Electric Vehicle Counts			
Calendar Year Ending	Total Registered Vehicle Count	Known Electric or Hybrid Vehicles	Electric/ Hybrid Vehicles Percentage
2022	17,264	165	0.96%
2024	11,296	106	0.94%

Source: Newmarket Town Clerk

A wider and stronger network of electric vehicle charging stations is needed to support the growing electric vehicle sector. In March 2025, New Hampshire had 284 public electric vehicle charging locations, the fewest locations in New England.² Charging locations are strategically located along the major interstate highways, I-89, I-93, and I-95, and in major urban areas. The New Hampshire Department of Transportation (NHDOT) is expected to continue to enhance the charging infrastructure along the major travel corridors of I-93 and NH-16.



Figure 1 Electric Vehicle Charging at Newmarket Public Library (source: Don Sanders)

In January 2025, the State was awarded \$15 million in federal grant funding to strategically deploy publicly accessible electric vehicle charging infrastructure throughout the State. The grant funds will be used to administer the “Next Level NH,” program which will take public Level 2 (L2) and Direct Current Fast Charging (DCFC), in both urban/suburban and rural areas, to the next level in New Hampshire by increasing EV charging hubs through the state. The initiative aims to support two key education and outreach efforts: a Technical Assistance Provider Network and an EV Basic-Training Bootcamp. Additionally, “Next Level NH” seeks to facilitate EV travel, boost EV adoption, and address range anxiety while reducing localized greenhouse gas emissions from tailpipes by

establishing EV charging hubs in currently underserved areas.

The town should encourage the development of EV charging stations by continuing to provide public charging stations as well as encouraging private businesses to install supporting infrastructure. This could include encouraging multi-family building owners to install infrastructure as part of new construction or renovations or working with destinations in Town that attract visitors to install EV charging stations. Adding EV stations to strategic locations can also contribute to the town’s vibrancy by adding another incentive to visit, play and stay downtown.

As of 2022, the Town maintains 3 electric vehicle charging stations located at the Newmarket Public Library, the municipal parking lot at Schanda Park and the Community Center. There are also a number of privately owned charging stations at businesses throughout Town. Respondents to the Master Plan survey indicated that they would support additional electric vehicle charging stations throughout Town.

Connectivity Goals

1. Support an integrated multimodal transportation system to reduce vehicle-miles-driven that includes increased walkability, encourages bicycles and other efficient modes of transportation, and creates a town public transportation service for all residents, such as a town-run rideshare service.
2. Transition municipal fleet to all electric or plug-in hybrid.
3. Provide opportunities for increasing the number of electric charging stations in town.
4. Support regional, state, and national actions to reduce greenhouse gas emissions.

Affordability and Accessibility

An accessible community has an environment that is meaningful and usable for as many people as possible and where options for clean, renewable energy are made available to all residents regardless of whether they are businesses, individual homeowners, renters or members of a Homeowners Association. An affordable community is where people can live comfortably and where Newmarket businesses and residents of all income levels can participate in energy efficient programs.

Energy efficiency and conservation are often the most affordable and accessible measures that can be undertaken to reduce energy consumption. These efforts focus on one main objective - reducing overall energy consumption across all sectors, thus reducing energy costs and environmental pollutants. Energy audits are one tool that all sectors can use to establish a base line of energy consumption, and based on the results, create a plan that can reduce energy consumption and costs over time.

One of the Town of Newmarket's goals is to reduce the town's carbon footprint and aspire to achieve 100% reliance on renewable and carbon neutral sources of electricity for municipal facilities by the year 2030 and 100% reliance on renewable and carbon neutral sources of fuel for heating by 2050. The Town owns, operates and maintains a variety of public facilities to support its residents. These facilities include the Department of Public Works/Fire & Rescue, Police Department, Town Hall, Community Center, Library, Sunrise-Sunset Senior Center, Transfer Station, Wastewater Treatment Facility, pump stations, water treatment plant, as well as a number of municipal wells [link to the Community Facilities Chapter for more details]. Other facilities that consume electricity include outdoor street lighting, traffic lights, electric vehicle charging stations, Macallen Dam, emergency services dispatch, and municipal parks such as Arbor Park, and Heron Point Sanctuary.

Although the energy used in municipal operations is minor compared to that of the residential and commercial sectors, Newmarket municipal facilities should lead by example and reduce the energy used in its buildings and operations, outdoor lighting, and vehicle fleet. Energy improvements will save taxpayer dollars and will create a model for businesses and residents to adopt. In 2018, the Town worked with ENE Systems and EEI (Energy Efficient Investments, Inc) to conduct an energy audit at five municipal

buildings: Town Hall, Public Works/Fire & Rescue, Police Station, the Sunrise-Sunset Senior Center and the Library. The audit consisted of an initial energy assessment, site visit, and analysis of the utility and operational costs of the facility.

The audit found opportunities for the Town to find efficiencies in operations through upgrades to LED lighting with Smart controls, upgrading heating and cooling systems, insulating attics and pipes, and installing direct digital controls (DDC) which are automated systems that use sensors and digital devices to monitor and control building systems such as HVAC, lighting, and security. The audit also recommended the installation of a 50kW solar photovoltaic system on the Public Works/Fire facility. Following the assessment, the consultants developed a project plan for each facility that, when implemented, would increase energy conservation and reduce annual energy expenditures. To date, LED lighting and DDCs recommended in the audit have been installed in all 5 municipal buildings, and a solar system was added to Fire & Rescue facility in 2019. The recommendations are evaluated and added as systems are replaced or upgraded and budget allows.

In 2021, the Newmarket Environmental Services Water and Wastewater Departments studied electricity usage and identified potential efficiencies. These included operational water system measures such as improvements to the wells, upgrades to thermostats, pumps, and installing heat pumps. Improvements to the wastewater system included installation of thermostats, improved system ventilation, and upgrades to heating systems. When implemented, the potential electric energy savings is approximately 16% annually for water systems and 8% annually for wastewater systems with a potential annual savings of \$20,000 (see Appendix D for summary tables).

The Town should continue to conduct audits of additional municipal operations including buildings, street and outdoor lighting, water and sewer, and transportation options; and formulate plans to upgrade town operations to the most efficient methods, materials, and technologies, as well as create a standard of efficiency for town operations moving forward.

The Town has been able to consistently track energy use and costs for five municipal facilities: DPW/Fire & Rescue, Police Station, Sunrise Sunset Senior Center, Town Hall, and the main building of the Community Center.

A baseline table for 2023 and 2024 can be found in Appendix D. To more effectively track energy usage and monitor the effectiveness of energy improvements, the Town should consider creating a dashboard that could track all municipal facilities and have a public-facing component that tracks key usage and cost metrics. Over 50% of the respondents to the Master Plan survey indicated a high level of interest



Figure 2 Newmarket Streetlights (source: Olivia Brooks)

(extremely interested - 24% and very interested - 28%) in having the Town partner with energy professionals to offer energy efficiency audits to residents and businesses and to explore the creation of future tax incentive programs for energy efficiency improvements and renewable energy systems. Additionally, participants at the September 2024 Master Plan workshop indicated support for incentives for new construction and renovations to include the generation of electricity, energy efficiency, and heating/cooling from non-carbon-based sources (i.e. solar).

Accessibility / Affordability Goals

1. Audit Municipal operations including buildings, street and outdoor lighting, water and sewer, and transportation options; and formulate a plan to upgrade town operations to most efficient methods, materials, and technologies, as well as a standard of efficiency for town operations moving forward.
2. Encourage business owners and residents to develop energy efficiency improvement plans.
3. Encourage public and private participation in technical and financial assistance programs to reduce energy costs and consumption.
4. Encourage transition to renewable heating sources.

Resiliency

A resilient community can withstand, recover or adjust to adversity or change and readily adapt to opportunities related to energy efficiencies and environmental change.

One of the actions that the Town of Newmarket has recently undertaken to be more resilient is to join the New Hampshire Community Power Coalition. Newmarket is a founding member of the Community Power Coalition of New Hampshire, created to enable communities across the state to access services, resources and to participate in joint power solicitations. Community Power is a program authorized under RSA 53-E to provide electricity supply service for the Town's residents, businesses, and other types of customers, offering residential default rates that aim to be lower than or competitive with those offered by Eversource and provide a renewable energy content that is equal to or higher than Eversource. To the extent possible, Newmarket Community Power will aim to increase its renewable portfolio by 11% each year.

The Newmarket Town Council approved the Newmarket Community Power Electric Aggregation Plan in May 2023, and the Town launched Newmarket Community Power in March 2024. Newmarket's Community Power Program operates on an "opt-in" or "opt-up" basis, allowing consumers to select a variety of renewable energy products up to 100%. The program operates on a competitive basis allowing customers to switch between power suppliers as desired. Newmarket's goal is to increase its renewable portfolio by 11% each year. The Newmarket Energy and Environment Advisory Committee, also

designated as the Community Power Electric Aggregation Committee, advises the Town Council about policies and services needed to implement and operate the program. The Town's Electric Aggregation Plan can be found here: www.newmarketnh.gov/DocumentCenter/View/202/Newmarket-Community-Power-Electric-Aggregation-Plan-PDF

As of March 2025, after one full year of operation, Newmarket Community Power supports 73% of all electric accounts in Newmarket. Approximately 1% of the 4,089 Newmarket Community Power Accounts have currently opted for a higher level of clean energy over the default Granite Basic product which is composed of 24% clean energy. For those accounts that have selected a higher level of clean energy, in one year, they have eliminated an additional 48 tons of carbon emissions. With Newmarket Community Power we will have the opportunity to meet our renewable portfolio goal of 11% and reduce carbon emissions with minimal impact to Newmarket residents.

Another way that Newmarket can be resilient, maximize cost-efficiency and ensure more reliable energy security is to consider building municipally owned energy production as part of the Newmarket

Community Power energy procurement. This could include town solar fields, retrofitting dams for hydroelectricity, or decentralized town solar arrays constructed on private property in public private partnerships.

Respondents to the Master Plan survey indicated a high level of interest (24% were



Figure 3 Stone Church Solar Panels (source: Revision Energy)

extremely interested and 24% very interested) in Town development of municipally owned energy generation projects, such as solar arrays, dams or hydroelectric power, or others.

Resiliency Goals

1. Through Newmarket Community Power, launched in 2024 starting at 22% renewable portfolio, and the Community Power Coalition, support Newmarket's own publicly owned electricity provider that provides a 100% renewable plan, and has a higher renewable portfolio for the default plan and comparable or better costs than Eversource.
2. Determine priorities for sourcing different types of renewable energy, prioritizing actual renewable and carbon neutral or better energy generation, and including considering town owned generation projects.

Endnotes

¹ US Department of Energy, Office of Energy Efficiency and Renewable Energy, Alternative Fuels Data Center, Electric Vehicle Registrations by State, <https://afdc.energy.gov/data/10962>.

² US Department of Energy, Office of Energy Efficiency and Renewable Energy, Alternative Fuels Data Center, <https://afdc.energy.gov/> , NH State Data accessed March 2025.

ARTS, CULTURE AND HISTORIC RESOURCES CHAPTER

Adopted xxx 2026



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Vision

Newmarket will be a community where arts, culture and history are not just part of a storied past but are the heart of our contemporary identity - expressing who we have been, who we are, and who we hope to be. These values will be woven into the very fabric of living, where residents, workers, students and visitors participate and take pride in the vibrant cultural life to be found in every corner of town. Newmarket's continued commitment to the arts, its culture, and historic preservation and restoration will significantly contribute to the town's unique community character.

Executive Summary

From a rich history in shipbuilding to the present-day thriving arts scene, the Town of Newmarket has evolved over time with each generation taking its turn in shaping the community. Today's Newmarket places a high value on the role that arts, culture and historic resources play in contributing to the quality of life for residents and recognizes that they also provide a destination for tourists, which strengthens the local economy. The Town prides itself in offering a myriad of arts, cultural and historic programs and events that connect people to their past, present and future – highlighting the culture of Newmarket that is unique within the Seacoast region.

The Town is fortunate to have a number of organizations focused on cultivating arts, culture and historic resources - all of which contribute to Newmarket's sense of community. The Town aspires to be a place where artists, residents, visitors, businesses can connect both in person and online, enhancing the economic and social aspects of the entire community, and engaging people who are not able to experience events or visit in person.

There are many actions and investments Newmarket can make to achieve these goals, such as developing a robust website that coordinates all of the various arts, culture and historic programs and events, including a digital library, as well as investing in a creative and engaging wayfinding system for people to access events and places from well-defined parking areas. In addition, the Town should work toward creating a recognizable town brand/identity, which may evolve organically or deliberately, to engage residents and attract visitors for the purpose of building vibrancy and financial efficiency for local artists and businesses.

Master Plan Themes

Five guiding themes emerged from the public engagement process: Vibrancy, Connectivity, Accessibility, Affordability, and Resiliency. Each Master Plan chapter uses the themes to explore the subject matter from different perspectives, helping to focus community goals and actions.

Vibrancy

For Arts, Culture and Historic Resources, a vibrant community provides spaces where people can interact and connect to their past, present and future, engage in community activities, and attract tourists of all ages. A vibrant community recognizes that ongoing investment in arts, culture and historic preservation is a priority, provides opportunities for public performances, artistic education and engagement, and supports individual artists and their ability to thrive financially.

The Town of Newmarket occupies a rich and vibrant place on the New Hampshire seacoast. In 2027 the Town will celebrate 300 years as its own municipality, where people from all over the world have sought economic opportunities and a better life in a beautiful setting. The Town's status as a desirable place to live is rooted in its history and the present-day vitality of its people. The Town's most attractive attribute and its greatest source of strength comes from its people and how tightly knit and proud they are of their community, which uniquely sits on the edge of the Lamprey River. Newmarket's vibrant downtown is host to public arts and cultural offerings, as well as thriving local performance venues such as the Stone Church, Millspace and Rockingham Ballroom, which together help to attract visitors and strengthen local business opportunities. The Downtown Riverfront Chapter examines the history and present day uses in Newmarket's downtown riverfront area and establishes goals and actions for maintaining its vibrancy including "Celebrate the social, economic, and natural history of the Downtown Riverfront area" and "Incorporate arts and culture into riverfront improvements and activities."

Residents place a high value on the role that arts, culture and history play in contributing to vibrancy. This was confirmed by public input collected during the Master Plan Survey and workshops. The top cultural resource priorities selected by respondents were the creation of outdoor and indoor venues for performing arts, art festivals, walks, showcases or tours, and murals to showcase Newmarket history and culture (see Appendix E).

Participants at the September 2024 Master Plan workshop identified potential locations for performing arts venues mostly near and within existing community assets. Potential outdoor areas include Leo A. Landroche Memorial Field - Jr/Sr Highschool; Newmarket Elementary School; Schanda Park; and the Public Works Department.

Indoor areas include South Main Street (near Jr/ Sr Highschool); The Loft; and Beech Street Extension.

Respondents to the Master Plan Survey also identified the types of cultural events that most appealed most to them, which included performance art, art appreciation activities, historical tributes and recognition, and art making experiences (see Appendix E). Newmarket hosts a wide array of cultural activities which encourage social engagement and connection (see Appendix E). These events contribute

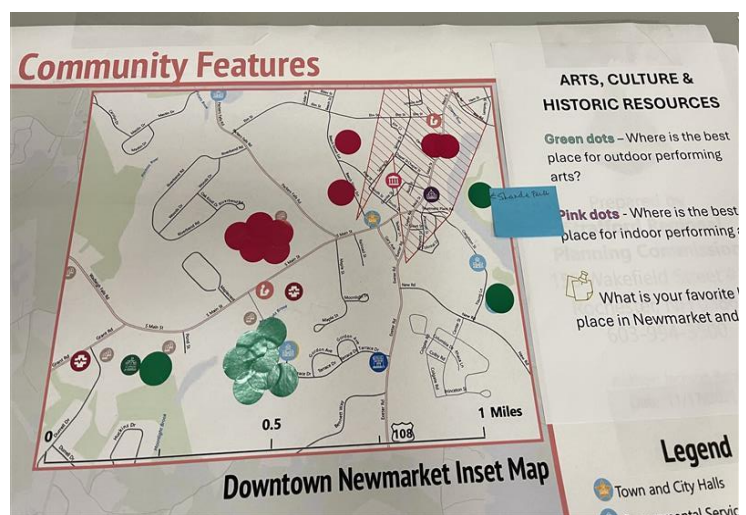


Figure 1 September 2024 Master Plan workshop results

to Newmarket's vibrancy and would not be possible without the committed and engaged residents who work to develop, promote and host them. Newmarket is fortunate to have a rich foundation from which to showcase its resources throughout town and room to continue to engage future generations of residents and visitors.

Opportunities to expand arts, culture and historic offerings include the addition of murals in key downtown locations such as Elm Street, along and near Main Street, as well as the at the Library. As noted above, the community would support the development of additional outdoor spaces for public engagement throughout town, including the Historic Firehouse Project, Cheswill Monument at Arbor Park, Vietnam Memorial, as well as at the Library and schools. In addition, art installations should be considered as part of any new public projects along the River Front, Heron Point, Schanda Park, as well as other redevelopment projects, Arbor Park, and in appropriate rights of way, South Main St Extension, Civil War Memorial, and in pocket parks.

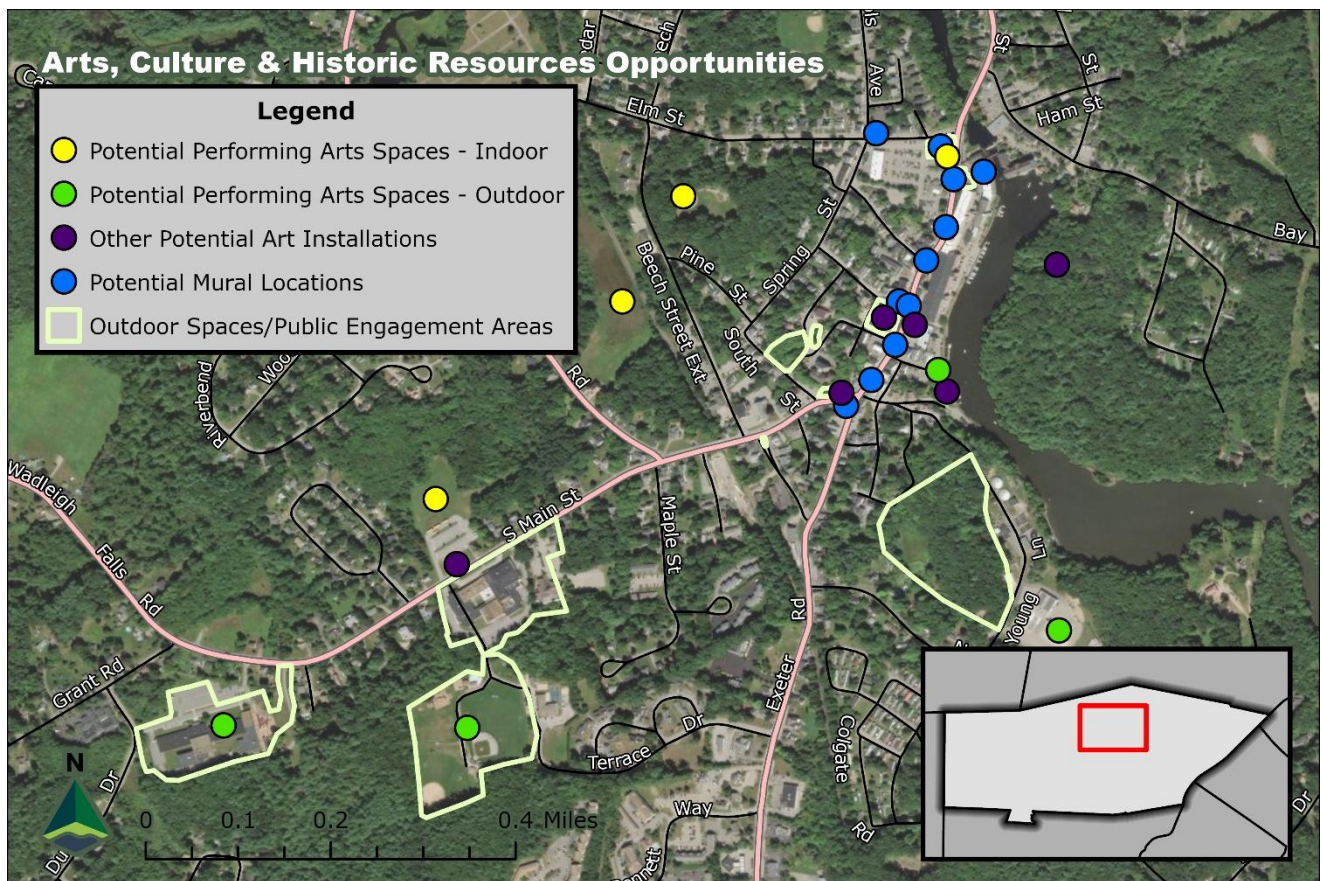


Figure 2 Potential arts, culture & tourism locations

Other future activities could include more arts-driven festivals, where people come from neighboring communities and beyond to enjoy live music (indoors and out), to browse and purchase art from gallery spaces and at art walk events, and to attend ticketed and free community theatre performances

Vibrancy Goals

1. Create fertile ground for a vibrant and sustainable arts and culture ecosystem in which both existing and new artists are welcomed, recognized and supported for their essential contribution to creating and maintaining a thriving, healthy and innovative town.
2. Newmarket should be recognized as a destination for the arts, driving tourist visitation and strengthening the local business environment. Consider opportunities to maximize the downtown stretch of the Lamprey River as a festival environment that would enhance the draw.
3. Foster an appreciation of historic preservation as a vital aspect of community character. Leverage Newmarket's history as a source and springboard for artistic expression in a variety of forms—visual, literary or performative.

Connectivity

For Arts, Culture and Historic resources, connectivity is experienced through organizations collaborating to bring educational and cultural events and programs to Newmarket, and through the intentional act of placemaking, creating spaces both on-line and in person, where artists, residents, visitors, businesses can connect, enhancing the economic and social aspects of the entire community.

Newmarket's priority for history, arts and culture is evident in the strong organizations that focus on these efforts, including the New Market Historical Society, the Arts, Culture and Tourism Commission, the Millspace, Newmarket Main Street Corporation, Newmarket Public Library, Friends of the Newmarket Library, Bloomin' Newmarket, among others. Cultural events and efforts focusing on connecting people to their past, present and future include Newmarket's 300th Anniversary celebrations and accompanying book, Elm Street Mural Renovation and more.



Figure 3 Mural at Willey House Central Park (Image: Newmarket Arts, Culture & Tourism Commission)

While the Town's organizations often plan, host and carry out community cultural events together, there is room for improving collaboration, connections and relationships. This could include making sure there is cross representation on boards to facilitate communication or simply meeting on a regular basis to share ideas and to understand each other's action priorities. Collaborative fundraising is also a way for groups

to work together to develop, write and partner on funding opportunities through Town, State and Federal grants, sponsorships, and other contributions.

Connectivity occurs by creating spaces, both on-line and in person, where artists, residents, visitors, and businesses can connect, enhancing the economic and social aspects of the entire community. Improving the range of digital options available for people who are not able to experience events or visit in person expands the way the community connects with each other and visitors from near and far. This could include developing a robust Arts, Culture and Tourism website that explores the murals, art installations, historic buildings and other locations in town, filming and streaming cultural events, and promoting and enhancing the resources that exist on New Market Historical Society or Newmarket Main Street Corporation websites.

Connectivity Goals

1. Encourage town policymaking and practices to integrate creative thinking into the work of every municipal department and all planning efforts.
2. Collaborate across institutions, sectors and organizations, to generate excitement about, interaction with, and demand for resources to support arts, culture, historic resources and tourism.
3. Organize arts networking events to connect the arts community and strengthen collaboration and participation among artists and arts organizations/businesses.

Affordability and Accessibility

For Arts, Culture and Historic resources, an affordable and accessible community provides opportunities for people of all economic and social backgrounds to enjoy and participate in community programs, events and activities.

Through the redevelopment process of the mill buildings, the Town requested that affordable live-work spaces be incorporated into the construction. The mills have been successfully renovated and are thriving, however, the status of affordable options should be further investigated. Newmarket should continue to encourage the creation of these types of affordable places. Newmarket's rich arts, culture and historic resources are generally available to residents and tourists of all ages free or at a reasonable cost. Examples of these resources include the New Market Historical Society's downtown walking tour and the Newmarket Main Street Corporation's Historic Plaque Project.

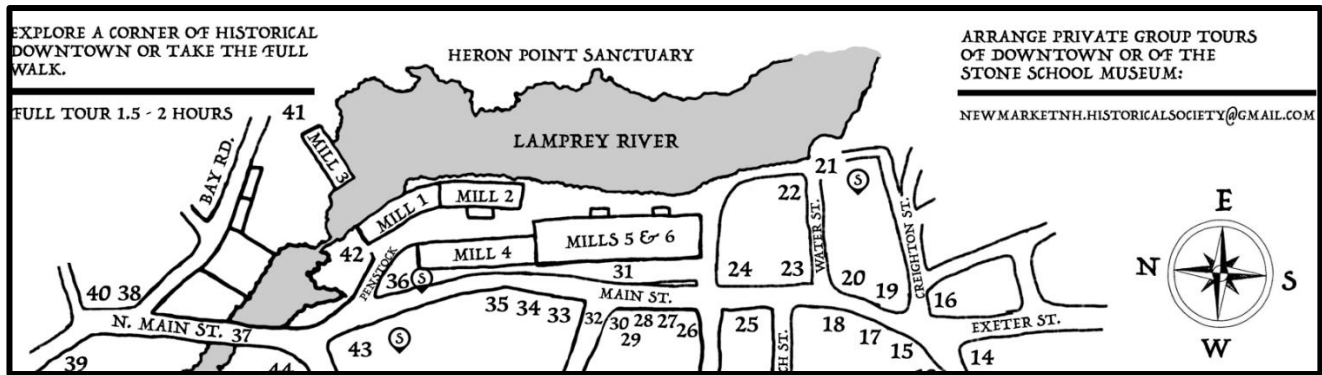


Figure 4 Newmarket Historical Society Walking Tour

As noted in the Connectivity section, there are many organizations that foster engagement through community programs, events and activities. Publicity and outreach for these events is vital so that people know what is happening in town and can participate in person or virtually. A centralized communication system is needed for people to be informed about programs, activities and events. This could include easily accessible and strategically placed information kiosks, as well as an online hub of information that includes a digital library for those unable to physically access public forums and activities.

Along with a communication system, it is also important for people and visitors to be able to know where to park and how to get to the event or place from parking areas. Newmarket should investigate developing a comprehensive wayfinding system that directs people along safe walkable routes from parking areas to their destination using maps or other creative signage. The Transportation and the Downtown Riverfront Chapters establish goals prioritizing the creation of clear and prominent wayfinding for downtown and as well as throughout town not only to expand navigation and walkability, but to also bolster community identity using creative and engaging signage. Helping visitors to find unique art and culture installations throughout downtown would add to Newmarket's unique downtown experience.

Accessibility / Affordability Goals

1. Engage people of all ages and abilities in existing and new art and historical experiences.
2. Create a centralized information system that coordinates online and in person outreach for all Newmarket organizations that is easily accessible for residents and tourists.
3. Cultivate a town where all cultural and ethnic traditions and expressions are respected, promoted and where opportunities to engage with arts and culture are accessible to all.

Resiliency

For Arts, Culture and Historic Resources, resiliency means that these resources remain a priority in civic life and that the next generation be engaged in their continued stewardship.

Newmarket enjoys a solid foundation of organizations, volunteers, residents, businesses and public institutions that together form the fabric of Newmarket's cultural identity. To ensure that this continues for future generations, Newmarket should continue to invest time and resources to support these efforts.

The economic and social impact of nonprofit arts and culture organizations and their audiences is well documented by many sources, including Americans for the Arts annual Arts and Economic Prosperity surveys. Surveys completed in the Seacoast region demonstrate an appreciation for how the arts and culture impact the social well-being of the community and its residents. Respondents valued venues and events as pillars of the community, inspiring pride, and worthy of support for future generations, and felt that private and public investment in arts, culture and historic resources brings a return on investment.

Newmarket's cultural institutions are considered community assets, but they are also businesses. They depend on a healthy mix of residents and visitors to sustain them and help them prosper. A vibrant arts culture keeps residents spending locally and encourages visitors which helps strengthen the economy. The Town of Newmarket can support the local economy by partnering with local organizations and businesses to develop an engaging marketing campaign to promote the town as a destination for arts, culture and historic resources.

As noted throughout this chapter, Newmarket enjoys the energy, time and attention of committed and enthusiastic volunteers, businesses, and municipal staff. They are stewards of the town's arts, cultural and historic resources and sustain the programs and events that occur throughout the year. Newmarket should continue to invest in preserving and enhancing these resources and foster an atmosphere where organizations and programs can evolve and engage new generations.

Resiliency Goals

1. Integrate arts, culture and historic resources into all aspects of civic life, inspiring residents and visitors to value, practice and reap the benefits of creativity in their individual lives and in their community.
2. Create a marketing campaign to promote the town as a destination for arts, culture and historic resources.
3. Ensure that historic resources are preserved for future generations.

LAND AND WATER CONSERVATION CHAPTER

Adopted xxx 2026



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Vision

Our community will ensure a healthy and resilient future by preserving the natural environment in harmony with sustainable development and economic opportunities. Strategic planning will aim to strengthen critical infrastructure and promote land use practices that protect our valuable environmental assets – clean air; safe and abundant drinking water; freshwater wetlands, salt marshes, and floodplains; river corridors, shoreland buffers, and stream crossings; and critical wildlife habitats and intact forests – while supporting appropriate community growth.

Sustainable land use practices will protect ecological, scenic, and recreational values, as well as improve economic prosperity. Through strategic conservation and land management, we envision a network of interconnected open spaces, a robust trail network, and a revitalized downtown riverfront that enhances our community's character and well-being.



Figure 1 Meadow at Wiggin Farm Conservation Area (source: E. Snyder)

Executive Summary

The Newmarket Land and Water Conservation Chapter of the Master Plan was created by merging the most relevant components of the Town's Open Space Plan (2024) and Water Resources Chapter (2020) into one succinct document and organizing its goals and recommendations to align with the five themes of the master plan. Integrating these two chapters allowed for a more robust discussion of Newmarket's land and water resources, and the central role they play in contributing to the community's identity by providing recreational, ecological, and engagement opportunities. Public input obtained during the engagement process helped to inform the chapter narrative and was used to confirm prior recommendations. The Open Space Plan and Water Resources Chapter, in their entirety, are attached as Appendices.

The Open Space Plan, which was originally developed in 2007, was updated in 2024 to serve as a guide to advance conservation and management strategies that promote resiliency, stewardship, and stability between the needs of the environment, wildlife, and the community. Additionally, the updated plan describes a vision of distinct and multifunctional open spaces that are secured and properly maintained to enhance the character and well-being of the community. The Water Resources Chapter was adopted by the Planning Board in 2001 and 2009. The 2020 update considers shifts in development patterns, increases in population, and impacts from changing climate conditions and reinforces the need to protect surface and groundwater resources, wetlands, floodplains, and protect against emerging threats to drinking water supplies.

Together, these two chapters outline a vision that seeks to balance the need for development with conservation efforts that protect essential habitats, reduce pollution, and promote responsible stewardship. Strategic land use regulations and policies are necessary to support growth, while preserving the Town's natural assets and enhancing recreational opportunities through the expansion of parks and green spaces, trail connectivity and wayfinding, and access to waterways. Avoidance of wetlands and floodplains, as well as the restoration of stream crossings will preserve aquatic and upland habitat connectivity and support wildlife, biodiversity, and outdoor activities like hiking and fishing. Addressing climate vulnerabilities, protecting riparian buffers, and educating residents on the importance of protecting water quantity and quality will ensure the long-term sustainability of existing and future drinking water supplies.

The integration of the Open Space Plan and Water Resources Chapter into the Newmarket Land and Water Conservation Chapter provides a comprehensive framework to guide the community's conservation efforts. Through strategic planning, public input, and careful consideration of emerging challenges, Newmarket can continue to foster a thriving, resilient landscape that balances



Figure 2 Piscassic River (source: E. Snyder)

ecological preservation, recreational opportunities, and responsible stewardship for future generations.

Master Plan Themes and Goals

Five guiding themes emerged from the public engagement process: Vibrancy, Connectivity, Accessibility, Affordability, and Resiliency. Each Master Plan chapter uses the themes to explore the subject matter from different perspectives, helping to focus community goals and actions.

Vibrancy

A vibrant community encourages outdoor recreation, promotes ecological stewardship, and actively engages the public in preserving local landscapes and waterways for future generations.

Newmarket's land and water resources are central to our community's identity. The town's rivers, wetlands, uplands, and other open spaces offer opportunities for recreation, ecological stewardship, and public engagement. By enhancing access to open spaces, encouraging active participation and education in conservation efforts, and preserving the community's natural assets, Newmarket can foster an even more vibrant, inclusive, and connected environment.

Findings from the 2023 Open Space and Housing Survey in Newmarket reveal that over half of respondents visit parks, recreation areas, and conservation lands at least weekly, underscoring the importance community members place on access to open space. Outdoor spaces that offer diverse recreational opportunities add to Newmarket's vibrancy. We can increase community awareness of and deepen connections to Newmarket's lands and waters through expanded offerings of workshops, field trips, educational and volunteer initiatives, and civic engagement. Investments in signage, wayfinding efforts, and infrastructure improvements will help ensure that these areas remain accessible and ecologically sustainable.

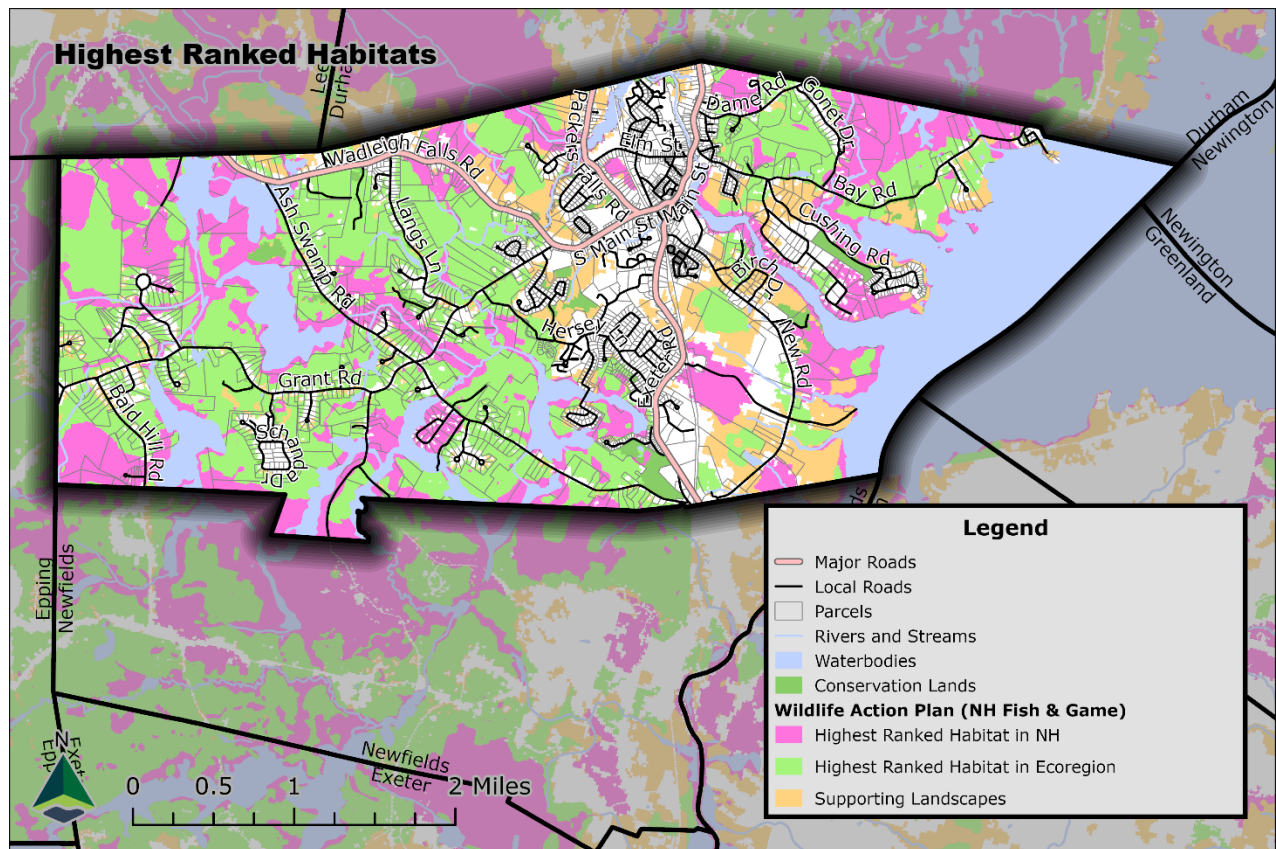


Figure 3 NH Wildlife Action Plan Data (source: SRPC)

The highest ranked in the State habitats include the top 15% by area for each type, with rare habitats (e.g., alpine, dunes, salt marshes, rocky shores) fully included due to their importance. Known critical habitats for state-listed species were also added. Highest Ranked in the Biological Region compares habitats within areas of similar climate, geology, and other biological factors. The top 30% of each habitat is included per region, excluding areas already ranked as Highest in the State. Additional high-priority natural communities identified by the NH Natural Heritage Bureau were added to highlight plant diversity. Supporting landscapes includes the remainder of the top 50% of each habitat area mapped as part of the resilient and connected network by the Nature Conservancy.

Outreach and education, paired with regulatory, zoning, and conservation tools, will encourage stewardship of our shared public assets. Conservation and stewardship of open spaces will maintain native plants and animals and their habitats, reduce erosion and pollution, protect groundwater recharge areas, and a host of other values, while also providing enriching outdoor enjoyment.



Figure 4 Heron Point Sanctuary looking south at the Lamprey River (source: E. Snyder)

Vibrancy Goals

1. Enhance Public Engagement – Increase opportunities for residents to participate in water and land conservation through workshops, surveys, field trips and events, volunteer citizen science efforts, stewardship workdays, and more.
2. Promote Recreation Areas – Expand and enhance recreational access to rivers, trails, and conserved areas to foster community and stewardship.
3. Conserve Natural Resources – Protect the Great Bay Watershed, including the Wild & Scenic Lamprey River and its tributaries, and associated freshwater wetlands, salt marshes, and freshwater and tidal rivers.
4. Support Biodiversity through Conservation – prioritize habitat protection of conservation focus areas that benefit people and nature, strengthening community engagement and stewardship.
5. Protect Drinking Water – protect existing and future drinking water supplies
6. Enhance and Maintain Flood Storage Capacity – protect floodplains, wetlands, and shoreland buffers

Connectivity

A connected community provides links between essential locations such as residential areas, job centers, and schools with recreational areas through well-integrated and maintained sidewalks and trail networks and maintains connectivity across undeveloped lands for nature via wildlife corridors, unfragmented forest blocks, rivers, and streams.

In Newmarket, a network of lands and waters link people to their daily needs, recreational opportunities, and natural areas. These networks strengthen our connectivity and further our identity as an accessible and welcoming community.

Trails that link the built and natural environments strengthen a sense of place, enhance mobility, and help promote sustainable transportation options. Wayfinding signage enhances access for people of all abilities, expanding residents' and visitors' understanding of the ecological and cultural significance of the town's lands and waters, fostering a greater appreciation and connection to Newmarket's open spaces.

Preserving and restoring aquatic and upland habitat connectivity ensures that we enable the safe movement of wildlife throughout the region. Our interconnected network of conserved areas on public and private land provides this connectivity as well as habitat for a rich diversity of native plants and animals. Residents and visitors enjoy the benefits of these protected spaces too, through outdoor activities such as hiking, cycling, fishing, and birdwatching.

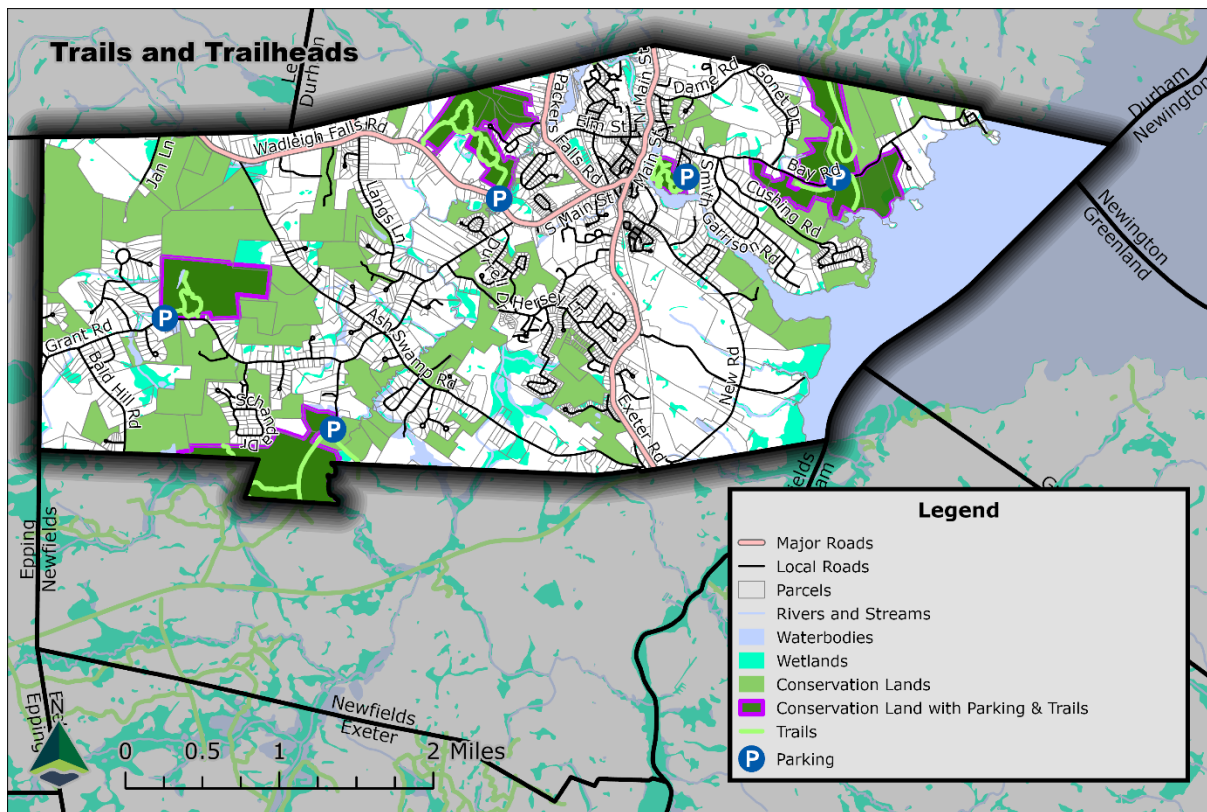


Figure 5 Trails and Trailhead Locations

Aquatic connectivity is essential for maintaining the ecological health and resilience of our waterways. Restoring stream crossings and improving culverts not only supports biodiversity but also enhances public safety by reducing flooding risks. Preserving riparian buffers along the Lamprey and Piscassic Rivers will help protect water quality and prevent erosion while ensuring these natural corridors continue to serve as vital links for wildlife and recreation. Green infrastructure, including rain gardens and permeable pathways, can also play a crucial role in improving aquatic and natural connectivity, mitigating stormwater runoff, and enhancing water quality.

Connectivity Goals

1. Promote Wildlife Corridors – Maintain connectivity between habitats by preserving natural spaces.
2. Expand Trail Networks – Develop trails and interconnections between trail systems that link built and natural assets in Newmarket and surrounding communities.
3. Improve Aquatic Crossings – Restore stream crossings to support biodiversity and reduce flooding risks, which will also improve public safety.
4. Protect Connectivity between Surface and Groundwater – protect wellhead areas and stratified drift aquifers to ensure healthy and abundant drinking water supply.

Accessibility

An accessible community provides recreational and open spaces, such as parks, conservation lands, and waterways, that are designed to be inclusive, welcoming, and available to people of all abilities.

As an accessible community, we want to ensure that all residents benefit from Newmarket's lands and waters, including access to recreational opportunities, safe transportation options, and outdoor public spaces. By incorporating universal design, improving trail and sidewalk connectivity, and ensuring open spaces remain available to people of all abilities, we can foster inclusive and enriching outdoor experiences.

Improving and promoting access to public waterways and natural areas will encourage broader community engagement and support for stewarding these public spaces and assets. Investments in alternative transportation options that connect key recreational and natural areas will help ensure that residents without personal vehicles can access these open spaces. Clear and easily accessible information about trails, conservation efforts, water quality, and outdoor activities helps ensure that the community can fully engage with and appreciate Newmarket's natural resources. Creating fishing piers, developing accessible docks, and creating improved signage will enhance access to water-based recreational opportunities for all.

Access to safe and abundant drinking water is an essential benefit available in our community. This requires continued education and awareness about reducing erosion, pollution, and stormwater runoff from land into waterways and groundwater recharge areas. This will ensure that we can protect and maintain this vital resource for all residents.



Figure 6 Piscassic River at Sliding Rock Conservation and Recreation Area (source: E. Snyder)

Accessibility Goals

1. Develop Inclusive Open Spaces – Develop accessible parks and trails and upgrade infrastructure for safe and accessible access to natural and recreational assets.
2. Enhance Water Resource Education – Promote outreach and information about conservation, environmental stewardship, and water quality.
3. Increase Access to Waterways – Invest in improvements to infrastructure to strengthen recreational use accessibility.

Affordability

An affordable community is one where residents have access to housing and economic opportunities based on sustainable development patterns and practices that allow growth, while preserving natural resources and infrastructure that benefit all residents.

Available land in Newmarket holds immense value for both conservation and development, as it serves as a critical resource for preserving biodiversity and ecosystem services, while also enabling economic growth and meeting the housing demand. Balancing these two uses, as to not disrupt general supply and demand principles that can drive up costs, requires thoughtful and intentional planning that integrates conservation with strategic housing and economic development initiatives. Policies that encourage mixed-use zoning, conservation-minded approaches, and sustainable practices will support long-term affordability while preserving the town’s character. By prioritizing strategic land use planning, leveraging local natural assets for economic benefit, and strengthening regional collaborations, Newmarket can ensure that affordability remains a central focus.

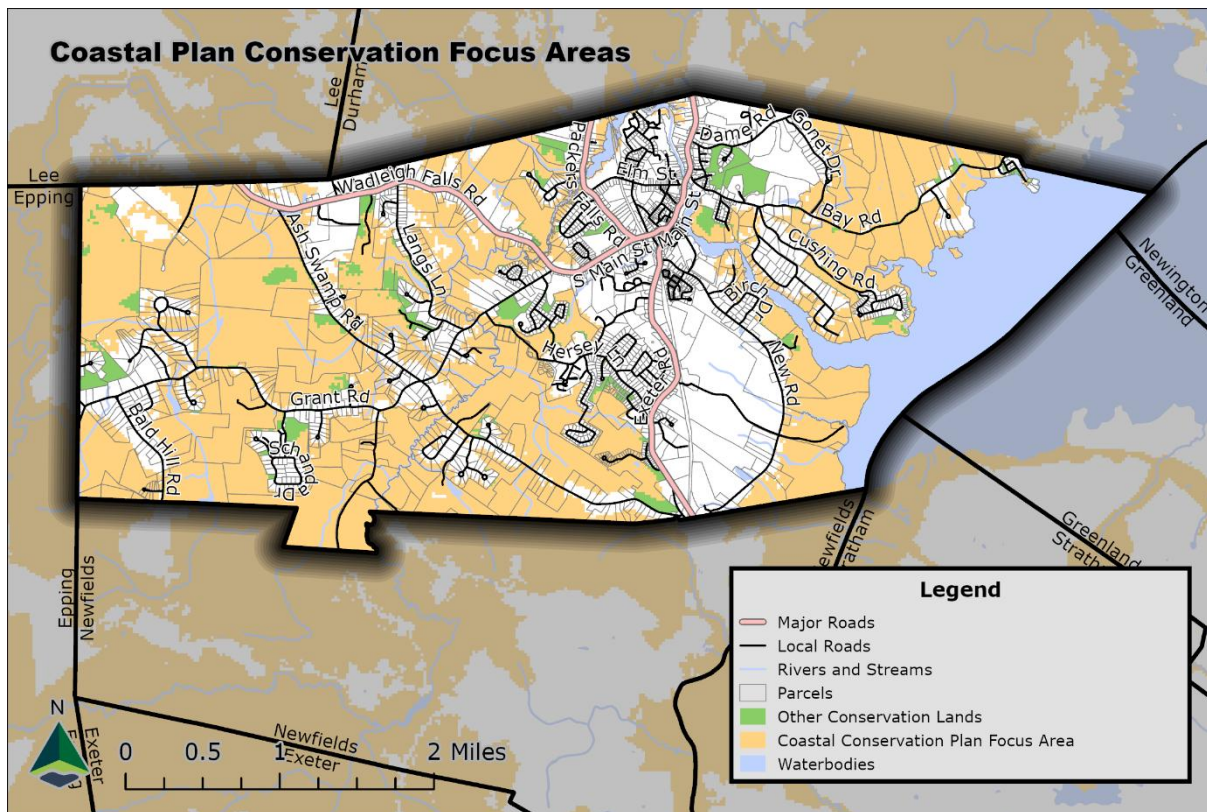


Figure 7 Coastal Plan Conservation Focus Areas

Conservation-based economic development offers an opportunity to enhance affordability while supporting the local economy. Ecotourism initiatives that leverage Newmarket's natural resources can create jobs, attract visitors, and generate revenue for local businesses, all while promoting sustainability and resource preservation. Additionally, supporting local food production and other farm-to-table initiatives such as farmstands, community gardens, and community-supported agriculture can strengthen the local economy while preserving the town's character. A local economy can thrive through conservation, ensuring that economic growth supports the community without causing negative environmental impacts.

Public parks, conservation lands, and outdoor spaces that are easily accessible allow all residents to enjoy the town's natural resources. Expanding trail networks, public water access points, and green spaces near residential areas will provide more opportunities for outdoor recreation while maintaining both affordability and accessibility.

Partnerships with regional, state, and federal agencies, as well as nonprofit organizations and conservation groups, can expand opportunities for community investment and resource protection. These partnerships can provide financial and technical assistance to help Newmarket implement land use strategies, conservation programs, and economic initiatives focused on affordability. Extending these partnerships to include knowledge sharing, research collaboration, and resource management strategies will further enhance the town's ability to maintain affordability while preserving its natural assets. Additionally, leveraging public-private partnerships by fostering

relationships with private-sector partners and local businesses can bring in extra resources and innovative solutions.

Affordability Goals

1. Incorporate Sustainable Land Use Changes – balance development, housing, open space, and conservation in strategic ways that ensure affordable and healthy living options.
2. Encourage Conservation-based Economic Development – explore pathways to support the local economy with eco- or agritourism that benefit the community.
3. Develop and Expand Conservation Partnerships – collaborate with regional, state, and federal partners, organizations, and agencies to expand opportunities for community investments.

Resiliency

A resilient community works collaboratively with regional partners and neighboring communities to build sustainable infrastructure, maintain healthy ecosystems, and protect air and water quality, all to withstand and recover from the shared challenges of changing environmental conditions.

Changing and unpredictable environmental conditions requires us to incorporate resiliency and ruggedness into our built and natural infrastructure. Newmarket can strengthen its ability to withstand and recover from future adversity by developing climate adaptation strategies, protecting critical lands, as well as surface and groundwater resources, maintaining critical infrastructure, and engaging in ecosystem restoration efforts.

Preserving wetlands and floodplains is essential for mitigating the impacts of flooding and maintaining biodiversity and ecological health. Restoring ecosystem function, includes re-building better stream culverts, improving aquatic habitat, reducing flood damage, and improving public safety along roads. These efforts, along with education, careful planning, and conservation of wetlands, riparian areas, and other natural areas are valuable tools in building resilience in our community.

Threats to existing and future drinking water supplies, such as prolonged periods of drought, increases in demand, emerging contaminants, changes in land use, and rising groundwater levels,

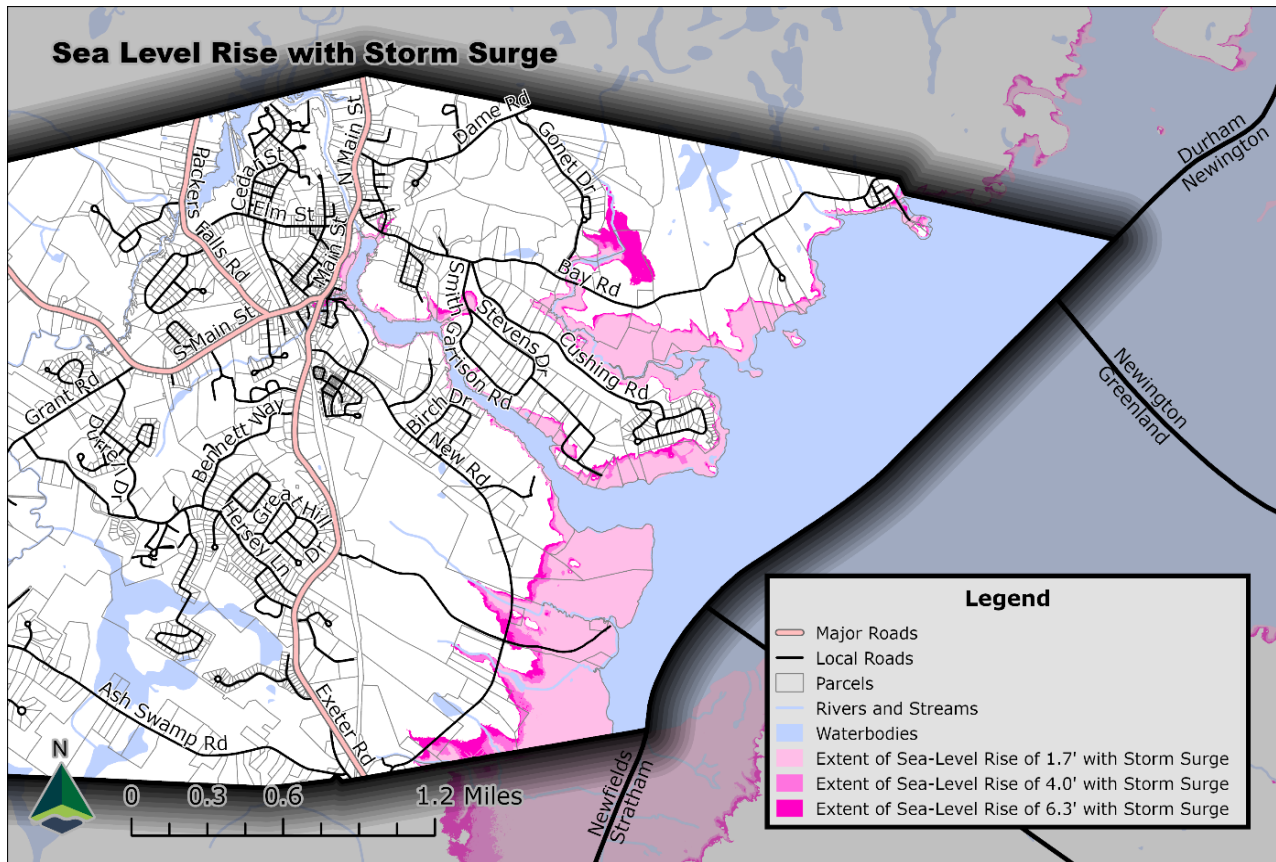


Figure 8 Sea Level Rise with Storm Surge

poses new and complicated challenges that will need to be addressed through appropriate regulatory mechanisms, outreach, and infrastructure investment.

Climate strategies that incorporate regular assessments of the community's vulnerabilities and the risks associated with extreme weather will guide future planning decisions and community investments. Developing local policies based on these assessments will help ensure that the community's decisions are well-informed, and that the town is prepared to withstand changes or challenges. Collaborating with neighboring communities to address the impacts of increased flooding, water supply issues, water infrastructure needs, and other water management challenges is a key component of building local and regional resiliency.

Resiliency Goals

1. Develop and Implement Climate Strategies – develop regular assessments of community vulnerability to aid in future planning and investments.
2. Preserve Wetlands and Floodplains – develop plans and actions to protect these natural areas to enhance ecological resilience and mitigate flood risks.
3. Regional Water Management Collaborations – work with other communities on regional efforts to address shared challenges with water resources.
4. Ecosystem Restoration – develop projects that strengthen natural areas and resources.
5. Protect Long-Term Drinking Water Supplies – ensure quantity and quality of drinking water sources are protected through environmentally sensitive land use regulations.

DOWNTOWN RIVERFRONT CHAPTER

Adopted xxx 2026



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Vision

Newmarket's Downtown Riverfront will be recognized and celebrated as a place where the community enjoys the Lamprey River from the shoreline or from the water. The Downtown Riverfront will bolster local businesses and connect people with the beauty, serenity, and natural resources of this special place in the community. The area will offer diverse opportunities for the community to enjoy the Lamprey River. Existing publicly owned land will be reimagined to enhance public access to the riverfront. The Town will work thoughtfully and strategically with property owners and the community to identify creative solutions to create a cohesive riverwalk and pedestrian network, while respecting private property rights. Improvements and infrastructure projects will strive to maximize climate resiliency, integrate arts and culture, and protect natural resources and water quality.

Executive Summary

Like many mill towns in the state, Newmarket's industry and downtown grew around its riverfront. Situated at the head of the tide on the Lamprey River and steps from Main Street, the Downtown Riverfront is a bridge between the natural and the historic and contemporary built environment of Newmarket that continues to define the character of the community.

The importance of the Downtown Riverfront to the town warranted the addition of this new chapter of Newmarket's Master Plan. The geographic scope of this chapter extends north to the NH Route 108 bridge over the Lamprey River and south to the water treatment plant parcels and east to include Heron Point Sanctuary (see map below). Key components of the riverfront that are explored in this chapter include Schanda Park, The Riverwalk, Heron Point, Leo Filion Park, and Town property to the south of the Upper Narrows, and the linkages to these locations.

The central amenity of the Downtown Riverfront is Schanda Park, a small, well-utilized destination for enjoying the river and wildlife, walking, enjoying a picnic, launching a kayak or motorized watercraft, or attending a concert or event. The community has envisioned redesigning this space to increase its accessibility, functionality, and resilience.

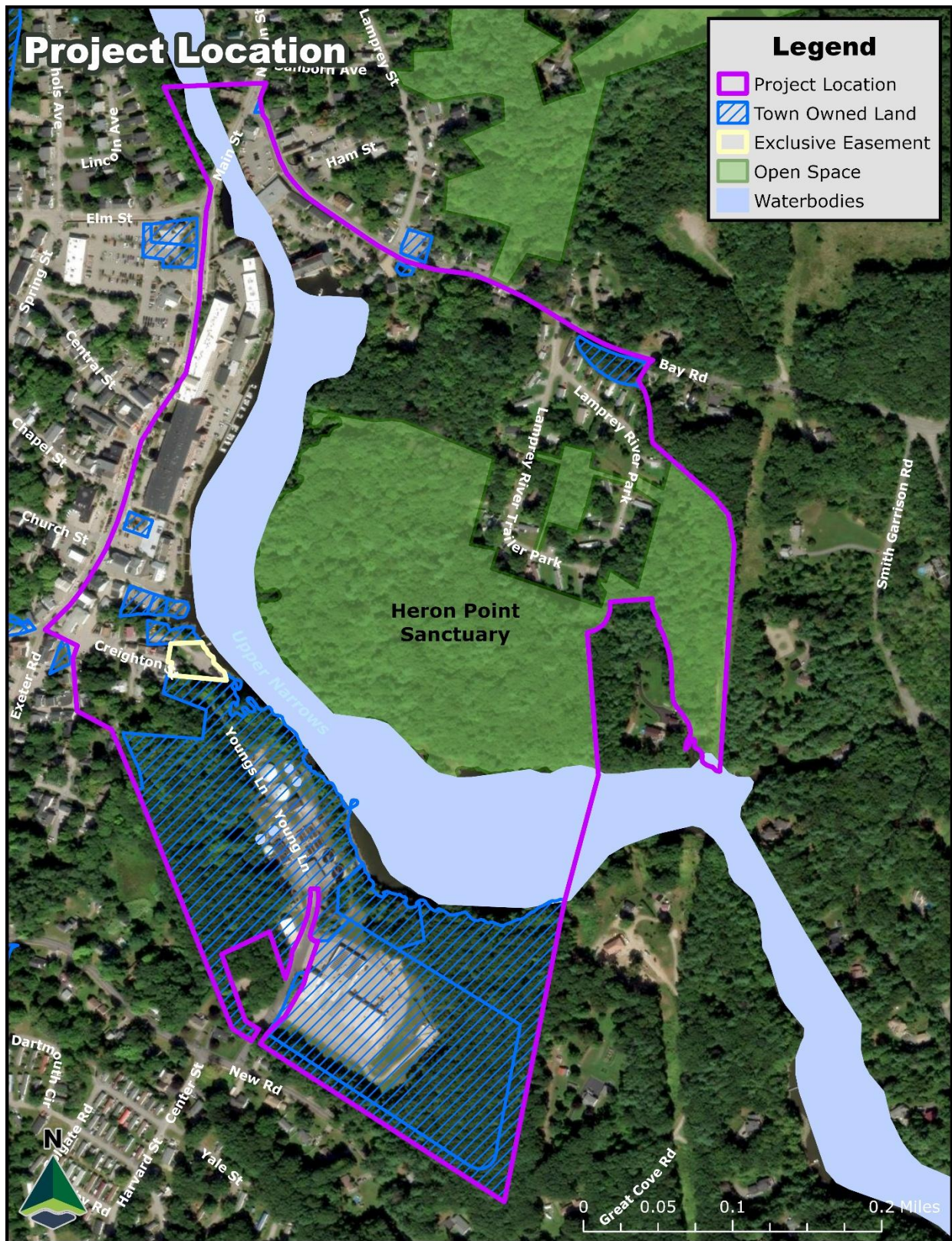
The Town aims to enhance the connectivity of the Downtown Riverfront through improvements at existing public lands, wayfinding, and identifying alternative ways to access destinations like Heron Point. One of the key challenges and opportunities in the Downtown Riverfront is navigating the patchwork of public and private property in this location in order to enable greater public access to the riverfront and water-based activities while respecting private property rights. The Town plans to gather information on existing property agreements to best understand existing property divisions and work with private abutters to develop a mutually beneficial approach to connectivity of public areas.

To realize the vision for the Downtown Riverfront, the Town has identified several key recommendations, including:

- Celebrate the social, economic, and natural history of the Downtown Riverfront area through increased educational signage and art

- Establish a cohesive riverwalk
- Improve Moonlight Brook and Creighton Street Pump Station infrastructure
- Advance the conceptual plan for Schanda Park
- Develop a workplan for the implementation of Downtown Riverfront projects.

In 2024, the Town engaged Strafford Regional Planning Commission (SRPC) and consulting firm EF | Design & Planning, LLC to create the Downtown Riverfront Chapter under the direction and guidance of the Newmarket Master Plan Committee, the Riverfront Advisory Committee, and Town staff. The Team captured input from the community on the current use and desired future use of the riverfront through a community-wide survey, a public forum, a Plan NH Design Charrette, and several stakeholder meetings. The input collected during these engagement efforts and through conversations with stakeholders directly informed the development of this chapter and its recommendations.



Aerial image of the Downtown Riverfront (source: SRPC)



Downtown Riverfront (source: EF | Design & Planning, LLC)

Master Plan Themes and Goals

Five guiding themes emerged from the public engagement process: Vibrancy, Connectivity, Accessibility, Affordability, and Resiliency. Each Master Plan chapter uses the themes to explore the subject matter from different perspectives, helping to focus community goals and actions.



View of the Downtown Riverfront from the south (source: Tom Morgan)

Vibrancy

A vibrant community is one that exudes energy and is full of activity and life. It is welcoming and friendly to all ages, supports cultural diversity, and provides economic opportunities.

Relative to the Downtown Riverfront, vibrancy means places to gather and enjoy the Lamprey River and surroundings, a healthy ecosystem, and thriving water-dependent and waterfront-enhanced uses.

The riverfront is widely utilized by the community in a variety of ways and is a critical element of Newmarket's downtown and identity. Public input collected during a Master Plan survey and workshops confirmed that one of the most popular activities in the Downtown Riverfront is walking. The riverfront is also used for parking, boating, picnicking, concerts, and enjoying natural spaces and views. The Downtown Riverfront is a place for relaxing and taking in the natural surroundings, including the birds and ducks that frequent this area. Scenic outdoor space, access to the river, high foot traffic, and proximity to Main Street, and the historic mills – along with their commercial and residential occupants – contribute to the vibrancy of the Downtown Riverfront. The variety of land uses in this area, including conservation land and parks, commercial, industrial, mixed-use, and residential land, helps to create this diversity of uses and experiences in the Downtown Riverfront.

The heart of the Downtown Riverfront is an 0.36-acre Town-owned park located on parcels at the end of Water and Creighton Streets that are adjacent to the Lamprey River. This waterfront space was acquired by the Town in 1981 and 1984 with funds from the National Park Service

Land and Water Conservation Fund. Additional funding from the Land and Water Conservation Fund enabled the development of boating facilities in 1984. In 2004, with improvements funded by a New Hampshire Department of Environmental Services Coastal Program Grant¹ and other donors, the park was renamed Richard Schanda Conservation Park, after Richard “Red” Schanda (1929-2004), a lifelong resident of Newmarket who was active in the community. It is now known as Schanda Park.

Today, Schanda Park's amenities include picnic tables, a commemorative bench, landscaping, a small, multi-used paved space, and a short walking path over Moonlight Brook to a boat dock. Parking



View of Schanda Park from above (above) (Image: Tom Morgan) and overlooking the Lamprey River (below) (Image: Liz Durfee)

at the Schanda Park lot — which is used by patrons of the park, The Riverwalk, the Town boat ramp, and other locations in the downtown — is limited to 15 spaces (refer to the Transportation Chapter for additional information about parking). The park is an excellent location for viewing tidal portions of the Lamprey River, Heron Point Sanctuary, the wildlife that inhabits these areas, and Newmarket's historic mill structures.

In addition to providing a place for informal gatherings, casual strolls, and rejuvenation, Schanda Park is home to the Arts in the Park Concert Series. The Concert Series draws around 40 to 80 community members during each of the five to eight concerts offered each season. To date, the program has been funded through sponsorships from local businesses and donations at the concerts but would benefit from a stable funding source.² Enhancements to Schanda Park may also be required for the long-term success of this program.

Since 2015, Schanda Park has been a key location for the Recreation Department for its kayak rental program. Over the last four years, the Recreation Department has rented an average of 43 kayaks per season at Schanda Park. Expanding the rental season, establishing a kayak launch, and addressing some of the rental program logistics could enhance this program and enable more people to get out on the water.

As the only public gathering space on the Lamprey in the downtown, there are many demands on Schanda Park, which itself provides a relatively small amount of greenspace. When asked to rank investment options, community members prioritized more greenspace.

The Heron Point Sanctuary on the opposite side of the river provides 35 acres of open space and shoreline for the community to explore. Improving access to this natural area would significantly increase the area of open space within proximity to the downtown. In addition, there are other Town or publicly owned waterfront properties that may provide additional locations for the public to enjoy riverfront greenspace. Portions of the parcels to the south of the Upper Narrows where the Wastewater Treatment Plant and Water Treatment Plant are located may be adapted to accommodate the demand for open space, recreational space, or a boat launch,³ as well as parking for these uses. In addition, the NH Fish & Game-owned Leo Filion Park near the fish ladder at Macallen Dam is another underutilized property that offers a unique vantage point of the river. These locations will be discussed further in other sections of this chapter.



Public input collected at the Plan NH Design Charrette

In addition to the quantity of greenspace, the community values the quality of the space. Maintenance and beautification of Schanda Park, the Riverwalk, and other highly trafficked waterfront destinations should be prioritized. Infrastructure in the Downtown Riverfront, including the Creighton Street Pump Station, other public utilities, and private utilities should be well screened

to enhance aesthetics. A prime concern of residents is the impact of dog waste and feeding ducks and other waterfowl — which negatively affects water quality and health of wildlife — on visitors’ experience at the waterfront, as well as on water resources.⁴

During the Plan NH Design Charrette in October 2024, several conceptual improvements to Schanda Park and Moonlight Brook were explored. These concepts were informed by site investigations, review of past projects including the Great Bay Living Shoreline Design Project (discussed further in the Resiliency Theme of this chapter) and discussions with the community. Shown in the conceptual plan below, creation of a plaza-like deck or bridge structure over Moonlight Brook is a key feature of the reimagined Schanda Park. This plaza would serve several purposes, including expanding park space, offering a unique visitor experience, addressing stream hydraulics and stabilization of the bank, and increasing resilience to sea level rise and flooding.⁵ The plaza would offer gathering space on its deck and the adjacent park segments. Shade trees and native plants would enhance habitat while also providing shade.⁶

Art and design can make Schanda Park a more engaging and welcoming place for people of different ages. Play structures, a tunnel log, or steppingstone paths, for example, would enhance the space for younger users while also helping to address the demand for amenities for children in the downtown. More seating options would provide a place for pedestrians to rest and enjoy the view.

“As part of the greater effort to revitalize Newmarket’s whole waterfront, the Town wishes to address existing concerns associated with the park’s boat ramp and deteriorating shoreline revetment, as well as develop the park’s overall resilience and aesthetic character”

Source: Great Bay Living Shoreline Design Memo

Signage, along with public art, are two components that shape sense of place, or the connection between people and surroundings. In addition to wayfinding signage, which is discussed in the Connectivity Theme of this chapter, art creates more vibrant spaces. The Town’s Arts & Culture Commission strategic plan envisions Newmarket as a town where vibrant cultural life can be found in every corner of the town. Part of this includes permanent art installations located in places where people gather. Opportunities to enhance the public realm in the Downtown Riverfront abound. For example, one idea garnered from the Master Plan Survey was to paint more murals downtown. Street art – such as paintings,

sculptures, or footprints of species found in the Lamprey River – could be used to guide residents and visitors to Schanda Park and other waterfront amenities. Art can also be used to tell the story of the historic shipbuilding industry in Newmarket. The Charrette Design Team also identified the opportunity to enhance user experience of Schanda Park through installation of a climbable structure for kids and adventurous adults. Countless concepts to connect park visitors to their environment could be explored, including an interactive and climbable weir.⁷

Elements to address stormwater, improve the boat ramp, add interpretive signage, enlarge recreation space, and accommodate living shorelines are integrated into this plan and discussed further throughout this chapter.



Conceptual plan for plaza-like bridge structure over Moonlight Brook (source: Ironwood Design Group, LLC, Plan NH Charrette)

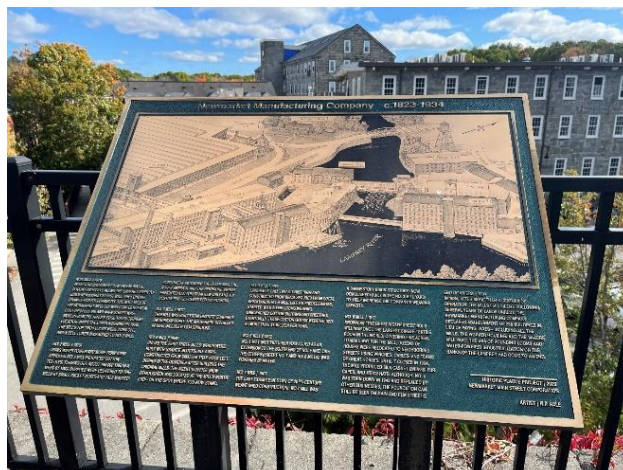
The vibrancy and character of the Downtown Riverfront is strongly influenced by its history and historic built environment. The presence of the mills is a dominant element of the Downtown Riverfront. Newmarket's mills date back to 1823, when the Newmarket Manufacturing Company built its first mill along the Lamprey.⁸ By 1917, a total of eight large mills loomed over the Lamprey and bolstered the town's economy. The mills operated until 1934 when discrepancies between laborers and management drove the closure and abandonment of the mills. Residents and visitors can glimpse a view of the mill yard in its heyday via the bronze plaque installed in 2021 on the overlook off Main Street near Number 4 Mill. The plaque depicts the former mill structures and describes the timeline of their development.

After years of abandonment, the buildings now known as Bryant Rock Condominiums, Rivermoor Landing, and the Selectwood building were redeveloped in the 1980s through 2000. Between 2010 and 2012, four other mill buildings were redeveloped and converted to mixed-use development. This project brought life back to four granite mill buildings on Main Street and Penstock Way and had a rippling economic impact on the downtown. The project was completed in part with a 20% Historic Preservation Tax credit from the National Park Service, which made the massive redevelopment viable and resulted in the preservation of the historic character of the mills.⁹

Today, the former mill buildings are home to approximately 220 residential condos and apartments, and over 50,000 square feet of commercial space, including the Millspace. The Millspace is a volunteer-run community civic space on the lower level, water side of the historic Newmarket Mills that is committed to bringing more art, theater, music, and history to the town of Newmarket. The Millspace brands itself as a community living room that is a place for people to gather, share ideas, and enjoy each other's company. It hosts a gallery and is available for the public to rent.¹⁰

The current land use along the riverfront includes mixed uses in the mill buildings and the Lang's Warf Townhouse Condominiums and F.E. Land Blacksmith building. Similar to the Newmarket Mills, the F.E. Lang Blacksmith building, formerly home of Joyce's Kitchen, was restored in 2013 using Federal Historic Tax Credits. Among the other uses in the riverfront area are the Rivermoor Landing Condominium Association's parking garage and parking lot, Arbor Park, the Creighton Street Pump Station, and a handful of homes and structures. Further downstream, the Town's Wastewater Treatment Plant occupies waterfront space. Much of the east side of the Downtown Riverfront is encompassed by Heron Point Sanctuary. The Lamprey River Estates Cooperative abuts Heron Point.

The current zoning in the Downtown Riverfront includes five zoning districts: M1, M2, R2, R4, and B2. The M-1 and M-2 districts emphasize enhancing the downtown waterfront and providing public access to the Lamprey River, respectively. The Town's ongoing form-based code rezoning project proposes to convert the zoning in most of the Downtown Riverfront vicinity to the proposed Village Corridor. This zone will emulate the traditional Main Street pattern of Newmarket.¹¹



Bronze plaque showing the Newmarket Mills (above) (Image: Liz Durfee) A sign on the west side of Main Street commemorates No. 8 Mill (below) (Image: Design Charrette Team)

As with nearly all waterfront spaces, effort should be made to prioritize water-dependent uses and public access to the waterfront.

To the extent possible, commercial spaces should be oriented towards enhancing physical or visual access to the river. This may be accomplished, for example, by providing outdoor public seating, maintaining pedestrian paths, or crafting land use regulations that preserve viewsheds and ensure that new development or redevelopment does not impede views of the river. One measure taken to enhance public access to the riverfront was the creation of The Riverwalk, which is discussed further in the Connectivity Theme section of this chapter. The vibrant riverfront draws both residents and visitors to the downtown and helps attract customers to patronize local businesses. Leveraging natural resources, such as the public riverfront and trails, to attract and connect people to business ranked fifth out of eight options to promote growth and enhancement of Newmarket's downtown businesses in the Town's Master Plan Survey.



View of the Newmarket Mills (source: Tom Morgan)



View of the weir in the Lamprey River (source: Liz Durfee)

While the mills dominate the contemporary visual landscape of the Downtown Riverfront, as noted by the New Market Historical Society in their walking tour transcript, “fishing, ship building, and trading were here long before the big stone mills,”¹² and pre-Colonial, Indigenous history of the Lamprey River dates back more than 8,600 years. The historical significance of fishing the Lamprey is evident in the nearly 100-year-old weir that sits in the river off Schanda Park. The use of weirs on the Lamprey predates European settlement.¹³ This weir, operated by Chick Hays from 1938-1979 and Jerry Collins from 1979 to the present, is the last known weir in New England.¹⁴ While fishing the weir is not as plentiful or economically viable as it once was, maintaining the tradition and showcasing this artifact has significant historical value.¹⁵ While there have been years that NH Fish & Game has not permitted fishing the weir due to low average herring counts in the Great Bay region, when it is fished, the weir provides valuable bait for local lobstermen.¹⁶

The weir's aesthetics, potential impacts to shoreline habitat, and perceived concerns related to navigation have led to some controversy over the weir. For over 40 years, the landing pocket of the weir has been stored in its current location on the edge of Schanda Park from around October to April. While the weir must be stored close to the location it goes into the water due to its size and brittleness, future improvements to the shoreline of Schanda Park should consider the best possible options for accommodating the weir and a living shoreline. Improved educational signage about the

weir and historical use of weirs would be an asset to Schanda Park, as those who are not familiar with what a weir is may not recognize this structure or appreciate its value, and visibility of the current granite sign is obstructed by snow fencing near Moonlight Brook.

Connectivity, accessibility, affordability, and resilience are driving forces of vibrancy. These topics are discussed next.

Vibrancy Goals

1. Celebrate the social, economic, and natural history of the Downtown Riverfront area.
2. Incorporate arts and culture into riverfront improvements and activities.
3. Maintain and enhance the amenities of Town-owned properties.



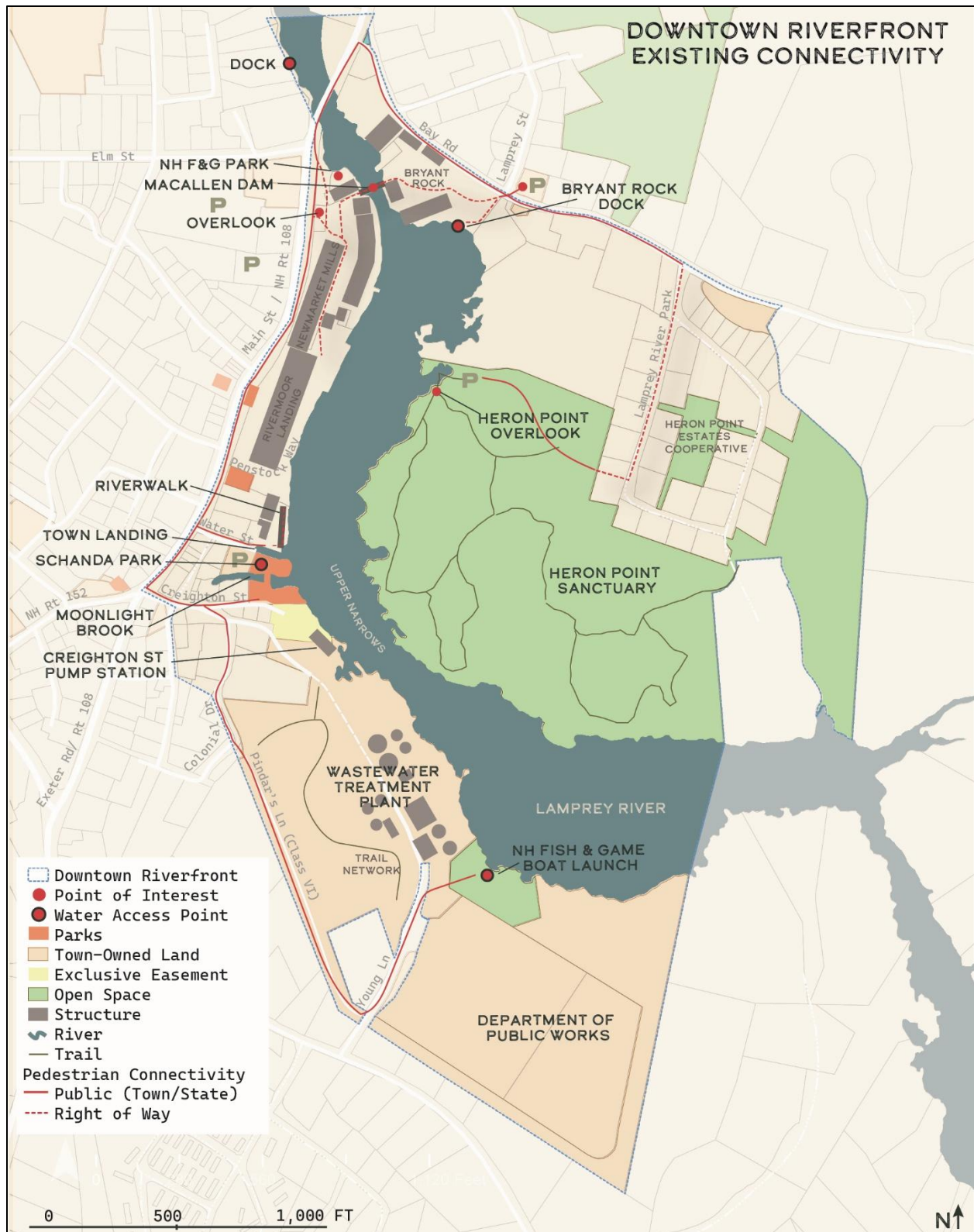
Image of Schanda Park (source: Sarah Wrightsman)

Connectivity

A connected community has efficient and safe links to daily needs such as between home, jobs, shopping, school, services, parks and open space, and provides welcoming and inclusive public places for social interaction.

Connectivity to and within the Downtown Riverfront is important to community members. As shown in the map below, the downtown is well connected through its sidewalk network. A key takeaway from the public input survey and Design Charrette was the need to improve the connectivity of riverfront spaces. The community is fortunate to have several Town-owned riverfront properties, but they lack connectivity and development for public use. In some cases, a lack of wayfinding signage is the primary impediment to a more unified waterfront, while in others, land ownership, physical constraints, and concerns over safety and vandalism are factors.

Additional community input received during the development of this chapter narrowed the scope of the options to enhance connectivity that were identified in the Design Charrette.¹⁷ Four key opportunities to improve connectivity are described below and shown in the map below. Refer to the [Design Charrette Report](#) for details on these and other concepts, including a bridge over the Lamprey River, that could be further investigated.



Existing and Potential Routes to Enhance Pedestrian Connectivity in the Downtown Riverfront (source: EF | Design & Planning, LLC)

Area A – Extended Riverwalk



The Riverwalk (left) (Image: Sarah Wrightsman) and aerial view of The Riverwalk and north (right) (Image: Tom Morgan)

One location lacking in connectivity is The Riverwalk, which is a 150-foot pedestrian way that extends north from the boat ramp at Water Street in front of the Lang’s Warf Townhouse Condominiums. The Riverwalk was developed in the early 2000s and includes brick walks, flowering trees, benches, lighting, decorative railings, and raised perennial beds. It offers public access and views of the Lamprey River that are now obscured by landscaping. The paved Riverwalk ends abruptly, transitioning to gravel before reaching Penstock Way, a private road.

While there are right-of-ways for the public to traverse the Newmarket Mills driveway (Penstock Way), The Riverwalk, Bryant Rock’s sidewalk and parking area, and the dock at Bryant Rock, there is a lack of signage clearly delineating where the public is welcome and where private property rights must be respected. The combination of a lack of wayfinding signs and clarity among all parties over property rights is a particular challenge at the Rivermoor Landing and Bryant Rock properties, both of which are areas that pedestrians frequently pass through and have on occasion disrespected property owners and their property. A legal review of the existence of a right-of-way or agreement that allow the public to pass through Rivermoor Landing property is ongoing. This review and further discussion with property owners may lead to opportunities to establish a missing link for pedestrian connectivity along the shoreline. During the [Design Charrette](#), publicly accessible sidewalks on Penstock Way and boardwalks were among the conceptual ideas explored.

A connected riverwalk has been a vision for decades. In 1996, a [Riverwalk Feasibility](#) study explored construction of a public Riverwalk along a 3,500 foot stretch of the Lamprey River between the NH Fish & Game land and the Route 108 bridge over the Lamprey River in order to: 1) enhance public access to the historic Newmarket waterfront, 2) Provide enjoyment of this unique waterfront, 3) Revitalize the historic downtown waterfront.

Area B – Schanda Park to NH Fish & Game Launch

A second opportunity to enhance connectivity is to link Town-owned parcels at Schanda Park and the Wastewater Treatment Plant. This would allow for the creation of a longer walking loop through Town-owned land, trails, and the Class VI road known as Pindar's Lane that runs from the top of Colonial Road to Young Lane. The Wastewater Treatment Plant (Tax Map U3-47) is located on an over 12-acre lot, approximately two-thirds of which is forested. Improved access in this areas could connect Schanda Park to the Fish & Game ice fishing launch, an underutilized water-access point with scenic views of Heron Point and the river.

Similar to an extension of The Riverwalk, completing this linkage would require negotiation with willing landowners. Any anticipated increase in foot traffic on Pindar's Lane would necessitate communication with abutters of Pindar's Lane, as some have structures infringing on this path. Wayfinding signage would be important to demarcate trails and the boundaries of private property.



View down Pindar's Way / Class VI Road
(source: Sarah Wrightsman)

Area C – Bay Road to Heron Point

The public can enjoy the Lamprey River waterfront and trails of the Heron Point Sanctuary, however access to this land is disconnected from the Downtown Riverfront. The Town permanently locked the access gate to drive into Heron Point in the summer of 2024, as discussed further in the Accessibility & Affordability Theme of this chapter. Several options to better connect Heron Point to the downtown were discussed during the Design Charrette and with stakeholders, including:

- Purchase land on Bay Road or an easement on property located on Bay Road.
- Create a boardwalk or waterfront trail from Bryant Rock or Bay Road to Heron Point.
- Modify the existing access to Heron Point, such as through increased policing, staffing the gate, or other means in order to minimize impacts to residents of Heron Point Estates Cooperative.
- Develop an educational trail/route with wayfinding signage to direct pedestrians from the downtown or the Bay Road Parking Lot to the existing Heron Point access road.

As with other proposed linkage improvements, additional community input and support and interested and willing landowners would be critical to the success of improved connectivity to Heron Point.

Area D – Leo Filion Park

The underutilized area located adjacent to the fish ladder at the Macallen Dam could serve as a potential linkage from the dam to an upstream kayak launch as well as an additional space for accessing the waterfront. Formally named Leo Filion Park, this State-owned parcel could be developed into a scenic park with excellent views of the freshwater portion of the Lamprey River above the dam and the historic mill structures. Events like the Lamprey River Advisory Committee's Herring Day are already held at this location. The Book Exchange building property holds an easement on this lot; Coordination with Paszec Investors Inc., the current property owner, would be required.



Existing Leo Filion Park (left)(source: Sarah Wrightsman) and conceptual connectivity plan for the park with the upstream kayak launch and existing pedestrian ways (Source: Bartsch Landscape Architecture)

Nearby, the pedestrian bridge over the Lamprey River provides scenic access to both sides of the river and a unique Newmarket experience. The existing pedestrian bridge will need to be replaced within 5-10 years due to corrosion. The Town submitted an application to NH Department of Transportation to include the bridge replacement project in the Transportation Alternatives Program.¹⁸

The new pedestrian bridge, in addition to the NH Route 108 bridge, are alternative locations that the Town is considering to reroute an existing sewer forcemain over the river instead of across the riverbed. Rerouting the forcemain on the pedestrian bridge structure would require the bridge to be replaced with a structure designed to carry that load.¹⁹



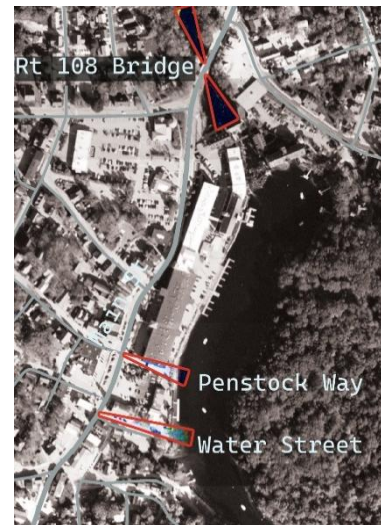
The Main Street / NH Route 108 bridge and the pedestrian bridge located below the Macallen Dam connect the east and west sides of the Lamprey River. They also serve as prime vantage points to view the upstream and downstream river (source (left): Tom Morgan, (right) Liz Durfee)

Visual Connectivity

Maintaining visibility of the river from Main Street is important both for attracting people down to the waterfront and up to Main Street businesses. While they are beautiful and historic components of the Downtown Riverfront, the large mill buildings effectively block views of the river from many points on Main Street. Existing views from Main Street down Penstock Way and Water Street should be enhanced to the extent possible. Further obstruction of the riverfront views should be avoided to preserve these scenic resources.

Regional Connectivity

Community members are interested in greater connectivity to local and regional trails and cycling routes within the town and surrounding communities.²⁰ Measures to increase the connectivity of destinations along the Downtown Riverfront may also enhance bike-pedestrian connectivity of the downtown to popular cycling routes including New Road, Bay Road/Durham Point Road, and Packers Falls. Community members noted the proximity of the Rockingham Recreational Rail Trail in Newfields to New Road, which connects to Young Lane and the Fish & Game ice fishing launch. Amenities like parking, regional trail signage, and bike racks at this property or adjacent Town land would be an asset to both boaters, cyclists, and other outdoor recreation enthusiasts.



River views from Main Street

Wayfinding Signage

Wayfinding signage is a critical component of an accessible and connected riverfront. Wayfinding signs can help direct residents and tourists to various destinations and points of interest along the riverfront, provide critical information to delineate public and private property, guide vehicular traffic to parking areas, and educate pedestrians about sensitive natural areas and resources. While limited signage – including a sign at the top of Water Street and near The Riverwalk – exists, more directional and educational signs are needed. One opportunity presented in the Design Charrette was use of art to enhance connectivity to and along the riverfront. Using pavers, street art, and other landscaping features can be an effective and aesthetic way to identify spaces where the public is welcome. Charrette participants also recognized the opportunity for a downtown map to be installed in a central location such as the gazebo on Main Street, Willey House plaza, or Arbor Park.



An example of how art can be used as part of the Downtown Riverfront wayfinding (Source: Pinterest)

Connectivity Goals

1. Establish a cohesive riverwalk.
2. Enhance the connectivity of Main Street, commerce, and the Lamprey River.
3. Seek creative solutions to strengthen the connectivity of all Town-owned properties in the vicinity of the Downtown Riverfront.
4. Enhance connectivity of the Downtown Riverfront, Newmarket and amenities in surrounding communities.



A boater launching watercraft at the Schanda Park ramp (source: Liz Durfee)

Accessibility and Affordability

An accessible community has an environment that is meaningful and usable for as many people as possible. An affordable community is where people can live comfortably without financial difficulty.

With respect to the Downtown Riverfront, connectivity and accessibility go hand in hand. With relatively little riverfront space and many competing uses, access to the waterfront is not an unfamiliar challenge in Newmarket, nor in other communities. In 1752, a Town Warrant recognized that the town's waterfront had become overrun with shipyards, stating that "the landing-place at Lamprey River is much incumbered with shipyards so the public have not the benefit of said landing place."²¹ In the 2024 Master Plan Survey, improved public water access opportunities (swimming, boat, kayak, dock) ranked second out of 15 options of where the Town should prioritize investment in recreation.

Boater Access

For boaters, the existing public water access points in the downtown vicinity include the:

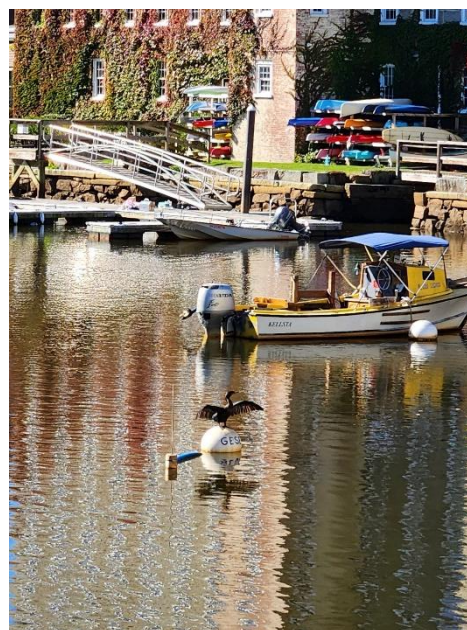
- Boat ramp at Schanda Park
- Seasonal dock at Schanda Park
- Dock at Bryant Rock Condominiums
- Fish & Game boat launch located near the Wastewater Treatment Plant.

Privately owned docks and slips include Langs Wharf Condo Association dock, Marina Falls Landing, and the Newmarket Mills dock.

There are no public ADA boat launches within the Downtown Riverfront. Communities like [Rochester](#) and [Dover](#) have good examples of ADA accessible facilities that allow people of all abilities to enjoy the river.

Several Master Plan Survey respondents noted that they would prioritize things like repair of the boat launch, creation of an all-tide boat and kayak launch and a day boat dock, more boat slips, public moorings, and permanent docks. Lamprey River water levels in the Downtown Riverfront currently change by about seven feet with the tidal cycle,²² presenting a challenge for maintaining dock access at all tides.

The boat ramp at Schanda Park is located at the end of Water Street and is managed by NH Fish & Game. The ramp is considered overly wide and requires improvements to address broken pavement near the high-water line as well as gravel that regularly washes away.²³ A renovation of the ramp would provide the opportunity to construct a ramp of standard, 18-foot precast concrete planks and allow for installation of a narrow floating dock alongside the boat ramp for use by kayakers, canoeists, and paddleboarders.²⁴ The addition of a floating dock at the boat ramp would provide the necessary space for launching non-motorized watercraft, especially as traffic on the river increases.²⁵ Other ideas to enhance access include rentable public dock and mooring space that would accommodate both residents and day visitors traveling to Downtown Newmarket via the Lamprey River.²⁶



Private kayak storage and boat mooring
(source: Tiffany Tononi Macnamara)



Schanda Park Dock at low tide (source: Sarah Wrightsman)

Vehicular and trailer parking were noted as a top priority for the Downtown Riverfront area by a handful of survey participants. The Schanda Park lot has 15 vehicle spaces and four boat trailer spaces, however because of this parking is not available on a regular basis there is a lack of direct vehicle access to the park and surroundings. One parking space has a charging station and is reserved for electric vehicles, and one space is ADA accessible. Street parking is also available on Water Street and nearby on Main Street, however cars parked at the top of Water Street obstruct visibility of oncoming traffic on Main Street.²⁷



The dock at Bryant Rock Condominiums is open to the public and accessible at all tides (source: Liz Durfee)

The Bryant Rock Condominiums dock, also referred to as the Lamprey Street dock, is a carry in boat launch that is accessible via the Bryant Rock Condominium property on Bay Road. Parking is available across Bay Road at the municipal lot. This dock may not be widely recognized as a location where the public can launch their canoe or kayak from.



The NH Fish & Game Lamprey River ice fishing access (source: Sarah Wrightsman)

Another location where carry in access is allowed is the NH Fish & Game's Lamprey River ice fishing access, located on a State-owned parcel adjacent to the Town's Wastewater Treatment Plant off of Young Lane. This site does not accommodate trailered boat access or access for any watercraft at lower tides. With parking improvements, the site could be better utilized. Expanding publicly accessible waterfront space on the Wastewater Treatment Plan parcel at 5 Young Lane could further enhance riverfront amenities in the southern end of the Downtown Riverfront.²⁸ Exploration of whether this location could provide better access during all tides than a dock as Schanda Park is warranted.

Pedestrian Access



View of the mills and Macallen Dam from Heron Point
(Image: Liz Durfee)



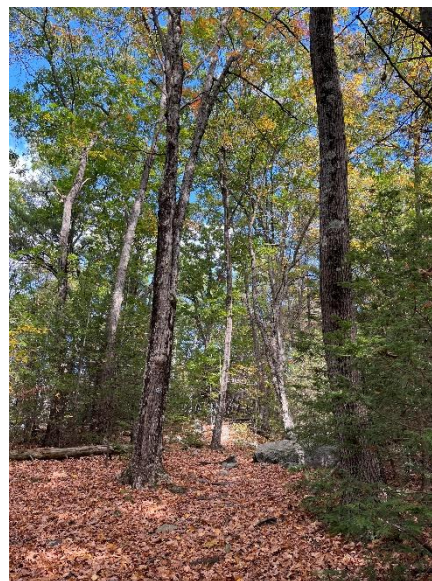
Access gate to Heron Point from Meadow Lane (Heron Point Estates Cooperative)(Image: Liz Durfee)

Pedestrian access to the Lamprey River consists of a patchwork of locations including Heron Point, Schanda Park, and the Riverwalk, as discussed in the Connectivity Theme of this chapter.

Although it does not have a boat launch, Heron Point Nature Sanctuary provides scenic waterfront recreational opportunities in all seasons and the ability to walk to water's edge. Heron Point was deeded to the Town in 1996 to preserve as undeveloped open space for the enjoyment of the public and education of the local community. In 2013, a 30-foot easement on Lot 86-18 was granted to the Town for the purpose of maintaining and improving an 18-foot-wide gravel driveway to Heron Point.²⁹

The access way was open from dawn to dusk until the Town permanently locked the electronic access gate in 2024 due to repeated damage to the electronic gate. This significantly impacted the accessibility of Heron Point, as visitors are required to park their cars in the municipal lot at Lamprey Street and Bay Road and walk approximately ¼ miles to the gate and another ¼ mile to get to the viewing deck and trailhead within Heron Point.

During the Design Charrette, several conceptual ideas for improving access to Heron Point were explored. Among the ideas discussed were an access easement or purchase of land between Bay Road and Heron Point. Such access would provide better pedestrian access to Heron Point from the Bay Road Parking Lot while also avoiding the need to pass through the privately owned Heron Point Estates Cooperative property.³⁰ Stakeholders also suggested the possibility of a boardwalk or river's edge trail connecting Bay Road to Heron Point.^{31,32} Another conceptual idea explored during the Charette was construction of a bridge spanning across the river to Heron Point from one of two locations,



The Conservation Commission maintains a well-utilized (and [mapped](#)) trail network at Heron Point with an interpretive kiosk and is responsible for stewardship of the Sanctuary (Image: Liz Durfee)

downtown Main Street or Town property in the vicinity of the Wastewater Treatment Plant. The feasibility and desirability of these options would require significant planning, analysis, community buy-in, funding, and in some cases, private landowner interest and support.

Affordable Access

For the Downtown Riverfront, affordability relates to the ability of community members of all income levels to enjoy the Lamprey River. This is particularly important because housing costs are high and public access to the riverfront is quite limited relative to the total frontage along the brackish and freshwater portions of the Lamprey in Newmarket.



Recreation Department kayak storage at Schanda Park
(Image: Sarah Wrightsman)

For the Town, this means maintaining and enhancing amenities like Schanda Park, the Riverwalk, the boat dock, and the boat ramp. These assets provide places for those that do not have access to a private dock with a place to launch their trailered or small watercraft and access Great Bay. The Town offers free programs like the Arts in the Park concert series in this scenic, downtown location, as well as a kayak rental program for people who do not own their own boat at Schanda Park.

Affordability of the Downtown Riverfront also relates to economically sustainable Town programming and spaces. While Public Works is responsible for waste removal and other general maintenance activities, the overall planning, maintenance, and improvement of Schanda Park falls under the purview of the Conservation Commission. The Commission received a one-time donation of \$4,000 for Schanda Park from the Masonic Lodge but does not otherwise have an annually appropriated budget. Members of the Conservation Commission, Ad Hoc Riverfront Advisory Committee, and Planning Director recognize that neither the Conservation Commission nor the Riverfront Advisory Committee have the capacity to steward Schanda Park and that this role is better suited to the Recreation Department and/or Public Works.³³ While the exact terms of a transfer in stewardship are not known, the Town is exploring this concept.

Partnering with businesses and volunteer groups to help maintain these public spaces brings in in-kind support to help keep these well-frequented places tidy while keeping maintenance costs down. For example, in 2024, students and a high school teacher assisted the Conservation Commission with maintenance by resetting bricks in the walkway, cleaning the patio and walkway, and installing new posts and fencing at Schanda Park during Newmarket Cares Day.³⁴

When investing in any improvements to waterfront locations, the Town should ensure that public investments are designed to withstand sea level rise and flood events. Investment in resilient infrastructure has been shown to generate a fourfold return on investment by avoiding the need to continually repair and rebuild,³⁵ thus avoiding future costs for taxpayers.

The Town should also endeavor to maintain and establish public-private partnerships to enhance riverfront spaces by creating more public space or contributing to the landscaping of existing public spaces.

With respect to private development, developers have had success utilizing tools such as 79-E Community Revitalization Tax Incentives and Historic Preservation Tax Credits to help finance redevelopment projects while retaining historic character. Opting into the array of tax incentives and business tax credits that are available in New Hampshire helps make redevelopment projects viable while also providing public benefits, which could take the form of enhanced public space or even community art in the Downtown Riverfront.



View south from the Heron Point shoreline (Image: Liz Durfee)

Affordability and Accessibility Goals

1. Ensure that all community members have access to the riverfront.
2. Improve water access points for motorized and non-motorized watercraft.
3. Continue to seek solutions to improve access to Heron Point Sanctuary.
4. Continue to offer free and low-cost programs and events in Schanda Park.
5. Seek opportunities to utilize public-private partnerships to establish and maintain spaces that are welcoming to the public.
6. Approach planning and design projects from a multi-faceted and integrated perspective that allows funding, efficiency, and coordination across departments, boards, commissions, committees, and regional partners to be maximized.

Resiliency

A resilient community can withstand, recover or adjust to adversity or change.

Resilient areas start with healthy ecosystems. Changes in climate, increases in impervious cover, and aging infrastructure have contributed to numerous and significant flood impacts in the Moonlight Brook watershed. In addition to flooding, precipitation events, development, and aging infrastructure and illicit sewer connections have also led to poor water quality in Moonlight Brook.

Clean water is a top priority for the community. Addressing and preventing pollutants from entering local waterways, followed by replacing aging and/or undersized storm drain systems ranked highest in terms of which stormwater challenge should be addressed first by survey respondents.

The main channel of Moonlight Brook runs approximately 1.5-miles from its headwaters to its outlet at the Lamprey River.³⁶ Moonlight Brook's 486-acre watershed³⁷ extends both northwest and south-southwest of the downtown and includes a drainage network of around 1.1 miles of pipes and 2.44 miles of open stream.³⁸ Within downtown Newmarket, areas including New Road and Great Hills drain to Moonlight Brook.³⁹ At the southern side of the Schanda Park parking lot, the brook runs through three 24 inch diameter precast concrete pipes before flowing into the Lamprey River.⁴⁰ Microbial source tracking in the Moonlight Brook watershed and other areas in the Lamprey River watershed, occurred in 2024 and will continue in 2025 to identify the types and sources of contamination.⁴¹ Both pet waste and human contamination have been detected in excess of NH Department of Environmental Services standards.⁴²

A climate adaptation plan was developed for the watershed in 2016. This plan identified several structural and non-structural low impact development (LID) mitigation strategies for target retrofit areas that have the greatest benefit for stormwater management at the lowest cost. A matrix of best management practices for runoff control from this study is included in the Appendix. One example of implementing LID is the Lang's Wharf redevelopment, which utilized disconnection of rooftop downspouts combined with Xeriscaping and infiltration to reduce the amount of runoff and associated pollutant from the development project.⁴³



The pathway connecting Schanda Park over Moonlight Brook (Image: Sarah Wrightsman)

The Town of Newmarket is responsible for implementing and performing various plans and activities related to stormwater management Pursuant to the requirements of the Environmental Protection Agency (EPA)'s "National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems (MS4)" (Source: [Town of Newmarket Website](#))

Several recommendations for Moonlight Brook were identified by the [Great Bay Living Shoreline Project](#). At high tide, the three concrete pipes that the brook runs through at Schanda Park are underwater, impacting the brook's hydraulics and causing sediment to block the pipes. Potential solutions included the replacement of the pipes with a culvert to daylighting the brook. Another recommendation was to remove the revetment and restore the tidal marsh to the south of the culvert where banks of the brook are steep.

A conceptual design for Schanda Park that accommodated measures to improve the hydraulics of Moonlight Brook was created during the Design Charrette (as discussed in the Resiliency Theme). The conceptual plan envisioned a plaza over Moonlight Brook and replacement of pipes with a more natural stream bank would serve to expand park space while enabling a free-flowing brook and increasing resilience to sea level rise and flooding.⁴⁴

The Town Council approved a resolution for engineering for the septage receiving station that would enable the removal of all of the truck traffic and septage out of the Creighton Street pump station to the Wastewater Treatment Plant in early 2023.⁴⁵ In addition to reducing traffic and impacts like odor in the neighborhood, this measure may also increase the space available for a living shoreline, which would help stabilize the shoreline in addition to creating an ecological feature.⁴⁶

Two priority projects for Moonlight Brook have been identified by the Town: 1) Implementing a stormwater treatment Best Management Practice (BMP) at the Schanda Park parking area, and 2) Addressing water quality issues and channel stabilization in Moonlight Brook. To advance implementation of these projects, a preliminary scope and cost estimate have been prepared for these projects by VHB.

Options for stabilizing the shoreline via a living shoreline were explored through the 2023 [Great Bay Living Shoreline Project](#), which aimed to create new living shoreline projects that protect salt marsh habitat and coastal communities from erosion, sea level rise, and flooding. The design team proposed improvements at Schanda Park including:

- Revetment removal and tidal marsh creation
- Boat Ramp upgrade
- Parking lot stormwater management upgrades
- Existing plantings and invasive species management plan.

The living shoreline design team also identified the need to redesign a culvert for Moonlight Brook and noted that moving the weir through existing or proposed tidal marsh area should be avoided.⁴⁷ Concepts for shoreline management were also explored in the 2024 Design Charrette, including use of vegetated wall systems and salt and flood tolerant plants like Seaside Goldenrod, Switchgrass, Bear Oak, and Serviceberry/Shadbush along the upland edge [Refer to Design Charrette Report].⁴⁸ Due to the urbanized nature of the area, a living shoreline installation could be anticipated to have an approximately 30-year lifespan before the tidal buffer and high marsh is forced out by sea-level rise.⁴⁹

A living shoreline is a management practice that provides erosion control benefits; protects, restores or enhances natural shoreline habitat; and maintains coastal processes through the strategic placement of plants, stone, sand fill and other structural organic materials. (Source: Great Bay Living Shoreline Project)

Therefore, it should be considered as a near-term component or phase of a long-term plan for shoreline management and adaptation to sea-level rise in the Downtown Riverfront.

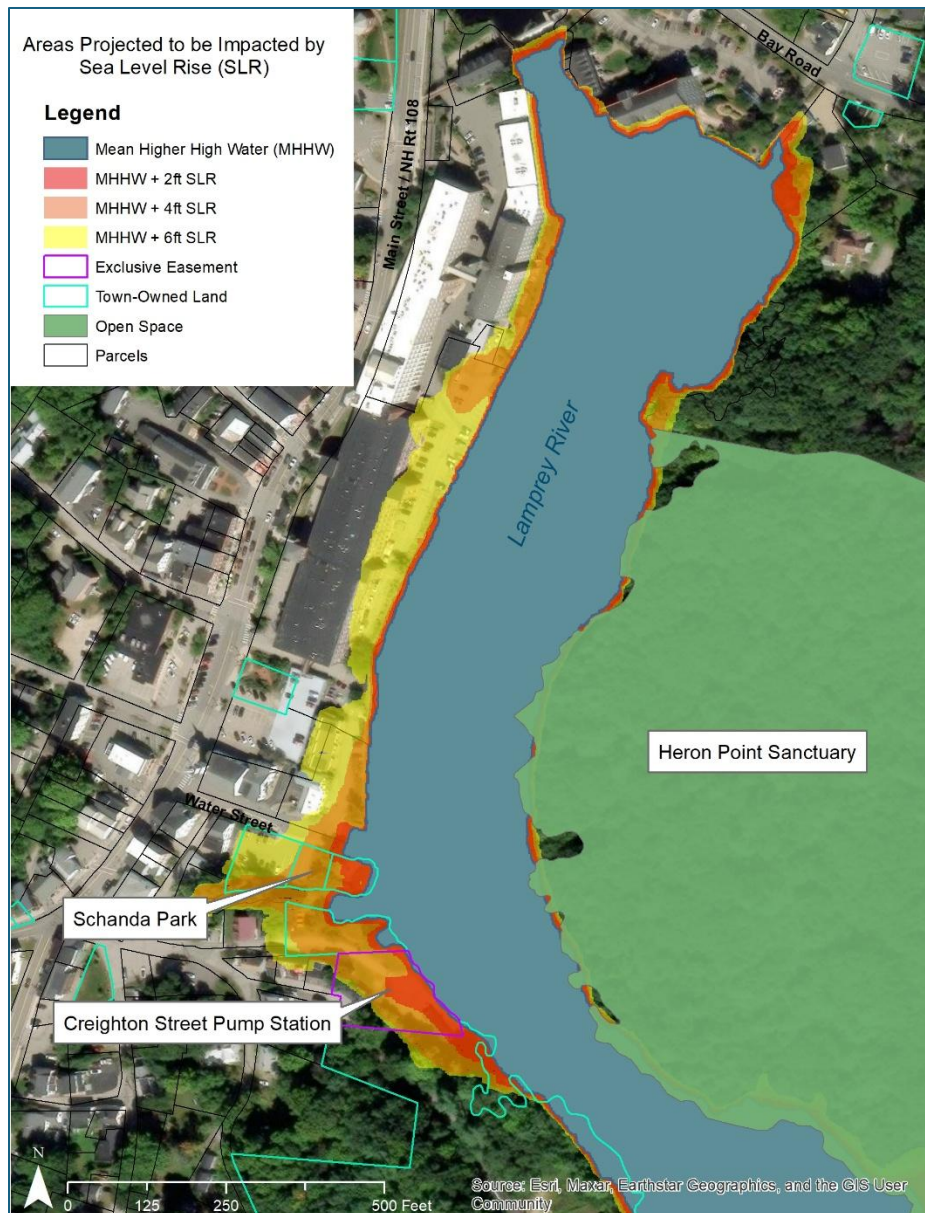
Sea level rise will impact connectivity and accessibility of the riverfront. A fundamental aspect of resilience in the Downtown Riverfront area is the ability to withstand, recover, or adapt to changes and stresses like flood events, sea level rise, and increased temperatures.

Portions of the Downtown Riverfront are located within the Federal Emergency Management Agency's (FEMA) Floodplain. Large portions of Schanda Park and the Creighton Street Pump Station, as well as private property along the shoreline, are vulnerable to the 1% annual change flood, meaning that each year, there is a 1% chance that these areas will flood. As Newmarket has seen in the past, flooding is not limited to those areas shown in official flood maps.



High tide flooding at The Riverwalk and Schanda Park, January 13, 2024 (Image: Peter Nelson)

When sea level rise is considered, the risk for flooding and inundation increases further. Although several miles from the New Hampshire seacoast, the Downtown Riverfront sits on the tidal portion of the Lamprey River and will be impacted by sea level rise. Sea level rise projections of two feet show river water reaching well into Schanda Park and the vicinity of the Creighton Street Pump Station, while scenarios of four and six feet of sea level rise extend over The Riverwalk and up Water Street, impacting several private properties, including the mill complexes and Penstock Way.



Map of areas projected to be impacted by sea level rise (EF | Design & Planning, LLC)

In 2017, a set of maps and statistical data about the potential impacts from sea-level rise and storm surge to infrastructure, critical facilities transportation systems, and natural resources, was produced for Newmarket through the Climate Risk In the Seacoast Vulnerability Assessment project.⁵⁰ Vulnerable critical infrastructure included the Creighton Street Pump Station, which is the primary influent pump station to the Town's Wastewater Treatment Plant. This site requires shoreline stabilization and general site improvements to increase resilience to flooding and sea level rise. Improvements to this site should account for sea level rise. The NH Coastal Flood Risk Summary, Part II: Guidance for Using Scientific Projections recommends the design of critical infrastructure with a design life through the year 2080 (approximately 55 years) should account for about four feet of sea-level rise.⁵¹

Coastal Flood Risk Summary, Part II: Guidance for Using Scientific Projections

[Coastal Flood Risk Summary, Part II: Guidance for Using Scientific Projections](#) includes a seven-step framework to guide decision makers in selecting appropriate coastal flood risk projections, assessing the impacts of those projections, and considering flexible and incremental actions to increase project resilience. The Guidance lays out the relative sea level rise and storm surge scenario to consider designing or planning for based on tolerance for flood risk and the project timeframe.

The elevated plaza for Schanda Park builds resiliency into the park design by allowing that portion of the park to be constructed above anticipated water levels. Climate-adaptive park space should be flexible and adjustable over time as conditions — such as access to the park or the viability of a living shoreline — change. The park should consider methods to manage stormwater and both advancing and receding and floodwaters. Any future boardwalks along the east or west side of the Lamprey River should be designed to accommodate sea level rise and storm surge.



The Trustees of Reservations concept plan for Boston Harbor urban waterfront park is an example of a flexible space designed to accommodate flooding or higher water levels (Source: The Boston Globe, November 22, 2020)

Adapting to sea level rise at Heron Point and the east side of the river may look different than the west. Measures to protect the shoreline from erosion, such as by encouraging visitors to stay on the

trail and off steep slopes, will be important. As water levels rise, there may also be an opportunity to expand the marsh land along portions of the shoreline.

Funding For Resilience

Enabling legislation allows municipalities to develop financing options for resilience. NH RSA 79-E:4-a enables communities to create a Coastal Resilience Incentive Zone (CRIZ) and grant tax relief to for implementing resilience measures such as elevation and freeboard renovations, construction of natural features, elevation of private driveways and sidewalks, and construction or enlargement of private culverts. The Town could also finance improvements through a tax increment financing district or a capital reserve fund or trust fund for the CRIZ in order to provide funding for projected municipal costs associated with projected sea level rise, storm surge, and extreme precipitation.

Under RSA 36:53-a, Strafford Regional Planning Commission can create a climate resilience cooperative agreement to form an authority to plan for an address sea-level rise, storm surge, and flooding from extreme precipitation. This authority can establish a coastal resilience fund that would be funded by contributions from participating parties or by bonds, to plan for and address current and future regional needs for projects such as, but not limited to, road projects, shared municipal facilities including wastewater treatment and wastewater systems, and other coastal mitigation and protection projects.

Resiliency Goals

1. Incorporate climate resilience into the planning and design of all infrastructure improvements and investments.
2. Improve the water quality of Moonlight Brook and the Lamprey River.
3. Enhance shoreline and aquatic habitat.
4. Educate the community about resilience.
5. Modify infrastructure at Moonlight Brook to improve hydrology.

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RECREATION CHAPTER

Adopted xxx 2026



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Vision

The Town of Newmarket is committed to enhancing the vibrancy of our community by providing accessible and affordable programs and events and creating opportunities for people to connect with each other and enjoy nature. The Town provides dynamic recreational experiences that promote well-being, resilience, and a sense of belonging for all. As we grow, the Town strives to expand opportunities for active engagement while ensuring an inclusive and sustainable recreation culture for future generations.

The Town of Newmarket's Recreation Department's values provide additional aspirational statements for this Recreation Chapter:

- **Lead with Heart:** We foster a welcoming and inclusive community where kindness, connection, and compassion drive everything we do.
- **Play with Passion:** We strive to create engaging and energetic recreational experiences that inspire joy, creativity, and a lifelong love of play.
- **Explore Personal Growth:** We provide opportunities for individuals to challenge themselves, develop new skills, and build confidence through recreation.
- **We Recognize You:** We celebrate the contributions, achievements, and unique qualities of every participant, volunteer, and staff member.
- **Support the Rec, Create Community:** By choosing to participate in Newmarket Rec programs, residents are directly investing in the town, as all net revenue helps to fund recreational capital projects without relying on tax dollars.

Executive Summary

Newmarket prides itself in offering diverse recreational amenities that enhance community life, from organized activities and events to opportunities to enjoy the town's wealth of natural public spaces. The Town has a unique opportunity to capitalize on and invest in these assets to enhance residents' quality of life and contribute to the Town's economic development.

Master Plan Themes and Goals

Five guiding themes for the Master Plan emerged from the public engagement process: Vibrancy, Connectivity, Accessibility, Affordability, and Resiliency. Each Master Plan chapter uses the themes to explore the subject matter from different perspectives, helping to focus community goals and actions.

Vibrancy

A vibrant community is one that exudes energy and is full of activity and life. It is welcoming and friendly to all ages, supports cultural diversity, encourages recreational living, and provides economic opportunities.

For recreation, vibrancy involves promoting recreational activities across the municipality by offering opportunities to connect, play, exercise and explore. The Town supports a variety of recreational experiences, including organized programs for all ages as well as unstructured and self-guided nature-based recreation.

Newmarket's recreational responsibilities are split amongst five entities including the Recreation Department, the Conservation Commission, the Public Works Department, the Newmarket Youth Athletic Association and the schools. The Recreation Department provides programs and events for the town's youth, adults, and senior populations at the Leo Landroche Field Complex, the Community Center, Kayak launches, schools, and the Sunrise Sunset Center. The Conservation Commission manages Town-owned conservation areas, develops and maintains the town's trail network, partners with other organizations to host educational programs and events, and stewards Schanda Park. The Public Works Department is responsible for the maintenance of parks, including mowing trails and fields, and often assists with enhancing or building new infrastructure. The Newmarket Youth Athletic Association (NYAA) is typically responsible for their select site maintenance along with operating several youth sports programs.

There are also other organizations that contribute to the vibrancy of Newmarket's recreation offerings such as residents, businesses, local organizations, land trusts, and interest groups. Together, these entities strive to work together to provide recreational opportunities that reach all ages, abilities, and incomes, providing a strong sense of well-being and community.

One aspect of recreational vibrancy that is especially successful in engaging residents and visitors is the variety of year-round family-friendly events and programs. The Recreation Department hosts a number of big events including the Halloween Haunt, the Backyard Bash, Easter Egg Hunt, and Christmas activities. The Conservation Commission offers seasonally focused activities such as the Turtle Fest, guided nature walks, and other nature-based activities often in partnership with other entities such as the Newmarket Library, Sunrise Sunset Center, and Other partners. The NYAA offers youth baseball, softball, soccer and basketball programs. Programs, activities and events like these are fantastic ways to strengthen Newmarket's bonds and enjoy significant resident participation. There is room to grow if additional public spaces are created or renovated to support these types of activities.



Figure 1 Schanda Park (source: S.J. Labadie)

Respondents to the Master Plan survey identified the addition of a permanent outdoor performance venue as a priority. The current outdoor stage at the Leo Landroche Field Complex is very limited and the Recreation Department must rent a temporary stage for events to allow for reasonable-sized performances. This need is also discussed in the Arts, Culture & Historic Resources Chapter. A larger permanent stage would allow the Town to host more vibrant events that can accommodate various performance types and support the

Arts in the Park Concert Series. Other recreational renovations that have been identified for future expansion include the Community Center and Sunrise/ Sunset Center to create multi-purpose rooms which would improve the vibrancy of indoor events, along with parking improvements.

Skateparks and pump tracks for mountain bikes are also examples of spaces where the young and the young at heart gather and contribute to the sense of vibrancy and vitality in the community. Providing designated public spaces for these types of uses would help focus the activities on an off-road safe place. Other public spaces that help support a vibrant community can be as simple as an open field or park where people can get together to play pick-up games of soccer, disc golf, picnic, or walk dogs. In the 2024 Master Plan Survey and at the Fall 2024 Master Plan Workshop, a few participants suggested the need for a dog park in Town (see Appendix I for a heat map showing the locations of where dog licenses have been issued). Neighborhood pocket parks and playgrounds are also important public places where people of all ages connect. Additional public engagement is needed to determine the feasibility, support and potential locations for these types of uses, depending on funding and available land.

Respondents to the Master Plan survey were asked to rank their interest in various types of recreational programming. The types of activities that received the highest interest were outdoor recreation “in nature” programs, and adult health, wellness, and fitness.



Figure 2 Rockingham Rail Trail (source: L Franceschini)

This is consistent with the observations that Newmarket's conservation areas saw a significant increase in use during the COVID-19 pandemic and interest in developing more nature-based recreation continues to rise. Working together or individually, the Recreation Department, Conservation Commission, Newmarket Library or others, could develop additional outdoor programming to support a multitude of age groups, interests, and capabilities. Examples

include expanded outdoor school programs or classrooms, walking trails, nature walks, swimming, fishing or kayaking lessons. This is a great way to enable residents and visitors to become more familiar with Newmarket's open space and provide context for the beautiful environment that exists within Town.

All of Newmarket's recreational offerings rely heavily on volunteers. The Recreation Department, Conservation Commission, Newmarket Library, and NYAA provide events and programming that rely heavily on the time and talent provided by committed residents. This pool of volunteers is the core of recreational vibrancy for a significant amount of time and there are concerns that this pool may shrink as the current pool ages. The Town should look always to bolster volunteerism to keep up with potential growth of events or capabilities at existing events.

Vibrancy Goals:

1. Provide spaces that support a variety of recreational activities for all age groups, abilities, and interests.
2. Offer family-friendly and nature-based community events that further strengthen the bond of Newmarket residents.
3. Investigate methods and options to increase volunteerism

Connectivity

A well-connected community addresses infrastructure needs and the emotional well-being of its residents. This means creating safe and efficient connections between homes, workplaces, schools, essential services, and recreational areas like parks that are inclusive to all and encourage social interactions among community members. Additionally, a connected community promotes the idea of ongoing communications, social networking, collaborations and partnerships among like-minded organizations and town entities to create a community atmosphere where we all work together for one connective common goal.

Connecting recreation destinations to homes, workplaces, schools, and essential services is a primary function of creating an active living environment in Newmarket. The Conservation Commission has established trail systems throughout town, some of which provide connections to trails in neighboring towns (Figure 3). Enhancing existing connections and building new physical connections to fill the gaps to recreation and conservation sites across town would allow people to visit outdoor spaces by walking, bicycling or driving.

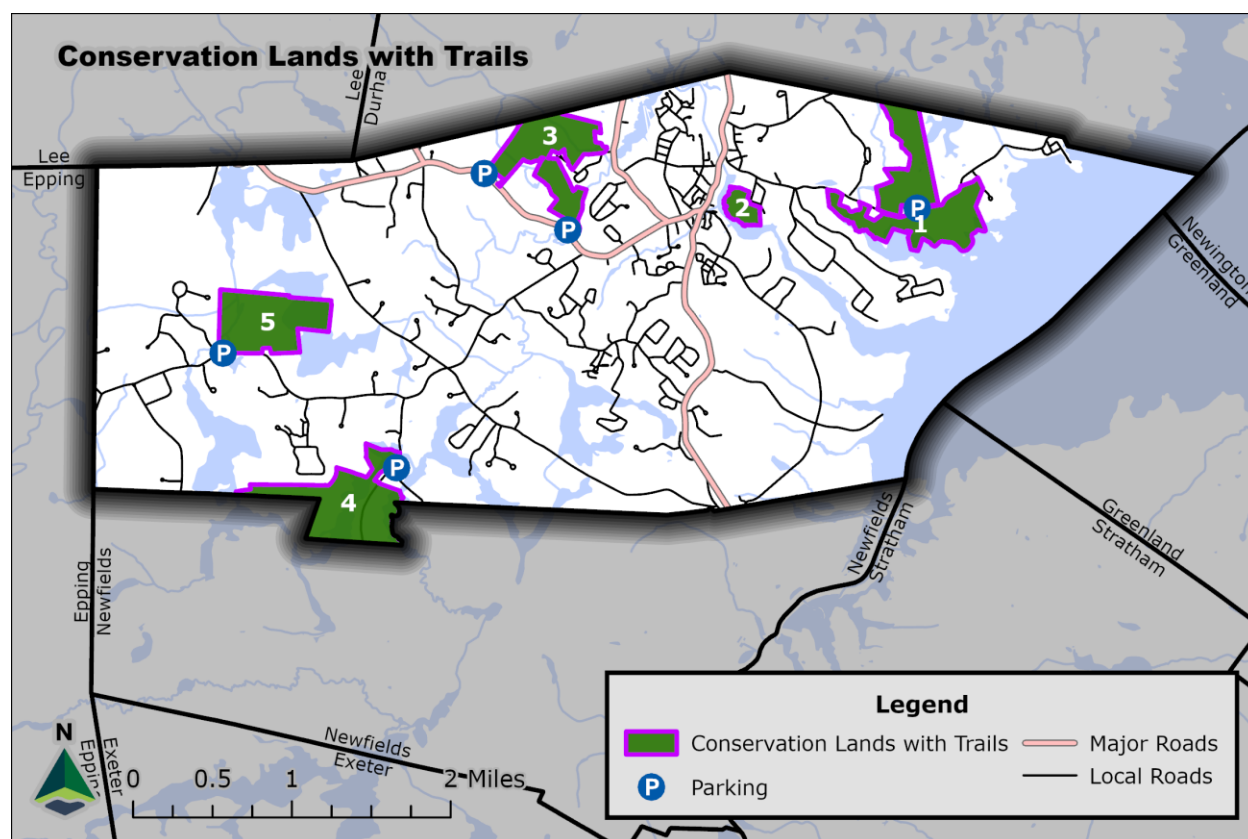


Figure 3 Conservation Lands with Trails (source: SRPC)

Enhanced connectivity between recreation sites in Newmarket could include sidewalks, trails, or safe bike lanes that extend to the village core, providing recreational users ways to connect to take advantage of the local shopping, open space, and services. In addition, many school children bike to school and informally use convenient areas in between the schools and neighborhoods that are often on private property. These initiatives will increase the quality of life throughout town by allowing people to access recreational activities without a car. For additional information about Newmarket's trails and conservation areas, see the 2024 Open Space Plan. Figure 4 indicates areas within an approximately 10-minute walk to recreation sites.

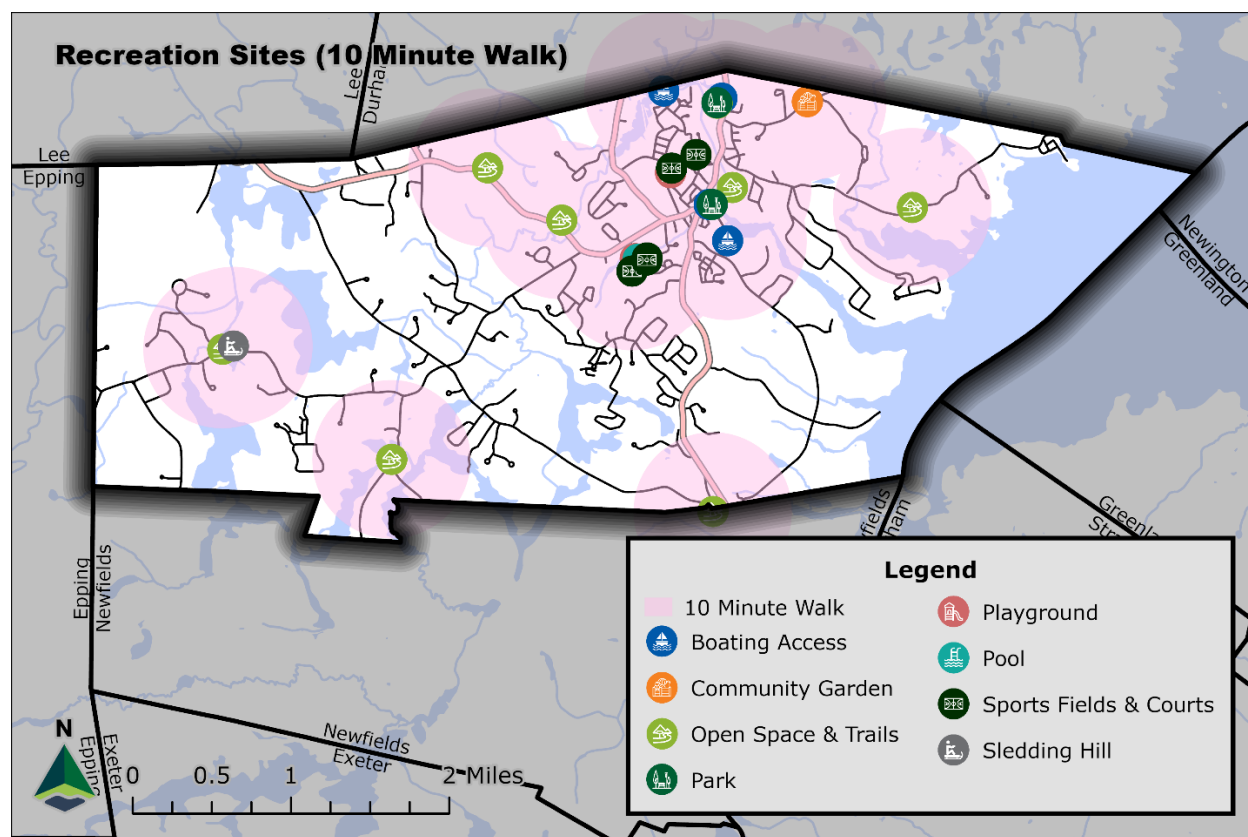


Figure 4 Recreation Sites within a 10 Minute Walk of Residences (source: SRPC)

The Transportation Chapter explores potential new bike and pedestrian connections. Developing a connection to the Rockingham Rail Trail and an off-road connection between Newmarket and Durham could add tremendous value to the town by providing a way for residents and visitors to access Newmarket's downtown from surrounding municipalities. A connection from the Rockingham Rail Trail to the village core would allow people to also access Newfields, Epping, Raymond, Candia, Auburn, and Manchester by bike or walking. Connecting an off-road trail to Durham would allow Durham and Newmarket students and residents to travel between the two towns in a safe manner without using Packer's Falls Road or NH108.

Figure 5, Recreation Sites Accessible by Sidewalks, illustrates where recreation sites are easily accessible by sidewalks. Recreation sites that are not directly connected to sidewalks could potentially be walkable where there are low volumes of traffic and the roadway can accommodate pedestrians and bicycles. The SRPC Pedestrian Level of Traffic Stress (PLTS) study, expected to be completed in 2025, will help to identify where sidewalks could be considered, or where the roadway can safely accommodate pedestrians.

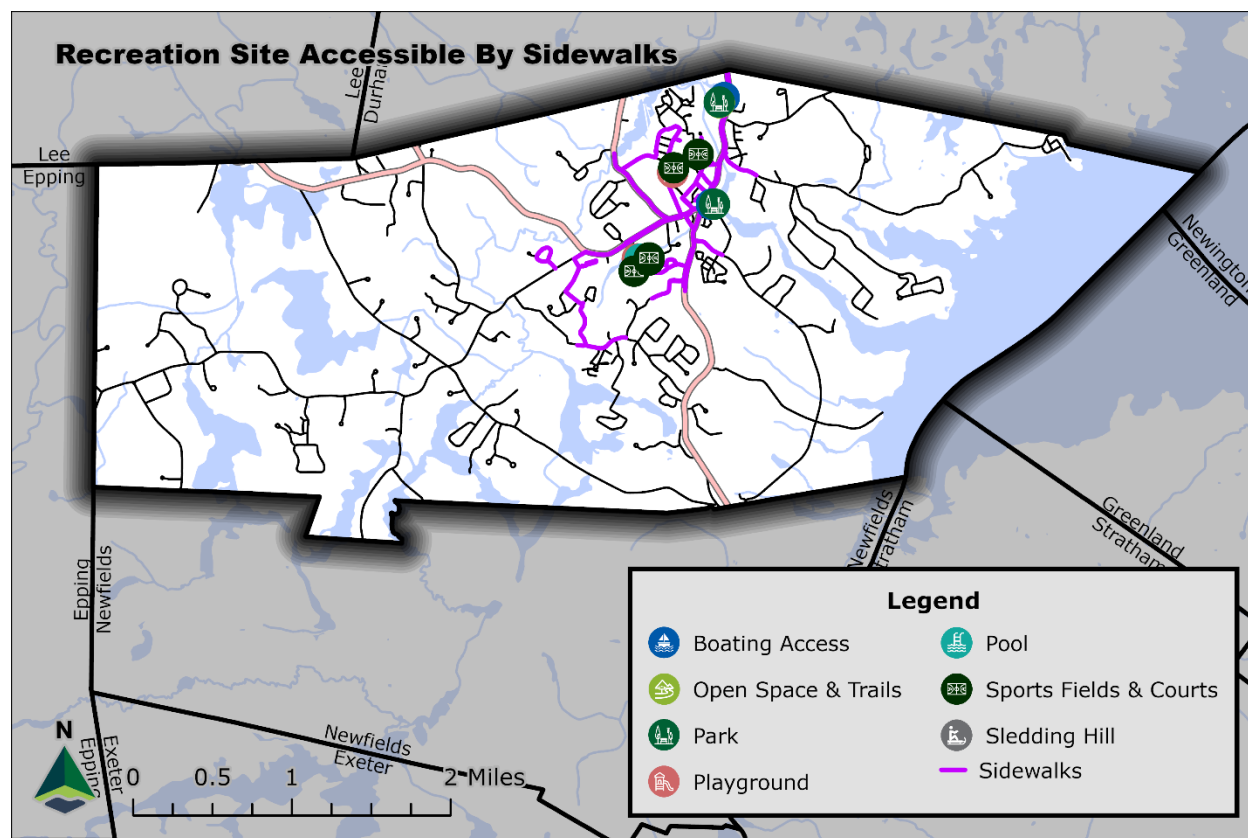


Figure 5 Recreation Sites Accessible by Sidewalks (source: SRPC)

Figure 6, Recreation Sites and Bicycle LTS, illustrates the Bicycle Level of Traffic Stress (BLTS), which indicates how comfortable it feels for most people to bike on a roadway. The analysis is based on the number of traffic lanes in each direction, posted and prevailing speed, type and width of bicycle infrastructure, presence and width of on-street parking, frequency of bike lane blockage, presence and characteristics of turning lanes, and presence and characteristics of unsignalized crossings. BLTS levels 1 and 2 are the two seen as “accessible” for most people. See Appendix I for an additional description of the analysis.

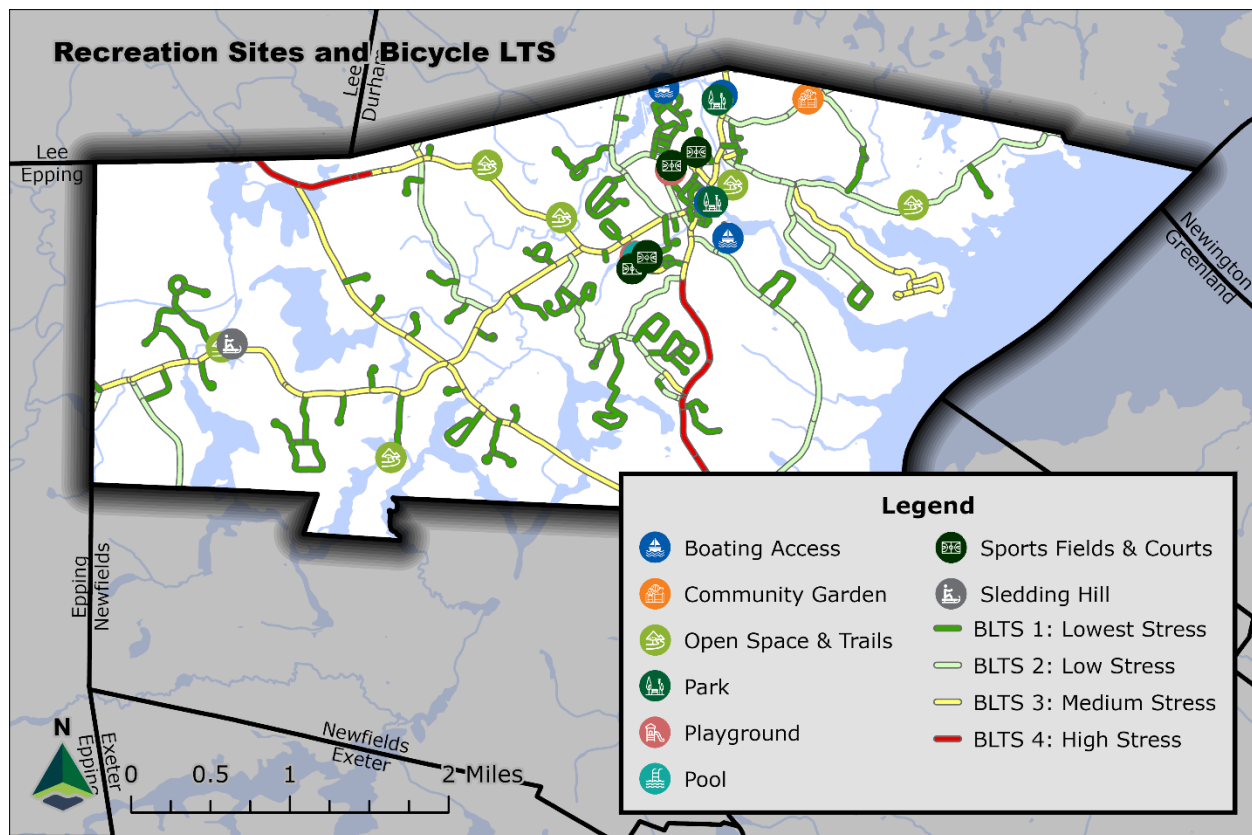


Figure 6 Bicycle Level of Traffic Stress to Recreation Sites (source: SRPC)

Figure 7, Recreation Sites Accessible by BLTS 1 or BLTS 2 Roadways, illustrates where all BLTS 1 and 2 roads exist alongside the outdoor recreation sites to determine areas where investment could be made to connect these areas to each other and allow biking to each recreation site safely.

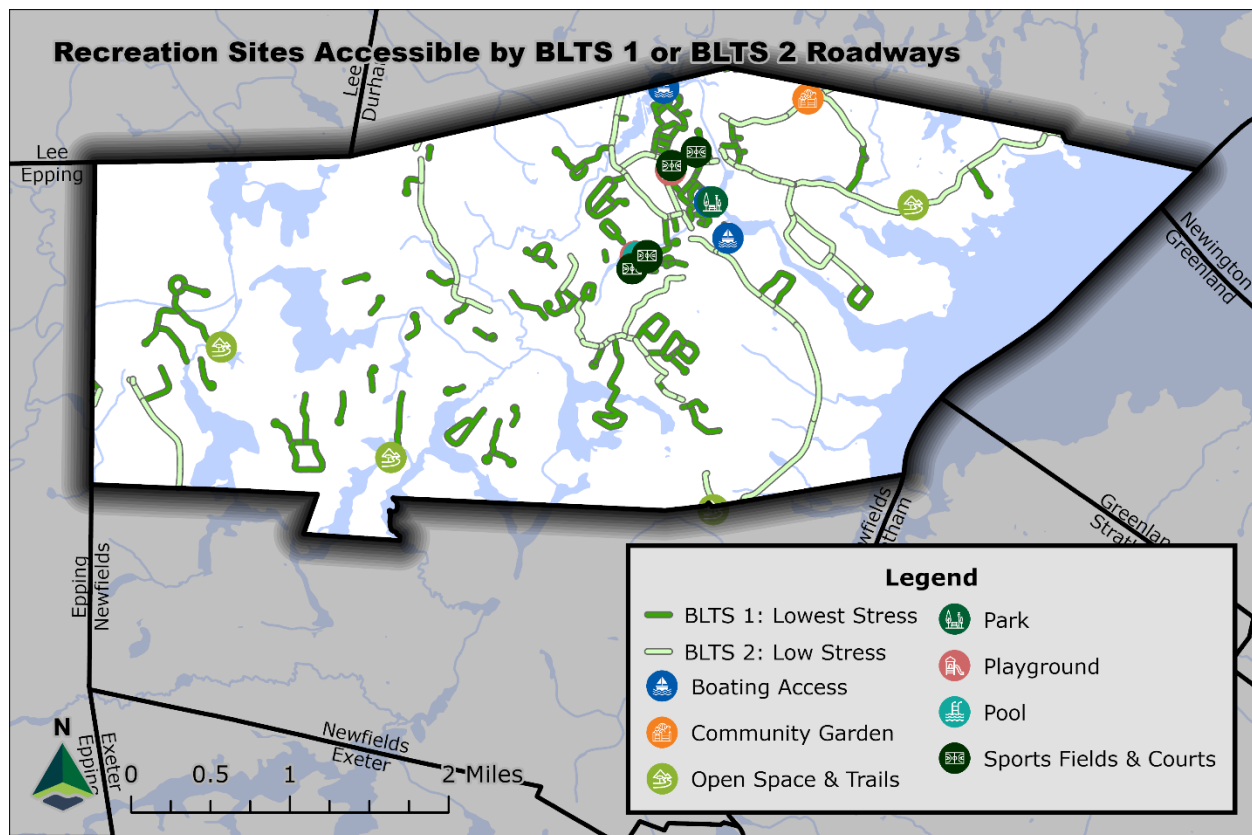


Figure 7 Recreation Sites Accessible by BLTS 1 or 2 Roadways (source: SRPC)

Social connections are as equally important as physical connectivity. Recreational activities organically facilitate interpersonal connections between participants. Ensuring that residents know about and can engage in activities in a variety of ways is critical for social connection. Newmarket does a good job of this through its weekly email Newsletter. Additionally, Newmarket hosts events such as “Rec Connect,” a year-round program that culminates in a one-stop hub for information pertaining to upcoming events and programs. Each year, Rec Connect hosts the Annual Recognition Mixer, which brings together community leaders, organizations, boards, and businesses. It provides an opportunity to network, share resources, learn about new developments in town, and collaborate on community improvement. This annual spring event aims to foster a sense of community and celebration. The Newmarket Business Association, a co-sponsor of the event, solicits nominations for various civic-minded awards, allowing community members to nominate deserving individuals.

The Arts, Culture and Tourism Chapter also discusses additional ways for residents to be informed and to encourage collaboration across organizations. This includes Newmarket Library, which is an important hub for community connection, offering educational events and programming, as well as the Sunrise Sunset Center, which provides important connections for the over 55 population in town.

Connectivity Goals:

1. Prioritize physical and mental well-being through spaces that encourage active living.
2. Promote the development of links between the local and regional recreational and conservation sites and the natural, historical, cultural, assets of the area.
3. Update, promote, and support community connections and the encouragement of sharing resources with town organizations, businesses, and resident stakeholders, through Rec Connect Community Collaborations program or similar programs.
4. Enhance townwide communication strategies to reach more of the community, such as e-news, social media, library, rec center, or strategically placed kiosks.

Accessibility and Affordability

An accessible and affordable community has an environment that is meaningful and usable for all in which it is a community where people can live and recreate comfortably without financial or physical difficulty.

Residents should be able to access recreation destinations safely and efficiently, regardless of income, age, or physical ability. The Americans with Disabilities Act (ADA) requirements for accessibility set the minimum standard for public buildings and infrastructure. While this is a good baseline, Newmarket should aim to incorporate more universal design standards into construction or renovation of recreational facilities and public spaces. Universal design allows all people to use the resource regardless of age, ability, or other characteristics, without the need for adaptation or specialized design. One example of where accessibility improvements could be deployed in recreation facilities is at the Sunrise/Sunset and Community Centers where installing automatic door openers would better accommodate all users. For nature-based recreation, the Town could develop a paved off-road path that allows people of all abilities to enjoy Newmarket's beautiful outdoor resources.

Wayfinding is a critical component of accessibility. People need to know where recreation resources are located, how to get there, and where to go once on site. Several chapters in this Master Plan, including the Transportation, Arts, Culture and Historic Resources, Economic Development and Downtown Riverfront Chapters discuss the importance of wayfinding to the future of the town's development). All wayfinding materials should be consistent and use the same thematic styling to make a cohesive identifiable marker to residents and visitors. The materials should also have an accessible color palette and fonts to allow readers to absorb information regardless of disorders such as color blindness and dyslexia.

In addition to being accessible, the Town should maintain and expand affordable or free recreational opportunities. As the main providers and stewards of Newmarket's recreational resources, the

Recreation Department and Conservation Commission strive to continue to provide these important amenities for residents and visitors.

The Newmarket Recreation Department prides itself in offering affordable recreational programs to the community throughout the year. Among its most cost-effective initiatives is the Summer Camp program, "Camp Wanna Iguana", which is one of the most affordable summer camps in the Seacoast. It also offers scholarships for more children to be able to attend. It also provides free events such as the Holiday Party, fishing derby, garden tour, and Arts in the Park.

Additionally, the splashpad at Leo Landroche Field is available for community use at no charge. By offering affordable programming to diverse age groups, Newmarket Recreation addresses the recreational needs of the municipality and adapts to evolving interests and trends. This approach also fosters interaction among different age groups and creates opportunities for multi-generational programming, including skill-sharing programs, mentorships, and family-friendly events. Newmarket Recreation's adult, teen, youth, and preschool programs remain more affordable than local private options, ensuring accessibility for all residents. Any net profit generated is reinvested into the Capital Reserve Budget. Newmarket Recreation also offers after-school programs that are competitively priced compared to private local alternatives.

The Conservation Commission is the steward of Newmarket's wealth of natural resources such as conservation lands and trails, which offer free or low-cost outdoor recreation opportunities. The Commission partners with other community entities, including Scouts, Newmarket schools, Department of Public Works, Newmarket Library, and Recreation Department, among others, to host trail walks and other activities that are free or no cost. In addition, the Commission developed a series of detailed trail maps that people can download from the town's website for residents and visitors to enjoy Newmarket's natural resources. Hiking, bird watching, fishing, biking, and kayaking are also low-cost activities that allow Newmarket to make use of its natural environment as a recreational asset for all to experience.

Connectivity Goals:

1. Expand recreational access and opportunities to serve a variety of needs and functions by adding multiple purposes and uses at existing and future recreational facilities.
2. Continue to provide affordable recreational events and programs for residents, including summer camp scholarships.
3. Continue to offer nature-based recreation at little to no cost to the community.

Resiliency

A resilient community must adapt to new or changing circumstances, plan for the future, recover quickly from setbacks, and support the well-being of its residents in times of crisis or concern.

Climate change is increasing the likelihood of extreme and damaging weather events. Once-in-a-generation storms are happening more often. These and other extreme events pose a rising threat to recreational assets. Sea level rise will change the landscape in the Great Bay and affect recreation sites and greenspace near the tidal portion of the Lamprey River. Larger storms and flooding pose a risk to fields, especially in spring when soils are soft. Along with unpaved parking lots, these facilities can get very messy during mud season. Several organizations made note of this in focus interviews held for this chapter in early 2025. Flood mitigation efforts were implemented at the Leo Landroche complex, but it still suffers from the combined use by local school sports and Recreation Department programs.

Staying active in regional climate adaptation process is essential for Newmarket to plan for anticipated challenges. The Town participated in the first New Hampshire Coastal Risk and Hazards Commission as well as the 2025 update to ensure local and regional climate concerns are represented in updated research and recommendations.

Newmarket is highlighted in the state's 2016 sea level rise report. As a coastal community, Newmarket plays a critical role in a regional decision-making process around climate adaptation. The primary recreation locations that could be affected by coastal flooding/riverine flooding are Schanda Park, Shoppmeyer Park, and Sliding Rock Conservation and Recreation Area ("Piscassic Boat Launch")

Planning for the future is an important factor to maintain resilient recreational assets and networks. As a part of the update process of this Master Plan, SRPC conducted a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis with the Recreation department to determine the improvements needed at several recreation sites in town. While the Recreation department is not responsible for each recreation site that they operate within, they do understand the issues and needs of these sites and have identified a number of needs for each facility (see Appendix I).

A primary recommendation in the Town's [2023 Municipal Facilities Master Plan](#) is that Newmarket should conduct a detailed study to guide future recreation space and programming needs. The result of the study could be used to inform renovation and development at Beech Street Community building, additional athletic and other fields, playgrounds, as well as other recreation facilities.

In addition to recreational facilities and programming, there are other areas in town that should be explored for future nature-based recreation opportunities which could also lead to economic opportunities. The hubs indicated on the map below are areas where there are current recreational activities and opportunities.

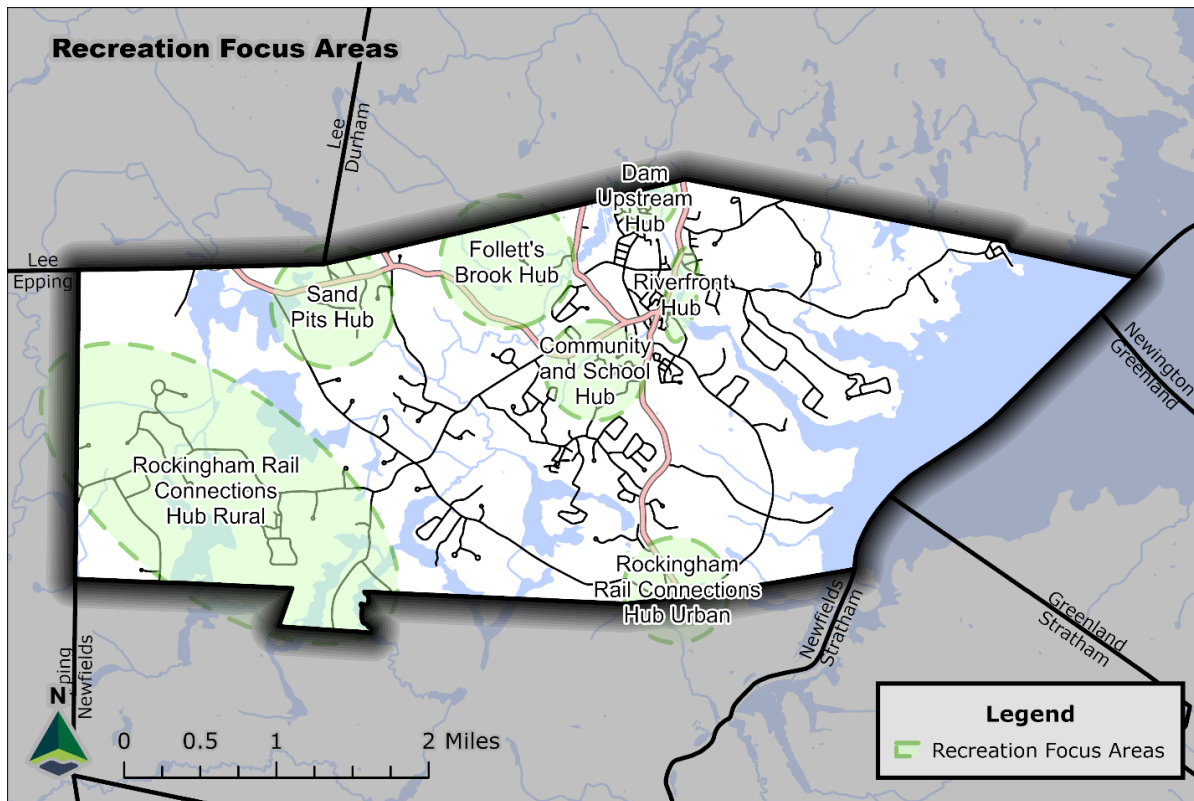


Figure 8 Recreation Focus Areas

Potential uses and ideas for each hub are described below. Further engagement and study should be conducted to prioritize, reach out to landowners in the respective areas, and plan for and fund projects for these areas.

1. Assess private landowners' interest in partnering with the town at each of these recreation hubs.
2. Gravel Pits Hub – Explore Potential Plan NH Charette for Gravel Pits to be converted into a potential recreation site.
3. Community and School Hub - Explore potential connections to school zone and primary recreation area of Leo Landroche Field.
4. Riverfront Hub - Increase trail and other recreation opportunities and connectivity along the Lamprey River Dam to Bay Road.
5. Dam Upstream Hub - Explore potential connection between Shoppmeyer Park and Piscassic Park. Increase connectivity, awareness, and utilization of those two sites.
6. Follett's Brook Hub - Explore potential trail connection between Newmarket and Durham. Explore further conservation opportunities with interested landowners in the Expand Follett's Brook watershed. Pursue sidewalk connection from the elementary school and high school to Piscassic River-Loiselle Conservation Area.

7. Rockingham Recreational Rail Trail Connections Urban Hub - Explore connection from Rockingham Recreational Rail Trail to New Road. Explore connection underneath NH108 bridge.
8. Rockingham Recreational Rail Trail Connections Rural Hub - Explore connections to the Rockingham Recreational Rail Trail specifically from Neal Mill Road and Bald Hill Road. An active trail and bikeway connection to downtown from these two roads should be explored as well.

Resiliency Goals

1. Follow town protocol to ensure disaster and emergency preparedness during times of crisis or concern at events or programs.
2. Continue to grow and adapt to the growing population and changing demographics of Newmarket that impact as many residents as possible while considering recreational trends.

Community Facilities & Utilities Chapter

Adopted xxx 2026



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Vision

Newmarket shall strategically invest in community services, educational institutions, and its facilities to improve the well-being of the community. Guided by innovative and solutions-driven approaches, Town staff, elected officials, and volunteers seek to implement measures to ensure resiliency for community facilities through proactive land use planning and capital investment initiatives. The Town prioritizes these investments by employing a balanced approach that integrates thoughtful strategies for community growth and preservation.

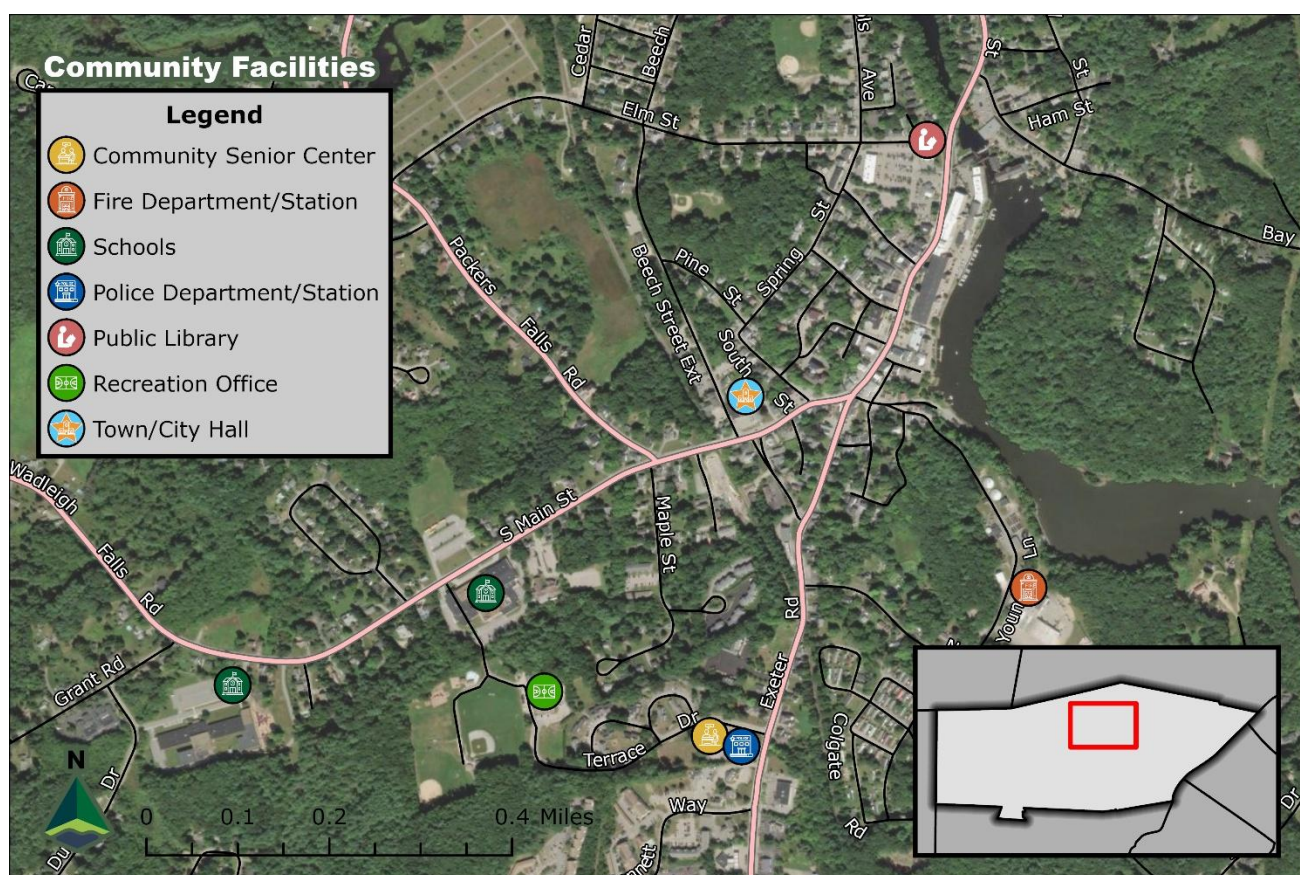
Executive Summary

The Newmarket Community Facilities and Utilities Chapter of the Master Plan summarizes the recent long-range planning work that the Town has completed for its major municipal facilities and utilities. These include: the 2023 Municipal Facilities Master Plan; the 2023 Newmarket School District Facilities Assessment; and the 2025 Water System Master Plan. This Master Plan Chapter incorporates relevant land use related goals and recommendations from these long-range plans and aligns them with the four master plan themes.

Vibrancy

Public facilities play a critical role in enhancing the vibrancy of community life, offering spaces where residents can engage in social activities, access services, and participate in local events. The presence of well-maintained parks, libraries, recreational facilities, and other venues adds color and energy to neighborhoods, fostering a sense of belonging and community spirit.

Newmarket's municipal facilities are important community assets that the Town has developed and maintained over many years. The use of a majority of these facilities has evolved over time, often being repurposed with each generation's different priorities and needs. These facilities are important public spaces that contribute to Newmarket's sense of place and community.



Municipal Facilities

In 2018, the Town conducted a Facilities Survey of municipal departments, followed by the completion of a comprehensive Facilities Master Plan in 2023 ([see 2023 Final Facilities Report](#)). The Plan focuses on the preservation and potential redevelopment of current facilities, as well as the identification of new facilities to address the Town's municipal needs over the next decade and beyond. The Plan presents in-depth condition assessments of the Police Department, Town Hall and former Water Treatment facilities, and high-level overviews of the Community Center,

Public Works/Fire Department, Sunrise-Sunset Senior Center, Public Library, Historic Fire House, and Beech Street Community facilities. The Plan also evaluates program and space needs analysis for municipal departments.

The key findings from the Plan include specific recommendations for the Police facility, an overview of current Town Hall issues, as well as its use and organization. It also provides development options for Town Hall, DPW/Fire Department, Beech Street Community Building, and the old Water Treatment Facility. The Plan notes that there are no significant facility or space needs for the Fire and Public Works Departments as they have recently expanded to add usable space within the existing facility. Nevertheless, the Town should continue to make incremental improvements to the facility as needed and maximize grant funding opportunities to accommodate operational demands

The Plan discusses potential opportunities for underutilized facilities such as the Historic Fire House, Beech Street Community Center, and the old Water Treatment Facility while concluding with a recommendation to engage in specialized planning for the Recreation Department and the Newmarket Public Library.

The Plan focuses on four primary recommendations:

- Renovate and expand existing Police Station & Develop Beech Street Site for Senior Center
- Renovate and expand existing Town Hall Building
- Utilize Old Water Treatment Building for Redevelopment
- Undertake Detailed Library and Recreation Studies to Guide Future Efforts

Prioritization of the physical reorganization and renovation of the Town Hall and Police facilities is highlighted in the Plan while presenting accompanying preliminary feasibility concepts and budgets for the Town's consideration. Together with the feasibility analysis, respondents to the 2024 Master Plan Survey were asked to prioritize improvements to various town owned or operated facilities (e.g., the Community Center, Town Hall and Police facilities) into short-, medium- and long-term priorities (see Appendix A Question 5). Considering only a portion of the town's population participated in past outreach events, confirmation is needed via additional public engagement and outreach efforts to prioritize, plan and fund these improvements.

Equally important to future facility planning efforts is the allocation of resources to study the Newmarket Transfer Station and water management operations. The Department of Public Works operates the Transfer Station and administers the Town's curbside rubbish and recycling contracts. Additional public outreach and engagement should be conducted to determine whether the Town should continue to provide transfer station services or to transition over to curbside waste management exclusively. Furthermore, the Town owns a capped landfill that

should be evaluated for future opportunities as the Town grows – potential uses could be as a recreation node, art walks or biking/trail system.

School District Facilities

The Newmarket School District also conducted a facilities planning assessment in 2023 for the Newmarket Elementary School, Newmarket Junior Senior High School, and the Newmarket School District Annex ([see Newmarket School District CIP](#)). The reports provide recommendations for short- and long-term capital needs that the Town should anticipate from 2025 through 2043. For each facility, the consultant examined and assessed the site's systems, building mechanical and electrical systems, building architectural systems, and interior areas. The Capital Improvement Committee developed short- and long-term funding strategies to address ongoing repair and upkeep of facilities, replacement cycles for equipment and planning for larger capital improvement needs that will arise from aging facilities.

The primary goals include:

- Short-Term: Implement a high-quality maintenance and improvement plan for regular, ongoing maintenance of facilities and equipment, extending lifespans as long as possible.
- Long-Term: Develop a schedule and funding plan for larger capital projects such as roof repairs and HVAC equipment replacement. Create an annual warrant article each year that would add a set amount to the existing School Improvement Capital Reserve Fund.
- Future Expansion/Strategic Investment: Annually evaluate the 10-year funding plan to determine when larger enhancement projects (ie. Athletic field/complex development, solar field development, etc.) might best fit in with existing capital needs.
- Avoid Tax Impact “Spikes and Valleys”: Budget for routine and regular maintenance at the same level each year, contribute an annual set amount for the annual warrant article to add funds to the CRF to “flatten out” the funding needed for the next 10 years, minimizing variability year-to-year in local tax burden.
- Revisit the CIP plan every 5 years to ensure that capital improvement needs have not changed, and funding needs are being met.

To fund the range of improvements needed, the School District proposes annual funding levels for the Capital Improvement Plan that range from \$200,000 per year (FY24-27), \$240,000 per year (FY28-33) and \$270,000 per year (FY33-43).

Respondents to the 2024 Master Plan Survey were asked to indicate their support of school district facilities being made more climate responsive to support school and community needs by adding generator capacity or central air conditioning to school facilities. There was strong

support for both improvements – Central air conditioning 66% and Backup generator capacity 57% (see Appendix A Question 4).

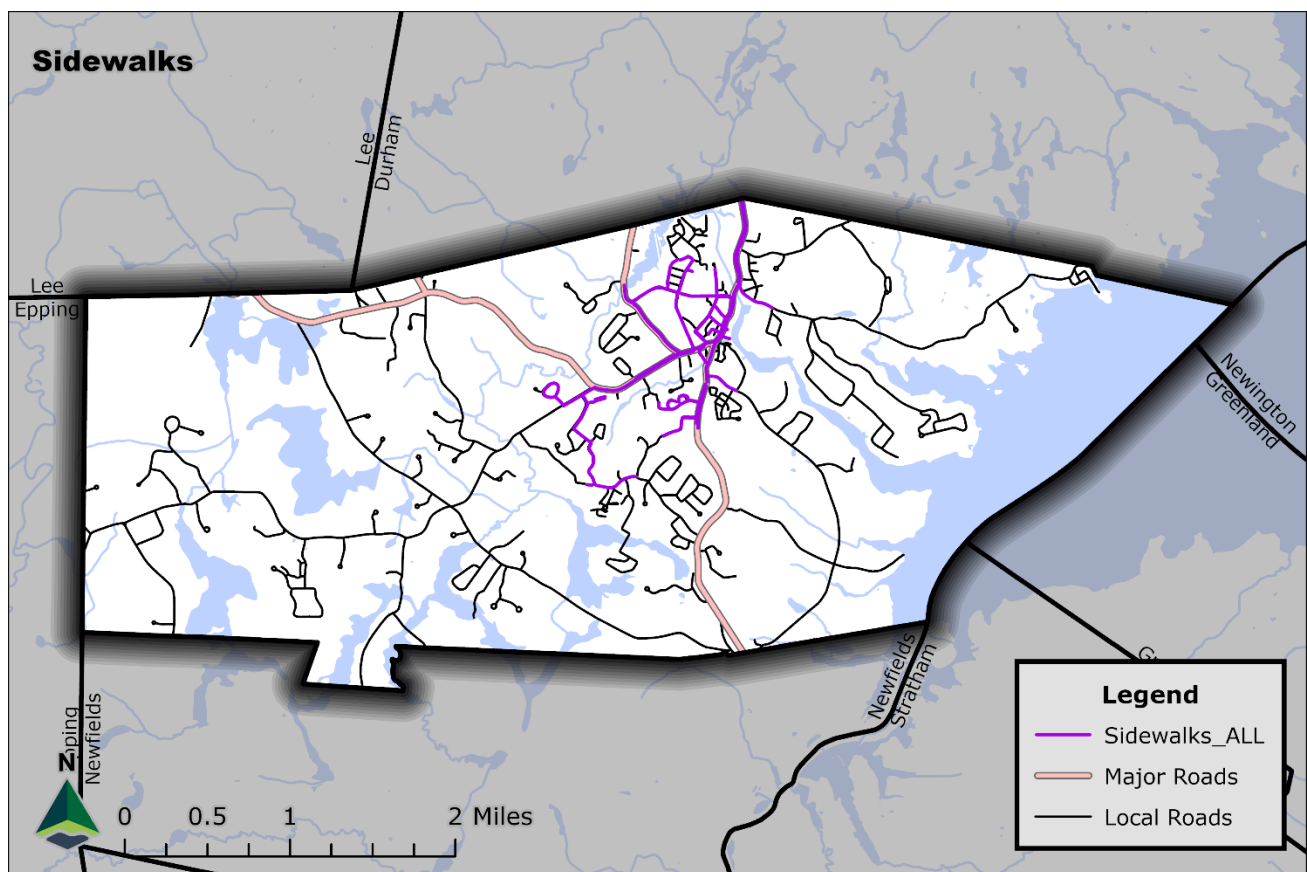
Vibrancy Goals

1. Conduct additional community outreach to help inform priorities during the planning of renovation and/or expansion of municipal facilities.
2. Determine appropriate disposition of underutilized facilities.
3. Undertake detailed library and recreation studies to guide future efforts.
4. Implement high-quality maintenance and improvement plans for regular, ongoing maintenance of all facilities and equipment, extending lifespans as long as possible.
5. Develop a schedule and funding plan for larger capital projects such as roof repairs and HVAC equipment replacement.
6. Seek to annually evaluate and improve the Capital Improvement Program process to ensure funding requests align with the Master Plan goals.

Connectivity

A well-connected community provides safe, efficient, and economical community utilities to support the needs of its residents and businesses.

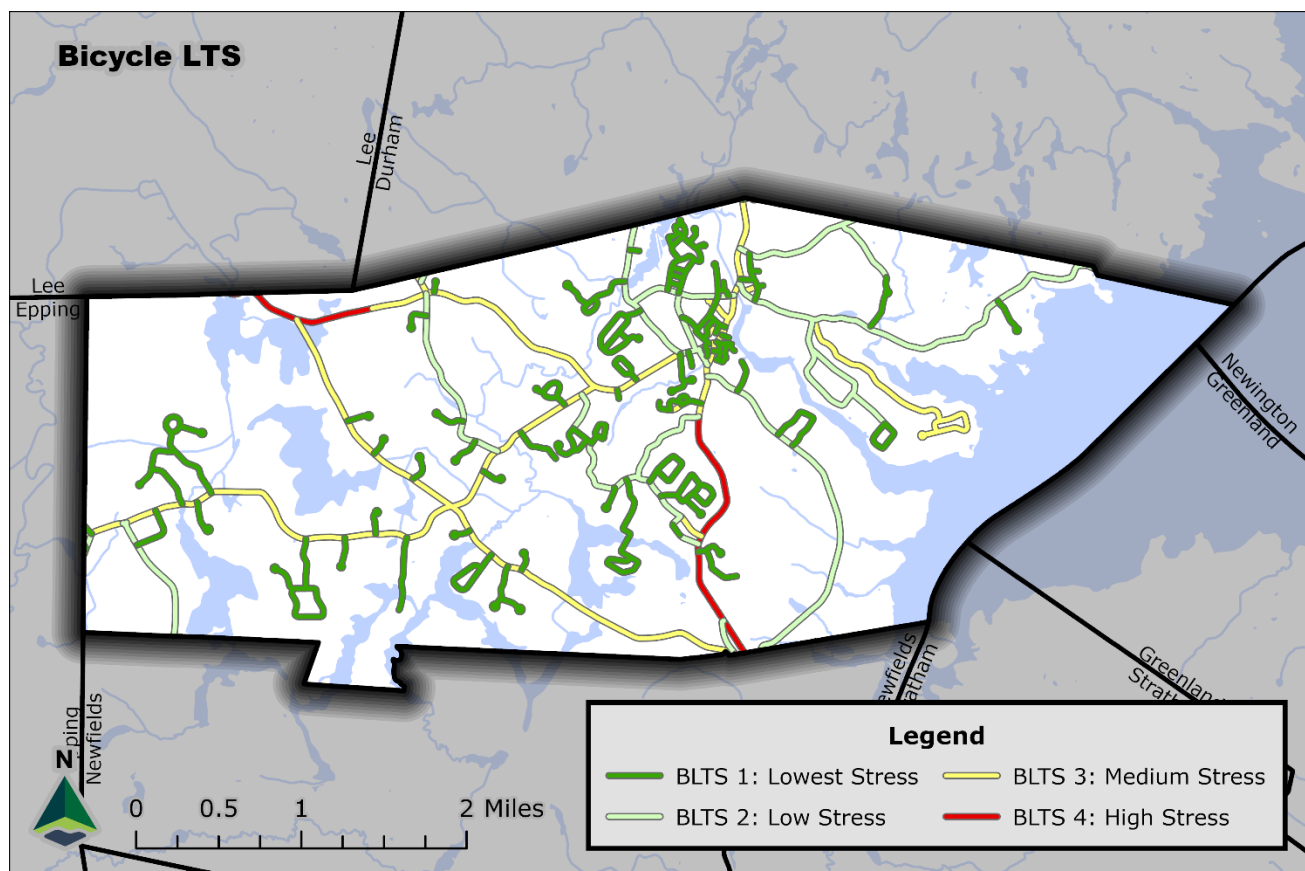
Newmarket's transportation network of streets, trails, and bike routes is fundamental to the Town's physical connectivity. Pedestrian safety was ranked the highest transportation priority in the 2024 Master Plan Survey, and maintaining and expanding walkability is identified as a primary goal in the Transportation Chapter [link]. Newmarket's sidewalks provide convenient connections primarily in the village core and on adjacent roadways.



In 2019 Underwood Engineers developed a Sidewalk Expansion Plan for the installation of asphalt sidewalk with vertical granite curb along New Road, Young Lane, South Main Street, Grant Road, Maple Street, Bennett Way, Hersey Lane, Salmon Street and Piscassic Street. These roadways are all located in high-density neighborhoods containing a high volume of both pedestrian and traffic. The Town began implementation of the plan in 2022 and is currently

working to install sidewalks over the next 5 to 6 years, as funded through the Town’s CIP. The work is being completed by DPW Staff with assistance from frequently used contractors to reduce the overall cost of construction.

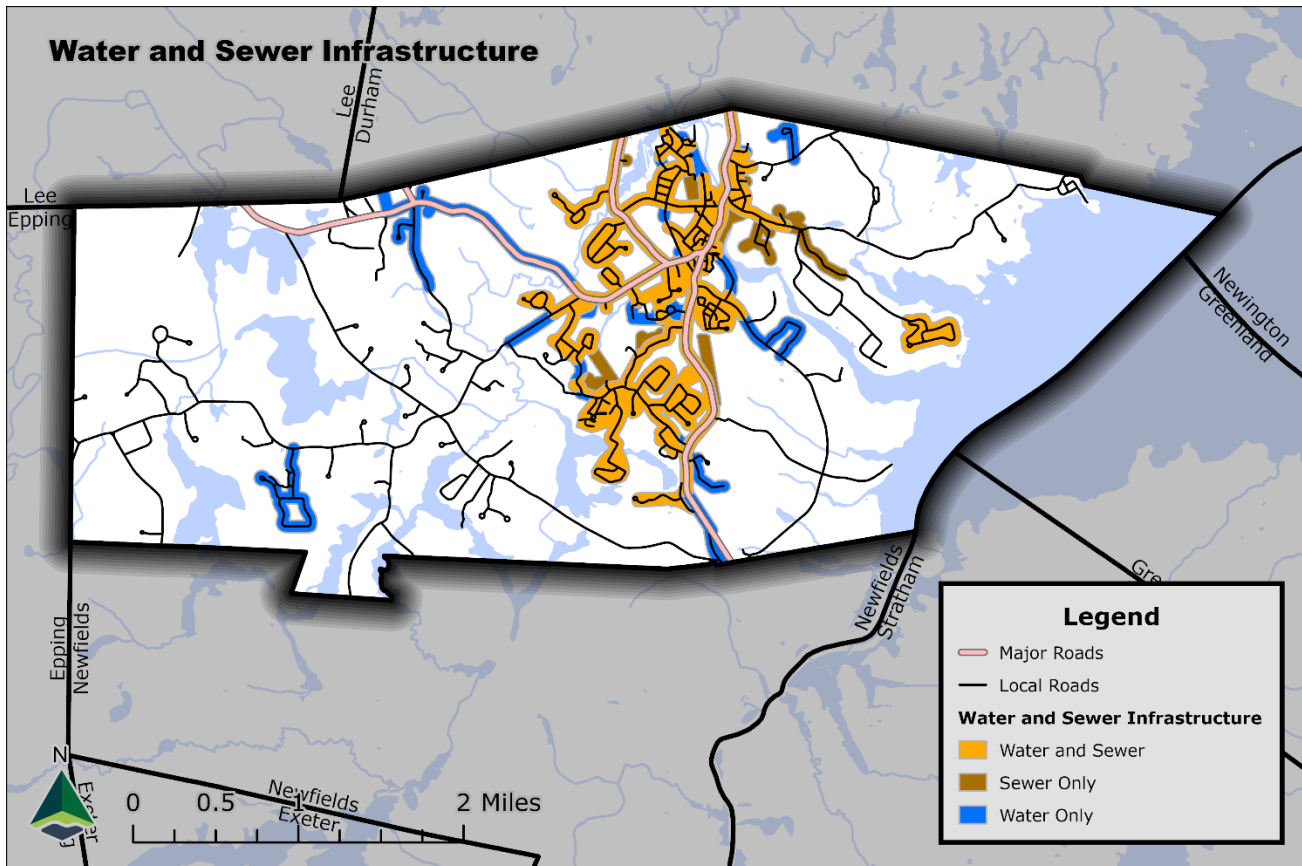
Many of Newmarket’s more rural roadways could also be appropriate and safe for walking and biking where there is lower traffic volume and safe shoulders. The Bicycle Level of Stress (BLTS) map below shows roadways in Newmarket where most people feel comfortable and safe biking and which roadways cause the most stress.



The SRPC is currently completing a Pedestrian Level of Stress (PLTS) analysis for Newmarket that will provide additional input into creating and mapping pedestrian and bike friendly routes within Town, allowing people to access most parts of Town without having to use vehicles. Additional aspects of connectivity are discussed in other Master Plan chapters such as Transportation, Recreation, Open Space Plan and Downtown Riverfront [link to chapters].

Newmarket’s water and sewer utilities are also important for Newmarket’s connectivity, internally and within the Seacoast region. They are community assets which are often a driver

for growth and require careful and considered planning to ensure Newmarket's future growth and prosperity. The Town's Environmental Services Water and Sewer Divisions are responsible for the Town's drinking water and wastewater disposal services, ensuring that they are high-quality, cost effective and in compliance with all regulatory requirements. It should be noted that several neighborhoods in Town are served by private water systems including Shanda Road and Moody Point.



The Town has conducted several long-range planning studies of the water and wastewater systems over the last decade including: Water System Master Plan (2025); [Twenty Year Water and Wastewater System Build-Out Study](#) (2017); [Ten Year Water System Capital Improvement Plan](#) (2018); [Nitrogen Control Plan](#) (2018); [Great Hill Water Tank Inspection](#) (2018); and [Corrosion Control](#) (2016).

The Water System Master Plan, completed by Underwood Engineers in 2025, evaluates the current water system (water quality, source, treatment, distribution and storage, and operations), projects future supply and demands, and provides a Capital Improvements Plan to

guide future growth and improvements through 2045. The Plan estimates that the current water supply is adequate to meet future demands and could support future expansion within Newmarket or within the region to interconnect with adjacent water systems. Should demand exceed the projections, there are options to increase the Town's water supply which include artificial recharge of the Newmarket Plains Aquifer and relocating the Bennett well. To help offset the costs to maintain and replace these facilities, the Capital Improvement Plan provides guidance to the Town Manager on funding allocations to respective capital reserve funds. The recommendations includes a forecast of anticipated funding requests for near-term projects over the next 6 years as well as future projections beyond that timeframe.

The Twenty-Year Water and Wastewater System Buildout Study, completed by Wright-Pierce in 2017, evaluates the water and wastewater treatment systems to accommodate potential future growth. The Study discusses the limitations on Newmarket's wastewater treatment plant, examines potential impacts of various build-out scenarios, and recommends a variety of demand management options including changes to zoning. The wastewater treatment facility underwent significant upgrades in 2017, and the Town has developed a capital improvements plan to continue to maintain and make improvements. Environmental Services is currently in the process of developing a Master Plan for the Wastewater System, which would include operations, staffing, collection system improvements and expansion, wastewater treatment plant improvements due to the impacts of changing regulations, and solids disposal. It will also identify the Wastewater Department needs, estimated costs, personnel and impacts.

Connectivity Goals

1. Continue to improve bicycle and sidewalk infrastructure.
2. Implement recommendations from the 2025 Water System Master Plan.
3. Complete and implement a Master Plan for the Wastewater Treatment Facility.

Affordability & Accessibility

Community facilities and utilities are planned for, maintained, and replaced through thoughtful and careful planning, avoiding significant “peaks and valleys” in the tax rate, keeping the Town stable, affordable and accessible.

The Town is committed to providing residents with adequate access to community facilities while maintaining cost efficiency. It is imperative for the Town to consistently evaluate the availability of appropriate infrastructure to all residents and assess the equitable distribution of community services throughout the municipality.

Newmarket has an active Capital Improvement Program (CIP) Committee that includes representatives from the Town Council, School Board, Planning Board, Budget Committee as well as the Director of Community Development and the Town Manager. The CIP is updated on an annual basis and is based on project requests for facilities and equipment submitted by town departments that span a six-year timeframe. Requests cover major municipality facility repairs, purchasing vehicles, roadway improvements, stormwater management measures; water and wastewater facilities; as well as recreation, library and school facilities and equipment. The CIP Committee reviews and evaluates the requests, ranking them as urgent, compulsory, necessary or desirable. The resulting recommendation schedule is then sent to the Budget Committee for consideration and inclusion in the Town’s annual budget.

The most recent CIP (2025 – 2031) was adopted in September 2024 and includes funding requests for maintaining municipal equipment and vehicles, roadway maintenance and improvements, sidewalk expansion, ensuring compliance with the NH MS4 Stormwater discharge permit, stormwater management, and water and wastewater facility upgrades.

Accessibility / Affordability Goals

1. Revisit the CIP plan annually to ensure that capital improvement needs have not changed, and funding needs are being met and to determine when larger enhancement projects might best fit in with existing capital needs.
2. Budget for routine and regular maintenance at the same level each year, contribute an annual set amount for the annual warrant article to add funds to the CRF to “flatten out” the funding needed for the next 10 years, minimizing variability year-to year in local tax burden.

Resiliency

A resilient community can withstand, recover or adjust to adversity or change.

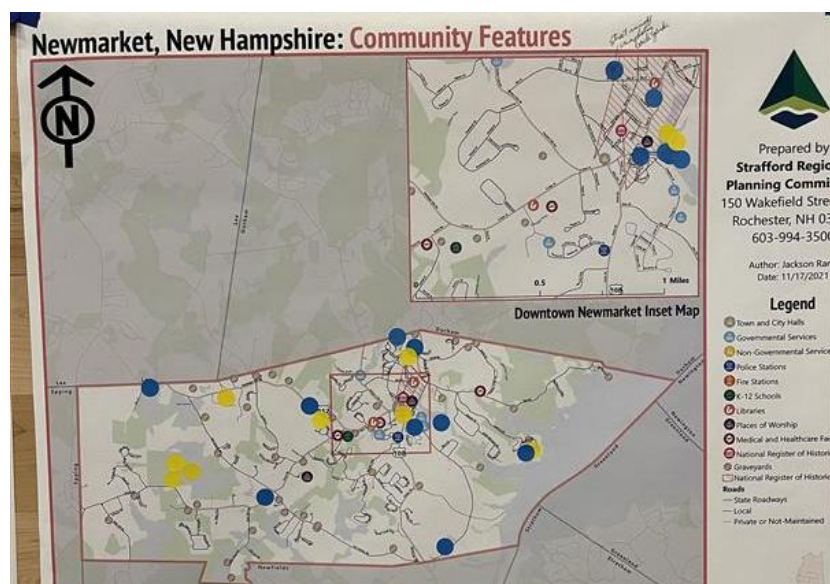
As a Seacoast community, it is critical to plan for a resilient public infrastructure that can withstand and quickly recover from increased flooding and sea level rise and severe storm damage. The Town's Multi-Hazard Mitigation Plan, updated in 2025 [link], considers natural, technological, and human-caused hazards and focuses on ways the Town can reduce or eliminate long-term risk to human life and property.

The Hazard Mitigation Plan examines the overall vulnerability and risk that climate change poses to the Town, including all types of natural hazards (flooding, drought, extreme temperatures, severe winter weather and wildfire), as well as technological hazards due to aging infrastructure and contaminants. Human-caused hazards such as cyber-attacks and mass casualty are also touched upon. The Plan proposes a wide variety of mitigation strategies and actions to enhance the Town's resiliency to anticipated hazards. The actions range from educational and public awareness campaigns to personnel training, purchasing equipment, regulatory changes and facility upgrades.

As a seacoast community, Newmarket is particularly susceptible to flooding events. Combined with expected sea level rise, there are infrastructure improvements that should be considered to ensure that the town can withstand and recover more quickly from these events. The 2024 Master Plan Survey asked respondents to rank stormwater challenges in Newmarket. The highest priority was to deal with and prevent pollutants from entering local waterways, followed by mitigation of localized flooding and replacing aging and/or undersized storm drain systems [see Appendix A Question 6]. At the Fall 2024 Master Plan Workshop, people identified areas where they have experienced flooding in Town.

The areas of concern included:

- Grant Road between Ash Swamp Road and Neal Mill Road
- Area along the Lee Town line near Jan Lane

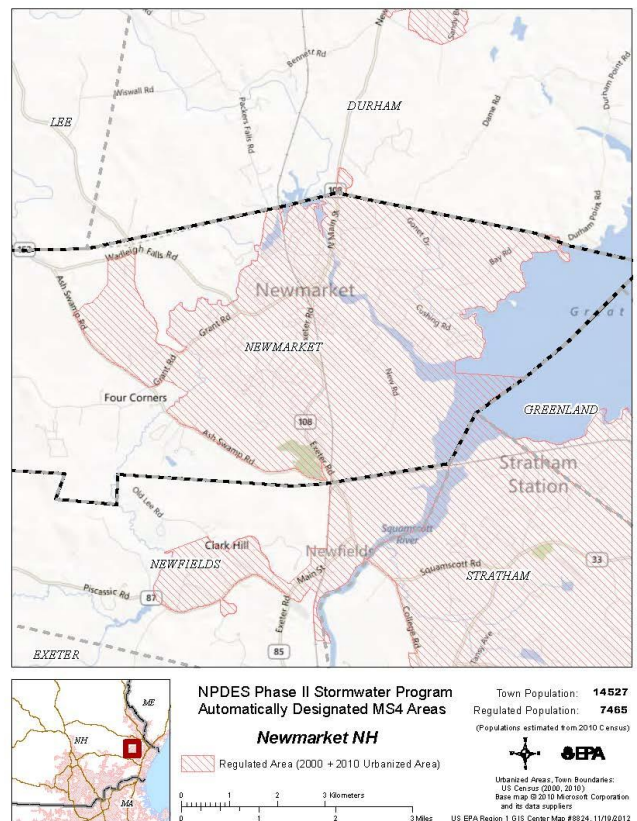


- Wadleigh Fall Road (NH 152) between Langs Lane and Grant Road
- Durham Town line near river
- N. Main Street near Pulaski Drive
- Cushing Road area
- Between Birch Drive and Stevens Drive
- Exeter Road/Short Street/Prescott Street
- End of Treatment Plant Road
- Near intersection of N. Main Street and Central Street
- Off of Elm Street near Elm Court
- New Road near Route 108
- New Road near Newfields Town line

The Town's Engineering Department is responsible for planning improvements to roadway and stormwater infrastructure and oversees capital projects to ensure that they are constructed to be durable, efficient, cost effective and safe. Under the National Pollutant Discharge Elimination System (NPDES), Newmarket's urbanized municipal separate stormwater sewer system (MS4) is required to maintain and implement a [Stormwater Management Program](#) (SWMP) for the designated area shown on the NPDES Phase II Stormwater Program map.

The Town Engineer coordinates the SWMP which is updated annually to comply with the terms of the permit. The SWMP is a 'living document' intended to be revised and updated as needed, but at a minimum, annually. The primary goals of the SWMP are to reduce the discharge of pollutants from the MS4 to the maximum extent practicable, to protect water quality, and to satisfy the appropriate water quality requirements of the Clean Water Act (CWA).

To achieve these goals, the Town implements certain Minimum Control Measures (MCMs), which include:



- Public Education and Outreach (see Stormwater Resources)
- Public Involvement/Participation
- Illicit Discharge Detection and Elimination (IDDE) Program
- Construction Site Stormwater Runoff Control
- Post-construction stormwater Management in New Development and Redevelopment Projects
- Pollution Prevention/Good Housekeeping for Municipal Operations

The Town of Newmarket received grant funding from NHDES toward development of a Stormwater Asset Management Program (AMP). DPW Staff is working with engineers from Wright-Pierce in development of that program. That work includes bringing existing GIS data, drainage studies, condition assessments and evaluations, and institutional system knowledge into a comprehensive and consistent management program, much like the plans/programs that the Town has for water and wastewater systems. In development of a Stormwater AMP, the Town will receive a written User Manual including standard operating procedures (SOPs) and workflows for GIS data collection, determining and updating condition assessments, updating risk assessments and updating asset prioritization for repair/replacement. It is anticipated that the AMP User Manual will include identification and prioritization of stormwater infrastructure upgrade projects that will be undertaken in the coming years to maintain acceptable levels of service.

Like many communities throughout New England, the Town of Newmarket is facing challenges presented by aging infrastructure, diminishing state and federal funding, increasing demands from stakeholders and a more complex regulatory environment. Development of a Stormwater AMP will provide the Town with a valuable planning and decision-making tool for use in maintaining and upgrading stormwater system infrastructure.

Resiliency Goals

1. Minimize loss and disruption of human life, property, the environment, and the economy due to natural, technological, and human-caused hazards through a coordinated and collaborative effort between federal, State, and local authorities to implement appropriate hazard mitigation measures.
2. Enhance protection of the general population, citizens, and guests of Newmarket before, during, and after a hazard event through public education about disaster preparedness and resilience and expanded awareness of the threats and hazards which face the Town.
3. Promote continued comprehensive hazard mitigation planning to identify, introduce, and implement cost effective hazard mitigation measures.
4. Address the challenges posed by climate change as they pertain to increasing the risk and impacts of the hazards identified within this plan.
5. Strengthen Continuity of Operations and Continuity of Government to ensure continuation of essential services.

ECONOMIC DEVELOPMENT CHAPTER

Adopted xxx 2026



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Vision

The Town of Newmarket should work to retain and support its current businesses, while providing opportunities for economic growth and activities which will strengthen the Town's economic base, provide employment for residents, and enhance its position in the regional economy.

Executive Summary

Newmarket is a quaint New England mill town with many unique assets that make it a prime location for economic growth and vitality. It is characterized by the historic downtown's proximity to the Lamprey River, quality open spaces, and well-maintained mill infrastructure that has been readapted into housing, commercial, and civic spaces. Furthermore, its dense, compact buildings downtown make for a charming community that blends architectural and historic character that set it aside from many other places and make it a prime location to support a vibrant business community.



Figure 1: Newmarket Photo Contest, Town of Newmarket, Chris Enzaldo

Newmarket's economic future will, in large part, be shaped by the Town's commitment to economic development activities, which will have a positive impact on its tax base, employment, and overall quality of life. To accomplish the goals and actions outlined in this chapter, it is a priority of the Town to establish a centralized economic development function to oversee these activities. Such activities include:

- Attracting the types of businesses that fit well with Newmarket's unique character and complement the needs and wants of residents;
- Enhancing year-round economic activity;
- Maintaining the downtown and continuing to enhance other areas suitable for new businesses or business expansion;
- Increasing regional and local connectivity to help support the workforce, access to jobs, and the expansion of existing and new industries;
- Creating a resilient economic base that can withstand social and economic changes;
- Promoting a more accessible environment for businesses and workers that promotes growth;
- And supporting business growth and expansion to have a positive impact on the Town's tax base, employment opportunities, and overall affordability.

Master Plan Themes and Goals

The 2025 Master Plan's approach is to explore each chapter's subject matter from five different perspectives to ensure that the community is evolving in a holistic manner. These five guiding themes

emerged from the public engagement process and are designed to act as touchstones to help the community achieve its goals. Below are the themes and corresponding definitions.

Vibrancy

A vibrant community is one that exudes energy and is full of activity and life. It is welcoming and friendly to all ages, supports cultural diversity, and provides economic opportunities.

For economic development in Newmarket, “vibrancy” means creating a lively and diverse atmosphere throughout Town where a mix of businesses like retail, restaurants, and professional services can thrive while drawing in and meeting the needs of both locals and visitors. A diverse mix of businesses that are aligned with the unique and quaint character of Newmarket will help ensure that the area is active year-round, offers a variety of employment opportunities, and fosters spaces for community members and visitors to mingle and socialize. Achieving vibrancy also includes a business community that is invested in revitalization efforts, involved in community decisions, leads by proactive example, and is supported by municipal policies and community investments.

A vibrant community is comprised of a diverse range of businesses that not only cater to, but also provide, employment opportunities for people of all ages and skill levels.

Working towards a vibrant economy includes promoting a diverse business sector, skilled workforce, strong entrepreneurial activity, and a culture of inclusion where people from all backgrounds have opportunities to participate and contribute to economic growth.

Understanding the composition of the Town’s population, including the population’s skills and age composition, as well as consumer behaviors, community feedback, and needs and wants of residents can provide key insights to understanding the types of businesses, services, and industries the Town should seek to attract to the community. See Appendix A for further discussion about Newmarket’s population trends.



Figure 2: Newmarket Photo Contest, D Smith

Beyond ensuring that efforts to attract businesses can focus on industries and services that align with the community’s preferences and skills, understanding community members’ wants can ensure these businesses will be economically viable. The community survey conducted in late summer/early fall 2024 indicated that while the majority of respondents wished to see a more affordable mid-sized grocery store, more retail and specialty shops, and more affordable and varied food and drink establishments (such as restaurants that offer outdoor seating, food trucks, or a restaurant by the water), other popular mentions included more places for kids and teens, more entertainment, and a medical dispensary. Many respondents also mentioned wanting to see more “third spaces”, or places outside of work and home where the community can gather (e.g. bookstores, coffee shops, picnic areas by the Lamprey River, etc.).

Maintaining the unique character of Newmarket.

In addition to attracting the types of businesses the community needs and wants, a priority for the Town is to ensure they match the unique character of Newmarket. When asked what vibrancy means in terms of economic development during the community workshop in the fall of 2024, attendees expressed wanting slow, intentional growth while maintaining a small town feel and welcoming environment, and there was little appetite for big box or national retailers. In the downtown core, for example, this may be accomplished by implementing a [Form Based Code](#) to create more density while maintaining and enhancing its quaint character, and avoiding large parking lots from being directly on Main Street to avoid fragmentation of street life. To increase vibrancy while maintaining Newmarket's small-town character, there are also opportunities for the Town to explore designating and allowing public areas dedicated to "kiosk-type" or "pop-up" businesses, where food trucks and other vendors can come together to provide goods and services during designated periods of time, and can be complemented by live music and other community activities (this would also allow for more affordable overhead costs for start-ups and small entrepreneurs).



Figure 3: Newmarket Photo Contest, Morgan Prestridge

Enhancing visitor access to support existing businesses and economic activity.

Enhancing visitor access is a crucial component to achieving and maintaining a vibrant downtown core, supporting existing businesses, economic activity, and a community atmosphere year-round. In the community survey, respondents indicated that they believe one of the top three challenges to economic development in Newmarket was low visitor access, something that is particularly evident in the winter months. To achieve this, it is a priority for the Town to explore ways to make public spaces more inviting year-round. This may include fortifying public-private partnerships between the Town and business/property owners to implement beautification efforts, improving lighting in public spaces, creating a safer, more walkable environment, improving signage and placemaking, and improving public access to and from the riverfront (see implementation matrix for more details). Pedestrian traffic count studies, which can be conducted by Regional Planning Commissions, can help the Town and businesses track and analyze visitor patterns in a designated area (e.g. the riverfront or downtown), which can help them make informed decisions regarding the best ways to attract visitors and clients year-round. (Link to Transportation Chapter)



Figure 4: Newmarket Photo Contest, Olivia Brooks

Parking is also a vital necessity when thinking about attracting year-round visitors to Town. The number one challenge to economic development in Newmarket identified by survey respondents and through one-on-one interviews with business owners was, by far, parking. While parking on Main Street remains limited, the Town has 466 total spaces (with 180 public spaces that are not reserved for specific businesses, permits, or vehicles) that can be used to accommodate visitors and residents. Marketing the availability of parking to visitors and encouraging owners and workers to use public lots (vs. on-street parking) is a small step that can have an immediate impact on helping alleviate some of the parking pressures and invites year-round visitor access.

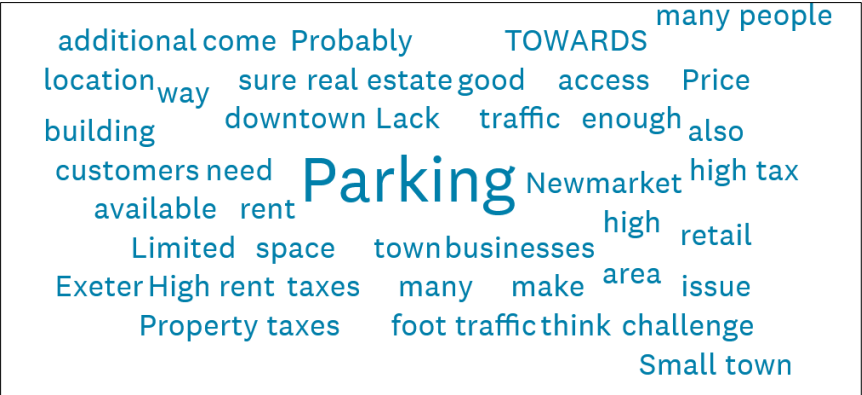


Figure 5: What challenges, if any, do you perceive to establishing a business or company in Newmarket?
Newmarket Master Plan Survey

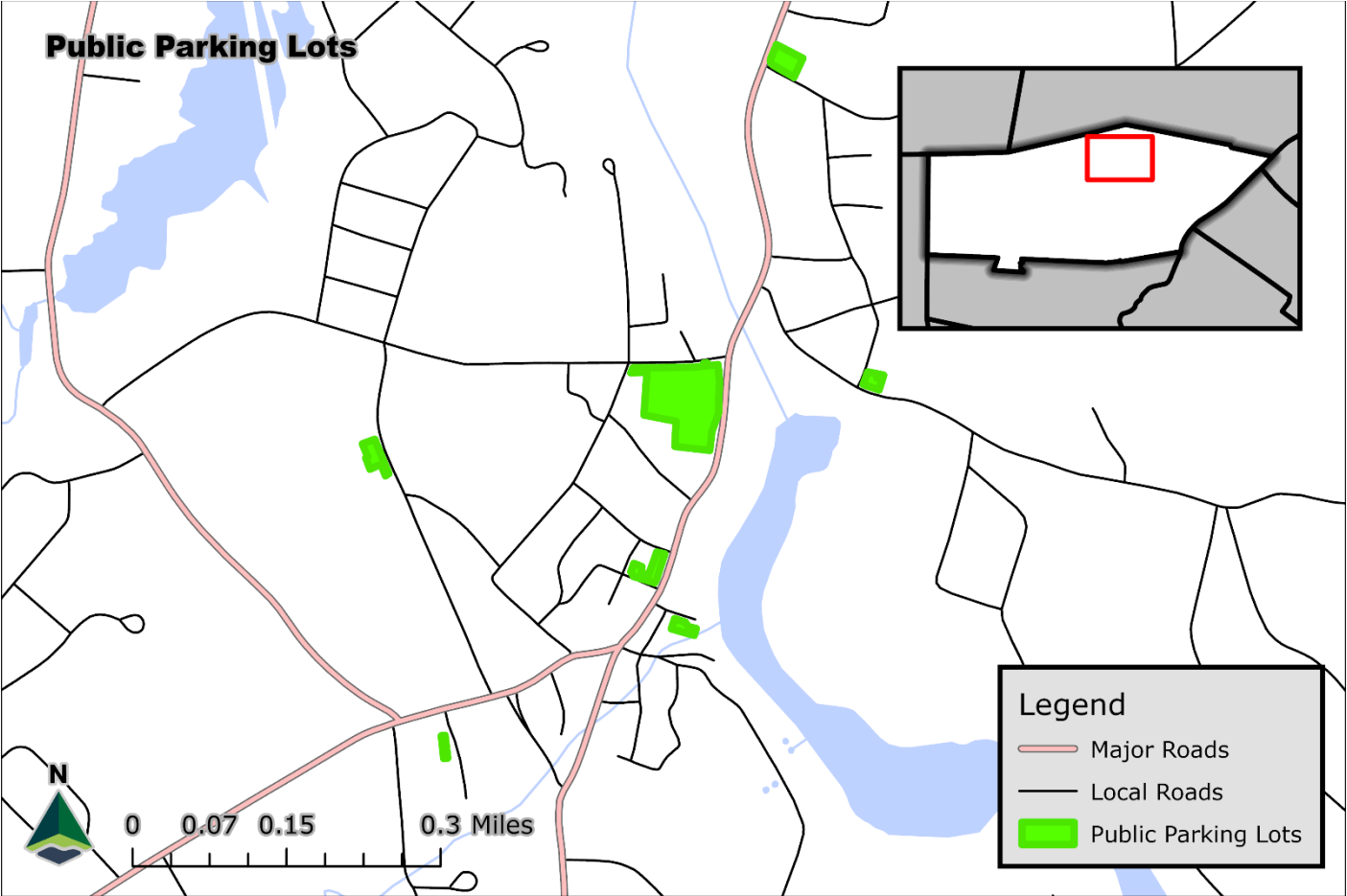


Figure 6: Public Parking Lots in Newmarket. Source: SRPC

As discussed in the Downtown Riverfront Chapter, using creative signage and wayfinding at the site of each lot to promote the various businesses, as well as the Town's natural resources, cultural points of interest, and arts and civic spaces can help guide and incentivize locals and visitors to use the public parking spaces while promoting businesses and amenities that the Town has to offer.

Given Newmarket's assets, there are opportunities for recreation, arts, and culture to become year-round economic drivers for the Town. Engaging in marketing efforts can also help promote these community assets, including a historic, quaint mill town with Main Street

businesses and food establishments, proximity to the Lamprey River, and various outdoor recreation, cultural, and community events and opportunities. Beyond the downtown core, enhanced marketing can also be used to promote the availability of commercial and industrial spaces throughout Town, as well as different incentives for development and the revitalization of underutilized and or/undeveloped spaces.

Exploring partnership opportunities with community and economic development organizations.

Exploring partnership opportunities with community organizations can encourage a strong sense of community and allow for new opportunities to help advance the goal of maintaining and enhancing vibrancy in the community, therefore increasing economic activity. As discussed in the Arts, Culture, & Historic Resources Chapter, there are several well-established organizations at the local, regional, and state level that work towards creating a more vibrant place in Newmarket and beyond. Organizations to explore, maintain and/or increase collaboration with include:

- Newmarket Main Street Corporation
- Lamprey Arts and Cultural Alliance (LACA)
- Newmarket Community Development Corporation (NCDC)
- Newmarket Heritage and Cultural Center Committee, (NHCCC) – subcommittee of LACA
- Newmarket Business Association (NBA)
- Strafford and Rockingham Regional Planning Commissions
- UNH Cooperative Extension
- NH Department of Business and Economic Affairs
- Seacoast Small Business Development Center
- NH Small Business Administration
- Apprenticeship NH
- Newmarket Arts, Culture and Tourism Commission

Beyond that, Newmarket's diverse population allows for an active and engaged community, involved in many volunteer and engagement opportunities that contribute to the enhancement of the Town.

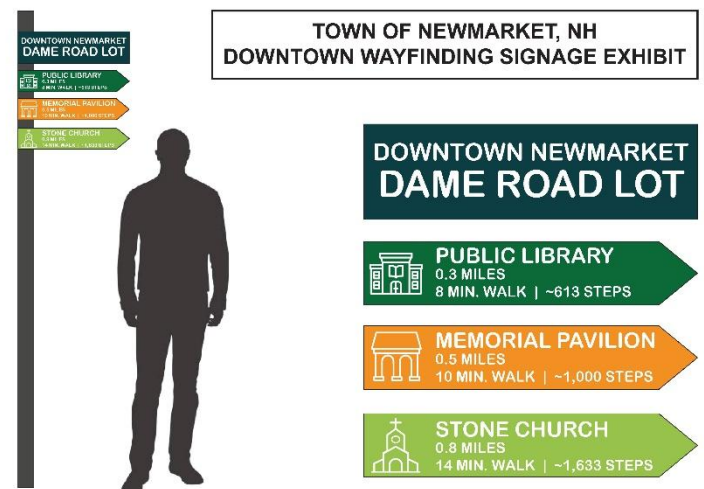


Figure 7: Wayfinding Example, SRPC

A vibrant community prioritizes the continued maintenance, investment, and enhancement of the downtown and other areas around Town that allow for economic opportunity.

The maintenance, investment, and continued enhancement of infrastructure in the Downtown and other economic nodes throughout Town is another essential component to maintaining the Town's vibrancy while contributing to its tax base. Over a decade ago, thanks to a combination of municipal and state funding, and innovative efforts through the Community Revitalization Incentive Zone District under NH RSA 79-E and Tax Increment Financing (TIF) districts, Newmarket underwent a \$6.8 million revitalization project that included major improvements to Newmarket's Business District, including the replacement of water, sewer, and drainage facilities, the removal of overhead wires, installation of new lighting and underground utilities, new sidewalks, crosswalks, landscaping, and streetscape improvements. While the Town has come a long way to preserve and revitalize the overall infrastructure and aesthetics of town, the continued investment in the enhancement, maintenance, and investment of town continues to be a priority. In the community survey, when asked to rank which actions people believed will promote the worth and enhancement of Newmarket's downtown businesses, the number one answer was "investing in the maintenance and enhancement of downtown's built environment".

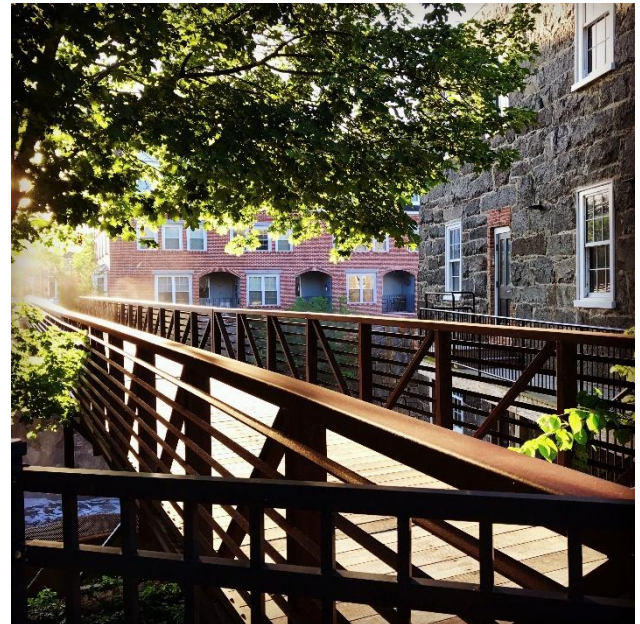


Figure 8: Newmarket Photo Contest, Mills Bridge, Melissa Sharples

The development of areas suitable for new businesses, or business expansion, is also key to promoting economic vibrancy. Other areas to leverage that can allow for economic growth include the "Gateways", or areas of economic opportunity. In 2019, the Arnett Design Group, LLC (ADG) was hired by the Town of Newmarket to conduct a "Gateway" study. The main goals of this study were to 1) clarify the Town's major gateways, 2) identify issues that may impact future development within each gateway, and 3) outline an action plan that will enhance positive development opportunities within each gateway. As a result of this study, three Gateways were identified: the North Gateway, West Gateway, and South Gateway.

Given the pivotal role that the implementation of economic development tools such as TIF districts and the NHA RSA 79-E tool had on the success of revitalizing Newmarket's downtown area, the Town might consider replicating this strategy to help catalyze infrastructure improvements within other areas across Town identified as good candidates for commercial development (such as the proposed Gateways), bringing these areas to their maximum potential. Continued utilization of these economic development tools will help enhance vibrancy throughout the entirety of Town by ensuring that available business and industrial sites are easily accessible for business growth and expansion, transportation infrastructure is adequate, and other infrastructure like water, sewer, and fiber optic broadband are modernized and

available.¹ Furthermore, the Town can also support this effort by studying an extension of sewer infrastructure to the identified Gateways, allowing them to outline an action plan to enhance future development within each area.

Other resources and tools that Newmarket can explore to encourage businesses to expand in -or relocate to - Newmarket include:

- [Economic Revitalization Zones and Opportunity Zones](#)
- Community Development Block Grants
- USDA Rural Development Grants
- Brownfields Program
- EPA Technical Assistance Programs

Enhancing and promoting the Town’s access to natural resources and proximity to the Lamprey River can also help promote vibrancy in the community.

The Lamprey River and Great Bay Estuary are unique natural resources which should not be overlooked for their economic values. The Lamprey River corridor is a diverse extensive wildlife habitat, with a number of endangered and threatened bird species and picturesque scenery with small rapids and falls in wooded areas. A portion of the river is protected under the federal Wild and Scenic Rivers program of the National Park Service and the entire river has been designated for protection under the New Hampshire Rivers Management and Protection Program by the NH Legislature.

As discussed in the Open Space Plan and the Land & Water Conservation Chapter, the river and its estuaries provide endless opportunities for outdoor recreation, including canoeing, fishing, swimming and tubing. Trails for hiking, jogging and cross-country skiing can be found along the river on town-owned lands, and scenic, natural, and historic sites along the way provide educational and recreational opportunities for all.

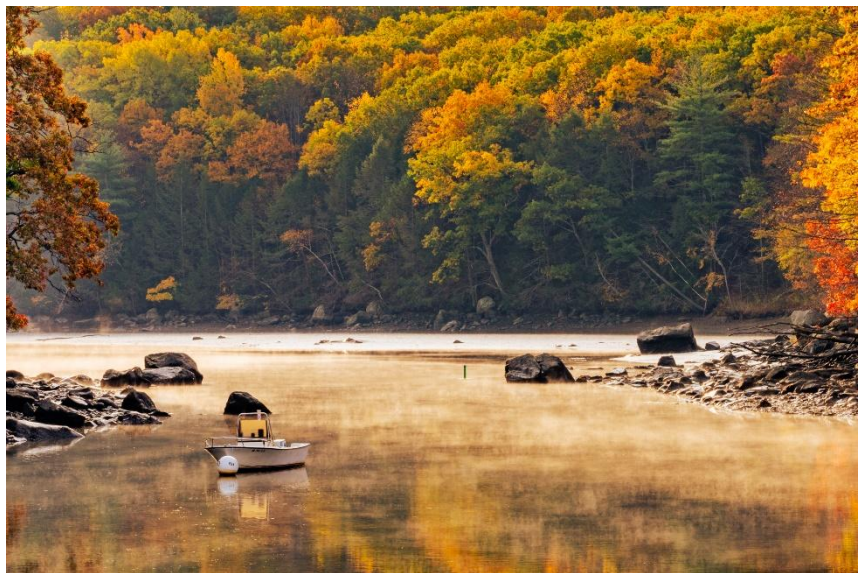


Figure 9: Newmarket Photo Contests, Lamprey River, Aaron Reddish

Promoting the Town’s natural resources is an important strategy for attracting new business. Many companies seeking to re-locate to an area have cited “quality of life” factors, such as trails, green space, parks, conservation lands, and recreation areas as reasons to locate in a particular place. It is important for the Town to turn these assets into a focal point, “trademark” and source of civic pride in positioning the community for economic development.

¹ As of 2024, 0.3% (or 15 out of 4,666) addresses in Newmarket were not serviced by broadband. Source: [NH BEA Broadband Mapping Initiative](#)

Supporting and Enhancing the Town's Industrial Base

Newmarket's industrial base, located within the town's industrial park and other areas in the community, provides valuable contributions to employment and innovation in the town. Supporting these areas through robust infrastructure, opportunities for thoughtful growth and expansion, and developing an environment suitable for industrial activities will strengthen the community's economic vibrancy.

Vibrancy Goals

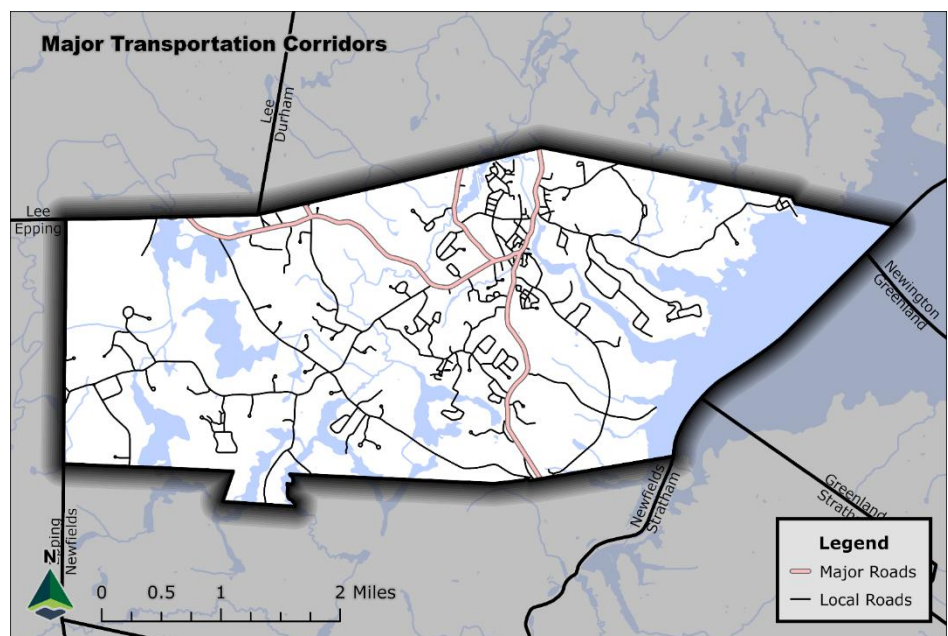
1. Support the development and retention of a diverse mix of businesses, including retail, restaurants, services, creative enterprises, and industry, that reflect Newmarket's unique character and history, and contribute to a robust, year-round economy.
2. Foster a business community that is actively engaged and invested in revitalization efforts, contributes to placemaking initiatives, and collaborates with the Town.

Connectivity

A connected community has efficient and safe links to daily needs such as between home, jobs, shopping, school, services, services, parks and open space, and provides welcoming and inclusive public places for social interaction.

For Economic Development in Newmarket, connectivity means making the Town more accessible and easier to navigate for everyone. This means creating open spaces and connecting them with networks of trails and parks, while planning for better parking infrastructure to handle increased traffic from community events and businesses. It is important to ensure that daily services and jobs are within reach, with safe options for walking, biking, and convenient parking to encourage more people to visit the downtown core of the community and key community and public facilities. Moreover, connectivity refers to improving the physical connections and geographies within town and regionally that help achieve the economic development goals laid out in the master plan.

This includes planning improvements around the public right of way, transit infrastructure, walkability & bike-ability, trail and open space network, and regional transportation and connectivity, all aimed at



improving economic growth and activity. This also means focusing on creating an environment where all residents, regardless of ability, can fully participate in the community.

This involves setting development standards that prioritize ADA compliance, helping ensure that both businesses and public spaces are welcoming and easy to navigate for everyone. Located equidistant between Boston, MA and Portland, ME (roughly one hour away from either city), Newmarket is a community that offers small-town charm with access to some of the country’s major urban centers. It benefits from having good infrastructure, such as public roads, and having access to major arterials such as NH routes 108 (Main St), 152 (S Main St), 4, 101, 125, 33, and the interstate system (I-95), and is within close proximity to the University of New Hampshire in Durham (5 miles north), the Manchester-Boston Regional Airport (35 miles west), the Port of New Hampshire (17 miles east), as well as the airport at Pease International Tradeport (13 miles east).

Furthermore, those visiting and residing in Newmarket benefit from easy access to the Lakes Region, the White Mountains, and the beaches of New Hampshire. However, the Town’s location can also be seen as somewhat of a liability given that its location is also somewhat “off the beaten path” compared to other similar communities nearby that benefit from easier, more direct access to I-95 and that also benefit from direct public transit connections to places like Boston and New York City. For instance, the C&J Bus, which connects passengers to Boston, NYC, and the Logan International Airport has its nearest station in Portsmouth, and Amtrak, which connects to Boston, NYC, and beyond has its nearest passenger stations in Durham and Exeter.

Making the Town more regionally connected can help generate economic activity.

To improve Newmarket’s position regionally, an important step towards promoting economic growth is identifying opportunities in which Newmarket can become more accessible to nearby markets and other communities in order to capitalize on business opportunities, labor force, jobs, visitors, and consumers. For instance, given that Amtrak’s passenger and freight rail corridor currently runs through town, there could be an opportunity to capitalize on the infrastructure that is already in place by adding a station in Newmarket to help the town become more regionally accessible. Moreover, exploring the demand for transit links within town, between Newmarket’s various economic nodes, and to jobs and workers in adjacent communities, can lead to an increase in regularly serviced and more frequent bus routes, further improving connectivity.

Newmarket’s population is highly skilled in a variety of different industries, and enhancing connectivity between the Town and other employment centers, such as Boston (education, financial, professional, and banking), Durham (education), Dover (healthcare, insurance), Exeter (healthcare, education), and Portsmouth (Naval Shipyard, professional services, retail, and tourism), can support access to jobs and expand employment opportunities for residents. Data shows that in 2022, out of the 5,564 jobholders in

Labor Force Efficiency

According to Longitudinal Employer-Household Dynamics (LODES) data from the US Census Bureau, in 2021 roughly **three quarters of the town’s labor force lived in Newmarket and worked elsewhere**, about 6% both live and work in Newmarket, and about 18% live outside but worked in Newmarket.

Figure 10: Major Transportation Corridors in Newmarket, SRPC

Newmarket, the major fields for Newmarket residents included Health Care and Social Assistance, followed by Educational Services, Retail Trade, Manufacturing, and Professional, Scientific, and Technical Services. Note: this data represents jobs held by Newmarket residents regardless of where they worked, which could be in Newmarket or anywhere else in the country.

Furthermore, there were 1,640 jobs in Newmarket in 2022. Top industries included Education Services and Health Care and Social Assistance, each with over 200 jobs. Other large industries with 100-200 jobs included Construction, Accommodation and Food Services, Professional, Scientific, and Technical Services, Retail Trade, and Public Administration. In addition to attracting new businesses, improving connectivity can also support the expansion of these top industries.

Moreover, given the low unemployment levels in Newmarket (1.7% in 2023; lower than the State's, Rockingham County's, and Strafford County's unemployment rates), it can be hard for businesses in town to attract workers and fill positions. Improving connectivity at a regional level can help with workforce attraction and retention.

Improving connectivity can help support business growth and expansion within Town.

Beyond regional connectivity, improving connectivity within the Town can help enhance economic activity, consumer spending, and access to jobs in the various economic nodes including downtown and beyond.

Connecting downtown to natural resources

The proximity of Newmarket's downtown to valuable natural resources that make the Town so unique allows for new opportunities to leverage these resources, which can lead to increased visitor access and spending. Improving connectivity between downtown businesses, existing trail networks, the Riverfront, and Heron Point can help attract visitors and increase access for residents, eventually bringing more customers and economic activity for the businesses downtown. Outreach and community engagement efforts have shown that there is interest in exploring a potential footbridge connection between the Riverfront/downtown and Heron Point making it an extension of downtown. A cost and feasibility study conducted by the Town can help explore this as a potential project for the future. Beyond leveraging natural resources and improving connectivity between conservation spaces and businesses, it is important to market these resources regionally to help attract visitors and consumers.

Connecting public parking lots to Newmarket's businesses, services, and natural, cultural, and civic spaces

In response to the sentiments towards parking expressed by business owners and the overall community, one of the Town's priorities is to analyze its current parking capacity and explore long term infrastructure solutions to address these concerns (e.g. by conducting a parking analysis that assesses the Town's current parking capacity and develop a long-term parking strategy that considers options such as developing a Parking Capital Reserve Fund). However, as part of a more immediate solution to address this challenge, beyond clearly identifying and promoting existing public parking lots (discussed in the Vibrancy section above), improving connectivity between these lots and other points of attraction, including main street businesses, can help alleviate parking pressures and lead to increased visitor and consumer access. Creating marketing materials that can be shared widely across the community and with businesses that clearly identify and inform users of existing public parking lots is crucial to ensuring

people are aware of parking availability and that the lots are being used. (See [Portsmouth Parking Locations Map and Pricing](#) as an example).

This initiative would also involve identifying clear paths to and from existing public parking lots to downtown and identifying enhancements that can be made to make it a safe, pleasant, and enjoyable walk that encourages people to use the existing lots.

Connecting residential neighborhoods to downtown

The latter can also be applied to pedestrian connections between nearby residential neighborhoods and downtown. As of 2020, there were approximately 3,700 people living within a half mile (average 10-minute walk) from downtown, as shown in the map below.² Creating and promoting safe, walkable paths by analyzing development opportunities for new pedestrian pathways and existing sidewalk enhancements can help connect nearby residents to main street businesses and services. In addition to fostering a more walkable community and promoting visitor access to businesses, this would also help alleviate some of the downtown parking pressures. As part of this effort, it is crucial to identify hazardous locations for pedestrians and cyclists and take steps needed to improve safety and increase usability.

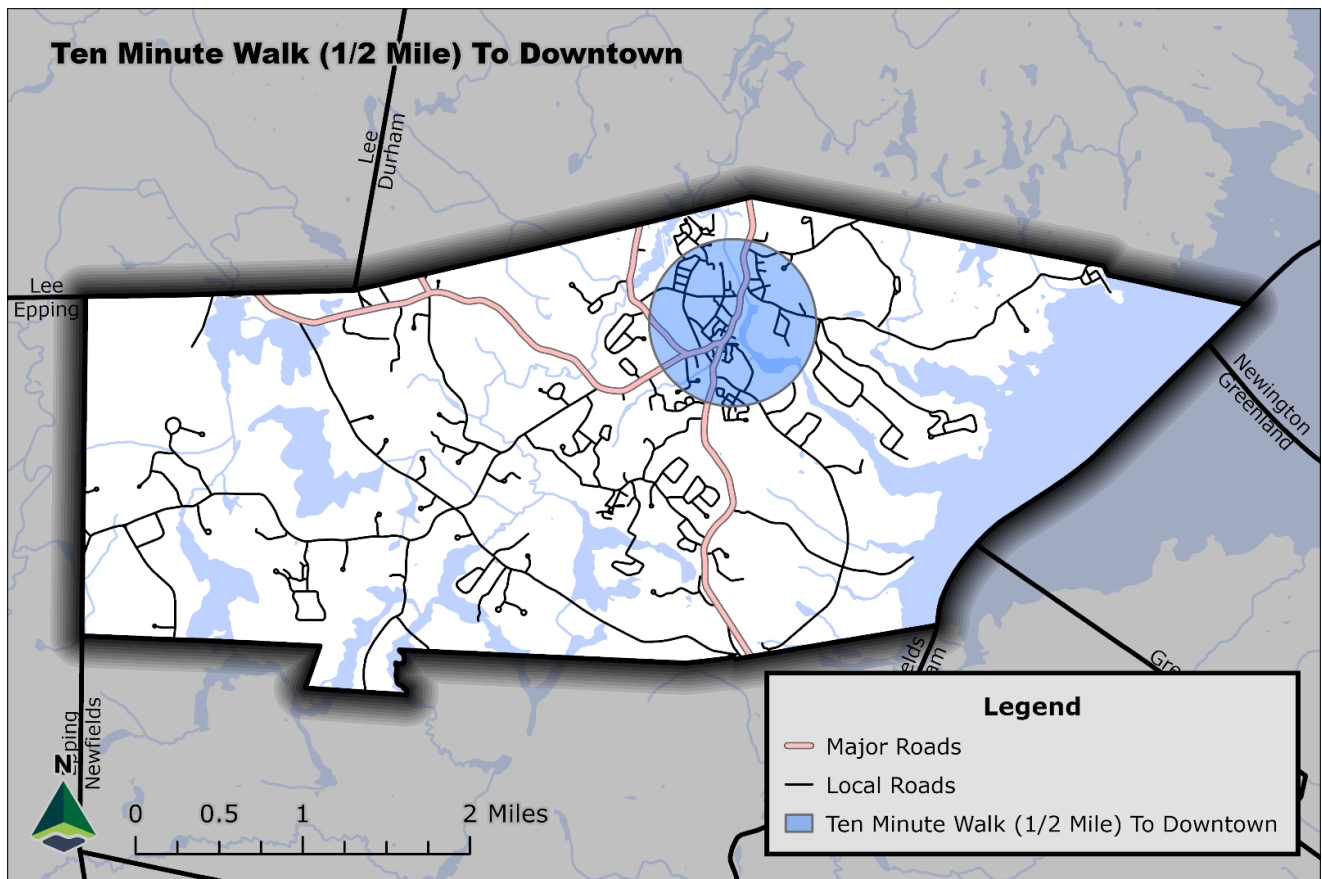


Figure 11: Radius Showing 10-Minute Walk (1/2 mile) from Main Street, SRPC

² Note: The 10-minute walk analysis does not take into account infrastructure, such as sidewalk or street availability. It assumes a straight line from any point to Main Street, so walk times might be higher. Furthermore, the analysis assumes an even distribution of population and does not account for the specific locations of housing structures.

Improving connections to and from the town's economic nodes

Moreover, improving connectivity to and from the Town's available business and industrial sites (Route 108 Corridor, Route 152 Corridor, the Newmarket Industrial Park, and the identified Gateways) can promote the attraction and expansion of new and existing businesses and industries, while also improving access to jobs and workers.

Enhancing connectivity through public-private partnerships.

Partnering with private and public entities can help the Town move towards achieving its connectivity goals. For instance, a partnership with the Newmarket Conservation Commission, whose members have worked to establish a vision for the Town's trail systems³, can be enhanced to leverage existing and new conservation areas, and establish a pedestrian trail system that aligns with their vision and interconnects existing trail networks that also lead to the businesses downtown. Moreover, partnering with private businesses can help fund wayfinding efforts and market parking availability, and partnerships with other establishments, such as the Newmarket Business Association or Newmarket Recreation can lead to innovative solutions to address some of the parking challenges, such as providing a low-cost or free shuttle to improve connectivity between lots and the downtown during civic and cultural events.

Connectivity Goals

1. Improve local and regional transportation, trails, and parking to better connect residents, visitors, jobs, and community spaces.
2. Ensure that development prioritizes inclusive design to make public and commercial areas accessible for all.

Accessibility

For economic development in Newmarket, promoting accessibility means improving the social infrastructure and economic conditions that catalyze economic development in the Town. This includes business and workforce training resources, educational and information resources, and public-private partnership initiatives that can help support the overall business environment in Town. Improving digital infrastructure is also key to accessibility for economic development. The goal is to foster an environment that is supportive of business activity and welcomes participation from diverse groups in the local workforce and community overall.

Enhancing public-private partnerships to better support the business community in Newmarket.

A survey conducted in the spring of 2025 showed that business owners generally feel like one of the biggest areas of opportunity to establishing, owning, operating, or expanding a business in Newmarket relates to its "community". People expressed that due to the size and friendly, welcoming nature of the Town, there

³ See Conservation Commission's [Pathways for People and Nature](#)

are many opportunities to connect with community members, organizations, and leaders on a direct level. Given this strength, there is an opportunity for the Town to leverage this asset, such as by establishing a centralized economic development function (e.g. an Economic Development Planner) that services businesses and strengthens the relationship between public and private entities, supporting current business operations and encouraging potential growth, expansion, or relocation in Town. A few highlights that came from the various outreach and engagement efforts regarding how the Town can increase business support, all of which could be supported through the work of a centralized economic development function, included:

- Maintaining and promoting a centralized business directory that provides up-to-date information on current businesses
- Balancing commercial space growth while maintaining Newmarket's small-town, unique character through Zoning and Land Use regulations
- Addressing current barriers to economic development, such as high rents, parking, and affordable housing for the workforce
- Supporting business networking opportunities (career fairs, business fairs, ribbon cuttings, open houses, after-hours mixers)
- Identifying and establishing a plan to grow a few specific focus areas, such as startups, inexpensive business incubators, food, outdoor recreation, tourism, or the arts
- Expanding high speed internet opportunities

“There is a growing pool of self-employed artists, authors, photographers, and other small LLCs that tend to get lost in the conversation and efforts to connect to networking resources due to the high costs of rents and living, and the cost of dues for some local networking groups...” Source: Newmarket Business Survey Respondent

Moreover, enhancing relationships with economic development organizations (see Appendix for a list of organizations) at the local, regional, and state level can help support existing and potential businesses in Town and increase visibility of Newmarket businesses at a regional level to attract visitors, customers, and new industries.

Increasing workforce support through networking and education.

Matching worker skill sets to growing industries can also help increase job accessibility. Employment projections for the Strafford Region⁴, which includes Newmarket, show that the biggest decline in the number of employees through 2030 will be seen in the Retail and Trade, General Merchandise Stores, Food and Beverage Stores, and Plastics and Rubber Products Manufacturing industries.

Meanwhile, the biggest increases in the number of employees are expected to be seen in the following industries, all of which are projected to experience an increase of 200 or more employees:

⁴ The Strafford Planning Region is comprised of 13 municipalities in Strafford County, 2 in Carroll County, 3 in Rockingham County, including Newmarket

Strafford Regional Planning Commission - Long Term Industry Projections					
Code	Industry	2020 Estimated Employment	2030 Projected Employment	2020 - 2030 Numeric Change	Percent Change
611300	Colleges, Universities, and Professional Schools	3,710	3,944	234	6.30%
810000	Other Services (Except Government)	2,337	2,592	255	10.90%
624000	Social Assistance	1,089	1,367	278	25.50%
541500	Computer Systems Design and Related Services	1,648	2,019	371	22.50%
611000	Educational Services	7,892	8,342	450	5.70%
621000	Ambulatory Health Care Services	2,934	3,421	487	16.60%
541000	Professional, Scientific, and Technical Services	2,869	3,358	489	17.00%
620000	Health Care and Social Assistance	7,427	8,423	996	13.40%
722000	Food Services and Drinking Places	3,827	4,956	1,129	29.50%
720000	Accommodation and Food Services	4,129	5,360	1,231	29.80%
102000	Service-Providing Industries	43,784	47,730	3,946	9.00%

Figure 12: Long Term Industry Projections in the SRPC Region, 2010 - 2030, SRPC. Note: displayed are the industries with the biggest increases only, see appendix for a list of all industries.

Notably, the three industries expected to grow the most are related to service and hospitality, which can largely be comprised of a labor force with entry-level skills. While Newmarket's highly educated workforce allows for more employment opportunities, it may leave some gaps to be filled in essential entry-level positions. This highlights the importance of helping ensure that the people who work here can also live here, which can be accomplished by supporting essential amenities (such as affordable housing) that are supportive of an overarching labor force, comprised of people of all incomes, skill levels, and backgrounds.

In addition to supporting the workforce through essential actions such as expanding access to affordable housing, it is important to explore ways to increase training and skills to help employees access jobs in the various growing industries which are expected to see rising demand for employees in future years, such as health care and social assistance, professional, scientific and technical services, and educational services. Partnering with educational institutions, such as UNH, Great Bay Community College, and Apprenticeship NH can lead to potential job and skills fairs, as well as access to a pool of potential job candidates, that can help support this goal.

Addressing affordability to increase accessibility for potential new businesses looking to establish or expand operations in Newmarket.

Addressing affordability is a necessary step to support entrepreneurship and increase accessibility for potential new businesses looking to establish or expand operations in Newmarket. Due to limited space availability and high rents, the cost of establishing a new business in Town can be a major obstacle, especially for start-ups and entrepreneurs. Finding an approach to creating small, affordable incubator spaces for new and small that are trying to get established is an important step to address this challenge. See more on this in the “Affordability” section below.

Improving accessibility through entrepreneurship, technology, and digital equity infrastructure.

Due to Newmarket’s close proximity to University of New Hampshire (UNH), many university faculty, students, and staff visit, live, or work in Newmarket. The University has programs and services from student projects to technology and research programs that might directly benefit Newmarket and be instrumental for local business development.

One of the offshoots of such research and technology transfer is the opportunity to establish small businesses that have identified a particular market niche and need space and support to get the business “off the ground”. Newmarket’s proximity to UNH and its vacant mill space provide great opportunities for such businesses. By providing “incubator” space, some may have the support necessary to establish viable businesses.

Moreover, in 2023, the UNH Cooperative Extension (UNHCE) developed a 5-year plan, known as the [NH Digital Equity Plan](#), aimed to connect NH residents with access to high-speed internet, digital devices, training, and the services and resources made possible through digital technologies. In addition to bridging the digital divide through the improvement of physical infrastructure, such as gaps in broadband availability, the plan emphasizes the need for digital equity programs aimed at educating individuals, while also ensuring that internet devices and associated services are accessible and affordable for residents of the state. One way to help advance Newmarket’s economic development and workforce goals is to partner with organizations such as UNHCE and use the findings and recommendations of the NH Digital Equity Plan to help individuals, entrepreneurs, and small business owners in Town have access to these opportunities in a meaningful way.

Accessibility Goals

1. Expand access to workforce training, business support, and partnerships that strengthen economic opportunity throughout the community.
2. Invest in key digital infrastructure and outreach efforts that ensure broad participation in efforts that impact Newmarket’s economy.

Affordability

For economic development in Newmarket, affordability means making sure that both residents and businesses can succeed and be a part of the community without being priced out. There is an opportunity to attract, retain, and support business growth by fostering and encouraging competitive lease terms for commercial spaces. Additionally, the community needs a mix of housing options for different levels of income and a variety of jobs to match the skills of the local workforce. Offering affordable housing, including options for first-time home buyers and keeping property tax burdens reasonable (lower than today) are critical, and an important way to achieve this is by attracting businesses that can help balance the residential tax burden. Supporting small businesses by reducing barriers to entry is a key component of ensuring the business needs of residents and visitors are met with excessive cost burdens.

Supporting businesses through affordable spaces and processes

Newmarket's current business landscape encompasses businesses from across the spectrum, ranging from eclectic cafes and restaurants, professional offices, and a large diversity of small and sole proprietorship business. For businesses to locate, grow, and succeed in Newmarket, adequate and affordable commercial and industrial spaces are needed. Affordability of commercial and industrial spaces is a multifaceted challenge, including ensuring there is adequate supply to meet current and future needs, that site plan standards align with the Town's vision to create more affordable spaces, and that approval processes for the development of commercial spaces, and approval of businesses, licensing, and site plans are streamlined.

Revisions to municipal processes would not only ease the approval steps that new businesses face but would also encourage developers to create spaces that may be more tailored to the needs of businesses of all sizes. Adjustments to zoning, and the utilization of form-based code in key areas of the community, could allow for additional mixed-use development, efficient designs, and compact spaces that could lower overhead costs for developers while increasing the supply of affordable business spaces. Smaller, more compact, commercial space designs could also be promoted as coworking or shared commercial spaces to support the incubation of innovation and entrepreneurship.

Existing analysis and work in Newmarket have highlighted specific areas as key areas suitable for economic development, known as Gateways, ensuring focus on these areas as assets to be leveraged when focusing on supporting businesses is key. Utilization of spaces and property in these areas in the community provides a unique opportunity to expand the charming character of the existing downtown through the thoughtful development of additional spaces that support compact design for commercial and mixed-use spaces, while also allowing additional businesses to locate in Newmarket and benefit the community.

Aligning the workforce, wages, and housing affordability

By increasing the permissiveness of residential and commercial design in the core downtown area, and throughout the key Gateway areas, density can be increased in places where existing infrastructure like roads and utilities are present, and development can be better supported. As mentioned in the Housing Chapter, embracing mixed use development, and the implementation of form-based code, will help expand the supply of housing and commercial space in the community, and secure a more resilient labor

force that is better connected to local enterprises. Recent statistics show that over three-quarters of the working population that lives in Newmarket work outside of the community, and nearly 20 percent commute over 40 minutes to work

Expanding affordable opportunities for businesses to locate and grow in Newmarket will support innovation and entrepreneurship. Additional supply of commercial spaces at various sizes will allow for new types of professions and service providers to develop, while also ensuring there is an ample supply of space to allow businesses to expand, downsize, or move within the community without the risks of needing to exit Newmarket and relocate to other communities that may have more adequate physical spaces for their needs. Additionally, creating a more affordable and accessible housing environment will allow for more individuals and families to live in Newmarket that can support business in the community through patronage and acting as a part of the local workforce, reducing the need for long commutes for portions of the population while providing more services and goods for the community. Current housing costs in Newmarket are out of reach for many individuals and families, including those already located in Newmarket who may end up priced out of the community. Median wages paid by the largest industries in Newmarket may not provide enough resources for housing in the community to be within reach of individuals earning those wages.ⁱ Housing affordability is typically defined as spending no more than 30 percent of income on housing expenses. The average private sector weekly wage paid in Newmarket in 2023 was \$1,146, indicating that monthly housing expenses should not be greater than about \$1,375 for an individual to not be cost burdened.

By ensuring there is an ample supply and variety of commercial spaces for businesses at affordable prices, and opportunities for housing are located strategically in mixed use areas or are connected to commercial areas in ways that promote cohesion and interaction, Newmarket's economic stability will be bolstered. The integration between business and residents is a critical component of ensuring that employment opportunities are robust and wages can support individuals who live in the community.

Balancing tax burdens through strategic development

Supporting density and expanding the permissiveness of more compact and mixed-use development of both commercial and residential spaces in areas where existing density and infrastructure exists has benefits that extend beyond expanded supply to promote affordability and better cohesion. Strategic planning strategies like form-based zoning, promotion of mixed-use development, and flexibility for a variety of types and sizes of commercial spaces with a focus on density, better utilizations of existing infrastructure such as roads, water, sewer, and other utilities, while generating more tax revenue and lower expenses for Newmarket.ⁱⁱ This would also help balance the residential tax burden for residents. Current tax rates in Newmarket are higher than several surrounding communities and additional business development and density can help better balance the current tax burden carried by existing property owners.

Supporting residents and entrepreneurs

Newmarket has a robust community of existing businesses, including small businesses and sole proprietorships with a wide range of expertise. Throughout the beginning of 2025, conversations and surveys distributed to small business owners highlighted several key items: affordability in the community, for residents and small business owners, was extremely challenging; coordinated marketing efforts and

business support from the town needs to be bolstered; and supporting business activities in the community needs to be a priority.

Key initiatives and infrastructure to support entrepreneurship and small businesses in the community can take on several forms, including local markets, business mixers, and public promotion to residents and visitors to Newmarket. Leveraging existing public spaces, like areas of the downtown, the Gateways, public parks, or other spaces to highlight small business and entrepreneurial offerings at community events or year-round can support the promotion and expansion of small businesses in Newmarket.

Supporting the creation of places such as small business incubators and makerspaces support innovation and business in the community. These spaces provide a low-cost entry point for startups and creative enterprises, offering not only an affordable space but also access to technical resources, mentorship, and networking opportunities. Expanded partnerships with regional organizations such as SCORE, SBDC, and more at the municipal level can also create better opportunities for pathways between the Town and business community.

Additionally, having a centralized economic development office or position within the community to act as the facilitator and champion to these efforts, including attracting new businesses, engaging with the community, studying development potential, researching the community's needs, wants, and capacity for business development, and more, would support efforts for economic development in Newmarket.

Affordability Goals

1. Promote affordable housing, commercial lease options, and job opportunities that meet the needs of residents and businesses.
2. Reduce tax burdens for existing property owners and decrease barriers for local entrepreneurs through streamlined permitting and additional business support.

Resiliency

For economic development in Newmarket, resiliency means building a diverse economic base of businesses that can withstand market changes and economic shocks/downturns. By having a broad range of businesses and employers, the community can better weather economic shifts, industry changes, large swings in consumer preferences, or other disruptions. The idea of not leaning too heavily into one industry or sector is key. Additionally, supporting and fostering sustainable practices for businesses, key investment to lessen the impacts of potential economic and environmental shifts, and planning for future potential scenarios will help mitigate impacts.

A resilient economy is one that can weather economic downturns and can also adapt, evolve, and thrive regardless of the external challenges and headwinds. Resiliency is a proactive vision to the diversification of businesses, sustainability, and key strategic investments which are supported by comprehensive

planning, risk assessments, and innovative strategies for economic strength. Beginning in the 1960s, Newmarket faced significant economic declines in its industrial base, which was the main foundation of the local economy. As a result of these industrial declines, the community faced declines in employment, incomes, and overall vibrancy. Economic diversification since 2000, thanks in part to new businesses investments along the Route 108 corridor, have diversified the types of businesses and services in the community, setting the business community towards a path of resilience. Additionally, key community actions and investments, ranging from the redevelopment of the physical infrastructure in the downtown (sidewalks, roads, lighting, and more), to initiatives based on improved neighborhood connectivity, investments in recreational assets, support for schools and other community resources, and engaging and listening to residents and community stakeholders, all support resiliency as well. Investments to support and diversify businesses in the community, along with actions that build a sense of place, promote social connectivity, and strengthen physical and social capital all lead to a more resilient Newmarket.

Fostering a diverse and adaptable economic base

Newmarket's current economic landscape encompasses a range of businesses and service providers across the downtown corridor, industrial areas, and other places throughout the community. To better understand the resiliency of the business mix in Newmarket, an analysis of businesses in the community can identify how diversified the local economy is and highlight areas that can be better supported or promoted. Generating this detailed analysis of the local conditions and business mix in the community will serve as a benchmark for future efforts and support marketing and promotion of the community. Efforts to better market the community, based on an analysis of business and the local economy, can showcase Newmarket's unique strengths and assets to visitors and potential new businesses and investors, while also promoting key components to highlight as the core economic development and business identity of the community.

Central to supporting businesses in the community is a dedicated individual to support these initiatives. A town economic development planner can coordinate and implement programming to support economic development efforts and business support. In addition to leveraging targeted marketing strategies, the planner could be responsible for monitoring key economic indicators, analyzing conditions to generate programming and partnership to support business growth and expansion, and exploring ways for the community to engage in public-private partnerships to support economic development and resiliency in the community. Additionally, an economic development planner can develop and foster key public-private partnerships that can support community infrastructure, business development, and overall vibrancy and resiliency. In addition to a dedicated staff-person to coordinate economic development initiatives, a standing committee in the community to organize efforts and ensure implementation of key actions at the community level related to economic development would be worthwhile to explore and organize.



Figure 13: Newmarket Photo Competition, 2019 Memorial Day Parade, Laura Nolan

Extending past and existing efforts for expanded business diversification and expansion can also be supported by the work of an economic development planner to better understand the business landscape. Evaluating existing economic nodes, including community gateways or emerging commercial clusters, is crucial to this work and could help identify areas for establishing additional Tax Increment Financing (TIF) districts which could spur mixed-use developments that integrate commercial, residential, and cultural spaces, reinforcing both vibrancy and economic stability.

Planning for economic challenges and utilizing and investing in infrastructure

Preparedness for uncertain times is a key component to resiliency. Comprehensive scenario planning methods that consider a range of potential disruptions, including from market downturns and shifting consumer behaviors, can bolster the preparedness and resiliency of businesses and the community as a whole. Data-driven risk assessments that help identify vulnerabilities in Newmarket's economic landscape could be led by an economic development planner, ensuring the town's approach to uncertainty is both coordinated and continuously updated based on the latest economic forecasts and conditions. Additional efforts include defining the town's unique identity and using this identity as a basis to attract cultural institutions and events that foster civic pride and social capital. Cultural heritage translates into economic strength through festivals, art installations, and community events that bolster local business activity and can support local investment into businesses. Public spaces in Newmarket also play a key role for resiliency in the community. By hosting community gatherings, cultural events, and forums in these public spaces, they become incubators for innovative business practices and collaborative partnerships.

Resiliency Goals

1. Diversify the local economy to ensure that multiple sectors and industries support the local economy to bolster resilience to disruptions.
2. Encourage sustainable business practices and provide key support that aid in long-term planning to prepare the community for economic change.

Appendix A – Existing and Future Land Use

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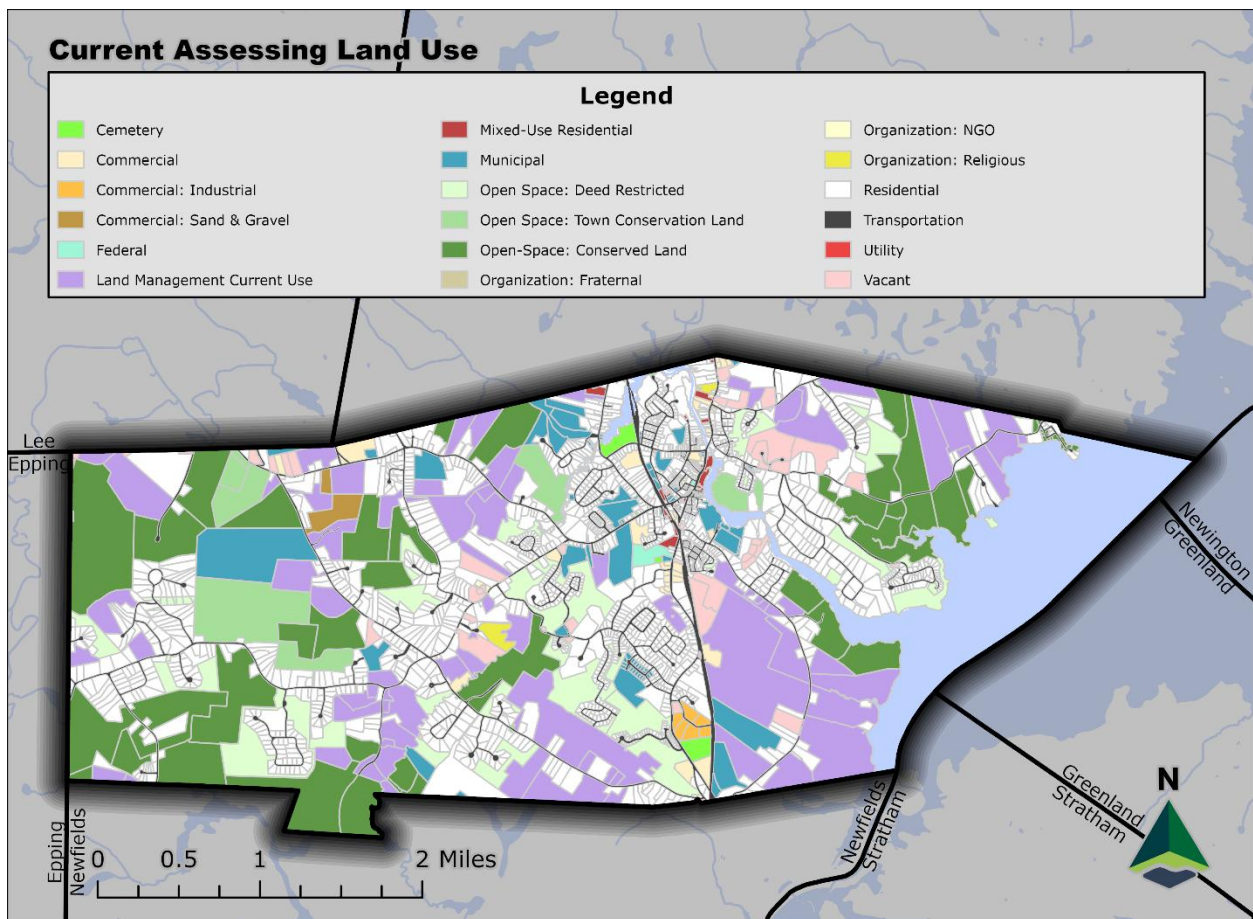
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Existing Land Use

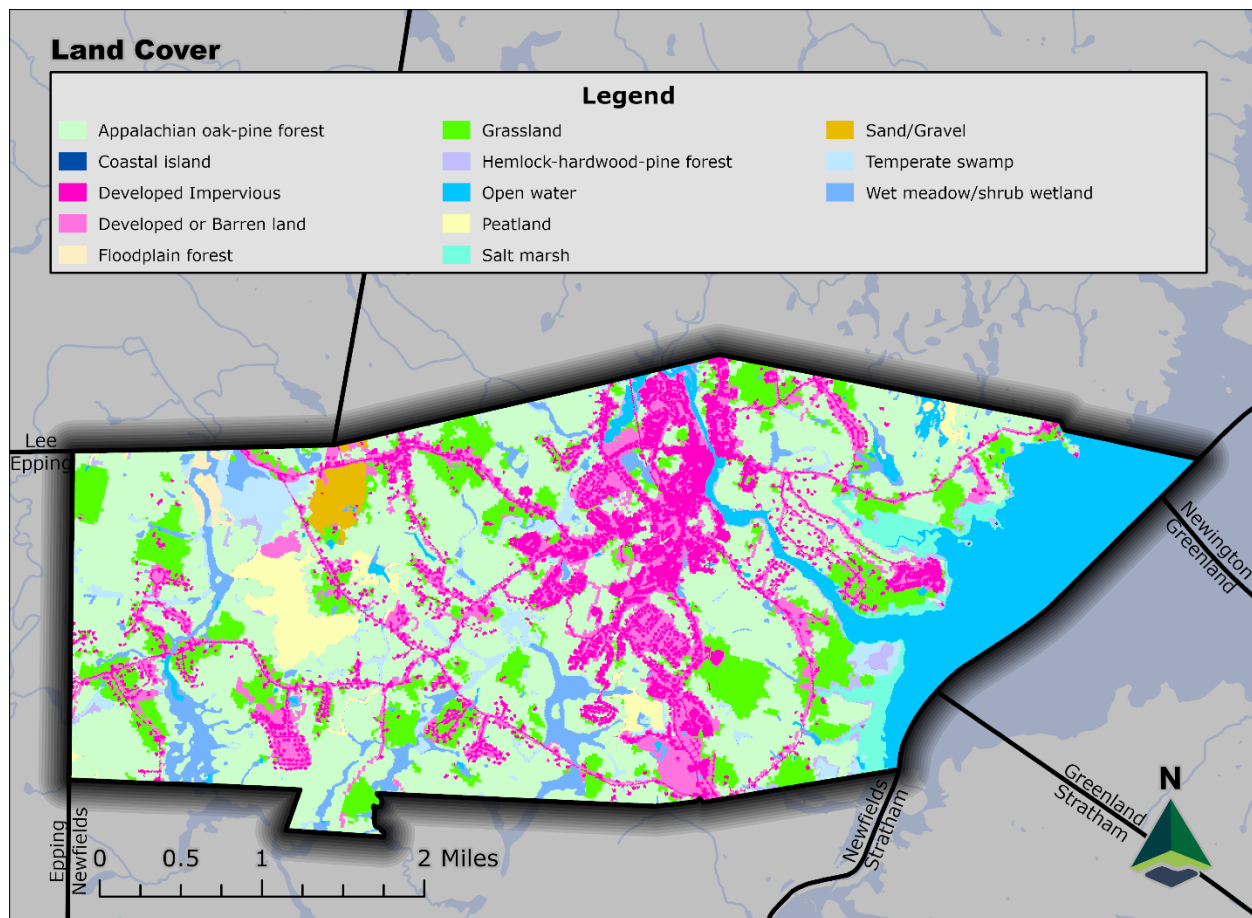
Land Use Type	Acres	% of Town
All Residential	1,951.73	21.44%
Multi-Family	132.04	1.45%
Single Family	1,787.31	19.63%
Mobile Home Parks	32.38	0.36%
Commercial, Services, Institutional	164.69	1.81%
Commercial Retail	14.31	0.16%
Services	15.44	0.17%
Government	10.56	0.12%
Institutional	16.56	0.18%
Educational	21.88	0.24%
Indoor Cultural/Public Assembly	1.11	0.01%
Mining	77.25	0.85%
Other Commercial	7.57	0.08%
Industrial	40.43	0.44%
Transportation, Communication, Utilities	207.75	2.28%
Rail Transportation	7.81	0.09%
Road Right-of-Way	148.35	1.63%
Parking Structure/Lot	6.03	0.07%
Auxiliary Transportation	5.12	0.06%
Electric, Gas, and Other Utilities	21.24	0.23%
Water and Wastewater Utilities	3.60	0.04%
Solid Waste Utilities	15.60	0.17%
Mixed Developed Uses	3.60	0.04%
Outdoor and Other Urban and Built-Up Land	201.83	2.22%
Outdoor Recreation	67.73	0.74%
Cemeteries	22.19	0.24%
Maintained Open Areas	111.91	1.23%
Vacant Land	1.38	0.02%
Agricultural Land	652.34	7.17%
Transitional Land	98.74	1.08%

Forest Land	3,560.04	39.11%
Water	1,028.10	11.29%
Wetlands	1,120.13	12.31%
Barren Land	72.20	0.79%
Total Land and Water Area	9,102.95	100.00%

Source: Strafford Regional Planning Commission, Land Use Database, 2022



Existing Land Use, 2024, Newmarket Assessing Parcel Data



Existing Land Cover, 2020, NH Wildlife Action Plan

Zoning and Developable Land Area Analysis

To assist in determining recommendations to meet the goals of the land use chapter, an analysis of existing zoning and natural constraints was conducted to determine land availability. A lack of land availability does not preclude future development where there is redevelopment potential.

Summary of Land Availability in Each Zoning District

Mixed Use Districts: The M-2 District (26 acres, 80% developed or constrained) provides for a mix of high density uses in the downtown village area, provides public access to the Lamprey River, and design compatible with the pedestrian scale and historic nature of the area. The M-3 District (124.18 acres, 90% developed or constrained) provides for the development of professional office space and health care related uses compatible with the existing nature and character of this predominantly residential neighborhood. Lastly, the M-4 District (143.6 acres, 65% developed or constrained) allows for the ongoing use of the golf course and adjacent commercial and residential development.

Business Districts: The B-1 District (72.4 acres, 34% developed or constrained) allows for business development along Route 108. The B-2 district (348.9 acres, 21% developed or constrained) provides the largest area available for commercial, business and industrial development within the town to broaden the tax base and provide employment opportunities for residents of the town and region. The B-3 District, (260.5 acres, 74% developed or constrained), has a similar objective to the B-2 district and is designed to enable the redevelopment of the Newmarket Sand and Gravel site.

Residential Districts: The largest, R-1 Rural Residential District (5,714.5 acres, 59% developed or constrained) protects the rural, unspoiled character of open spaces in the outlying areas of Newmarket, while allowing low density, 2-acre, single-family residential development. The R-2 and R-3 Districts provide a higher density transition zone between rural residential and the more intensively developed districts in and around the village area. The R-2 District (890.4 acres, 78% developed or constrained) and the R-3 district (124.2 acres, 90% developed or constrained), while still single-family like the R-1 district, allow a smaller 0.5-acre minimum lot size. The R-4 District (7.9 acres, 86% developed or constrained), characterized by steep slopes and narrow roads, accommodates high-density single-, two-, and multi-family residential immediately adjacent to the village area (0.25-acre minimum lots).

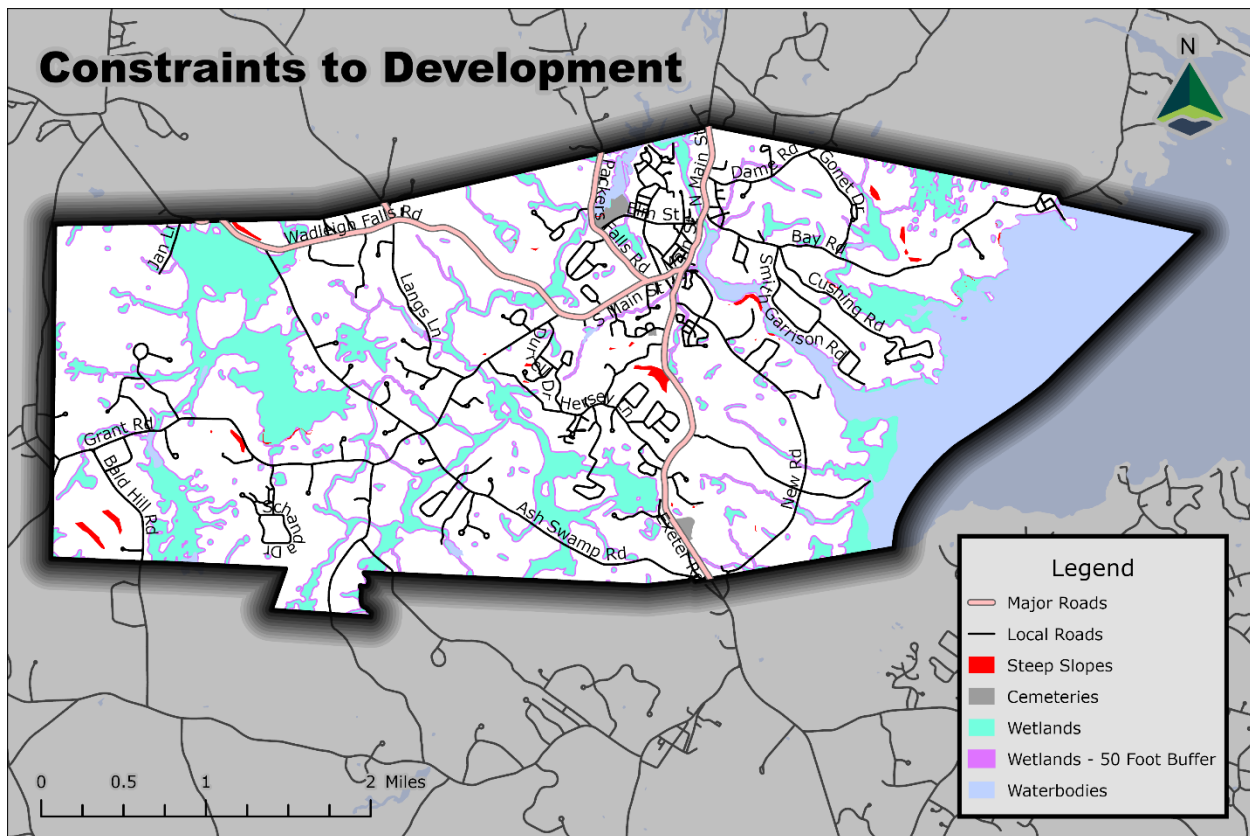
Village Center Districts: The VC-North District (65 acres, 72% developed or constrained), VC-Central (31.8 acres, 100% developed), and VC-South District (51.3 acres, 85% developed or constrained) provide for a broad mix of uses including single-, two-, and multi-family residential; commercial development including office, retail, services, and restaurants; cultural uses; institutional uses such as education and places of assembly; and light industrial uses.

Analysis Methodology

Buildable areas are those that are not permanently conserved, constrained by natural resources, or developed.

Naturally constrained areas in Newmarket total to 36.82% of all area, or 3,343.3 acres, and include:

- Waterbodies, Wetlands, and 50-foot Wetland Buffer: 2899.7 acres, 31.94% of total area
- Roads (Major and Local): 384.6 acres, 4.24% of total area (assumes 50-ft right of way)
- Steep Slopes: 35.9 acres, 0.40% of total area
- Cemeteries: 22.2 acres, 0.24% of total area



Buildable Lots by Zoning District

Zone	Total # of Lots	# of Undeveloped Lots	# of Buildable Lots	% of Lots Buildable
B-1 (Route 108 Business)	15	9	9	60.0%
B-2 (Commercial, Business)	16	5	5	31.3%
B-3 (Route 152 Commercial, Business)	30	14	11	36.7%
M-2 (Downtown Office Village)	88	5	5	5.7%
M-3 (Office)	28	2	2	7.1%
M-4 (Golf Course)	62	9	6	9.7%
R-1 (Rural Residential)	1,130	402	324	28.7%
R-2 (Low-Density Residential)	886	100	77	8.7%
R-3 (Medium-Density Residential)	160	8	6	3.8%
R-4 (High-Density Residential)	36	3	3	8.3%
VC-North (Village Center North)	63	5	5	7.9%
VC-Center (Village Center Center)	118	2	0	0.0%
VC-South (Village Center South)	30	3	3	10.0%
Grand Total	2,664	568	456	17.1%

Buildable Land Area by Zoning District

	Total Acreage	Built or Constrained Acres	Land Acres Buildable	% of Land Buildable
B-1 (Route 108 Business)	72.41	24.56	47.85	66.1%
B-2 (Commercial, Business)	348.87	73.75	275.12	78.9%
B-3 (Route 152 Commercial, Business)	260.47	192.53	67.95	26.1%
M-2 (Downtown Office Village)	26.08	20.94	5.15	19.7%
M-3 (Office)	61.09	42.59	18.50	30.3%
M-4 (Golf Course)	143.60	94.05	49.56	34.5%
R-1 (Rural Residential)	5,714.53	3,398.62	2,315.90	40.5%
R-2 (Low-Density Residential)	890.43	691.45	198.98	22.3%
R-3 (Medium-Density Residential)	124.18	111.41	12.76	10.3%
R-4 (High-Density Residential)	7.90	6.83	1.07	13.5%
VC-North (Village Center North)	65.01	46.68	18.32	28.2%
VC-Center (Village Center Center)	31.76	31.62	0.14	0.4%
VC-South (Village Center South)	51.34	43.39	7.95	15.5%
Grand Total	18,069.95	12,029.92	6,040.04	33.4%

Outreach Findings

How should the Town prioritize its planning for land use development over the next 10 years? Select your top three of the options below.		
Answer Choices	Responses	
Residential development opportunities	22.48%	58
Commercial development opportunities	18.99%	49
Mixed-use development opportunities	40.31%	104
Transportation infrastructure improvements (all types - pedestrian, bike, pedestrian, rail , vehicular)	58.91%	152
Renewable energy and resiliency infrastructure improvements	45.35%	117
Protection of conservation and recreation spaces	70.93%	183
Something else (please describe)	9.69%	25
	Answered	258
	Skipped	54

Appendix B: Housing Chapter Supporting Data

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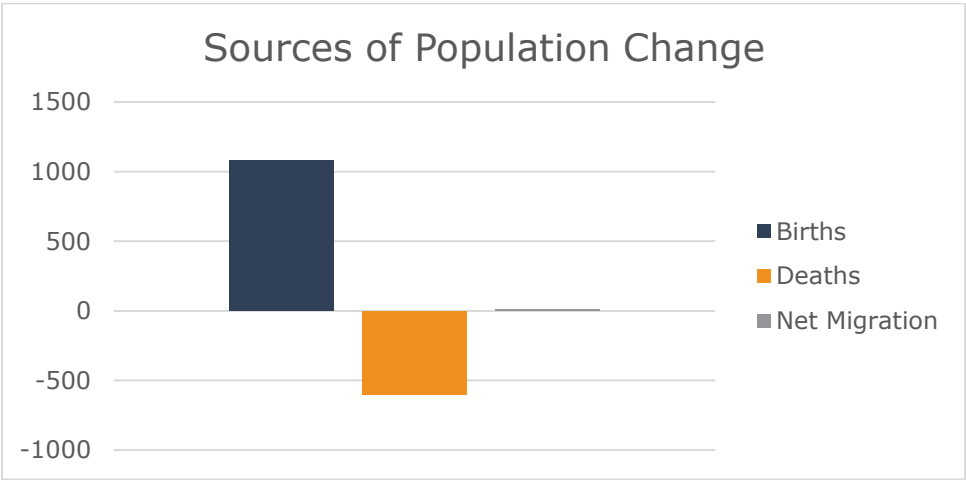
Demographics

Figure 1: Population Estimates and Projections

	Year	Population
Estimates	2010	8,936
	2011	8,950
	2012	8,942
	2013	9,173
	2014	9,149
	2015	9,170
	2016	9,172
	2017	9,359
	2018	9,455
	2019	9,460
	2020	9,430
Projections	2021	9,496
	2025	9,833
	2030	10,183
	2035	10,429
	2040	10,522
	2045	10,515
	2050	10,448

Sources: Census, NHOPD 2010-2050

Figure 2: Sources of Population Change



Sources: Census, NH Vital Stats 2010-2020

Figure 3: Population by Race and Ethnicity

Race and Ethnicity		Newmarket	Rockingham County
Total Population		9,400	315,169
	Hispanic	149	10,933
	Not Hispanic	9,251	304,236
White		8,754	290,277
	Hispanic	78	5,011
	Not Hispanic	8,676	285,266
African American		90	2,814
	Hispanic	-	269
	Not Hispanic	90	2,545
American Indian		-	155
	Hispanic	-	127
	Not Hispanic	-	28
Asian		130	6,466
	Hispanic	-	34
	Not Hispanic	130	6,432
Native Hawaiian or Pacific Islander		-	67
	Hispanic	-	-
	Not Hispanic	-	67
Some Other Race		63	3,363
	Hispanic	61	2,138
	Not Hispanic	2	1,225
Two or More Races		363	12,027
	Hispanic	10	3,354
	Not Hispanic	353	8,673

Source: ACS 2018-2022

Figure 4: Population with any Disability

	Newmarket	Rockingham County
Total Population	9,400	315,169
With a Disability	766	34,171
Without	8,634	280,998

Source: ACS 2018-2022

Figure 5: Median Age

Year	Newmarket	Rockingham County	NH
2012	36.6	42.3	41.1
2017	37	44.1	42.7
2022	38.5	44.7	43.1

Source: ACS 2007-2022

Figure 6: Population by Age

Age Group	Newmarket			Rockingham County			NH		
	2012	2017	2022	2012	2017	2022	2012	2017	2022
Under 10 Years	1,116	773	851	33,329	30,785	30,466	146,225	137,198	131,479
10 - 19 Years	1,110	823	833	40,423	36,923	35,596	179,567	165,328	162,096
20 - 29 Years	1,435	1,896	1,657	29,942	34,155	35,366	157,656	168,844	174,497
30 - 39 Years	1,199	1,419	1,610	33,152	33,784	39,425	153,433	153,029	171,144
40 - 49 Years	1,370	1,047	1,219	52,809	43,438	38,149	209,414	176,952	164,337
50 - 59 Years	1,274	1,257	941	49,420	53,596	51,119	208,367	217,925	207,906
60 - 69 Years	415	479	765	18,801	21,352	25,515	82,309	93,279	106,402
70 - 79 Years	535	831	959	21,671	29,588	36,588	98,760	129,717	158,814
Over 80 Years	330	230	495	11,729	13,338	16,724	57,678	61,133	73,391

Source: ACS 2007-2022

Figure 7: Fall School Enrollment

School Enrollment	Fall Enrollment				
	2019	2020	2021	2022	2023
Kindergarten	84	58	83	70	85
Elementary	419	391	363	379	367
Middle	259	246	241	226	227
High School	295	318	277	274	291
Total	1,057	1,013	964	949	970

Source: NH Department of Education 2019-2023

Income

Figure 8: Median Household Income By Tenure

Households	Newmarket			Rockingham County		
	2012	2017	2022	2012	2017	2022
All Households	\$60,398	\$70,057	\$98,002	\$77,939	\$85,619	\$110,225
Owner	\$86,772	\$97,841	\$116,467	\$91,252	\$101,330	\$127,256
Renter	\$41,812	\$47,728	\$77,715	\$43,700	\$48,704	\$62,998

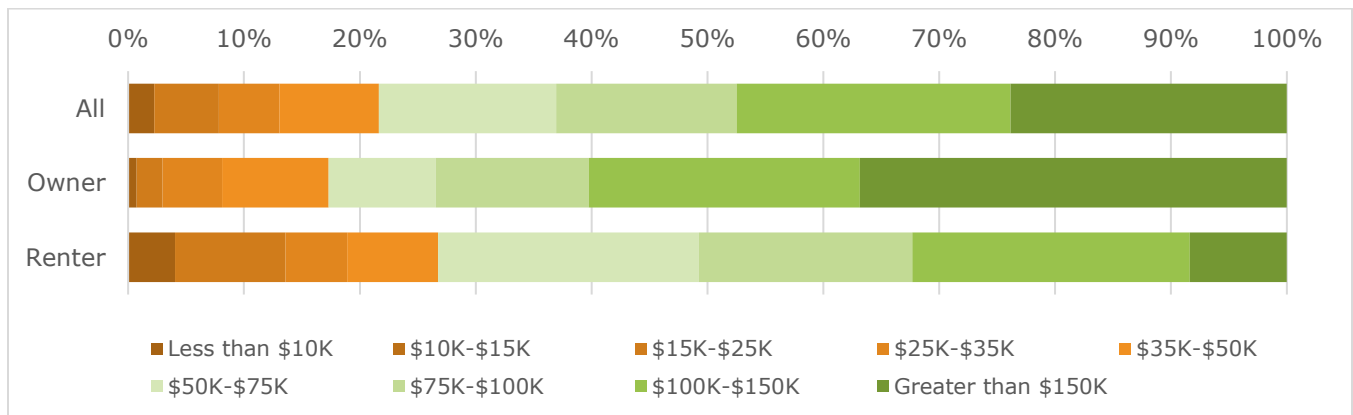
Source: ACS **2007-2022**

Figure 9: Households by Income Bracket and Tenure

Income	Newmarket			Rockingham County		
	All	Owner	Renter	All	Owner	Renter
<\$10K	4,203	2,282	1,921	125,464	98,479	26,985
\$10K-\$15K	95	17	78	2,878	1,730	1,148
\$15K-\$25K	0	0	0	2,371	1,063	1,308
\$25K-\$35K	234	51	183	5,317	3,021	2,296
\$35K-\$50K	219	117	102	5,236	2,928	2,308
\$50K-\$75K	361	210	151	8,551	5,094	3,457
\$75-\$100K	643	211	432	16,736	11,068	5,668
\$100K-\$150K	655	301	354	16,112	11,988	4,124
>\$150K	994	534	460	26,348	22,193	4,155

Source: ACS 2018-2022

Figure 10: Households by Income Bracket and Tenure and Relationship to Median Income



Source: ACS 2018-2022

Figure 11: Households by Cost Burden Status

Householder Age	Total			Cost Burdened			Not Cost Burdened		
	All	Owner	Renter	All	Owner	Renter	All	Owner	Renter
15-24	223	0	223	122	0	122	101	0	101
25-34	932	234	698	283	66	217	649	168	481
35-64	2,080	1,400	680	444	241	203	1,636	1,159	477
Over 65	919	638	281	483	281	202	436	357	79
Not computed	49	10	39						

Source: ACS 2018-2022

Households

Figure 12: Households by Tenure

Households	Newmarket			Rockingham County			NH		
	2012	2017	2022	2012	2017	2022	2012	2017	2022
All	3,693	4,077	4,203	115,552	119,955	125,464	516,845	526,710	545,116
Owner	2,055	2,154	2,282	89,320	92,025	98,479	372,021	372,304	393,945
Renter	1,638	1,923	1,921	26,232	27,930	26,985	144,824	154,406	151,171

Source: ACS 2007-2022

Figure 13: Average Household Size by Tenure

Households	Newmarket			Rockingham County			NH		
	2012	2017	2022	2012	2017	2022	2012	2017	2022
All	2.41	2.20	2.23	2.54	2.50	2.49	2.47	2.45	2.46
Owner	2.65	2.44	2.57	2.68	2.64	2.64	2.60	2.57	2.60
Renter	2.11	1.93	1.84	2.05	2.05	1.95	2.14	2.15	2.08

Source: ACS 2007-2022

Figure 14: Households by Size

	Newmarket			Rockingham County			NH		
	2012	2017	2022	2012	2017	2022	2012	2017	2022
Size = 1	990	1,248	1,225	26,167	27,864	29,747	130,449	134,536	147,474
Size = 2	1,383	1,614	1,722	42,288	44,010	48,134	193,222	200,911	209,739
Size = 3	601	591	768	19,849	20,584	20,603	81,457	85,961	82,528
Size = 4	514	416	330	18,108	18,319	17,634	73,431	68,544	68,169
Size = 5	95	167	103	6,585	6,759	6,887	26,487	25,317	25,524
Size = 6	65	41	55	1,829	1,614	1,572	8,012	7,328	7,677
Size >= 7	45	-	-	726	805	887	3,787	4,113	4,005

Source: ACS 2007-2022

Figure 15: Households by Type

Households	Newmarket			Rockingham County		
	2012	2017	2022	2012	2017	2022
Family Households	2,144	2,090	2,350	81,230	83,861	86,122
Married Couples	1,602	1,745	1,861	67,256	68,130	71,104
with Unmarried Female Householder	251	135	204	4,406	5,221	4,897
with Unmarried Male Householder	291	210	285	9,568	10,510	10,121
Non-Family Households	1,549	1,987	1,853	34,322	36,094	39,342
One Person	990	1,248	1,225	26,167	27,864	29,747
Multiple People	559	739	628	8,155	8,230	9,595

Source: ACS 2007-2022

Figure 16: Households with Children

Households	Newmarket			Rockingham County		
	2012	2017	2022	2012	2017	2022
Households with "own" children	1,025	794	957	37,598	36,399	35,129
Married Parents	669	604	583	29,424	27,205	26,390
Single Parents	356	190	374	8,174	9,194	8,739
Unmarried Female Parent	122	27	186	2,300	2,946	2,528
Unmarried Male Parent	234	163	188	5,874	6,248	6,211

Source: ACS 2007-2022

Figure 17: People Living Alone

Households	Newmarket			Rockingham County		
	2012	2017	2022	2012	2017	2022
Under 65 Years Old	690	761	797	16,499	15,869	15,583
Over 65 Years Old	300	487	428	9,668	11,995	14,164

Source: ACS 2007-2022

Newmarket Housing Stock

Figure 18: Permitted New Buildings

Year	Residential			Other		Total
	Single Family	Multifamily	Manufactured Housing	Commercial	Other	
2008	6	0	1	0	0	7
2009	0	3	0	0	0	3
2010	0	0	0	0	0	0
2011	2	0	0	0	0	2
2012	6	0	0	0	0	6
2013	1	4	0	0	0	5
2014	10	0	0	0	0	10
2015	21	14	0	0	0	35
2016	36	45	0	0	0	81
2017	24	4	0	0	0	28
2018	25	4	0	0	0	29
2019	19	19	0	0	0	38
2020	8	2	0	0	0	10
2021	2	0	1	0	0	3
2022	19	8	0	21	0	48

Source: SRPC's Building Permit Database 2008-2021

Figure 19: Buildable Land with Access to Utilities

Buildable Land with Access to...	Land Acres	% of Land
Water and Sewer Infrastructure	1,635.99	20%
Water Infrastructure Only	491.47	6%
Sewer Infrastructure Only	296.97	4%
All Buildable Land	2,548.95	32%

Source: City Data 2023

Figure 20: Potential and Existing Density

Infrastructure	Potential Density		Existing Density Range
	Low	High	
Water and Sewer	4 units/acre	6 units/acre	0.05 - 26.49 units/acre
Water or Sewer	1 unit/acre	1.5 units/acre	0.05 - 7.42 units/acre
None	0.5 unit/acre	1 unit/acre	(DES Septic Prevails)

Source: City Data 2023

Figure 21: Newmarket Zoning Districts that Allow Any Residential Uses

Housing Type	Land Acres	% of Land
All Land	8,034.51	100%
All Residential	7,309.91	91%
Single Family (Allowed + Conditional)	7,300.23	91%
Single Family (Allowed)	7,300.23	91%
Single Family (Conditional)	-	0%
Two-Family (Allowed + Conditional)	229.70	3%
Two-Family (Allowed)	229.70	3%
Two-Family (Conditional)	-	0%
Multi-Family (Allowed + Conditional)	177.23	2%
Multi-Family (Allowed)	144.51	2%
Multi-Family (Conditional)	32.72	0%

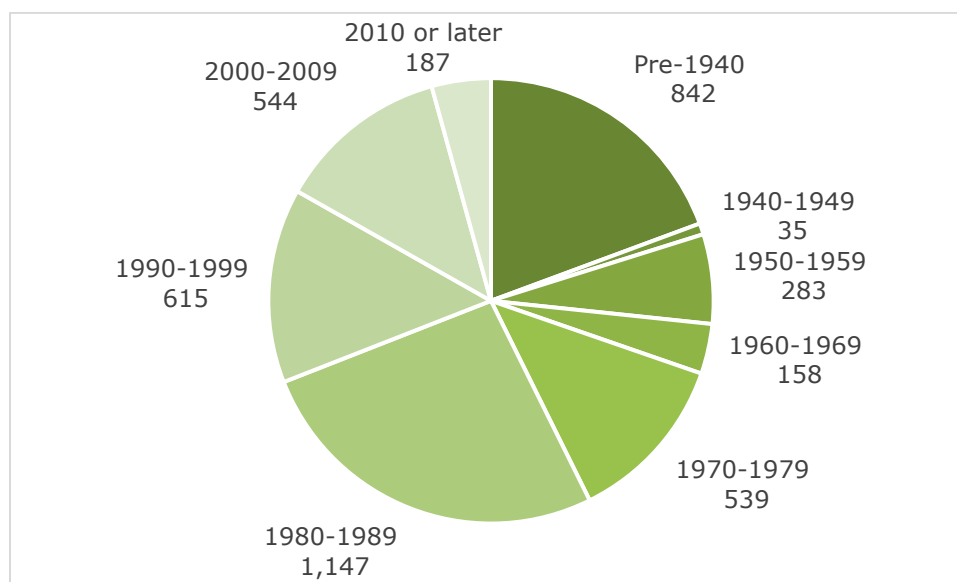
Source: City Data 2023

Figure 22: Number of Units in Structures

	Newmarket		Rockingham County	
	2012	2022	2012	2022
1 Unit	2,107	2,470	98,563	105,666
2 Units	148	247	6,464	5,692
3-9 Units	789	495	10,316	10,007
10-49 Units	805	903	9,484	11,491
50+ Units	26	235	1,781	2,678
Total Households	3,875	4,350	126,644	135,585

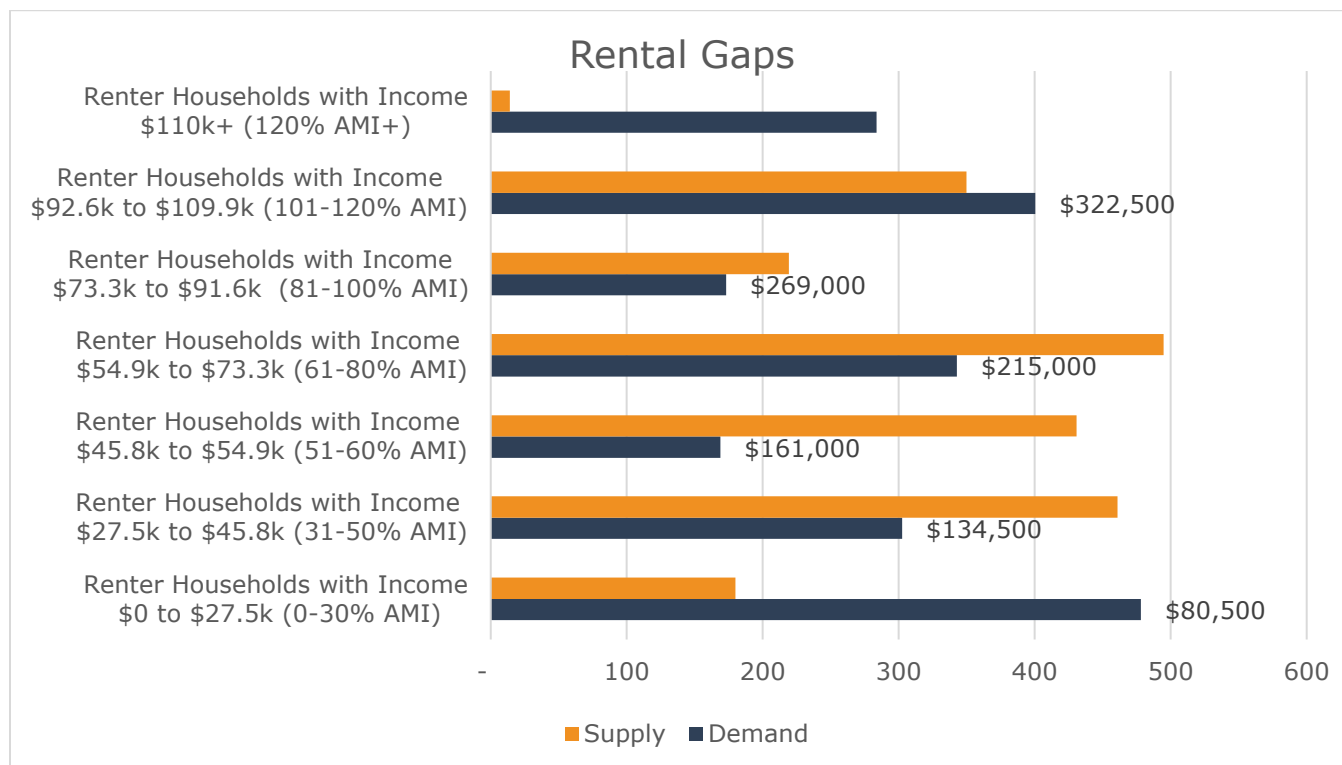
Source: ACS 2007-2022

Figure 23: Age of Housing Structure



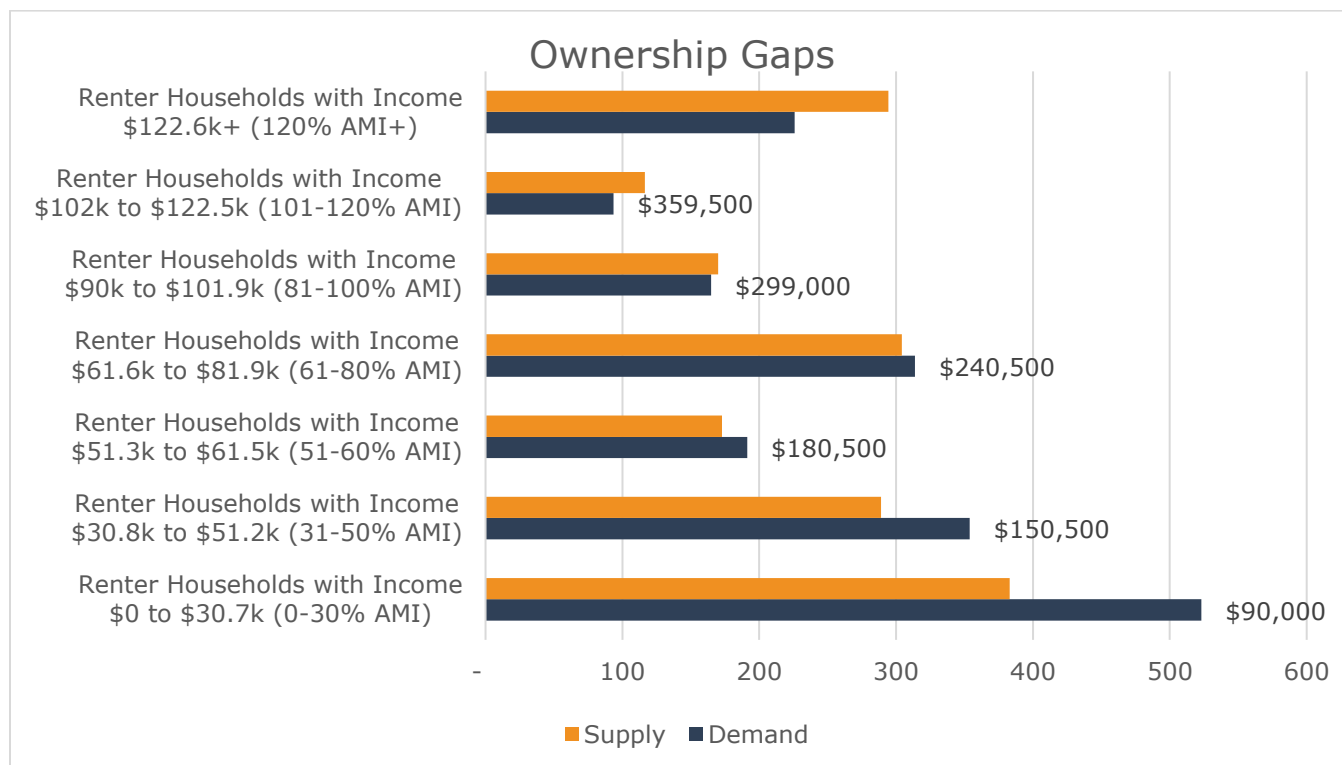
Source: ACS 2018-2022

Figure 24: Housing Gaps for Rental Housing



Source: Regional Housing Needs Assessment 2021

Figure 25: Housing Gaps for Home Ownership



Source: Regional Housing Needs Assessment 2021

Figure 26: Housing Production Needs for Newmarket

New Units Needed by		2025	2030	2035	2040
Total		278	511	668	756
Owner Occupied		189	347	451	506
	Below 100% AMI	70	129	168	188
	Above 100% AMI	119	218	284	318
Renter Occupied		89	164	217	249
	Below 100% AMI	24	44	58	66
	Above 100% AMI	65	120	159	183

Source: *Regional Housing Needs Assessment 2021*

Affordability

Figure 27: Median Home Purchase and Rental Costs

Year	Median Purchase Prices			Median Rent (All Units)		
	Newmarket	Rockingham County	NH	Newmarket	Rockingham County	NH
2005	\$273,519	\$307,000	\$250,000	\$988	\$973	\$901
2006	\$270,000	\$303,750	\$249,900	\$815	\$994	\$928
2007	\$283,000	\$300,000	\$252,500	\$844	\$1,031	\$946
2008	\$245,000	\$285,000	\$240,000	\$918	\$1,042	\$969
2009	\$229,400	\$247,000	\$210,000	\$1,197	\$1,047	\$969
2010	\$207,500	\$259,000	\$215,000	\$1,146	\$1,099	\$980
2011	\$220,000	\$250,000	\$207,000	\$1,268	\$1,051	\$983
2012	\$242,400	\$255,000	\$205,000	\$1,451	\$1,070	\$1,005
2013	\$233,000	\$269,000	\$220,000	\$1,267	\$1,099	\$1,018
2014	\$250,000	\$268,000	\$219,000	\$1,218	\$1,123	\$1,037
2015	\$227,500	\$275,000	\$221,000	\$1,328	\$1,163	\$1,069
2016	\$250,000	\$294,000	\$230,000	\$1,321	\$1,241	\$1,113
2017	\$280,000	\$312,500	\$240,000	\$1,409	\$1,268	\$1,143
2018	\$288,900	\$330,000	\$254,000	\$1,456	\$1,245	\$1,177
2019	\$320,000	\$349,000	\$270,000	\$1,481	\$1,467	\$1,251
2020	\$345,000	\$395,000	\$302,300	\$1,548	\$1,548	\$1,283
2021	\$375,000	\$449,900	\$350,000	\$1,566	\$1,556	\$1,373
2022	\$494,900	\$501,300	\$400,000	\$1,634	\$1,578	\$1,510
2023	\$500,000	\$530,000	\$418,000	\$1,914	\$1,911	\$1,644

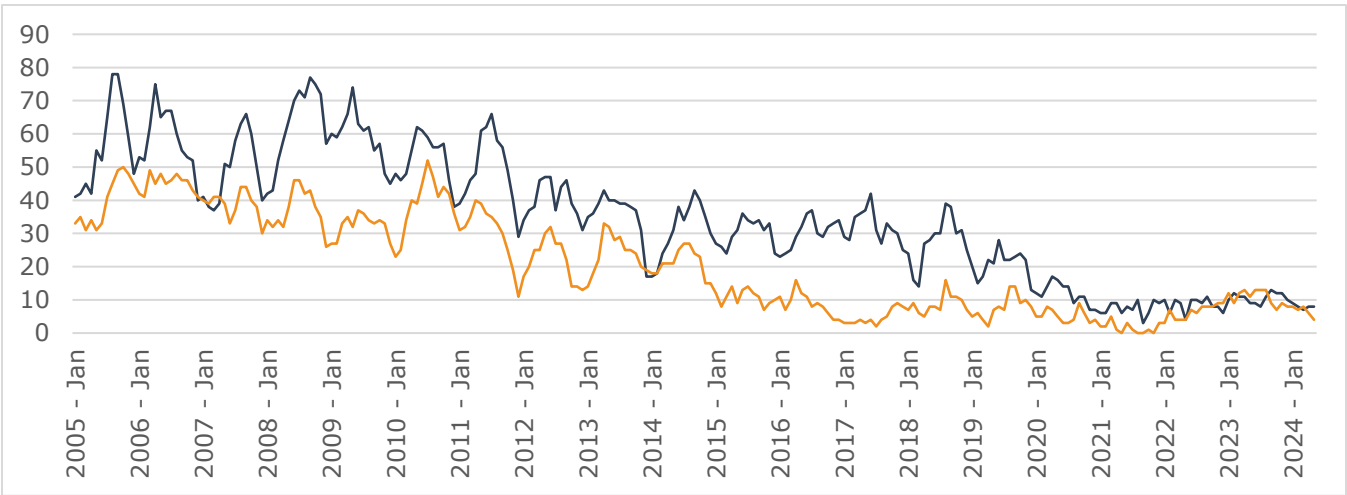
Source: *New Hampshire Housing Finance Authority 2005-2022*

Figure 28: Portsmouth-Rochester Metro Area Fair Market Rents

Unit Size	2020	2021	2022	2023
Studio/0 Bedroom	\$1,000	\$969	\$977	\$1,112
1 Bedroom	\$1,029	\$1,033	\$1,092	\$1,232
2 Bedroom	\$1,315	\$1,330	\$1,399	\$1,563
3 Bedroom	\$1,795	\$1,803	\$1,871	\$2,034
4 Bedroom	\$2,212	\$2,226	\$2,295	\$2,488
5 Bedroom	\$2,544	\$2,560	\$2,639	\$2,861
6+ Bedroom	\$2,876	\$2,894	\$2,984	\$3,234

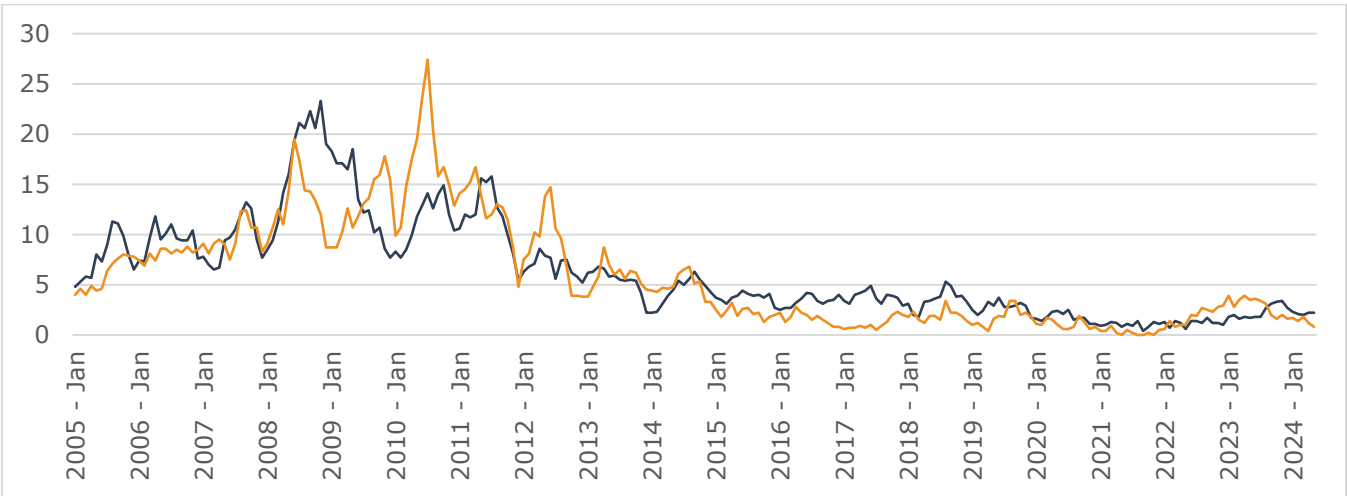
Source: HUD 2020-2023

Figure 29: Homes for Sale Each Month



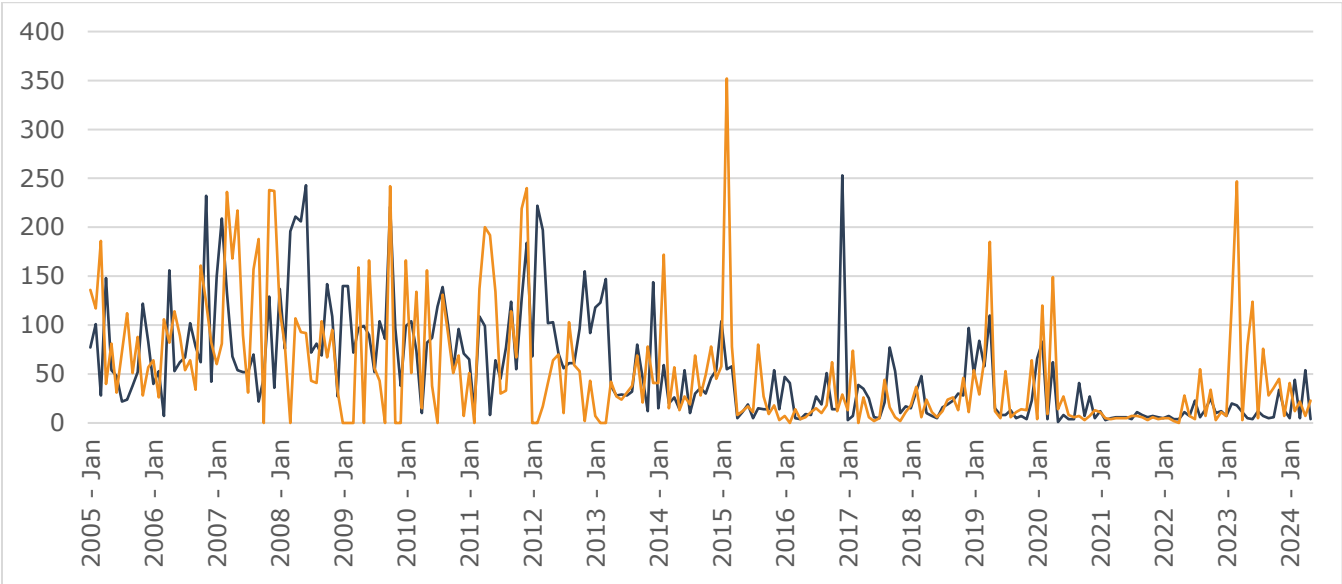
Source: NH Association of Realtors 2005-2024

Figure 30: Months' Supply of Housing Inventory



Source: NH Association of Realtors 2005-2024

Figure 31: Average Days on Market



Source: NH Association of Realtors 2005-2024

Figure 32: Newmarket Housing Choice Vouchers

Housing Choice Vouchers (2021)	
Number of Households	13
Average rent	\$1,315
Median rent	\$1,914
Applicants	23
Actively looking for units	4

Source: Regional Housing Needs Assessment 2021

Figure 33: Subsidized Housing Units

Subsidized Units	Newmarket
LIHTC Units	Yes
Special Needs Units	No
Age-Restricted Units	Yes
% Age-Restricted Units	63%
% Units within 1/2 mile of Transit	62%
Total Subsidized Units	134

Source: Regional Housing Needs Assessment 2021

Figure 34: Employment and Wages for Rockingham County's Top Occupations

Occupations	Employees	Wages			
		Entry	Mean	Experience	Median
Total, All Occupations	153,900	\$32,654	\$64,590	\$80,557	\$49,475
Retail	5,710	\$27,678	\$39,495	\$45,403	\$35,204
Health Care Practitioners	7,960	\$54,178	\$108,465	\$135,339	\$88,519
Health Care Support	4,180	\$32,529	\$44,166	\$49,985	\$43,128
Food Service and Preparation	15,090	\$24,994	\$36,756	\$42,637	\$34,760
Teachers	8,630	\$35,839	\$59,020	\$70,611	\$56,567
Elementary Teachers	1,250	\$49,945	\$68,578	\$77,895	\$66,028
Protective Services	2,890	\$36,451	\$57,638	\$68,231	\$57,559
Police (Patrol Officers)	580	\$54,808	\$65,934	\$71,496	\$63,940
Firefighters	650	\$36,417	\$53,368	\$61,844	\$54,742
Construction and Extraction	5,800	\$42,818	\$62,179	\$71,860	\$58,566

Source: NH Employment Security 2023

Figure 35: Maximum Affordable Rent for Rockingham County's Top Occupations

Occupations	Employees	Max Rent Affordable				Median Rent
		Entry	Mean	Experience	Median	
Total, All Occupations	153,900	\$816	\$1,615	\$2,014	\$1,237	\$1,914
Retail	5,710	\$692	\$987	\$1,135	\$880	\$1,914
Health Care Practitioners	7,960	\$1,354	\$2,712	\$3,383	\$2,213	\$1,914
Health Care Support	4,180	\$813	\$1,104	\$1,250	\$1,078	\$1,914
Food Service and Preparation	15,090	\$625	\$919	\$1,066	\$869	\$1,914
Teachers	8,630	\$896	\$1,476	\$1,765	\$1,414	\$1,914
Elementary Teachers	1,250	\$1,249	\$1,714	\$1,947	\$1,651	\$1,914
Protective Services	2,890	\$911	\$1,441	\$1,706	\$1,439	\$1,914
Police (Patrol Officers)	580	\$1,370	\$1,648	\$1,787	\$1,599	\$1,914
Firefighters	650	\$910	\$1,334	\$1,546	\$1,369	\$1,914
Construction and Extraction	5,800	\$1,070	\$1,554	\$1,797	\$1,464	\$1,914

Source: NH Employment Security 2023

Figure 36: Maximum Affordable Home Purchase Price for Rockingham County's Top Occupations

Occupations	Employees	Max Mortgage Affordable				Median Price
		Entry	Mean	Experience	Median	
Total, All Occupations	153,900	\$95,500	\$189,500	\$236,500	\$145,000	\$500,000
Retail	5,710	\$81,000	\$115,500	\$133,000	\$103,000	\$500,000
Health Care Practitioners	7,960	\$159,000	\$318,500	\$397,000	\$259,500	\$500,000
Health Care Support	4,180	\$95,500	\$129,500	\$146,500	\$126,500	\$500,000
Food Service and Preparation	15,090	\$73,500	\$108,000	\$125,000	\$102,000	\$500,000
Teachers	8,630	\$105,000	\$173,000	\$207,000	\$166,000	\$500,000
Elementary Teachers	1,250	\$146,500	\$201,000	\$22,850	\$193,500	\$500,000
Protective Services	2,890	\$107,000	\$169,000	\$200,000	\$168,500	\$500,000
Police (Patrol Officers)	580	\$106,500	\$156,500	\$181,500	\$160,500	\$500,000
Firefighters	650	\$160,500	\$193,500	\$209,500	\$187,500	\$500,000
Construction and Extraction	5,800	\$125,500	\$182,500	\$210,500	\$171,500	\$500,000

Source: NH Employment Security 2023

Living Wage

The MIT Living Wage Calculator estimates the cost of living in a county and determines the necessary living wage and the poverty wage based on those costs. The table below represents the Rockingham County Living Wages.

Figure 37: Living Wages for Rockingham County

Household Type		Poverty Wage	Poverty Salary	Poverty Salary per month	Living Wage	Living Salary	Living Salary per month
1 Adult	0 Children	\$7.24	\$15,059	\$1,255	\$25.73	\$53,518	\$4,460
	1 Child	\$9.83	\$20,446	\$1,704	\$45.80	\$95,264	\$7,939
	2 Children	\$12.41	\$25,813	\$2,151	\$58.10	\$120,848	\$10,071
	3 Children	\$15.00	\$31,200	\$2,600	\$75.92	\$157,914	\$13,159
2 Adults (1 Working)	0 Children	\$9.83	\$20,446	\$1,704	\$34.54	\$71,843	\$5,987
	1 Child	\$12.41	\$25,813	\$2,151	\$42.32	\$88,026	\$7,335
	2 Children	\$15.00	\$31,200	\$2,600	\$47.37	\$98,530	\$8,211
	3 Children	\$17.59	\$36,587	\$3,049	\$50.83	\$105,726	\$8,811
2 Adults (both working)	0 Children	\$4.91	\$10,213	\$851	\$17.27	\$35,922	\$2,993
	1 Child	\$6.21	\$12,917	\$1,076	\$25.24	\$52,499	\$4,375
	2 Children	\$7.50	\$15,600	\$1,300	\$31.53	\$65,582	\$5,465
	3 Children	\$8.79	\$18,283	\$1,524	\$37.40	\$77,792	\$6,483

Source: MIT Living Wage Calculator 2022

Income vs Mortgages

Figure 38: Down Payment, Mortgages, and Salaries Needed to Afford Median Priced Homes

Loan Assumptions			Down Payment			Monthly Mortgage Payment				Monthly Mortgage Payment + Utilities, Tax, PMI, and Insurance				Median Rents	Salary Needed				
Year	Average 30-year rate	Median Price	20% Down	10% Down	3.5% Down	20% Down	10% Down	3.5% Down	0% Down	20% Down	10% Down	3.5% Down	0% Down	All Units	20% Down	10% Down	3.5% Down	0% Down	Median Rent
2000	8.05	\$165,000	\$33,000	\$16,500	\$5,775	\$973	\$1,034	\$1,095	\$1,156	\$1,174	\$1,217	\$973	\$1,500	\$1,588	\$1,676	\$1,703	\$1,764	Unknown	\$38,940
2001	6.97	\$185,000	\$37,000	\$18,500	\$6,475	\$981	\$1,043	\$1,104	\$1,165	\$1,184	\$1,227	\$981	\$1,512	\$1,601	\$1,690	\$1,717	\$1,779	Unknown	\$39,258
2002	6.54	\$241,000	\$48,200	\$24,100	\$8,435	\$1,223	\$1,300	\$1,376	\$1,453	\$1,476	\$1,529	\$1,223	\$1,885	\$1,996	\$2,106	\$2,140	\$2,217	Unknown	\$48,934
2003	5.83	\$236,000	\$47,200	\$23,600	\$8,260	\$1,111	\$1,180	\$1,250	\$1,319	\$1,340	\$1,389	\$1,111	\$1,712	\$1,812	\$1,913	\$1,943	\$2,014	Unknown	\$44,441
2004	5.84	\$255,000	\$51,000	\$25,500	\$8,925	\$1,202	\$1,277	\$1,352	\$1,427	\$1,450	\$1,503	\$1,202	\$1,852	\$1,961	\$2,070	\$2,103	\$2,179	Unknown	\$48,083
2005	5.87	\$273,519	\$54,704	\$27,352	\$9,573	\$1,293	\$1,374	\$1,455	\$1,536	\$1,560	\$1,617	\$1,293	\$1,992	\$2,110	\$2,227	\$2,262	\$2,344	\$988	\$51,729
2006	6.41	\$270,000	\$54,000	\$27,000	\$9,450	\$1,353	\$1,438	\$1,522	\$1,607	\$1,632	\$1,691	\$1,353	\$2,084	\$2,207	\$2,330	\$2,366	\$2,452	\$815	\$54,119
2007	6.34	\$283,000	\$56,600	\$28,300	\$9,905	\$1,407	\$1,495	\$1,583	\$1,671	\$1,697	\$1,759	\$1,407	\$2,167	\$2,295	\$2,422	\$2,461	\$2,550	\$844	\$56,275
2008	6.03	\$245,000	\$49,000	\$24,500	\$8,575	\$1,179	\$1,252	\$1,326	\$1,400	\$1,422	\$1,473	\$1,179	\$1,816	\$1,923	\$2,029	\$2,061	\$2,136	\$918	\$47,142
2009	5.04	\$229,400	\$45,880	\$22,940	\$8,029	\$989	\$1,051	\$1,113	\$1,175	\$1,193	\$1,237	\$989	\$1,524	\$1,614	\$1,703	\$1,730	\$1,793	\$1,197	\$39,571
2010	4.69	\$207,500	\$41,500	\$20,750	\$7,263	\$860	\$914	\$967	\$1,021	\$1,037	\$1,075	\$860	\$1,325	\$1,403	\$1,481	\$1,504	\$1,559	\$1,146	\$34,397
2011	4.45	\$220,000	\$44,000	\$22,000	\$7,700	\$886	\$942	\$997	\$1,053	\$1,069	\$1,108	\$886	\$1,365	\$1,446	\$1,526	\$1,550	\$1,606	\$1,268	\$35,453
2012	3.66	\$242,400	\$48,480	\$24,240	\$8,484	\$888	\$943	\$999	\$1,054	\$1,071	\$1,110	\$888	\$1,368	\$1,448	\$1,529	\$1,553	\$1,609	\$1,451	\$35,517
2013	3.98	\$233,000	\$46,600	\$23,300	\$8,155	\$887	\$943	\$998	\$1,054	\$1,070	\$1,109	\$887	\$1,367	\$1,447	\$1,528	\$1,552	\$1,608	\$1,267	\$35,491
2014	4.17	\$250,000	\$50,000	\$25,000	\$8,750	\$974	\$1,035	\$1,096	\$1,157	\$1,175	\$1,218	\$974	\$1,501	\$1,589	\$1,678	\$1,704	\$1,766	\$1,218	\$38,976
2015	3.85	\$227,500	\$45,500	\$22,750	\$7,963	\$853	\$907	\$960	\$1,013	\$1,029	\$1,067	\$853	\$1,315	\$1,392	\$1,469	\$1,492	\$1,547	\$1,328	\$34,132
2016	3.65	\$250,000	\$50,000	\$25,000	\$8,750	\$915	\$973	\$1,030	\$1,087	\$1,104	\$1,144	\$915	\$1,410	\$1,493	\$1,576	\$1,601	\$1,659	\$1,321	\$36,615
2017	3.99	\$280,000	\$56,000	\$28,000	\$9,800	\$1,068	\$1,135	\$1,202	\$1,268	\$1,288	\$1,335	\$1,068	\$1,646	\$1,742	\$1,839	\$1,868	\$1,936	\$1,409	\$42,724
2018	4.54	\$288,900	\$57,780	\$28,890	\$10,112	\$1,177	\$1,251	\$1,324	\$1,398	\$1,420	\$1,471	\$1,177	\$1,814	\$1,920	\$2,027	\$2,059	\$2,134	\$1,456	\$47,087
2019	3.94	\$320,000	\$64,000	\$32,000	\$11,200	\$1,213	\$1,289	\$1,364	\$1,440	\$1,463	\$1,516	\$1,213	\$1,868	\$1,978	\$2,088	\$2,121	\$2,198	\$1,481	\$48,509
2020	3.11	\$345,000	\$69,000	\$34,500	\$12,075	\$1,180	\$1,254	\$1,328	\$1,402	\$1,424	\$1,475	\$1,180	\$1,818	\$1,925	\$2,032	\$2,064	\$2,139	\$1,548	\$47,213
2021	2.96	\$375,000	\$75,000	\$37,500	\$13,125	\$1,258	\$1,337	\$1,415	\$1,494	\$1,517	\$1,572	\$1,258	\$1,938	\$2,052	\$2,166	\$2,200	\$2,280	\$1,566	\$50,319
2022	5.34	\$494,900	\$98,980	\$49,490	\$17,322	\$2,209	\$2,347	\$2,486	\$2,624	\$2,665	\$2,762	\$2,209	\$3,404	\$3,604	\$3,804	\$3,864	\$4,005	\$1,634	\$88,376
2023	6.81	\$500,000	\$100,000	\$50,000	\$17,500	\$2,610	\$2,774	\$2,937	\$3,100	\$3,149	\$3,263	\$2,610	\$4,022	\$4,258	\$4,495	\$4,566	\$4,731	\$1,914	\$104,415

Source: US Federal Reserve and NHHFA 2000-2023

Base Assumptions used in the table above:

- Median Purchase Prices are for Rockingham County
- 30-year interest rates are annual averages for each year
- “Mortgage + PMI” accounts for utilities, tax, PMI and mortgage insurance and assumes that these cost 45% of the original mortgage payment.
- Salary needed to afford each mortgage is the salary at which Mortgage + PMI is less than 30% of the monthly income.
- Down payments used are:
 - 20% to avoid needing PMI and Mortgage Insurance
 - 10% as an easier to attain high percentage down
 - 3.5% as a common minimum for many assistance programs
 - 0% as the minimum for veteran assistance and other programs

Appendix C – Transportation

1. Complete Streets and Safety Improvements.....	1
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1. Complete Streets and Safety Improvements

The Strafford Regional Planning Commission and Rockingham Planning Commission are completing a pedestrian stress analysis. You may know of sidewalks that feel “unsafe” despite being separated from the road, and you may know of shoulders that feel “safe” due to very low traffic or traveling speed of vehicles. This study will expand on these notions throughout the Seacoast. The table here includes questions that may be asked as part of such an analysis or a similar “walk audit.”¹

The New Hampshire Department of Transportation defines Complete Streets² as “roadways that are designed and operated to prioritize safety, comfort, and access to destinations for all road users, including motorists, pedestrians, bicyclists, and transit users.” Across all definitions and implementations, complete streets are context-sensitive and no two will look the same when completed.

Sidewalks	Curb Ramps
• Is a sidewalk present? • Is the sidewalk continuous • Is the sidewalk wide enough? • Is the sidewalk well-maintained? • What is the sidewalk made of? • Are there any obstructions?	• How wide is the curb ramp? • Where are utilities placed in relation to the sidewalk? • Does the drainage system keep the base of the ramp clear of water, ice, and debris? • Are the crosswalks and curb ramps aligned?
Crossings	Bes Stops
• Is there a marked crosswalk? • What is the crossing distance? • How long does it take to cross? • How long is the wait time for a signal or a gap in traffic? • Are there pedestrian crossing signals?	• Is the stop convenient to origins and destinations? • Is the stop clearly marked? • Are there any obstacles near the stop? • Is there shelter? • Is there lighting?

¹ Howard County Pedestrian Master Plan. Howard County, Maryland. December 2019. walkhoward.org/wp-content/uploads/2019/12/walkhoward_county_council_version_2019_12_18_compressed_for_web.pdf

² See this map of Complete Streets efforts across New Hampshire from the New Hampshire Municipal Association: storymaps.arcgis.com/stories/952fc598a56c46f588227de59adfe652

Examples of this comes from the City of Portsmouth where, due to the adoption of a city-wide policy, the city was able to incrementally design Complete Streets specific to each street and neighborhood's context and limitations.³ The City of Lebanon⁴ provides standards and guidelines for complete streets. Also, along NH 108 between Rochester, Somersworth, and Dover, the first state level complete streets project will be constructed. The purpose of the project is to increase visibility of pedestrians and cyclists and modify driver behavior. Currently, this corridor hosts many major local employers, dense housing, shopping, and recreation opportunities and inadequately accommodates pedestrian and bicycle traffic by only providing a shoulder to travel on and access to several isolated COAST bus stops.

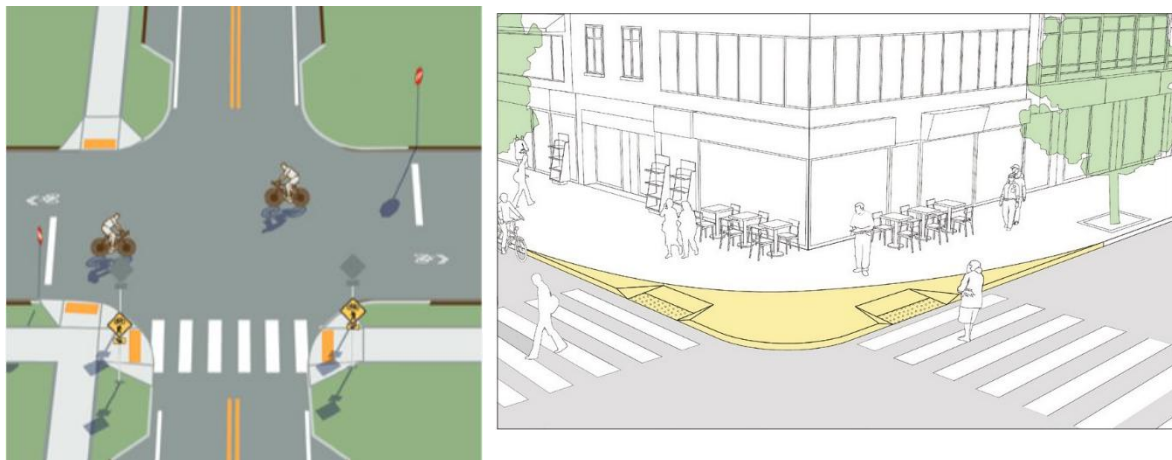
Below are examples of traffic calming techniques that may be applicable in Newmarket. These and other improvements should be repeated as the village core expands. There are many traffic calming techniques that have been catalogued by the U.S. Department of Transportation: "Proven Safety Countermeasures" that apply to multiple modes, and "Safe Transportation for Every Pedestrian" which focuses on non-motorized users.

Proven Safety Counter Measures

Safe Transportation for Every Pedestrian (STEP)

Curb Extensions

Curb extensions reduce traffic exposure and increase visibility of crossing users. Curb extensions should not be used within shoulders where they interfere with bicycle travel along the major roadway.



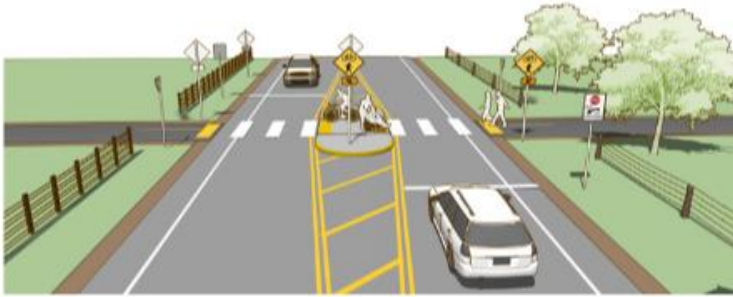
Source: Federal Highway Administration

³ City of Portsmouth Complete Streets Design Guidelines. City of Portsmouth, New Hampshire. June 2017. files.cityofportsmouth.com/files/planning/CompleteStreetsGuideJuly2017.pdf

⁴ Design & Construction Standards for Streetscapes. City of Lebanon, New Hampshire. June 2012. lebanonnh.gov/DocumentCenter/View/191/Design-and-Construction-Standards-for-Streetscapes-PDF

Median Enhanced Crosswalks

Median islands visually narrow vehicle travel lanes and allow users to cross one lane of traffic at a time. They are particularly beneficial for people who may travel slower, such as children, older adults, and people with disabilities. Median islands are beneficial on roadways with high volumes and/or high speeds, and on roadways with three or more travel lanes.



Source: Federal Highway Administration

Roundabouts

Roundabouts are an alternative to traditional 90-degree intersections. There are many reasons why Newmarket should consider converting intersections to roundabouts when the opportunity or need arises:

- They have a proven track record of reducing or eliminating fatal crashes.
- They reduce vehicle traffic speeds.
- They can double as an attractive “gateway” point approaching the village core.
- They reduce congestion because they create a continuous flow of traffic.
- They can reduce emissions from vehicles waiting at traffic signals.

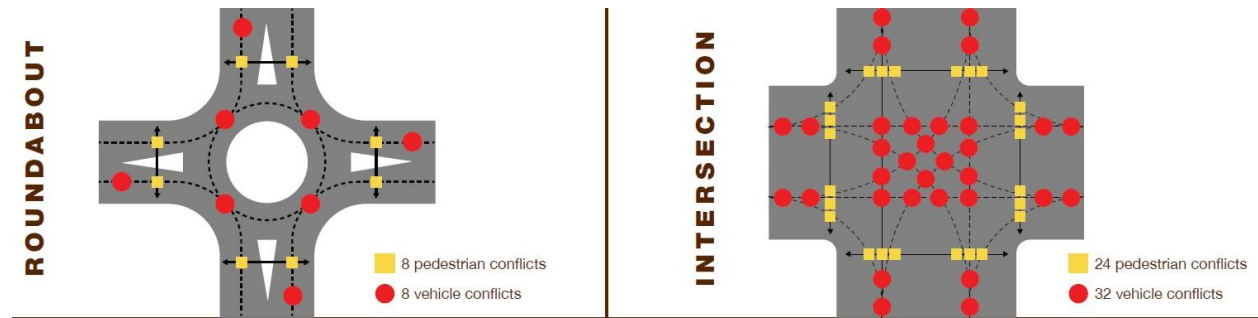
Important design considerations:

- Roundabouts have fewer “conflict points” for pedestrians, but require specific design elements like lighting and splitter median islands.
- Roundabout can be any size but may require more right-of-way than a standard four-way stop-controlled or signalized intersection.



Sources: Left image – Massachusetts DOT; Right image – Federal Highway Administration

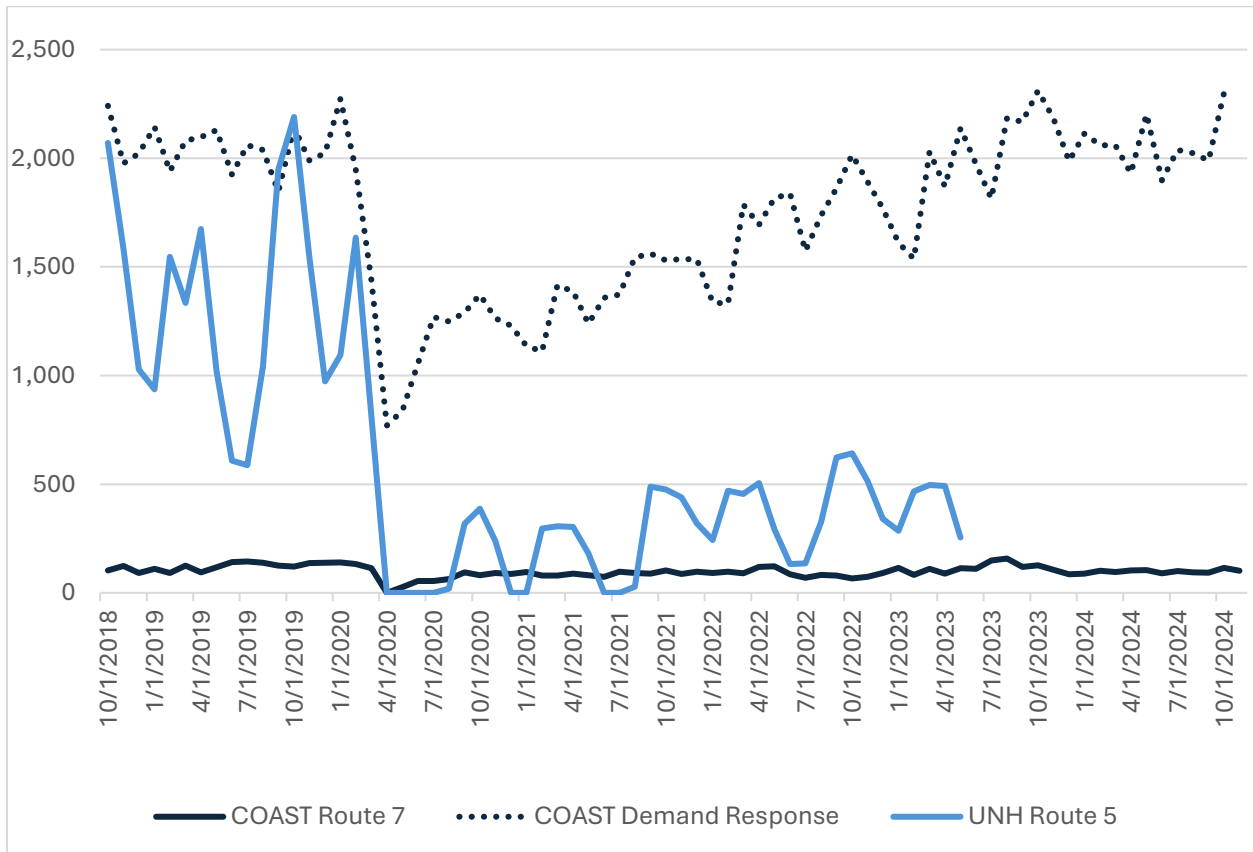
Roundabouts reduce potential conflict points compared to a stop-controlled or signalized intersection.



Source: Montana DOT

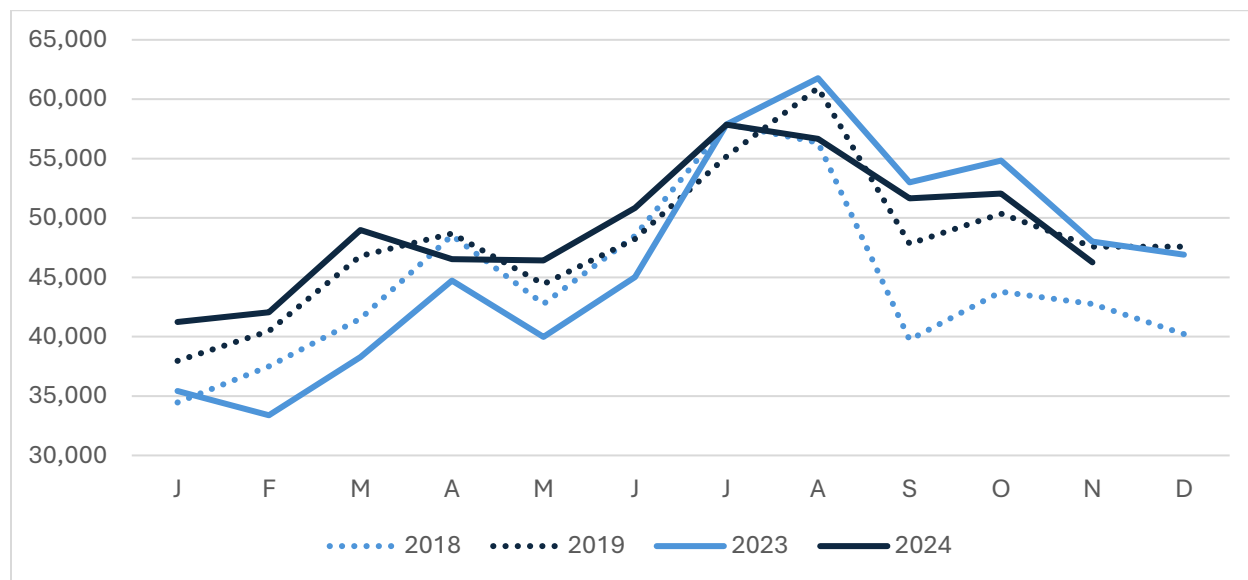
2. Demographics and Ridership Data

Figure 1 – Monthly Transit Ridership on Routes that Serve Newmarket October 2018 to Present



Sources: Federal Transit Administration (FTA), COAST, UNH

Figure 2 – Amtrak Downeaster Monthly Ridership 2018, 2019, 2023, 2024



Source: Northern New England Passenger Rail Authority (n.d. December 2024)

Figure 3 - Potentially "Vulnerable" Transportation Users in Newmarket

	Under 18	65 over	Experiencing a Disability
2013	1,966	903	758
2018	1,572	1,322	981
2023	1,541	1,574	855

Source: American Community Survey 5-year Estimates

Figure 4 - Households without Access to a Vehicle in Newmarket

	Households without Access to a Vehicle
2013	187
2018	284
2023	91

Source: American Community Survey 5-year Estimates

Figure 5 - Commuting Modes in Newmarket

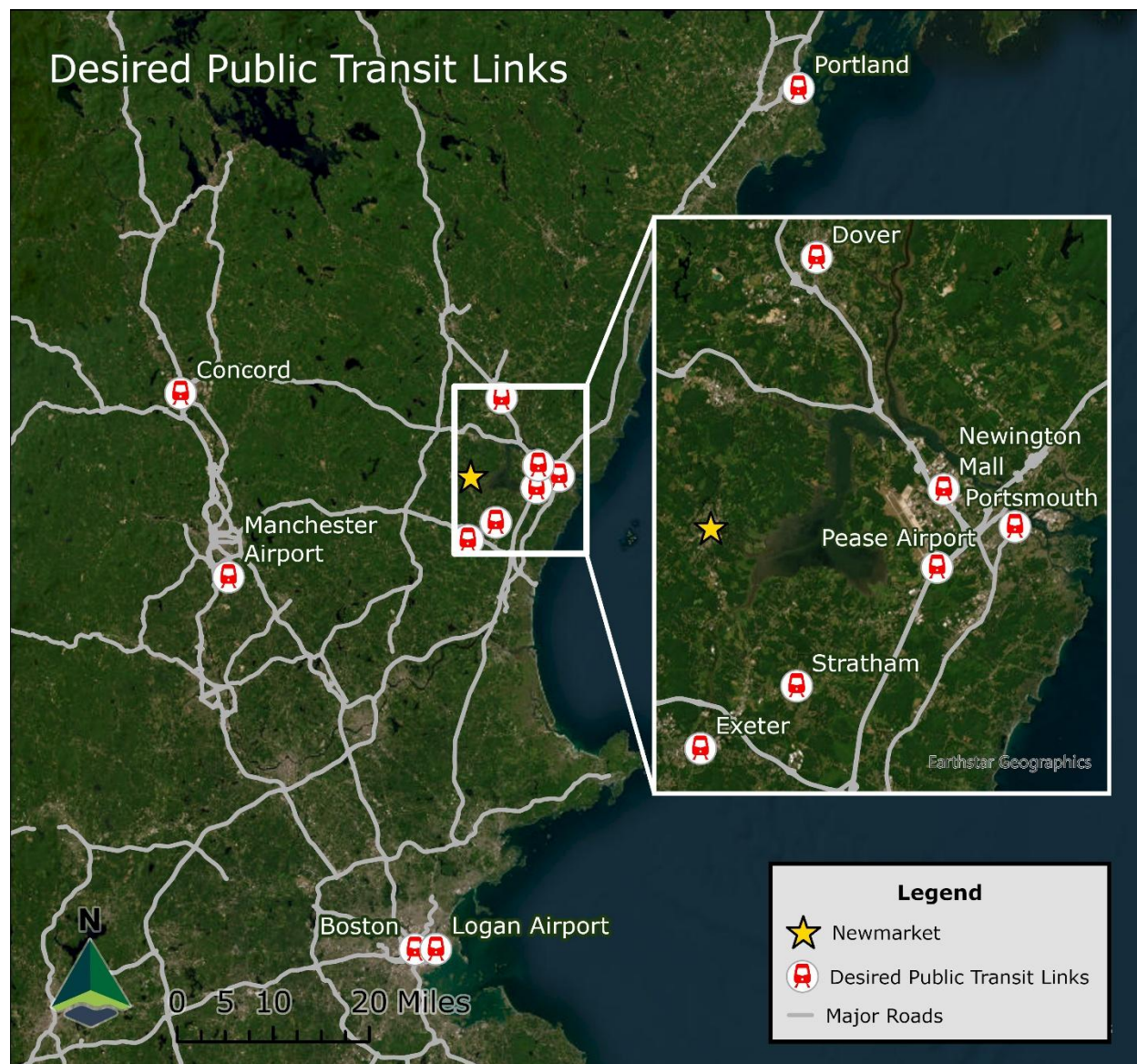
Mode	2023	5-year change
Drove Alone	74%	-12%
Worked from Home	17%	13%
Carpooled	5%	-1%
Walked	4%	3%
Public Transit	0%	-1%
Biked	0%	0%
Other	0%	-2%

Source: American Community Survey 5-year Estimates

Top Commuting Origins and Destinations to and from Newmarket (2022)					
Live in Newmarket and commute to...	Number	Change since 2017	Work in Newmarket and commute from...	Number	Change since 2017
Portsmouth	946	9%	Dover	100	32%
Exeter	446	11%	Rochester	82	95%
Dover	266	-14%	Portsmouth	61	5%
Durham	219	-3%	Exeter	55	-17%
Manchester	185	19%	Durham	46	-16%
Boston, Mass.	150	-4%	Epping	41	58%
Stratham	138	-7%	Hampton	40	111%
Hampton	129	-17%	Barrington	39	-11%
Seabrook	126	19%	Nottingham	36	44%
374 workers live and work in Newmarket, a 5-year increase of 14%					
All others	2,585	4%	All others	766	4%

3. Public Transit Options

Public Transit Options In and Around Newmarket							
Provider	Destination type	Accessible vehicle/ seating?	Reservation required?	Availability	Trip Purpose	Destinations or Areas Served	Cost (one-way)
COAST Route 7	Fixed stop or station	Yes	Yes	Mo, We, Th, Fr, Sa	Any purpose	Multiple stops along NH108 between Newmarket and Exeter	\$1.50 to \$3.00
Community Rides	Exact, curb-to-curb	Yes	Yes	Mo, We, Th, Fr, Sa	Non-emergency Medical	38 towns throughout Strafford, Rockingham, and Carrol Counties	Free
C&J Bus	Fixed stop or station	On request	Yes	Weekdays and weekends	Any purpose	Stations in Dover, Portsmouth, Seabrook, Boston, MA, Portland, ME	\$17.00+
Amtrak Downeaster	Fixed stop or station	Yes	No	Weekdays and weekends	Any purpose	Stations in Dover, Durham, Exeter	\$10.00+
Ready Rides	Exact, curb-to-curb	On request	Yes	Weekdays	Medical appointments	Serves residents of Barrington, Deerfield, Durham, Epping, Lee, Madbury, Newfields, Newmarket, Northwood, Nottingham, Strafford	Free
Meals on Wheels of R'ham Co.	Exact, door-to-door	On request	Yes	Mo, Fr	Meals, shopping, medical	Newmarket Senior Shuttle	Free
Future in Sight	Exact, curb-to-curb	No	Yes	Weekdays and weekends	Medical appts., some shopping	Throughout the state (need to be an active member)	Free



4. 2025 Parking Study Summary of Findings

In the spring of 2025, Strafford Regional Planning Commission conducted a parking study in Newmarket's village core. The study results supported feedback heard during public outreach for the master plan – that downtown parking is at capacity. Local committees developed multiple recommendations and actions for improving parking. Newmarket should balance the need for additional parking with other priorities in the downtown village core, such as pedestrian safety. A range of options should be considered for parking, including parking garages, and satellite lots.

“Very few of the wonderful business in the downtown area are accessible to wheelchair users. Combined with the difficulty parking near businesses, Newmarket is difficult to access for people with mobility impairments. A master plan must improve access for all.”

-2024 Master Plan Survey Respondent

The parking study findings include:

- The average overall occupancy for all zones is around 50% on weekdays, and over 60% on Saturday. However, distribution is not even, with concentrations at the small Weavers Row lot, Old Brick Bank Lot, and Library lot.
 - Note that some analysis zones have one or two spaces, so may appear to have deceptively high occupancy rates.
- 71% of Main street spaces were occupied on weekdays, and peaked near 100% after 5pm. On Saturday, the Main Street zone was over 90% occupied for the entire study period.
- The former Bank lot was also popular throughout the study period and near full capacity on Saturday. In addition to the marked spaces, additional cars were parked in the drive through bays. Data was only collected on the marked spaces, but up to 24 vehicles might be in this lot at one time. The Town should consider where those 24 vehicles might park when the building is leased again.
- The highest rates of turnover were along Main Street on weekdays. Main Street analysis zones saw an average of 6 new vehicles during the weekday study periods. Average Main Street turnover on Saturday was slightly lower, but still highest of all zones.
- The Beech St, Dame Rd, Railroad, and Bay Rd satellite lots all had the lowest occupancy rates of all analysis zones on all days. They shared the lowest turnover rates with some sections nearer the village core (such as the post office, Water St, and South Main St.
- People may be confused by the variety of parking regulations and lack of clear signage.
- Wayfinding signs for the satellite lots could be improved, as well as the sidewalk infrastructure to the Railroad St lot.

There are isolated areas where people are parking longer than the posted time limit: the post office lot, some sections of Main Street and side streets, and in the Weaver St lot adjacent to the Library. SRPC Staff saw parking enforcement officers out all three days,

Appendix D – Energy Chapter

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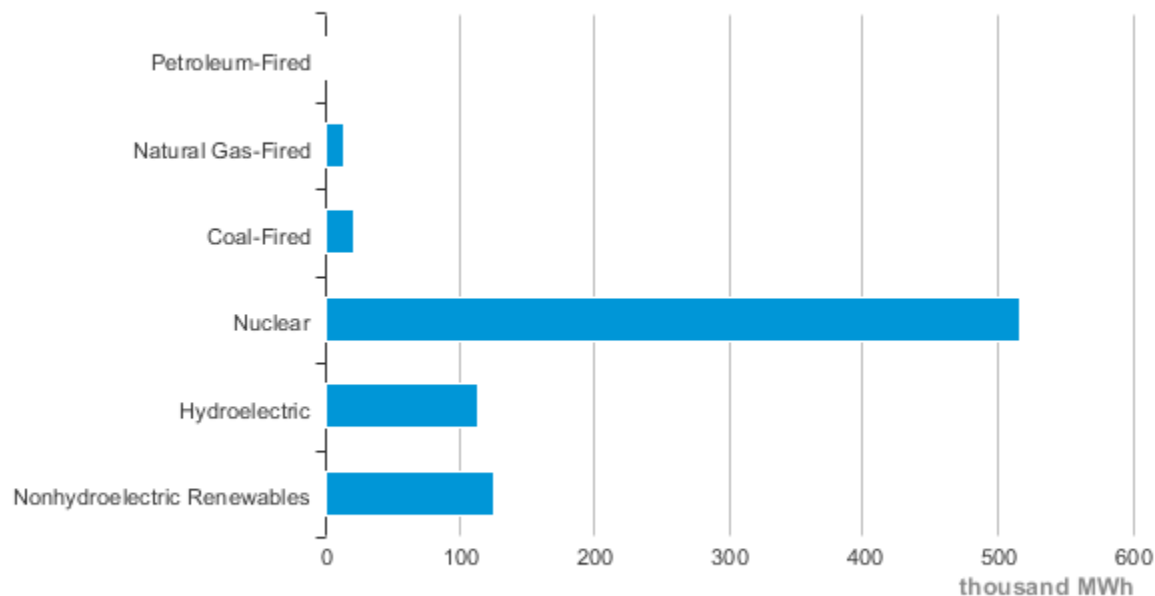
Energy Profiles

State of New Hampshire

1. Sources of Electricity Generation

The U.S. Energy Information Administration (www.eia.gov) collects, analyzes and reports on statewide and national energy data. The most recent New Hampshire State Energy Profile (November 2024) provides a summary of New Hampshire’s net electricity generation.

New Hampshire Net Electricity Generation by Source, Nov. 2024



Source: Energy Information Administration, Electric Power Monthly

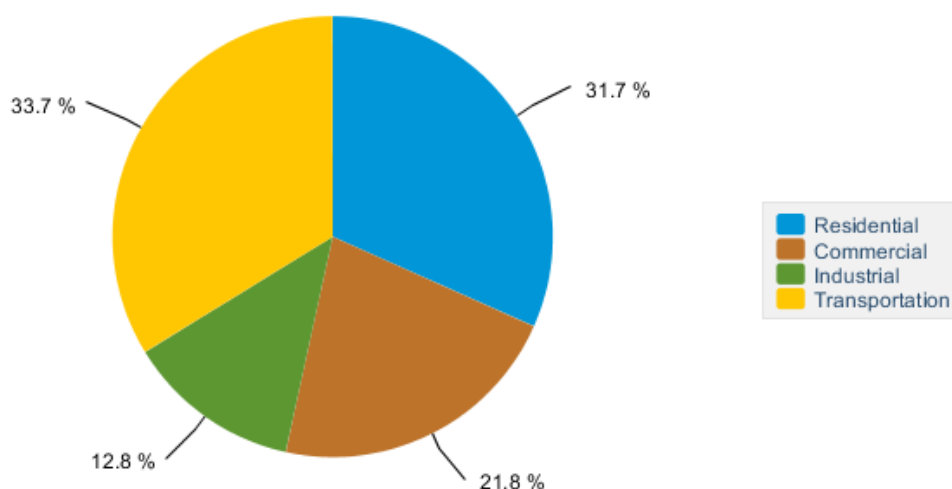
Key points from the NH State Profile include:

- Seabrook, one of two nuclear power plants in New England and New Hampshire's largest power plant, provides approximately 56% of New Hampshire's total in-state net electricity generation.
- Although NH has no natural gas reserves, two natural gas-fired plants provided nearly 25% of the state's total electricity generation.
- In 2023, renewables, including hydroelectric power, biomass (primarily from wood and wood-derived fuels), wind, and solar supplied 18% of the state's total generation.
- The rest of the state's generation was fueled by small amounts of petroleum and coal.
 - Petroleum, which is used primarily to generate power when demand is highest, fueled less than 1% of the state's generation.
 - Coal's contribution declined from 25% of New Hampshire's total in-state generation in 2001 to less than 1% in 2023, while the contribution from natural gas increased from less than 1% to nearly 25% during the same period.

2. Consumption by Sector

The NH State Energy Profile shows that the residential and transportation sectors make up nearly equal shares of New Hampshire's total energy consumption, followed by the commercial and industrial sectors.

New Hampshire Energy Consumption by End-Use Sector, 2022



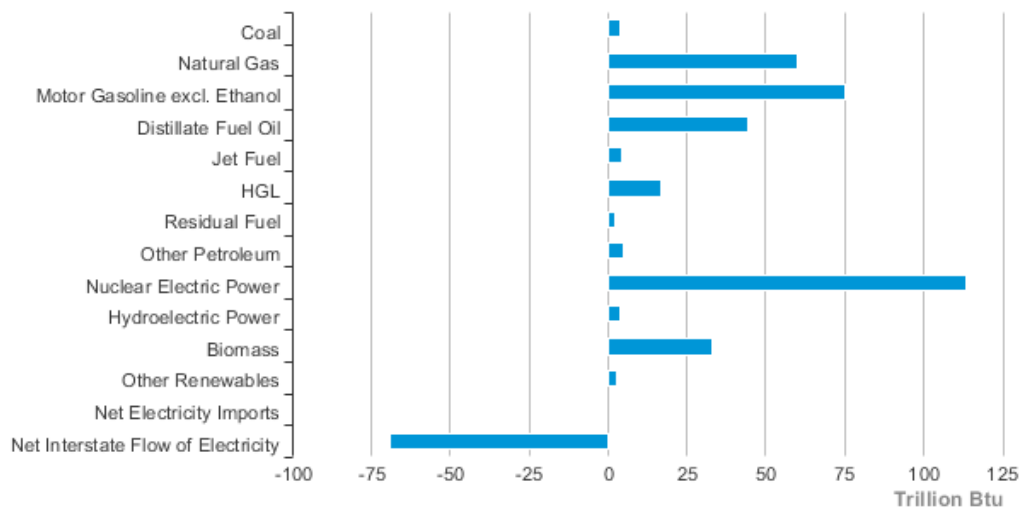
Source: Energy Information Administration, State Energy Data System

Key points about New Hampshire's consumption include:

- The commercial sector accounts for about one-fifth of state energy consumption and the industrial sector uses only slightly more than one-eighth.
- Only 1 in 10 New Hampshire households use electricity as their primary heating source, but in part because of fewer winter daylight hours than in many other states, the residential sector accounted for about 44% of the state's electricity use in 2023.
- About three-fifths (59%) of New Hampshire households use petroleum products as their primary heating fuel, the second-largest share among the states.
- Wood is used as a primary heating source for 1 in 16 New Hampshire households, almost 5 times the national average.

New Hampshire highest consumption is of nuclear power, motor gasoline, natural gas and distillate fuel oil. Renewables make up a small percentage of energy consumed with biomass the largest portion of renewables consumed.

New Hampshire Energy Consumption Estimates, 2022



 Source: Energy Information Administration, State Energy Data System

3. Demand Projections

ISO New England is an independent, not-for-profit corporation authorized by the Federal Energy Regulatory Commission (FERC) to be responsible for keeping electricity flowing across the six New England states and ensuring that the region has reliable, competitively priced wholesale electricity today and into the future. ISO operates the New England electric grid, administers the markets, and manages the regional power system planning process. ISO's most recent energy outlook shows net electricity use for New Hampshire to grow from 12,510,000 MWh in 2021 to 14,757,000 MWhs in 2030, a compound annual growth rate of 1.9%

ISO New England anticipates that over the next 20 years, renewable resources will displace natural gas as the main source of electricity generation in the region—just as natural gas displaced coal and oil generation beginning 20 years ago. <https://www.iso-ne.com/about/where-we-are-going/regional-electricity-outlook> The ISO predicts that continued electrification of the heating and transportation sectors will result in a sharp increase in the region's demand for electricity just as the grid is incorporating huge amounts of intermittent, weather-dependent resources. The technology to power the New England grid solely through carbon-free resources has not yet been fully realized so the need for other resources, including carbon-emitting, will continue to play a role in filling supply gaps and ensuring the reliable flow of electricity. <https://www.iso-ne.com/system-planning/system-forecasting>

Town of Newmarket

1. Electric Usage Profile of Residential and Commercial Property

The technology, equipment, and techniques to drastically reduce energy use and source energy more cleanly and sustainably are becoming more readily available at a rapid rate. Understanding current energy consumption in the private sector will help the Town of Newmarket effectively plan for sourcing clean and renewable energy in the future and for choosing which of the emerging technologies and methods are most appropriate for Newmarket's expected growth. The table below shows the average annual number of accounts and annual electricity usage of Newmarket customers who receive electricity delivered by Eversource for the years ending 2020 and 2022.

Table 1 – Baseline Account Data

Type Account	Calendar Year Ending	Average Number Of Accounts	Net MWh	Net Metered Accounts
Commercial	2020	628	9,728	Not Available
Residential	2020	4,864	29,014	Not Available
Outdoor Lighting	2020	Not Available	Not Available	Not Available
Commercial	2022	555	11,150	15
Residential	2022	4,959	30,085	139
Outdoor Lighting	2022	47	39	0
Commercial*	2024	294	2,198	16
Residential*	2024	4,089	20,001	175
Outdoor Lighting*	2024	63	26	0
Totals	2020	5,492	38,742	N/A
Totals	2022	5,561	41,274	154
Totals*	2024	5,571		

2020 and 2022 data supplied by Eversource, includes other energy source supplier data collected by Eversource.

**2024 data is for Newmarket Community Power accounts, approximately 73% of all electric meters in Newmarket*

The baseline data in Table 1 is information that the Town obtained from Eversource through the process of implementing Community Power (see the Resiliency Section of the Energy Chapter for more details). Through the program the Town tracks residential, commercial and other types of accounts opting to participate. As of December 2024, there were 5,571 accounts (73% of all accounts) participating in the Newmarket Community Power program.

2. Municipal Facilities

Tables 2 and 3 below show the most recent electricity usage from select town and school facilities. Town should continue to track electricity usage at these and other facilities to monitor the effectiveness of implementing energy efficiency measures. For the school facilities, in addition to electric usage, we have included propane and oil usage as this information was readily available. The goal being to eventually reduce the need for non-renewable energy sources.

Table 2 – Town Municipal Facility Electric Usage

	2023	2024
DPW/Fire & Rescue		
Total Net (kWh)	53,360	59,440
Total Purchases (kWh)	20,400	78,640
Total Sales (kWh)	\$ 2,800.00	\$ 19,200.00
Annual Electricity Cost	\$ 14,531.38	\$ 17,130.96
Police Department		
Total Net (kWh)	72,400	70,040
Annual Electricity Cost	\$ 15,689.22	\$ 15,983.17
Town Hall		
Total Net (kWh)	51,040	48,120
Annual Electricity Cost	\$ 12,367.73	\$ 12,614.22
Community Center		
Total Net (kWh)	58,560	64,920
Annual Electricity Cost	\$ 14,243.85	\$ 16,382.65
Sunrise-Sunset Center		
Total Net (kWh)	14,508	13,262
Annual Electricity Cost	\$ 4,029.36	\$ 4,057.71
All Facilities		
Total Net (kWh)	249,868	255,782
Annual Electricity Cost	\$ 60,861.54	\$ 66,168.71

Table 3 - Newmarket School Facilities Electric, Propane and Oil Usage 2023-2024

Newmarket School Facilities Electric Usage

Facility		2023	2024
HS Parking Lot	Total Net (kWh)	2,478.70	2,461.20
	Total Cost	\$639.32	\$676.96
JSHS	Total Net (kWh)	777,000.00	812,250.00
	Total Cost	\$131,694.57	\$154,700.11
NES	Total Net (kWh)	329,423.30	309,321.70
	Total Cost	\$123,457.94	\$70,855.81
SAU	Total Net (kWh)	28,219.50	26,179.20
	Total Cost	\$5,540.50	\$5,575.50
Annex	Total Net (kWh)	9,865.10	9,357.10
	Total Cost	\$1,894.66	\$1,913.02
District Totals	Total Net (kWh)	1,146,986.60	1,159,569.20
	Total Cost	\$263,226.99	\$233,721.40

Newmarket School District Propane Usage 2021-2024

		2023	2024
	Total Gallons	84,569.30	76,359.10
	Total Cost	\$1,833,657.12	\$149,092.00

Newmarket School District Oil Usage 2021-2024

		2023	2024
	Total Gallons	412.8	417.8
	Total Cost	\$1,289.21	\$1,266.77

Tables 4 and 5 Summarize the results of the 2021 Audit of the Water and Wastewater Treatment Facilities

Table 4- Summary of Water System Measures

Summary of Water System Measures					
No	Cost Saving Measures	Annual Energy Savings (kWh)	First Year Annual Savings (\$)	Initial Cost (\$)	Simple Payback (yrs)
ENERGY MANAGEMENT PRACTICES					
EMP 1	Benchmark Energy Use with Operational Data	--	--	--	--
Total for EMPs		--	--	--	--
OPERATIONAL MEASURES					
OM 1	Sewell Well Impeller Clearance Adjustment	7,183	\$1,755	\$1,000	<1
OM 2	Investigate Macintosh Well Propane Vaporizer	9,600	\$1,430	\$500	<1
OM 3	Install Well Thermostat for Folsom Booster Electric Heater	2,100	\$313	\$300	<1
Total for OMs		18,883	\$3,498	\$1,800	<1
ENERGY CONSERVATION MEASURES					
ECM 1	Bennett Well Pump Replacement	10,057	\$2,575	\$28,000	10.9
ECM 2	Replace Electric Heaters with Heat Pumps	12,050	\$2,272	\$19,000	8.4
Total for ECMs		22,107	\$4,847	\$47,000	9.7
Electric Energy Cost Savings		40,990	\$8,345	\$48,800	5.8
Total		40,990	\$8,345	\$48,800	5.8

The proposed measures are expected to reduce system energy costs by \$8,345 annually which is 16% of the 2020 electric energy costs

[Click here to reveal comments and reactions](#)

Table 5 – Summary of Wastewater System Measures

Summary of Measures

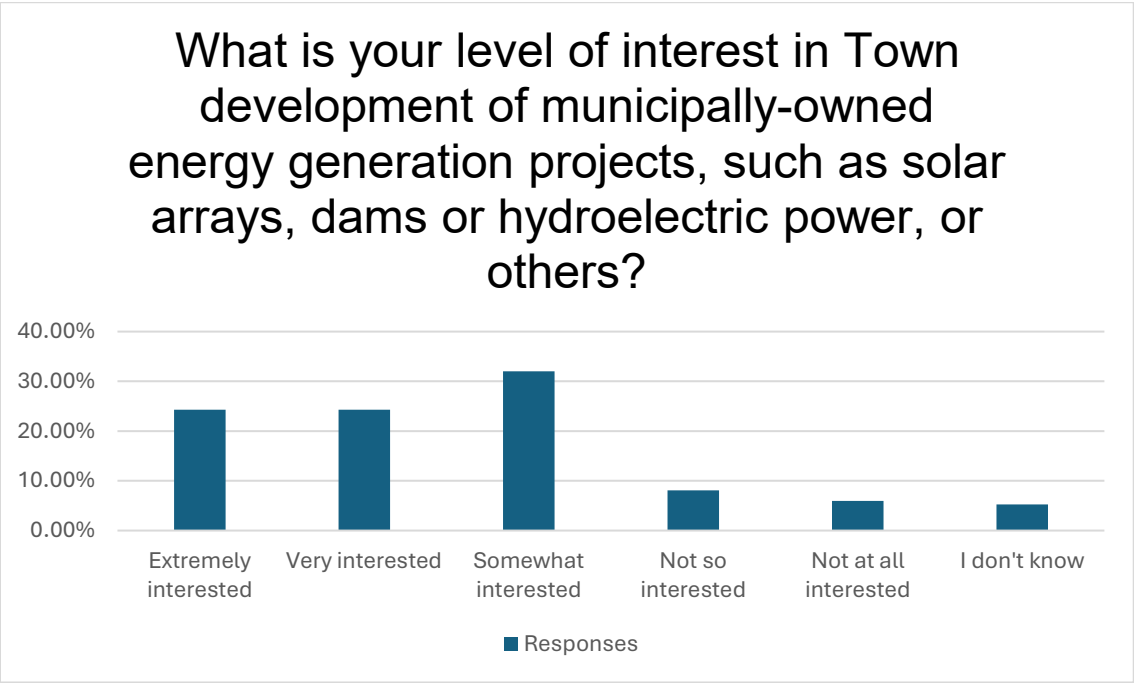
No	Cost Saving Measures	Annual Energy Savings (kWh)	First Year Annual Savings (\$)	Initial Cost (\$)	Simple Payback (yrs)
ENERGY MANAGEMENT PRACTICES					
EMP 1	Benchmark Energy Use with Process Data	--	--	\$3,000	--
Total for EMPs		--	--	--	--
OPERATIONAL MEASURES					
OM 1	Creighton Street Electric Heat Thermostats	8,300	\$1,145	\$1,000	<1
OM 2	Creighton Street Ventilation System Cycling	21,836	\$3,750	\$3,000	<1
OM 3	Operate Plant with Primary Treatment (<i>start initiative in 2021</i>)	18,315	\$2,527	--	--
OM 4	Cycle WAS Holding Tank Blower (<i>start initiative in 2021</i>)	12,147	\$1,676	--	--
OM 5	Adjust Maintenance Building Thermostats	--	\$574	--	--
Total for OMs		60,598	\$9,672	\$4,000	<1
ENERGY CONSERVATION MEASURES					
ECM 1	Install VFDs for Zone A Mixers	13,544	\$2,183	\$5,600	2.6
Total for ECMs		13,544	\$2,183	\$5,600	2.6
WWTF Propane/Fuel Oil Energy and Cost Savings		--	\$574	--	--
WWTF Electric Energy and Cost Savings		74,142	\$11,281	\$12,600	1.1
Total		74,142	\$11,855	\$12,600	1.1

The proposed cost saving measures are expected to reduce system energy costs by \$12,600 annually which is 8% of the 2020 electric energy costs

or reveal comments and reactions

Master Plan Survey Results

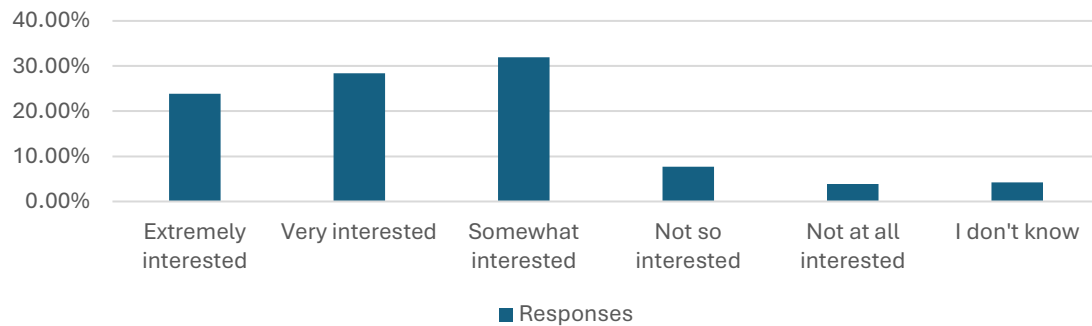
2024 Newmarket Master Plan Survey Question 7



Answer Choices	Responses	
Extremely interested	24.30%	69
Very interested	24.30%	69
Somewhat interested	32.04%	91
Not so interested	8.10%	23
Not at all interested	5.99%	17
I don't know	5.28%	15
Answered		284

2024 Newmarket Master Plan Survey Question 8

What is your level of interest in a partnership of the Town with energy professionals who would offer energy efficiency audits to residents and businesses and future tax incentive programs for energy efficiency improvements and renewable energy systems?



Answer Choices	Responses	
Extremely interested	23.86%	68
Very interested	28.42%	81
Somewhat interested	31.93%	91
Not so interested	7.72%	22
Not at all interested	3.86%	11
I don't know	4.21%	12
Answered	285	

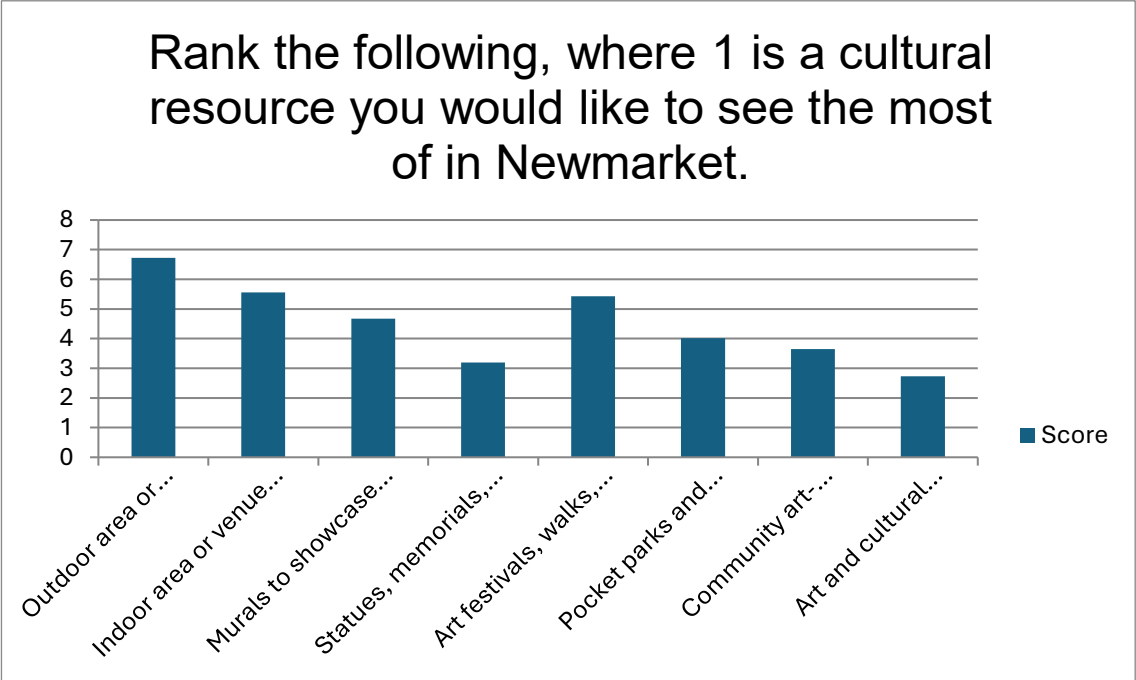
Appendix E – Arts, Culture & Historic Resources

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1. Survey Input

Town of Newmarket 2024 Master Plan Survey – Question 9

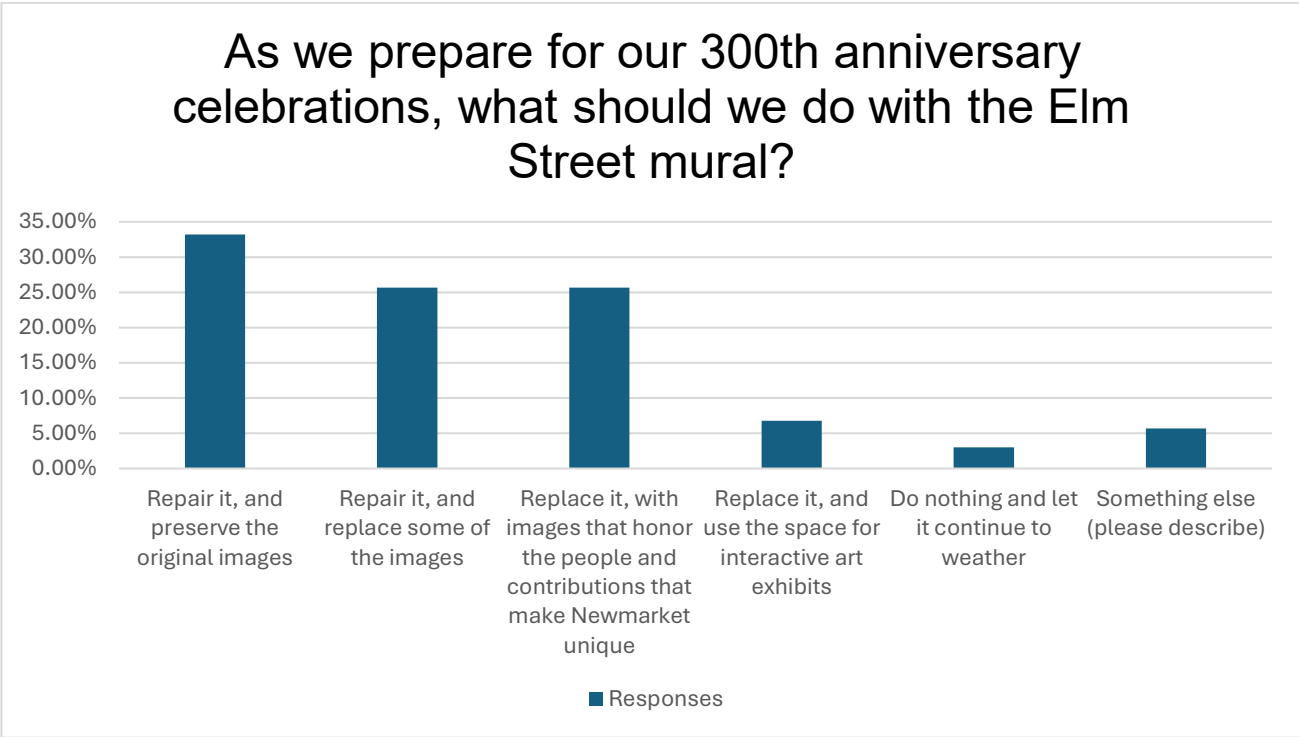


Rank the following, where 1 is a cultural resource you would like to see the most of in Newmarket.	Weighted Score
Outdoor area or venue for performing arts (play, theater, dance, poetry, stand-up, etc.)	6.73
Indoor area or venue for performing arts	5.56
Art festivals, walks, showcases, or tours	5.43
Murals to showcase Newmarket history and culture	4.67
Pocket parks and mini-art galleries	4.02
Community art-making activities and workshops	3.65

Statues, memorials, fountains, etc.	3.2
Art and cultural education	2.73

Source: Town of Newmarket Master Plan Survey. Summer 2024.

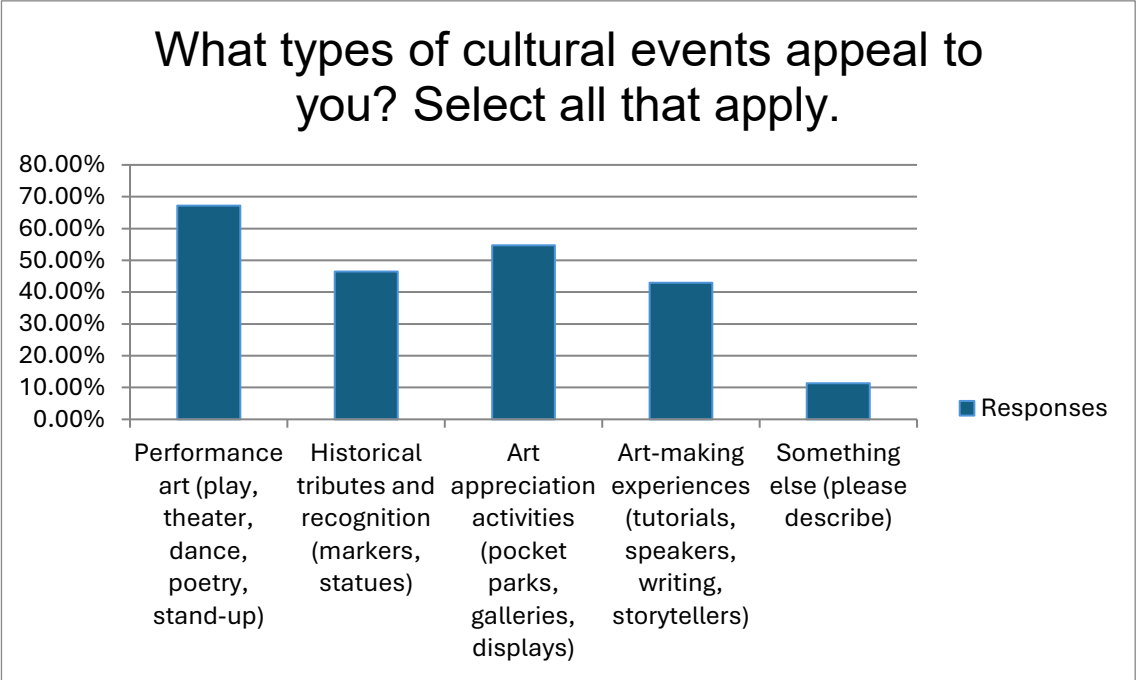
Town of Newmarket 2024 Master Plan Survey – Question 10



As we prepare for our 300th anniversary celebrations, what should we do with the Elm Street mural?		
Answer Choices	Responses	
Repair it, and preserve the original images	33.21%	88
Repair it, and replace some of the images	25.66%	68
Replace it, with images that honor the people and contributions that make Newmarket unique	25.66%	68
Replace it, and use the space for interactive art exhibits	6.79%	18
Do nothing and let it continue to weather	3.02%	8
Something else (please describe)	5.66%	15
	Answered	265
	Skipped	47

Source: Town of Newmarket Master Plan Survey. Summer 2024.

Town of Newmarket 2024 Master Plan Survey – Question 11



What types of cultural events appeal to you? Select all that apply		
Answer Choices	Responses	
Performance art (play, theater, dance, poetry, stand-up)	67.19%	172
Art appreciation activities (pocket parks, galleries, displays)	54.69%	140
Historical tributes and recognition (markers, statues)	46.48%	119
Art-making experiences (tutorials, speakers, writing, storytellers)	42.97%	110
Something else (please describe)	11.33%	29

Summary of “Something else” responses

Something Else Responses
Music
Music (6)
Music included in performance art
Open Acoustic Music Jams
Outdoor live music in a location where more people can gather.
Contemporary music concerts and public performance spaces
Festivals, Family Days, Outdoor Music (waterfront is not a good place for this, too small not family friendly)
Nature/Gardens
Gardens (4)
nature workshops

Miscellaneous
Sharing regional/international foods as a means of introducing culture; breaking bread to break the ice
nothing except lowering property taxes
Museum
I don't believe Newmarket can compete with the experiences we can easily travel to in Durham, with the UNH offerings, or Portsmouth or Dover. I would keep things here simple and not try and compete. The Word Barn, Vernon Farm and other Dover venues satisfy these other needs. Newmarket could focus on its own historical markers, from the choices above.
Public exotic dance class
Street fair and theme events (ie: Fall festival)
I think we have those things already.
Bike repair station(s)
Markers only
No preference
Honestly none of these appeal to me and would not motivate me to come downtown any more than I already do.
Kid-friendly activities
There's only so much "art this and art that" we can handle... coming from a former Los Angeles and Chicago resident, it just gets old. Potlucks are a much better way to foster community, and the history of the town is strong and worth sharing.

Source: Town of Newmarket Master Plan Survey. Summer 2024.

2. Organizations and Activities

Organizations

The **New Market Historical Society** was formed to tell Newmarket's story, preserve its local artifacts, and sponsor historical events and educational opportunities. Its primary collection is housed in the Stone School Museum, built in 1841 as a two-room schoolhouse. The Historical Society's long-standing outreach and education program is multi-faceted and includes partnerships with Newmarket schools, bringing the annual third-grade field trip to the Stone School Museum as well as facilitating specialized displays at the elementary (loan of indigenous artifacts) and high schools (100th anniversary display) (see nhnmhs.com).

The **Arts, Culture and Tourism Commission** is charged by the Town Council to study, consider, and make recommendations to the Town Council and Town Manager, about general policies for the arts and tourism in the Town of Newmarket. The Commission is also charged with developing and promoting programs, forums, and exhibits that highlight local talent and active art-related venues currently existing within the Town. The Commission serves as a hub for information and resources and facilitates communication between Town organizations to maximize the impact and reach for individual organizations (see www.newmarketnh.gov/171/Arts-Culture-Tourism-Commission).

The Millspace, located in the lower level of the restored Newmarket Mills, was developed as part of the mill redevelopment project. The interior art space as well as live-work spaces are designed to encourage affordable and accessible housing, work and public spaces. The Millspace is a civic gathering space offering opportunities for educational and community-oriented programs in the form of round table discussions, workshops, panels, lectures, visual and audio gallery installations, historical engagement, music, education, and live theater. It also serves as a workspace for musicians, entrepreneurs, designers, programmers, writers, freelancers, and technologists to interact and collaborate in the exploration of history, technology, art, business, film, photography, theater, community, and the web (see www.millspace.org/). It is operated by the Lamprey Arts and Cultural Alliance (LACA) a 501c3 "DBA as Millspace."

Dedicated to celebrating Newmarket's story, the mission of the nonprofit **Newmarket Main Street Corporation (NMSC)** is to strengthen the historic and cultural characteristics of the community, preserving the legacy of Newmarket for future generations. For 15 years, the NMSC produced the annual Newmarket Heritage Festival, a vibrant celebration of the arts, culture, history, and community spirit that drew people from around the region. The NMSC also led the Newmarket Engine House restoration effort, completed in 2010, forging a private-public partnership to preserve this historic treasure. Ongoing projects include History in Bronze, a project that highlights snippets of Newmarket's past on historic markers designed and installed on buildings throughout the downtown village area. A display of the town's shipbuilding era and

a statue commemorating the Timberland era in the mills are both in the works. Committed to collaborating with others, the NMSC is proud to foster the civic engagement and vibrant downtown that make Newmarket an inviting place to live and visit (see newmarketnhmainstreet.org/).

Other organizations and groups that contribute to Newmarket's sense of place and wellbeing include the **Newmarket Public Library** provides educational programming for all ages and organizes community cultural events throughout the year (see newmarketlibrary.org/index.html). **Friends of the Newmarket Library** is a group of people who work cooperatively with the library to develop, maintain, and enhance facilities, resources and services to the public. They support and volunteer for Library programs, fundraise, provide materials not covered by the library budget such as museum passes and special events. They encourage community support and hold a variety of special public events (arts, educational, community building), and focus on the importance of Newmarket having a vital public library (see newmarketlibrary.org/friends-of-the-library.html).

Bloomin' Newmarket is a NH non-profit sprung from the ashes of the former Newmarket Gardeners, formed in 1997 by a group of public-spirited citizens who wished to improve the appearance of Newmarket's public spaces. Bloomin' Newmarket's mission is to care for Newmarket's public gardens and cultivate an appreciation for the landscape (see [Blooming Newmarket | Growing Community Through Gardening & Sustainability](#)). This entirely volunteer-run gardening group plants and maintains public gardens in Newmarket in an effort to help Newmarket bloom. Their annual plant sale, held in late May or early June, is their sole fundraiser and provides the funds for purchasing plants and necessary supplies for maintaining the various public gardens around Newmarket. Blooming Newmarket's dedicated volunteers maintain five beautiful public gardens across town: The Wall, The Cannon, Ash Swamp, Gerry Ave, and the gardens surrounding the Newmarket Public Library.

Events and Activities

- **Riverside Cemetery Reveal** – This annual event showcases local actors telling the stories of some of those who are buried at Riverside Cemetery.
- **Flax to Linen Project** - In cooperation with UNH, the project features a flax garden at the Stone School Museum along with demonstrations on the historical processing of flax (with public participation encouraged). The summer of 2025 will be the second year of this effort.
- **Interweave-** a multi-generational community art-making series, which centered on demonstrating the value and impact of the Lamprey River on life in Newmarket. The results are permanently on display at the Town Hall, Sunrise Sunset Center & Library.

- Unveiling of **Newmarket Mural** featuring students from the Russian Ballet School performing on the Bandstand.
- **New Market Historical Society** – programming focusing on town history (2025 schedule includes Newmarket during World War II, the Newmarket Manufacturing Company 1823-1932, and The Elm St. Mural).
- **Trolley Tours** – focusing on Halloween-season stories of Newmarket.
- **Art in the Heart of the Garden** – The Arts, Culture and Tourism Commission and Newmarket Parks & Recreation work in partnership on this event which promotes diverse local artists and economically supports their work and the work of the Commission. The accompanying Art Walk, hosted simultaneously downtown in local businesses and at the MillSpace, engages people of all ages in the creation and appreciation of local art.
- **Events at the Millspace** – The Millspace is a civic space that serves as a community living room - a place for people to gather, share ideas and enjoy each other’s company. It offers live performances and hosts a dynamic art gallery. It provides opportunities for a variety of educational and community-oriented programs located in a corner of a historic mill, honoring its legacy of historical significance to the Town (see www.millspace.org/).
- **Newmarket's 300th anniversary book Portraits of Newmarket: 103 People, Places and Things** - featuring 103 stories written from the perspective of nearly 70 local authors, with research and support of the New Market Historical Society. This effort began in 2023 with outreach to numerous town and regional groups soliciting topics. In 2024, authors were engaged with writing, editing, formatting and designing in 2025 and publication expected in 2026.
- **Timberland Boot Sculpture (in-work – expected 2025 unveiling)** - The iconic Timberland boot, launched in 1973, was cut and stitched right here in the Newmarket mills—where Timberland announced its commitment to building the finest outdoor footwear in the world. Today, the NMSC is partnering with the company to install a sculpture memorializing this chapter in Newmarket’s industrial era.
- **Library Mural Project** – This project aims to capitalize on the central location of the library to attract and promote town’s history and events through six changing mural inserts on the exterior of the library’s turret.
- **Elm Street Mural Renovation** - The Elm Street mural is painted on the original Mill foundation making it historically significant. It should first be repaired to stabilize its structure then elevated to a unique community pathway which celebrates the people, places and things which have shaped the Town we are today. Respondents to the Master Plan Survey favored repairing the mural and preserving the images.
- **REC Connect** - The Recreation Department brings together other organizations, businesses, Town staff, volunteers and the community annually to celebrate, connect, and foster the sharing of ideas and new initiatives

- **Backyard Bash** - The Recreation Department and other Newmarket Organizations host the Annual Backyard Bash Community Night, a community night event under the lights at the Rec Center.
- The **New Market Historical Society's downtown self-guided walking tour** consists of a detailed map accompanied by an audio narrative as well as additional details and stories (see nhnmhs.com/the-walking-tour/).
- Since 2012, the **Newmarket Main Street Corporation (NMSC)** has been commemorating Newmarket's history through their **Historic Plaque Project**, which recognizes key people and places along Main Street with bronze historic markers. NMSC maintains an interactive map on its website that includes a photo and description of each marker along with directions to find it (see newmarketnhmainstreet.org/historic-plaques/).
- The **Sunrise-Sunset 55+ Adult Activity Center** serves as an affordable and accessible resource for Newmarket and the surrounding areas. The Center runs regular social, education, health programs, hosts a lending library, and a place to drop in for coffee (see www.newmarketnh.gov/340/Sunrise-Sunset-Center).
- **The Millspace** – The Millspace is a volunteer run community civic space located in the historic Newmarket Mills committed to bringing art, theater, music, and history to the town of Newmarket. www.millspace.org/

3. Historic Resources

INTRODUCTION

One of Newmarket's most valuable attributes is its historic character. The town is filled with landmarks representing past rural and industrial eras. These landmarks include historic residences, stores, mills, schools, old roadways, farms, graveyards, and stone walls. The remaining tangible evidence of Newmarket's past contributes greatly to the town's current character and composition.

The identification and preservation of Newmarket's historic landmarks is an important goal. It is also an important consideration when evaluating and shaping community development. The preservation of noteworthy architectural and significant historical resources from Newmarket's rich past keeps the town's heritage in clear view when new development proposals are introduced that may negatively impact the historic resources. To encourage the continued preservation and viability of Newmarket's significant historic structures, the town should provide information about the business values that can be realized from restoration and thoughtful adaptive re-use.

This Appendix provides an overview of Newmarket's heritage, exemplified by the numerous sites and structures that remain today.

HISTORIC OVERVIEW

In the 16th century, members of the Squamscot tribe had a settlement here, below the Lamprey First Falls (east bank). An indigenous gravesite existed on the west side of the river. Newmarket's one remaining weir (as of 2025) is a lone reminder of their earlier culture.

The Squamscot found their world changing in the early 17th century as Europeans began settling here. People from Dover moved south and others from Exeter headed north to this area, attracted by the tumbling waters of the First Falls. Known as Lamprey River Village, this early settlement straddled the boundary of those two towns.

By the 1640s, John Goddard had a garrison in the oldest section of Lubberland (Doe's Neck), and John Smart had moved from Exeter Village onto Bayside lands south of the Lamprey. Grants were made at the First Falls of the Lamprey and the First Falls of the Piscassic River for sawmills and grist mills. As farms gradually spread up the rivers, settlers made use of the falls further upstream.

By 1657 the boundary between the two older towns was settled on the Lamprey River and Goddard's Creek. Ships were built beside the Lamprey below the First Falls. Remnants of our shipbuilding past include the Town Landing and old rings at the Lower Narrows and beneath Picked Rock Bridge. Further documentation (maps and published accounts) indicates names and locations of workshops and wharves, as well as a rope walk down beneath the ledges of Zion Hill.

By 1670 residents of the peaceful Squamscot settlement on Heron Point had left the area and headed west. They were never part of the massacres and kidnappings that terrorized the New England colonies during the early 1700s. It was other tribes that carried out those attacks—usually as a

strategy the French (in Quebec) used against their English neighbors to the south. Colonists responded by forming militias and building garrisons.

In 1727 the northern portion of Exeter separated and became the new township of Newmarket. The area that is now Newfields was part of Newmarket until 1849, and the first geographical center was approximately at the site of the present Rockingham Junction. The First and Second Meeting Houses were there, as was the home (still standing) of the first long-time minister Rev. John Moody (1730).

Newmarket entered into the industrial era when the Newmarket Manufacturing Company (NMCo) was established in 1822. This Salem, Massachusetts-based company purchased vast tracts of land in and around the First Falls and upriver as well. Thus did the old Lamprey River Village become a company town, with simultaneous development of factories, homes, shops, and institutions. The new mills, built with local granite, used waterpower for cotton textile production based on practices brought from England by Samuel Slater.

NMCo dominated the town for over a century, but increasing labor unrest in the 1920s culminated in a strike in 1929. This, followed by the stock market crash that same year, was the beginning of the end. NMCo abandoned Newmarket in 1932, and economic vitality all but vanished from Newmarket.

Limping through the Great Depression, Newmarket slowly attracted new businesses to populate the old mill buildings. In 1939 the Sam Smith Shoe Co. came to Newmarket and stayed for nearly 30 years. A variety of industries followed, including other shoe companies, a distillery, the Macallen Co. (mica insulation products), Pioneer Mfg., and Timberland Boots.

Another exodus from the old mill buildings started in the 1980s. Fortunately, by the turn of the century, another regeneration had begun. Eric Chinburg took on redevelopment of Newmarket's old stone and brick mills, transforming them into spaces for commercial and residential use.

Many other historic buildings—both rural and downtown—survive here as well. They are but one of the topics that keep volunteers busy at the New Market Historical Society. Maps, documents, and many artifacts are maintained in the Stone School Museum. The Historical Society website is another repository that provides information on town history and announces educational programming.

HISTORIC SITES & STRUCTURES

Types and Styles of Architecture

Newmarket's six surviving textile mills are an integral part of the town's history, and they strongly impact the downtown layout. Water powered their machinery.

The first three mills were built of great granite blocks and dominate the handsome setting at the Lamprey First Falls.

- Mill No. 1 (1824) originally had a clerestory, but it was lost in rebuilding after a fire.
- Mill No. 2 (1825) retains its impressive bell tower.
- Mill No. 3 (1827), across the river, was linked by a covered footbridge to Mill No. 2.

- Mill No. 4 (1869) was the last stone building, built of trap rock and situated farther away from the river.
- Mills No. 5 (1881) and No. 6 (1892) were the first brick mills; attached to Mill No. 4, they make a continuous structure along Main Street.
- Mill No. 7 (1901), also of brick, was across the river and crammed in close to Mill No. 3. It was removed during the latest mill redevelopment.
- Mill No. 8 (1918), the “great weave shed,” was torn down as the U.S. entered WWII, with metal going to the war effort.
- Also part of the NMCo complex are stone sheds north of the river and a brick machine shop at the Falls.

Other stone buildings in town include the two on either side of Tenney's Corner (lower Main St.), and on Zion's Hill the Stone Church (1834) and the Stone School (1841).

Other brick buildings include:

- The small late Federal brick building just north of the old wooden "Willey Hotel" (1822).
- Newmarket Public Library (1884), with its slate roof and unique tower room; its benefactor was retired Mill Agent John Webster.
- Mill Agent's House (1825-1830) is across the street from the Library.
- New Village duplexes (1918) are of brick and of stucco—also a mill housing project.

There are a number of older wooden buildings in the downtown area, some of which may date back to the 18th century:

- A 3-story wooden structure on Main St. (built with balloon construction) was at one time a tailoring shop, with an upstairs office providing space for Newmarket's first public library collection.
- "Steamboat Block" on Spring St. still provides housing--an unusual relic of early wooden mill housing.
- Duplex mill housing remains in use in and around Nichols Ave. and across the Lamprey River bridge.
- The Caswell Mansion (196 South Main St.) is an example of a fine Victorian home, built in 1885. It was never mill housing but has been converted to several townhouses.
- Many other fine old 18th and early 19th century wooden town homes and farms survive as well.

Inventory of Historic Structures

For more than a decade, the Newmarket Main Street Corporation has been designing and installing historic markers, each one a carefully researched glimpse of the past, cast in bronze. This list shows the plaques already affixed, as well as several that are being developed:

Plaque No.	Plaque Name
1	Engine House – 1853 (Old Fire Dept - Main & South Streets)
2	Kingman's – 1873 (86 Main St.)
3	Mathes Building – c. 1830 (154 Main St.)
4	Durgin Block - 1894 (110 Main St.)
5	No. 4 Mill - 1869 (55 Main St.)
6	No. 5 Mill - 1886 (125 Main St.)
7	John Webster Hall - 1884 (1 Elm St.)
8	Cheswell's Store – pre-1817 (117 Main St.)
9	No. 1 Mill - 1824 (Penstock Way)
10	No. 2 Mill - 1825 (Penstock Way)
11	Edward Smith Building – c. 1830 (98 Main St.)
12	Willey Hotel – c. 1822 (100 Main St.)
13	Branscomb's Tavern – c. 1800 (80 Main St.)
14	Griffin Hardware – c. 1847 (165-169 Main St.)
15	Newmarket National Bank - 1855 (112 Main St.)
16	No. 8 Mill (Foundation along Main St. - building torn down)
17	Tenney's Corner – c. 1830 (170 Main St.)
18	Mill Overview Plaque (40"w x 30"h) - All mill buildings 1824-1918
19	Barnard Block - 1891 (102 Main Street)
20	Brooks Block - 1826 (72-78 Main Street)
21	Macallen Dam - 1887 (awaiting installation)
22	Ship Building Plaque - In progress
23	Timberland Tribute Plaque - In progress

Appendix 2 lists other historic structures.

Historic Graveyards

The New Market Historical Society has compiled a list of public and private graveyards of historical significance. Many of the sites have as few as one tombstone or marker but provide a major link to Newmarket's past. There is a renewed effort to clean up some of the private graveyards during 2025.

The map of the historic graveyards in town is available on the Historical Society website at:

<https://nhnmhs.com>

New Hampshire Historic Markers in Newmarket

The Wentworth Cheswill Cemetery: Route 152; 206-208 South Main St. Raised in an era known for the trade of sugar and slaves, Wentworth Cheswill (1746-1817) became the first African American elected to public office. Like Paul Revere, he rode as a messenger for the patriotic cause. He was also an early archeologist and historian.

Henry “Hammerin’ Hank” Wajda (1934-1973): Route 108, Calvary Cemetery. A descendant of Newmarket’s Polish immigrant community, Henry was a jockey who ranked fifth in the nation. He set a world record in 1958. He died in 1973 following an accident at Rockingham Park, Salem, NH.

NEWMARKET INDUSTRIAL & COMMERCIAL HISTORIC DISTRICT

On December 1, 1980, the town established and identified structures in the Newmarket Industrial & Commercial Historic District, which is located in an irregular pattern along Main and Exeter Streets, bounded roughly on the north and east by the Lamprey River, on the west by Granite Street, and on the south by Gerry Ave.

The district is listed in the National Register of Historic Places.

Appendix 1: Bibliography

Lamprey River Village, the Early Years, Sylvia Fitts Getchell, 1976. The history of the early settlement along the Lamprey River

Newfields, NH, 1638-1911, James Hill Fitts, 1912.

Newmarket Downtown Walking Tour. New Market Historical Society, 2022 Walkable online tour of 50 downtown sites at: <https://www.newmarketnhhistoricalsociety.org/the-walking-tour/>

"Newmarket Revisited: Looking at the Era of Industrial Growth (1820-1920)," Richard Candee. (Traces the period of rapid expansion in Newmarket when the town was dominated by the Newmarket Manufacturing Company. Published as part of the NHCH-funded "Newmarket Revisited" project.)

Old Newmarket, Nellie Palmer George, 1932. The history of early Newmarket.

The Tide Turns on the Lamprey...a History of Newmarket, S.F. Getchell, 1984.

Appendix 2: Historical Sites

The following is a general guide of the most historically significant and noteworthy structures in Newmarket, including the approximate age and location. This list is updated to March 2025. "WT" indicates that it's a stop on the Walking Tour.

Businesses

- Charles Doe Tailoring Shop, 145 Main St.
- Filion's Stables, WT, 1 Beech St. Extension
- Stackpole Blacksmith Shop, 8 Exeter St.
- Lang's Blacksmith Shop (1891), WT, National Registry of Historic Places
- Rockingham Country Club, (Neal House), 200 Exeter Rd.
- Benjamin Brooks House, WT, 72 Main St.
- New Creighton Block, WT, 141 Main St.
- Doe-Folsom-Bouras House, WT, 156 Main St.

Cemeteries

- Old Town Cemetery, Terrace Drive

Churches

- Stone Church, WT, 5 Granite St.
- Newmarket Community Church, WT, 137 Main St.
- St. Mary Church, WT, 184 South Main St.

Private Homes

- Durell House, 1 Grant Road
- Caswell Mansion, WT, 196 Main St.
- Benjamin Tuttle House (c. 1833), 14 Exeter St.
- French House, 15 Exeter St.
- Meserve Place House (1833), 18 Exeter St.
- Day-Priest House (1833), 20 Exeter St.
- French House, 23 Exeter St.
- Z. Dow & Susan Creighton House (1832), 12 Exeter St.
- The Ledges, 5 Chapel St.
- Baillargeon House (c. 1840), 6 Chapel St.
- James Brackett Creighton House (c. 1837), 310 Wadleigh Falls Rd.
- Loiselle House, 272 Wadleigh Falls Rd.
- Wiggin-Walker-Nelson House, 288 Wadleigh Falls Rd.
- Chapman-Sewall House, 351 Wadleigh Falls Rd.
- Thomas Bennett House, 297 Wadleigh Falls Rd.
- Watson-McDaniel House, 2 Langs Lane.
- Doe-Perkins-Chesley House, 29 Ash Swamp Rd.
- Pendergast-Hamel House, 191 Ash Swamp Rd.
- Walter Bryant Smith House (c. 1790-1810), WT, 6-10 Central St.
- Moody Parsonage (1730), 15 Ash Swamp Rd.
- Deacon Paul Chapman House (1764), WT, 198 South Main St.
- Mill Agent's House WT (c. 1825-1830), 2 Elm St.
- Dave Legault House, 11 North Main St.
- Captain Benjamin Smith House, WT, 51 North Main St.
- John Smart House (c. 1867; moved in 1912), 3 Packers Falls Rd.
- Varney House, 10 Packers Falls Rd.
- Metcalf House, 13 Water St.

Schools

- Stone School, National Registry of Historic Places, WT, 3 Granite St.
- South Side Primary School (1848-1946) & Fire Station (1949-2004), WT, 178 Main St.
- Plains Road School (John Stevens), 386 Wadleigh Falls Rd.
- North Side Primary School, WT, 48 North Main St.

Town Buildings

- Bandstand War Memorial, 1920, WT, across from 100 Main St.
- Rockingham Junction Railroad Station, Ash Swamp Rd.

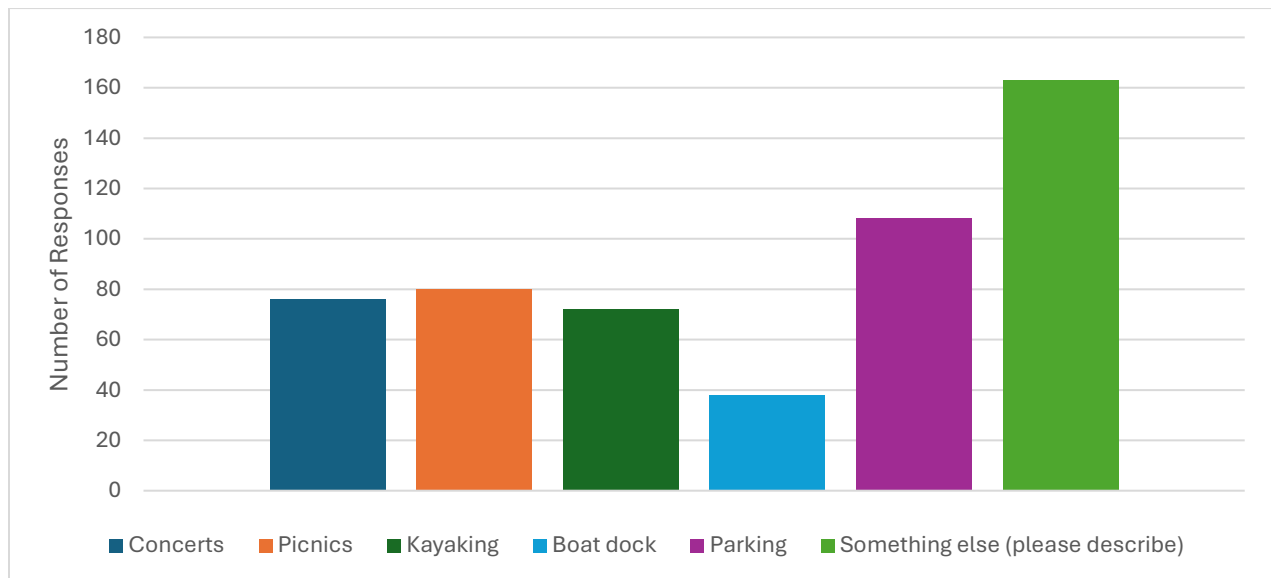
Appendix F: Downtown Riverfront Chapter Supporting Data

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Master Plan Survey Input

Figure 1: How do you currently use the Downtown Riverfront area? Select all that apply

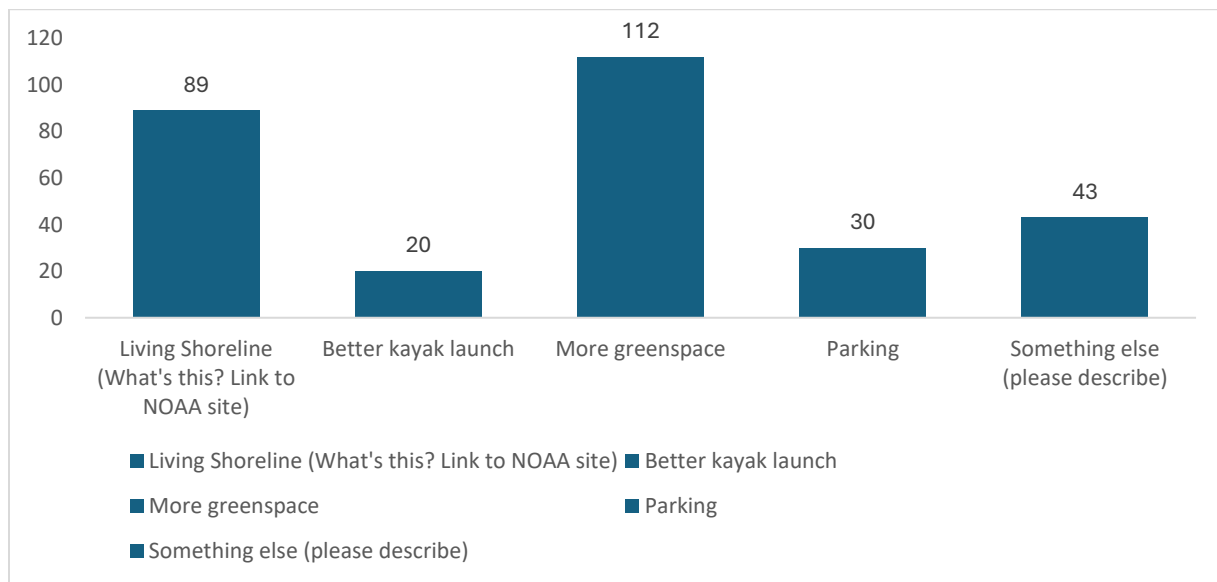


Summary of “Something else” responses

Comments	Number of Responses
Walking	100
N/A, don't use it	16
Shopping, restaurants, dining, ice cream	15
Sitting, relaxing, reading, gardens, contemplation, quiet	14
Taking in natural surroundings, views, river, greenery	11
Bird/Duck Watching	9
Dog Walking	8
Playing, Exploring, Relaxing with Kids	6
Access issues, a lot of private property, condos block access	6
Meeting up with others and socializing	5
Boat trailer parking, ramp/launch	4
EV charging station	3
My home	1
Fishing	1
Biking	1
Concerns about condos, development, rent, and potential contamination from condo dumpsters	1

Source: Town of Newmarket Master Plan Survey. Summer 2024.

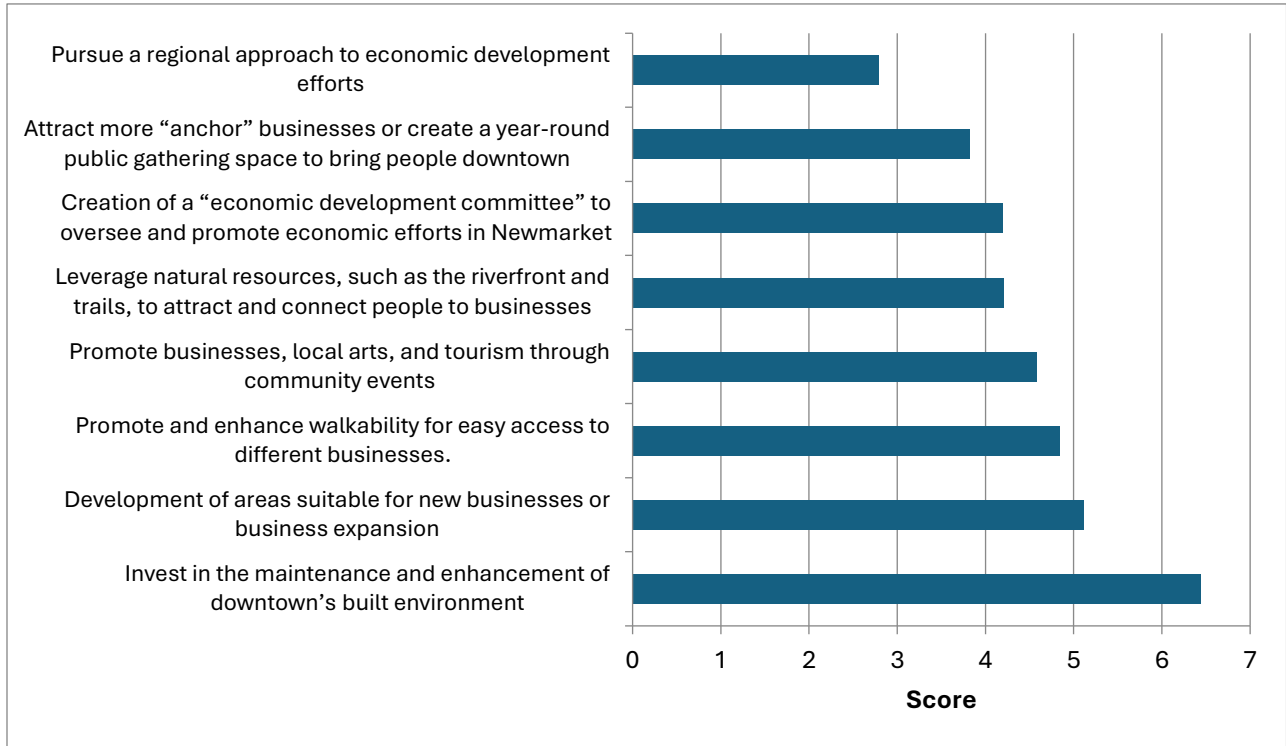
Figure 2: Select Your Top Priority for What You Would Like to See in the Downtown Riverfront Area?



Summary of “Something else” responses

Comments	Number of Responses
Repair boat launch/ all tide boat and kayak launch (6)	6
Restaurant with deck on river (5)	5
Make a cohesive river walk that is fully accessible by public, purchase or seize land (5)	5
Public day boat dock, more boat slips, public moorings and permanent docks (4)	4
Parking, parking for trailers (3)	3
Natural playground, kids programs/playground (3)	3
Nothing/no opinion (3)	3
Concerts (2)	2
safe swimming area, better water quality (2)	2
café table/chairs, more seating (2)	2
Greenspace/living shoreline (2)	2
Walking trails/trail connectivity (2)	2
Pave walkway next to red dumpsters near Rivermoor, paint the outside concrete of parking garage with a mural (1)	1
Better historical signage (1)	1
Picnic/park (1)	1
community activities (1)	1
Nude beach (1)	1
Nothing (1)	1
DC fast charger (1)	1
Building repair, uniformity of buildings (1)	1

Figure 3: Which Actions Do You Believe Will Promote Growth and the Enhancement of Newmarket's Downtown Businesses? Please Rank, Where 1 Will Help Promote the Most Growth and Enhancement



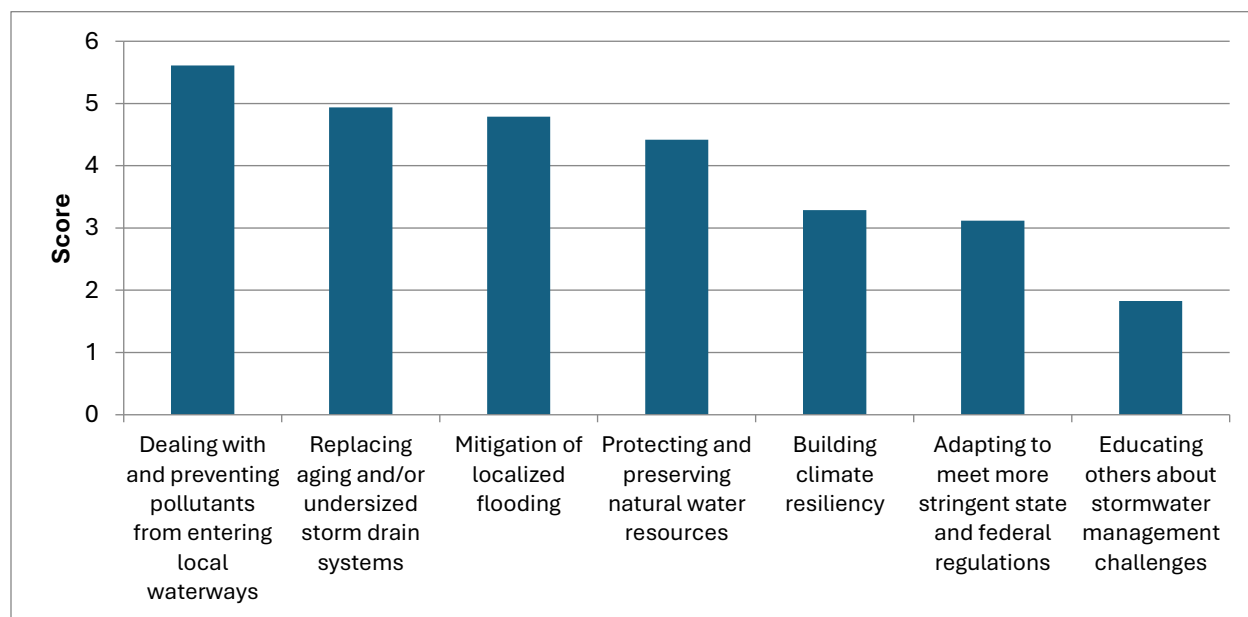
Source: Town of Newmarket Master Plan Survey. Summer 2024.

Figure 4: Where should the Town of Newmarket prioritize investment in its recreation facilities? How much?

Option	Weighted Score
Nature-based recreation opportunities (bike trails, pump track, disc golf)	2.24
Improved public water access opportunity (swimming, boat, kayak, dock)	2.23
Rec Center general facilities upgrades as needed (playground, volleyball and basketball courts)	2.13
Multi-use community gym (adjacent to Community/Rec Center)	2.11
Community/Rec Center expansion and upgrades, such as adding multi-use rooms and parking lot improvement	2.07
Upgrade Beech St. Ext. Center into an affordable multi-generational Health & Wellness Center	2.05
Additional community outdoor sport courts (pickleball, basketball)	1.94
Add additional community multi-use athletic field(s) (soccer, lacrosse, track, etc.)	1.87
Sunrise Sunset Center for 55+ smart development upgrades	1.79
New residential playground (open community access)	1.78
Outdoor ice-skating rink	1.78
Aqua Land Splash Pad & Gazebo expansion and/or future upgrade	1.72
Public dog park	1.72
Upgrade outdoor stage at Leo Landroche to create a covered performance location	1.7
Skate park	1.48

Source: Town of Newmarket Master Plan Survey. Summer 2024.

Figure 5: Rank the following stormwater management challenges in Newmarket, where 1 should be addressed the soonest.



Downtown Riverfront Design Charrette (Oct 18-19, 2024)

Figure 6: Summary of public input during small group discussions at the Design Charrette

What do you see?	What do you want to see?
• Recreation • Sewage • Accessible • Wildlife • Close-knit • Vandalism • Weir • Vibrant • Dogs • Charming • Nature • Walkable • Concerts	• Parking • Maintenance • Lighting • Bridge • Docks • Trails • Access • Wayfinding • Playgrounds • One-way travel

Schanda Park Recreation Programs & Events

Figure 7: Overview of the Arts in the Park Concert Series at Schanda Park

Arts in the Park is fully funded through sponsorships from local businesses and donations at the concert itself. Arts in the Park began when Kennebunk Saving Bank (KSB) moved into Newmarket. KSB offered to sponsor a concert series and contributed \$1,500 the first year. Another \$1,500 was sponsored by the Newmarket Business Association (NBA). Since KSB recently moved out of Newmarket, it is possible that their annual sponsorship may disappear. Additionally, the NBA is no longer able to sponsor the total of \$1,500, so the Recreation Department relies on individual businesses to make up the difference. The last two years, the line up has had to be cut from eight to five shows due to funding. It is estimated that 40 to 80 people attend each concert.

Source: Aimee Gigandet, Director of Parks and Recreation, via email dated 12/20/24

Figure 8: Challenges with the Arts in the Park Concert Series

Arts in the Park Concert Series Challenges	
Location	The lack of parking and seating space is a challenge for growing the program. The lack of a proper stage and cover for inclement weather and lighting when it starts to get dark earlier in the evening at the end of the summer are ongoing challenges.
Sponsorship	Securing sponsors for the series is a challenge.

Source: Aimee Gigandet, Director of Parks and Recreation, via email dated 12/20/24

Figure 9: Opportunities for the Arts in the Park Concert Series

Arts in the Park Concert Series Opportunities	
Location	Moving to the Recreation Department/Leo Landroche and upgrading the stage could draw more patrons, which may attract more sponsors. However, the Recreation Department initially wanted the concert to be held downtown to help promote foot traffic and support of local restaurants.
Collaboration	Collaborate with other organizations and local artists to enhance the program.

Source: Aimee Gigandet, Director of Parks and Recreation, via email dated 12/20/24

Figure 10: Number of Kayak Rentals at Schanda Park over the last Five Years

Year	Rentals	Revenue ^b
2020	95 ^a	Unknown
2021	57	\$ 1,575
2022	49	\$ 1,445
2023	31	\$ 885
2024	36	\$ 1,060
TOTAL	268	\$ 4,965
2021-2024 Average	43.25	\$ 1,241

^a Total for 2020 may be inflated due to coding errors

^b Revenue from rentals to the general public. Kayaks were originally purchased with a grant for the free program “Club Chameleon,” which catered to middle and high school age “at risk” youth.

Source: Aimee Gigandet, Director of Parks and Recreation, via email dated 12/20/24

Figure 11: Challenges with the Kayak Rental Program at Schanda Park

Kayak Rental Program Challenges at Schanda Park	
Open Hours	The Recreation Department is only able to rent kayaks during the hours that the Department is open. Renters pick up equipment (keys, paddles, life vests) from the Recreation Department prior to their rental during business hours. This limits multiple rental per weekend. It also limits potential revenue to the program because weekend rentals are only charged one day. Additionally, it may impact people without the ability to drive to the Recreation Department during business hours to rent a kayak.
Lock System	The Department uses a lock system for each kayak. On occasion, renters will either not lock the kayaks back up correctly or can mix up the local if they are renting multiple kayaks.
Accessibility	There is no designated kayak launching dock at Schanda Park. This can pose difficulty for renters with mobility issues and kayak beginners, particularly when the tide is out and the water level is low.
Start of Season	The start of the rental season occurs when the Recreation Department is preparing for summer camp. Getting the rental season started is often not prioritized during this time. Residents have expressed interest in renting kayaks earlier in the spring/summer.

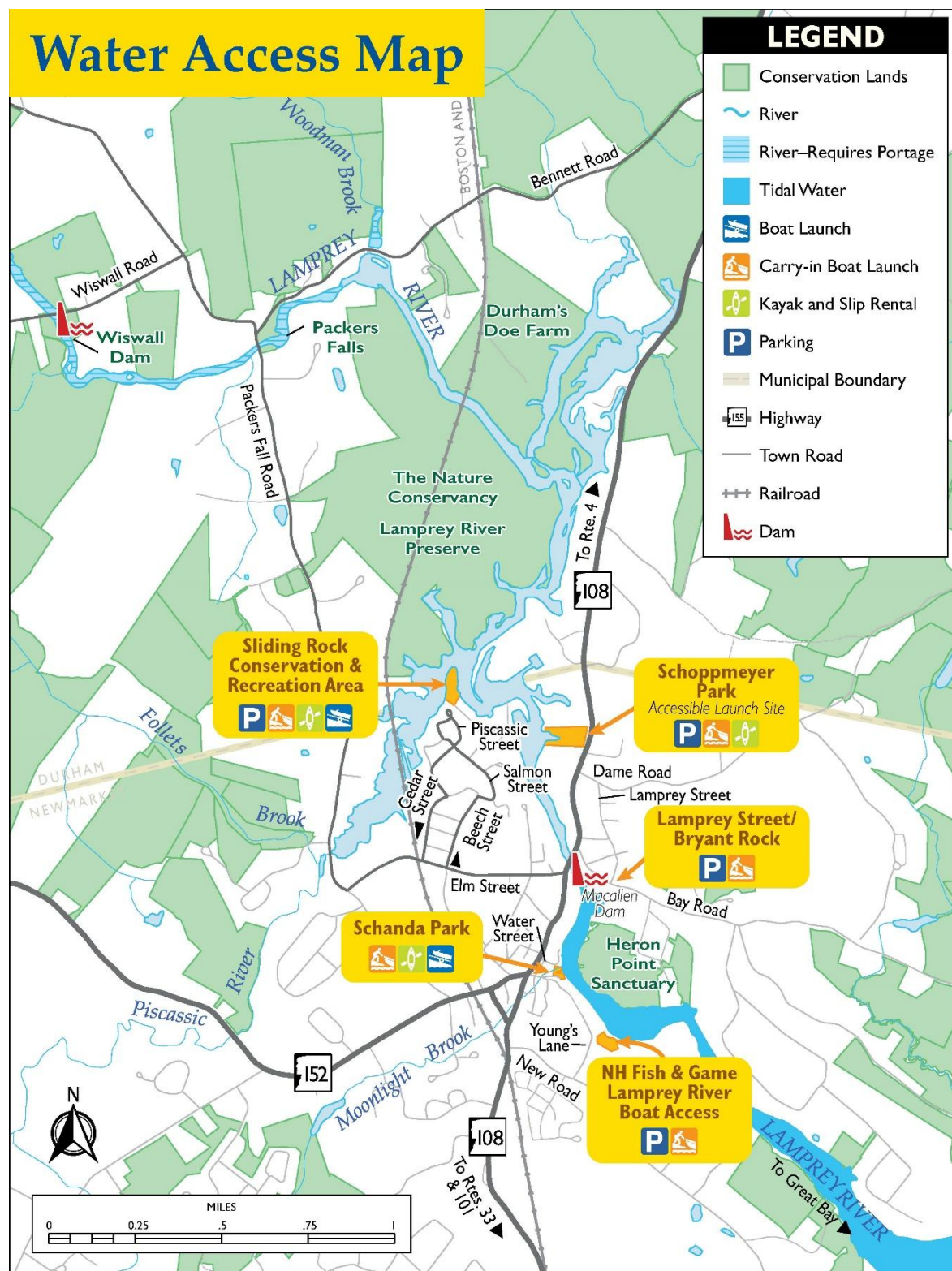
Source: Aimee Gigandet, Director of Parks and Recreation, via email dated 12/20/24

Figure 12: Opportunities for the Kayak Rental Program at Schanda Park

Kayak Rental Program Opportunities at Schanda Park	
Staffing or Rental Automation	Staffing the rental program at Schanda Park for limited hours or automating the rental process so that renters can access the paddles and life vests at Shanda Park rather than at the Recreation Department would allow for more rental opportunities. There may also be potential to rent kayaks/kayak equipment from the Slash Pad concession stand on weekends with sufficient staffing at the concession stand.
Marketing	Once the Recreation Department has more capacity to efficiently rent kayaks and to rent to multiple parties each weekend, the program could be more widely advertised.
Accessibility	Add an ADA accessible kayak launch either at the Town dock or to the boat launch if possible. If the kayak launch is added to the Town dock the dock size should be increased.
Storage	The ability to store the kayaks year-round at Schanda park would alleviate the logistics of hauling the kayaks in and out of the park each season. This may enable an earlier start to the season.
Town Dock	Increasing the Town dock se would likely encourage more kayak travel to paddle to the downtown Newmarket area.

Source: Aimee Gigandet, Director of Parks and Recreation, via email dated 12/20/24

Figure 13: Map of Water Access Points



Source: Town of Newmarket Conservation Commission

Figure 14: Matrix of structural runoff control measures by land use

CATEGORY	COVER TYPE	STRUCTURAL NUTRIENT MANAGEMENT MEASURES									
		Wet Pond	Gravel Wetland	Subsurface Infiltration	Sand Filter	Biofiltration	High Efficiency Biofiltration	Tree Pits	Raingarden	Dry Well	Permeable Pavement
LAND USE	Residential	Pervious					•		•	•	
		Impervious					•		•	•	
		Roof					•		•	•	
	Residential Subdivision	Pervious				•	•				
		Impervious				•	•				•
		Roof				•	•			•	
	Commercial/Industrial/Institutional	Pervious	•	•	•	•	•	•			
		Impervious	•	•	•	•	•	•			•
		Roof			•	•	•			•	
	Road/Freeway	Impervious	•	•		•					
	Outdoor/Other Urban Land	Pervious		•	•	•	•	•			
		Impervious		•	•	•	•	•			•

Source: Waterstone Engineering

Figure 15: Sea-level rise projections

- Coastal New Hampshire is likely (67% probability) to experience RSLR of 0.5 to 1.3 feet between 2000 and 2050. There is a 1-in-20 chance that RSLR will exceed 1.6 feet, a 1-in-100 chance that RSLR will exceed 2.0 feet, a 1-in-200 chance that RSLR will exceed 2.3 feet, and a 1-in-1000 chance that RSLR will exceed 2.9 feet by 2050.
- Coastal New Hampshire is likely (67% probability) to experience RSLR of 1.0 to 2.9 feet between 2000 and 2100. There is a 1-in-20 chance that RSLR will exceed 3.8 feet, a 1-in-100 chance that RSLR will exceed 5.3 feet, a 1-in-200 chance that RSLR will exceed 6.2 feet, and a 1-in-1000 chance that RSLR will exceed 8.7 feet by 2100.
- Coastal New Hampshire is likely (67% probability) to experience RSLR of 1.2 to 4.6 feet between 2000 and 2150. There is a 1-in-20 chance that RSLR will exceed 6.4 feet, a 1-in-100 chance that RSLR will exceed 9.9 feet, a 1-in-200 chance that RSLR will exceed 11.7 feet, and a 1-in-1000 chance that RSLR will exceed 18.1 feet by 2150

Source: New Hampshire Coastal Flood Risk Summary, Part II: Guidance for Using Scientific Projections

Figure 16: Current and Predicted Tidal Datum for Schanda Park

	2002 ¹	2050 ²
Highest Observable Tide (HOT)³	3.9'	5.5'
Mean Higher High Water (MHHW)	3.7'	5.3'
Mean High Water (MHW)	3.4'	5.0'
Mean Sea Level (MSL)	0.2'	1.8'
NAV88⁴	0.0'	0.0'
Mean Low Water (MLW)	-3.3'	-1.7'
Mean Lower Low Water (MLLW)	-3.4'	-1.8'

Based on analysis of pressure transducer data collected on site between 9/2/21 and 11/16/21 and projected sea level rise from *New Hampshire Coastal Flood Risk Summary, Part II: Guidance for Using Scientific Projections (2020)*.

1. Water levels based on pressure transducer data gathered between 9/2/21 and 11/16/21.
2. Based on 1.6' of sea level rise according to Intermediate-High scenario.
3. Highest Observable Tide Based on highest water level recorded during data collection period.
4. Water level data tied to NAVD88 by surveying water surface elevation at 6:25 PM on 10/11/21.

Source: Great Bay Living Shoreline Project, Design Memo for Schanda Park

<https://www.nhcaw.org/wp-content/uploads/2022/05/SchandaParkDeliverables.pdf>

Figure 17: Scoping of Five Priority Projects

1. Stormwater treatment Best Management Practice (BMP) at the Schanda Park parking area.
2. Upgrade the existing boat launch at Schanda Park.
3. Address water quality issues and channel stabilization in Moonlight Brook.
4. Shoreline stabilization at the existing Creighton Street Pump Station and/or at Shanda Park.

Maps

Figure 18 Flood Zones map

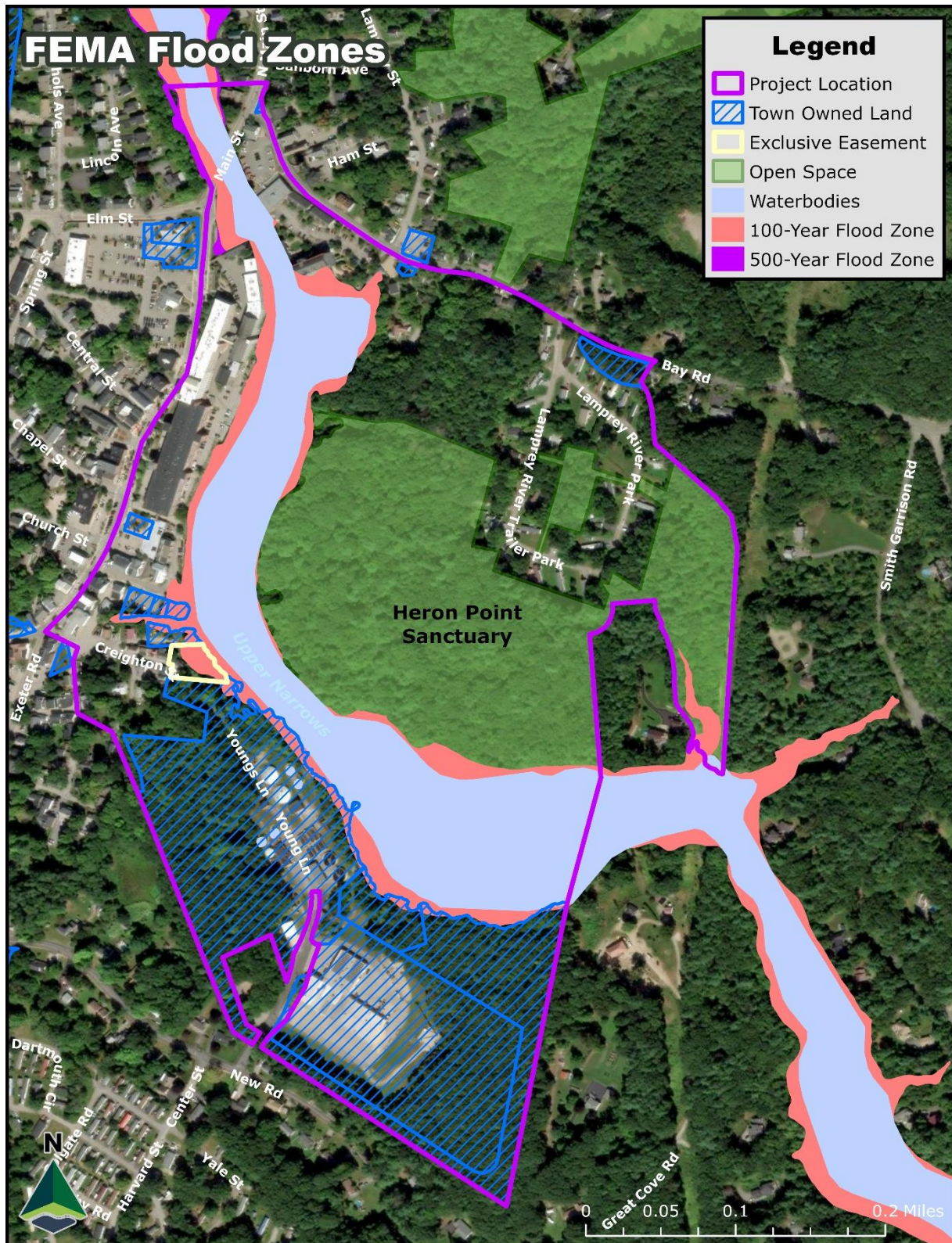


Figure 19 Salt Marsh migration map

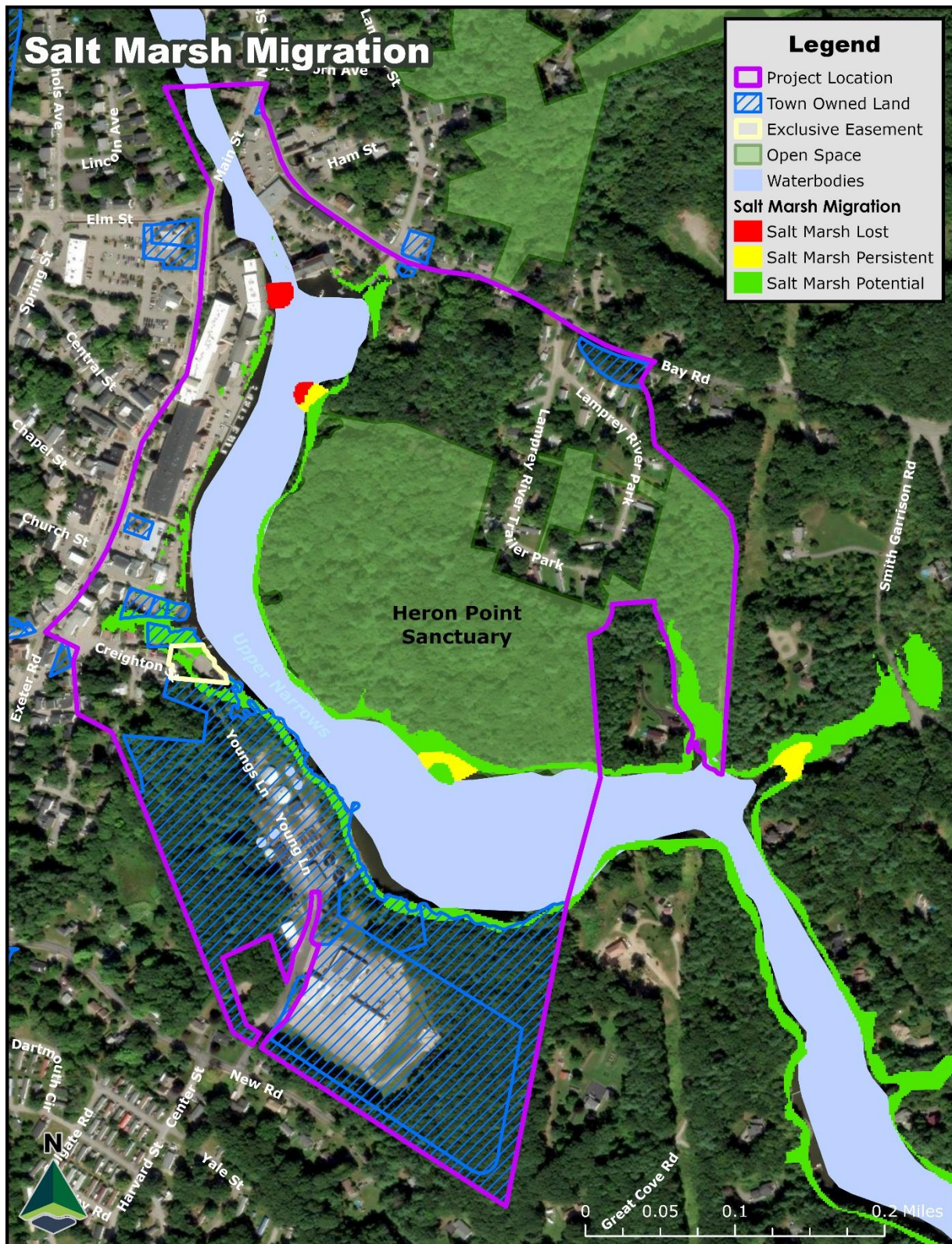


Figure 20 Sea Level Rise(SLR) map

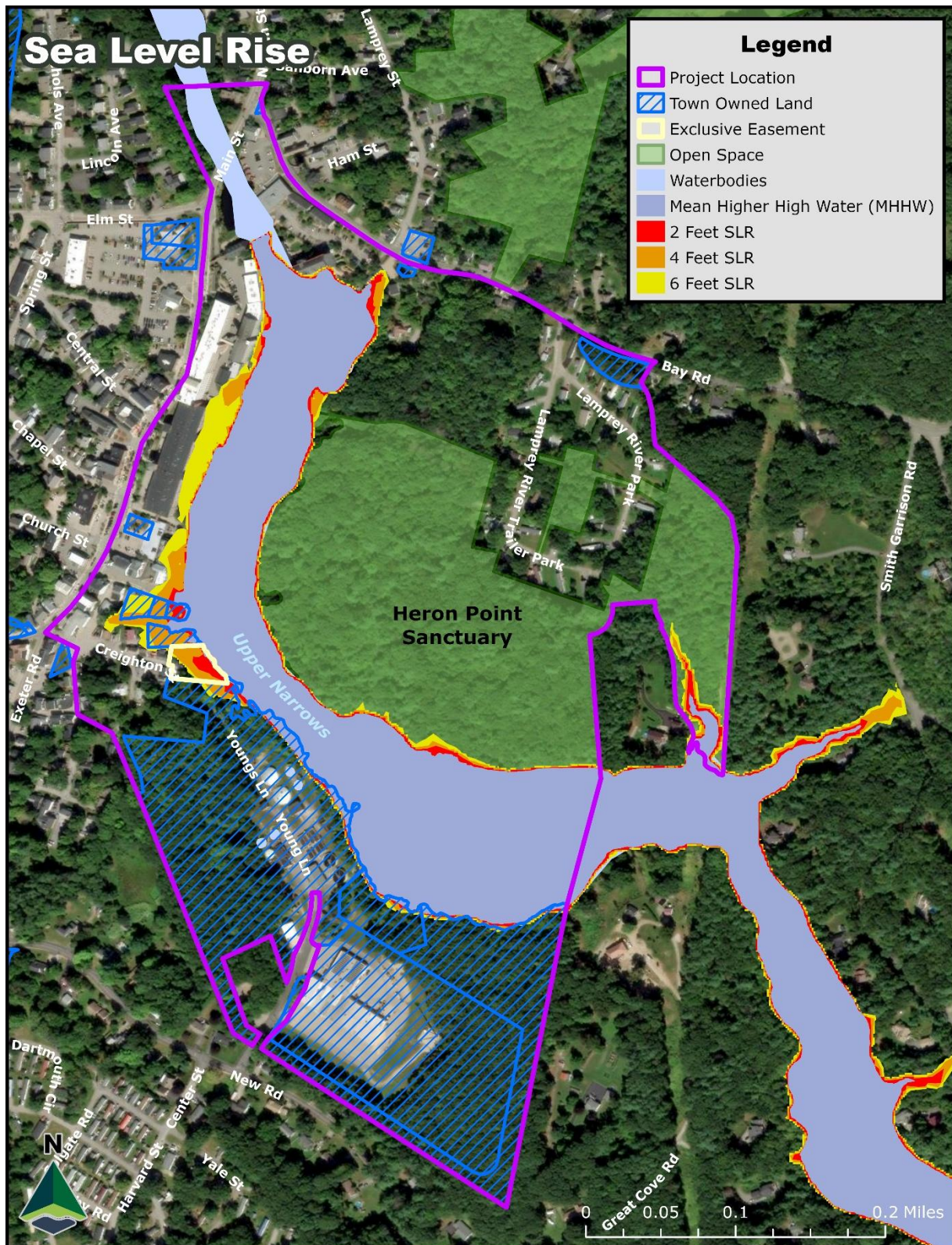
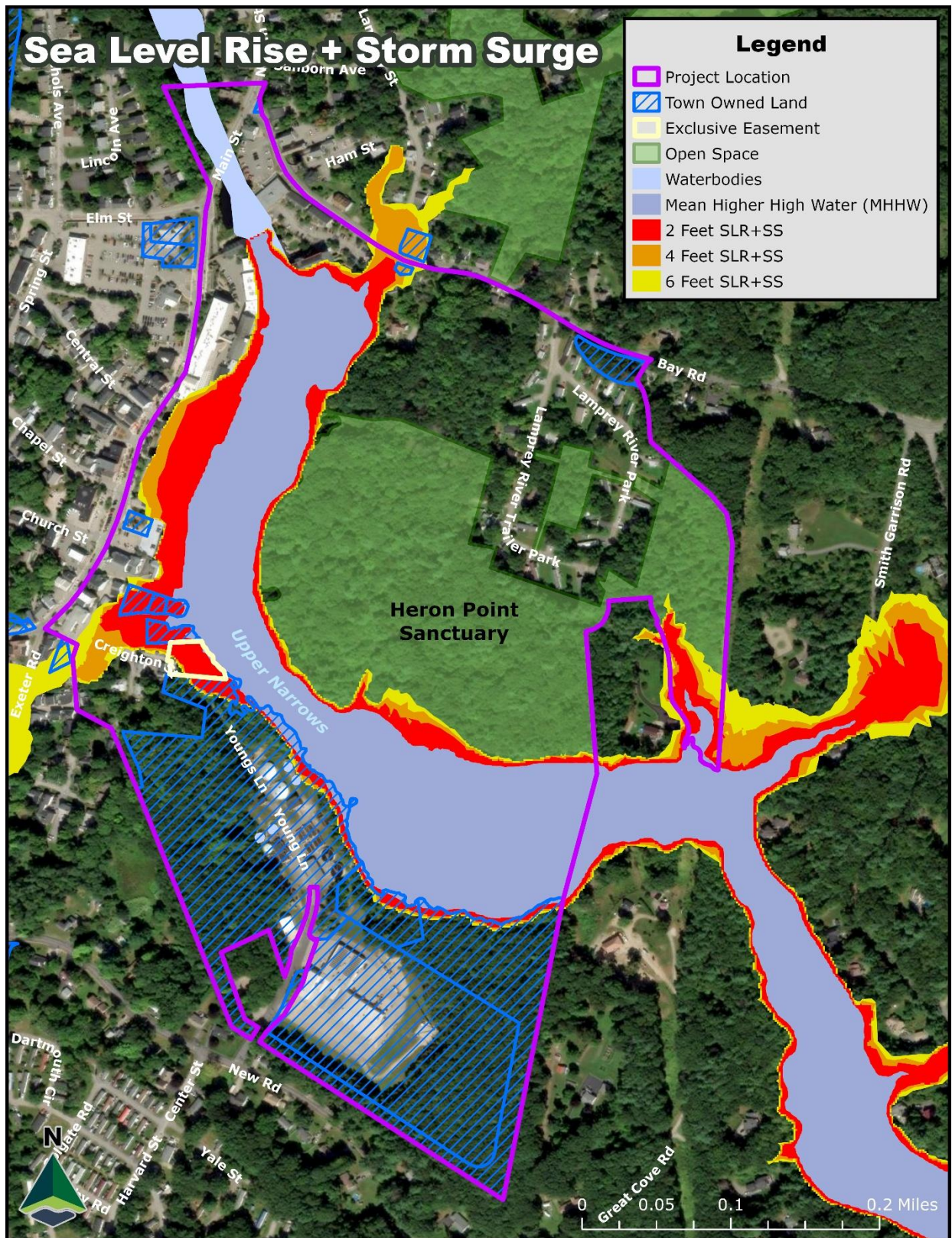


Figure 21 Sea Level Rise (SLR) and Storm Surge (SS) Map



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Newmarket, NH

2024 Open Space Plan

May 24, 2024

Land Acknowledgement

We are located on **N'dakinna**, which is the traditional ancestral homeland of the Abenaki, Pennacook, and Wabanaki Peoples, past and present. We acknowledge and honor with gratitude the land and waterways and the **alnobak** (people) who have stewarded **N'dakinna** throughout the generations. Today, we draw on the wisdom of the indigenous cultures and our current understanding of the ecology of place to care for and respect these lands and waters.

Cover Photo: View of the Lamprey River from Heron Point Sanctuary. Photo by Ellen Snyder.

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Introduction

This Open Space Plan (“OSP”) purpose is to serve as a guide for the Town of Newmarket (“Town”) to advance conservation and management strategies that promote resiliency, stewardship, and stability between the needs of the environment, wildlife, and the community. The decisions made today will affect the essence of the town for generations to come. Given this premise, it is vital that a network of distinct and multifunctional open spaces are secured and properly maintained to enhance the character and well-being of the community. The Town values the protection of its drinking water and fresh and saltwater wetlands; maintaining and restoring the natural shoreline along the Lamprey and Piscassic Rivers; sustaining critical natural habitats, healthy ecosystems, and connectivity for wildlife on land and in water; revitalizing the downtown riverfront; creating trail connectivity across Town and between our neighboring communities; and stewarding our conservation lands for people and nature.

The environmental and geographic attributes of this region of New Hampshire make it attractive for people to live, work, and enjoy. Demographic trends indicate that Rockingham and Strafford counties have some of the highest population growth rates in the state. As a result, development pressures are amplifying to accommodate this population influx to a degree that is exacerbating the features and functionality the region’s valuable natural resources and ecological systems. Nevertheless, the Town recognizes the necessity to develop a strategy to increase its housing supply and economic development opportunities in an environmentally sound manner. Accordingly, the goals and actions within this plan are intended to enrich our community, foster a healthy ecology, and advance a more economically sustainable Newmarket.

The development of the 2024 Newmarket OSP update was led by the Newmarket Conservation Commission, in partnership with the Strafford Regional Planning Commission (SRPC), and reviewed by the Master Plan Subcommittee and Planning Board. The OSP incorporated several community engagement activities to seek public input. Specifically, through the Fall of 2023, a community wide survey was conducted which focused on both housing and open space topics and received 429 responses. In March of 2024, a community workshop was held on the topics of housing and open space and garnered 48 participants. Visioning sessions were held at local board meetings in April of 2024 as a part of the larger update process for the Master Plan.

Residents vision for the community is diverse, friendly, green, and sustainable, embracing community, connectivity, and natural spaces. It is clear community members value their open spaces – more than half of survey respondents visit parks,

recreation, and conservation spaces at least weekly and 62% said it's extremely important to enhance the riverfront's natural environment. When asked to how residents prioritize open space and housing needs, foremost the consensus was to balance the two. However, more people prioritize open space protection over housing development. Ultimately, residents and community boards see Newmarket as a leader and a partner within the region to protect and enhance natural resources for the future.

The Newmarket Open Space Plan update was also supported by the [Connect to Protect Technical Assistance](#) program, where partners helped to develop a Land Acquisition Criteria Evaluation tool for the Conservation Commission to use in evaluating new conservation land opportunities. This is an update to the 2007 Newmarket Open Space Conservation Plan, which was adopted into the Town Master Plan in XXXX.

Newmarket's Natural Landscape

Situated in New Hampshire's coastal plain on the western shore of Great Bay, the Town of Newmarket boasts a rich diversity of natural habitats. The ecological importance of Newmarket is represented by the [NH Wildlife Action Plan](#) classification of Newmarket: 30% (2,714 acres) is identified as Highest Ranked Habitat in the State, 30% (2,721 acres) is considered Highest Ranked Habitat in this biological region of the State, and 16% is Supporting Landscape (Figure 1). Looking down from a small airplane at the broad sweep of Newmarket you would notice that the town is about 42% forested, 23% water and wetlands, 23% developed, and 12% grassland/farmland (Figure 2). In addition to hosting a rich biodiversity, this natural landscape provides open spaces that help people reduce stress and improve mental and physical health.

The Piscassic River winds through the central region of Town, reaching the confluence with the Wild & Scenic Lamprey River at the Town's Sliding Rock Conservation and Recreation Area. Natural floodplains along these two major rivers provide enormous benefits in controlling and slowing floodwaters and preventing erosion and runoff that can degrade water quality. Salt marsh along Great Bay and the large Tuttle Swamp/Ash Swamp wetlands system in the western region of Town provide myriad benefits to plants and animals. These waters and wetlands offer habitat for rare turtles, freshwater mussels, and plants; nesting and resting areas for migratory birds; safe movement corridors for wildlife, and much more.

Newmarket is relatively flat. However, if you explore the topography of the community, you will find rock outcrops, hilltops, rolling fields, undulating woods, and other subtle but interesting variations in the land. Elevations in Newmarket range from near sea level along the downtown and Great Bay waterfront to 276 feet atop Bald Hill in the southwest corner of Town. Other high points include Grapevine Hill (235'), Great Hill (222'), Long Hill (171'), and Jeff's Hill (138').

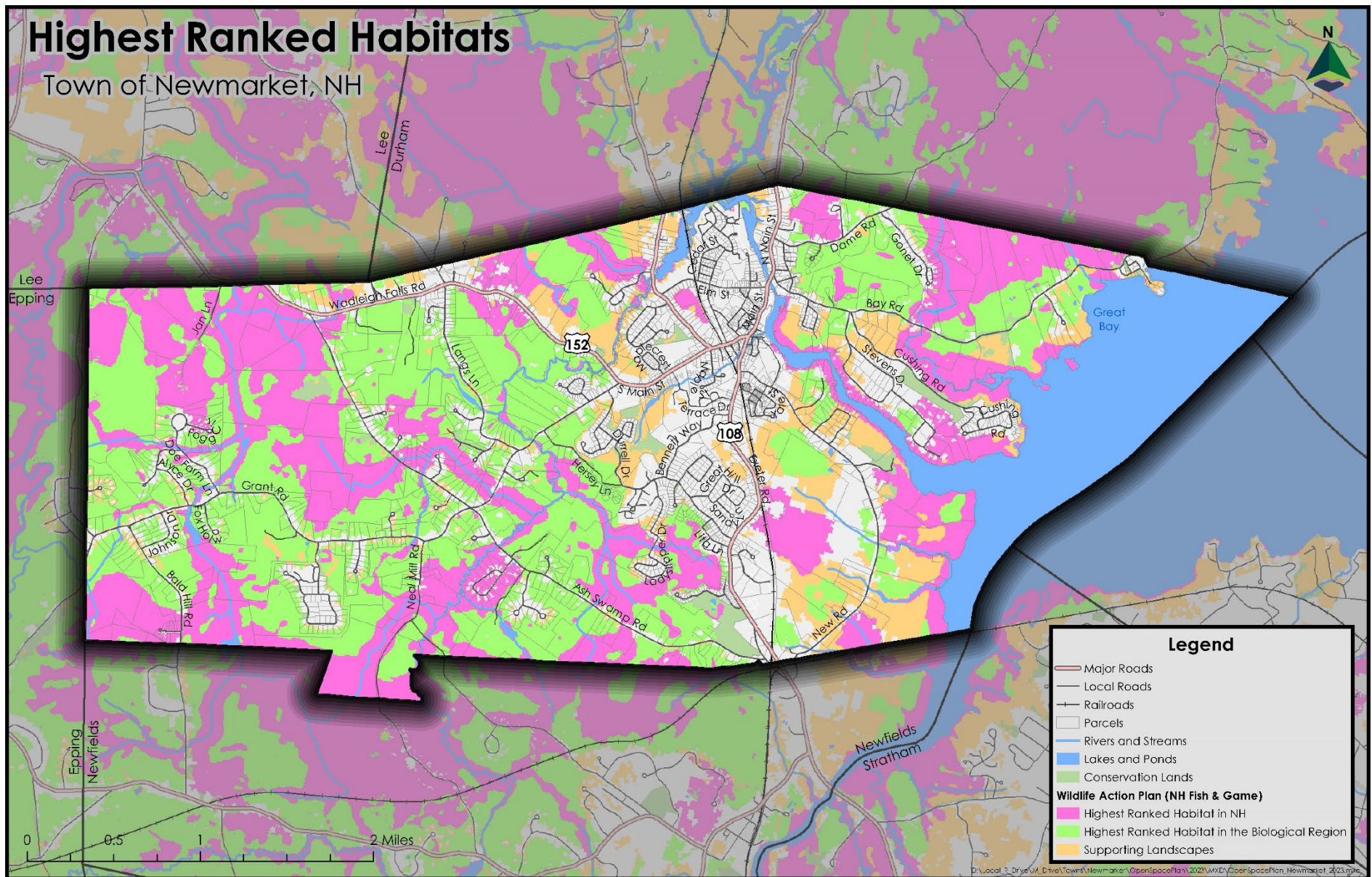
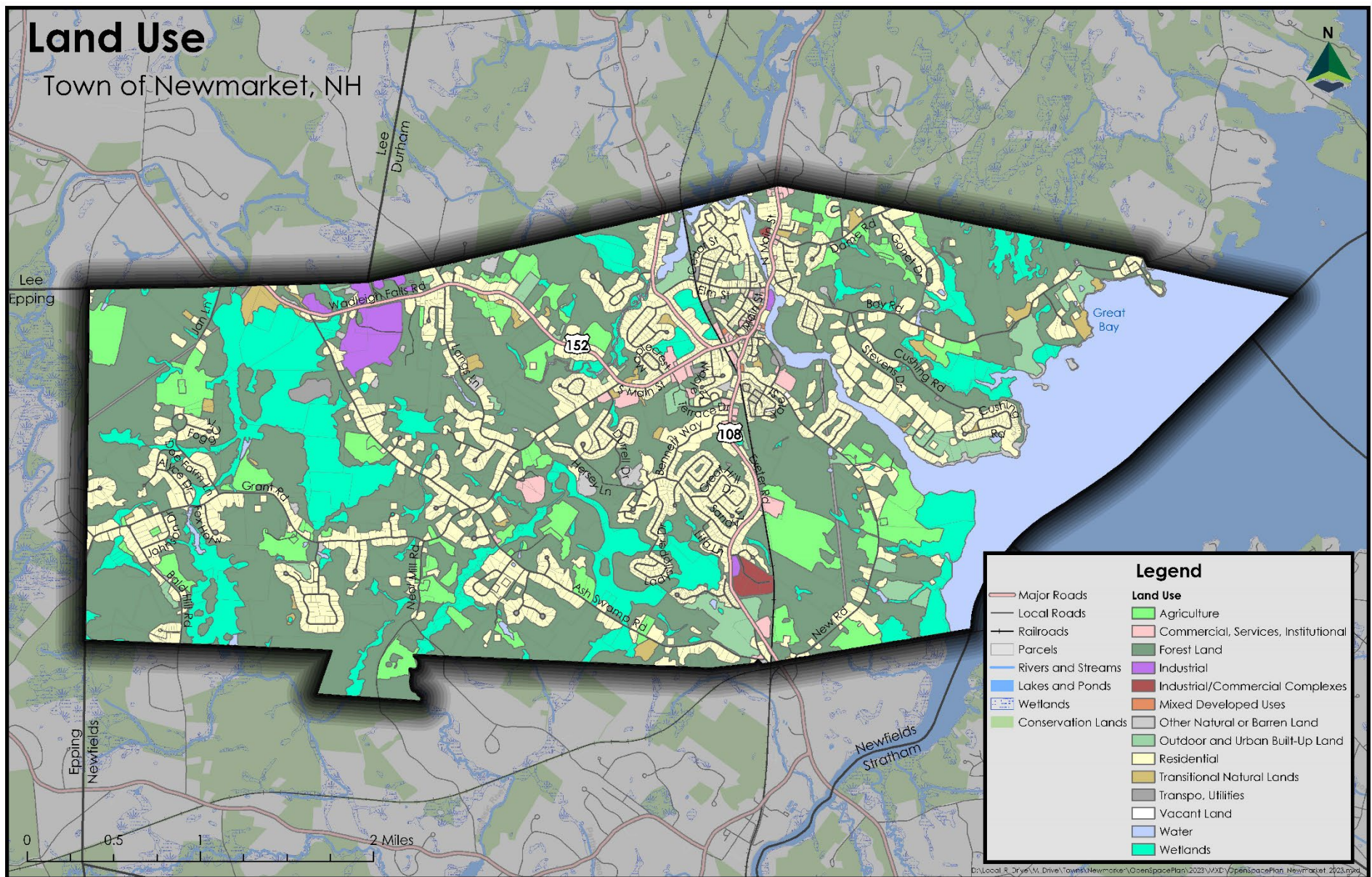


Figure 1: Highest Ranked Habitats



Our Watersheds

We all live in a watershed; actually, many watersheds at different scales. A watershed is an area of land bounded by mountains, hills, or ridges (the highest points of elevation), where all the surface water within drains into the same river, lake, or pond. Watersheds can be large or small; smaller watersheds, or sub-watersheds, are subsets of larger watersheds.

Newmarket lies within the 1,085 square mile coastal watershed (Figure 3). New Hampshire's coastal watershed encompasses many of the diverse and complex habitats that the New England region has to offer. Despite the rapid population growth and development pressures in this region, many areas of ecological significance remain within our community.

Watersheds connect us to our neighbors and to people living upstream and downstream. Protecting water quality, preventing erosion, and avoiding flooding is largely dependent on land use practices within the watershed. Activities on the land, such as malfunctioning septic systems, excessive fertilizers on lawns, or oils and other pollutants in stormwater runoff, can affect the health of groundwater and surface water. Keeping river corridors naturally vegetated within any watershed helps maintain a healthy land and water for people and nature.

All the surface water in Newmarket flows toward the Great Bay Estuary. The pathway of this flow falls within one of four coastal sub-watersheds or drainages: Lamprey River, Piscassic River, Squamscott River, and Great Bay drainage. The Piscassic River is a tributary to the Lamprey River: thus, most of Newmarket is within the larger Lamprey drainage. Only portions of the Bay Road area drain directly into Great Bay and lands mostly east of Route 108 south of downtown flow into the Squamscott River or Great Bay (Figure 4).

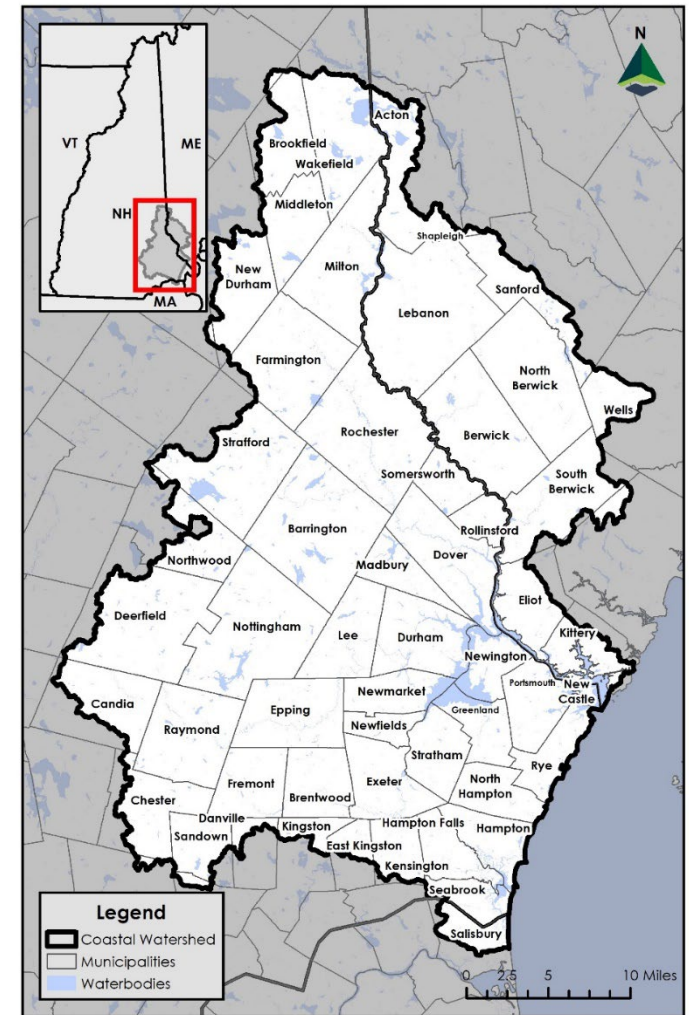


Figure 3: NH's Coastal Watershed

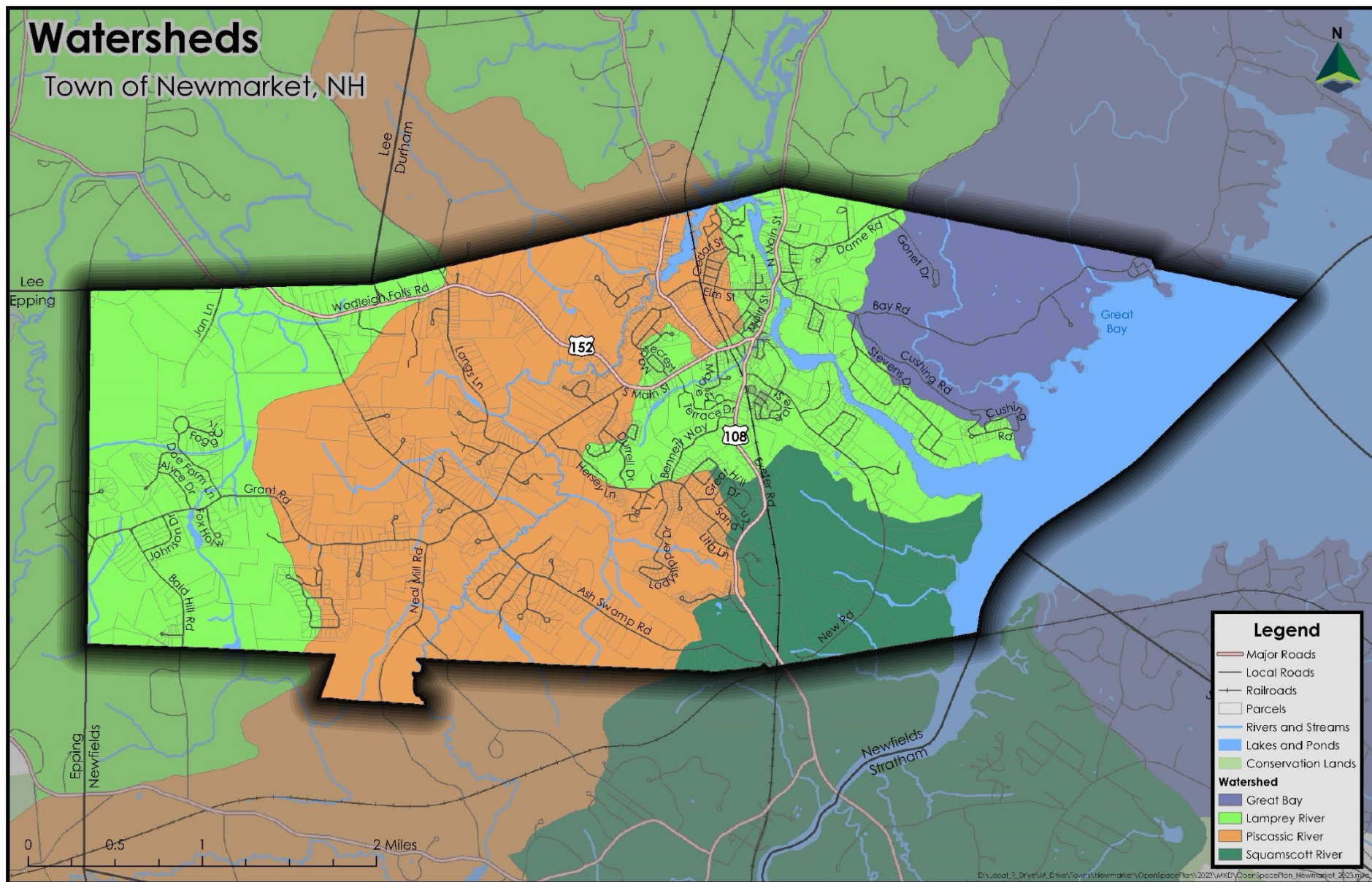


Figure 4: Sub-Watersheds within Newmarket, NH

Lamprey River Watershed

The Lamprey River begins in Northwood Meadows State Park and meanders 47 miles through seven towns before it reaches the Macallen Dam at the Mills in Newmarket (Figure 5). Below the dam, the Lamprey continues as a tidal river to Great Bay. From there, the waters flow down the Piscataqua River to the Gulf of Maine.

Of the eight rivers flowing to Great Bay, the Lamprey River watershed contributes the greatest volume of freshwater, playing a major role in maintaining the overall health of the economically and ecologically important Great Bay Estuary. This connectivity, between the fresh and salty parts of this coastal watershed, is exemplified by river herring, fish that are born in the freshwater reaches, migrate down to the estuary to feed, then out to the ocean to spend a few years, and then back again to breed and spawn. A remarkable journey that requires clean freshwater, estuarine habitats such as saltmarshes, eel grass beds and oyster reefs, and a healthy ocean.

Twenty-three miles of the Lamprey—from West Epping to the confluence with the Piscassic River—are designated as a National Wild & Scenic River to preserve the river’s “outstandingly remarkable values” including clean and abundant water; habitat for fish and wildlife; paddling, fishing, birding, and other outdoor recreation; history of people and place. The entire

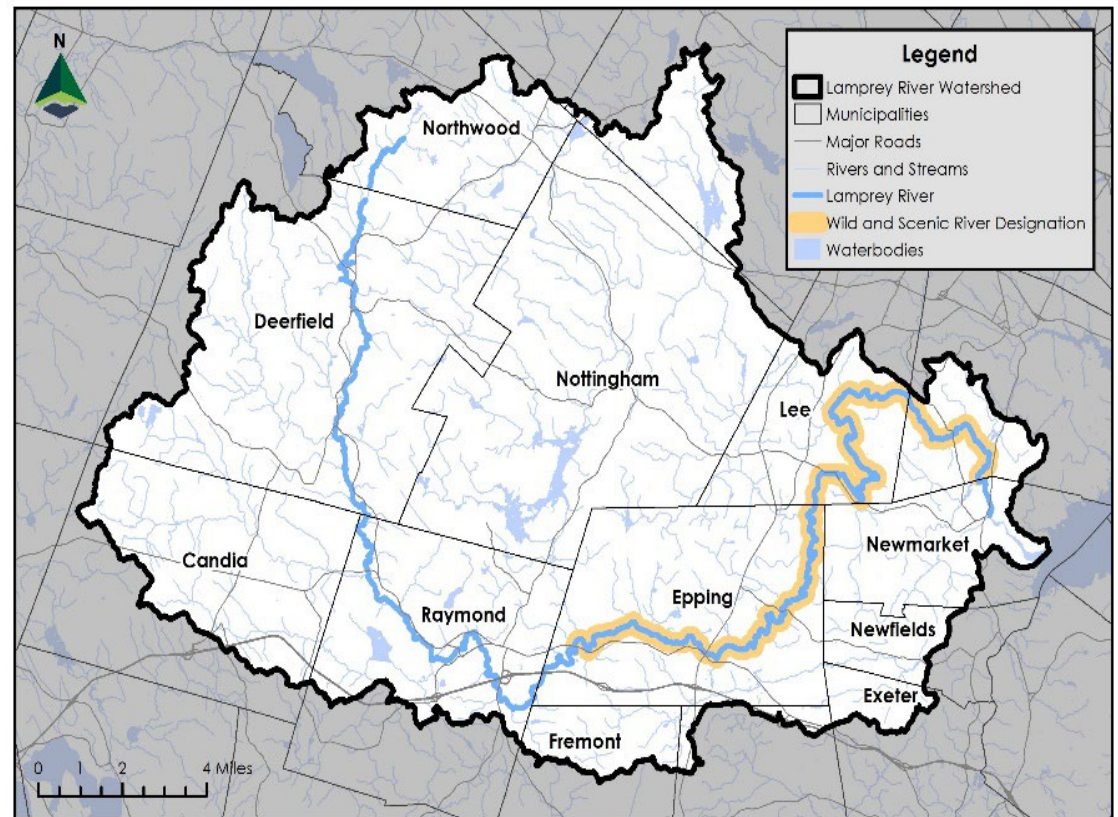


Figure 5: Lamprey River Wild and Scenic Designated Reaches

Lamprey River and its five major tributaries--Little, North, North Branch, Pawtuckaway, and Piscassic--are also recognized by the State of New Hampshire for outstanding natural and cultural values.

“Outstandingly Remarkable Values”

Historically the Lamprey River supported large populations of river herring, sea lamprey, American shad, American eel, and Atlantic salmon. Dams constructed for industrial and commercial purposes have long blocked or limited fish passage upstream. The McCallen Dam, site of the first natural falls on the Lamprey, separates the tidal portion of the river from the freshwater portion. A Denil fish ladder on this dam enables alewives, American eels, sea lamprey, and American shad to move upriver. Blueback herring do not use the ladder and have been seen spawning below the dam. Three and a half miles upstream of McCallen is the Wiswall Dam in Durham, originally constructed in 1835. This dam has no fish passage creating a barrier to fish movement farther upriver. A project to install a nature-like bypass channel around the dam has been proposed. A third dam at Wadleigh Falls in Lee has been breached, but under typical flow conditions, its remnants still constitute a barrier.

The Lamprey River was one of the first rivers designated into the New Hampshire Rivers Management and Protection Program in 1990, and the full river and five major tributaries were designated into the program in 2011 with unanimous support from the 14 corridor communities. The Lamprey River Advisory Committee (LRAC), with members from all 14 municipalities along the river corridor, has the principal responsibility for development and implementation of a long-range River Management Plan and reviews and comments on projects that could impact the river. The LRAC is working on a 2024 Management Plan update. You can learn much more about the Lamprey River at <https://www.lampreyriver.org/>.

Piscassic River Watershed

Piscasssic is an Abenaki expression meaning “at the branch.” The Piscassic River is the largest “branch” or tributary to the Lamprey River. This river meanders 15 miles from its beginning in the northeast corner of Fremont, through Brentwood, Epping, Newfields, then Newmarket where it flows through the heart of Newmarket into the Lamprey River near the Newmarket/Durham town line.

Along the way, three smaller streams or tributaries join the Piscassic: Brown River in the headwaters, Fresh River above the ice pond in Newfields, Follet’s Brook near the confluence with the Lamprey River in Newmarket. Numerous other small unnamed streams flow into the Piscassic River. Together these waterways—year-round and seasonal flows-- encompass the Piscassic River Watershed.



Figure 6: The Piscassic River viewed from Old Lee Class A Trail in Newmarket.

The lower Piscassic River, below the dam at Packers Falls Road, is often thought to be part of the Lamprey River. However, the waters in this area are an extension of the impounded waters of the Lamprey behind the McCallen Dam. The Piscassic River is the only waterway within the entire Lamprey River watershed classified as Class A – the highest water quality standard in New Hampshire.

Water from the Piscassic River (below the dam) was used as a drinking water source until 2004, until the water treatment plant was shut down. Since then, the Town has relied solely on groundwater from four municipal wells, three of which are in the Piscassic River watershed.

Squamscott River Watershed

The Squamscott River is the downstream, tidally influenced portion of this river system and the Exeter River is the upstream, freshwater portion. The Squamscott River begins in the Town of Exeter and flows into Newmarket, where it drains into Great Bay. In Newmarket, this watershed includes several unnamed tributaries that flow into the Bay, east of Route 108 and New Road. This area harbors some of the best ecologically important salt marsh in the Town.

Great Bay Watershed

The northeast corner of Newmarket's land area flows directly into Great Bay. This area includes The Nature Conservancy's 400-acre Lubberland Creek Preserve that features a unique salt marsh, a rich upland forest community hosting vernal pools, wetlands, and rocky outcrops. The 4-mile [Sweet Trail](#) begins here and extends into Durham. Where Lubberland Creek flows under Bay Road is the site of a successful partnership with TNC and the Town of Newmarket to install a new open bottom box culvert, allowing unrestricted stream flow and aquatic passage for fish, and safe crossing for other wildlife. Indeed, one of the first images captured on a wildlife camera after the work was completed was of a bobcat using the new passage.

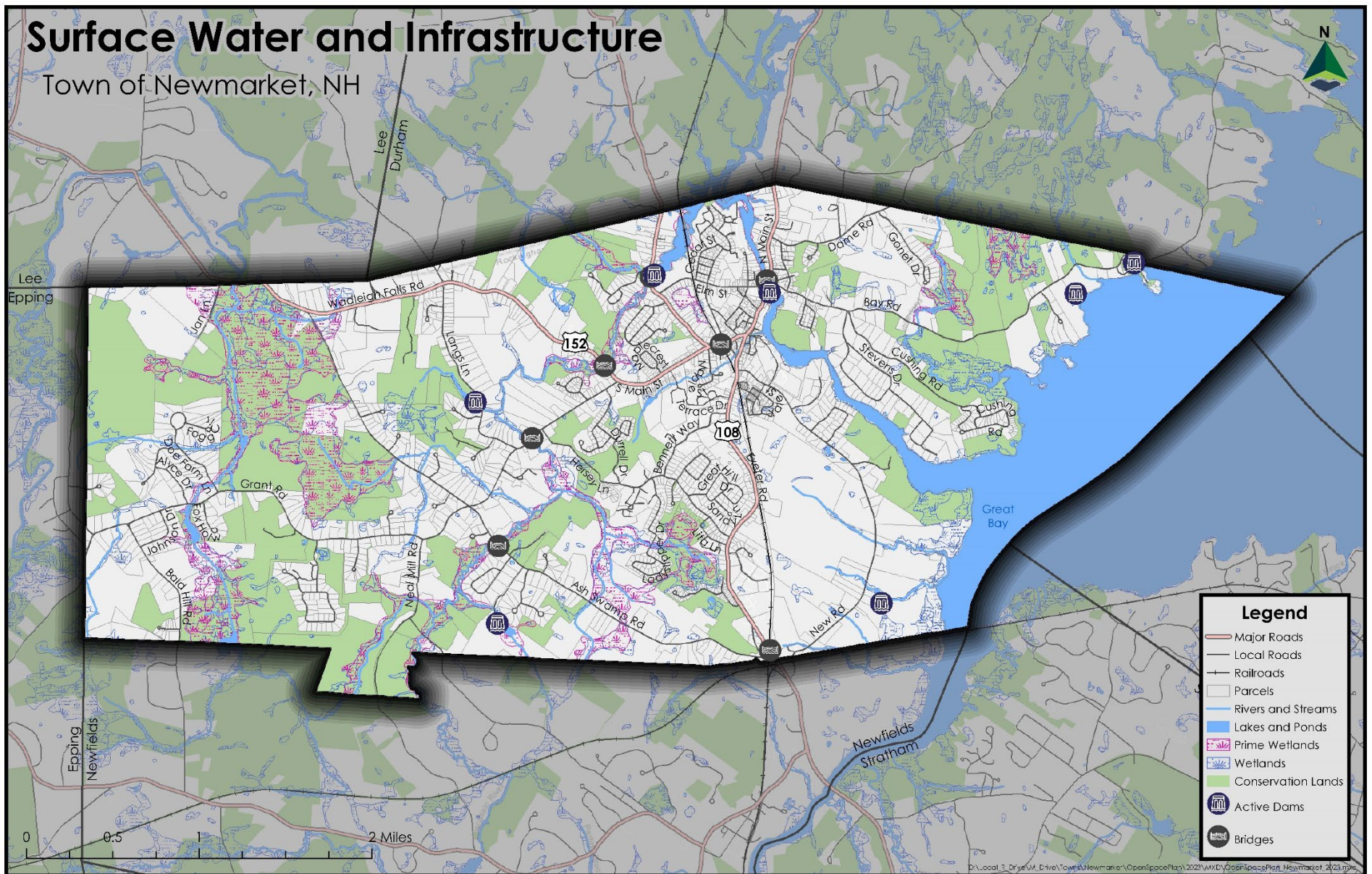


Figure 7: Surface Waters, Bridges and Active Dams

Water and Wetlands

The most significant body of open water in Newmarket is the 875 acres of Great Bay within the Town bounds (Figure 7). Although the Town has no other great ponds or lakes, there is significant water associated with waterways and wetlands. The [2020 Water Resources Chapter of the Master Plan](#) provides description of this topic; we provide a summary below of key elements.

Flowing Waters: Perennial and Intermittent Streams

The major rivers of Newmarket—Lamprey and Piscassic—were described earlier under their respective watersheds. Several smaller brooks and creeks are imbedded in these watersheds throughout Town, including Lubberland Creek and Follet's Brook. We often recognize the importance of these large waterways; however, smaller streams are an integral and important part of the hydrology of a watershed. All along the length of a river, small streams gather water from higher up in a watershed and flow into what is called the main stem. These small headwater streams are often unnamed and unmapped and sometimes intermittent, drying up in summer. They may begin as trickles, seeps, small wetlands, or depressions in the hillside. The health of larger downstream rivers, streams, ponds, and bays—such as the Piscassic or Lamprey Rivers and Great Bay—are dependent on the health of these smaller streams farther up in the headwaters of a watershed.

The upper reaches of a watershed store water, recharge groundwater, and reduce the intensity and frequency of downstream flooding. Small streams are a critical link between land and water. Not only are they linked to upstream and downstream portions of the watershed, but water flowing from the land into the stream carries insects, leaves, branches, and other material that are the start of a food chain. This exchange between land and water occurs in a transition zone along the edges of stream channels, called a riparian area. Connectivity between stream channels, stream bottoms and banks, and the riparian area is important to protect water quality and aquatic habitats. Maintaining a natural stream channel and associated riparian habitat of tangled roots, fallen tree limbs, shrub, trees, and herbs is key to sustaining the health of these waters.

Wetlands

Wetlands are rich habitats with immense benefits for nature and people: absorb and slow floodwaters, filter sediments and pollutants; recharge groundwater; host myriad uncommon plants, animals, and aquatic life; serve as scenic backdrops and

sites for recreation and education. Wetlands come in a variety of types, but all have three things in common: soils that are saturated sometime during the growing season; most of the vegetation is adapted to these saturated soils; and the soils in the area are periodically or permanently inundated with water during the growing season.

Newmarket is 23 percent water or wetlands. In addition to the waters associated with Great Bay and the rivers and streams, the Town hosts several other wetland types of significance as described in the NH Wildlife Action Plan.

Marsh & Shrub Wetlands

These wetlands cover 430 acres or 4.7% of the Town and come in three flavors. *Wet meadows* are typically dominated by sedges and grasses and are found at the upper edges of a wetland or lower edges of fields. *Emergent Marshes* contain plants that grow out of water, but whose roots are wet, such as cattails, pickerelweed, and water lilies. Shrub wetlands are thickets of shrubs and young trees growing out of wet soils, including red maple, dogwoods, alders, viburnums, and highbush blueberry. The Tuttle Swamp/Ash Swamp wetlands complex in the western region in Newmarket contains the largest, best, and intact examples of marsh and shrub wetlands in Newmarket. Notable wildlife species living in this wetland ecosystem include five species of turtles, American woodcock, beaver, great-blue heron, yellow warbler, dragonflies, and hundreds of other aquatic and wetland-adapted species.

Beavers are key stewards of these lands, as they play a critical role in supporting the well-being of the marshlands while facilitating the creation of habitat that aids the rest of the wetland community. They are most active at night so you might not see them, but you can easily find their industrious tell-tale signs: a chewed stick; a gnawed tree; a lodge; or a dam. You might hear a loud slap of their tail, warning other beavers of your (or your dog) presence. A beaver-modified wetland will cycle through a series of changes over time from ponded water (marsh) to abandoned/drained when they run out of food (wet meadow), and re-growth (shrub wetland). The highest quality wetlands are those that are isolated from development, surrounded by intact vegetation, and in remote areas where beaver activity doesn't damage roads or other infrastructure—as represented best by Tuttle Swamp.

Wooded Wetlands

Floodplain forests, swamps, and vernal pools are all wooded wetlands, and occur on 336 acres or 3.7% of Newmarket. Floodplain forests occur primarily along the Lamprey and Piscassic Rivers. River floodplains are dynamic environments

affected by periodic, temporary flooding. As water levels rise during heavy rainfall, sediment is carried downstream, and deposited where water slows and spreads out across a floodplain next to the river channel. Silver maple is the best adapted tree for life in a floodplain. Depending on the periodicity and intensity of flood events other species are often common, such as red maple, American elm, musclewood, hornbeam, wild grapes, tall meadow-rue, cardinal flower, and ferns. A swamp white oak floodplain forest in Tuttle Swamp is the largest such example in the entire Lamprey River Watershed. Historically, floodplain forests were cleared for development due to their proximity to rivers and plowed for agriculture due to their rich and productive soils. The remaining Intact floodplain forests contain uncommon plants and animals and are important reservoirs of our biodiversity.

Swamps are distinguished from marshes, in part, due to the presences of trees, which marshes lack. Seasonal water fluctuation is typical in swamps, and they usually occur in stagnant basins with saturated, organic soils. Depending on the location and soils the following plants may be common: red maple, black gum, black ash, sphagnum moss, ferns, and a diversity of shrubs, including speckled alder, male berry, northern spicebush, winterberry, nannyberry, and highbush blueberry. Red-shouldered hawk, veery, Blanding's turtle, bats, four-toed salamander, and occasionally moose occur in the swamps of Newmarket.

Vernal pools are ephemeral (temporary) wetlands that fill in spring from rainfall, snowmelt, or rising groundwater. Some pools also fill in the fall after autumnal rains. These pools are typically small, ranging from less than 1/10th acre to more than 2 acres. Size, however, is not always an indicator of the importance of a vernal pool to the animals that live there. Most vernal pools completely dry out by the end of summer and therefore cannot support fish populations, which makes these pools safe for breeding amphibians.

These small wetlands typically harbor fairy shrimp, wood frogs, and spotted salamanders. Smaller organisms such as bacteria, fungi, zooplankton, caddisfly and other insect larvae, crustaceans, and insects are all food for the larger animals. Wood frogs and spotted salamanders travel to vernal pools in the spring to breed, and then spend the rest of the year (11+ months) in the uplands, typically within 1,000 feet of the pool. Canopy shade, deep leaf litter, and fallen trees and stumps are used by frogs and salamanders as cover and therefore are important habitat features in the upland surrounding a vernal pool. Spotted and Blanding's turtles, great blue herons, raccoons, and predatory insects travel to vernal pools to feed on amphibian eggs, tadpoles, insects and crustaceans in the pools.

Some sunnier vernal pools may contain sphagnum moss, sedges, ferns, and shrubs such as high-bush blueberry or buttonbush. Red maple and eastern hemlock commonly grow on the edges of vernal pools, although pools may be found in many different forest types. Given their small size, vernal pools are easy to overlook. They are best observed and mapped when they are filled with water. Dry vernal pools can sometimes be identified by the presence of dark, matted leaves within a depression in the ground. Newmarket has not mapped vernal pools. Scouting for vernal pools before commencing work using heavy machinery, will help protect these valuable wetlands. Ruts, roads, and similar disturbance can change the hydrology and ability of the pool to hold water.

Peatlands

Peatlands cover 242 acres or 2.6% of Newmarket, most of which is in one large complex in the Tuttle Swamp/Ash Swamp wetland complex. The water in peatlands has low nutrient content and typically high acidity caused by limited groundwater input and surface runoff. These environmental conditions are such that plant and animal material take a very long time to decompose. This organic material contains carbon and other nutrients, storing it away and slowly releasing it into the atmosphere, providing an important place for carbon sequestration.

The vegetation in a peatland—more specifically called a bog or fen--depends on site conditions, although Sphagnum and other mosses are typically present. Newmarket's peatlands would benefit from a more detailed assessment of the animal and plant community.

Salt Marsh

Salt marshes are intertidal wetlands typically located in low energy environments such as estuaries. They exist both as expansive meadow marshes and as narrow fringing marshes along shorelines. Salt marshes are considered one of the most productive ecosystems in the world due to high rates of plant growth. They provide important ecological functions,

including shoreline stabilization, wildlife habitat, and nutrient cycling, and serve as important breeding, refuge, and forage habitats for many species of crustaceans and other invertebrates, and fish.

Salt marshes are a scarce habitat type, occupying only about 0.1% of the land area of New Hampshire (Figure 8). Rising sea levels will likely have the greatest impacts on current salt marsh habitats; however, many scientists believe these systems can keep pace with sea level rise by migrating landward if there is an adequate supply of sediment or peat build up and no natural, or human-made, barriers present. Future sea level rise scenarios predict that, if not able to migrate, much of today's low marsh will be mostly submerged and transformed into mudflats or sub-tidal bays. According to the Sea-Level Affecting Marsh Migration (SLAMM) model, Newmarket is a community within the coastal watershed where current conditions allow for potential salt marsh growth as sea levels rise. In fact, upwards of 170.7 acres of potential salt marsh will have the opportunity to migrate into surrounding upland areas as sea levels rise, but the Town may, lose some salt marsh habitat due to coastal inundation.

Prime Wetlands

Under NH State Statute, municipalities may elect to designate wetlands as “prime-wetlands” if, after thorough analysis, it is determined that high-quality wetlands are present. Typically, a wetland receives this designation because of its large size, unspoiled character, and ability to sustain populations of rare or threatened plant and animal species. In 2000, the Newmarket Conservation Commission spearheaded such an analysis. West Environmental Inc. completed a final list and map of these high value wetlands following extensive field research and other data collection, wherein 16 wetlands (totaling 908.94 acres) were identified as prime wetlands. These prime wetlands are afforded additional protection within the Newmarket Zoning Ordinance. The Conservation Commission and Planning Department received a grant in 2024 from the Piscataqua Region Estuaries Project (PREP) to update the prime wetlands

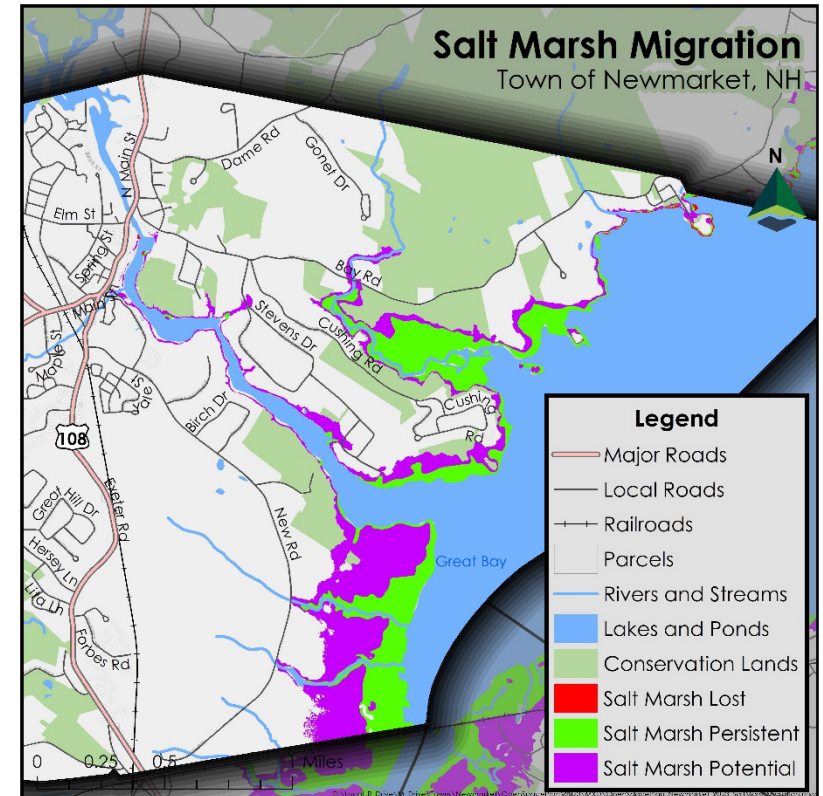


Figure 8 Lost, Persistent, and Potential Salt Marshes

maps, utilizing more accurate mapping tools now available as well as to reflect changes in hydrology. Our goal is to ensure maximum protection of the prime wetlands and to ensure that they are mapping accurately in fairness to property owners.

The Forests of Newmarket



Figure 9: Appalachian Oak-Pine Forest

New Hampshire is the most heavily forested state after Maine; Newmarket is about 43% forested. Two broad upland forest types occur in Town: Appalachian oak-pine (A-O-P). hemlock-hardwood-pine (H-H-P).

Most of Newmarket is the Appalachian oak-pine forest type (Figure 9), which is found primarily in central and Appalachian states, only extending into southern and coastal New Hampshire. The dominate trees are a mix of red, black, and white oaks, shagbark hickory, and white pine. Historically, Appalachian oak-pine forests were influenced by frequent fires, which periodically modified the age structure of the forest. The diverse age and structure of the forest helps to promote wildlife diversity. In the absence of fire, more fire-intolerant species increase, such as red maple, American beech, and birches.

The abundance of nut-bearing oaks and hickories provides a high-protein, carb, and fat source for wildlife, such as squirrels, chipmunks, mice, black bear, white-tailed deer, wild turkey, ruffed grouse, blue jay, and wood duck. In turn, fishers, bobcats, great-horned owls, and raptors prey on the abundance of small mammals and birds. Tall white pines in the oak-pine forests, especially near water, offer nest and perch sites for bald eagles, ospreys, and great blue herons.

Intense development pressure particularly in southeast New Hampshire has dramatically reduced naturally occurring fires and increased fragmentation of this forest type. Land conservation is critical to protecting large forest blocks (>500 acres) of Appalachian oak-pine habitat. These large forest blocks are rare and are critical to protect wide-ranging species such as bobcat, black bear, and moose.

Hemlock-hardwood-pine forest is the most widespread habitat in New Hampshire but is found in only a few small patches in Newmarket. White pine and eastern hemlock are the dominant trees. On sites where this forest type was historically

subjected to pasturing or timber harvesting, the dominant early and mid-successional species are red oak, white pine, red maple, black birch, and paper birch. Hemlock and American beech typically increase in dominance as the forest ages. Mostly pure hemlock stands occur in ravines and steep, rocky north-facing slopes. Hemlock is shade-tolerant and blocks out light for any other species, creating a mostly barren understory. The ground cover and understory are slightly richer in the mixed forest of oak, beech, and pine, but not greatly so. The presence of Hemlock Woolly Adelgid and other non-native insects may affect the trajectory of plant succession in these forests.

There is life in dead trees and cavities are good.

Dead or partially dead trees (“snags”) and live and decaying trees with cavities and dens are an essential part of our forests and provide essential habitat to more than 40 birds and mammals. Tree cavities serve as a nest, den, and roost site, providing protection from harsh weather and temperature extremes and safety from predators. Tree dens are used by raccoon, porcupine, gray fox, fisher, and black bear. Bats and brown creeper (a bird) roost or nest under loose or shaggy bark. Dead and dying trees are often full of bark- and wood-boring beetles, carpenter ants, and other native insects, which are important food sources for woodpeckers and other birds that glean food from the tree bark. Rotting wood helps recycle nutrients, serves as nurse logs for tree seedlings, and provides habitat. Leaving fallen trees, branches, and overturned roots in the woods is good for wildlife and the health of a forest.

Agriculture and Grasslands

Farming is part of New Hampshire’s scenic landscape and cultural heritage. For more than 300 years New Hampshire’s agricultural community has adapted to changing landscape conditions and markets. The agricultural sector in the State remains vibrant and diverse and shows growth in small-scale farms based on retail markets. In Newmarket, approximately 648 acres, or 7% of Newmarket is considered potential for agriculture—land that is currently field, pasture, or cropped. Some active farms remain and are already conserved including the Clarke Farm on Camp Lee Road and Nostrom Farm on Doe Farm Lane. Other landowners retain fields as pasture or other uses.

The 2020 NH Wildlife Action Plan identified 1,046 acres of grassland habitat in Newmarket. Some of those acres are included in the potential agricultural land above; however, many of these “fields” are conserved as habitat for rare plants

and animals. For example, the 15-acre meadow at Wiggin Farm Conservation Area was conserved, in part, with grant funds from NH Fish and Game and the Land and Community Heritage Investment Program (LCHIP) to protect grassland and shrub nesting birds, such as bobolinks and American woodcock, nesting turtles, insect pollinators, and other wildlife. The Nature Conservancy maintains natural grasslands as habitat at their Lubberland Creek Preserve.

Whether active farmland or grassland habitat, these openings in our largely forested community also provide scenic backdrops along roads and trails.

Sand and Gravel and other “Barren” Lands

Newmarket has 77 acres or less than 1% of the Town in sand and gravel operations. While these areas are often considered ecologically “barren,” they can provide some remarkably interesting habitat once the sites are closed. Sand and gravel excavation areas are usually dry and lack the soil organic layers needed to regrow vegetation, and thus plant succession is slow. They often have brushy edges, bare ground, few tall trees, leftover boulder piles, and are nutrient poor, thus requiring little effort to maintain.

Reclamation of closed “pits” typically involves adding topsoil and leveling slopes, but this can diminish its value as unique wildlife habitat. But if left mostly as is when closed (except for safety procedures), these areas can offer habitat: bare ground for nesting common nighthawks and rare turtles, steep sand banks for nesting bank swallows, basking areas for snakes, exposed sandy areas for tiger beetles and other ground insects, shrub habitats for New England cottontails and songbirds. NH Audubon’s Smith Sisters Sanctuary off Route 152 has a great example of this transition from active sand and gravel pit to habitat.

Wildlife Corridors

Wildlife need to move, to find food and shelter, to find mates, to migrate seasonally, to disperse to new territories. A [wildlife corridor](#) of suitable habitat allows wildlife to move safely from one area to another. A corridor can be through an intact forest, along rivers or streams, or even along a field edge. As our landscape becomes more fragmented by roads and other development, maintaining a network of connected habitats is important to allow safe passage for individual animals and

gene flow between populations. Protecting wildlife corridors provides other benefits too, such as healthy forests and clean water and air. Most of Newmarket's important wildlife corridors are through intact forests, wetlands, and along watercourses.

Road Crossings

Many of the roads in Newmarket have been here for a long time; the network of streams and wetlands even longer. The two are often intertwined. Wherever a road crosses a stream, a bridge or culvert makes that crossing possible. That road crossing can sever the natural pathway or corridor for fish, turtles, and other wildlife or in some cases cause excessive road mortality, such as for turtles. Incorrectly sized, poorly placed, or damaged bridges and culverts prevent fish and wildlife from moving up and downstream to find food, breeding areas, and other habitats.

Degraded crossings also cause excessive flooding, road washouts, and expensive maintenance, and they can be a safety hazard.

Culverts that are undersized relative to the natural width and depth of a stream tend to cause higher velocity stream flows. These high flows cause scouring immediately downstream of the culvert, which leads to "perching," where the culvert ends up higher than the streambed, preventing passage by many fish and wildlife. Fortunately, new designs for stream crossings are available that are safe, stable, reduce expensive erosion and washouts, and are fish and wildlife friendly. The ideal stream crossings are bridges and open-bottomed arches rather than pipe culverts.

A significant upgrade to the Bay Road crossing over Lubberland Creek in Newmarket has greatly improved safe aquatic and upland wildlife passage as well as minimized maintenance issues and flooding hazards. The Town has identified several other such road crossings that would benefit from improved crossings. One site is the Ash Road crossing over a significant wetland drainage where rare and common turtles are killed on the road annually. The Conservation Commission, along with Planning, Engineering, and Public Works Staff are working with NH Fish and Game to find and fund a sustainable option for this location. Other sites that may need road crossing improvements are shown on the [NH Aquatic Restoration Mapper](#). Encouraging drivers to slow down using signage and traffic calming techniques is also being explored.

INSERT photo of the Lubberland Creek culvert

Newmarket's Conservation Areas

Conserved Lands

Newmarket's 9,080 acres support a population of 9,430 residents (2020 Census), with most of the population concentrated in the downtown region. In 1998, 516 acres or 6 percent of Newmarket was in permanent conservation. By 2023, 2,792 acres (or 31%) of the Town was conserved in some form (Figure 10). See Appendix B for details on each parcel under conservation in each of the categories listed in Table 1.

Table 1: Conserved Lands Summary

Conservation Land Type	Acres	% of Conservation Lands
Town-Owned Conservation Land	416	15%
Town-Held Conservation Easement	368	13%
Town-Held Executory Interest	232	8%
Subdivision Open Space	511	18%
Other Public or Private Conservation Lands	1,265	45%
Total	2,792	31% of Total Town Area

The community has benefited from a strong partnership with public and private conservation entities, including NH Fish and Game, Land and Community Heritage Investment Program, NH DES Drinking Water Protection Program, Great Bay Resource Protection Partnership, The Nature Conservancy, NH Audubon, and the Southeast Land Trust. In addition, the Town of Newmarket has contributed to land conservation projects through the Conservation Fund, Drinking Water Fund, and Open Space Bond. Also, many private individuals have contributed funds or land value. A few properties were conveyed to the Town as part of a subdivision project and others via tax liens. From 2003 to 2022, the Town of Newmarket assisted with the conservation of 1,016 acres in which the Town holds some interest in the land: fee ownership (416 acres), conservation easement (368 acres), and executory interest (232 acres). The costs of these conservation projects totaled

more than \$4.4 million with Town leveraging its contribution of \$2.1 million with more than \$2.5 million in grants and funds from conservation partners.

Trails

One of the benefits of open spaces is the opportunity for people of all ages to use nature trails that wander through forests and fields or across boardwalks. Several conservation areas in Town have trails: Wiggin Farm, Piscassic River-Loiselle (with connectivity to NH Audubon Sanctuary), Heron Point Sanctuary, and Sliding Rock (Piscassic Boat Launch) (Figure 11). You can learn more about these and other conservation areas on the [Conservation Commission website](#).

We are fortunate to also have several other trails in Newmarket and nearby towns. These include the Sweet Trail from Newmarket to Durham. The SELT's Piscassic Greenway trail network accessible from Newmarket, Newfields, and Lee. Both Newmarket and Newfields reclassified their respective sections of Old Lee and Neal Mill/Halls Mill Class VI Roads as Class A Trails. This heightens the value of these pathways for public recreation and enables the communities to invest in their upkeep.

Newmarket continues to seek ways to enhance the trail network to connect town conservation areas and parks, provide safe pathways from downtown to other regions of town, and connectivity between towns. As development continues to consume more land and the remaining areas are often wet or rocky, the opportunities to create new pathways becomes more of a challenge. We will look for creative ways and partnerships to find ways to achieve this vision.

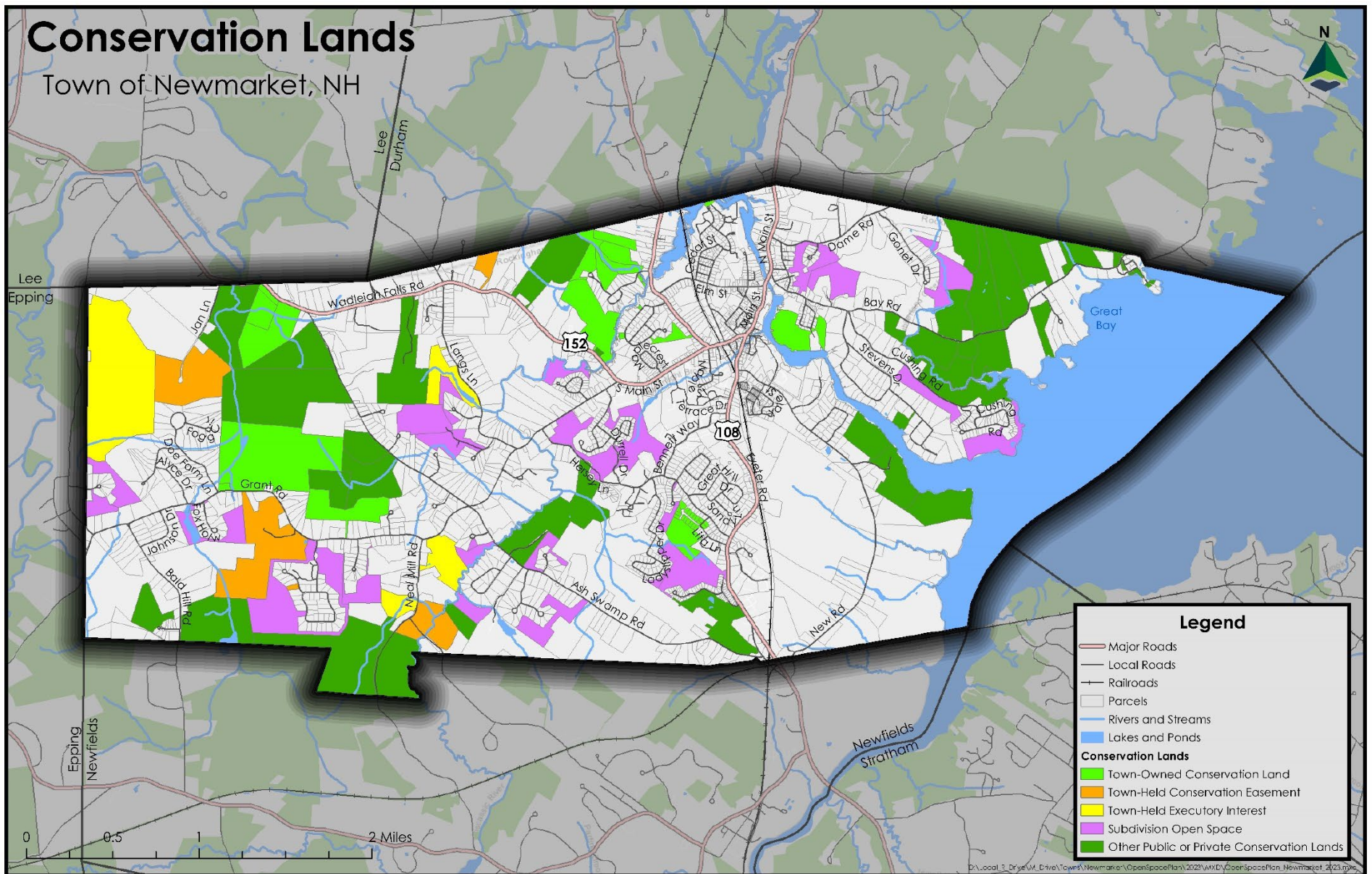


Figure 10: Conservation Lands by Ownership Type

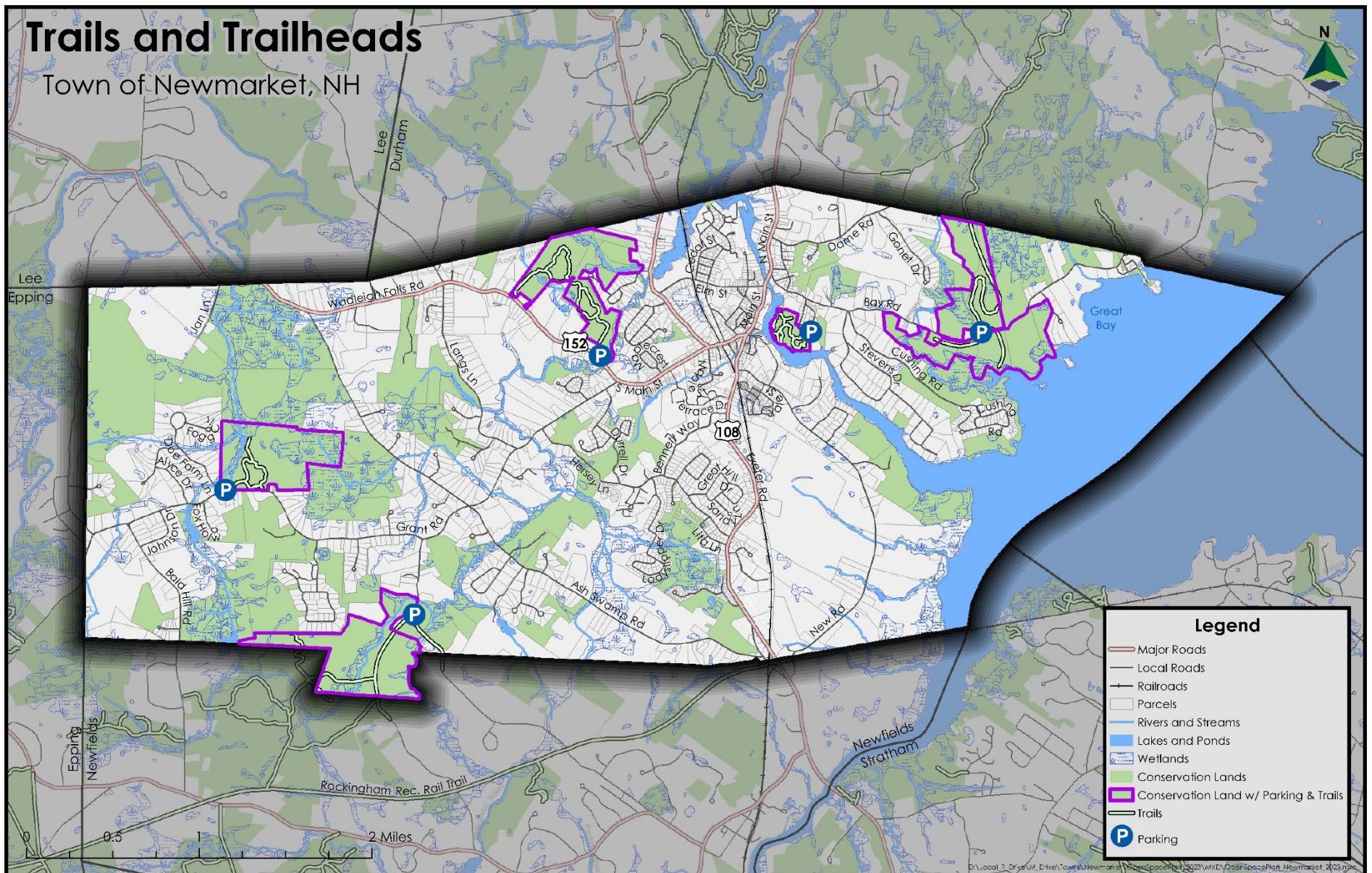


Figure 11: Trails, Trailheads, and Parking Locations within Newmarket's Conservation Areas

Town Funding Sources

The Conservation Fund

The Conservation Fund is a specific fund authorized by RSA 36-A; it is non-lapsing and can accumulate from year to year. This enables the Conservation Commission to plan for projects such as the acquisition of land, building of trails and associated infrastructure, educational programs, and other stewardship-related projects. For most expenditures, the Conservation Commission spends the money by a majority vote of the Commission at its public meetings. Prior to using these funds for the purchase of any interest in real property, the Conservation Commission must hold a public hearing and the Town Council must approve the acquisition. The Conservation Fund can hold public and private funds from different sources. The primary source of funding since its approval in 1989 has been 50% of the Land Use Change Tax (LUCT). This is money paid to the municipality when land that was enrolled in the Current Use assessment program is removed from current use to be developed. From 2003 to 2023, \$405,562 was deposited into the Conservation Fund from the LUCT. With less land in current use, the amount of LUCT deposited into the Conservation Fund in the next 10 years will be much less than in past decades.

Richard Schanda Park Fund

In 2020, the Masonic Lodge contributed \$4,000 to the Richard Schanda Fund, which the Conservation Commission uses to help steward Schanda Park, located near the boat landing on the Lamprey River.

General Fund Allocation

The Conservation Commission receives an annual appropriation from the General Fund that is included in the annual town budget, which is approved at the March Town Meeting. These funds are used for operating expenses such as part-time salary for the recording secretary, annual dues to the NH Association of Conservation Commissions, contracts for easement monitoring, and miscellaneous supplies. In recent years, the annual appropriation has been approximately \$4,500.

At the 2009 Newmarket Town Meeting, voters passed a warrant article that "...adopts the provisions of RSA 36-A: 4-a, I (b) allowing the Conservation Commission to expend funds for contributions to qualified organizations (such as land trusts) for the purchase of property interests, or facilitating transactions related to thereto, where the property interest is to be held by

the qualified organization and the town will retain no interest in the property.” At the same town meeting, voters did not approve provisions related to RSA 36-A: 4-a, I (a), which would have authorized the Conservation Commission to expend funds to purchase interest in land outside the boundaries of Newmarket.

In 2002, the residents of Newmarket passed a \$2 million Land Acquisition Bond, which has been used to protect several significant parcels in Town, including the Wiggin Farm, Nostrom Farm, Piscassic River-Loiselle, Hilton Tree Farm, among others.

Drinking Water Protection Fund

Newmarket voters, through warrant article, initially established this as an Aquifer Protection Easement Fund in 1999, approving allocations to this fund in 1999, 2000 and 2001. In 2003 voters approved enhancing the purpose of the aquifer fund to include fee simple acquisitions as well as easements and to include potential surface water sources. Most of this fund was expanded for conservation easement along the Piscassic River (a potential drinking water source), although additional allocations could be made to this fund through future warrant articles.

Conservation Tools

Municipalities have a range of tools and options available to conserve important open spaces. These include voluntary tools such as land protection and education, and regulatory measures such as overlay districts in the zoning ordinance that protect key features such as wetlands and floodplains. Some of these measures (e.g., land acquisition) depend on funding, whereas others require no financial outlays by the community. Most importantly, towns (and landowners) have access to many conservation partners to assist with all options, including state and federal funding sources, technical assistance, educational programs, and more.

We describe a suite of such tools that have been used successfully in Newmarket, in the areas of land conservation, land use planning, education, and land stewardship.

Land Conservation

Fee Ownership

Newmarket has a diversity of town-owned conservation areas that range in size from small pocket parks (less than 1 acre) near downtown to the 160-acre Wiggin Farm Conservation Area on the west side of town. The Town of Newmarket has full ownership of these lands (called “fee simple” ownership). These lands were acquired through a variety of methods that include town bond and conservation funds (land use change tax), state and federal grants, conservation partner contributions, tax liens, and other sources. Each offers different opportunities for public use based on size, location, natural features, purpose, and source of conservation funds. Some areas were acquired to protect specific resources such as drinking water or wetlands and some were acquired to provide public access to Great Bay or the Lamprey River. The Town owns these lands, and the Conservation Commission is responsible for overseeing their stewardship and managing of public uses, in partnership with Town Department of Public Works. See Appendix B for details about these fee-owned parcels.

The town holds many other special places that are while are not conservation areas, they are valued open spaces for residents and visitors to enjoy. The new Willey House Central Park is a new arts centric pocket park created by the Newmarket Arts, Culture and Tourism Commission with funds from the town, local organizations and a grant from the State Arts Council. The park will feature a “Welcome to Newmarket” mural and celebrate its location on the Lamprey River and mill history. Schoppmeyer Memorial Park, on the banks of the Lamprey River provides 3 acres of green space, a boat launch, and on-site kayak rentals from the Newmarket Recreation Department. The park was purchased with funding from the Lamprey River Advisory Committee (LRAC). The Newmarket Community Garden received a small grant from the Grass Roots Fund in 2009 to improve garden infrastructure and its 33 plots.

These unique and cherished locations across Newmarket also the Riverwalk and Town Landing, Riverside Cemetery, Piscassic and Lamprey Rivers, Piscassic Boat Launch and surroundings, Great Hill Trails, Elm Street playground, Aqua Land Splash Pad, benches along Main Street, and many ballfields and trails. Explore Newmarket’s recreation sites through the SRPC [Promoting Outdoor Play](#) interactive viewer.

Conservation Easements

A landowner has a bundle of rights to use and modify the property that they own. A conservation easement is a legal agreement between a landowner and a conservation organization, agency, or municipality that transfers some of these rights (typically the “development rights”) to the organization that holds the easement. Typically, a conservation easement is granted in perpetuity and therefore the development rights are extinguished forever, preserving the land as open space. The easement conveyed through a deed, applies to the land regardless of who may own it in the future.

Land under easement is still privately owned and managed in accordance with the terms of the easement. (Some publicly owned lands also have easements held by another entity.) Each easement is crafted to fit the features of the property to be protected, the needs of the landowners, and the goals of the entity accepting the easement. Easements are used to provide permanent protection from subdivision or other development or uses that could degrade or destroy ecological, scenic, or other natural resources. Easements often provide for continued farming, forestry, wildlife management, and recreation. Easements don’t always require public access; although often landowners allow this access, and some grant sources require public access as part of funding a conservation easement project.

A landowner who conveys a conservation easement is the grantor and the recipient organization is the grantee. Easements can be donated or sold for full or partial value. The easement document outlines the procedures for enforcing the easement, which typically lie with the grantee. In some transactions, another organization is given “back-up” or Executory Interest in the easement in case the grantee is unable to carry out its easement responsibilities. A Third Party Right of Enforcement is another instrument that can be used to provide some level of “interest” in the land being put into conservation. In addition to these conservation easements, some landowners and developers of subdivisions convey easements to the Town that provide some protection to natural features on the property. The provisions in these easements are usually driven more by the landowner’s interests than those of the grantee (e.g., Town or conservation organization).

The Conservation Commission helps oversee the annual monitoring of seven Conservation Easements held by the Town. The State of New Hampshire monitors two Town conservation areas over which they hold easements: Wiggins Farm and Dearborn Conservation Areas. The Town of Newmarket also holds Executory Interests on four conservation properties. See Appendix B for details about properties with conservation easements or executory interests.

Zoning Ordinance Protections

There are a variety of land use planning tools that can be used to both acquire and protect natural resources. These typically are designed as zoning overlay districts that may apply town wide or to select areas. A zoning overlay district is a zone that imposes additional restrictions to the underlying district. Newmarket has chosen to apply overlay zones in specific areas that need additional protection to protect the public health and welfare as well as town resources. The following overlay districts and open space subdivision ordinance have been established to protect our natural resources.

Open Space Subdivisions

The Newmarket Zoning Ordinance includes [Article 6: Residential Open Space Design Development by Special Use Permit](#). The intent of this provision is to allow an alternative residential development option that preserves larger areas of open space than conventional subdivisions. The open space design subdivisions are currently allowed in zoning districts R1, R2, and M-4 and require a special use permit. The open space must be designated as such on the approved and recorded subdivision plan. More than 510 acres have been designated as open space associated with these subdivisions. Most of these lands are owned by a homeowner's association and are only open to the residents of that subdivision. See Appendix B for details about the existing subdivisions with open space.

Aquifer Protection Overlay District

The [Aquifer Protection Overlay District](#) adds a layer of protection for groundwater supplies and recharge areas critical to drinking water supplies. The ordinance operates by restricting uses and the intensity of development that could introduce harmful contaminants into groundwater supplies. While the overlay district does not create or set aside open space land, it does ensure natural resources are protected for public benefit. The aquifer protection area includes all land identified as stratified drift aquifer near Newmarket Plains (along NH Route 152, Lee Hook Road, Langs Lane, and Ash Swamp Road) as well as designated wellhead protection areas.

Shoreland Protection Overlay District

The companion to the Aquifer Protection Overlay District, the [Shoreland Protection Overlay District](#), aims to conserve and protect surface water quality. Newmarket, home to the Great Bay, Lamprey and Piscassic Rivers, and other water bodies,

adopted this overlay district to reduce pollution, prevent degradation, and protect fisheries, among other water resource protection goals. It also aims to ensure the surrounding land uses are complementary to the water's health, by maintaining and improving adjacent forests, habitat, and buffers. The ordinance applies to all tidal waters of Great Bay, the Lamprey River and Lubberland Creek, the non-tidal portion of the Lamprey River, the impoundment above the Macallen Dam, and the Piscassic River. To create these protections, primary structures must be at least 125' away from the shoreline and uses such as salt storage sheds, junkyards, and hazardous waste facilities, and chemicals are prohibited within 250' of the shoreline.

Wetland Protection Overlay District

Wetlands provide a host of ecological and water resource benefits, natural beauty, and recreation opportunities for the community. They help to filter contaminants before they reach water supplies, retain water during floods, and prevent shoreline erosion from stormwater. The [Wetland Protection Overlay District](#) sets no-disturbance buffers around wetlands and poorly drained soils with a goal of protecting their many functions and qualities. These buffers range from 25 to 100 feet for buildings and an additional distance for septic systems.

Class A Watershed Protection Overlay District

This [overlay district](#) originally adopted in 1996 and last updated in 2017, requires septic systems to be set back 150 feet from the Piscassic River and Follett's Brook, protecting these Class A surface waters.

Steep Slope Protection Overlay District

The [Steep Slope Protection Overlay District](#) requires additional protections be put in place prior to construction where slopes are equal to or in excess of 25 percent to minimize erosion and runoff that could be exacerbated by disturbance. Construction of new roads is also discouraged on steep slopes.

Floodplain Protection Overlay District

The [Floodplain Protection Overlay District](#), safeguards floodplains from development that could "aggravate flooding," residents from building in high risk areas that could require emergency rescue during a flood, and maintains wildlife habitats.

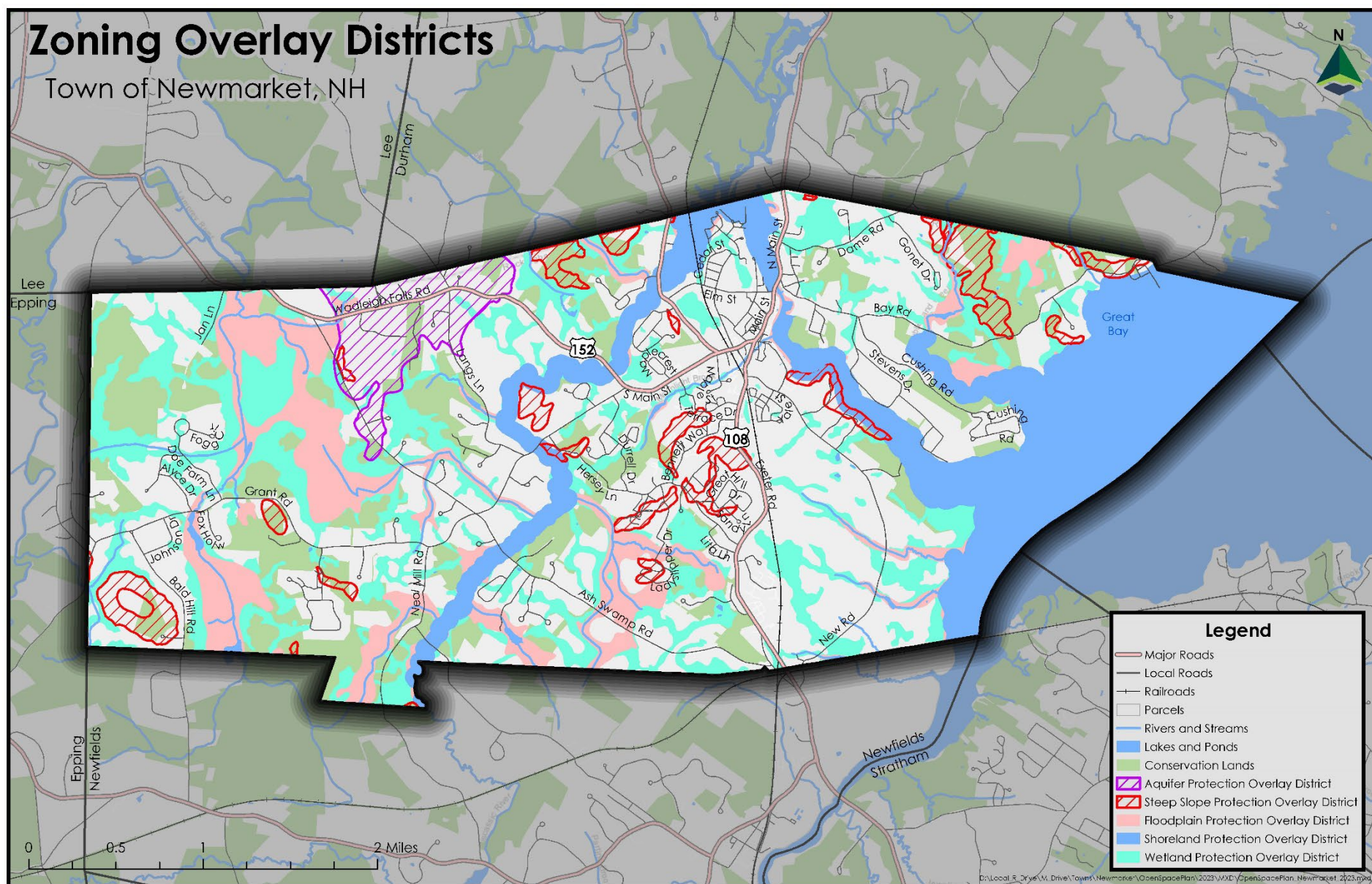
Newmarket's ordinance exceeds the minimum requirements of the National Flood Insurance Program. Throughout most all of Newmarket, new buildings or expansions to existing buildings may not occur within the floodplain, protecting these valuable lands. The exception is within the M-1 or M-2 zoning districts, the mills and downtown, where construction must be "floodproofed" and approved by the town's building official.

Transfer Development Rights

This innovative zoning tool can be used to generate conservation funds, protect natural resources and balance the need for conservation and development. A Transfer of Development Rights (TDR) Ordinance works by selling development rights in a "sending zone" or area designated for protection to a "receiving zone" where development is preferred. Locally, Dover, NH has a TDR that could serve as a model for Newmarket. Dover has designated zones where development is better suited and those where there are sensitive natural resources ideal for conservation. Developers can either directly conserve land in these "sending zones" or they may purchase credits in exchange for increased density allowances in the "receiving zones." This latter option is used as a funding mechanism for the Conservation Commission to make strategic land purchases in support of their open space goals.

Subdivision and Site Plan Review Standards

In addition to Zoning Ordinances provisions and Transfer of Development Rights, municipalities have a third land use tool to encourage private development of recreation and open space. State Statute, RSA 674:36 provides the framework for subdivision regulations. Through this mechanism planning boards can adopt regulations that call for open spaces, parks, and playgrounds that fit within a larger development proposal. RSA 674:44 that governs site plan review regulations is not as specific and therefore planning boards are limited to providing open spaces that meet needs for the health, safety, convenience, and prosperity of the community.



Education

Educational programs on conservation and environmental topics are important and helpful in sharing information, building support, receiving input, and engaging volunteers in Newmarket's open space conservation goals. Most people support conservation and might be interested in volunteering their time or doing things differently if they knew what to do. Inviting residents to learn about the natural features, conservation lands, public trails, and other conservation efforts is important in building an ecologically and economically sustainable community.

Newmarket is fortunate in having multiple ways for people to learn about our open spaces and conservation. All monthly meetings of town boards and commissions are broadcast live and can be viewed later. A weekly electronic newsletter offers space to highlight events, news, and other helpful tips and information about current issues and activities. We host workshops and field trips and invite guest speakers to monthly meetings. Larger community events—such as the Backyard Bash and OysterFest—provide opportunities to reach people of all ages. The Conservation Commission webpages include information on town conservation areas, trails, and other open space and related environmental information.

Land Stewardship

The Newmarket Conservation Commission and Department of Public Lands steward the town conservation areas with the help of volunteers. This includes managing habitats (e.g., mowing fields, controlling invasive plants), maintaining trails, installing welcome kiosks, creating interpretive signage, caring for parking areas, and other maintenance. We encourage people to access and enjoy Town conservation areas. As more people seek to get outside, it is important to care for these lands for the benefit of nature, to keep them safe and accessible for visitors.

Newmarket continues to benefit from volunteers and conservation partners. Local Scout Troops have helped build and re-route trails and install signs, benches, and other infrastructure. Residents from Newmarket and neighboring towns have participated in volunteer stewardship workdays to clean up trails, parking areas, and roadsides, repair bridges, and related projects. Recently we've partnered with the Newmarket High School as part of Newmarket Cares Day to spend a morning fixing up town conservation areas. The UNH Nature Groupie program has provided summer interns, an online calendar for posting volunteer workdays, and a stewardship toolshed where we can borrow hand tools for our volunteer workdays. Newmarket DPW and the Conservation Commission work closely on stewardship-related tasks as needed.

Newmarket's Conservation Fund, Schanda Park Fund, and General Fund have been used to fund various land stewardship projects on town lands. We have also benefited greatly from a partnership with the Lamprey River Advisory Committee (LRAC), which has funded several projects including kiosks and interpretive signs at Schanda Park, Heron Point Sanctuary, Sliding Rock, and Wiggin Farm. The NH Fish and Game Small Grants Program has helped with stewardship on the Wiggin Farm Conservation Area.

Conservation Focus Areas -- 2024

Coastal Watershed Conservation Plan

The [2021 Coastal Watershed Conservation Plan](#) produced by The Nature Conservancy, identified priority conservation focus areas for all the towns in the coastal watershed. The Plan utilized several spatial datasets from existing state and regional plans, representing the following categories: wildlife and habitat, water resources, climate adaptation, and agricultural resources. Thus, the resulting recommendations represent a comprehensive regional vision for a balanced network of conservation focus areas that seeks to protect natural systems and create resilient communities, recognizing that a coordinated regional approach is necessary to protect ecosystems and associated habitats that cross political boundaries. The Plan also considered the need for economic development and growth across the watershed, integrating this delicate balance into its results. Figure 14 shows the Coastal Conservation Plan Focus Areas for Newmarket.



Figure 13: Conservation Commission members work with volunteers to improve trail access at Wiggin Farm

Photo by Ellen Snyder

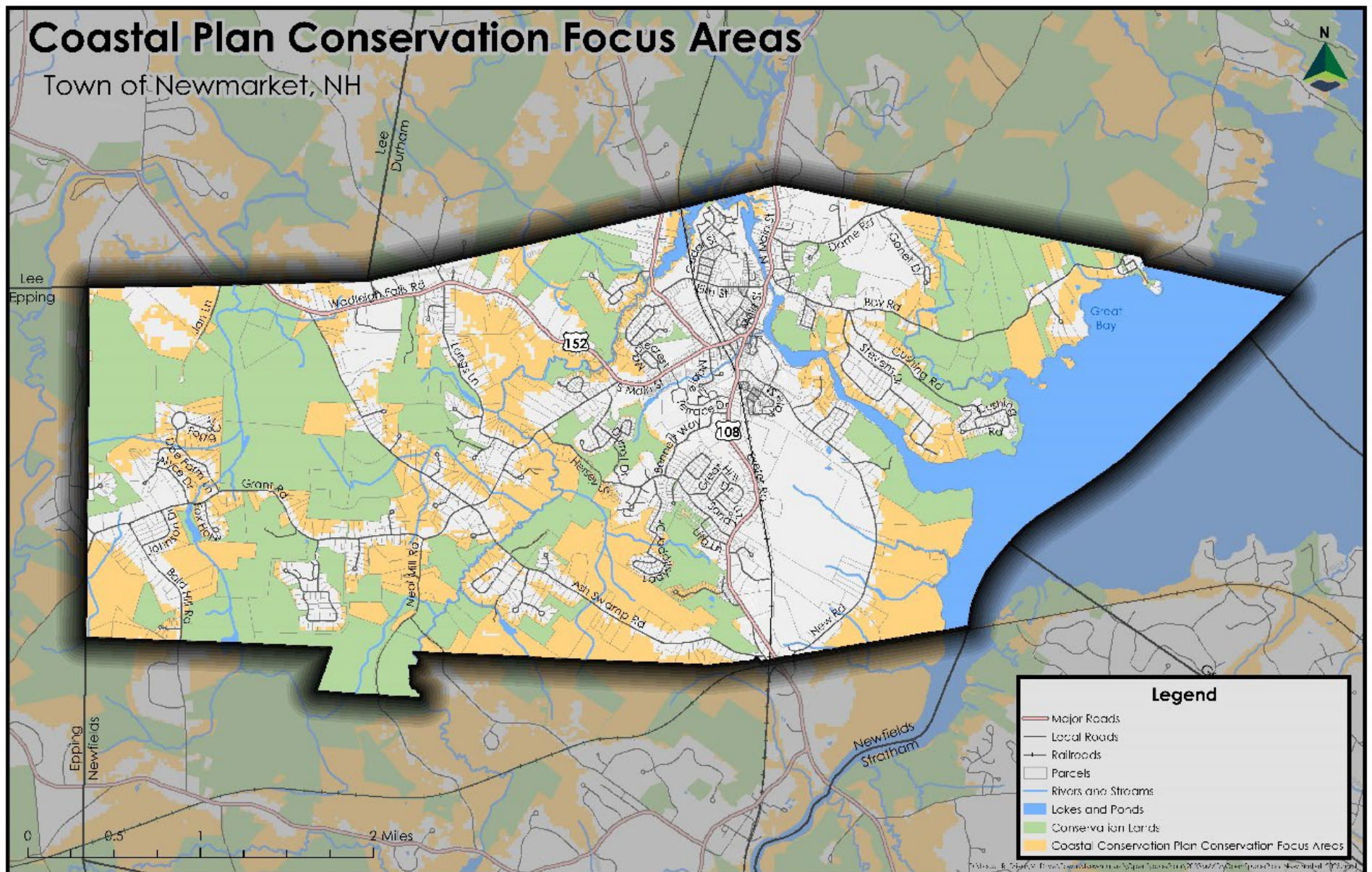


Figure 14: Conservation Focus Areas, NH's 2021 Coastal Conservation Plan, The Nature Conservancy

Cooccurrence Mapping

Similar to the Watershed Conservation Plan, the co-occurrence mapping analysis identified locations where several natural resources were present. In the following maps, the darker the color gradients indicate resource rich areas. Two different analyses were prepared to help identify high value natural resource (Figure 15) and drinking water areas. Each incorporates the following resources:

Land Resources

- Agricultural Lands
- Forest Lands
- Conservation Lands
- Conservation Focus Areas
- Farmland Soils
- Flood Zones
- Poorly Drained Soils
- Wetlands
- Prime Wetlands
- Prioritized Habitat Blocks
- Wildlife Corridors
- Rivers and Streams
- Waterbodies
- Unfragmented Lands
- Wildlife Action Plan Habitat Tiers

Water Resources

- Rivers and Streams
- Waterbodies
- Wetlands
- Prime Wetlands
- Designated Rivers
- Groundwater Reclassified Areas
- Source Water Protection Areas
- Stratified Drift Aquifers
- Wellhead Protection Areas
- Flood Zones
- Shoreland Protection Areas

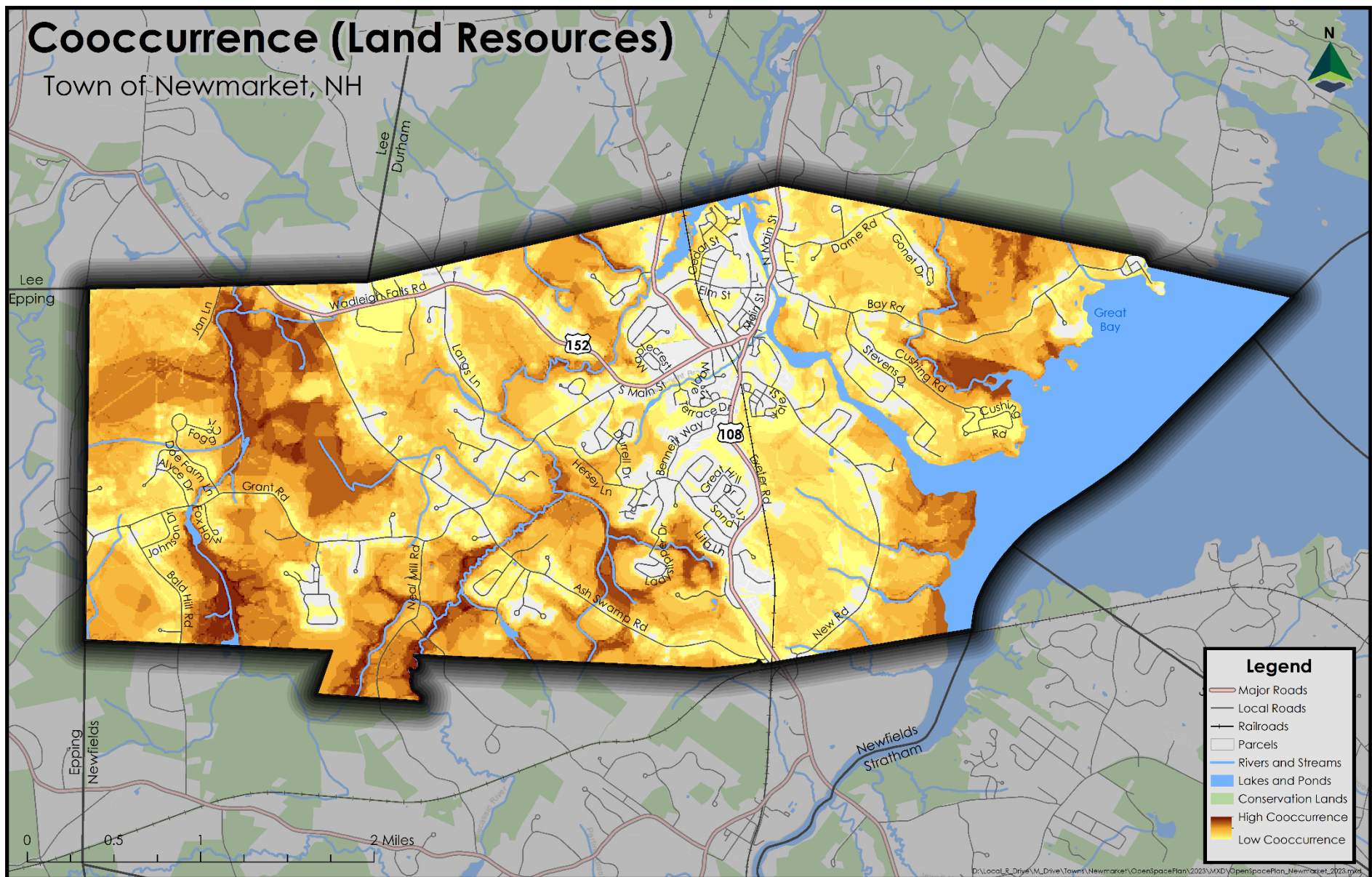


Figure 15: Cooccurrence of Natural Resources

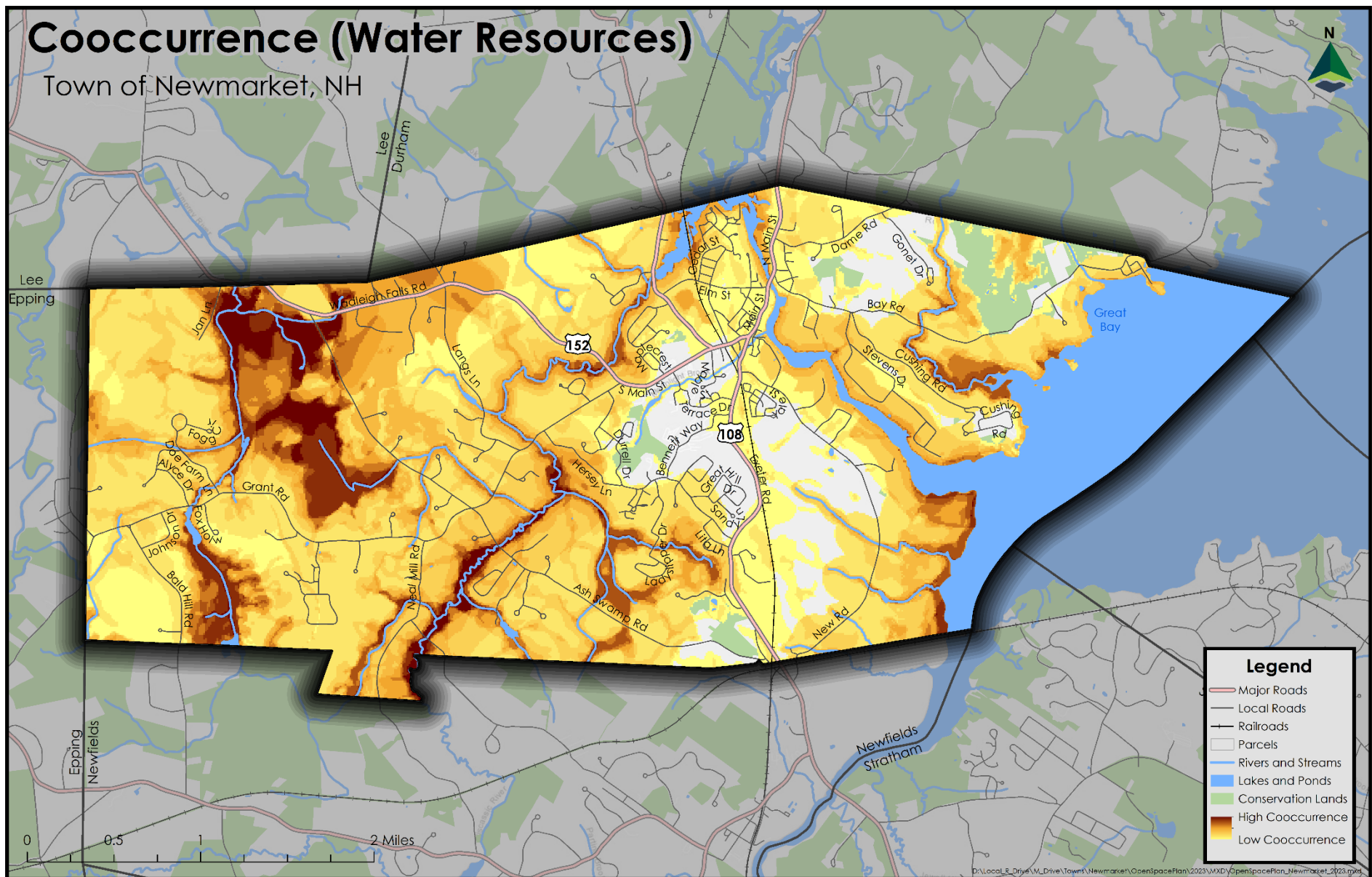


Figure 16: Cooccurrence of Water Resources

The Benefits of Open Space

There are many reasons for our community to continue to work with interested landowners and conservation partners to protect important natural places. These include:

- **Recreation and Health:** Exposure to nature reduces stress, anxiety, and depression. Spending time in the outdoors—hiking, birding, snowshoeing, running, dog-walking, or other ways to enjoy natural places—improves our mental and physical health. Conserved lands such as Wiggin Farm offer places for respite and relaxation. Public and private conservation lands in Newmarket offer trails for outdoor enthusiasts including the Sweet Trail, Piscassic Greenway, Follet's Brook, Wiggin Farm.
- **Clean Drinking Water:** Every resident in Newmarket depends on groundwater for their drinking water supply. The Town maintains four municipal wells serving approximately 50 percent of Newmarket's residents. Spanning approximately 410 acres, the Town's most productive groundwater resource and primary drinking water source is a stratified drift aquifer known as the Newmarket Plains Aquifer. The remainder of the town relies on private wells or small community wells. Land uses on the surface impacts our ability to protect the quality and safety of our drinking water. Conserving land around the municipal wells and over aquifers throughout town is still one of the best strategies for protecting current and future water supplies.
- **Flood Control and Storage:** Maintaining natural areas, especially wetlands and floodplains, helps absorb flood waters and slow the release of water to minimize excessive runoff. Several conservation areas, with frontage along rivers or encompassing large wetlands, are especially critical for flood storage: Piscassic River-Loiselle Conservation Area and the Silverman-Schneer Conservation Easements along the Piscassic River and the Wiggin Farm Conservation Area at Tuttle Swamp.
- **Minimizes Impervious Surfaces:** Development Increases the amount of impervious surfaces (rooftops, sidewalks, roads, and parking lots), contributing to higher volumes and rates of stormwater runoff. Currently, Newmarket has 599.95 acres or 6.61% of the Town covered by impervious surfaces; natural systems begin to degrade at 10% impervious. The increased flows from impervious surfaces can carry excess nutrients, heavy metals, oils, and other pollutants into our waterways. Increased runoff also exacerbates sedimentation and erosion. Green spaces--

including natural riverfronts, in-town parks and gardens, and larger conservation areas—integrated into developed spaces, helps minimize the impact of developed spaces.

- **Habitat and Connectivity for Plants and Animals:** Large tracts of habitat, unbroken by roads, houses, or other development, are becoming increasingly rare in southeastern New Hampshire. In the larger blocks with a diversity of interconnected woods and wetlands provides secure travel corridors for wide-ranging wildlife such as bobcat, fisher, bear, and moose. Songbirds, small mammals, and other wildlife are less susceptible to mid-sized predators that do well in human landscapes, including fox, raccoon, skunk, and domestic cats. Fewer fragmenting roads also means fewer road-killed snakes, turtles, small mammals, and deer. Newmarket's remaining large tracts still harbor some rare plants and unusual plant communities.
- **Healthy Forests:** Forests offer shade and cooler temperatures for people in the heat of summer, [combating the urban heat island effect](#), and provide similar benefits to aquatic life. Forests provide lumber, firewood, and other products; offer watershed protection by purifying air and water and preventing erosion; serve as carbon sinks, critical in efforts to confront the impacts of anthropogenic climate change.
- **Local Food:** People are interested in buying or growing fresh, local foods. Farmstands, community gardens, community-supported agriculture (CSAs), and farmers markets all depend on local or regional open space. Conserving lands with good farm soils and farming opportunities provides many of the other benefits listed here.
- **Coastal Resilience:** Relative sea level (RSL) is rising in coastal New Hampshire. Tide gauges off the coast indicate relative sea level in southern New Hampshire rose 8 inches from 1912 to 2018, and this trend is expected to continue. Coastal and inland impacts from storm surge will increase with relative sea level rise. As extreme weather events increase in frequency and intensity, storm surge will also increase, causing rising groundwater levels and the potential for saltwater intrusion. Protecting our salt marshes along Great Bay, as well as the ability for salt marsh migration, builds coastal resiliency in our community.

Our Priority Conservation Areas

As presented in the NH Coastal Watershed Conservation Plan Focus Area Map for Newmarket (Figure 14), many areas of ecological significance remain unprotected from future development or other land use changes. This is a testament to both the biologically rich Newmarket landscape and water supplies, and that many landowners have continued to steward their land as open space. As development pressure continues apace, the Conservation Commission identified five focus areas that warrant dedicated efforts to ensure that they continue to provide the benefits critical to Newmarket's sustainability and economic and environmental health. These five regions encompass areas identified in the Coastal Plan and all support significant wildlife habitat values as shown in the NH Wildlife Action Plan Map (Figure 1) and vital drinking water resources. Of paramount importance in seeking opportunities to conserve additional lands within these focus areas, is the willingness and interest among landowners within these areas in partnering on conservation options.

Bald Hill Region

Bald Hill, at 276 feet, is the highest point in Newmarket. Located in the southwest corner of Town, the Bald Hill region hosts upland forests, hayfields, large wetlands that flow toward Tuttle Swamp, important wildlife corridors, connectivity to other conserved lands, and habitat for hundreds of rare and common animals and plants. Successful land conservation projects have been completed—with more ongoing—through partnerships with landowners, the Southeast Land Trust, NH Fish and Game, and the Town of Newmarket, among other funding entities. Bald Hill Road is one of the most scenic drives in this area and it is popular with runners, cyclists, dog-walkers, and others that enjoy the scenic backdrop of forests and fields.

Ash Swamp Road East

A large wetland system and tributary to the Piscassic River is located on either side of Ash Swamp Road between Grant Road and Route 108. This ecologically significant area extends into Newfields. It supports populations of rare and common turtles, among other wildlife. The connectivity along this tributary is severed by Ash Swamp Road, leading to significant mortality of turtles annually. The Newmarket Conservation Commission, Public Works and Engineering, and Planning Department are collaborating with NH Fish and Game to implement an improvement aquatic passage that would provide a safer crossing for wildlife, including the turtles. Conserving the lands and waters in this region with interested landowners would complement the efforts to create a better road/wetland interface.

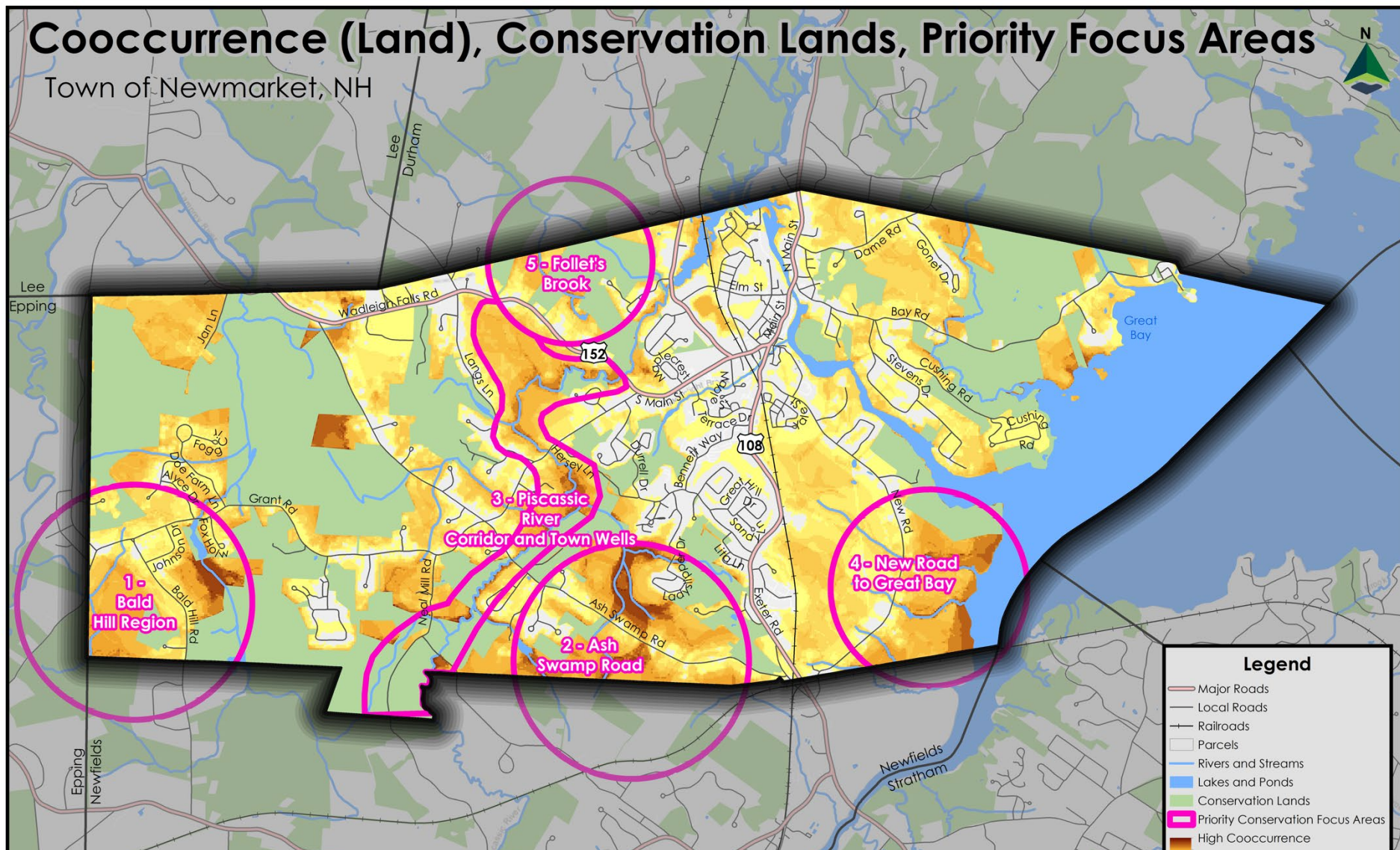


Figure 17: Priority Areas, Land Resources Cooccurrence Conservation Land

New Road to Great Bay

The Great Bay Estuary is nationally recognized and designated as the Great Bay National Estuarine Research Reserve. The region of Newmarket between New Road and the Bay is still one of the largest blocks of undeveloped land in Town and on the Bay. It also harbors the largest contiguous stretch of salt marsh in Newmarket and offers opportunities for salt marsh migration landward as sea levels rise. This area connects ecologically with conserved lands located across the Squamscott River and Great Bay in Stratham. Several unnamed tributaries flow under New Road and into the Bay, highlighting the importance of protecting the ecological health of these small streams to protect the health of the Bay.

Piscassic River Corridor and Town Wells

The Piscassic River is the largest tributary that flows into the Lamprey River and the lower portion of the watershed is entirely within Newmarket except at the point where it flows into the Lamprey in Durham. The Southeast Land Trust and the Town of Newmarket have protected significant Piscassic River frontage and associated riparian areas and floodplains in the Neal Mill Road region of Newmarket. The entire river corridor is important for protecting water quality, easing floodwaters, preventing runoff and erosion, maintaining wildlife connectivity, maintaining water temperatures and habitat for aquatic life. The river corridor and intersecting large blocks of undeveloped land also help protect Newmarket municipal wells.

Follett's Brook

Follett's Brook flows southeasterly from Durham and joins up with the Piscassic River just above the Packers Falls Road dam. The lower third of Follett's Brook watershed is within Newmarket. Prior to 1990, this brook was the principal municipal water supply source with treatment provided at the Packers Falls Road Water Treatment Plant. In the 1990s, Newmarket ceased withdrawing from Follett's Brook and now relies entirely on groundwater wells for public drinking water. Follett's Brook remains a largely intact waterway with significant natural buffers and much of the watershed in Durham and Newmarket is conserved. Several critical parcels, if conserved, would provide additional protection to the water and wildlife in this watershed. Additionally, the Conservation Commission is evaluating opportunities to create trail connectivity between Newmarket and Durham through this region.

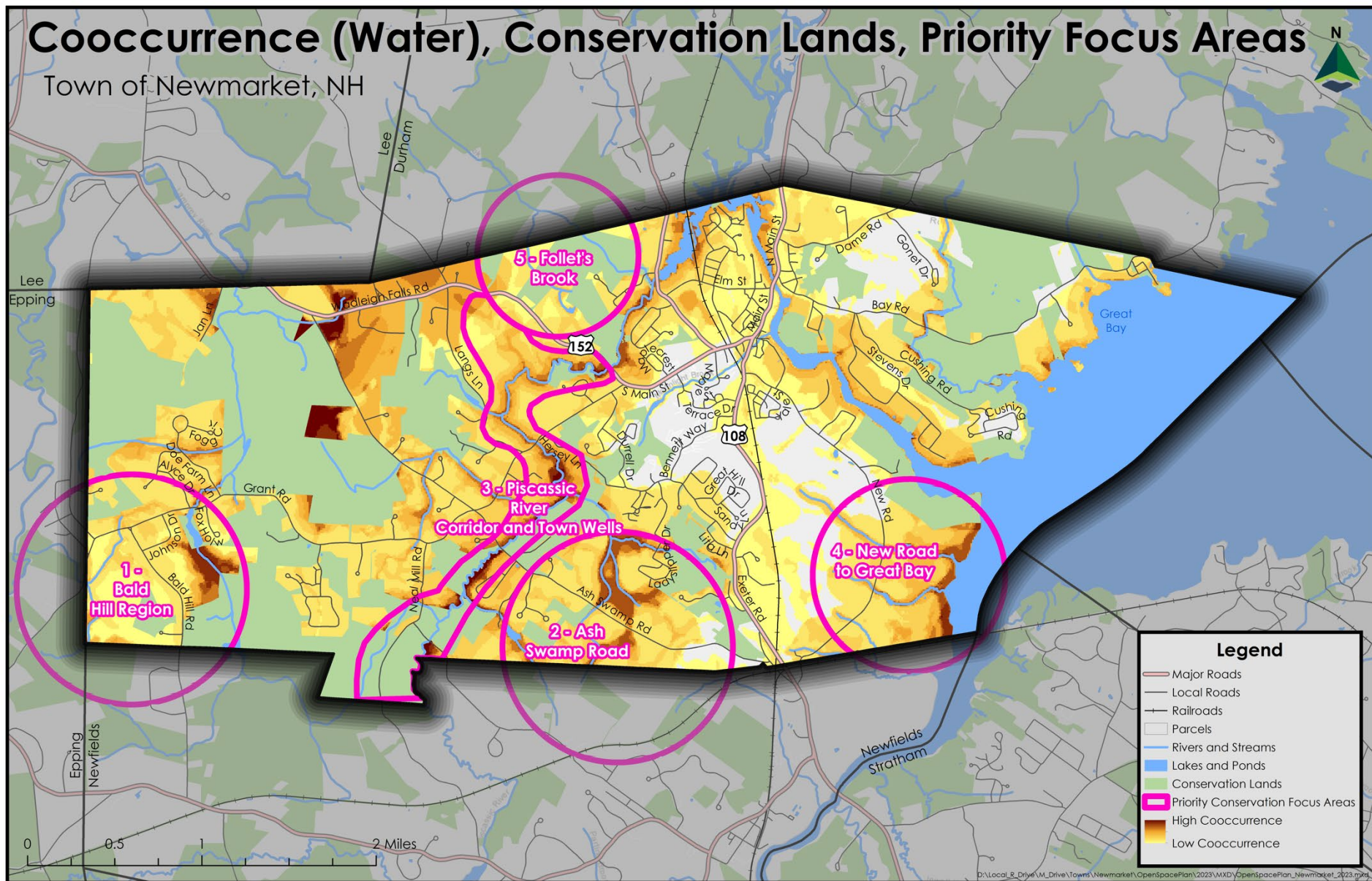


Figure 18: Priority Areas, Water Resources Cooccurrence Conservation Land

Newmarket Plains Aquifer

One area of Town not included in one of the five focus areas above is the Newmarket Plains Aquifer. This area includes the Municipal Bennett Well and the Sand and Gravel Operations in the Route 152 northwest region of Newmarket. This is a major gateway to Town and although town sewer and water don't currently reach that far, this area will likely be a prime development area in the future. Given its location over Newmarket's largest aquifer and proximity to the ecologically significant Tuttle Swamp ecosystem and the Lamprey River, this area will require careful and creative development. The Aquifer Overlay District affords some protections to this sensitive area. Additional attention to incorporating green space, trail connectivity, water quality protection, and other measures is warranted for this area.

Land and Water Conservation Goals and Actions

Key components in this Open Space Plan will be incorporated into the Land and Water Conservation Chapter as part of the Master Plan Update. The Master Plan includes an Implementation Guide that describes goals, actions, timeline, responsible party, partners, and potential funding sources as needed. The goals and actions related to land and water conservation are summarized below and relate to the information presented in the above sections.

Protect Drinking Water

- Educate community members on ways to protect drinking water sources and source water protection areas from harmful land uses and contamination.
- Utilize innovative use planning and conservation tools to provide additional protection to the Aquifer Overlay District and Wellhead Protection Areas.

Protect Surface Waters and Wetlands

- Restore the water quality and natural conditions (where feasible) of Moonlight Brook. Utilize living shoreline and other green infrastructure to the maximum extent practicable.
- Maintain, and restore where needed, natural buffer areas along the Lamprey and Piscassic Rivers, Follett's Brook, Lumberland Creek, and other unnamed tributaries.
- Protect freshwater wetlands including buffers and floodplains using land use planning tools such as the Wetlands and Floodplain Overlay Districts and educational materials and outreach.
- Update Newmarket's prime wetlands maps and maintain a higher degree of protection on prime wetlands.
- Protect salt marsh along Great Bay and explore opportunities for salt marsh migration amid sea-level rise.
- Maintain involvement in committees related to the Wild & Scenic Lamprey River and its Watershed.
- Work with surrounding towns to update maps of vernal pools.

Restore Aquatic Passage and Stream Connectivity

- Building on the success of the Lubberland Creek culvert upgrade on Bay Road, collaborate among Town Departments and Boards and conservation partners, to improve stream crossings and restore aquatic connectivity where needed throughout Newmarket.
- Use the NH Aquatic Restoration Mapper to assess all road crossings/culverts and town roads. Set priorities for restoring/upgrading aquatic passage.
- Create safe turtle crossings by improving stream flow and passage at Ash Swamp Road by replacing existing culverts, adding fencing, and other infrastructure including highway speed slowing techniques.

Protect and Connect Priority Lands

- Dedicate 100% of the Land Use Change Tax (LUCT) to the Conservation Fund.
- Work with interested landowners and conservation partners to conserve the lands and waters within the Newmarket Priority Conservation Focus Areas.
- Protect habitat corridors and enhance connectivity of open spaces and priority lands across Newmarket and abutting municipalities.
- Utilize innovative use planning, education, and conservation tools to protect lands and waters within the NH Coastal Watershed Conservation Focus Areas.
- Dedicate tax lien properties abutting existing conservation lands or within conservation focus areas as conservation areas to enhance existing network of conservation land.

Steward Town Conservation Lands

- Implement (and update as needed) Management Plans for Town conservation areas, including Wiggin Farm Conservation Area, Piscassic River-Loiselle, Heron Point Sanctuary.
- Maintain accurate records of all town-owned conservation areas, town-held conservation easements and town-held executory interests.

- Monitor town-held conservation easements annually and participate in annual monitoring by State of NH of Wiggin Farm and Dearborn Conservation Areas.
- Update the NH GRANIT conservation lands layer as needed; ensure that new subdivision open space is similarly updated when created.
- Maintain property and educational information on the Newmarket Conservation Commission webpages.
- Maintain infrastructure at town conservation areas including parking areas, entrance signs, information kiosks, interpretive signage, and related features.
- Review the Town Ordinances and Resolutions that pertain to use of conservation lands to ensure that the ordinances are consistent with the purposes for which the land was conserved.
- For town conservation areas with multiple tax parcels, work with the Planning Department to merge lots to create one tax parcel. This includes Tuttle Swamp Conservation Area, Lita Lane, and Follett's Brook.
- Work with the Riverbend and Mastin Road neighborhoods to identify ways to manage the pocket parks in these neighborhoods and evaluate opportunities for trail connectivity.
- Conduct a Natural Resource Inventory of the Town's Follett's Brook properties to assess ecological significance and opportunities for expanded trail network. Partner with NH Audubon and their Follett's Brook sanctuaries.

Promote Sustainable Land Use

- Promote Pollinator-Friendly Habitats, especially native plants, and notably such habitat improvements that can be made to public spaces such as schoolyards, traffic islands, and pocket parks.
- Incorporate lists of recommended and prohibited plant species into Newmarket's Site Plan & Subdivision regulations.
- Implement all feasible stormwater management practices to prevent and minimize runoff that contains contaminants and causes erosion.
- Require open space design development for residential subdivisions.
- Continue to support a balance between affordable housing needs and conservation priorities. Support housing in-fill and other locations that are not ecologically significant or within Conservation Focus Areas. Encourage inclusion of sidewalks, green pathways, pocket parks as part of new developments or redevelopments.
- Consider adopting a roadside Japanese knotweed control plan, to reduce the environmental and safety issues with this invasive plant.

Revitalize Downtown Riverfront

- Enhance Newmarket's waterfront. Evaluate ways to improve the Newmarket riverfront for people, restore a living shoreline to prevent further erosion, and restore the health of Moonlight Brook as it flows into the Lamprey River at Schanda Park.
- Maintain safe and accessible boat access to the Piscassic and Lamprey Rivers while maintaining scenic quality.
- Educate residents and visitors on best practices along riverfront, such as not feeding wildlife, respecting private property, etc.

Create Trail Networks

- Create safe routes and connectivity, where feasible, for hiking, biking, horseback riders, and other trail users, within Newmarket and between neighboring communities.
- Develop policy that requires integration of trails and green spaces into new developments and ensures maintenance of existing and proposed natural amenities.
- Explore opportunities to develop trail connectivity among Follet's Brook properties, connecting Newmarket and Durham.
- Explore ways to create safe pathways for pedestrians and cyclists from downtown to conservation areas such as Heron Point Sanctuary and Piscassic River-Loiselle Conservation Area.
- Utilize Strafford Regional Planning Commission's (SRPC) pedestrian counters and traffic counters to monitor usage of trails and town parks and conservation areas.

Appendix A: Land Acquisition Criteria Evaluation

(follows)



Town of Newmarket Conservation Commission Land Acquisition Criteria Evaluation (LACE)

Tax Map and Lot: _____ Parcel Size: _____

Property Owner: _____

Property Address: _____

Financial Considerations: ☐ Parcel or Conservation Easement (CE) to be donated by owner
☐ Significant bargain sale
☐ Owner needs full appraised value

Purpose: The Newmarket Conservation Commission has adopted the following evaluation criteria for protecting and preserving important parcels of land for the future benefit of the residents of Newmarket.

Potential Benefit	Reference	Condition
1. Abuts existing Conservation Land	Newmarket GIS; Open Space Plan Map 2	☐ Directly abuts existing Conservation Land
		☐ Does not abut existing Conservation Land
2. Conservation Focus Areas (CFA)	Open Space Plan Map 1	☐ Includes land identified as a CFA
		☐ Does not include land identified as a CFA
3. Agricultural Resources	NH Coastal Watershed Conservation Plan	☐ Includes a Priority Agricultural Resource (PAR)
		☐ Adjacent to a PAR
		☐ Meets none of the above
	Discussion with Property Owner	☐ Currently a working farm
4. Drinking Water Protection (groundwater)	Newmarket GIS; NHDES; Open Space Plan Map 3 & 6	☐ Parcel within Aquifer Protection Overlay
		☐ Parcel within Source Water Protection Area
		☐ Parcel within Wellhead Protection Area
		☐ Meets none of the above
5. Surface Water Quality	Newmarket GIS; NH Coastal Watershed Conservation Plan; Open Space Plan Map 6	☐ Area has river frontage
		☐ Area has surface water or wetland present
		☐ Area has vernal pools present
		☐ Area has Prime Wetland present
		☐ Area has salt marsh present
		☐ Area has salt marsh migration potential
		☐ Area is within 100 year floodplain

Potential Benefit	Reference	Condition
		☐ Project does not have surface waters
6.	Wildlife Habitat Quality	Wildlife Action Plan; Open Space Plan Map 4
		☐ Area contains Highest Ranked Habitat in NH
		☐ Area contains Highest Ranked Habitat in Region
		☐ Area contains Supporting landscape
		☐ None
7.	Wildlife Corridor	Connect the Coast
		☐ Area contains a Wildlife Corridor
		☐ Area close to a Wildlife Corridor
		☐ No Wildlife Corridor identified
8.	Public Access	Discussion with Stakeholders
		☐ Unlimited public access to project area
		☐ Gain of public access to project area
		☐ Improvement to trail connectivity
		☐ No public access to project area
9.	Scenic Views (visible from public roadways, public trails or waterways)	Site Walk
		☐ Parcel features extensive Scenic Views
		☐ Parcel exhibits some Scenic Views
		☐ No Scenic Views
10.	Unique Ecological & Cultural Features	(vernal pools, exemplary natural communities)
		☐ Unique ecological features present
		☐ Area has New Hampshire Heritage Bureau rare species present
		☐ Unique cultural features present
		☐ Unique historical features or values present
		☐ No unique features
11.	Funding Leverage	Discussion with Stakeholders
		☐ Funding leverage associated with project
		☐ Potential funding leverage with project
		☐ Donation associated with project
		☐ No funding leverage with project
12.	Development Threat	Discussion with Stakeholders
		☐ Project under immediate development threat
		☐ Project under potential development threat
		☐ Project not under immediate development threat
13.	Property Size	Newmarket GIS
		☐ Conservation value would not be diminished if adjacent properties are developed.

Potential Benefit		Reference	Condition
			☐ Conservation values would be diminished if adjacent properties are developed.
14.	Aligns with Open Space or Master Plan Goals	Open Space Plan; Land & Water Conservation Master Plan	☐ Project aligns with goals or does not conflict with Plans
			☐ Project does not align with goals
15.	Stewardship	Discussion with Stakeholders	☐ Project does not present stewardship or land management challenges
			☐ Project presents stewardship or land management challenges

Appendix B: Conservation and Open Space Lands

Table 2: Town Owned Conservation Land

Conservation Area	Size (Acres)	Date Acquired	Tax Map Lot #	Location	Recorded Deeds	Recorded Plans (Surveys)
Dearborn	38.09	2016-11-14	R6, Lot 27	206 Grant Rd	Quitclaim Deed Dearborn to Town: BK 5772 PG 2831 (11/14/2016) CE Deed Dearborn to NHFG: BK 3466 PG 378 (4/10/2000) Driveway ROW Deed Newmarket to Hyland: BK 6492 PG 1355 (7/3/2023)	D-27921 (3/22/2000)
Follet's Brook-Leary	10	2004-05-14	U1, Lot 17-1	57 Packers Falls Rd	Warranty Deed Leary to Town: BK 4291 PG 2483 (5/14/2004)	D-31597 (4/1/2004)
Follet's Brook-Rousseau	9.4	2005-02-03	U1, Lot 20	67R Packers Falls Rd	Warranty Deed Rousseau to Town: BK 4433 PG 1818 (2/3/2005) Warranty Deed Town to Casella, Lot 20-1 BK 4633 PG 2614 (3/27/2006)	D-33023 (9/8/2005)
Follet's Brook-Szacik	0	2005-12-16	originally part of U1, Lot 21	Packers Falls Rd	Warranty Deed Szacik to Town: BK 4596 PG 0242 (12/16/2005)	D-33023 (12/16/2005)
Follet's Brook - Trotter Park	0.63	1990-02-01	U1, Lot 88	0 Mastin Drive	Warranty Deed VMJ Enterprises to Town: BK 2825 PG 1418 (2/1/1990)	D-16753 (7/30/1987)
Follet's Brook - Trotter Park (Carolyn Drive)	8.49	1993-04-15	U1, Lot 96	12 Carolyn Dr	Warranty Deed VMJ to Town: BK 2977 PG 0372 (4/15/1993)	D-20528 (6/1/1989) D-20287 (12/1/1988)
Follet's Brook - Waterworks	9	1915-11-10	U1, Lot 97	2 Carolyn Drive	Deed Green to Newmarket Water Works: BK 700 PG 32 (1915-11-10)	D-16753 (7/30/1987)
Follet's Brook - Waterworks	14	1894 to 1938	U1, Lot 16	Follet's Brook	Deed Mathes to Newmarket Water Works: BK 940 PG 87 (1938-02-12) Deed Knight to Newmarket Water Works: BK 719 PG 224 (1918-01-30) Deed Wiggins to Newmarket Water Works: BK 636 PG 382 (1908-02-26) Deed Green to Newmarket Water Works: BK 700 PG 32 (1915-11-10) Deed Wiggins to Newmarket Water Works: BK 543 PG 272 (1894-09-01)	Oct 1946 Plan by Weston and Sampson Engineers

Conservation Area	Size (Acres)	Date Acquired	Tax Map Lot #	Location	Recorded Deeds	Recorded Plans (Surveys)
Piscassic River-Loiselle Conservation Area	45.3	2003-07-28	R5, Lot 91-2	270 Wadleigh Falls Rd	Warranty Deed Loiselle to Town: BK 4100 PG 2110 and BK 4100 PG 2114 (7/28/2003) LCHIP Executory Interest Deed: BK 4100 PG 2123 (7/28/2003)	D-30811 (7/1/2003)
Heron Point Sanctuary	32	1996-12-31	R2, Lot 119	14 Heron Point Dr	Quitclaim Deed and Conservation Restrictions Klein and Parker to Town: BK 3193 PG 1697; Town merged lot lines: BK 3289 PG 2637 (5/5/1998)	D-19531 (7/1/1989)
Lita Lane	19.5	1984-01-23	R3, Lot 30-47	1 Pembroke Drive	Confirmatory Warranty Deed from Gouchberg to Town: BK 2477 PG 20 (1/23/1984)	D-7938 (5/1/1978) and D-7939 (9/1/1977)
Lita Lane	~8.5	1999-11-04	R3, Lots 30-9, 30-10, 30-19 through 30-36	Pembroke Dr, Brandon Dr, Lita Lane	Tax Collector Deed from Gouchberg to Town: BK 3435 PG 1587 (11/4/1991)	D-7938 (5/1/1978) and D-7939 (9/1/1977)
Riverbend	5.46	1988-03-29	U1, Lot 1-1P	7 Packers Falls Rd	Deed from American Land Development Corp to Town: BK 2732 PG 2207 (3/29/1988) Deed from American Land Development Corp to Town: BK 2684 PG 1722 (6/8/1987)	D-10912 (11/1/1981)
Riverbend	19,602 sq ft	1988-03-29	U1, Lot 1-4P	Riverbend Rd	Deed from American Land Development Corp to Town: BK 2732 PG 2206 (3/29/1988)	D-10912
Riverbend	1.12	Unknown	U1, Lot 1-46	24 Riverbend Rd	Unknown	D-10912
Schanda Park	15,246 sq ft	1954-01-18	U3, Lots 5, 6, 7	8, 10, and 12 Water Street	Tax forfeiture Deed Doucette of U3, Lot 5 to Town: BK 1306 PG 117 (1/18/1954) Deed Gallant of U3, Lot 7 to Town: BK 2518 PG 1332 (11/1/1984)	D-10736 (2/1/1982)
Sliding Rock Recreation and Conservation Area	2.5	1975-09-10	U2, Lot 124	32 Piscassic Street	Warranty Deed from Cheney to Town: BK 2243 PG 784 (9/1/1975)	Plan of Lots, Sliding Rock, House Lots and Apt Complex, Newmarket, NH for Walter Cheney, Inc Jan 1973
Tuttle Swamp	42	1990-06-11	R6, Lot 38	481 Wadleigh Falls Rd	Quit Claim Deed Growth Mortgage Co, Inc to Town: Book 2840 Page 2061 (6/11/1990)	no boundary survey
Tuttle Swamp	2.8	1996-04-18	R6, Lot 39	471 Wadleigh Falls Rd	Warranty Deed Currier to Town: Book 3150 Page 0661 (4/18/1996)	no boundary survey

Conservation Area	Size (Acres)	Date Acquired	Tax Map Lot #	Location	Recorded Deeds	Recorded Plans (Surveys)
Tuttle Swamp	14	1996-04-18	R6, Lot 40	479 Wadleigh Falls Rd	Warranty Deed from Currier and Walker to Town: Book 3150 Page 0663 (4/18/1996)	no boundary survey
Wiggin Farm	160	2003-09-05	R6, Lot 21	280 Grant Road	Warranty Deed Falzone to Town: BK 4142 PG 1801 (9/5/2003) Acquired by Town as conservation land; NHFG Easement: BK 4142 PG 1825 (9/5/2003) LCHIP Executory Interest: BK 4142 PG 1813 (9/5/2003)	D-32876 (5/1/2004)
Wiggin Farm	2	2003-06-01	R6, Lot 21-1	290 Grant Road	Creation of 2-acre lot for parking area	D-30810 (6/1/2003)

Table 3: Easements Held by the Town of Newmarket

Site Name	Current Landowner	Easement Monitoring	Executory Interest	Size (acres)	Date Acquired	Tax Map Lot#	Location	Recorded Documents
Bald Hill Reservation	SELT	Newmarket Conservation Commission	none	21	2015-11-18	R7, Lot 24-21	Hayden Place	Warranty Deed and Conservation Restrictions from Chinburg Developers to SELT and Town of Newmarket, respectively: BK 5671 PG 496 (11/18/2015) Plan D-38917 (6/1/2015)
Hilton	George "Win" Hilton	Town contracted with SELT	none	96	2004-08-30	R7, Lot 15	233 Grant Road	Conservation Easement Deed Hilton to Town: BK 4354 PG 448 (8/30/2004) Easement monitoring MOA with SELT: BK 4354 PG 470 (8/30/2004) Plan D-31934 (8/1/2004)
Smith Sisters Sanctuary	NH Audubon	Newmarket Conservation Commission	none	115	2008-12-18	R5, Lot 78-1	356 Wadleigh Falls Rd	Conservation Easement Deed from The Nature Conservancy to Town: BK 4968 PG 1330 (12/18/2008); Plan D-35746 (9/1/2008) Warranty Deed Smith Sisters to TNC: BK 4968 PG 1322, Deed TNC to NH Audubon: BK 5102 PG 380 (4/9/2010)

Site Name	Current Landowner	Easement Monitoring	Executory Interest	Size (acres)	Date Acquired	Tax Map Lot#	Location	Recorded Documents
Nostrom Farm	Jeff Cantara	Town contracted with SELT	none	65.6	2006-02-24	R6, Lot 42	31 Doe Farm Lane	Conservation Easement Deed from Nostrom to Town: BK 4621 PG 2589 (2/24/2006) Grant Agreement Town to USFWS: BK 4621 PG 2622 (2/24/2006) Plan D-33538 (2/1/2006)
Piscassic Greenway - Gaziano Tract	SELT	Newmarket Conservation Commission	LCHIP (State of NH)	32	2022-06-15	R7, Lot 1	75 Neal Mill Rd	Warranty Deed from Gaziano to SELT: BK 2105 PG 5159 (8/30/2021) Conservation Restriction Deed from SELT to Town, LCHIP, State: BK 6416 PG 561 (6/15/2022)
Schneer	Jean Silverman Estate	Newmarket Conservation Commission	none	5.6	2006-03-03	R4, Lot 55	55 Neal Mill Road	Conservation Easement Deed from Schneer to Town: BK 4625 PG 1116 (3/3/2006) Plan D-33470 (1/1/2006)
Silverman	Joffree Barnett	Newmarket Conservation Commission	none	32.8	2006-03-03	R4, Lots 51, 53, 55A	41 Neal Mill Road	Conservation Easement Deed from Silverman to Town: BK 4625 PG 1131 (3/3/2006) Grant Agreement Town to USFWS: BK 4609 PG 2518 (1/23/2006) Plan D-33470 (1/1/2006) Affidavit for corrected survey error: BK 4625 PG 1113 (3/3/2006)

Table 4: Easements on Town Land Held by Other Entities

Site Name	Easement Holder	Easement Monitoring	Executory Interest	Size (acres)	Date Acquired	Tax Map Lot#	Location	Recorded Documents
Dearborn	NHFG (State of NH)	NH Conservation Land Stewardship Program	none	38.1	2016-11-14	R6, Lot 27	206 Grant Rd	Quitclaim Deed Dearborn to Town: BK 5772 PG 2831 (11/14/2016) CE Deed Dearborn to NHFG: BK 3466 PG 378 (4/10/2000) Plan D-27921 (3/22/2000) Driveway ROW Easement to abutter: BK 6492 PG 1355(7/3/2023)

Site Name	Easement Holder	Easement Monitoring	Executory Interest	Size (acres)	Date Acquired	Tax Map Lot#	Location	Recorded Documents
Piscassic River-Loiselle Conservation Area	None	Newmarket Conservation Commission	LCHIP (State of NH)	45.3	2003-07-28	R5, Lot 91-2	270 Wadleigh Falls Rd	Warranty Deed Loiselle to Town: BK 4100 PG 2110 and BK 4100 PG 2114 (7/28/2003) Plan D-30811 (7/1/2003) LCHIP Eexecutory Interest Deed: BK 4100 PG 2123 (7/28/200#0
Wiggin Farm	NHFG (State of NH)	NH Conservation Land Stewardship Program	LCHIP (State of NH)	160	2003-09-05	R6, Lot 21	280 Grant Rd	Warranty Deed Falzone to Town: BK 4142 PG 1801 (9/5/2003) NHFG Easement: BK 4142 PG 1825 (9/5/2003) LCHIP Executory Interest: BK 4142 PG 1813 (9/5/2003) Plan D-32876 (5/1/2004)

Table 5: Town Held Executory Interests

Conservation Area	Size (acres)	Date Acquired	Tax Map Lot#	Location	Current Landowner	Easement Holder	Recorded Documents
Richmond	26	2003-10-10	R5, Lot 50	Lang's Lane	Amanda Richmond	SELT	Conservation Easement Deed from Richmond to SELT: BK 4170 PG 1050 (10/10/2003) Plan D-31045 (10/1/2003)
Dodds	30.5	2008-04-18	R4, Lot 47	151 Grant Road	Dodds	SELT	Conservation Easement Deed from Dodds to SELT and Executory Interest to Town of Newmarket: BK 4908 PG 1017; Plan D-21057 (3/1/1991)
Clarke Farm	175	2021-05-04	R6, Lot 43	134 Camp Lee Rd	Linda Clarke	SELT	Conservation Easement Deed from Clarke to SELT: BK 6274 PG 673 (5/4/2021) Plan D-42735 (4/26/2021)
Piscassic Greenway -Tucker Tract	15 and 1	2020-05-08	R7, Lot 4-5 R4 Lot 52	Neal Mill Rd and Old Lee Rd	SELT	USDA NRCS WRE	Warranty Easement Deed from Tucker to USDA: BK 6111 PG 2953 (5/8/2020) Fiduciary Deed from Tucker to SELT: BK 6111 PG 2969 (5/8/2020) Plan D-42110 (5/8/2020) Plan D-41270 (1/16/2019)

* No easement monitoring required by Conservation Commission

Table 6: Subdivision Open Space

Name	Tax Map Lot #
Blackhawk (Schultz Place)	R2-19-3
Briallia Circle (Piscassic River Village)	R5-37-40
Boulder Subdivision	U2-297
Channing Way	R4-43-3 and OPEN SPACE
Durrell Woods	R5-40 and R5-130
Fox Hollow	R7-17
Gonet Drive (Bayfields)	OPEN SPACE LOT A AND LOT B
Hamel Farm	R4-42-22
Harvest Way	OPEN SPACE
Harvest Way	R6-14-17
Hilton Drive	R7-10
Ladyslipper Drive	R4-134
Madison	R4-40-11
Mockingbird Lane	OPEN SPACE and OPEN SPACE B
Moody Point	R2-36-4 and R2-36-11
Norton Woods	portions of R6-13 and R5-47-10
Rockingham Green	R3-23-54
Schanda Farm	R7-14
Stonewall Way	R4-25
Winslow Drive	R5-49-13

Table 7: Other Public and Private Conservation Lands

Name	Tax Map Lot #
Bald Hill Forest (SELT)	R7-24-21
Follett's Brook (NHAudubon-Kwaks)	R5-84
Great Bay WMA	R3-36-1, R3-36-3, R1-6, R1-7, R1-17, R1-22, R1-24, R1-28, R1-29, R1-31, R1-32, R1-33, U3-51
Lubberland Creek (TNC)	R2-29-5, R2-28-1, R2-28-2, R2-25, R2-10, R2-26, R2-27, R2-36-13 and R1-38-8
Piscassic Greenway SELT)	R7-31 and R7-1
Piscassic River WMA (NHFG)	R7-23
Tuttle Swamp WMA (NHFG)	R6-41-1, R6-37, R6-31-1 and R6-32
Conservation Easements	R2-50, R6-1, R3-36, R4-24, R1-1, R1-5, R1-4-1, R6-31
Bennett Well	
Sewall Well	R5-91-1
Tucker Well	R4-50-1
Landfill/Transfer Station	R6-36

Appendix C: Implementation Matrix

Goals & Actions	Feasibility	Timeline	Responsible Parties	Partners	Potential Funding Sources
GOAL 1: Protect Drinking Water					
Educate community members on ways to protect drinking water sources and source water protection areas from harmful land uses and contamination.					
Utilize innovative use planning and conservation tools to provide additional protection to the Aquifer Overlay District and Wellhead Protection Areas.					
GOAL 2: Protect Surface Waters and Wetlands					
Restore the water quality and natural conditions (where feasible) of Moonlight Brook. Utilize living shoreline and other green infrastructure to the maximum extent practicable.					
Maintain, and restore where needed, natural buffer areas along the Lamprey and Piscassic Rivers, Follett's Brook, Lubberland Creek, and other unnamed tributaries.					
Protect freshwater wetlands including buffers and floodplains using land use planning tools such as the Wetlands and Floodplain Overlay Districts and educational materials and outreach.					
Update Newmarket's prime wetlands maps and maintain a higher degree of protection on prime wetlands.					

Protect salt marsh along Great Bay and explore opportunities for salt marsh migration amid sea-level rise.					
Maintain involvement in committees related to the Wild & Scenic Lamprey River and its Watershed.					
Work with surrounding towns to update maps of vernal pools.					
Implement all feasible stormwater management practices to prevent and minimize runoff that contains contaminants and causes erosion.					
GOAL 3: Restore Aquatic Passage and Stream Connectivity					
Building on the success of the Building on the success of the Lubberland Creek culvert upgrade on Bay Road , collaborate among Town Departments and Boards and conservation partners, to improve stream crossings and restore aquatic connectivity where needed throughout Newmarket.					
Create safe turtle crossings by improving stream flow and passage at Ash Swamp Road by replacing existing culverts, adding fencing, and other infrastructure and highway traffic speed slowing techniques.					
Use the NH Aquatic Restoration Mapper to assess all road crossings/culverts and town roads. Set priorities for restoring/upgrading aquatic passage.					
GOAL 4: Protect and Connect Priority Lands and Waters					
Dedicate 100% of the Land Use Change Tax to the Conservation Fund.					

Work with interested landowners, conservation partners, and grant programs to conserve the lands and waters within the Newmarket Priority Conservation Focus Areas.					
Protect habitat corridors and enhance connectivity of open spaces and priority lands across Newmarket and abutting municipalities.					
Utilize innovative use planning, education, and conservation tools to protect lands and waters within the NH Coastal Watershed Conservation Focus Areas, including active farms and prime farm soils.					
Dedicate tax lien properties abutting existing conservation lands or within conservation focus areas as conservation areas to enhance existing network of conservation land.					
GOAL 5: Steward Town Conservation Lands					
Implement (and update as needed) Management Plans for Town conservation areas, including Wiggin Farm Conservation Area, Piscassic River-Loiselle, Heron Point Sanctuary.					
Maintain accurate records of all town-owned conservation areas, town-held conservation easements and town-held executory interests.					
Monitor town-held conservation easements annually and participate in annual monitoring by State of NH of Wiggin Farm and Dearborn Conservation Areas.					
Update the NH GRANIT conservation lands layer as needed; ensure that new subdivision open space is similarly updated when created.					

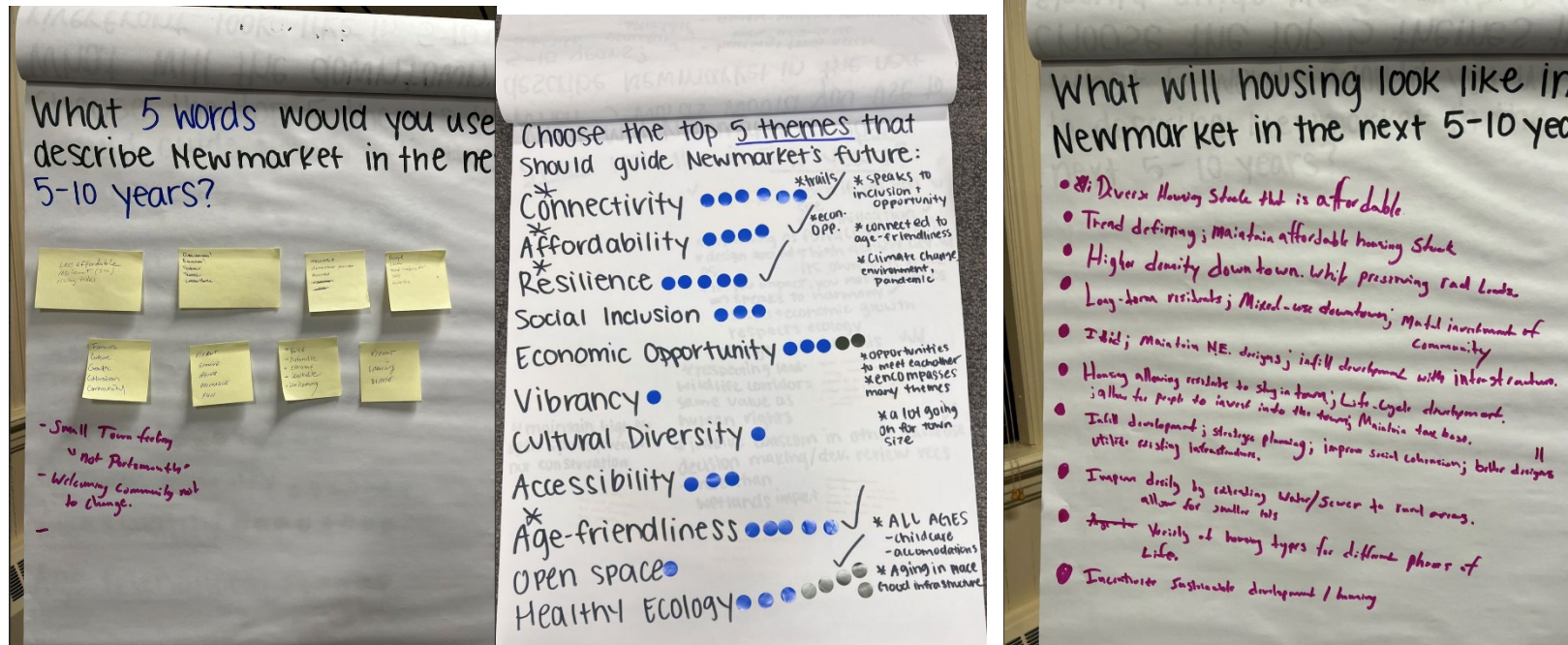
Maintain property and educational information on the Newmarket Conservation Commission webpages.					
Maintain infrastructure at town conservation areas including parking areas, entrance signs, information kiosks, interpretive signage, and related features.					
Review the Town Ordinances and Resolutions that pertain to use of conservation lands to ensure that the ordinances are consistent with the purposes for which the land was conserved.					
For town conservation areas with multiple tax parcels, work with the Planning Department to merge lots to create one tax parcel. This includes Tuttle Swamp Conservation Area, Lita Lane, and Follet's Brook.					
Work with the Riverbend and Mastin Road neighborhoods to identify ways to manage the pocket parks in these neighborhoods and evaluate opportunities for trail connectivity.					
Conduct a Natural Resource Inventory of the Town's Follett's Brook properties to assess ecological significance and opportunities for expanded trail network. Partner with NH Audubon and their Follett's Brook sanctuaries.					
GOAL 6: Promote Sustainable Land Use					
Promote Pollinator-Friendly Habitats, especially native plants, and notably such habitat improvements that can be made to public spaces such as schoolyards, traffic islands, and pocket parks.					

Incorporate lists of recommended and prohibited plant species into Newmarket's Site Plan & Subdivision regulations.					
Implement all feasible stormwater management practices to prevent and minimize runoff that contains contaminants and causes erosion.					
Require open space design development for residential subdivisions.					
Continue to support a balance between affordable housing needs and conservation priorities. Support housing in-fill and other locations that are not ecologically significant or within Conservation Focus Areas. Encourage inclusion of sidewalks, green pathways, pocket parks as part of new developments or redevelopments.					
Consider adopting a roadside Japanese knotweed control plan, to reduce the environmental and safety issues with this invasive plant.					
GOAL 7: Revitalize Downtown Riverfront					
Enhance Newmarket's waterfront. Evaluate ways to improve the Newmarket riverfront for people, restore a living shoreline to prevent further erosion, and restore the health of Moonlight Brook as it flows into the Lamprey River at Schanda Park.					
Maintain safe and accessible boat access to the Piscassic and Lamprey Rivers while maintaining scenic quality.					

Educate residents and visitors on best practices along riverfront, such as not feeding wildlife and respecting private property.					
GOAL 8: Create Trail Networks					
Create safe routes and connectivity, where feasible, for hiking, biking, horseback riders, and other trail users, within Newmarket and between neighboring communities.					
Develop policy that encourages integration of trails and green spaces into new developments and ensures maintenance of existing and proposed natural amenities.					
Explore opportunities to develop trail connectivity among Follet's Brook properties, connecting Newmarket and Durham.					
Explore ways to create safe pathways for pedestrians and cyclists from downtown to conservation areas such as Heron Point Sanctuary and Piscassic River-Loiselle Conservation Area.					
Seek to provide on trails seating areas at intervals appropriate for users living with mobility challenges.					
Utilize Strafford Regional Planning Commission's (SRPC) pedestrian counters and traffic counters to monitor usage of trails and town parks and conservation areas.					

Appendix D: Outreach Summaries

Visioning Week



SRPC and the Town of Newmarket conducted a visioning week on April 8th -11th, 2024 with the Riverfront Committee, Planning Board, Master Plan Steering Committee, and the Conservation Commission. The sessions were centered on the answering three questions that aimed to identify an overall vision for Newmarket as well as for individual master plan chapter. The Conservation Commission focused on the Open Space Plan, which was only a portion of what the other boards and committees discussed. The following summarizes Open Space visioning predominantly from that Conservation Commission meeting and supplemented with feedback from the other three boards and committees.

Question 1: What 5 words would you use to describe Newmarket in the next 10 years?

- A great place to live
- Aesthetically attractive
- Balanced
- Caring
- Coastal
- Connected
- Conservation connections
- Culture
- **Diverse (4)**
- Efficient
- **Evolving (2)**
- **Friendly (2)**
- **Growing (4)**
- **Historical (3)**
- Interesting
- Less growth
- **Natural (2)**
- **Pedestrian friendly (3)**
- Proud
- Recreational
- Rising Tides
- Small-town feel
- Town “Mayberry RFD”
- United
- **Welcoming (5)**
- Accessible
- **Affordable (4)**
- Beautiful
- Charm
- **Community (3)**
- Connected trails
- Cultivation
- Desirable
- **Downtown focused (2)**
- Energy efficient
- Experience
- Fun
- Happy
- Housing
- Leading
- Local
- Original
- Planned
- Quaint
- **Regional leader (2)**
- Rural Character
- **Sustainable (3)**
- Traffic
- **Vibrant (7)**
- Well-planned
- Accessible trails
- Aging
- Carbon neutral
- Clean/better water
- Community involvement
- **Connectivity (2)**
- Cultural Development
- Destination
- Dynamic
- Envied
- Families
- **Green (2)**
- Heritage
- Innovative
- Less Affordable
- Multi-Generational
- **Peaceful (2)**
- Progressive
- Quiet
- **Resilient (4)**
- Safe
- Thriving
- Transit
- **Walkable (3)**

Question 2: What 5 themes that should guide Newmarket's future?

- Connectivity (12)
 - Newmarket cannot do everything by itself. Newmarket needs to be connected with other communities in the region such as Durham and Newfields and those communities that share access to The Lamprey River.
 - Tied to regional communities including economic opportunity and education systems
 - In terms of infrastructure and resources, trail connectivity is important
 - Connectivity also speaks to inclusion and opportunity
- Vibrancy (11)
 - encompass accessibility, age friendliness, cultural diversity, economic opportunities
 - parks and recreation areas
 - accessibility for all to enjoy these amenities
 - Riverfront is a gathering place and an enhancement
- Healthy Ecology (8)
- Accessibility (8)
- Affordability (7)
- Vibrancy (6)
- Resilience, Economic Opportunity, Accessibility and Age-Friendliness (5)
 - Opportunities to meet each other, connect
 - Consider needs of all ages
 - Ensure community needs are met such as child care and ability to age in place
 - Good infrastructure
- Social Inclusion (3)
 - All races, ages and economic tiers are included
 - Riverfront brings the riverfront together
 - Is related to connectivity

Question 3: what will Newmarket's open space look like in 5-10 years?

Resilient connected healthy ecology where the town is prepared for the effects of climate change and extreme weather and our biodiversity is prioritized and protected. **Restored aquatic passages, clean water for people, connected and protected open spaces, trail connectivity, wildlife- friendly flora and fauna** level of respect on par with economic and social growth.

- Respect land and wildlife corridor as we value as human rights
- Involve the Conservation Commission in other land use decision making beyond wetlands impacts

An **environmentally healthy riverfront** is the first and most important to achieve and would have the most immediate impact. This includes:

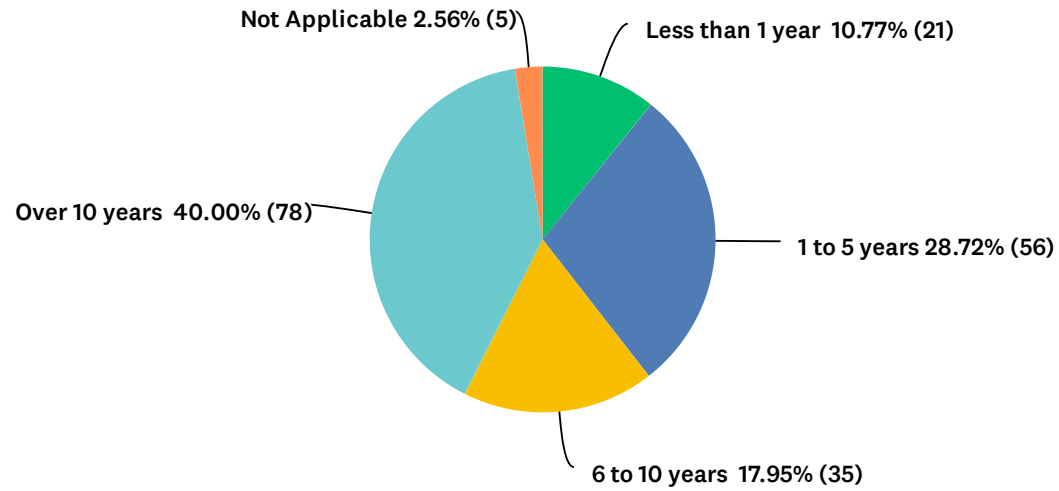
- Undertake needed maintenance
- Address contamination of Moonlight Brook
- Make sure residents know about the importance of a healthy riverfront/river, including create opportunities for education

Survey Results

The following pages include Open Space related questions from the Housing and Open Space survey conducted in the fall of 2023.

Q4 How long have you lived in Newmarket?

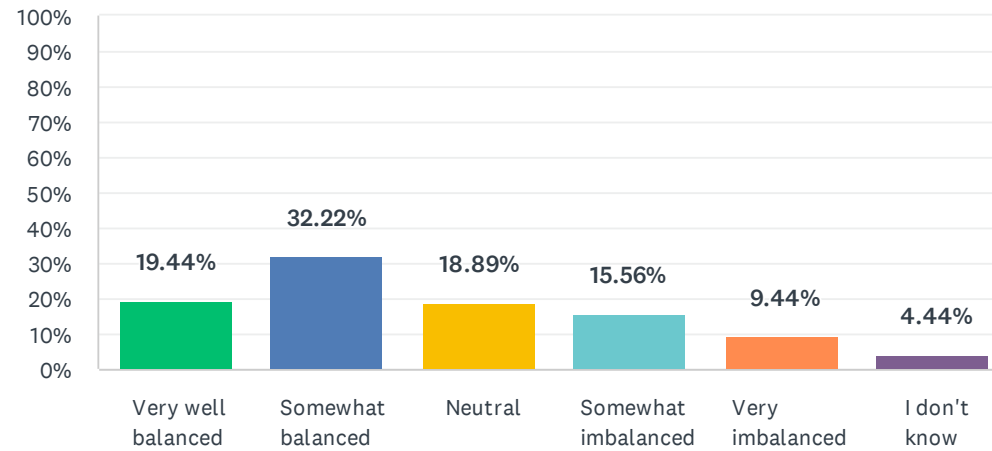
Answered: 195 Skipped: 1



ANSWER CHOICES	RESPONSES	
Less than 1 year	10.77%	21
1 to 5 years	28.72%	56
6 to 10 years	17.95%	35
Over 10 years	40.00%	78
Not Applicable	2.56%	5
TOTAL		195

Q14 How well do you think the balance between housing development and open space conservation is currently being maintained in our community?

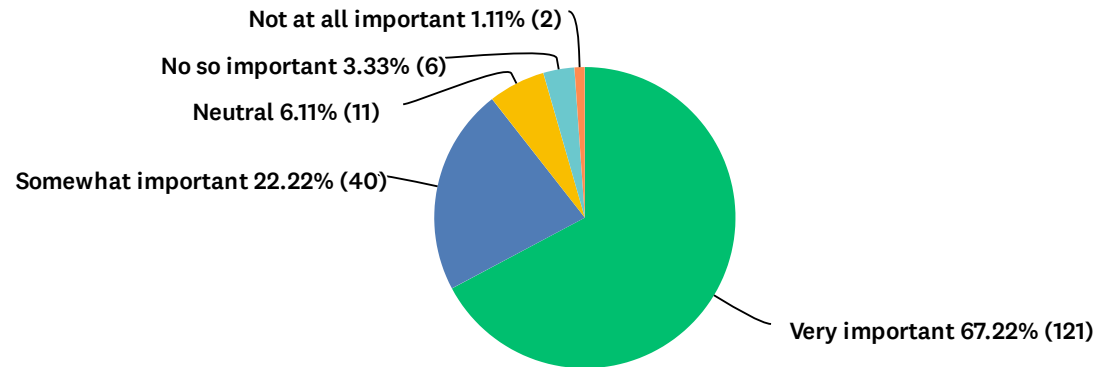
Answered: 180 Skipped: 16



ANSWER CHOICES	RESPONSES	
Very well balanced	19.44%	35
Somewhat balanced	32.22%	58
Neutral	18.89%	34
Somewhat imbalanced	15.56%	28
Very imbalanced	9.44%	17
I don't know	4.44%	8
TOTAL		180

Q15 How important is it for new housing developments to incorporate sustainable design practices?

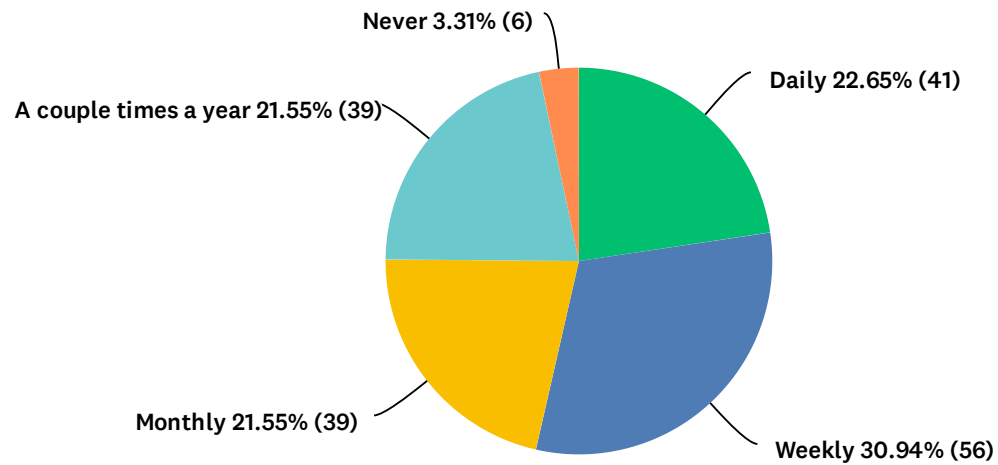
Answered: 180 Skipped: 16



ANSWER CHOICES	RESPONSES	
Very important	67.22%	121
Somewhat important	22.22%	40
Neutral	6.11%	11
No so important	3.33%	6
Not at all important	1.11%	2
TOTAL		180

Q16 How frequently do you and your family utilize local parks, recreational areas, or conservation land for outdoor activities?

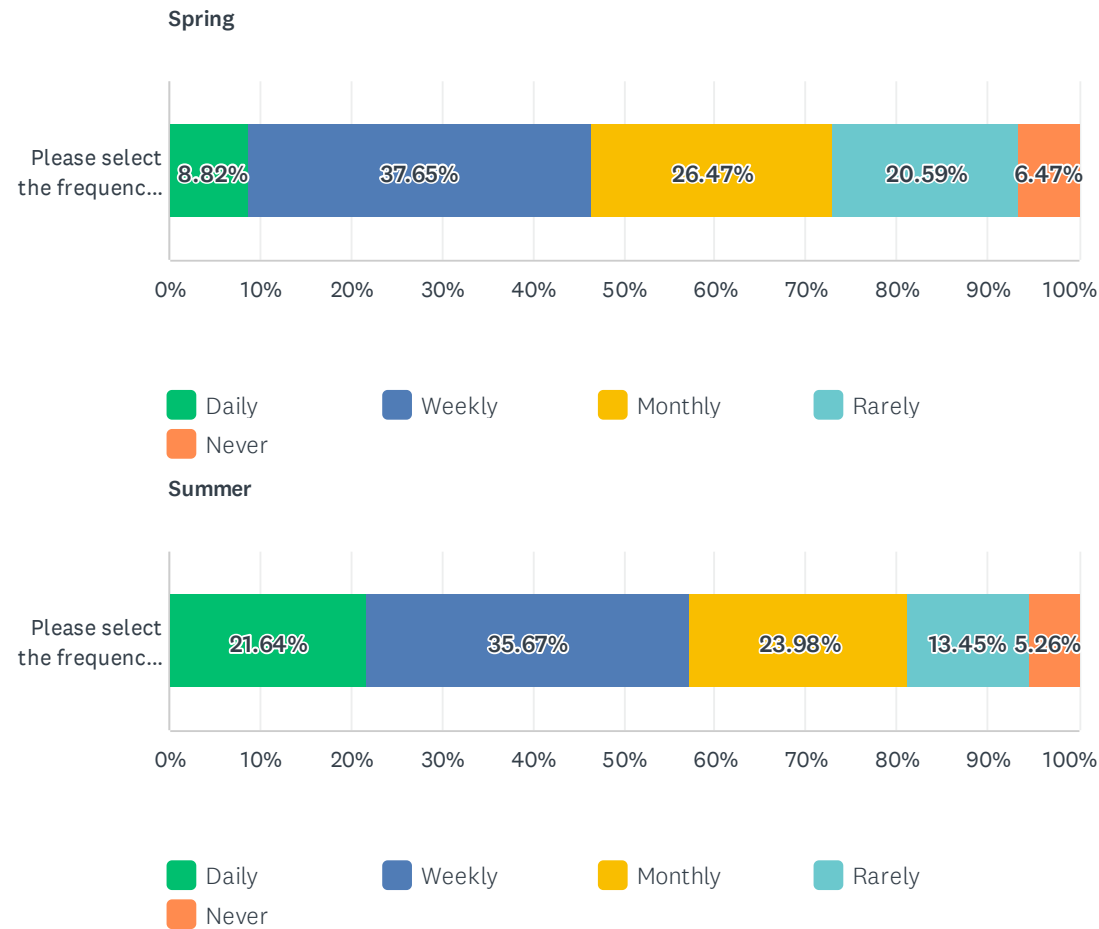
Answered: 181 Skipped: 15



ANSWER CHOICES	RESPONSES	
Daily	22.65%	41
Weekly	30.94%	56
Monthly	21.55%	39
A couple times a year	21.55%	39
Never	3.31%	6
TOTAL		181

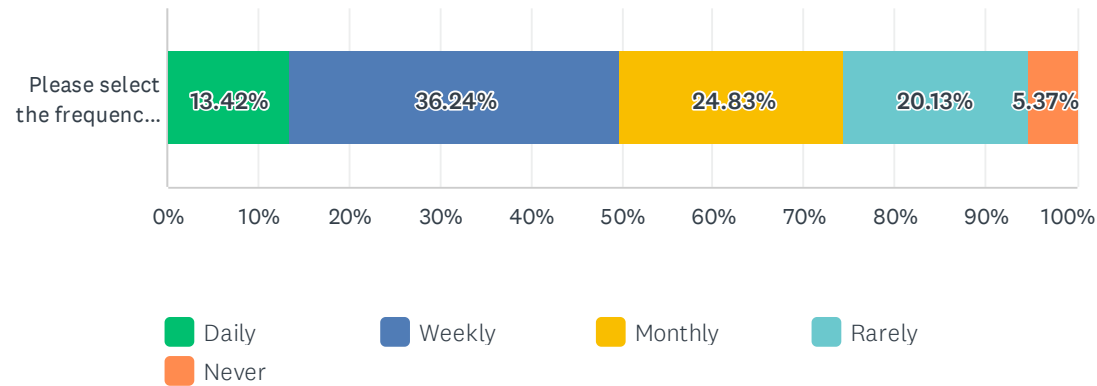
Q17 How often do you visit the downtown riverfront area (including Heron Point)?

Answered: 172 Skipped: 24

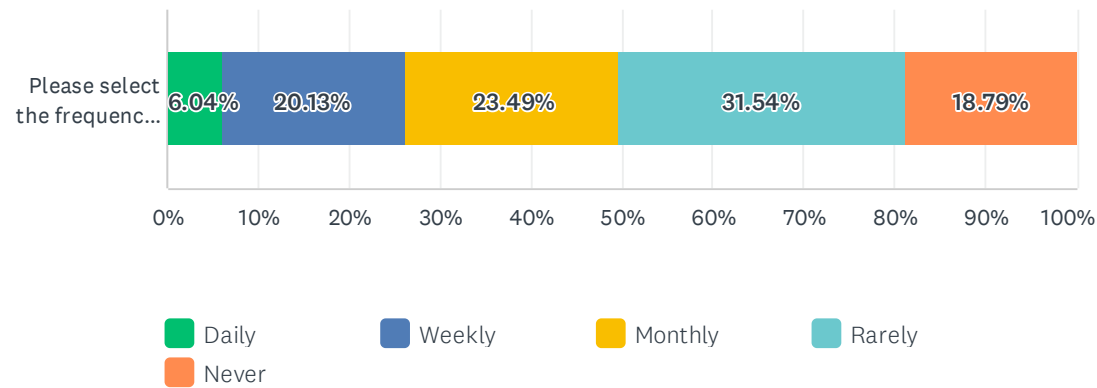


Newmarket Master Plan Update: Housing and Open Space Chapters

Fall



Winter



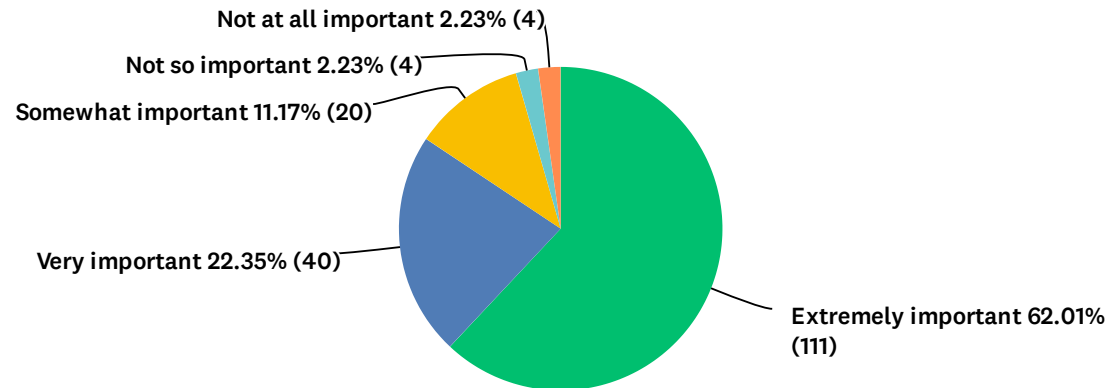
Spring						
	DAILY (1)	WEEKLY (2)	MONTHLY (3)	RARELY (4)	NEVER (5)	TOTAL
Please select the frequency for each season	8.82%	37.65%	26.47%	20.59%	6.47%	
	15	64	45	35	11	170
BASIC STATISTICS						
	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION	
Please select the frequency for each season	1.00	5.00	3.00	2.78		1.07

Newmarket Master Plan Update: Housing and Open Space Chapters

Summer						
	DAILY (1)	WEEKLY (2)	MONTHLY (3)	RARELY (4)	NEVER (5)	TOTAL
Please select the frequency for each season	21.64% 37	35.67% 61	23.98% 41	13.45% 23	5.26% 9	171
BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION	
Please select the frequency for each season	1.00	5.00	2.00	2.45	1.12	
Fall						
	DAILY (1)	WEEKLY (2)	MONTHLY (3)	RARELY (4)	NEVER (5)	TOTAL
Please select the frequency for each season	13.42% 20	36.24% 54	24.83% 37	20.13% 30	5.37% 8	149
BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION	
Please select the frequency for each season	1.00	5.00	3.00	2.68	1.10	
Winter						
	DAILY (1)	WEEKLY (2)	MONTHLY (3)	RARELY (4)	NEVER (5)	TOTAL
Please select the frequency for each season	6.04% 9	20.13% 30	23.49% 35	31.54% 47	18.79% 28	149
BASIC STATISTICS	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION	
Please select the frequency for each season	1.00	5.00	4.00	3.37	1.17	

Q18 How important is preserving and enhancing the natural environment of the riverfront to you?
Please feel free to add why this is or is not important to you in the comments section.

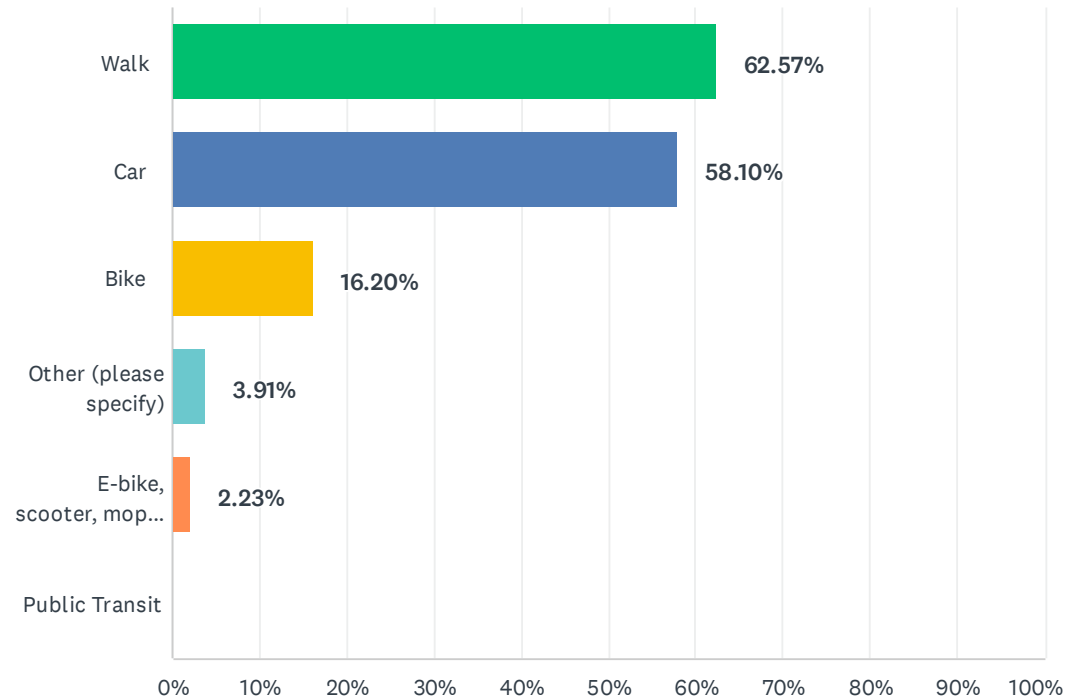
Answered: 179 Skipped: 17



ANSWER CHOICES	RESPONSES	
Extremely important	62.01%	111
Very important	22.35%	40
Somewhat important	11.17%	20
Not so important	2.23%	4
Not at all important	2.23%	4
TOTAL		179

Q19 How do you currently commute to the downtown riverfront?

Answered: 179 Skipped: 17

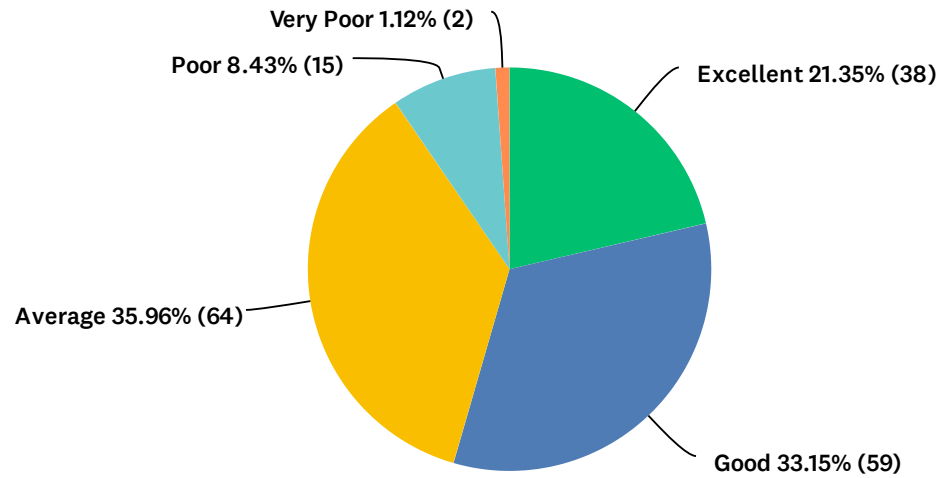


Newmarket Master Plan Update: Housing and Open Space Chapters

ANSWER CHOICES	RESPONSES	
Walk	62.57%	112
Car	58.10%	104
Bike	16.20%	29
Other (please specify)	3.91%	7
E-bike, scooter, moped, etc.	2.23%	4
Public Transit	0.00%	0
Total Respondents: 179		

Q20 How would you rate the accessibility of the downtown riverfront for pedestrians and cyclists?

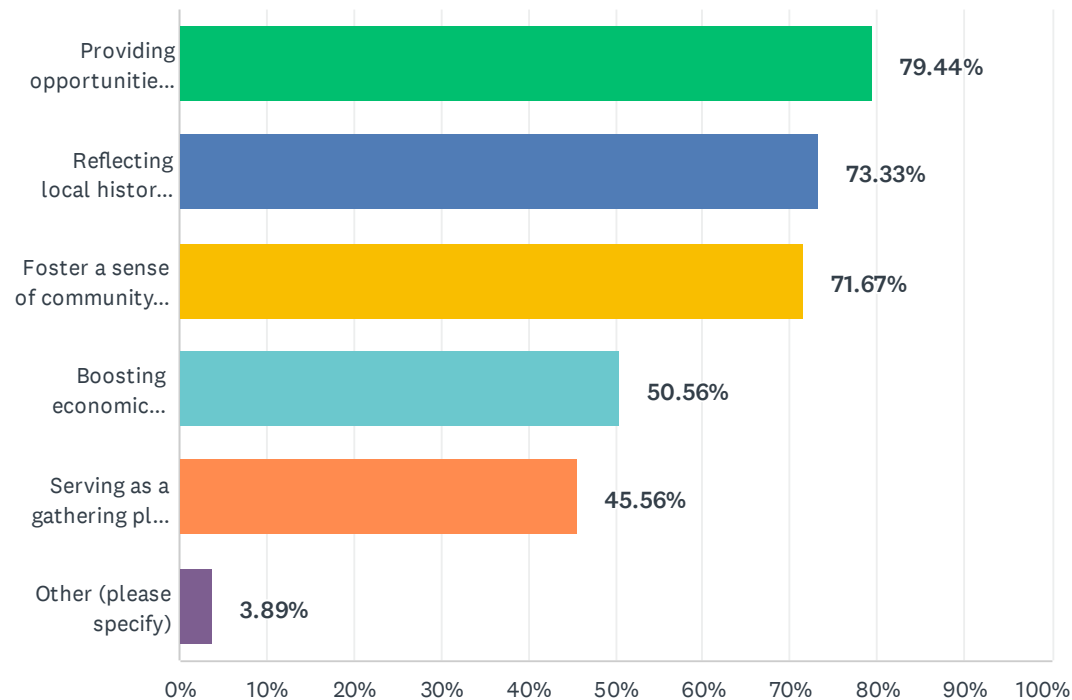
Answered: 178 Skipped: 18



ANSWER CHOICES	RESPONSES	
Excellent	21.35%	38
Good	33.15%	59
Average	35.96%	64
Poor	8.43%	15
Very Poor	1.12%	2
TOTAL		178

Q21 How do you envision the downtown riverfront contributing to the overall identity and character of the community? Check all that apply.

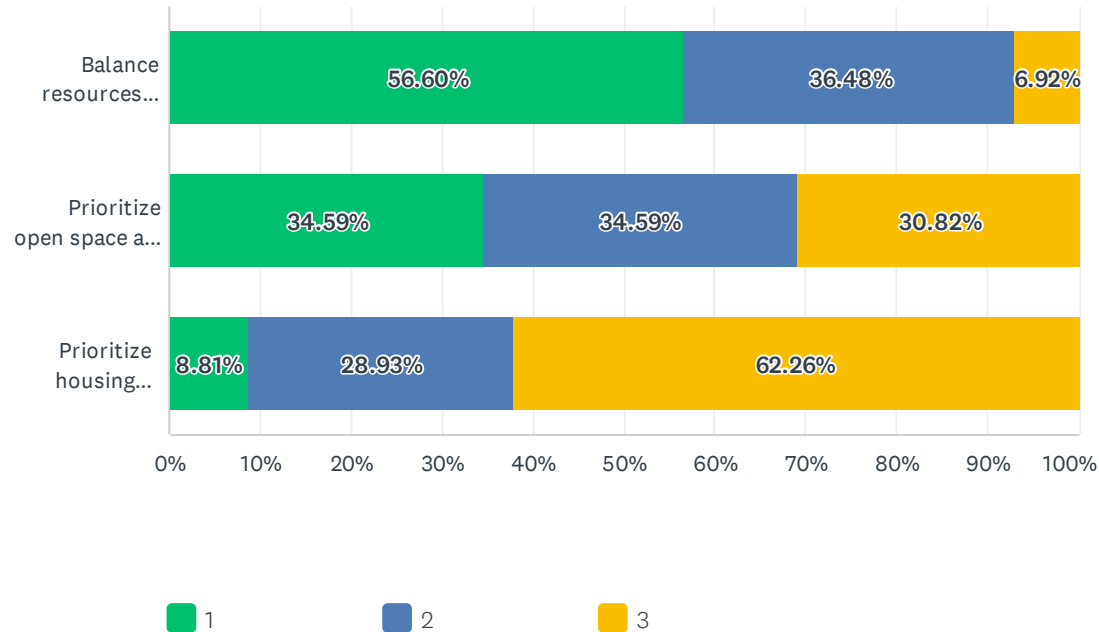
Answered: 180 Skipped: 16



ANSWER CHOICES	RESPONSES	
Providing opportunities to observe the natural environment (views of the river, wildlife observation areas, etc.)	79.44%	143
Reflecting local history and culture	73.33%	132
Foster a sense of community pride	71.67%	129
Boosting economic vitality	50.56%	91
Serving as a gathering place for diverse groups	45.56%	82
Other (please specify)	3.89%	7
Total Respondents: 180		

Q22 How would you prioritize allocating community resources between housing development, and open space conservation and water resource protection initiatives? Please rank these 1 through 3, with 1 being the top priority.

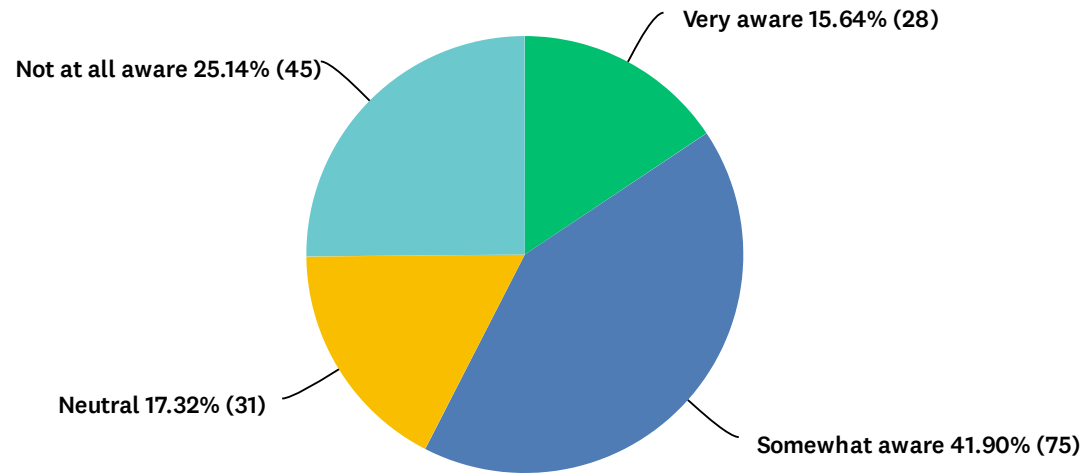
Answered: 159 Skipped: 37



	1	2	3	TOTAL	SCORE
Balance resources equally among housing, open space conservation and water resource protection	56.60% 90	36.48% 58	6.92% 11	159	2.50
Prioritize open space and water resource protection	34.59% 55	34.59% 55	30.82% 49	159	2.04
Prioritize housing development	8.81% 14	28.93% 46	62.26% 99	159	1.47

Q23 How aware are you of educational programs or information about Newmarket's conservation areas and water resources (e.g., drinking water, wetlands, rivers)?

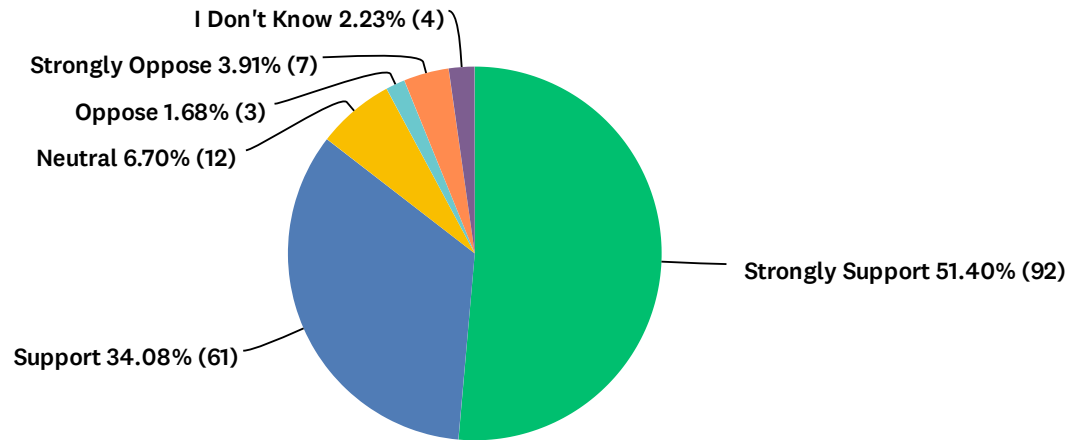
Answered: 179 Skipped: 17



ANSWER CHOICES	RESPONSES	
Very aware	15.64%	28
Somewhat aware	41.90%	75
Neutral	17.32%	31
Not at all aware	25.14%	45
TOTAL		179

Q24 Would you support protecting our water resources from potential contamination through additional local regulations?

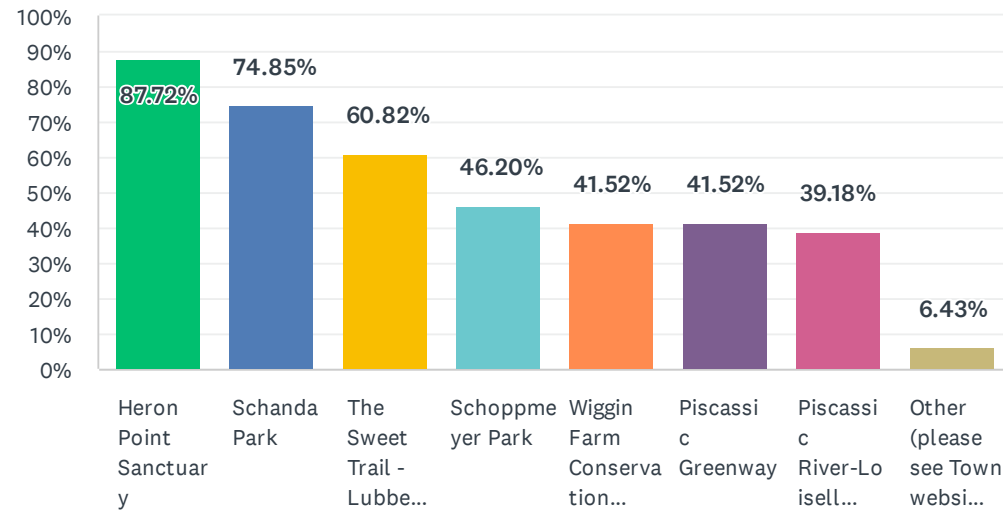
Answered: 179 Skipped: 17



ANSWER CHOICES	RESPONSES	
Strongly Support	51.40%	92
Support	34.08%	61
Neutral	6.70%	12
Oppose	1.68%	3
Strongly Oppose	3.91%	7
I Don't Know	2.23%	4
TOTAL		179

Q25 Which of the following conservation areas and parks are you aware of and/or visit?

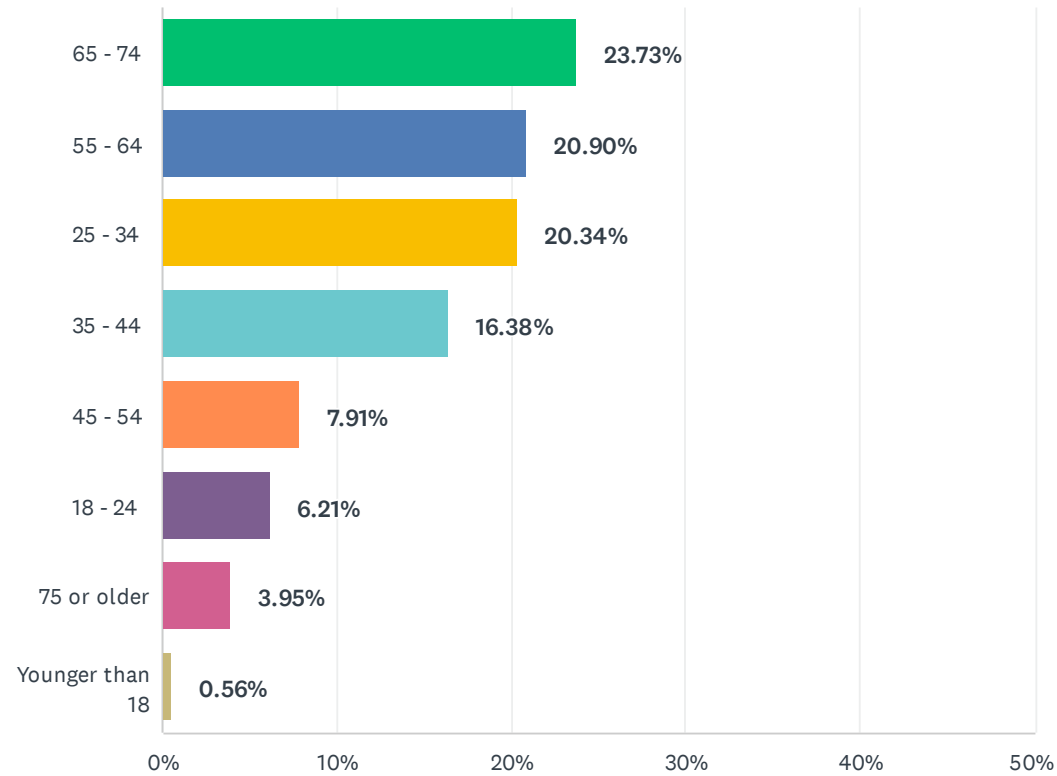
Answered: 171 Skipped: 25



ANSWER CHOICES	RESPONSES	
Heron Point Sanctuary	87.72%	150
Schanda Park	74.85%	128
The Sweet Trail - Lubberland Creek Preserve	60.82%	104
Schoppmeyer Park	46.20%	79
Wiggin Farm Conservation Area	41.52%	71
Piscassic Greenway	41.52%	71
Piscassic River-Loiselle Conservation Area	39.18%	67
Other (please see Town website with other choices: https://www.newmarketnh.gov/conservation-commission/pages/conservation-areas-and-parks)	6.43%	11
Total Respondents: 171		

Q26 Please select your age.

Answered: 177 Skipped: 19



Newmarket Master Plan Update: Housing and Open Space Chapters

ANSWER CHOICES	RESPONSES	
65 - 74	23.73%	42
55 - 64	20.90%	37
25 - 34	20.34%	36
35 - 44	16.38%	29
45 - 54	7.91%	14
18 - 24	6.21%	11
75 or older	3.95%	7
Younger than 18	0.56%	1
TOTAL		177

Water Resources

Town of Newmarket Master Plan

Adopted unanimously by the Newmarket Planning Board following a Public Hearing on November 10, 2020.







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Acknowledgements

The Town of Newmarket is greatly indebted to all who participated either directly or indirectly in the process of developing the 2020 Water Resources chapter. From service on municipal boards to professional technical assistance the input and guidance from so many individuals helped to shape the recommendations and vision presented herein. The town extends a thank you in advance to all who will work to implement this plan and its recommendations in the future.

A special acknowledgement should be offered to chapter's primary funder, the New Hampshire Department of Environmental Services (NHDES) Drinking Water Source Protection Program. This program has been essential in providing technical and financial assistance, and to enforce state regulations that serve to protect the state's sources of drinking water.

The contributions of those identified below are particularly noteworthy.

Master Plan Steering Committee

Bill Arcieri, Member At-Large
Gretchen Kast, Town Council
Michal Zahorik, Planning Board Alternate
Patrick Reynolds, Conservation Commission
Val Shelton, Planning Board

Town of Newmarket Planning Board

Eric Botterman, Chair
Valerie Shelton, Vice Chair
Christian Matthews, Town Council ex officio
Jamie Bruton, Member
Jane Ford, Member
Jon Kiper, Town Council ex officio
Michal Zahorik, Alternate
Sarah Finch, Member
Ted Seely, Alternate
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Alaina Rogers, Data Collection & Analysis Assistant
Kyle Pimental, Principal Regional Planner
Jackson Rand, GIS Planner

Front Cover:
Photograph by Bill Doucet

A special thanks to Bill Doucet and Mike Hickey for all the local photos.



Introduction

The protection and use of water resources are critical concerns to the Town of Newmarket. With virtually all residents dependent upon wells for domestic use, the quantity and quality of available groundwater must be protected from depletion and contamination. Other Town water resources, such as swamps, ponds, streams, and wetlands are important because they are hydrologically related to groundwater, and provide ecological, scenic, and recreational value to residents.

In general, there is a direct relationship between land use and water quality. It is the responsibility of the Town to take reasonable and prudent precautions to protect all water resources from incompatible uses, thus protecting the health and general welfare of the community. Appropriate steps should be taken by the Town to ensure that enough water supply exists for use by Newmarket residents, as well as native wildlife and plant communities. The Town needs to examine and address water supply issues, watershed management, pollution, and potential aquifers/gravel areas.

Vision Statement

Protect all water resources in Newmarket from threats that include but are not limited to contamination, depletion, alteration, and degradation through appropriate policies, regulations, and actions.

Guidance for policies, regulations, and actions that affect Newmarket's water resources derives from the following water resources management objectives and conservation measures.

- a) *Protect public health, safety, and welfare*
- b) *Maintain high environmental quality*
- c) *Ensure that growth minimizes impacts to environmental quality*
- d) *Direct development to environmentally suitable areas*
- e) *Assure adequate water supply for residents*
- f) *Preserve water quality and quantity for future residents*
- g) *Educate residents about water resource issues*
- h) *Participate in inter-municipal water resources management efforts*
- i) *Comply with applicable local, state, and federal regulations*

Overview

The Town of Newmarket covers a total area of 14.2 square miles (9,080.3 acres), with a land area of 12.6 square miles (8,053.5 acres) and a water area of 1.6 square miles (1,026.8 acres). With a population of 8,977 (according to the [2013-2017 American Community Survey 5-year estimates](#)), Newmarket has experienced roughly a 10.6% increase in total population since 2000 (8,027).

The topography of Newmarket is gently rolling, and elevations range from sea level along tidal areas to greater than 280 feet on Bald Hill in the westernmost area of town. Great Bay and the Lamprey River are the town's most significant waterbodies. The Town has many acres and types of water resources, which are summarized in the table below. These resources provide valuable functions and services that benefit the public health and welfare and the environment.



Table 1: Water Resource Statistics

Resource Type	Total Area	% Municipal Area
Freshwater Surface Waters	656.1 Acres	7.2%
Coastal/Tidal Waters	1,061.9 Acres	11.7%
Streams and Rivers (miles)	31.4 Miles	N/A
Freshwater Wetlands	979.3 Acres	10.8%
Prime Wetlands	908.9 Acres	10.0 %
Floodplain (2005)	512.9 Acres	5.7%
Floodplain (2014)	529.9 Acres	5.8%
Stratified Draft Aquifer	657.5 Acres	7.2%

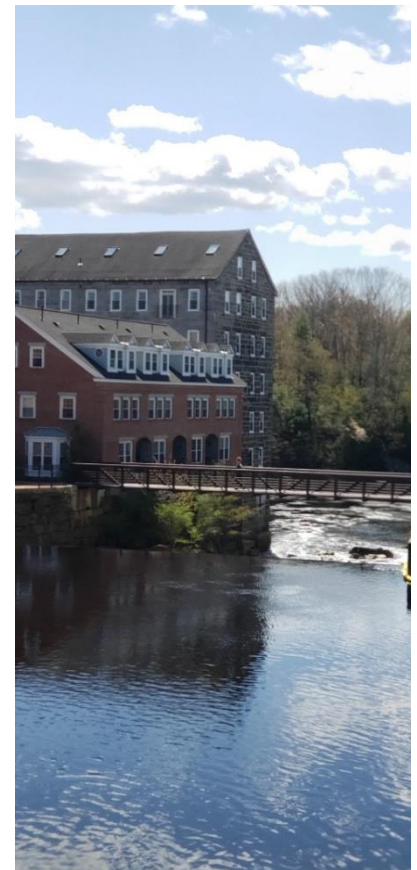
[Sources: NH Hydrography Dataset, National Wetland Inventory, FEMA DFIRMs, NH GRANIT]

Newmarket is positioned in the lowermost reaches of the Coastal Watershed, and within portions of the Lamprey River, Exeter River, and the Great Bay watersheds. It contains both freshwater and tidal rivers and estuarine ecosystems. Tidal influence on the Lamprey River extends to Macallen Dam in downtown near the NH Route 108 crossing. Tidal influence of the Great Bay extends up Lubberland Creek and the Squamscott River, as well as several unnamed tributaries in the southern areas of town.

Water Resource Chapter Update

The original Water Resources Chapter of the Master Plan was developed and adopted by the Planning Board in 2001; an update was completed in 2009. Since that time, social and environmental conditions have changed, including shifts in local development patterns, increases in population, and impacts from changing climate conditions, all of which have placed additional stress on the Town's water resources. As a result, Newmarket has compiled a series of recommendations from multiple reports on the town's water system into one comprehensive Capital Improvement Plan (CIP). The Town is improving their stormwater management through compliance with the EPA's [Municipal Separate Storm Sewer System](#) (MS4) program. Newmarket has been a part of several climate adaptation projects, including updates to their [hazard mitigation plan](#), a [flooding study](#) in the Moonlight Brook watershed, a [climate vulnerability study](#), and an [infrastructure project](#) to replace an undersized culvert on Lubberland Creek. In addition, the Town has collaborated with regional land conservation agencies to protect land containing critical water resources including wetlands, floodplain, streams and rivers, and riparian habitat.

Federal, state, and local non-governmental partners have also conducted significant research, inventories, and evaluation of water resources in the Coastal and Great Bay watersheds. These efforts have produced valuable scientific information about the status, health, and viability of water resources in these watersheds. The results of these efforts have sparked much discussion about future management and sustainability of ecosystems, natural resource functions and benefits, emerging contaminants that are a risk to human health, and drinking water supplies in many communities in the Seacoast.



Lamprey River north of the Dam
[Photo Credit: Mike Hickey]

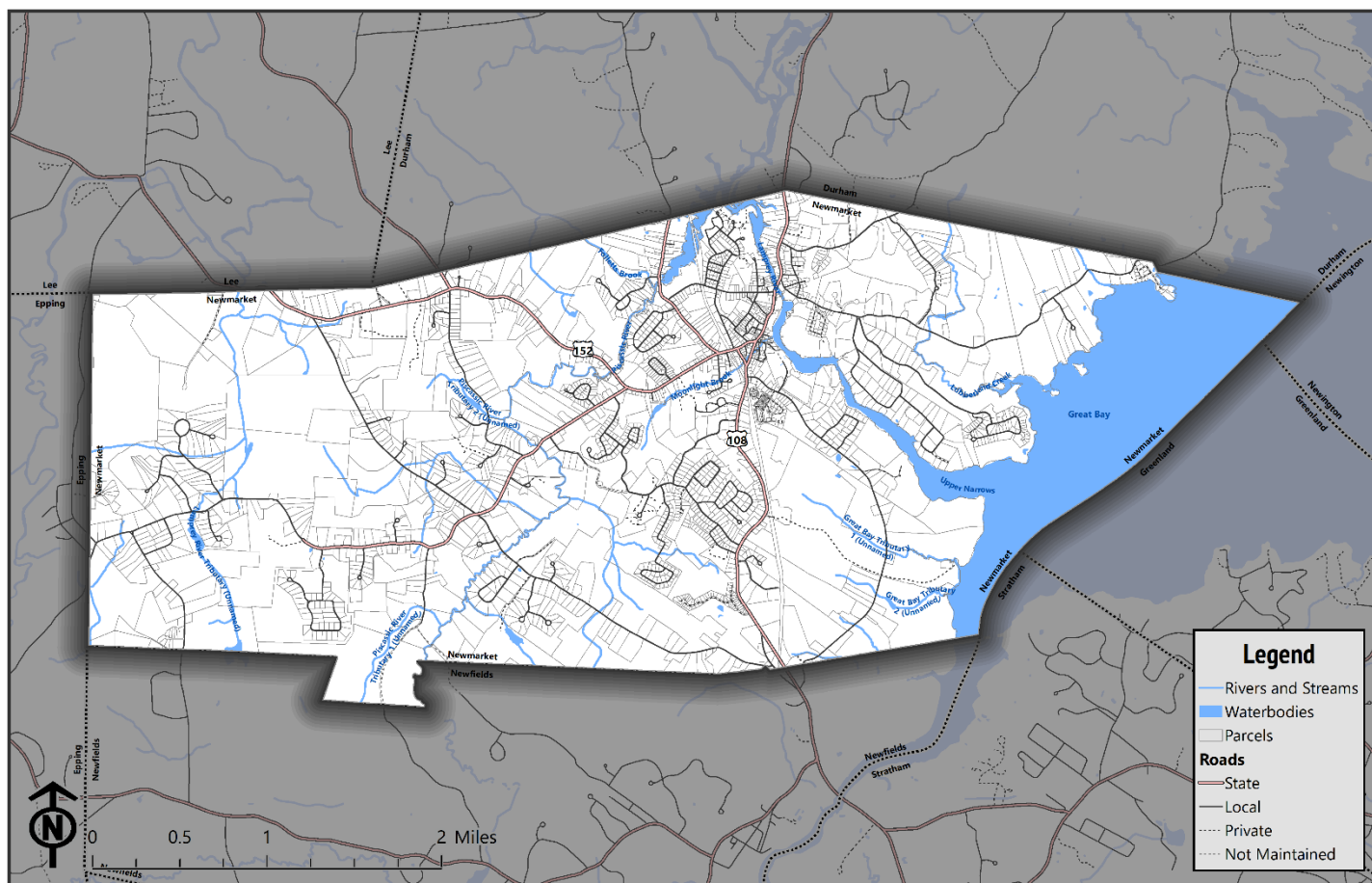
In 2019, the Town of Newmarket, in partnership with the Strafford Regional Planning Commission, applied for and received funding to update the existing Water Resources Chapter of the Master Plan by incorporating new information to better plan for the management and sustainability of the Town's water resources.



Surface & Groundwater Resources

Surface Water Policy Statement

Reduce the loss of shoreland buffers by minimizing the granting of variances and waivers during the application and permitting process, as well as strengthening enforcement efforts.



Map 1. Newmarket's Surface Water Resources [Source: US Geological Survey (USGS), NH Hydrography Dataset (NHHD)]

Rivers & Perennial Brooks, Creeks, Streams, and Tributaries

According to the New Hampshire hydrography dataset, Newmarket has a total of 24.6 linear miles of streams and rivers, including 23 miles of perennial creeks, streams and rivers and 1.6 miles of intermittent streams and creeks, that provide a myriad of benefits for residents and visitors to the region.

Lamprey River

The portion of the Lamprey River in Newmarket is located at the confluence of the Piscassic River at the Sliding Rock Conservation Area. The river flows south towards the Macallen Dam—where it is tidally influenced—and the downtown waterfront, where there are major access points for boaters and other recreational enthusiasts using



the Great Bay. The total drainage area of the watershed covers almost 214 square miles and includes fourteen towns, making it one of the largest watersheds in New Hampshire. The Lamprey River supports a variety of recreational uses including boating, fishing, swimming in certain areas, and ice fishing and skating in the winter. It is considered to have significant ecological value, supporting some of the most important anadromous fishery habitat in the state, as well as providing aquatic habitat for numerous wildlife and waterfowl species.

The Lamprey River is recognized on both the state and federal levels as a river with outstanding resources, and for that reason, it is afforded protections not normally provided to other rivers. On the federal level, certain sections of the Lamprey are designated as a Wild and Scenic River by the National Park Service and the US Congress. At the state level, the Lamprey and its main tributaries are in the New Hampshire Rivers Management and Protection Program.



Lamprey River at the Macallen Dam
[Photo Credit: Bill Doucet]

Piscassic River

The Piscassic River is a major tributary to the Lamprey River and flows northerly from Newfields through much of the area around Ash Swamp Road, Grant Road and Lang's Lane. The river then flows beneath Route 152, spills over the dam at Packers Falls Road and then joins up with the Lamprey River about one half mile downstream. The lower Piscassic River, below the dam at the former Water Treatment Plant on Packers Falls Road, is often mistakenly considered to be part of the Lamprey River because it is an extension of the impounded waters behind the Macallen Dam that is located downstream. The confluence with the Lamprey River is located just north of the Durham and Newmarket town boundary.

Follett's Brook

Follett's Brook flows southeasterly from Durham and joins up with the Piscassic River just above the Packers Falls Road dam. Only the lower third of Follett's Brook watershed is within Newmarket. Prior to 1990, Follett's Brook was used as the principal municipal water supply source with treatment provided at the Packers Falls Road Water Treatment Plant. The Piscassic River was used as a backup water supply source. In the last ten years, the Town has principally relied on groundwater from several municipal wells for drinking water.

Moonlight Brook

The main channel of Moonlight Brook runs for approximately 1.5 miles from its headwaters to its outlet into the Lamprey River. It is routed under three road crossings before passing under a railroad track near downtown Newmarket. Downstream of this point, Moonlight Brook is routed through a series of culverts and pipes before emerging back into its natural channel just upstream of its outlet to the Lamprey River. During large storm events, Moonlight Brook receives significant inflow from the Piscassic River, which connects to Moonlight Brook at its headwaters. During the 100-year storm event, inflows from the Piscassic River reach an estimated 307 cubic feet per second (cfs), almost doubling the peak flow within Moonlight Brook.¹

¹ Waterstone Engineering & Horsley Witten Group (2016). *Climate Adaptation Plan for the Moonlight Brook Watershed: Building Resilience to Flooding and Climate Change in the Moonlight Brook Watershed*. [online] Available at: <https://www.nhcaw.org/wp-content/uploads/2018/05/13-306-21-Newmarket-Final-Report.pdf> [Accessed 27 Dec. 2019].



Lubberland Creek

Lubberland Creek, which runs under Bay Road, is one of several smaller tributaries that drain directly to Great Bay. Lubberland Creek originates in wetlands along Dame Road in Durham and then drains southerly crossing beneath Bay Road and enters the Great Bay along the north side of Moody Point. The lower portions of the Creek contain extensive salt and freshwater wetlands. Much of the watershed associated with this drainage system remains as either open fields or forested areas with sparsely located homes, including a portion of the Gonet Drive subdivision.



Lubberland Creek
[Photo Credit: Bill Doucet]

Significant Unnamed Tributaries

There are several other unnamed tributaries of significance, including the following:

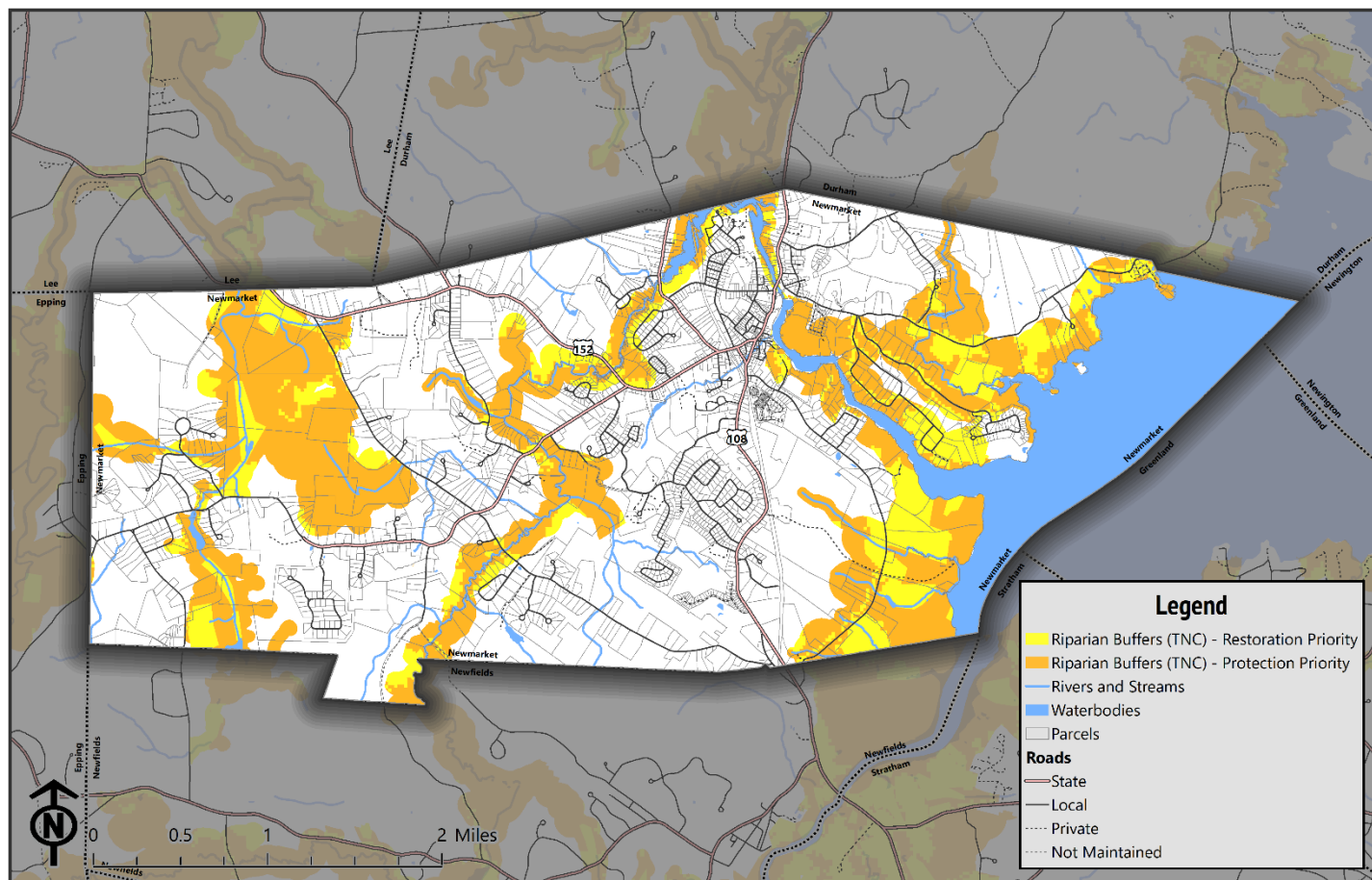
- 1) Piscassic River Tributary (1): Draining from a large wetland west of Hall's Mill Road in Newfields, this stream flows northeasterly before crossing underneath Neal Mill Road and emptying into the Piscassic River.
- 2) Piscassic River Tributary (2): Draining from several wetlands southeast of the Wadleigh Falls Road in the vicinity of the gravel pits, this stream flows easterly before crossing Langs Lane just north of Winslow Drive and emptying into the Piscassic River.
- 3) Lamprey River Tributary: Draining from a series of a large wetlands east of Bald Hill Road, this stream flows northerly before crossing Grant Road, then Doe Farm Lane, and into the Wiggan Farm Conservation Area. It continues north towards the Tuttle Swamp Conservation Area before crossing Wadleigh Falls Road and emptying into the Lamprey River.
- 4) Great Bay Tributaries: There are two relatively significant unnamed perennial streams that originate behind Newmarket Storage on Route 108 and flow easterly crossing beneath New Road and into Great Bay.

Buffer Functions and Benefits

Buffer Options for the Bay (BOB)² defines a buffer as a "naturally vegetated segment of land directly upslope of a water resource, such as a lake, stream, river, pond, estuary, or other wetland type." The value of buffers is diverse; they support wildlife capacity, enhance water views, and help meet water quality standards for municipalities. In New Hampshire, decisions involving buffer lands around waterbodies are often made by communities and individual landowners.

According to GIS data developed by the Nature Conservancy, which was created as part of the 2016 update to the Land Conservation Plan for New Hampshire's Coastal Watersheds, there are several locations identified as priority riparian buffer areas suitable for restoration and/or protection. These locations include: 1) the unnamed Lamprey River tributary (see above for description) and areas surrounding Tuttle Swamp, 2) the mainstem of the Piscassic River, 3) the Lamprey River (both the freshwater portion and tidal portions), 4) Lubberland Creek, and 5) the shoreline of Great Bay.

² [Buffer Options for the Bay](#) is an informational resource intended to support policy and land use decisions in NH's Great Bay region that involve buffers.



Map 2. Newmarket's Surface Water Resources [Source: US Geological Survey (USGS), NH Hydrography Dataset (NHHD)]

BOB'S "Exploring the Trends, Science, & Options for Buffer Management in the Great Bay Watershed"³—an analysis of local factors influencing buffer-related decision-making in the Great Bay watershed—revealed these top four findings:

- Buffer-related decisions are inherently complex, requiring municipalities to balance many factors including property rights, community character, natural resource protection, abutters' concerns, and economic growth.
- People may not understand the individual and social benefits of buffers.
- Buffer oversight and enforcement can be logistically difficult and lack capacity.
- Developers want consistent regulations, flexibility in the review process, and not a 'one-size-fits-all' rule.

Did you know?

Research has shown that the effectiveness of green infrastructure (natural areas like buffers that provide ecosystem services) in reducing pollution is not only comparable to that achieved by gray infrastructure (e.g., constructed stormwater interventions), but that green infrastructure typically costs markedly less.

³ Flanagan, Shea E.; Patrick, David A.; Leonard, Dolores J.; and Stacey, Paul, "Buffer Options for the Bay: Exploring the Trends, the Science, and the Options of Buffer Management in the Great Bay Watershed Key Findings from Available Literature" (2017). PREP Reports & Publications. 380. <https://scholars.unh.edu/prep/380>



BOB's "[Navigating Regulations: What regulatory options do towns have?](#)" and their "[Regulatory options for buffer action](#)" are available to help communities navigate regulations and show different options for buffer action. One other additional resource is the minimum recommended buffer widths for various buffer functions (see Figure 1). These widths are a result of a synthesis of many sources. For more specific information about how these widths were generated, please reference the [Coastal Science Literature Review](#).

As Newmarket continues to grow, increased priority should be placed on increasing buffers for all waterbodies and aquifers with additional steps taken to address septic systems to ensure water quality and shoreland protection.

Water Quality Impairments

According to the [DRAFT 2018, Section 303\(d\)](#) list of impaired waterbodies⁴, which is produced by the NHDES Surface Water Quality Assessment Program every two years as a federal mandate under the Clean Water Act, Newmarket has several waterbodies with water quality impairments, including the Lamprey River, Great Bay, Piscassic River, and Moonlight Brook.

Local Water Quality Monitoring

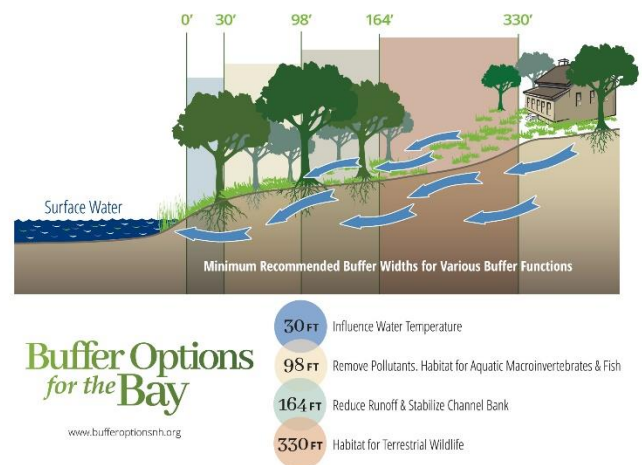
The NH Department of Environmental Services through its Volunteer River Assessment Program (VRAP) maintains a water quality-monitoring program for the Lamprey River and its tributaries. The Lamprey River Watershed Association has undertaken this role and has been doing so since 1999. Long-term monitoring provides a basis for understanding the river's dynamics, or variations on a station-by-station and year-to-year basis. The data also serves as a baseline from which to determine any water pollution problems in the river and/or watershed.

In Newmarket, there are four sampling locations, including the Piscassic River at the Grant Road Bridge, Piscassic River at the Route 152 Bridge, Piscassic River at the Packers Falls Bridge, and the Lamprey River at the Route 108 Bridge. According the 2017 Lamprey River Watershed VRAP Data report, the only measurements not meeting New Hampshire surface water quality standards were dissolved oxygen and pH. Dissolved oxygen is essential for bottom-dwelling organisms and pH affects chemical and biological processes in the water and different organisms flourish within a range of pH levels⁵.

Lakes, Ponds, and Great Bay

Lakes, ponds, freshwater/tidal rivers, and Great Bay comprise 1,046.2 acres in Newmarket. This includes Great Bay, which is a 6,000+ acre tidal estuary and represents roughly 84% of the total water area in town, that acts as

Figure 1. BOB Buffer Width Recommendations



⁴ Identified waterbodies that are impaired or threatened; not expected to meet water quality standards within a reasonable time even after application of best available technology standards for point sources or best management practices for nonpoint sources; or requires a comprehensive water quality study (total maximum daily load) in order to meet water quality standards.

⁵ NH Volunteer River Assessment Program. (Revised 2011). Interpreting VRAP Water Quality Monitoring Parameter: Chemical Parameters. [online] [Accessed 27 Aug. 2020]. Available at: https://www.des.nh.gov/organization/commissioner/pip/publications/wd/documents/vrap_parameters.pdf



the Town's easterly border and is home to upland forest, salt marsh, mudflats, tidal creek, rocky intertidal, eelgrass beds, channel bottom/subtidal and upland field habitats.⁶

Table 2: Surface Waterbodies by Type and Acreage

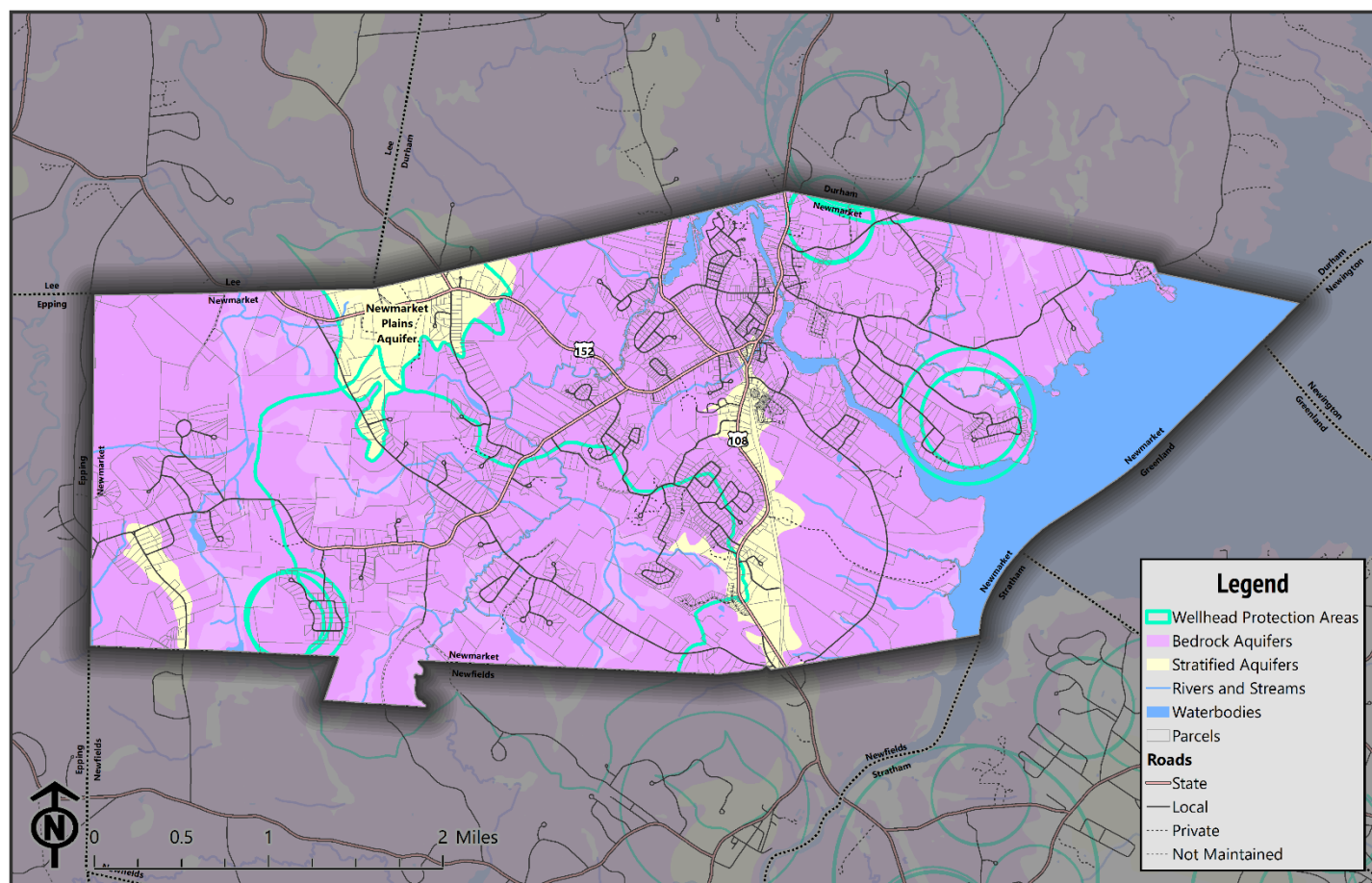
Surface Water	Acreage	% Total Water Area
Lamprey River (Freshwater)	16.8	1.6
Lamprey River (Tidal)	23.1	2.2
Lakes (Impoundments)	33.4	3.2
Ponds	95.2	9.1
Great Bay	877.7	83.9
Total	1,046.2	100

[Source: NH Hydrography Dataset]

Newmarket's many small ponds and other unnamed surface water bodies are typically located within large wetland complexes in low lying areas through which rivers, streams, and small unnamed tributaries flow.

Groundwater Policy Statement

Protect the volume and quality of groundwater resources for current and future sources of drinking water, and to sustain downstream surface waters and wetlands through appropriate policy and regulatory measures.



Map 3. Newmarket's Groundwater Resources [Source: USGS, NHDES]

⁶ Great Bay Stewards. (2019). Great Bay Map, NH & ME. [online] Available at: <https://greatbaystewards.org/home-page-great-bay-stewards-supporting-great-bay-estuary-greenland-nh/great-bay-map/> [Accessed 27 Dec. 2019].



Stratified Drift Aquifers

Stratified drift aquifers consist of well-sorted sand and gravel deposits that are typically laid out in layers by historic glacial outwash streams and rivers. Depending on the depth and the coarseness of the material, these deposits generally provide good sources of groundwater because of their high capacity to store groundwater over large areas.

Table 3: Acres of Stratified Drift and Bedrock Aquifers

Type	Acres	% of Total Municipal Area
Stratified Drift	657.5	7.2
Bedrock Aquifers	8,127	89.5
Total	8,784.5	96.7

[Source: NH GRANIT]

Newmarket Plains Aquifer

The Town's most productive groundwater resource is a stratified drift aquifer generally referred to as the Newmarket Plains Aquifer located in the northwest part of town along Route 152 near Lee Hook Road. The surficial area of the aquifer is approximately 410 acres (0.64 square miles) and is about 60 to 80 feet deep at its deepest point.⁷ The Newmarket Plains Aquifer represents the Town's primary source of drinking water from two municipal wells, the Bennett and Sewall Wells. The Bennett Well was installed in 1974 and is 48 feet deep. The Sewall Well was installed in 1985 and is 83 feet deep. Historically, these two wells were thought to produce a safe yield of 200 and 260 gallons per minute (gpm) of high-quality drinking water that requires minimal treatment. The drought conditions in 2016 resulted in revised safe yield estimates of 110 and 155 gpm, respectively. This is a major reduction in the Town's water supply capabilities.

There are only two other identified stratified-drift aquifer deposits in Newmarket. One exists along Bald Hill Road in the western portion of the town, and the other deposit is situated directly beneath Route 108 and extends from about the Rockingham Golf Course area north to about the railroad crossing. Neither of these deposits are considered to have high water supply potential because these deposits are relatively shallow with depths of less than 20 feet and are also narrow extending out only 300 to 400 feet in width. In addition, the existing development along Route 108 presents a risk of contamination.

Bedrock Aquifers

Bedrock aquifers are composed of fractured bedrock or ledge. Groundwater is stored in voids that are created by these fractures. On average, bedrock aquifers tend to yield smaller volumes of groundwater than wells drilled in stratified drift and finding one sizable enough void or fracture can be a costly procedure. Areas of Newmarket not covered by stratified drift deposits are underlain by bedrock. Typically, most bedrock has variable water yield depending on subsurface conditions (i.e. type of bedrock and the degree of fracturing and connectivity).

In 2016, the Town put the MacIntosh Well on-line. This well has a safe yield of 300 gpm, but due to water quality issues, this well must be blended with water from the other two wells. As a result, Bennett and Sewall Wells must be operating at 100% of their safe yield to pump MacIntosh at 300 gpm. The Town has permitted a fourth well (Tucker Well) but has not developed this well or tied it into the distribution system. This well has a permitted

⁷ Richard B. Moore, *Geohydrologic and Groundwater Quality Data for Stratified-drift Aquifers in the Exeter, Lamprey and Oyster River Basins, Southeastern New Hampshire*, USGS, 1990. Available at <https://pubs.usgs.gov/wri/1988/4128/report.pdf>.



capacity of 275 gpm, but like the Macintosh Well, will likely be limited by water quality issues to less than this capacity unless the water is treated.

Federal/State Protection Measures

Shoreland Water Quality Protection Act

The Shoreland Water Quality Protection Act, originally named the Comprehensive Shoreland Protection Act (CSPA), was enacted into law in the 1991 session of the Legislature. The act establishes minimum standards for the subdivision, use, and development of shorelands adjacent to the state's public water bodies. During the 2011 legislative session, the CSPA was renamed to the Shoreland Water Quality Protection Act and included changes to vegetation requirements within the natural woodland and waterfront buffers, the impervious surface limitations and included a new shoreland permit by notification process.

Alteration of Terrain Permit

The NHDES has jurisdictional review and a permitting process for all land development activities that will disturb an area of more than 100,000 square feet, or 50,000 square feet in locations within 250 feet of a designated public water body, to ensure that adequate erosion control and storm water management measures will be implemented to treat runoff before it leaves the proposed site.

Groundwater Protection Act

The Groundwater Protection Act (RSA 485-C) was passed in 1991. This legislation recognized that a variety of activities involve the use of materials that can, if not properly handled, contaminate groundwater. There have been numerous instances of groundwater contamination in New Hampshire from leaking storage facilities, improper waste disposal, accidental spills, and from normal use of these materials. The Groundwater Protection Act directed the New Hampshire Department of Environmental Services (NHDES) to adopt rules specifying best management practices (BMPs) for the Potential Contamination Sources (PCSs) as defined by RSA 485-C.

NHDES 2015 Model Groundwater Protection Ordinance

This model was created in response to municipal officials requesting more local tools to protect stratified-drift aquifers. The model provides an example of an ordinance that complies with state laws and is consistent with current approaches to groundwater protection.

NH Code of Administrative Rules Part Env-Wq 401 Best Management Practices for Groundwater Protection

These rules apply to all potential contamination sources in the state. The BMPs within the rules are essentially common-sense operating practices that are simple and economical to implement. The purpose of the BMPs is to help prevent a release of regulated substances, as defined under this rule. Regulated substances include oil, as defined under RSA 146-A, III, regulated contaminants established pursuant to RSA 485-C:6, and hazardous substances listed under the Code of Federal Regulation (CFR), within 40 CFR § 302. Cleaning up the release of a regulated substance can be very expensive. Following the BMP rules reduces environmental liability and minimizes potential cleanup costs.

NH Code of Administrative Rules Part Env-Dw 302 Large Production Wells and Wells for Large Community Water Systems

The purpose of these rules is to implement portions of RSA 485, the New Hampshire Safe Drinking Water Act, pertaining to the department's obligation to approve public water systems, by establishing procedures and standards for the development of large production wells for community water systems (CWS) in order to ensure that such wells will be capable of producing an adequate supply of water that meets drinking water quality standards.



Existing Local Protection Measures

Shoreline Protection Overlay District

The Shoreland Protection Overlay District shall include all land within 250 feet of the reference line. The applicable water bodies are designated on the Newmarket Shoreland Protection Overlay District Map, as amended. In Newmarket, these include all tidal waters of Great Bay, the Lamprey River and Lubberland Creek, the non-tidal portion of the Lamprey River, the impoundment above the Macallen Dam, and the Piscassic River. General requirements outline that all primary structures be setback 125 feet from the reference line, while accessory structures shall be setback at least 20 feet from the reference line.

Class A Watershed Protection Overlay District

Septic systems shall be set back a minimum of 150 feet from the reference line of all Class A surface waters. The definition of "reference line," pursuant to RSA 483-B:4(XVII)(d), shall be the ordinary high-water mark. Class A surface waters in Newmarket include the Piscassic River and Follett's Brook. Septic systems shall be setback a minimum of 150 feet from the reference line of all Class A surface waters.

Aquifer Protection Overlay District

The Aquifer Protection Overlay District shall include all land identified as stratified drift aquifer (of any kind) in the vicinity of Newmarket Plains (along NH Route 152, Lee Hook Road, Langs Lane, and Ash Swamp Road) on Plate 6 of the report entitled "Geohydrology and Water Quality of Stratified Drift Aquifers in the Exeter, Lamprey, and Oyster River Basins, Southeastern New Hampshire" ([USGS, Water Resources Investigations Report 88-4128, 1990 revised](#)); as well as the wellhead protection area designated by the map: Wellhead Protection Area - WHPA Delineation Map, as contained in a letter report dated October 3, 2006 to the Town of Newmarket entitled "Delineation of Newmarket Plans Aquifer Wellhead Protection Area" (Comprehensive Environmental Incorporated (CEI)).

Recommendations

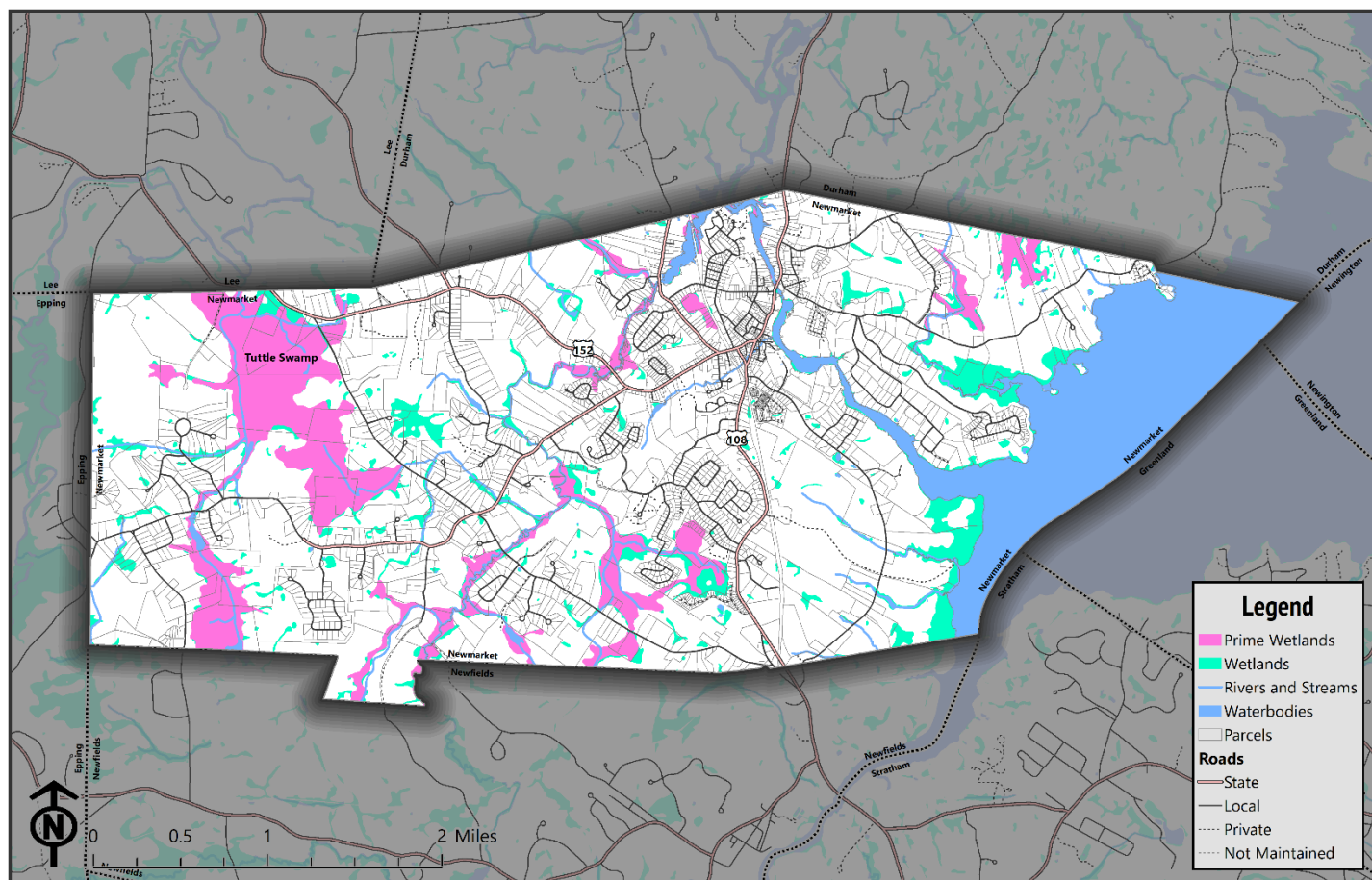
1. Review the current Aquifer Protection Overlay District with the state's updated model ordinance to recommend any necessary revisions.
2. Review all permitted uses within the base zoning districts to ensure that high intensity uses are consistent and in sync with the goals and objectives outlined in the Master Plan.
3. Evaluate the current regulations and ordinances with regards to septic system setbacks to ensure all waterbodies are adequately protected.
4. Continue to support local watershed groups and organizations.
5. Investigate funding opportunities to help pay for the development of watershed-based plans to recommend methods to address specific impairments identified in the 303(d) list.
6. Use resources, such as the NH [Statewide Asset Data Exchange System](#) (SADES) crossing database, [Resilient Tidal Crossing Assessment](#), and the C-RiSe climate ready culvert analysis, to identify infrastructure projects for inclusion in the Capital Improvements Plan that would assist with long-term planning decisions regarding the placement, design, and size of new culverts or when upgrades and repairs are being made to existing culverts. Site specific projects include the replacement of the Grant Road and Ash Swamp Road crossings over the Piscassic River to help restore surface waters to natural, free flowing systems, and the replacement of the Route 108 crossing over the northernmost unnamed perennial stream behind the Newmarket Storage that flows easterly beneath New Road into Great Bay to improve wetland function.



Wetlands

Wetlands Policy Statement

Implement comprehensive protection of wetlands, particularly prime wetlands, and their buffers through regulatory, educational, and voluntary efforts to maintain and protect their critical functions and values.



Map 4. Newmarket's Wetland Resources [Source: National Wetlands Inventory]

Overview of Wetlands

New Hampshire State Statute RSA 482-A:2 (X) defines wetlands as an area that is inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal conditions does support, a prevalence of vegetation typically adapted for life in saturated soil conditions. According to the [New Hampshire Water Resources Primer](https://www.des.nh.gov/organization/divisions/water/dwgb/wrpp/primer.htm)⁸, wetlands share three characteristics:

- 1) standing water or water at or near the ground surface during some portion of the growing season;
- 2) soils with characteristics that show they are saturated some of the time; and
- 3) plants adapted to growing in saturated soils.

⁸ All, or individual chapters, of the Water Resources Primer can be accessed and downloaded at the following website: <https://www.des.nh.gov/organization/divisions/water/dwgb/wrpp/primer.htm>



State jurisdiction of wetlands is found in NHDES Administrative Rules Chapter [Env-Wt 100](#), and states that a jurisdictional area is subject to regulation under RSA 482-A, including but not limited to surface waters, streams, lakes, rivers, ponds, wetlands, banks, flats, shores, sand dunes, upland tidal buffer zones, and duly-established 100-foot buffers.

There is tremendous diversity in the types of wetlands found in the state. Tidal marshes and mud flats, freshwater red maple swamps, bogs, vernal pools, Atlantic white cedar swamps and wet meadows are all wetland types found in New Hampshire.

Wetlands in Newmarket

Wetlands identified by the U.S. Fish & Wildlife Service, National Wetlands Inventory (NWI) are summarized below by major wetland type and acreage. The total area of NWI wetlands mapped in Newmarket is 2,185.84 acres or nearly 24.07% of the Town's total area.

Table 4: Wetlands in Newmarket

Wetland Type	Acres	% of Total Municipal Area
Estuarine and Marine Deepwater	573.71 Acres	6.32%
Estuarine and Marine Wetland	533.34 Acres	5.87%
Freshwater Emergent Wetland	176.81 Acres	1.95%
Freshwater Forested/Shrub Wetland	783.34 Acres	8.63%
Freshwater Pond	78.87 Acres	0.87%
Lake	20.61 Acres	0.23%
Riverine	19.12 Acres	0.21%
Total	2,185.84 Acres	24.07%

[Source: National Wetlands Inventory]

Most wetlands in Newmarket are in coastal transition zones, where tidal seawater meets freshwater rivers. A large wetland area, known locally as Tuttle Swamp, extends from Lee into Newmarket along the western side of Ash Swamp Road with a smaller area on the eastern side of Ash Swamp Road. This wetland is a major groundwater discharge area that receives drainage from the surrounding upland areas. The northern half of Tuttle Swamp discharges to the Lamprey River in Lee while the southern half and eastern areas of the wetland system discharge to the Piscassic River. This wetland, combined with others in the area, provide flood control during high flow periods.

In addition to Tuttle Swamp, there are extensive wetlands within the Piscassic River and Follett's Brook drainage areas. These wetlands provide for flood control during high flow periods. Other wetland areas of note include the extensive salt marshes along the Great Bay shoreline near New Road and in the north near Lubberland Creek. Aside from water-related issues, these wetlands provide an extensive network of habitat for a variety of flora and fauna.

Did you know?

Given the important functions and values of wetlands described above, there have been several attempts to place an economic value on wetland resources. In 2002, a study by the Clean Water Network estimated the economic value of New Hampshire's remaining wetlands to be approximately \$1.2 billion.

[Source: New Hampshire Water Resources Primer: Chapter 5 Wetlands]



Unique and Important Wetland Habitats

Wetlands are important for removing excess nutrients and sediment from the water, slowing and storing floodwaters, promoting groundwater infiltration, and providing habitat for a variety of vegetation and wildlife. In addition, wetlands provide recreational, educational and research opportunities.

Salt Marsh

Salt marshes (*Spartina patens* and *Spartina alterniflora*) are intertidal wetlands typically located in low energy environments such as estuaries. They exist both as expansive meadow marshes and as narrow fringing marshes along shorelines. Salt marshes are considered one of the most productive ecosystems in the world due to high rates of plant growth. They provide important ecological functions, including shoreline stabilization, wildlife habitat, and nutrient cycling, and serve as important breeding, refuge, and forage habitats for many species of crustaceans and other invertebrates, and fish.



View of Great Bay salt marsh
[Photo Credit: Bill Doucet]

Salt marshes are important components of the food web base that support all estuarine invertebrates, fish, and birds, and provide important, often essential, habitat for hundreds of other species. The ecological services provided by eelgrass and salt marshes include protection from shoreline erosion, nutrient and sediment trapping, and pollution filtration. Salt marshes are a scarce habitat type, occupying only about 0.1% of the land area of New Hampshire.

The following information was extracted from the [Wildlife Action Plan: Appendix B](#), rising sea levels will likely have the greatest impacts on current salt marsh habitats; however, many scientists believe these systems can keep pace with sea level rise by migrating landward if there is an adequate supply of sediment or peat build up and no natural, or human-made, barriers present. Future sea level rise scenarios predict that, if not able to migrate, much of today's low marsh will be mostly submerged and transformed into mudflats or sub-tidal bays. Current high marsh will change to low marsh, and high marsh will likely migrate upland several feet (if allowed).

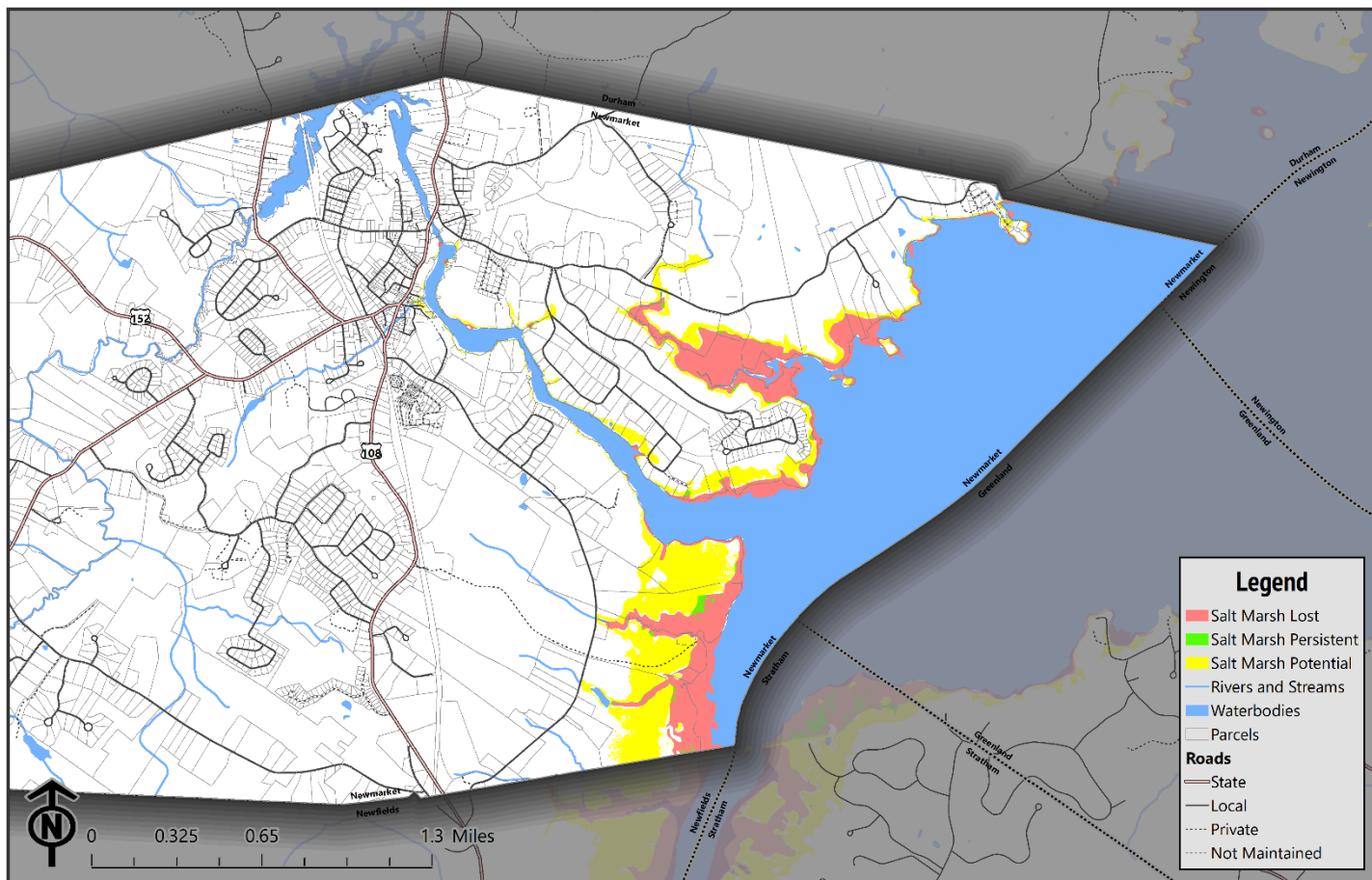
According to the Sea-Level Affecting Marsh Migration (SLAMM) model⁹, Newmarket is a community within the coastal watershed where current conditions allow for potential salt marsh growth as sea levels rise. In fact, upwards of 170.7 acres of potential salt marsh will have the opportunity to migrate into surrounding upland areas as sea levels rise. The Town may, however, lose approximately 169.9 acres of salt marsh habitat due to coastal inundation (see Table 5).

Table 5: SLAMM Results for Newmarket	
2100 Timeframe with 6.6 feet of SLR	Total Acreage
Salt marsh lost	169.9
Salt marsh persistent	5.7
Salt marsh potential	170.7
[Source: New Hampshire Fish & Game, 2014]	

⁹ This model simulates the dominant processes involved in wetland conversion and shoreline modification under different scenarios of sea level rise. SLAMM tracks the rise of water levels and the salt boundary in 25-year time steps and predicts changes to wetland habitat based on known relationships between wetland types and tide ranges. This information is available [here](#).



Tidal areas with the highest potential for salt marsh migration are found along the outskirts of the existing marsh system around Lubberland Creek, the tidal portion of the Lamprey River, and the shoreline of Great Bay east of New Road and north of the Squamscott River confluence. Protecting riparian areas through living shoreline efforts and best management practices is likely to retain the functions of these natural systems.



Map 5. Potential Salt Marsh Migration in Newmarket [Source: NH Fish and Game]

Did you know?

In 2019, the Town of Newmarket, in partnership with The Nature Conservancy and NH Coastal Program, completed a tidal culvert replacement project on Bay Road over Lubberland Creek that will support fish passage, salt marsh migration, and reduce ongoing flooding issues in the area.

In May 2019, a report titled "[Resilient Tidal Crossing: An Assessment and Prioritization to Address New Hampshire's Tidal Crossing Infrastructure for Coastal Resilience](#)"¹⁰ was published with a focus on enhancing coastal resilience for both human and natural communities. The report identified a culvert on New Road as a high priority for replacement due to the crossing being in poor condition, restrictive, and exhibiting high erosion; however, offers little potential for salt marsh migration.

¹⁰ Weblink here: <https://www.des.nh.gov/organization/divisions/water/wmb/coastal/documents/r-wd-19-20-compiled.pdf>



Prime Wetlands

Prime wetlands are designated by a municipality according to the requirements of RSA 482-A: 15 and Chapter Env-Wt 700 of the NHDES Administrative Rules. The designation of these wetlands must then be adopted by the municipality by vote of the residents after undertaking a process comparable to the adoption of zoning ordinances. Prime wetlands that were designated between September 11, 2009 and August 17, 2012 are subject to an additional 100-foot buffer; however, Newmarket's prime wetlands were designated in 2006, a period in which no additional buffers were required.

Vernal Pools

Vernal pools are temporary bodies of water that flood each year for a limited time during wet months, typically early spring to mid- or late summer months. Their common characteristics are the absence of fish, temporary flooding regime, and the presence of vernal pool species. The hydrology of vernal pools is maintained primarily by runoff from melting snow and precipitation, and in some cases groundwater flow. Vernal pools usually dry up by mid- to late summer, depending upon climate factors such as the amount of rain and temperature. Species typically found in vernal pools in New Hampshire include: Wood Frog, Spring Peeper, Green Frog or Bullfrog, Spotted Salamander, Jefferson Salamander, Blue-spotted Salamander, Marbled Salamander, Eastern Spotted Newt, Four-toed Salamander, Fairy Shrimp, Spotted Turtle, Blanding's Turtle and Wood Turtle.¹¹ Except for the Marbled Salamander, these species are present in some of Newmarket's wetlands. The [Identifying and Documenting Vernal Pools in New Hampshire](#) is a useful tool that can be used to help train the public to identify and document vernal pool habitat.

Federal/State Protection Measures

NHDES Fill and Dredge in Wetlands

The mission of the Wetlands Bureau is to protect, maintain and enhance the environmental quality in New Hampshire through the powers set forth in RSA 482-A to regulate impacts to those areas wherever the tide ebbs and flows or freshwater flows or stands by requiring a permit for dredge or fill or construction of structures in wetlands or other waters of the state. The law also protects sand dunes and upland tidal buffer zones. RSA-482-A and the rules promulgated under that law require that projects be designed to avoid and minimize impacts to wetlands and other jurisdictional areas.

Existing Local Protection Measures

Wetland Protection Overlay District

The wetlands protection overlay district shall include all areas of land that meet the criteria of the NHDES Wetlands Bureau rules for determination of wetlands, poorly drained and very poorly drained soils (as amended), prime wetlands, as delineated by the Newmarket Conservation Commission and approved in accordance with RSA 482-A:15 (as amended) and associated buffers. Current regulations include:

- 1) Prime wetlands: There shall be no disturbance of any kind (including but not limited to construction, filling, dredging and the removal of vegetation) within a prime wetland or within a buffer area within 75 feet around the prime wetland. Structures shall be set back a minimum of 100 feet from prime wetlands. On-site septic systems shall be set back a minimum of 125 feet from prime wetlands.
- 2) Very poorly drained soils (hydric A):¹² Such wetlands shall not be included in the minimum lot size or as part of any lot density calculation as required by any provision of this chapter. There shall be no

¹¹ New Hampshire Audubon Society, *Conservation Fact Sheet: Vernal Pools*, 1998.

¹² A map (Map #6) of very poorly and poorly drained soils can be found in the Appendix of this chapter.



disturbance of any kind (including but not limited to construction, filling, dredging and the removal of vegetation unless in accordance with the provisions of this chapter) within such wetlands or within a buffer area 50 feet around such wetlands.

- 3) Poorly drained soils (hydric B): Such wetlands may be used to fulfill up to 25 percent of the area of the minimum lot size or 25 percent of any lot density requirement as part of any section of this chapter. There shall be no disturbance of any kind (including but not limited to construction, filling, dredging and the removal of vegetation unless in accordance with the provisions of this chapter) within such wetlands or within a buffer area 25 feet around such wetlands.

Recommendations

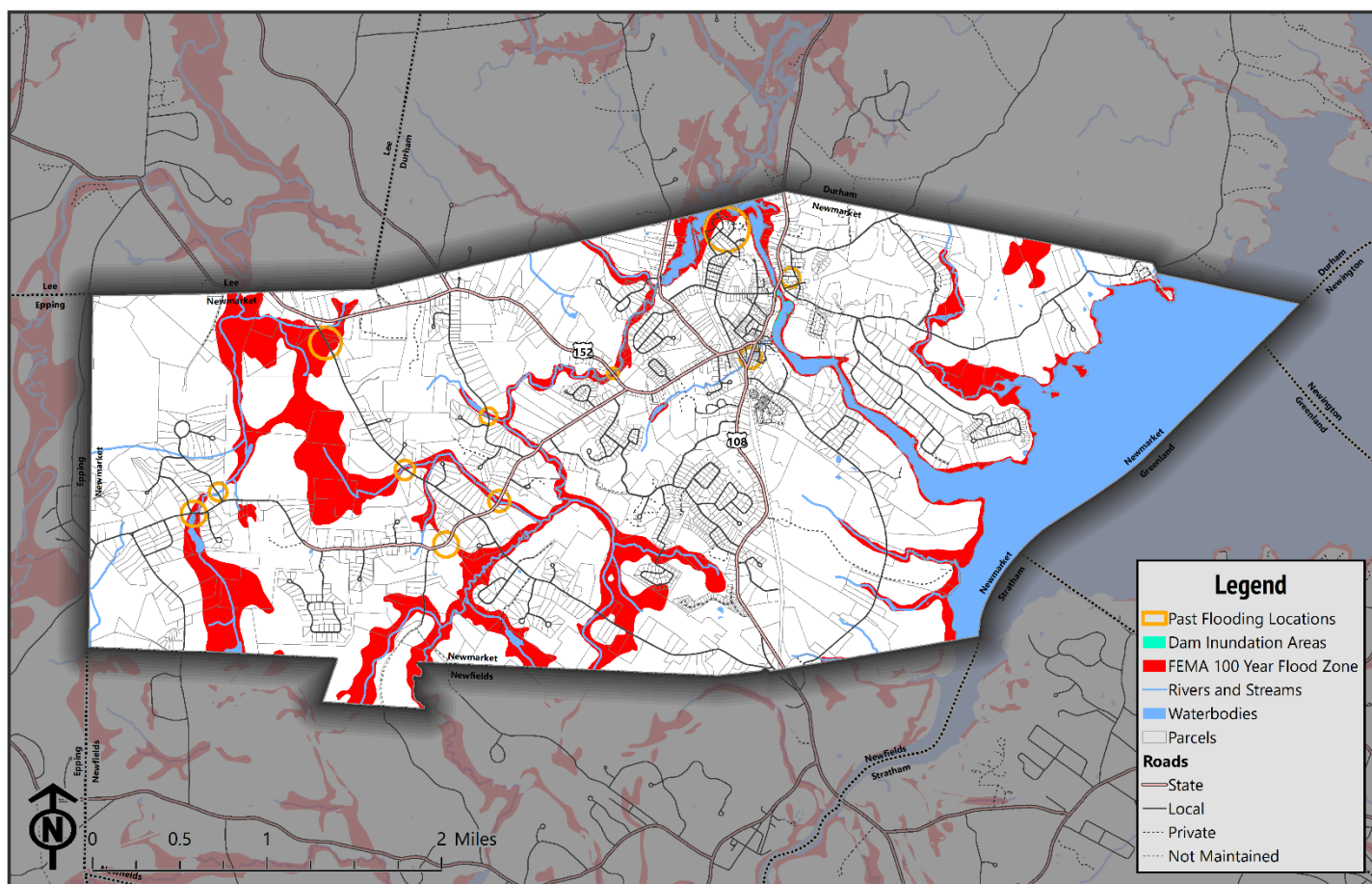
1. Explore funding opportunities to conduct a town-wide vernal pool inventory to locate, document, and map vernal pools in Newmarket.
2. Update the Town's Prime Wetland Maps and associated GIS layers that were completed in 2006 using new available GIS and Lidar data.
3. Compare the existing Wetland Protection Overlay District with new state rules and make necessary revisions to be consistent with jurisdictional areas and other state-level changes.
4. Collaborate with local, regional, and statewide partners to identify other wetland mitigation projects or restoration opportunities.
5. Consider adopting stricter buffer requirements for setbacks to wetlands that include consideration of climate change in order to protect land that allows coastal habitats and populations to adapt to changing conditions and also provides ecosystem services that protect people, structures, and facilities.



Floodplains

Floodplain Management Policy Statement

Implement regulatory, educational, and voluntary measures that incorporate the latest science on climate change to improve resiliency against future events, maintain the natural functions of floodplains, and minimize damage to municipal and private property.



Map 7. Newmarket's Existing Floodplains [Source: FEMA Digital Flood Insurance Rate Map (DFIRM) 2005]

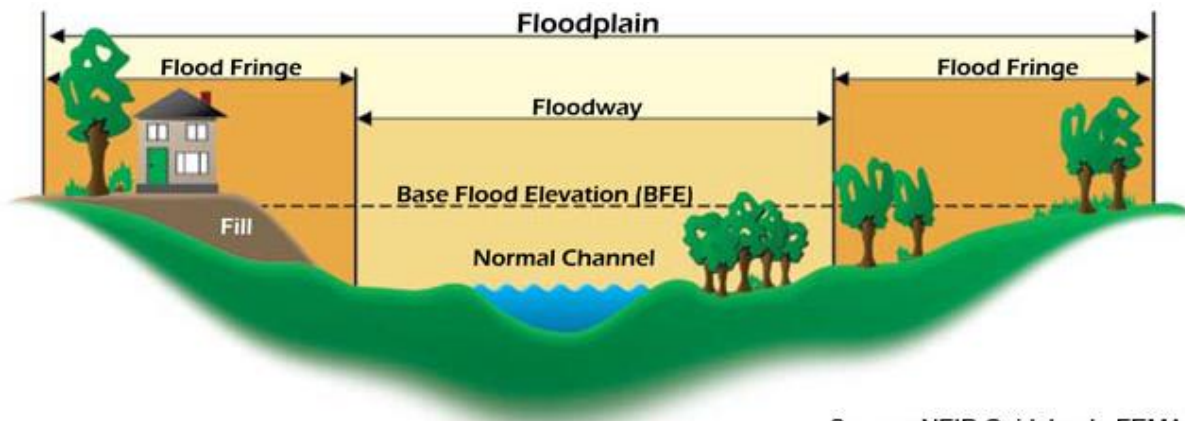
Overview of Floodplains

Floodplains are generally low-lying areas adjacent to rivers, streams, and other surface water bodies, which are susceptible to flooding. Floodplains perform an important water storage function during storm events and periods of excessive water run-off, by storing water temporarily and gradually releasing it back into the drain system or infiltrating floodwater into the subsurface where it is discharged to streams and recharge groundwater.

Refer to the diagram below for the components of a floodplain: normal channel, floodway, fringe, and flood hazard area or 100-year floodplain. The floodway and flood fringe serve as critical floodwater storage areas, and the floodplain vegetation acts to slow the velocity of floodwaters and reduce erosion of the floodplain and adjacent lands.



Figure 2. Characteristics of a Floodplain



Source: NFIP Guidebook, FEMA

Although the flood mitigation capacity of floodplains is relatively well protected by federal and local regulations, other factors can contribute to increased flooding. These factors include: increases in impervious surface coverage, filling of wetlands in the upper watersheds, stormwater management practices that increase peak flow rates, inadequate infrastructure to accommodate current storm flow volumes, beaver dams and less natural dissipation of flood flows through infiltration and interception by trees and vegetation.

Special Flood Hazard Areas

According to the Federal Emergency Management Agency (FEMA), flood hazard areas identified on the Flood Insurance Rate Map are identified as a Special Flood Hazard Area (SFHA). SFHA are defined as the area that will be inundated by the flood event having a 1-percent chance of flooding being equaled or exceeded in any given and a 26% chance of flooding over the life of a 30-year mortgage. In communities that participate in the National Flood Insurance Program, mandatory flood insurance purchase requirements apply to all high-risk zones.

Riverine and Coastal Flooding and Flood Prone Areas in Newmarket

Riverine flooding is the most common natural disaster to impact New Hampshire. Riverine flooding occurs when surface water runoff introduced into streams and rivers exceeds the capacity of the natural or constructed channels to accommodate the flow. As a result, water overflows the river banks and spills out into adjacent low lying areas.¹³ Floods are most likely to occur in the spring due to the increase in rainfall and the melting of snow; however, floods can occur at any time of the year because of heavy rains, hurricane, or a Nor'easter.

According to the [2018 Hazard Mitigation Plan Update](#), Newmarket has approximately 24.0% (2,183.4 acres) of its area in 100-yr. floodplain. It should be noted that this estimation is likely overstated since the FEMA floodplain contains open water. If the tidal portions along the Lamprey River and Great Bay were removed, the approximate acreage may be more accurately depicted as 12.6%. Based on extent of the floodplain, the Town has flooding potential along the Lamprey River and the Piscassic River. The Lubberland Creek, Follett Brook and Tuttle Swamp area, as well as along the tributaries to the Great Bay, also have an expansive floodplain area (1,144.1 acres). Newmarket has no existing man-made flood control measures. The Macallen Dam, originally built in 1887, does have floodgates; however, the dam's primary function is for recreation not for flood control.

¹³ [FEMA Training Chapter 2 Types of Floods and Floodplains](#)



Coastal flooding is often associated with storm surge, extreme precipitation events, and sea-level rise, and can be devastating to human health and safety, public and private structures and facilities, and the economies of coastal and inland coastal communities. Results of the [2017 C-RiSe](#) assessment report state that the inland coastal portion of Newmarket that is most susceptible to coastal flooding are those areas located south of the Macallen Dam on the west side of the Lamprey River near the downtown, low-lying areas around Lubberland Creek, and low-lying land south of the Lamprey River along Great Bay.



King Tide flooding at pump station on Creighton St.
Photo Credit: Kyle Pimental

Past Flooding Events

During extreme flood events, floodwaters from the Lamprey River overflow NH Route 108 upstream in Durham and are diverted into the Oyster River basin. This diversion of floodwaters reduces peak flood discharges of the Lamprey River by approximately 20 percent before it reaches the town.¹⁴ Between 2016-2018, NHDOT completed major roadway construction on Route 108, which included grade changes and drainage improvements, to construct 4-foot bike shoulders and other miscellaneous safety improvements. According to the Town's consultants, these alterations had little impact on improving or worsening flooding problems along this stretch of roadway; however, a separate project in a similar location in Durham was determined, if built, would negatively impact downstream systems and was redesigned. The Oyster River drainage basin remains an important flood protection and mitigation function for the Town, and regional projects within this sub-watershed should be carefully planned to reduce impacts upstream and down.

Numerous floods have been recorded on the Lamprey River since the U.S. Geological Survey (USGS) installed a gauging station near Packers Falls in Durham in July 1934. Historically, the two largest flood events since 1934 occurred in March 1936 (peak discharge of 5,490 cubic feet per second) and April 1987 (peak discharge of 7,500 cubic feet per second). These events had estimated frequencies of 25 and 100 years, respectively. In recent years, these historical flood events were exceeded in spring 2006 and 2007.



Overturned Jeep on Exeter Street during flooding
Photo Credit: Town of Newmarket

May 2006 Mother's Day Flood Event

From May 11-15 2006, central and southern New Hampshire experienced severe flooding caused by as much as 14 inches of rainfall. In addition to the precipitation volume being exceptional, the month of May 2006 was the second wettest May in New Hampshire on record (based on NOAA data). The U.S. Geologic Survey Lamprey River gauging station located near Packers Falls Road Bridge measured the highest flow ever recorded of approximately 8,970 cubic feet per second (CFS) on May 16. This flood level was estimated to be a flood event with a recurrence interval between 100 and 500 years. The Piscassic River rose to a level that exceeded its normal drainage basin, entered Moonlight Brook, and was impounded behind the PanAm Railways culvert at the intersection of Gerry Avenue and Exeter Street. The earthen embankment at the railroad arch culvert

¹⁴ Federal Emergency Management Agency, Flood Insurance Study, Town of Newmarket, New Hampshire, Rockingham County, 1991.



subsequently failed and storm flows flooded Route 108, in the "Exeter Street Bowl." During this flood event, floodwaters in Exeter Street were approximately four feet deep, vehicles were submerged, oil tanks and dumpsters displaced and silt from eroded roadways and foundations was discharged into the Lamprey River. As a result of the flood damage, a presidential disaster declaration was made on May 25, 2006 for seven New Hampshire counties, including Rockingham County.

Patriot's Day 2007 Flood Event

On April 15 and 16, 2007 nearly seven inches of rain fell in Newmarket. The U.S. Geologic Survey Lamprey River gauging station located near the Packers Falls Road Bridge measured a peak flow of approximately 8,450 cubic feet per second on April 18, 2007, the second highest flow. This flood level was estimated to have a recurrence interval of just below 100 years. Normal flows for this date would be 654 cubic feet per second. While there was flooding in the "Exeter Street Bowl" again, the damage was not as severe as occurred with the 2006 flood. Flooding in the New Road area extending to Exeter Street was significant necessitating temporary road closures.



Major flooding on Exeter Street "the Bowl" during flooding event
Photo Credit: Town of Newmarket

Both floods resulted in significant damage to public and personal property in Newmarket. Roads were impassable for days and severely damaged, and residential areas were evacuated due to high water levels and inundation of homes by floodwaters.

Other Localized Events of Significance

Data gathered from the [2018 Hazard Mitigation Plan Update](#) identified three additional flooding events of consequence, including the spring of 1996, February 2010, and October 2016. The February storm impacted parts of Route 152. The October storm impacted parts of Route 108 and Gerry Ave; however, the issues at Gerry Ave were attributed to beaver damage in a local manhole that backed up water from Moonlight Brook and has not happened since. The Committee could not recall the specifics of this storm other than it caused damage in the "bowl" area on Exeter Street. According to the Flood Insurance Study for Rockingham County (2014), this event had a recurrence interval of approximately 100 years and recorded a peak discharge of 3,060 cubic feet per second (cfs) on parts of the Exeter River in Brentwood.

Compliance with the National Flood Insurance Program

According to FEMA's Community Status Book Report, Newmarket has been a member of the National Flood Insurance Program (NFIP) since May 2, 1991. In order to remain in NFIP compliance, Newmarket has implemented several floodplain management actions, including: providing education materials to homeowners, participating in a FEMA Community Assistance Visit, updating Master Plan Chapters with a focus on climate adaptation and resilience, replacing an undersized culvert over Lubberland Creek, completing a climate study in the Moonlight Brook watershed, and improving drainage at the Middle/High School.

On July 29, 2020, FEMA issued a Letter of Final Determination (LFD) finalizing the preliminary coastal Rockingham County Flood Insurance Rate Maps (FIRMs) and Flood Insurance Study (FIS) report that were originally issued in



Additional Studies, Plans, and Initiatives

New Hampshire Coastal Flood Risk Summary Part 1: Science

The New Hampshire Coastal Flood Risk Summary – Part 1: Science provides a synthesis of the state of the science relevant to coastal flood risks in New Hampshire. Specifically, this document provides updated projections of sea-level rise, coastal storms, groundwater rise, precipitation, and freshwater flooding for coastal New Hampshire. This information is intended to serve as the scientific foundation for the companion New Hampshire Coastal Flood Risk Summary - Part II: Guidance for Using Scientific Projections and is intended to inform coastal land use planning and decision-making

New Hampshire Coastal Flood Risk Summary Part II: Guidance for Using Scientific Projections

The primary purpose of the 2019 New Hampshire Coastal Flood Risk Summary, Part II: Guidance for Using Scientific Projections (NHCFR Guidance) is to help decision-makers assess and incorporate best available projections for relative sea-level rise (RSLR), coastal storms, RSLR-induced groundwater rise, and extreme precipitation into state and local land use planning and decision-making.

Gomez & Sullivan and GZA GeoEnvironmental, Inc.: Macallen Dam Findings

Gomez and Sullivan Engineers (GSE) were originally contracted by the Town to conduct a dam removal feasibility study. However, as the study progressed the Town broadened the focus of the project to identify other potential alternatives, other than dam removal, to address NHDES requirements to pass the 100-year flood with one foot of freeboard based on past studies and the information gained from the study. Subsequent to that, final design and engineering services related to the rehabilitation of the Macallen Dam were prepared by GZA GeoEnvironmental to provide the Town with conceptual alternatives to choose from in meeting the NHDES letter of deficiency relative to the Macallen Dam. Construction, involving renovations to the dam, is moving forward at the time of this chapter revision, with a completion date of December 2020.

Climate Adaptation Plan for the Moonlight Brook Watershed

In 2016, Newmarket, in partnership with the Horsley Witten Group, participated in a resiliency to flooding and climate change project in the Moonlight Brook watershed. This project was a two part effort to: 1) study flood risk associated with climate change as well as how future development and build out of the community affect these risks, and 2) design robust green infrastructure practices within the Moonlight Brook watershed to help reduce risk of flooding while reducing pollutant load into the Brook and further downstream into the Lamprey River and ultimately Great Bay. Current erosion at Schanda Park, as witnessed by members of the Conservation Commission, indicates increased tidal flooding, as well as impacts from severe rain events at this location.

Coastal Risk in the Seacoast: Vulnerability Assessment

The Climate Risk in the Seacoast (C-RiSe) vulnerability assessment project produced maps and statistical data about the potential impacts to New Hampshire's ten inland coastal municipalities from sea-level rise and storm surge to infrastructure, critical facilities transportation systems, and natural resources. The project also assessed both aquatic organism passage capacity and hydraulic flow capacity of twelve road crossings in each of the ten inland coastal municipalities.



King Tide Flooding at the fishing weir at Schanda Park
Photo Credit: Kyle Pimental



New Hampshire Flood Hazard Handbook: A Guide for Municipal Officials

The Flood Hazards Handbook was developed and released in 2019 by the New Hampshire Silver Jackets, a unified team of individuals from federal and state agencies. The Silver Jackets work collaboratively on the state's flood risk management priorities and provide technical expertise to help reduce flood risk in New Hampshire communities.

A Guide to Assessing Green Infrastructure Costs and Benefits for Flood Reduction

The purpose of this guide is to provide a process that communities can use to assess the costs and benefits of green infrastructure to reduce flooding. The guide takes a step-by-step, watershed-based approach to documenting the costs of flooding; projecting increased flooding and associated costs under future land use and climate conditions; and calculating benefits and costs of reducing flooding with green infrastructure over the long term.

Federal/State Protection Measures

National Flood Insurance Program

The National Flood Insurance Program (NFIP), administered by the Federal Emergency Management Agency (FEMA), is designed to manage floodplains, and restrict development in floodplains to reduce flood hazards and structural damage. Under this program, flood hazard areas are mapped and studied in participating communities.

Existing Local Protection Measures

Floodplain Overlay District

Section 32-158 of the Town's Zoning Ordinance (as revised June 21, 2017) outlines the Town's floodplain development regulations (last updated August 4, 2010). The purposes of the floodplain protection overlay district are to: protect floodplains from development and construction activities which would aggravate flooding; prevent development in locations which would place occupants at risk or which would likely require rescue of occupants by emergency services personnel during floods; protect the floodplains for use as habitat and for the aesthetic qualities; and ensure town compliance with the National Flood Insurance Program. The regulations shall apply to all lands designated as areas of special flood hazard by FEMA in its "Flood Insurance Study for the County of Rockingham, N.H." dated May 17, 2005. The Town has recently received word from FEMA that new modified and flood hazard information and revised map panels will become effective as of January 29, 2021.

Recommendations

1. Review the updated floodplain model ordinance from NH Office of Strategic Initiatives and update the Town's floodplain ordinance, once FEMA maps are approved and adopted. An outreach campaign targeting existing property owners shall accompany this update.
2. Explore options to develop a creative outreach campaign to educate the public on future coastal flood risk (i.e. high-water mark initiative, participation in the king tide photo contest, etc.) at public spaces such as Schanda Park and Heron Point.
3. Use the New Hampshire Living Shoreline Site Suitability Assessment¹⁶ to identify sites in Newmarket that may be suitable for specific living shoreline approaches to address erosion issues along the tidal shoreline.
4. Incorporate impacts to municipal infrastructure identified in the C-RiSe project into current and future capital infrastructure projects, including water access at Schanda Park, the pump station on Creighton

¹⁶ Download report here: <https://www.des.nh.gov/organization/commissioner/pip/publications/documents/r-wd-19-19.pdf>



Street, and flooding on critical roads such as Treatment Plant Road. This also includes evaluating the extent of sea-level rise and storm surge flooding on individual facilities such as sewer pipes located at the end of Water Street, Creighton Street, and Lamprey Street and the intersection of Bay Road.

5. Revisit the Climate Resiliency in Moonlight Brook report to accomplish the two remaining ICLEI Climate Resilient Communities milestones identified in the plan. Site specific projects include: alleviate flooding in re-occurring areas by redirecting stormwater flows away from downtown in the "bowl " area on Route 108; installing a new drainage system with a gravel wetlands to provide water quality treatment on New Road and a stormwater outfall on Young Lane; and assess impacts upstream in the watershed at the new drainage system at the Elementary School.
6. Identify and implement green infrastructure and nature-based approaches to improve flood resilience and stormwater management throughout the Town referenced in the New Hampshire Flood Hazard Handbook.
7. Review Appendix C in the Town's 2018 Multi-Hazard Mitigation Plan to identify riverine flooding mitigation approaches, including prevention, property protection, natural resource protection, emergency services, structural projects, and public education.
8. Update the Town's Open Space Plan to strategically identify high value land for future land conservation. Incorporate climate resilience benefits, such as future flood storage salt marsh migration, etc., into scoring criteria to ensure the Town considers climate adaptation benefits when evaluating land for conservation purposes.
9. Integrate climate adaptation measures into all future master plan updates.



Potential Threats to Water Resources

Potential Threats to Water Resources Policy Statement

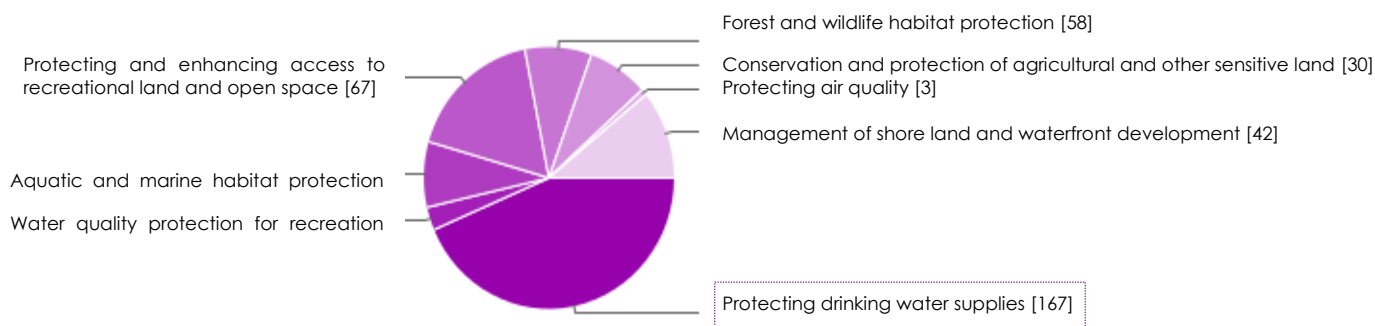
Protect water quality for drinking water sources and wildlife habitat from current and potential threats to preserve critical functions, benefits, and the ecological integrity of these resources.

Overview

In previous iterations of the Water Resources Chapter, Newmarket has approached potential threats to water resources through a point and non-point source threats lens. Based on available data, this worked; however, Newmarket's revised [Vision Chapter of the Master Plan \(2015\)](#) encourages vigorous protection of **ALL** water resources. This chapter update includes a summary of local upgrades and efforts, as well as potential threats based on new information about contaminants, degradation, and climate change impacts.

Figure 3. Results from Visioning Showing the Public's Prioritization of Protecting Drinking Water Supplies

Which of the following would you place the highest priority on in Newmarket over the next 10 years?



Source: 2015 Master Plan Visioning Public Input

Local Upgrades and Efforts

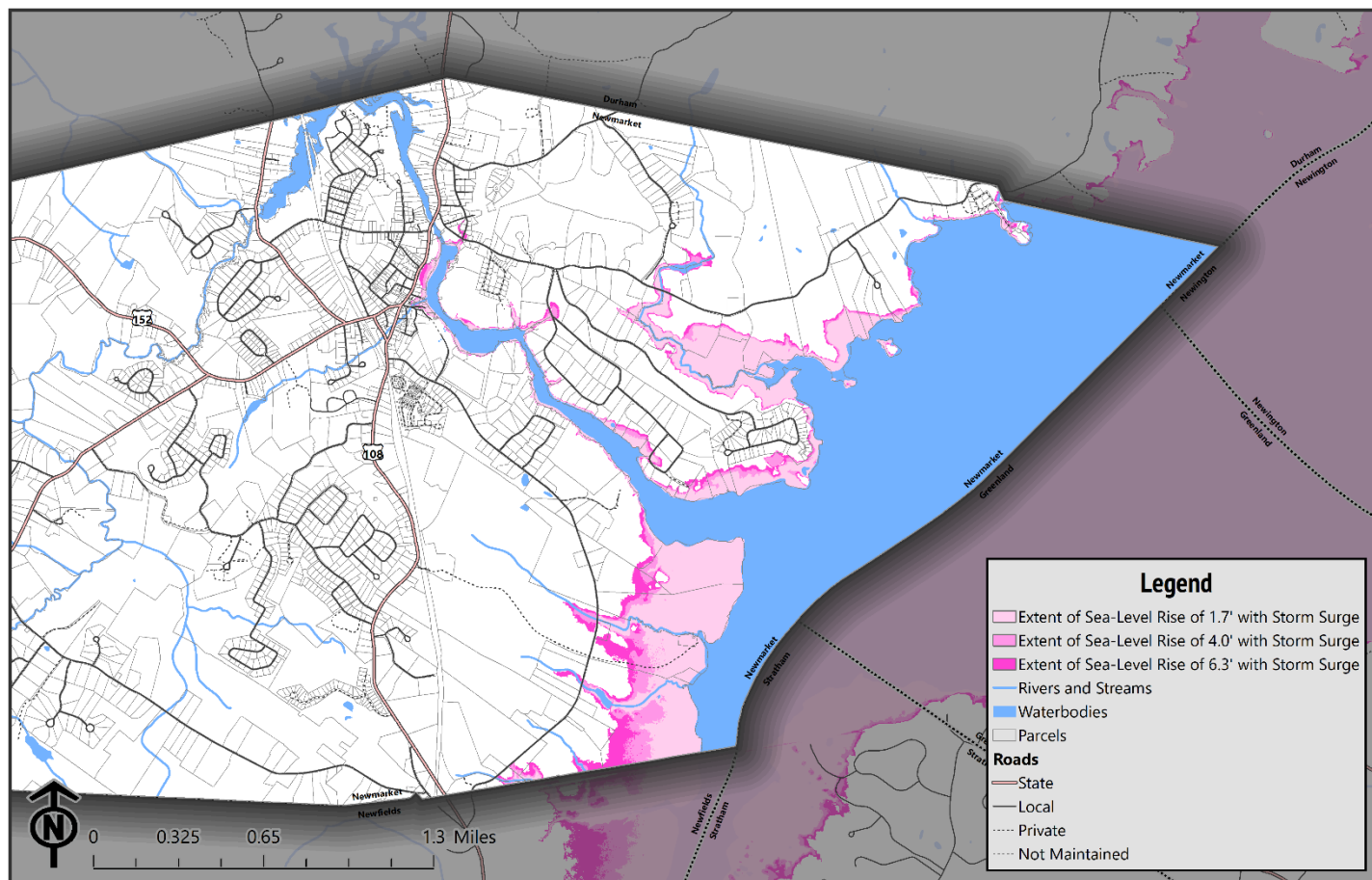
Historically, much of Newmarket's attention on threats to water resources has been focused on addressing challenges with the Town's wastewater system and exploring ways to improve it to minimize pollution. The Town's most recent [National Pollution Discharge Elimination System \(NPDES\) Permit](#), which was originally authorized in 2000 and extended in 2011 to 2016, allows the Town to discharge from their Young Lane Wastewater Treatment Plant to the Lamprey River below the Macallen Dam. The most current upgrade to the facility was completed in 2017 and included a 4-Stage Bardenpho process for nitrification and denitrification. This upgrade was given national recognition when the Town was awarded the 2019 PISCES Exceptional Project for Region 1, a first in New Hampshire, and will help the Town meet nitrogen effluent limits and improve the water quality of the Lamprey River and Great Bay Estuary.

Newmarket has also honed in on stormwater runoff, pollution, erosion, and sedimentation. The Town has been proactive in making substantial efforts to reduce the total nitrogen load to the Lamprey River. Strategies include infrastructure maintenance, organic waste and leaf litter collection, enhanced street and pavement cleaning, and stormwater structural BMPs. Lastly, during the development of this chapter, the Town was actively working to develop and implement a water quality program to monitor the effectiveness and in-stream quality response of implementing the 2018 Nitrogen Control Plan as part of the EPA's Administrative Order of Consent.



Groundwater Threats

While New Hampshire is a relatively water rich state, NHDES [recommends](#) that surface waters are not used as a source for drinking water for private homes because of their risk to contamination. Instead, they suggest groundwater through bedrock wells or wells installed in sand and gravel. The Town withdraws water primarily from the Sewall Well and the Bennett Well (the MacIntosh Well facility was constructed and put into operation in 2016 and the Tucker well is permitted but has yet to be developed).



Map 9. Sea-Level Rise Scenarios in Newmarket [Source: NH GRANIT]

Impacts from Sea Level Rise (Groundwater Rise and Saltwater Intrusion)

In 2017, Strafford Regional Planning Commission (SRPC), in partnership with the University of New Hampshire (UNH) implemented a [groundwater modeling study](#) to “identify existing and potential future locations where public water systems may be vulnerable to sea-level rise impact on groundwater” in Newmarket. The analysis identified one contamination hazard site, one local potential contamination site, one sewer pump station, as well as 30 private drinking water suppliers that have a potential to be impacted by groundwater rise. In addition, the study found that the Moody Point development is projected to experience saltwater intrusion.

Did you know?

In March 2019, Newmarket voters approved up to \$12.2 million in municipal bonds for seven water system upgrade and extension projects, including construction plans to extend a public watermain to the Moody Point development in response to the groundwater rise threat. The project ranked #10 (out of 72) in the 2019 NHDES drinking water SRF project priority list and is scheduled for construction in the summer of 2021.



As a coastal community, Newmarket will have to explore opportunities to combat salinity concentrations with new water treatment technology, replacement of underground pipes that corrode faster under salt water, and possibly the extension of municipal water infrastructure to locations with high salt concentrations. Homeowners may need to site new private drinking wells and relocate septic systems.

Public Water Supply Susceptibility

Drinking water can be contaminated through natural or man-made causes. Man-made contamination can happen because of failing septic systems, animal waste, plumbing fixture leaching, leaking storage facilities, or improper waste disposal. Public health standards are in place to protect water sources, and New Hampshire currently tracks four man-made contaminants: atrazine, Di (2-ethylhexyl) Phthalate (DEHP), Tetrachloroethylene (PCE), and Trichloroethylene (TCE) to protect community water systems.

In 2007, NHDES assessed the vulnerability of [every source of public water in Newmarket](#). Each source is ranked according to several criteria. According to the report, of greatest concern in Newmarket are confirmed detections of certain contaminants, the presence of numbered state highways or active railroads, the presence or density of septic systems and sewer lines.

Aquifers

As mentioned in the Surface and Groundwater Section, there are four identified stratified-drift aquifers deposits in Newmarket encompassing a total of 657.5 acres. While these are extremely important from a biological standpoint, they are at risk due to the combination of inland droughts and floods, increased surface water components and diversions, increased groundwater withdrawals, sea level rise, and increased storm surges. The Sewall Well and the Bennett Well produce high quality drinking water that requires minimal treatment. However, recent studies indicated that the rate of withdrawal from this source and several years of drought conditions resulted in the lowering of the groundwater levels in the aquifer. Recovery of the aquifer after the drought years of the early 2000's has continued, reaching nearly expected capacity with careful management of water withdrawals. Since the drought, the Town has initiated a water management program, allowing better control of water use during times of drought or other periods of high demand on the water system.

Land Use Discharges into Groundwater

In Newmarket, groundwater usually flows from areas of high groundwater altitude toward natural discharge areas in the Lamprey River and Great Bay. While groundwater is naturally cleaned of particulate matter, both natural and human-induced chemicals can still be found in it. Industrial discharges, groundwater intrusion, urban activities, agriculture, groundwater pumping, and disposal of waste can all affect the groundwater quality. Any commercial activity using regulated substances or contaminants that discharges into the ground, or any activity that releases a chemical having a groundwater standard without approval from NHDES is a violation of state law (See NH Code of Administrative Rules Part Env-Ws 421 and Newmarket Code of Ordinances CH. 32 Art. V Sect. 32-153 "Aquifer Protection Overlay District").

Arsenic, Radon, and other Natural Contaminants Levels

According to survey data from the [Spring 2018 Granite State Poll](#), NH resident's top concerns about their drinking water include bacteria, PFC, lead, arsenic, radon, taste, and odor.

Arsenic occurs naturally in groundwater across New Hampshire. When present above the drinking level standard, it is important to reduce the concentration as it has negative long-term consequences on human health. In October 2019, the State of NH lowered the Maximum Contaminant Level for arsenic in drinking water from 10



parts per billion (ppb) to 5 ppb.¹⁷ Currently, the Town water system levels are at 6 ppb. To become compliant by July 1, 2021, Newmarket is designing a new facility to treat water from the Macintosh and Tucker Wells to lower arsenic levels to 2 ppb.

Radioactive elements (radon, radium 226, radium 228, uranium, and gross alpha emitting particles) are naturally present in New Hampshire rock, soil, and water. When dissolved in water, radionuclides are colorless, tasteless, odorless, and cannot be detected by our senses, but are a health concern regarding such as cancer, kidney damage, and tumors with long-term exposure.¹⁸ All drinking water radionuclides can be treated at the kitchen sink or point-of-use as they are not volatile and cannot be absorbed through the skin. Newmarket's water system is in compliance with the Safe Drinking Water Act requirements.

Most radon exposure is through the air because it is a gas. A smaller amount of exposure happens through water because water use (shower and water use) exposes the radon. Radon concentrations in both air and water are measured in picocuries per liter (pCi/L) and [NHDES recommends](#) a general rule of thumb that for every 10,000 pCi/L of radon in a home's water supply, the radon concentration in indoor air is increased by 1 pCi/L.

Higher sodium and chloride levels imply contamination of groundwater sources by human activities, including the use and storage of road salt, discharges from water softeners, human or animal waste disposal, leachate from landfills, and other activities.¹⁹ Chloride, in the form of salt, is imported to local watersheds from several major sources: roadway deicing, snow removal, food waste, water softeners, atmospheric deposition, and roadway salt pile runoff. Chloride is most transported within a watershed through stormwater runoff and groundwater flow to surface waters. Year to year variations in chloride contributions are primarily due to differences in the severity of any given winter. Currently, the Town is not required to have a Chloride TMDL²⁰, as it is not on the [3030D List](#) for Newmarket, but the Town might need to address it as part of NH-MS4 in the future.

According to the Groundwater Modeling study, high levels of sodium and chloride can result in increased treatment costs for water providers and may render groundwater wells unusable. This may require the development of new well locations or alternative sources of freshwater. Sodium and chloride levels in the seacoast area typically reach up to 75 mg/L sodium and 150 mg/L chloride. While the EPA does not identify a maximum contamination level, advisory drinking water standards for these two contaminants are 250 mg/L (a concentration level at which drinking water can taste salty). Higher levels of sodium and chloride can also indicate that surface water is reaching wells and is potentially bringing in other contaminants with it. While public water sources are regulated, private wells are not and could be more prone to contamination. Newmarket's water system is in compliance with the Safe Drinking Water Act requirements.

PFAS

PFAS stands for "Per- and Polyfluoroalkyl Substances." These are synthetic chemicals that have historically been used in a variety of household and commercial products from non-stick cookware and microwave popcorn bags, to shampoo and dental floss. Outside of the home, they have been used in firefighting foams and other industrial processes. While studies do not clearly show whether PFAS causes cancer and further study is needed, several studies suggest that PFAS may have various harmful impacts on human health.

¹⁷ <https://www.newmarketnh.gov/water-wastewater/pages/arsenic-levels-october-2019>

¹⁸ [NHDES Radionuclides in Drinking Water Fact Sheet](#)

¹⁹ [NHDES Sodium and Chloride in Drinking Water Fact Sheet](#)

²⁰ Total Maximum Daily Load refers to pollutant reduction a water body needs to meet [NH's water quality standards](#).



In July 2016, New Hampshire Department of Environmental Services emailed and/or mailed a letter requesting that all community and non-transient, non-community water systems voluntarily sample for PFOA, PFOS, and four other per fluorinated chemicals (PFCs) totaling nine samples. Results from this effort led to NHDES deciding that Newmarket did not need to continue monitoring on a regular basis.

In July 2018, the Water Department made the decision to resample for PFOA and PFOS because technology made it possible to detect a greater number of per fluorinated chemicals. Again, Newmarket came back well under accepted levels according to New Hampshire Department of Environmental Services. The Town of Newmarket Water Department plans to continue to sample for PFOA/PFOS as science and technology improves making it possible to detect different variations of per fluorinated chemicals to try and stay ahead of this emerging contaminant. In July 2020, a NH law set new standards were set and require local water systems, landfills, and wastewater plants to routinely test and treat for four PFAS chemicals. These include PFOA, PFOS, PFHxS, and PFNA. These will take effect in October 2020.²¹

Offline Wells

Bennett and Sewall Well pump stations are essential to the overall supply capacity for Newmarket's drinking water system, and yet have undergone only minor upgrades since their installation. If one of these wells were to go offline line, Macintosh's well supply would need to be reduced because this water currently needs to be blended with the Sewall and Bennett wells. Improvements, according to recommendations by Underwood Engineers²², include replacing the chemical feed, electric, heating, ventilation, and some structural improvements.

Surface Water Threats

Newmarket currently does not use any surface waters as a source for public drinking water and there are no plans to charge aquifers with surface water from the Lamprey River; however, there are several important surface water resources that play a vital ecological role in the community. As mentioned in surface and groundwater section, the Lamprey River, Great Bay, Piscassic River, Moonlight Brook are all identified waterbodies that are impaired or threatened. This means they are not expected to meet water quality standards within a reasonable time even after the application of best available technology standards or best management practices; or they require a comprehensive water quality study (total maximum daily load) in order to meet water quality standards.



Lamprey River Winding Through the Downtown Mills
Photo Credit: Bill Doucet

Stormwater Runoff

Studies conducted in the northeast have documented that by converting as little as ten (10) percent of a watershed to impervious surfaces, stream water quality, stream channel structure, and species habitat begins to deteriorate. As of 2015, Newmarket's land based (excluding open water) impervious coverage²³ was estimated to be 8% and will likely rise as Newmarket continues to grow.

²¹ More information is available [here](#).

²² [Macintosh and Tucker Wells Treatment Evaluation](#)

²³ An updated GIS impervious coverage dataset for 2020 will likely be available sometime in 2021.



According to data collected during the development of the 2015 Vision Chapter, residents expressed their concern with this population growth and the impacts it could have on water quality. Development associated with rapid population growth changes the natural water balance on a site by increasing impervious area and reducing the amount of ground area capable of infiltration, converting naturally vegetated areas to impervious or manicured areas, and compacting natural soils.

On July 1, 2018, Newmarket officially became subject to the United States Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) program. This is a national program aimed at improving New Hampshire's water quality, with improved stormwater management as well as an array of training and implementation tools to assist communities with implementation, commonly referred to as the MS4 program.

Increased Flooding Impacts

In New Hampshire, there are many types of flooding: riverine, flash flooding, coastal flooding, and shallow flooding. Riverine flooding is produced by a river or stream and has potential to last for longer periods of time. Flash flooding can occur when large amount of rain falls in a short amount of time, and usually rise and recedes quickly. This allows little or no warning time to evacuate and can be destructive and hazardous. Coastal flooding occurs in low-lying areas in NH's coast due to major storms in combination of full moon tides causing storm surge and wave effects. Shallow flooding occurs in flat areas where water is prevented from draining easily due to inadequate channels. One type of shallow flooding, urban drainage, occurs when man-made drainage structures, meant to handle 10 year-storm water levels, are overloaded by larger storms and result in backed-up sewers and overloads ditches.



Roadway Damage from Flooding
Photo Credit: Town of Newmarket

Although the flood mitigation capacity of floodplains is relatively well protected by federal and local regulations, other factors can contribute to increased flooding. These factors include: increases in impervious surface coverage, filling of wetlands, stormwater management practices that increase peak flow rates, inadequate infrastructure to accommodate current storm flow volumes, beaver dams and less natural dissipation of flood flows through infiltration and interception by trees and vegetation.

Other identified flood risks include the inability of culvert stream crossings to withstand storm flows (see [C-RiSe](#) report for hydraulic ratings and assessments), loss of tidal wetlands and salt marsh habitat from sea level rise.²⁴ Current threats to salt marshes include reduced tidal flow due to undersized culverts under roadways and train beds, loss of the upland buffer due to coastal development, saltwater intrusion, and colonization by invasive species such as *Pinus strobus* (northern white pine) and *Lythrum salicaria* (purple loosestrife).

Erosion and Sedimentation

The erosion and sedimentation development processes typically involve the removal of vegetation, the alteration of topography, and the covering of some previously vegetated surfaces with impervious cover such as roads, driveways, and buildings. These changes to the landscape may result in the erosion of soil and the sedimentation of water bodies as soil travels to streams, rivers, and lakes in water runoff during storms at an increased velocity due to the lack of vegetative cover. The removal of vegetative cover and its roots system

²⁴ [NH Wildlife Action Plan Appendix B Habitats](#)



compromise the ability of vegetation to stabilize soil, reduce the velocity of runoff, shield the soil surface from rain, and maintain the soil's ability to absorb water.

Increased Extreme Temperatures and Drought

Over the past two decades, Newmarket has experienced several significant periods of drought (2001-2002; 2015-2016; and most recently 2020). According to the NH Drought Management Program, the drought that impacted the state in the early 2000's was the third worst on record. Locally, during the dry summer months, the capacity of Newmarket Plains Aquifer, which was the Town's primary source of drinking water, was significantly reduced to critical levels; however, with careful management the aquifer recovered within a few years. To accomplish this, the Town started implementing a Water Management Program in 2002 (see Figure 4.) that requires all users to adhere to restrictions during these critical dry periods.

NEWMARKET WATER DEPARTMENT WATER MANAGEMENT PROGRAM			
STAGE 1	STAGE 2	STAGE 3	STAGE 4
Voluntary Water Conservation The public is requested to refrain voluntarily from watering lawns and encouraged to conserve water in all practical ways.	Mandatory Odd/Even Outside Watering The public is required to restrict lawn watering to every other day based on address and calendar day. EXAMPLE Even address Even calendar day Odd address Odd calendar day	Mandatory Two-Day Restrictions on Lawn Watering by Address. Each address is to restrict watering to two (2) days per week between the hours of 5-8 am and 6-9 pm on the following schedule: <u>Allowed Days</u> <u>Street Address</u> Monday, Wednesday Odd Number Tuesday, Thursday Even Number No washing driveways, sidewalks, autos, or boats.	Mandatory Outside Water Ban. The public is required to restrict the following. <u>NO OUTSIDE WATER USE</u>
Water Conservation Ordinance #2002-05 is available at town office.	NOTICE Hand held hoses may be used for flower and vegetable gardens plus shrubbery without hour and day restrictions. (STAGE 2 and 3 ONLY)		For additional information on water saving ideas check these web sites: www.awwa.org www.cpa.gov www.des.state.nh.us www.waterwise.org
How will you know what Stage is in affect? Stage in effect will be posted at locations entering town, on the Town Hall marquee, and in local newspapers.	WATER SAVING TIPS		
Why Do We Need Levels? To ensure adequate pressure and fire protection, storage tank must be 3/4 full. If this amount cannot be replenished during non-watering times, more restrictive hours must be established by going to the next Stage.	1. Check your toilet for leaks. 2. Install water-saving shower heads or flow restrictors. 3. Check faucets and pipes for leaks. 4. Use your automatic dishwasher only for full loads. 5. Use your automatic washing machine only for full loads. 6. Keep a bottle of drinking water in the refrigerator. 7. Water your lawn only when it needs it. 8. Water during cool parts of the day. 9. Don't wash down driveways or gutters. 10. Plant drought-resistant trees and plants. 11. Put a layer of mulch around trees and plants. 12. Cover swimming pools to reduce evaporation.		

Figure 4. Newmarket's Water Management Program

For many years, the Town has operated at a Stage 2 level. More recently in September 2020, that warning was upgraded to a Stage 3 level. The upgraded warning was a result of severe drought conditions along with the decision to remove the MacIntosh well off-line temporary to install treatment for arsenic. Capacity at both the Bennett and Sewall wells appear to be in good condition. This is largely because when the MacIntosh well came online in 2016, it allowed the Town to operate the Bennett and Sewall wells at lower pumping rates for 4 years.



As the 2020 drought continues, 100% of New Hampshire's population is experiencing abnormally dry conditions. According to the [United States Drought Monitor](#), it is estimated that 16.7% of the State is facing extreme drought conditions, categorized by major crop or pasture losses and widespread water restrictions and shortage. Figure 5 depicts the most up-to-date drought conditions in New Hampshire (at the time this plan was developed) and indicates that Newmarket is in an area experiencing the most severe conditions in the State.

The NHDES Drought Management Program has stated that the drought was due to a combination of a below average snowpack in the spring, little precipitation to recharge the groundwater, and the inability of watersheds to store large volumes of water due to their geology.

More extreme heat in New Hampshire, because of climate change, not only causes a rise in electricity demand and urban heat effects, but also increases the demand for water. Additionally, as air temperatures rise, so do ocean, lake, and river temperatures. This can lower water quality and affect fish populations (such as causing them to migrate and loose suitable habitat) and the deaths of other aquatic organisms. The [2014 National Climate Assessment](#) states that increasing air and water temperatures, paired with increases precipitation and runoff, and intensifying droughts can decrease water quality in several ways. These potential threats include increases in sediment, nitrogen, and other pollutant loads and other climate change triggers such as declining water levels, greater flood risk, and altered precipitation patterns.²⁵

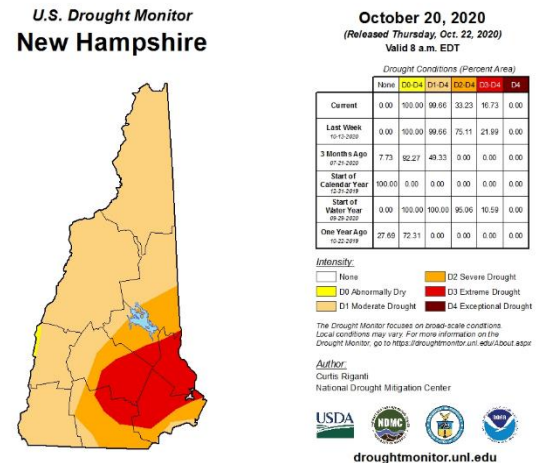
Often paired with increases in extreme heat are increase in drought across the U.S. Droughts are natural events that are part of the cyclical fluctuations of the climate; they can last anywhere from several months to years but there is not reliable method to accurately predict a drought.²⁶ Even in New England, where water is comparably abundant to the rest of the U.S., recent droughts—paired with NH's limited long-term water storage—have serious consequences on human demand for freshwater resources.²⁷ Compounding on these issues are increased demand for drinking water, saltwater intrusion, and rapidly development in watersheds, more extreme temperatures because of climate change.

Regulatory and Conservation Challenges

Regulatory

Current water regulations, which are based around preservation and restoration, assume that natural systems “fluctuate within an unchanging envelope of variability (stationarity)”.²⁸ Climate change is projected to impact water supplies in wide-ranging and pervasive ways and may reveal weaknesses in current water regulations.

Figure 5. US Drought Monitor: New Hampshire (10/20/20)



²⁵ More information can be found on the Conservation in a Changing Climate [website](#).

²⁶ [NHDES Water Resources Primer](#)

²⁷ Analysis of Drought Conditions in New Hampshire. J.M. Davis and M. Stampone. University of New Hampshire. December 2014. Available [here](#).

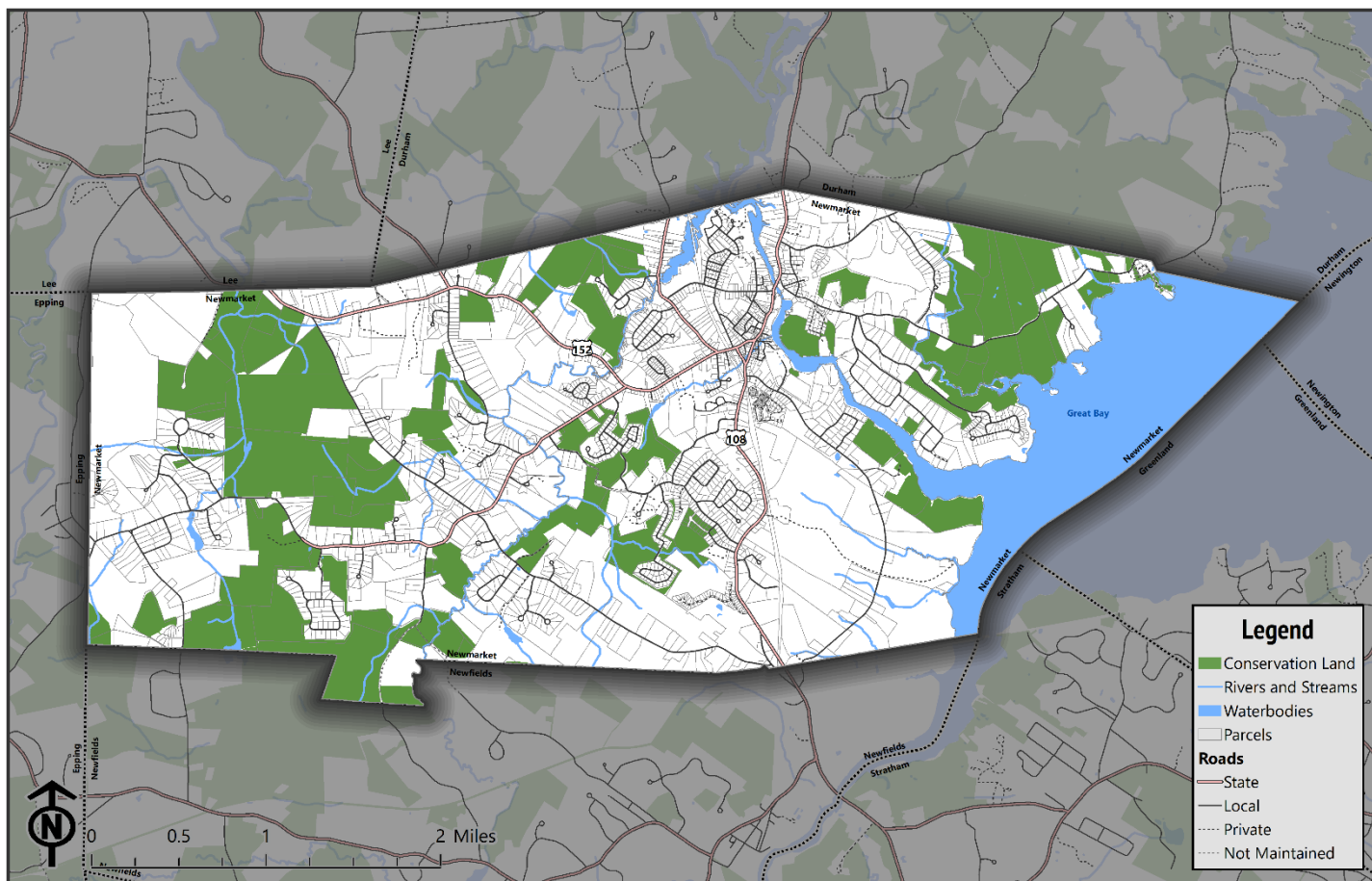
²⁸ [Ibid](#)



Therefore, assumptions about stationarity are unhelpful when writing and using water regulations. Agencies may need to seek flexibility in regulations and laws to achieve the best use of limited water resources and capacity.

Conservation Challenges

New Hampshire watersheds rank among the most highly threatened watersheds in the nation because of the high potential for conversion of private forests to residential development. In fact, three of the four most threatened watersheds in the US (which could experience the largest change in water quality because of increased residential development in private forests) occur at least partially in New Hampshire.²⁹ The long-term impacts of this rapid population growth and the associated changes in land use on New Hampshire's surface waters are uncertain. Of concern are the impacts of pollution such as septic systems, urban runoff, stormwater, application of road salt and fertilizers, deforestation, and wetland conversion.



Map 10. Conservation Lands in Newmarket [Source: NH GRANIT]

Newmarket's [Vision for the Future](#) emphasizes the importance of numerous environmental protection measures, including conservation of land and preservation of open spaces for the town's ongoing drinking water goals to be met. The 2015 Master Plan Visioning Public Input Session revealed that the public values the Town's emphasis on conservation and want to see it continue to be a priority.

²⁹ Stein et al. Private Forests, Public Benefits: Increased Housing Density and Other Pressures on Private Forest Contributions. USDA. 2009. Available [here](#).



The Newmarket Open Space Plan reports identifies areas with key natural resources and a high priority for protection through land conservation efforts, including the Town's drinking water sources (Newmarket Plains Aquifer and surrounding wellhead protection areas); floodplains of the Lamprey and Piscassic Rivers; prime wetlands; the Great Bay Estuary; highest quality wildlife habitat (NH Fish and Game, Wildlife Action Plan); ecologically significant areas (NH Coastal Program, The Nature Conservancy, and partners); and large unfragmented blocks of forests and farmland.

Federal/State Protection Measures

Refer to Surface and Groundwater Resources section.

Existing Local Protection Measures

Refer to Surface and Groundwater Resources section.

Recommendations

1. Ensure that the sanitary protective radius around the four (4) existing wells (Tucker, MacIntosh, Bennett, and Sewall) are all protected and controlled by the Town through ownership or easements.
2. Continue to explore grant opportunities to secure funding for existing and future drinking water protection efforts.
3. Finalize DRAFT stormwater regulations and adopt at the Planning Board.
4. Ensure that land use regulations protect environmentally sensitive resources including drinking water aquifers, tidal wetlands, and salt marsh that are subject to potential saltwater intrusion or other negative impacts associated with groundwater rise.
5. Collaborate with NHDES to update 2007 assessment of public water supply sources for susceptibility criteria including well proximity to septic, highways, and agriculture. Use this assessment to identify threats and target protection management (such as education for landowners, an inspection program, or emergency response planning) techniques.
6. Encourage better management of activities that add salt into or onto the ground (i.e. using newer technologies, equipment upgrades, good housekeeping measures, and inspection of storage sites on commercial areas such as Bennett Way).
7. Consider requiring advanced treatment for septic systems to reduce pollution often associated with traditional systems.
8. Increase awareness of radon levels and protection practices for Newmarket residents by posting NHDES information on the Building Department's webpage.
9. Work with state, federal regulators, and the Seacoast PFAS Commission to minimize PFAS contamination in the Town. This may including exploring water and land uses that could mitigate PFAS use and release; obtaining the latest inventory of (Tier II) data collection for facilities that have the potential to discharge PFAS using guidance from NHDES (SWP Grant 301).
10. Increase coordination with other watershed towns, higher-level collaboration with water-related organizations and stakeholders, and encourage a greater involvement of Newmarket's Conservation Commission in leading public education programs on water resources management and efforts to ensure compliance with stormwater requirements.
11. Prioritize buffer and floodplain protection based on Buffer Options for the Bay's regulatory options and suggestions.
12. Review appropriate zoning for activities that use chemicals or processes that could affect drinking water to proactively protect these resources.



13. Research effective education and outreach efforts to strengthen Newmarket's community values around water resources. Create community dialog around water resource stewardship for future generations.
14. Ensure that Planning and Zoning Board members are aware and have access to relevant land use trainings (e.g. OSI conferences, NHMA lectures, regional planning workshops) so that participants fully understand local ordinances, regulations, and state laws when making important decisions.
15. Continue to appropriate adequate funding to enable the Town to implement recommendations set forth in Newmarket's "Twenty-Year Water and Wastewater System Build-Out Study."
16. Continue efforts in implementing the Water Management Plan and educating the public of what they can do to complement these local actions.



Implementation Key

Action Type:

There are three action types, including:

- Regulatory
- Operations, Policies, and Procedures
- Outreach, Engagement, and Partnerships

Action Item:

Various recommendations for the Town to consider implementing to protect water resources over the lifespan of the chapter.

Chapter Topic:

There are five water resource topics:

- SW: Surface Water
- GW: Groundwater
- WET: Wetlands
- FLD: Floodplains
- THR: Potential Threats

Protection Type:

- RP: Resource Protection
- DWP: Drinking Water Protection
- WQP: Water Quality Protection

Priority:

There are four priority rankings, including:

- Ongoing: Actions which are continuous or already being carried out
- High: Actions which should be undertaken in 1–2 years
- Moderate: Actions which should be undertaken in 3–5 years
- Low: Actions which will take more than 5 years to initiate and complete

Responsible Party:

The identified party or municipal department that is the acting or responsible body to implement that action item.



Implementation Matrix

Action Items		Chapter Topics	Protection Type	Priority	Timeframe	Responsible Party
Regulatory						
1.	Review the current Aquifer Protection Overlay District with the state's updated model ordinance to recommend any necessary revisions.	GW	DWP	High	1–2 years	Planning Board & Conservation Commission
2.	Review all permitted uses within the base zoning districts to ensure that high intensity uses are consistent and in sync with the goals and objectives outlined in the Master Plan.	SW/GW	RP/DWP	High	1–2 years	Planning Board & Conservation Commission
3.	Evaluate the current regulations and ordinances with regards to septic system setbacks to ensure all waterbodies are adequately protected.	SW	RP	High	1–2 years	Planning Board & Conservation Commission
4.	Compare the existing Wetland Protection Overlay District with new state rules and make necessary revisions to be consistent with jurisdictional areas and other state-level changes.	WET	RP	High	1–2 years	Planning Board & Conservation Commission
5.	Review the updated floodplain model ordinance from NH Office of Strategic Initiatives and update the Town's floodplain ordinance once FEMA maps are approved and adopted. An outreach campaign targeting existing property owners shall accompany this update.	FLD	RP	High	1–2 years	Planning Board, Conservation Commission, Building Official
6.	Ensure that the sanitary protective radius around the four (4) existing wells (Tucker, Macintosh, Bennett, and Sewall) are all protected and controlled by the Town through ownership or easements.	THR	WQP	High	1–2 years	Town Council, Conservation Commission, Water Department
7.	Finalize DRAFT stormwater regulations and adopt at the Planning Board.	THR	WQP	High	1–2 years	Planning Board
8.	Review appropriate zoning for activities that use chemicals or processes that could affect drinking water to proactively protect these resources.	THR	WQP	Moderate	3-5 years	Fire Department & Town Council
9.	Consider adopting stricter buffer requirements for setbacks to wetlands that include consideration of climate change in order to protect land that allows coastal habitats and populations to adapt to changing conditions and also provides ecosystem services that protect people, structures, and facilities.	WET	RP	Low	5+ years	Planning Board & Conservation Commission
10.	Ensure that land use regulations protect environmentally sensitive resources including drinking water aquifers, tidal wetlands, and salt marsh that are subject to potential saltwater intrusion or other negative impacts associated with groundwater rise.	THR	WQP	Low	5+ years	Regional Planning Commissions (Strafford/Rockingham)
11.	Consider requiring advanced treatment for septic systems to reduce pollution often associated with traditional systems.	THR	WQP	Low	5+ years	Building Official
12.	Prioritize buffer and floodplain protection based on Buffer Options for the Bay's regulatory options and suggestions.	THR	WQP	Low	5+ years	Planning Board & Conservation Commission

Master Plan: Water Resources Chapter

Town of Newmarket, New Hampshire



Action Items		Chapter Topics	Protection Type	Priority	Timeframe	Responsible Party
Operations, Policies, and Procedures						
13.	Incorporate impacts to municipal infrastructure identified in the C-RiSe project into current and future capital infrastructure projects, including water access at Schanda Park, the pump station on Creighton Street, and flooding on critical roads such as Treatment Plant Road. This also includes evaluating the extent of sea-level rise and storm surge flooding on individual facilities such as sewer pipes located at the end of Water Street, Creighton Street, and Lamprey Street and the intersection of Bay Road.	FLD	RP	Ongoing	-	Town Department of Environmental Services
14.	Encourage better management of activities that add salt into or onto the ground (i.e. using newer technologies, equipment upgrades, good housekeeping measures, and inspection of storage sites on commercial areas such as Bennett Way).	THR	WQP	Ongoing	-	MS4 Coordinator, Town Planner, Town Engineer, and Public Works
15.	Continue to appropriate adequate funding to enable the Town to implement recommendations set forth in Newmarket's "Twenty-Year Water and Wastewater System Build-Out Study."	THR	WQP	Ongoing	-	Town Engineer & Town Department of Environmental Services
16.	Continue efforts in implementing the Water Management Plan and educating the public of what they can do to complement these local actions.	THR	WQP	Ongoing	-	
17.	Revisit the Climate Resiliency in Moonlight Brook report to accomplish remaining ICLEI Climate Resilient Communities milestones identified in the plan. Site specific projects include:	FLD/THR	RP/WQP	Ongoing/ High	1–2 years	MS4 Coordinator, Public Works, Town Department of Environmental Services
	Alleviate flooding in re-occurring areas by redirecting stormwater flows away from downtown in the "bowl " area on Route 108; installing a new drainage system with a gravel wetlands to provide water quality treatment on New Road and a stormwater outfall on Young Lane; and assess impacts upstream in the watershed at the new drainage system at the Elementary School.		RP/WQP			
			RP/WQP			
18.	Update the Town's Prime Wetland Maps and associated GIS layers that were completed in 2006 using new available GIS and Lidar data.	WET	RP	High	1–2 years	Conservation Commission & Planning Department
19.	Update the Town's Open Space Plan to strategically identify high value land for future land conservation. Incorporate climate resilience benefits, such as future flood storage salt marsh migration, etc., into scoring criteria to ensure the Town considers climate adaptation benefits when evaluating land for conservation purposes.	FLD	RP	High	1–2 years	Conservation Commission

Master Plan: Water Resources Chapter

Town of Newmarket, New Hampshire



Action Items		Chapter Topics	Protection Type	Priority	Timeframe	Responsible Party
20.	Identify and implement green infrastructure and nature-based approaches to improve flood resilience and stormwater management throughout the Town referenced in the New Hampshire Flood Hazard Handbook.	FLD	RP	High	1–2 years	Planning Department, MS4 Coordinator, Planning Board
21.	Use resources, such as the NH Statewide Asset Data Exchange System (SADES) crossing database, Resilient Tidal Crossing Assessment, and the C-RiSe climate ready culvert analysis, to identify infrastructure projects for inclusion in the Capital Improvements Plan that would assist with long-term planning decisions regarding the placement, design, and size of new culverts or when upgrades and repairs are being made to existing culverts. Site specific projects include:	SW/WET/FLD	RP	High	1–2 years	Conservation Commission & Public Works
	*Replacement of the Grant Road and Ash Swamp Road crossings over the Piscassic River to help restore surface waters to natural, free flowing systems.		RP			
	*Replacement of the Route 108 crossing over the northernmost unnamed perennial stream behind the Newmarket Storage that flows easterly beneath New Road into Great Bay to improve wetland function.		RP			
*Projects should include hydraulic analyses and survey data on channel dimensions to determine appropriate bridge sizing as part of a larger Town-wide infrastructure capacity assessment.						
22.	Integrate climate adaptation measures into all future master plan updates.	FLD	RP	Moderate	3-5 years	Planning Board & SRPC
Data, Studies, and Research Needs						
23.	Explore funding opportunities to conduct a town-wide vernal pool inventory to locate, document, and map vernal pools in Newmarket.	WET	RP	Ongoing	-	Conservation Commission
24.	Review Appendix C in the Town's 2018 Multi-Hazard Mitigation Plan to identify riverine flooding mitigation approaches, including prevention, property protection, natural resource protection, emergency services, structural projects, and public education.	FLD	RP	Ongoing	-	Emergency Management Director, Public Works, Town Engineer
25.	Continue to explore grant opportunities to secure funding for existing and future drinking water protection efforts.	THR	WQP	Ongoing	-	Town Department of Environmental Services
26.	Collaborate with NHDES to update 2007 assessment of public water supply sources for susceptibility criteria including well proximity to septic, highways, and agriculture. Use this assessment to identify threats and target protection management (such as education for landowners, an inspection program, or emergency response planning) techniques.	THR	WQP	Ongoing	-	Town Department of Environmental Services
27.	Use the New Hampshire Living Shoreline Site Suitability Assessment to identify sites in Newmarket that may be suitable for specific living shoreline approaches to address erosion issues along the tidal shoreline.	FLD	RP	Low	1–2 years	Conservation Commission, Riverfront Committee, Lamprey River Advisory Committee, SRPC

Master Plan: Water Resources Chapter

Town of Newmarket, New Hampshire



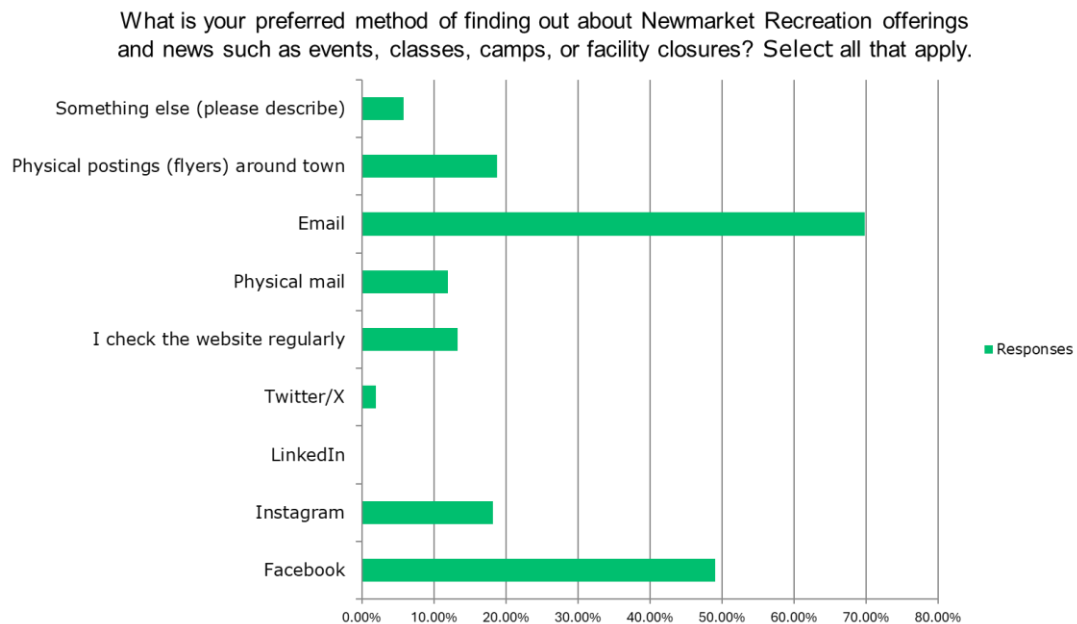
Action Items		Chapter Topics	Protection Type	Priority	Timeframe	Responsible Party
28.	Work with state, federal regulators, and the Seacoast PFAS Commission to minimize PFAS contamination in the Town. This may include exploring water and land uses that could mitigate PFAS use and release; obtaining the latest inventory of (Tier II) data collection for facilities that have the potential to discharge PFAS using guidance from NHDES (SWP Grant 301).	THR	WQP	Low	1–2 years	Water Department & Town Department of Environmental Services
29.	Investigate funding opportunities to help pay for the development of watershed-based plans to recommend methods to address specific impairments identified in the 303(d) list.	SW	RP	Moderate	3-5 years	MS4 Coordinator, Town Engineer, Town Department of Environmental Services, and Conservation Commission
Outreach, Engagement, and Partnerships						
30.	Continue to support local watershed groups and organizations.	SW/GW	RP/DWP	Ongoing	-	All Town Boards, Commissions, and Departments
31.	Collaborate with local, regional, and statewide partners to identify other wetland mitigation projects or restoration opportunities.	WET	RP	Ongoing	-	Conservation Commission
32.	Explore options to develop a creative outreach campaign to educate the public on future coastal flood risk (i.e. high-water mark initiative, participation in the king tide photo contest, etc.) at public spaces such as Schanda Park and Heron Point.	FLD	RP	Ongoing	-	Conservation Commission & Historical Society
33.	Increase coordination with other watershed towns, higher-level collaboration with water-related organizations and stakeholders, and encourage a greater involvement of Newmarket's Conservation Commission in leading public education programs on water resources management and efforts to ensure compliance with stormwater requirements.	THR	WQP	Ongoing	-	Conservation Commission
34.	Research effective education and outreach efforts to strengthen Newmarket's community values around water resources. Create community dialog around water resource stewardship for future generations.	THR	WQP	Ongoing	-	MS4 Coordinator
35.	Ensure that Planning and Zoning Board members are aware and have access to relevant land use trainings (e.g. OSI conferences, NHMA lectures, regional planning workshops) so that participants fully understand local ordinances, regulations, and state laws when making important decisions.	THR	WQP	Ongoing	-	Planning & Zoning Boards
36.	Increase awareness of radon levels and protection practices for Newmarket residents by posting NHDES information on the Building Department's webpage.	THR	WQP	Low	1-2 years	Building Department

Appendix I – Recreation

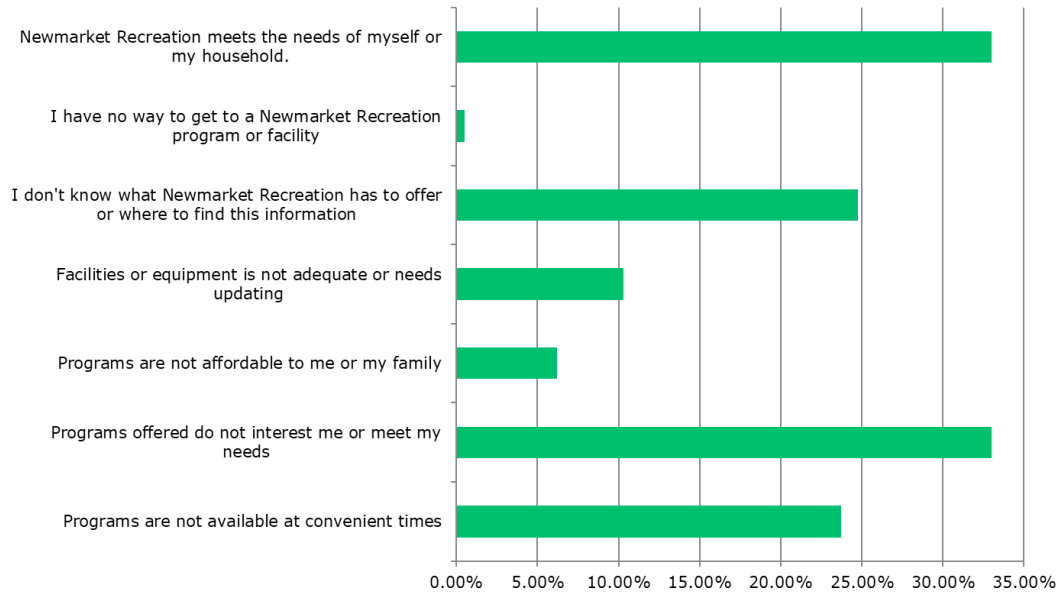
Contents

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2. Bicycle Level of Traffic Stress	6
3. Recreation Department Facility Needs	7
4. Additional Recreation Maps	9

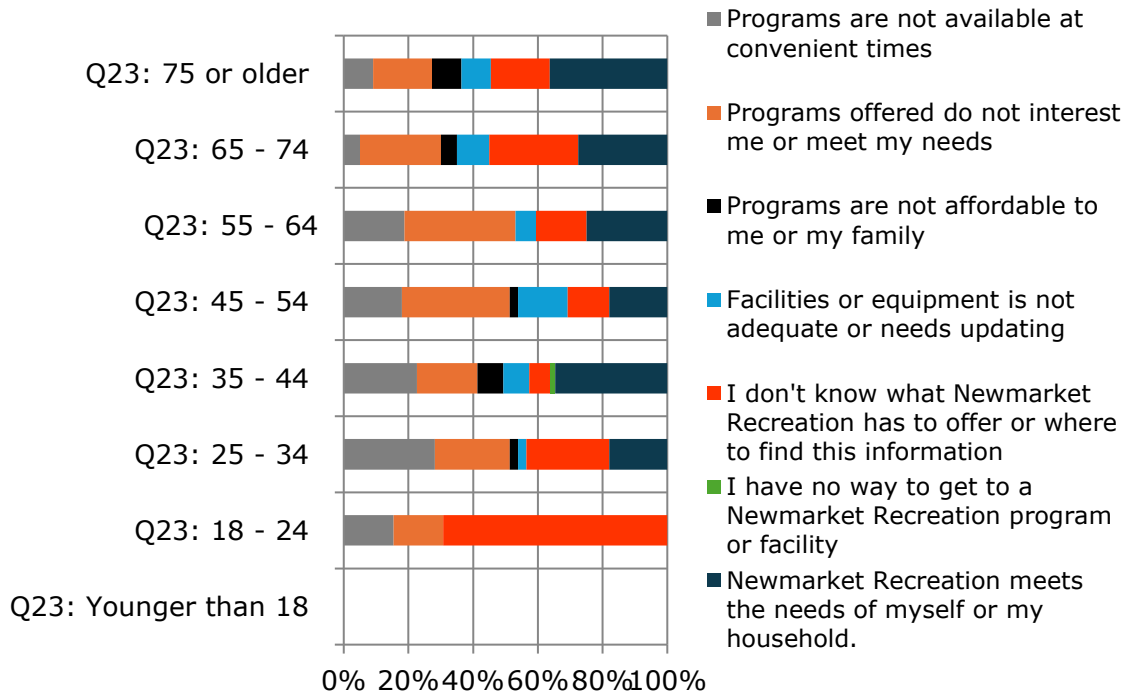
1. Community Engagement



What are barriers that prevent you or your household from participating in Newmarket Recreation programming? Select all that apply and feel free to use the comment box below to elaborate.



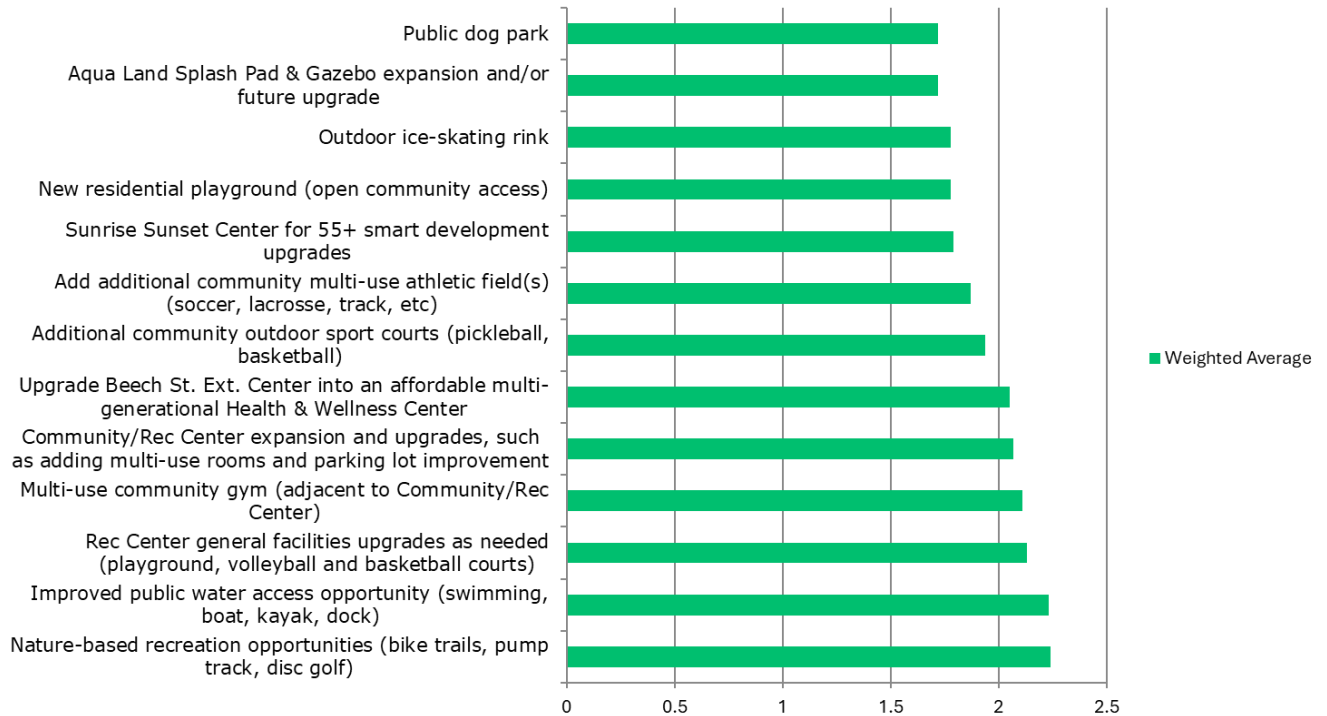
What are barriers that prevent you or your household from participating in Newmarket Recreation programming (by Age)



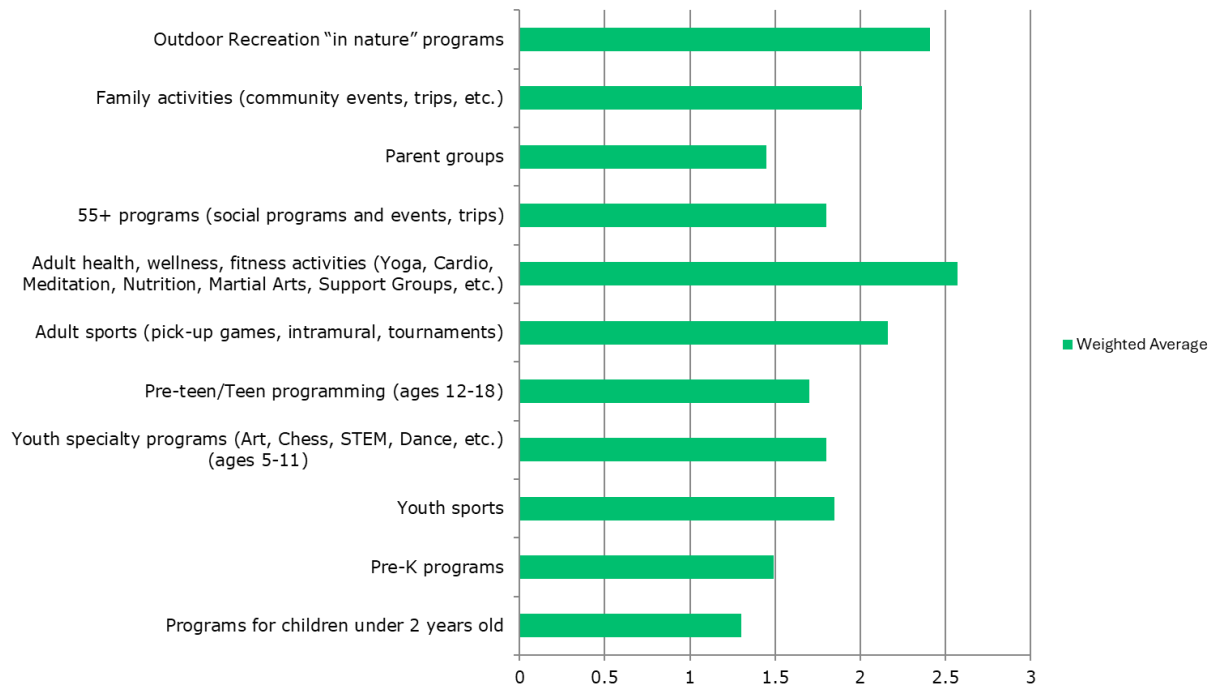
The primary barriers for adults ages 25-64 were “programs offered do not interest me or meet my needs” and “programs are not available at convenient times” with nearly 50% responding in that adult age group. Meanwhile, around 25% adults aged 25-64 said that Newmarket Recreation met their needs or their household’s needs. The primary barriers for the senior population (65+) were spread out amongst all options with nearly 40% responding that Newmarket Recreation met their needs or their household’s needs. Young adult ages 18-24 had a primary barrier of not knowing what is offered or where to find information. There were no respondents from ages <18 for this question. Age groups 55+ and 35-44 (parents) scored the highest for recreation that meets their or their household’s needs. The Newmarket Recreation department will continue to attempt to meet their community needs by targeting specific age groups for potential growth of programs or events.

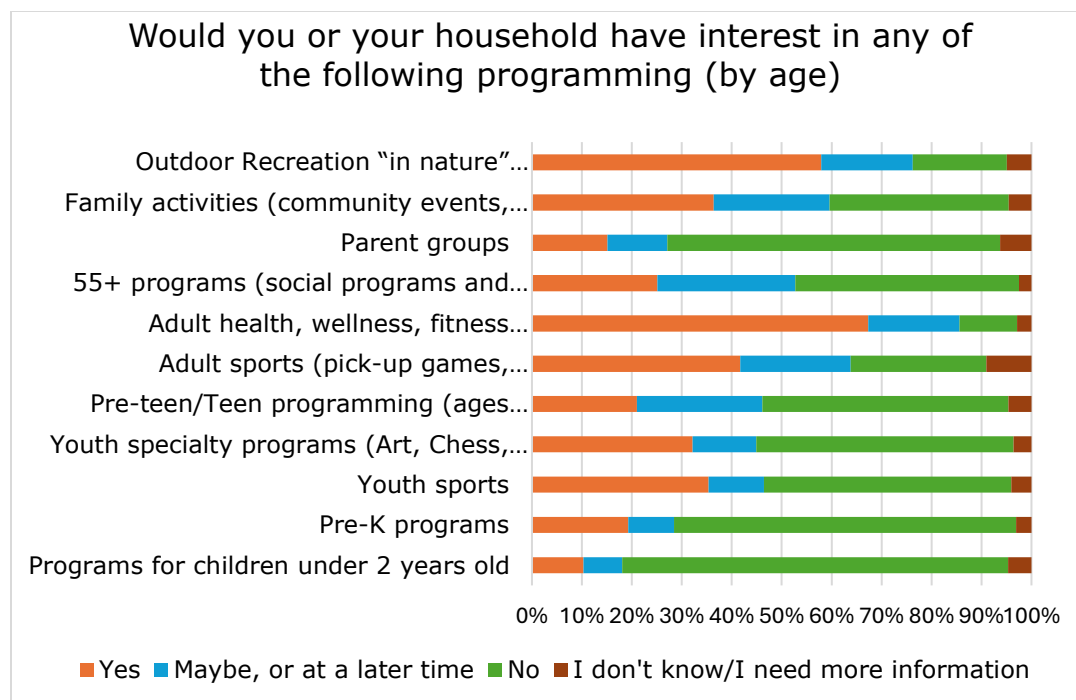
To determine the type of programming to address each age group’s potential expansion to reach as many people as possible, the survey also included a question asking what program interests’ residents have.

Where should the Town of Newmarket prioritize investment in its recreation facilities? How much?



Would you or your household have interest in any of the following programming?





As seen above, the two programming categories with the most interest were outdoor recreation “in nature” programs, and adult health, wellness, and fitness activities with over 50% of respondents choosing “yes”. This both speaks to the desires of the community and the gaps of programming currently available through the recreation department around these program categories. Both categories are potential avenues of gaining more traction with the adult population. A possible health, wellness, and fitness facility has been discussed, but site identification must occur first. Working congruently with the Recreation Department, Conservation Commission, and the School District, additional outdoor nature-based programming could be created to support a multitude of age groups, interests, and capabilities.

The lowest scoring programs were with Pre-K programs, programs under 2-year-old, and parent programs with 20 percent or less responding that they would be interested in those types of programming. This is likely due to a smaller population that has children at pre-k and under 2 or those families did not respond to the survey, however 60% of survey respondents had at least one minor in their household.

2. Bicycle Level of Traffic Stress

Inputs include the number of traffic lanes in each direction, posted and prevailing speed, type and width of bicycle infrastructure, presence and width of on-street parking, frequency of bike lane blockage, presence and characteristics of turning lanes, and presence and characteristics of unsignalized crossings.

LTS Rating	LTS Rating Description	Population Class	Population Class Description
LTS 1	Strong separation from all automobiles, except low speed, low volume traffic. Simple-to-use crossings. Suitable for children.	Unsteady and nervous	Children and other first-time riders
LTS 2	Except in low speed / low volume traffic situations, cyclists have their own place to ride that keeps them from having to interact with traffic. Physical separation from higher speed and multilane traffic. Crossings that are easy for an adult to negotiate. Limits traffic stress to what the mainstream adult population can tolerate	Interested but concerned	Uncomfortable negotiating fast, high volume traffic
LTS 3	Interaction with moderate speed or multilane traffic, or proximity to higher speed traffic.	Enthused and Confident	Willing to ride with minimal bicycle accommodations
LTS 4	Forced to mix with moderate speed traffic or proximity to high-speed traffic.	Strong and Fearless	Willing to ride under any condition

3. Recreation Department Facility Needs

The following recreation facility needs were identified by the current Recreation Department staff. They are subject to change as improvements are made or conditions change with time or have been reevaluated.

1. Renovate or Expand Community Center

1. Create ADA accessible doorways and restrooms.
2. Establish phase 3 of the community center for Indoor Gym Expansion.
3. Identify potential users of kitchen area in center.
4. Reorient Reception and establish security barrier to protect public in center.
5. Expand upon or renovate existing rooms or rooms that no longer serve their original purpose.

2. Renovate or Expand Sunrise Sunset Center

1. Identify existing areas to create additional storage or create their own.
2. General renovation of the activity center and/or specific program areas.
3. Research options to gain additional parking spaces:
 1. Build sidewalks on both sides of Terrace Drive:
 1. Side street parking for participants is safer
 2. Allows for possibility cross walk to be added in front of Center if additional parking can be made available across the street on HUD land.
 2. Establish parking agreement with police station to allow for additional parking for programs.

3. Renovate Beech Street Facility:

1. Only after proper mitigation and thorough assessment of property will any major renovations of Beech Street Extension Center be made for expanding health and wellness programs.

4. Revitalize Leo Landroche Field Complex

1. Fix Drainage issues on fields and establish use agreement with School to reduce traffic on fields during mud season.
2. Build outdoor multi-use performance venue (repeat)
3. Identify locations for additional shading structures or natural assets.
4. Renovate outdoor volleyball area. (if not repurposed - repeat)
5. Renovate outdoor basketball courts.(if not repurposed - repeat)
6. Install Emergency Intercom to communicate with all field users during emergencies. (repeat)
7. Establish more efficient lighting for fields.
8. Work with HUD to determine land potential for parking or recreation.
9. Build a Second Pavilion.

10. Replace large playground and/or surrounding play equipment with new play equipment that is equal to or better when safety concerns arise due to years of wear and tear.

5. Improve Beanie Howcroft Field

1. Fix Irrigation issues on field
2. Investigate potential parking lot shift to northern section of property to find a more welcoming entrance to property at the end of Nichols Ave.
3. Add Temporary Bathrooms

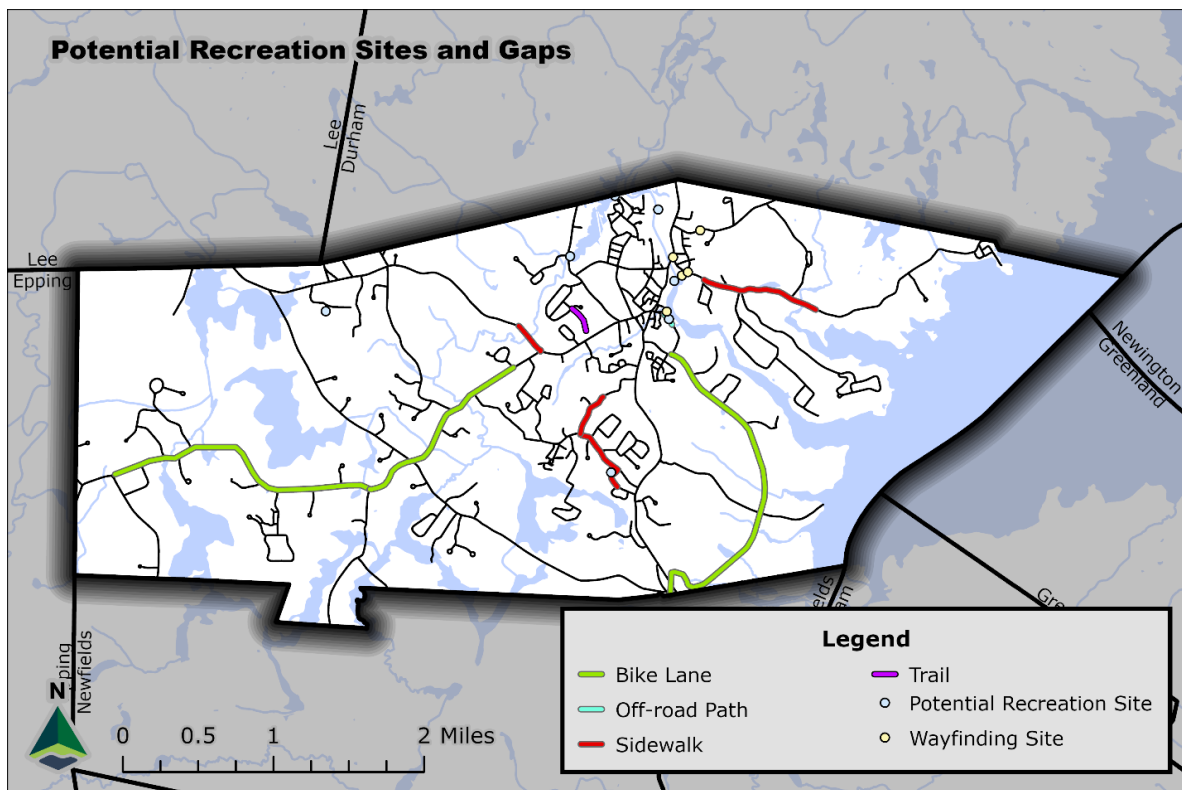
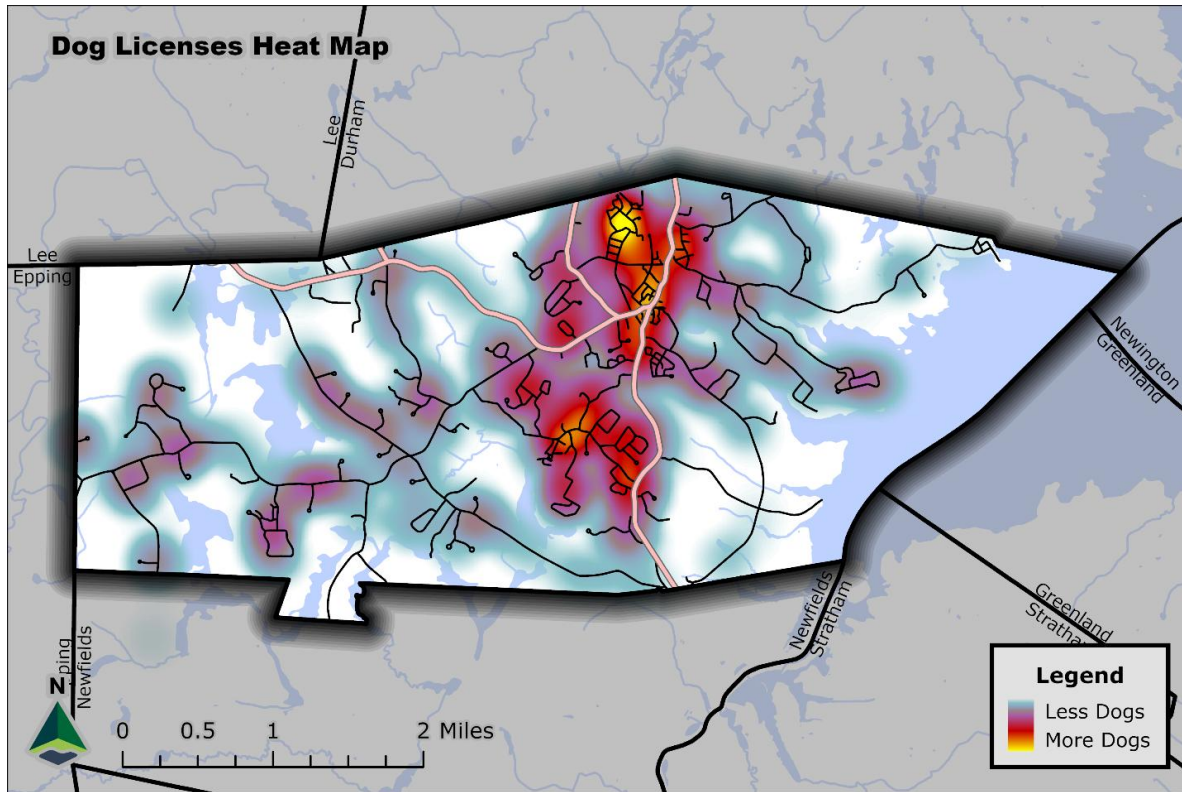
6. Improve Shoppmeyer Park

1. Improve awareness of site with wayfinding assets.
2. Install play type structures or playground on this property.
3. Identify additional parking with agreement with Church.
4. Establish an outdoor education opportunity or activity.
5. Resolve potential contamination at site.

7. Renovate Schanda Park

1. Dock expansion with Accessible Kayak Launch
2. Expand footprint of park for more people friendly green space.
3. Establish potential bike paths from Young's Lane.
4. Identify strategy to reduce erosion issues at kayak launch.
5. Pursue grant opportunities, such as the Land and Water Conservation Fund (LWCF) to help with the major site improvements.

4. Additional Recreation Maps

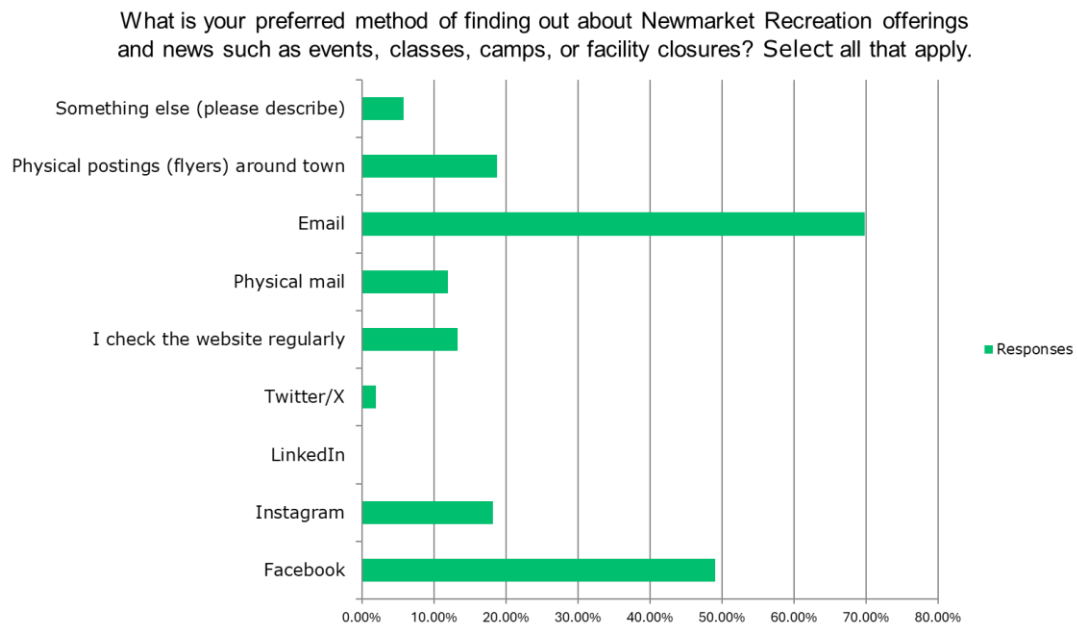


Appendix I – Recreation

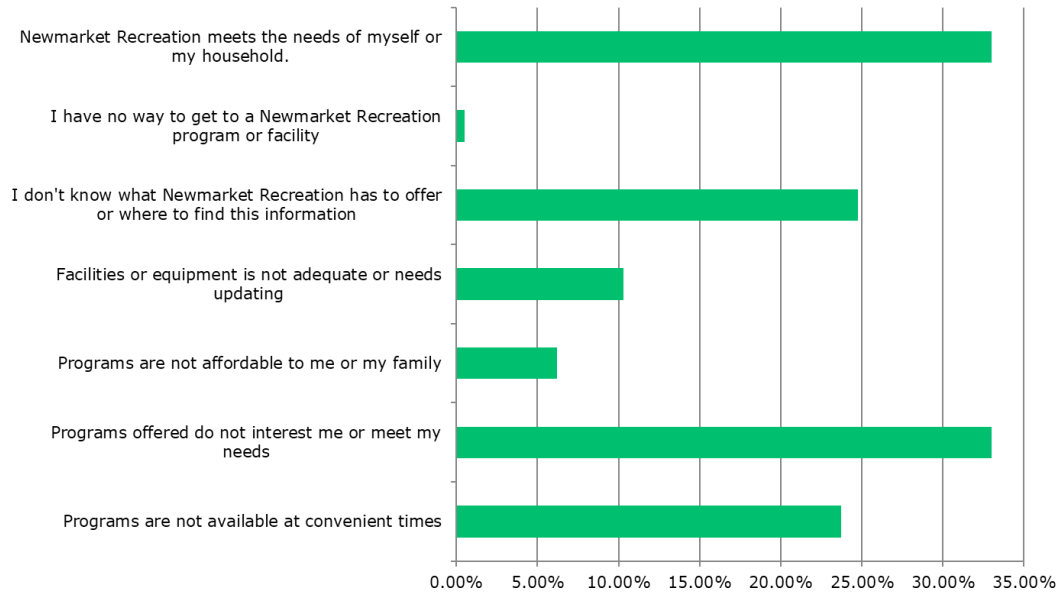
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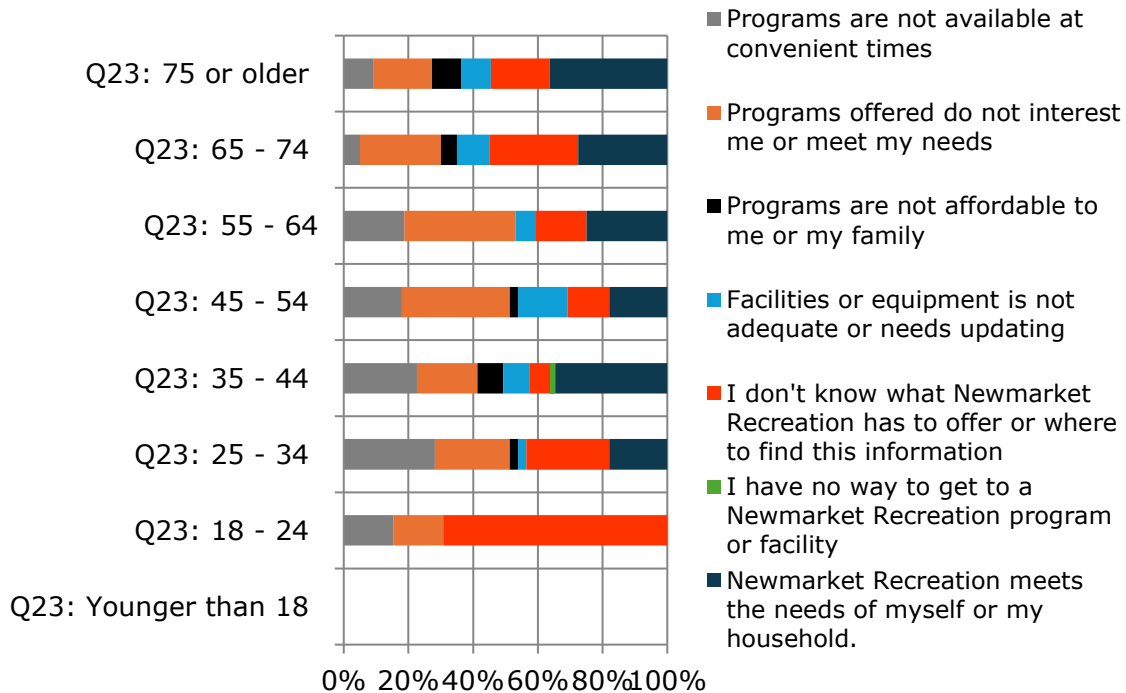
1. Community Engagement



What are barriers that prevent you or your household from participating in Newmarket Recreation programming? Select all that apply and feel free to use the comment box below to elaborate.



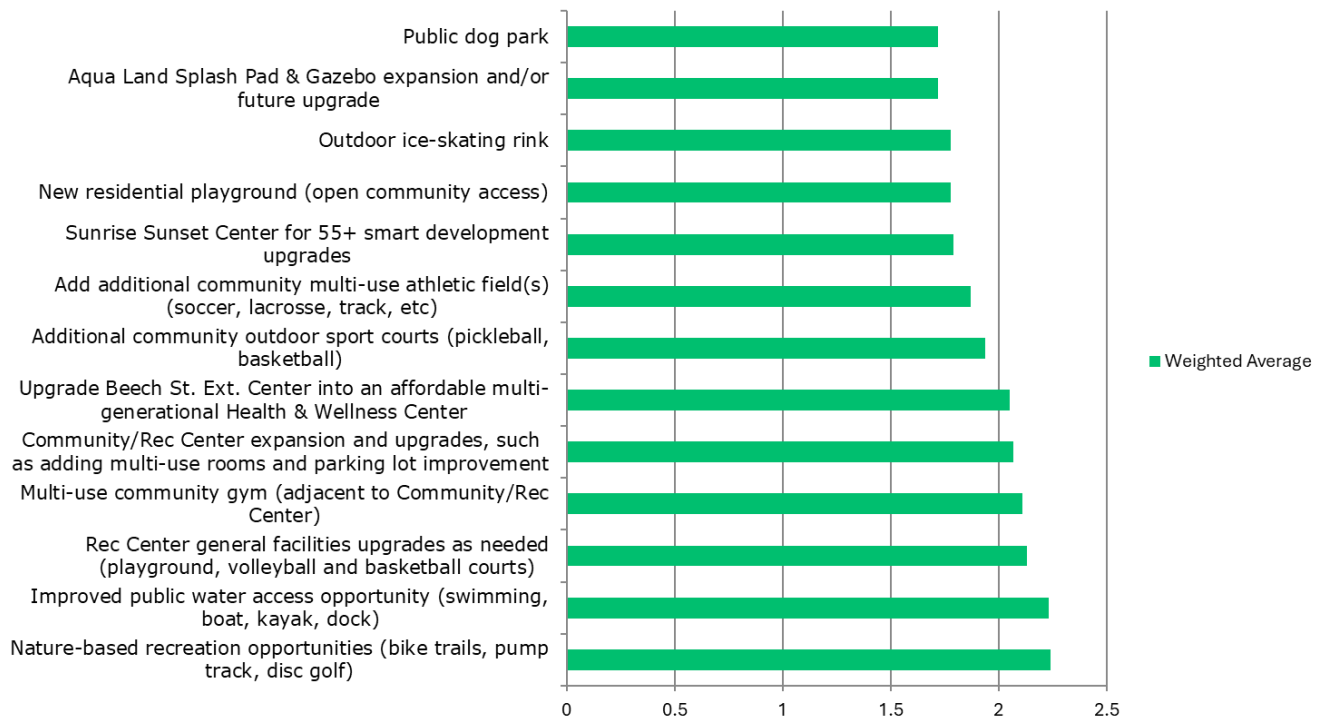
What are barriers that prevent you or your household from participating in Newmarket Recreation programming (by Age)



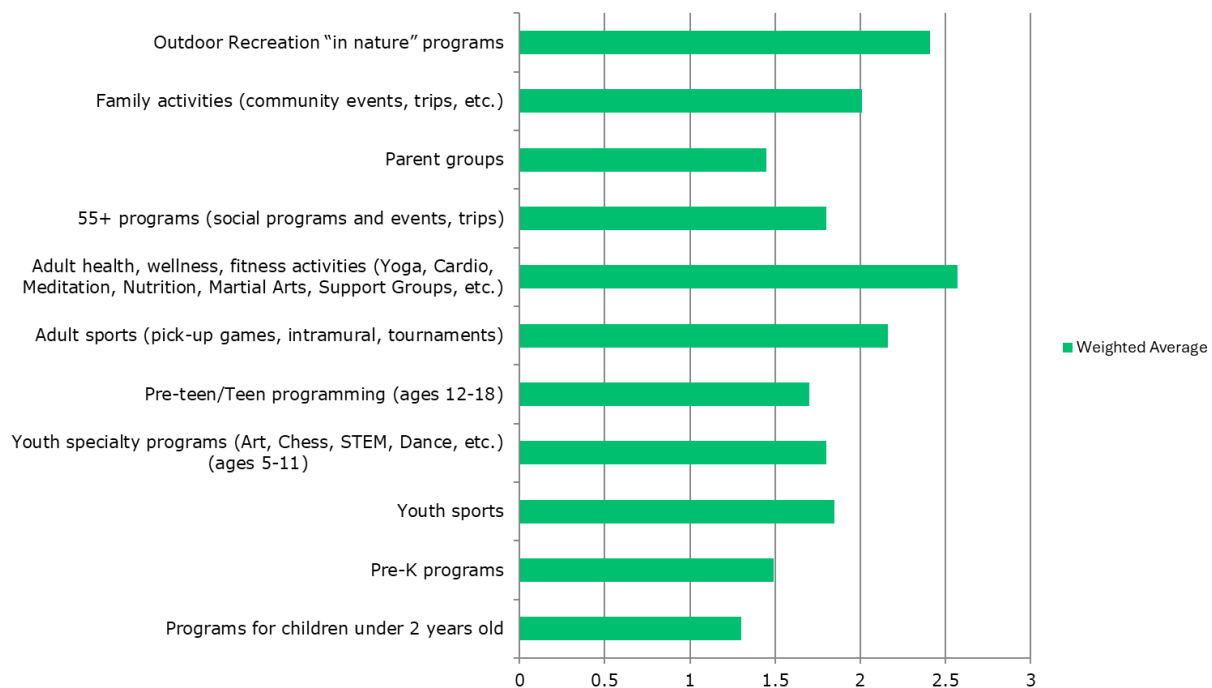
The primary barriers for adults ages 25-64 were “programs offered do not interest me or meet my needs” and “programs are not available at convenient times” with nearly 50% responding in that adult age group. Meanwhile, around 25% adults aged 25-64 said that Newmarket Recreation met their needs or their household’s needs. The primary barriers for the senior population (65+) were spread out amongst all options with nearly 40% responding that Newmarket Recreation met their needs or their household’s needs. Young adult ages 18-24 had a primary barrier of not knowing what is offered or where to find information. There were no respondents from ages <18 for this question. Age groups 55+ and 35-44 (parents) scored the highest for recreation that meets their or their household’s needs. The Newmarket Recreation department will continue to attempt to meet their community needs by targeting specific age groups for potential growth of programs or events.

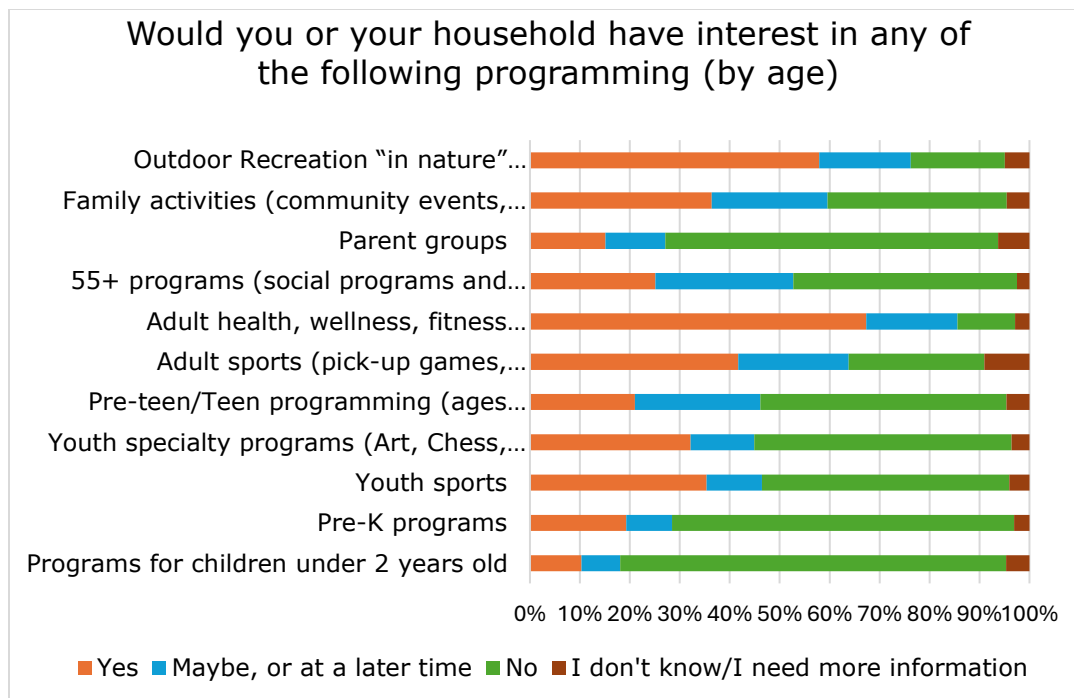
To determine the type of programming to address each age group’s potential expansion to reach as many people as possible, the survey also included a question asking what program interests’ residents have.

Where should the Town of Newmarket prioritize investment in its recreation facilities? How much?



Would you or your household have interest in any of the following programming?





As seen above, the two programming categories with the most interest were outdoor recreation “in nature” programs, and adult health, wellness, and fitness activities with over 50% of respondents choosing “yes”. This both speaks to the desires of the community and the gaps of programming currently available through the recreation department around these program categories. Both categories are potential avenues of gaining more traction with the adult population. A possible health, wellness, and fitness facility has been discussed, but site identification must occur first. Working congruently with the Recreation Department, Conservation Commission, and the School District, additional outdoor nature-based programming could be created to support a multitude of age groups, interests, and capabilities.

The lowest scoring programs were with Pre-K programs, programs under 2-year-old, and parent programs with 20 percent or less responding that they would be interested in those types of programming. This is likely due to a smaller population that has children at pre-k and under 2 or those families did not respond to the survey, however 60% of survey respondents had at least one minor in their household.

2. Bicycle Level of Traffic Stress

Inputs include the number of traffic lanes in each direction, posted and prevailing speed, type and width of bicycle infrastructure, presence and width of on-street parking, frequency of bike lane blockage, presence and characteristics of turning lanes, and presence and characteristics of unsignalized crossings.

LTS Rating	LTS Rating Description	Population Class	Population Class Description
LTS 1	Strong separation from all automobiles, except low speed, low volume traffic. Simple-to-use crossings. Suitable for children.	Unsteady and nervous	Children and other first-time riders
LTS 2	Except in low speed / low volume traffic situations, cyclists have their own place to ride that keeps them from having to interact with traffic. Physical separation from higher speed and multilane traffic. Crossings that are easy for an adult to negotiate. Limits traffic stress to what the mainstream adult population can tolerate	Interested but concerned	Uncomfortable negotiating fast, high volume traffic
LTS 3	Interaction with moderate speed or multilane traffic, or proximity to higher speed traffic.	Enthused and Confident	Willing to ride with minimal bicycle accommodations
LTS 4	Forced to mix with moderate speed traffic or proximity to high-speed traffic.	Strong and Fearless	Willing to ride under any condition

3. Recreation Department Facility Needs

The following recreation facility needs were identified by the current Recreation Department staff. They are subject to change as improvements are made or conditions change with time or have been reevaluated.

1. Renovate or Expand Community Center

1. Create ADA accessible doorways and restrooms.
2. Establish phase 3 of the community center for Indoor Gym Expansion.
3. Identify potential users of kitchen area in center.
4. Reorient Reception and establish security barrier to protect public in center.
5. Expand upon or renovate existing rooms or rooms that no longer serve their original purpose.

2. Renovate or Expand Sunrise Sunset Center

1. Identify existing areas to create additional storage or create their own.
2. General renovation of the activity center and/or specific program areas.
3. Research options to gain additional parking spaces:
 1. Build sidewalks on both sides of Terrace Drive:
 1. Side street parking for participants is safer
 2. Allows for possibility cross walk to be added in front of Center if additional parking can be made available across the street on HUD land.
 2. Establish parking agreement with police station to allow for additional parking for programs.

3. Renovate Beech Street Facility:

1. Only after proper mitigation and thorough assessment of property will any major renovations of Beech Street Extension Center be made for expanding health and wellness programs.

4. Revitalize Leo Landroche Field Complex

1. Fix Drainage issues on fields and establish use agreement with School to reduce traffic on fields during mud season.
2. Build outdoor multi-use performance venue (repeat)
3. Identify locations for additional shading structures or natural assets.
4. Renovate outdoor volleyball area. (if not repurposed - repeat)
5. Renovate outdoor basketball courts.(if not repurposed - repeat)
6. Install Emergency Intercom to communicate with all field users during emergencies. (repeat)
7. Establish more efficient lighting for fields.
8. Work with HUD to determine land potential for parking or recreation.
9. Build a Second Pavilion.

10. Replace large playground and/or surrounding play equipment with new play equipment that is equal to or better when safety concerns arise due to years of wear and tear.

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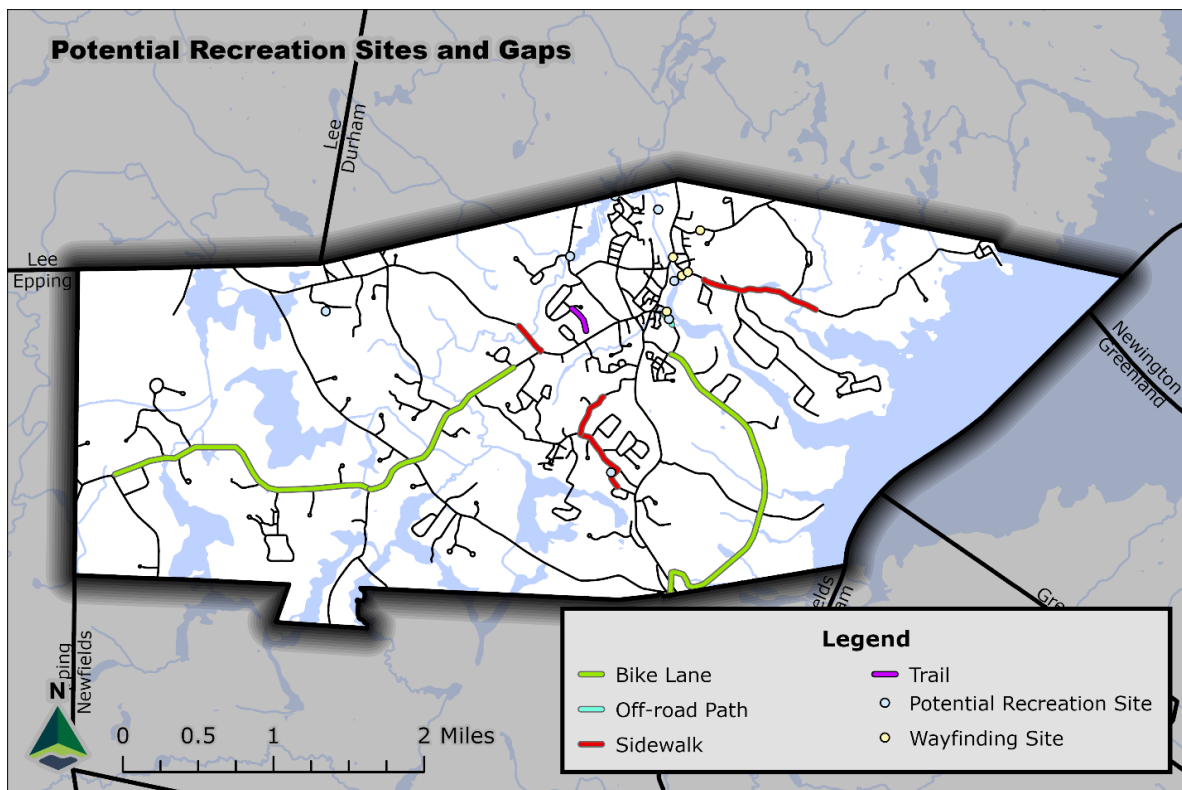
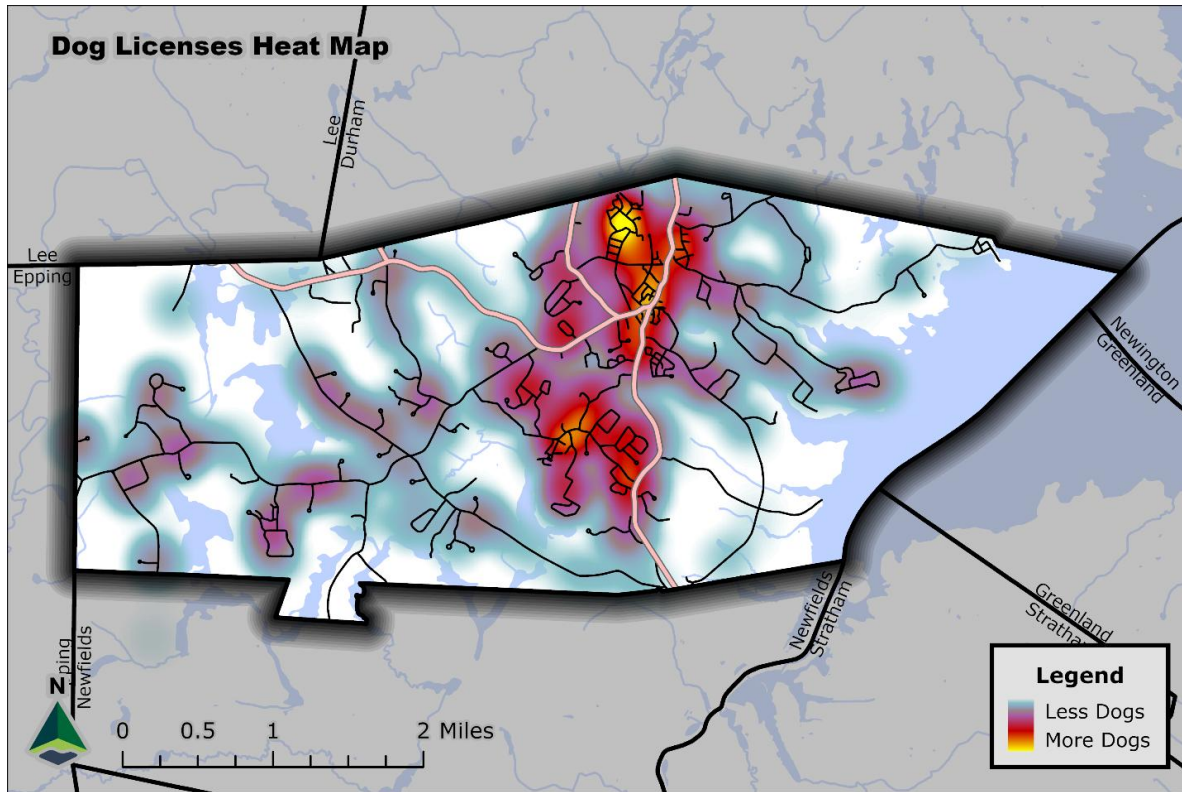
6. Improve Shoppmeyer Park

1. Improve awareness of site with wayfinding assets.
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1. Dock expansion with Accessible Kayak Launch
2. Expand footprint of park for more people friendly green space.
3. Establish potential bike paths from Young's Lane.
4. Identify strategy to reduce erosion issues at kayak launch.
5. Pursue grant opportunities, such as the Land and Water Conservation Fund (LWCF) to help with the major site improvements.

4. Additional Recreation Maps



Appendix A – Economic Development

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Appendix A: Data, Trends, and Additional Discussion

Summary of Notable Economic and Demographic Trends Since Last Chapter Update

Similar to the rest of the state and region, the Town of Newmarket has experienced substantial shifts in economic trends since the time of its last Economic Development chapter update in 2011, particularly in the recent years since Covid-19. The beginning of the prior decade was characterized by a relatively steady economic recovery after the serious economic downturn seen in 2008-2009. However, this trend shifted as a result of the pandemic in 2020, where similar to the rest of the country and world, the economy experienced a sudden economic downturn that resulted in high unemployment rates, sudden business closures, the shift to remote work, and disruption of global supply chains, among other things. In response to the fiscal policies implemented to help mitigate the impacts of the pandemic, including historically low interest rates, coupled with the benefits of remote work which allowed people to relocate more easily in search of better quality of life and more affordability, there was an astonishing increase in housing demand in the region. This was no different for Newmarket, where the median purchase price for a home in Newmarket rose by over 56% from 2019 to 2023 (\$320,000 to \$500,000).ⁱ Similarly, rents have increased by 67% during the same time period.ⁱⁱ This rapid increase in housing costs has impacted Newmarket's workforce, making it unaffordable for many in the community, including families, students, and essential workers. Moreover, the rapid incline in housing costs has also resulted in a sudden increase in property taxes, which has highlighted the importance of attracting new economic activity to Town to help offset the residential tax burden.

Shifts in workforce and business operations also led to changes in the demand for retail, commercial, industrial, and office spaces. Remote work led to a decrease in the need for office space, seen in the historically high office vacancy rates data in the Dover subregionⁱⁱⁱ, which includes Newmarket. Meanwhile, manufacturing and e-commerce businesses experienced growth, leading to more demand for industrial and warehouse and distribution spaces.

Once a strong manufacturing center, Newmarket lost much of its industrial base between 1960 and 1990, with the closure of several manufacturing operations resulting in the loss of significant jobs. This, along with the sudden impacts experienced as a result of the pandemic, highlight the importance of having a resilient and diverse economic base to help weather unforeseen changes in the economy.

Population and Demographic Trends

The population in Newmarket has increased by 6.5% from 2010 to 2022, which is slower than Strafford and Rockingham Counties, but faster than New Hampshire's, with the 70-79 age group experiencing the sharpest growth during this same period. Meanwhile, the population of Newmarket is highly skilled, providing a workforce available to fill professional and technical jobs, with 98.4% of individuals over 25 holding a high school diploma or higher and about half of those individual holding a bachelor's degree or higher in 2022.

Newmarket's population is highly educated, and is comprised of people of all ages. In 2022, 98.4% of individuals over 25 years held a high school diploma or higher, of that number 49.6% had a bachelor's degree, Master's, or PhD. According to 2022 Census Bureau Data, the Town's median age of 37.7 is significantly lower than the median

age for Rockingham County and the figure for the state as a whole. While the largest age group in Newmarket in 2022 was the 20-29 group closely followed by the 30-39 age group, the population ages 70-79 experienced the biggest increase from 2012 to 2022. Moreover, the largest employment fields that Newmarket residents participate in (meaning their job is in that sector, regardless of where the job might be located) included Health Care and Social Assistance, followed by Educational Services, Retail Trade, Manufacturing, and Professional, Scientific, and Technical Services.

Changes in Economic Indicators

Newmarket's labor force, jobs, employment base, private firms, and wages have all increased since the time of the last economic development chapter update. Newmarket's labor force increased by 7.57% from 2010 to 2023, growing at a faster pace than Strafford County's (4.29%) and New Hampshire's (2.74%) during the same period. Based on Census Bureau LODES data, there were 1,640 jobs in Newmarket in 2022 (vs. 1,305 in 2015). The major industries included Education Services and Health Care and Social Assistance, each with over 200 employees, with the largest employers in Town being the Newmarket Elementary and High Schools. Furthermore, after experiencing a decline in total employment of 26% from 2000 to 2009, Newmarket's total employment base grew by 27% (from 1,237 jobs to 1,576 jobs) from 2010 to 2023. This increase was seen in the private sector, while the number of total government employees decreased during this same period. The number of total private businesses grew by 22%, but the number of new employees in private businesses grew by 42%, representing a slower growth in the number of firms but more jobs. Wages in Newmarket increased as well. From 2010 to 2023, the average weekly wages for private business employees increased by 56% (from \$734 to \$1,146) and 54% for public entity employees (from \$734 to \$1,128).

Outreach



Figure 14: Newmarket Community Workshop, September 2024, SRPC

To help inform this chapter, several outreach efforts were conducted throughout 2024 and 2025. These included a community workshop, held at the Newmarket Jr/Sr High School on September 14, 2024, a community wide survey disseminated in the summer/fall of 2024, a business-specific survey, disseminated in early 2025, and one-on-one interviews with local businesses owners conducted in early 2025. The input received through these outreach and engagement efforts are integrated throughout the chapter and included in the Appendix.

Process

Pursuant to RSA 674:2, a Master Plan may include an “economic development section”, which proposes actions to suit the community's goals, given its economic strengths and weaknesses in the region. In 2024, the Town engaged the Strafford Regional Planning Commission (SRPC) to

update the Economic Development Chapter under the guidance of the Newmarket Master Plan Committee, Economic Development Subcommittee, and Town staff. Throughout this process, the Economic Development Subcommittee held 7 meetings where they collaborated on the vision, goals, action items, and overall content for this chapter.

Population Trends and Projections

The population in Newmarket from 2010 to 2020 has increased slower than Strafford and Rockingham Counties, but faster than New Hampshire's. Population projections, provided by the NH Office of Planning and Development show that Newmarket's population is expected to increase by 10.79% by 2050 to 10,448 people. By comparison Strafford County as a whole is expected to grow by 14.17% from 2020 to 2050 and New Hampshire by 9.05% over this same period.

	Year	Newmarket	Rockingham County	Strafford County	NH
Trend	2010	8,936	295,223	123,143	1,316,256
	2011	8,950	295,608	123,538	1,318,000
	2012	8,942	296,594	124,219	1,321,000
	2013	9,173	297,626	124,292	1,323,262
	2014	9,149	298,573	125,053	1,326,595
	2015	9,170	300,569	125,342	1,330,389
	2016	9,172	302,194	125,807	1,334,591
	2017	9,359	304,932	126,795	1,342,612
	2018	9,455	308,833	127,922	1,356,265
	2019	9,460	310,258	128,879	1,359,518
	2020	9,430	314,176	130,889	1,377,313
	2021	9,496	319,489	131,343	1,388,779
	2022	9,459	320,053	131,908	1,395,007
	2023	9,534	322,987	133,075	1,401,828
Projections	2025	9,833	327,586	136,162	1,430,601
	2030	10,183	339,248	140,565	1,473,286
	2035	10,429	347,444	144,214	1,501,045
	2040	10,522	350,560	146,813	1,511,770
	2045	10,515	350,316	148,384	1,509,955
	2050	10,448	348,082	149,435	1,501,909
Change	2010-2020	5.53%	6.42%	6.29%	4.64%
	2020-2050	10.79%	10.79%	14.17%	9.05%

Figure 15: Population Trends and Projections, 2010 – 2050, NH Office of Planning and Development

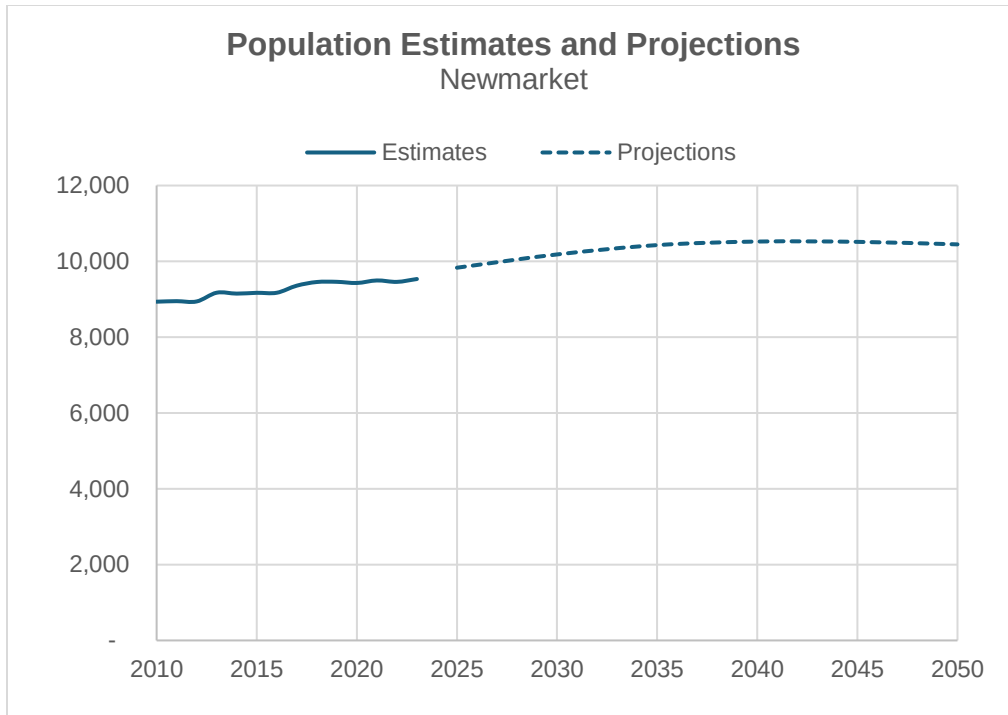


Figure 16: Population Estimates and Projections, 2010 – 2050, NH Office of Planning and Development

Population by Age

According to the US Census Bureau, the largest age group in Newmarket in 2022 was 20-29 closely followed by the 30-39 age group. The median age of Newmarket residents in 2022 was 38.5 years, which is slightly higher than Strafford County's median age (37.7) and significantly lower than Rockingham County's (44.7) and New Hampshire's (43.1). The age group that experienced the biggest increase compared to 2012 was the 70-79 age group, while the 0-9, 0-19, 40-49, and 50-59 age groups all experienced a decline.

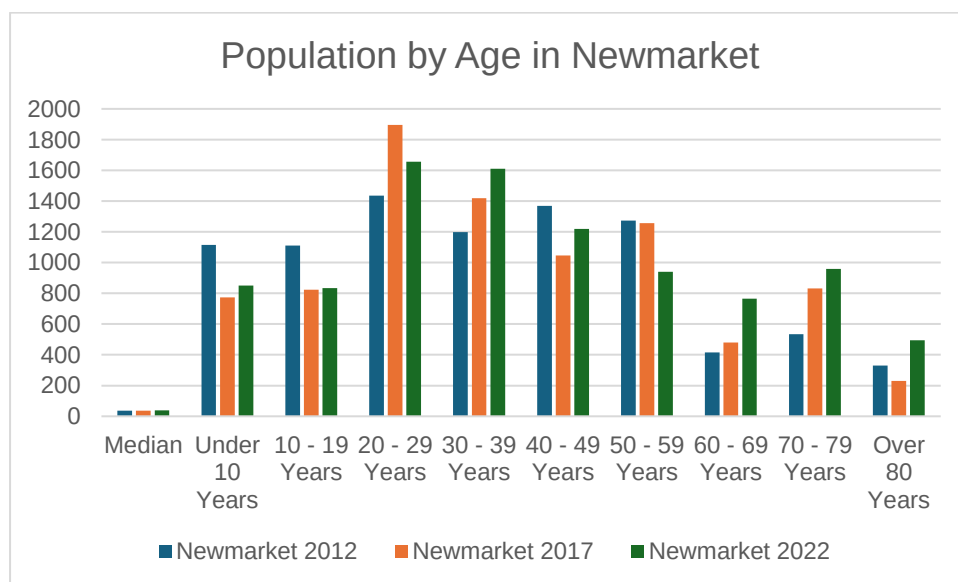


Figure 17: Population by Age in Newmarket, 2012, 2017, 2022, NH Employment Security

Labor Force

Based on estimates provided by the NH Department of Employment Security, the labor force in Newmarket increased by 7.57% from 2010 to 2023 (from 5,457 people in 2010 to 5,870 in 2023). While it has grown somewhat slower than Rockingham County's labor force (8.6% from 2010 to 2023), it has increased significantly compared to Strafford County's (4.29%) and NH's (2.74%).

The labor force in Newmarket remained steady from 2010 to 2014, when it started to increase consistently until 2020. It then experienced a decline due to the impacts of Covid-19 and has still not fully returned to pre-pandemic levels, though it has since returned to an upward trend.

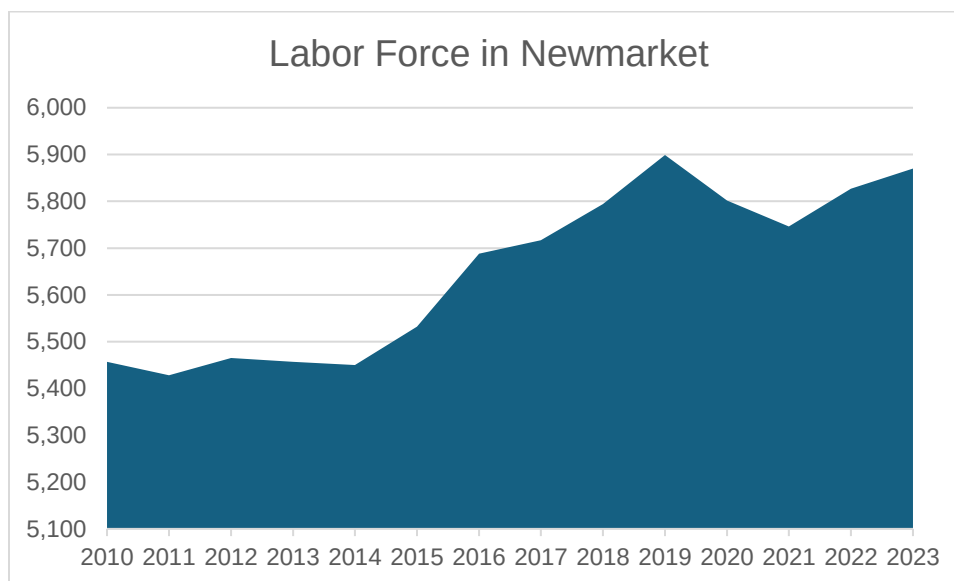


Figure 18: Labor Force in Newmarket, 2010 – 2023, New Hampshire Employment Security

Unemployment

Unemployment in Newmarket had been steadily declining since 2010 but saw a spike of 6.4% in 2020 due to business closures and furloughs that resulted from the Covid-19 pandemic. However, since then, the unemployment rate has continued to decline and is now lower than pre-pandemic levels (2.4% in 2019 vs. 1.7% in 2023). When looking at unemployment rates by month, the average monthly unemployment rate in 2023 dropped as low as 1.1% for the month of April.

The unemployment rate in Newmarket in 2023 (1.7%) was lower compared to NH's (2.2%), Rockingham County's (2.3%), and Strafford County's (2.1%).

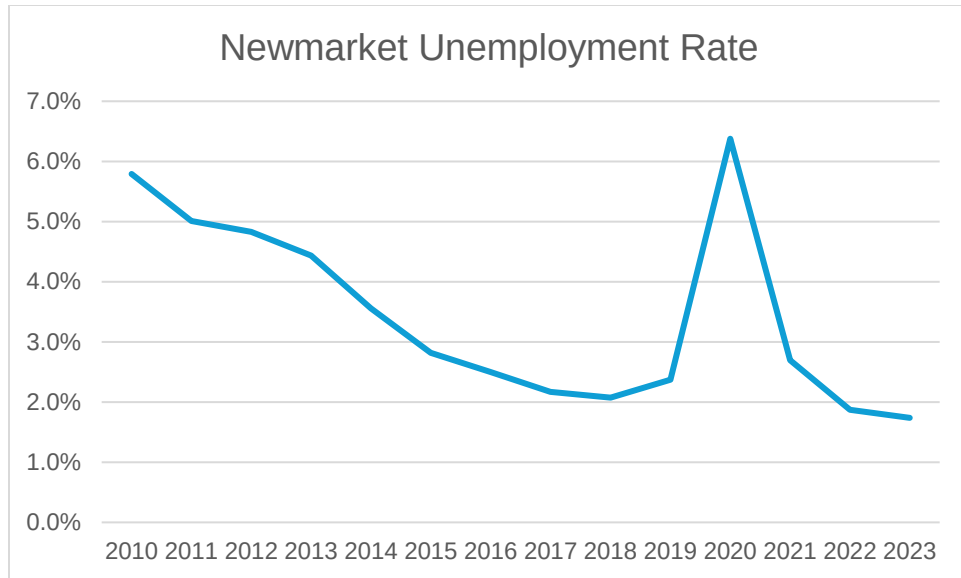


Figure 19: Newmarket Unemployment, 2010 - 2023, NH Employment Security

Labor Force Efficiency

According to Longitudinal Employer-Household Dynamics provided by the US Census Bureau, roughly three quarters of the labor force live in Newmarket and work elsewhere, about 6% both live and work in Newmarket, and about 18% live outside of Newmarket but work in Newmarket.

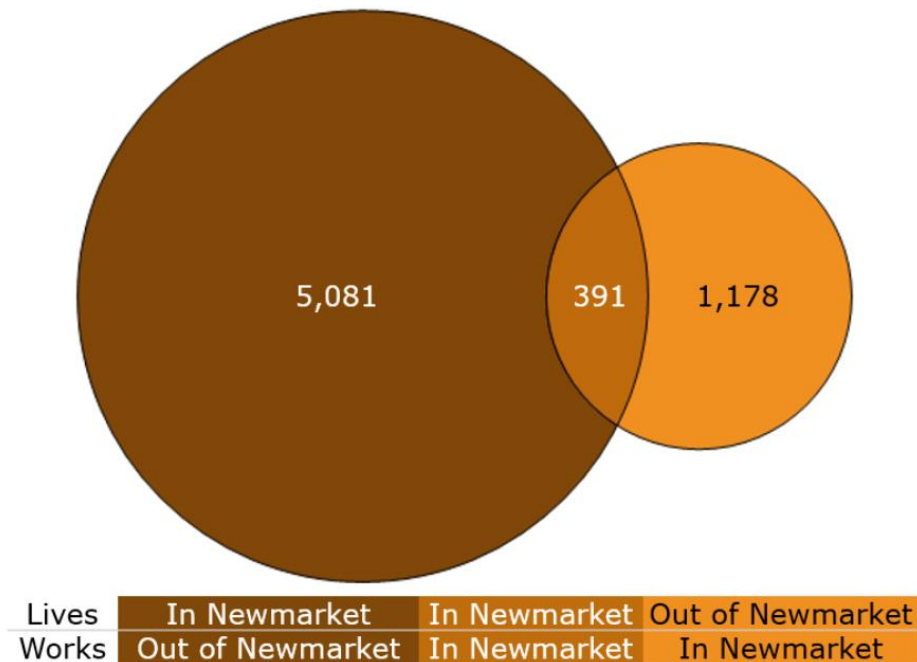


Figure 20: Newmarket Labor Force Efficiency, 2021, LEHD Origin-Destination Employment Statistics (LODES)

Lives	In Newmarket	In Newmarket	Out of Newmarket
Works	Out of Newmarket	In Newmarket	In Newmarket

Total	5,081	391	1,178
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Figure 21: Newmarket Labor Force Efficiency, 2021, LEHD Origin-Destination Employment Statistics (LODES)

Employment by Industry: Jobs and Job Holders by Sector

The table below shows the total number of jobs in Newmarket and Newmarket Resident's Fields, which indicates jobs held by Newmarket residents regardless of where they work. It represents Newmarket residents whose job is in each sector and might be in Newmarket or any other place in the country. The largest fields include Health Care and Social Assistance, followed by Educational Services, Retail Trade, Manufacturing, and Professional, Scientific, and Technical Services. The top 5 industries are highlighted in green.

		Jobs in Newmarket	Newmarket Resident's Fields
	Total	1640	5564
	NAICS sector 11 (Agriculture, Forestry, Fishing and Hunting)	0	9
	NAICS sector 21 (Mining, Quarrying, and Oil and Gas Extraction)	6	4
	NAICS sector 22 (Utilities)	0	29
	NAICS sector 23 (Construction)	197	223
	NAICS sector 31-33 (Manufacturing)	73	578
	NAICS sector 42 (Wholesale Trade)	40	276
	NAICS sector 44-45 (Retail Trade)	118	598
	NAICS sector 48-49 (Transportation and Warehousing)	5	143
	NAICS sector 51 (Information)	24	142
	NAICS sector 52 (Finance and Insurance)	22	278
	NAICS sector 53 (Real Estate and Rental and Leasing)	82	67

	NAICS sector 54 (Professional, Scientific, and Technical Services)	170	544
	NAICS sector 55 (Management of Companies and Enterprises)	0	99
	NAICS sector 56 (Administrative and Support and Waste	34	289
	NAICS sector 61 (Educational Services)	253	608
	NAICS sector 62 (Health Care and Social Assistance)	205	751
	NAICS sector 71 (Arts, Entertainment, and Recreation)	35	82
	NAICS sector 72 (Accommodation and Food Services)	188	455
	NAICS sector 81 (Other Services [except Public Administration])	75	170
	NAICS sector 92 (Public Administration)	113	219

Figure 22: Newmarket Employment by Industry, 2022, LODES Residential Area Characteristics and Workplace Area Characteristics

Jobs in Newmarket

Based on Census Bureau LODES data, there were 1,640 jobs in Newmarket in 2022. The major industries included Education Services and Health Care and Social Assistance, both with over 200 employees. Other large industries with 100-200 employees included Construction, Accommodation and Food Services, Professional, Scientific, and Technical Services, Retail Trade, and Public Administration.

Jobs in Newmarket				
Year	2010	2015	2020	2022
Total number of jobs	1305	1346	1418	1640
Number of jobs for workers age 29 or younger	351	336	314	411
Number of jobs for workers age 30 to 54	735	707	743	788
Number of jobs for workers age 55 or older	219	303	361	441

Number of jobs with earnings \$1250/month or less	388	416	322	354
Number of jobs with earnings \$1251/month to \$3333/month	471	453	387	368
Number of jobs with earnings greater than \$3333/month	446	477	709	918
Educational Services	239	206	194	253
Health Care and Social Assistance	180	194	216	205
Construction	46	134	156	197
Accommodation and Food Services	143	166	119	188
Professional- Scientific- and Technical Services	72	43	185	170
Retail Trade	117	82	85	118
Public Administration	79	77	100	113
Real Estate and Rental and Leasing	34	43	60	82
Other Services [except Public Administration]	45	55	76	75
Manufacturing	197	116	58	73
Wholesale Trade	19	54	39	40
Art	47	61	26	35
Administrative and Support and Waste Management and Remediation Services	41	90	67	34
Information	2	5	7	24
Finance and Insurance	23	12	26	22
Mining- Quarrying- and Oil and Gas Extraction	5	3	1	6
Transportation and Warehousing	6	5	3	5
Agriculture- Forestry- Fishing and Hunting	4	0	0	0
Utilities	4	0	0	0

Management of Companies and Enterprises	2	0	0	0
Number of jobs for workers with Race: White Alone	1248	1283	1336	1549
Number of jobs for workers with Race: Black or African American Alone	9	16	28	20
Number of jobs for workers with Race: American Indian or Alaska Native Alone	3	3	8	9
Number of jobs for workers with Race: Asian Alone	28	30	32	43
Number of jobs for workers with Race: Native Hawaiian or Other Pacific Islander Alone	0	0	1	1
Number of jobs for workers with Race: Two or More Race Groups	17	14	13	18
Number of jobs for workers with Ethnicity: Not Hispanic or Latino	1278	1320	1368	1583
Number of jobs for workers with Ethnicity: Hispanic or Latino	27	26	50	57
Number of jobs for workers with Educational Attainment: Less than high school	70	97	100	127
Number of jobs for workers with Educational Attainment: High school or equivalent - no college	231	277	269	305
Number of jobs for workers with Educational Attainment: Some college or Associate degree	325	309	329	372
Number of jobs for workers with Educational Attainment: Bachelors degree or advanced degree	328	327	406	425
Number of jobs for workers with Sex: Male	577	655	710	792
Number of jobs for workers with Sex: Female	728	691	708	848
Over 200	100-200	50-100	Less than 50	

Figure 23: Jobs in Newmarket, 2022, LODES Residential Area Characteristics and Workplace Area Characteristics

Employment Projections for the SRPC Region

Below are employment projections for different industries in the SRPC region. Changes are shown both in terms of number of jobs and as also as a percent change.

Code	Industry	2020 Estimated Employment	2030 Projected Employment	Numeric Change	Percent Change
000000	Total Employment	53,874	57,945	4,071	7.60%
101000	Goods-Producing Industries	7,207	7,377	170	2.40%
102000	Service-Providing Industries	43,784	47,730	3,946	9.00%
006010	Self-employed Workers	2,883	2,838	-45	-1.60%
110000	Agriculture, Forestry, Fishing and Hunting	417	454	37	8.90%
111000	Crop Production	329	359	30	9.10%
112000	Animal Production	56	61	5	8.90%
113000	Forestry and Logging	15	15	0	0.00%
115000	Agriculture and Forestry Support Activities	0	0	0	0
210000	Mining	16	16	0	0.00%
212000	Mining (except oil and gas)	16	16	0	0.00%
220000	Utilities	0	0	0	0
221000	Utilities	0	0	0	0
230000	Construction	1,881	2,060	179	9.50%
236000	Construction of Buildings	426	504	78	18.30%
237000	Heavy and Civil Engineering Construction	135	139	4	3.00%
238000	Specialty Trade Contractors	1,320	1,417	97	7.40%
310000	Manufacturing	4,893	4,847	-46	-0.90%
311000	Food Manufacturing	65	75	10	15.40%
312000	Beverage and Tobacco Product Manufacturing	25	49	24	96.00%
313000	Textile Mills	634	629	-5	-0.80%
314000	Textile Product Mills	10	9	-1	-10.00%
315000	Apparel Manufacturing	0	0	0	0

Code	Industry	2020 Estimated Employment	2030 Projected Employment	Numeric Change	Percent Change
321000	Wood Product Manufacturing	56	61	5	8.90%
322000	Paper Manufacturing	0	0	0	0
323000	Printing and Related Support Activities	224	177	-47	-21.00%
324000	Petroleum and Coal Products Manufacturing	0	0	0	0
325000	Chemical Manufacturing	19	25	6	31.60%
326000	Plastics and Rubber Products Manufacturing	785	708	-77	-9.80%
327000	Nonmetallic Mineral Product Manufacturing	51	56	5	9.80%
331000	Primary Metal Manufacturing	0	0	0	0
332000	Fabricated Metal Product Manufacturing	469	488	19	4.10%
333000	Machinery Manufacturing	443	430	-13	-2.90%
334000	Computer and Electronic Product Manufacturing	556	596	40	7.20%
335000	Electrical Equipment, Appliance, and Component Manufacturing	48	43	-5	-10.40%
336000	Transportation Equipment Manufacturing	792	776	-16	-2.00%
337000	Furniture and Related Product Manufacturing	47	43	-4	-8.50%
339000	Miscellaneous Manufacturing	473	479	6	1.30%
420000	Wholesale Trade	1,189	1,269	80	6.70%
440000	Retail Trade	7,211	7,049	-162	-2.30%
441000	Motor Vehicle and Parts Dealers	926	1,014	88	9.50%

Code	Industry	2020 Estimated Employment	2030 Projected Employment	Numeric Change	Percent Change
442000	Furniture and Home Furnishings Stores	0	0	0	0
443000	Electronics and Appliance Stores	61	35	-26	-42.60%
444000	Building Material and Garden Supply Stores	851	809	-42	-4.90%
445000	Food and Beverage Stores	2,279	2,191	-88	-3.90%
446000	Health and Personal Care Stores	311	296	-15	-4.80%
447000	Gasoline Stations	425	401	-24	-5.70%
448000	Clothing and Clothing Accessories Stores	141	171	30	21.30%
451000	Sporting Goods, Hobby, Book, and Music Stores	0	0	0	0
452000	General Merchandise Stores	1,128	1,031	-97	-8.60%
453000	Miscellaneous Store Retailers	328	291	-37	-11.30%
454000	Nonstore Retailers	501	549	48	9.60%
480000	Transportation and Warehousing	1,056	1,133	77	7.30%
481000	Air Transportation	0	0	0	0
482000	Rail Transportation	0	0	0	0
484000	Truck Transportation	190	206	16	8.40%
485000	Transit and Ground Passenger Transport	135	176	41	30.40%
488000	Support Activities for Transportation	0	0	0	0
491100	Postal Service, Federal Government	236	213	-23	-9.80%
492000	Couriers and Messengers	0	0	0	0
493000	Warehousing and Storage	187	204	17	9.10%
510000	Information	688	663	-25	-3.60%
511000	Publishing Industries	67	72	5	7.50%
512000	Motion Picture and Sound Recording Industries	0	0	0	0

Code	Industry	2020 Estimated Employment	2030 Projected Employment	Numeric Change	Percent Change
515000	Broadcasting (except Internet)	66	59	-7	-10.60%
517000	Telecommunications	0	0	0	0
518000	Data Processing, Hosting, and Related Services	0	0	0	0
519000	Other Information Services	31	34	3	9.70%
520000	Finance and Insurance	2,826	2,943	117	4.10%
522000	Credit Intermediation and Related Activities	647	626	-21	-3.30%
523000	Financial Investment and Related Activities	0	0	0	0
524000	Insurance Carriers and Related Activities	2,118	2,240	122	5.80%
530000	Real Estate and Rental and Leasing	395	414	19	4.80%
531000	Real Estate	307	332	25	8.10%
532000	Rental and Leasing Services	88	82	-6	-6.80%
541000	Professional, Scientific, and Technical Services	2,869	3,358	489	17.00%
541100	Legal Services	180	167	-13	-7.20%
541200	Accounting, Tax Prep., Bookkeeping, and Payroll Services	139	132	-7	-5.00%
541300	Architectural, Engineering, and Related Services	256	292	36	14.10%
541400	Specialized Design Services	7	17	10	142.90%
541500	Computer Systems Design and Related Services	1,648	2,019	371	22.50%
541600	Management, Scientific, and Technical Consulting Services	264	289	25	9.50%

Code	Industry	2020 Estimated Employment	2030 Projected Employment	Numeric Change	Percent Change
541700	Scientific Research and Development Services	21	21	0	0.00%
541800	Advertising and Related Services	25	27	2	8.00%
541900	Other Professional, Scientific, and Technical Services	329	394	65	19.80%
550000	Management of Companies and Enterprises	127	121	-6	-4.70%
551000	Management of Companies and Enterprises	127	121	-6	-4.70%
561000	Administrative and Waste Management Services	2,194	2,367	173	7.90%
561100	Office Administrative Services	428	469	41	9.60%
561200	Facilities Support Services	84	90	6	7.10%
561300	Employment Services	348	383	35	10.10%
561400	Business Support Services	163	134	-29	-17.80%
561500	Travel Arrangement and Reservation Services	0	0	0	0
561600	Investigation and Security Services	23	26	3	13.00%
561700	Services to Buildings and Dwellings	793	868	75	9.50%
561900	Other Support Services	0	0	0	0
562000	Waste Management and Remediation Services	248	272	24	9.70%
611000	Educational Services	7,892	8,342	450	5.70%
611100	Elementary and Secondary Schools	3,843	4,055	212	5.50%
611200	Junior Colleges	14	14	0	0.00%

Code	Industry	2020 Estimated Employment	2030 Projected Employment	Numeric Change	Percent Change
611300	Colleges, Universities, and Professional Schools	3,710	3,944	234	6.30%
611400	Business Schools and Computer and Management Training	0	0	0	0
611500	Technical and Trade Schools	0	0	0	0
611600	Other Schools and Instruction	114	166	52	45.60%
611700	Educational Support Services	0	0	0	0
620000	Health Care and Social Assistance	7,427	8,423	996	13.40%
621000	Ambulatory Health Care Services	2,934	3,421	487	16.60%
622000	Hospitals	2,427	2,593	166	6.80%
623000	Nursing and Residential Care Facilities	977	1,042	65	6.70%
624000	Social Assistance	1,089	1,367	278	25.50%
710000	Arts, Entertainment, and Recreation	562	669	107	19.00%
711000	Performing Arts, Spectator Sports, and Related Industries	33	63	30	90.90%
712000	Museums, Historical Sites, and Similar Institutions	25	27	2	8.00%
713000	Amusement, Gambling, and Recreation Industries	504	579	75	14.90%
720000	Accommodation and Food Services	4,129	5,360	1,231	29.80%
721000	Accommodation	302	404	102	33.80%
722000	Food Services and Drinking Places	3,827	4,956	1,129	29.50%
810000	Other Services (Except Government)	2,337	2,592	255	10.90%
811000	Repair and Maintenance	635	700	65	10.20%

Code	Industry	2020 Estimated Employment	2030 Projected Employment	Numeric Change	Percent Change
812000	Personal and Laundry Services	588	733	145	24.70%
813000	Religious, Grantmaking, Civic, Professional, and Similar Org	694	700	6	0.90%
814000	Private Households	420	459	39	9.30%
999100	Government, Federal (Excluding Postal Service)	144	131	-13	-9.00%
999200	Government, State (Excluding Education and Hospitals)	375	361	-14	-3.70%
999300	Government, Local (Excluding Education)	2,304	2,470	166	7.20%

Figure 24: Employment Projections in the SRPC Region, 2020 – 2030, NH Employment Security

Top Employers

According to data from Data Axle provided through NH Employment Security, the largest employers (those with 50-249 employees) in Newmarket include:

Employer	Business Description	Employer Size
NEWMARKET ELEMENTARY SCHOOL	Schools	100 to 249
NEWMARKET HIGH SCHOOL	Schools	100 to 249
PROMO CENTRIC	Promotions & Fund Raising	50 to 99

Figure 25: Newmarket Largest Employers, 2024, Data Axle and Town of Newmarket

Employees Under 18

Data is not available specifically for Newmarket alone, however, data for Strafford and Rockingham counties shows that historically, the number of employees under the age of 18 peaks around the third quarter every year, likely due to an increase in work taken by students during the summer break.

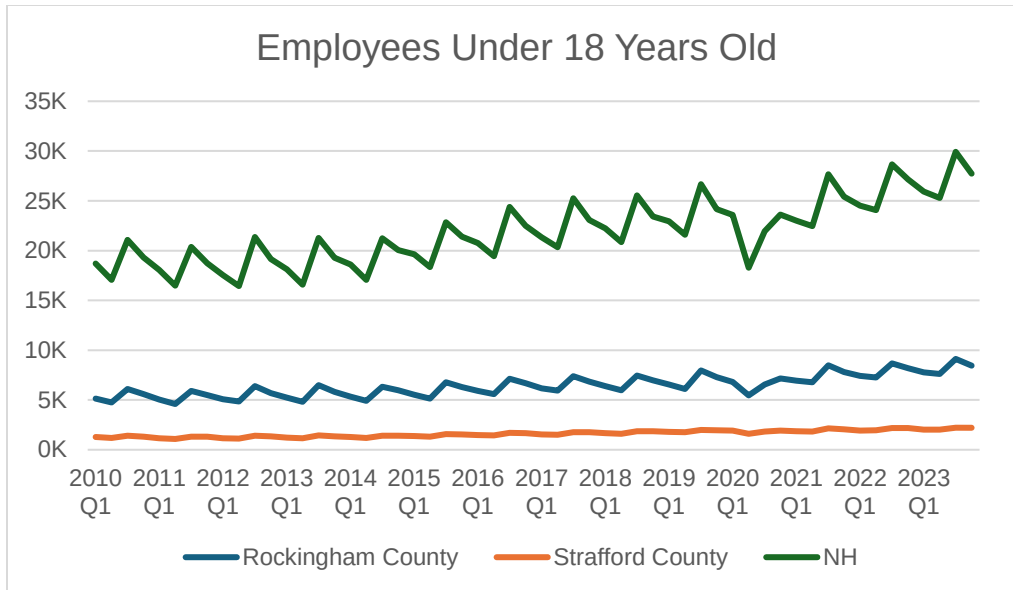


Figure 26: Employees Under 18 in NH and Rockingham and Strafford Counties, 2020 – 2023, Quarterly Workforce Indicators, US Census Bureau

Since 2010, the number of employees over the age of 65 has increased in Strafford and Rockingham Counties, though at a slower pace than the State.

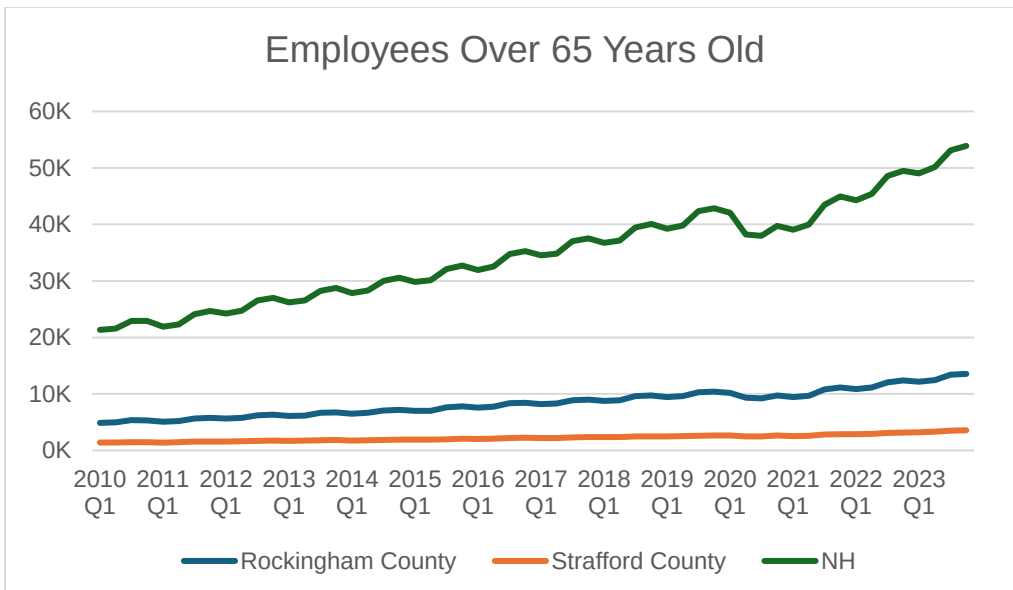


Figure 27: Employees Over 65 in NH and Rockingham and Strafford Counties, 2020 – 2023, Quarterly Workforce Indicators, US Census Bureau

Average Annual Covered Employment and Wages

After experiencing a decline in total employment of 26% from 2000 to 2009, Newmarket's total employment base grew by 27% (from 1,237 jobs to 1,576 jobs) from 2010 to 2023. This increase was seen in the private sector, which grew from 891 employees in 2010 to 1,266 employees in 2023, while the number of total government employees decreased during this same period.

The number of total private businesses grew by 22%, but the number of new employees in private businesses grew by 42%, representing a slower growth in the number of firms but more jobs.

	2010	2015	2020	2023
Total Private Businesses	134	145	163	163
Average Employees	891	1,020	1,165	1,266
Average Weekly Wage	\$734	\$802	\$1,018	\$1,146
Total Public Entities	6	6	6	6
Average Employees	345	311	300	310
Average Weekly Wage	\$734	\$844	\$1,012	\$1,128
Total Employment	1,237	1,331	1,466	1,576

Figure 28: Newmarket Average Annual Covered Employment and Wages, 2010, 2015, 2020, 2023, NH Employment Security

From 2010 to 2023, the average weekly wages for private business employees increased by 56% (from \$734 to \$1,146) and the average weekly wages for public entity employees increased by 54% (from \$734 to \$1,128).

Average Weekly Wages for Newmarket's Largest Industries

Below are the average weekly wages for the top 5 occupations in Newmarket as seen in the 2022 LODS Workplace Area Characteristics data (Jobs and Job Holders by Sector table)*. The number of jobs and average weekly wages displayed in the chart below are from NHES's 2021 Occupational Employment and Wage Statistics (OEWS) data. Annually, wages range from \$22,932 pre-tax for Accommodation and Food Services (#1 on the list of top 5 industries with a total of 207 jobs) to \$87,048 for Professional and Technical Services (#4 on the list of top 5 industries with a total of 169 jobs).

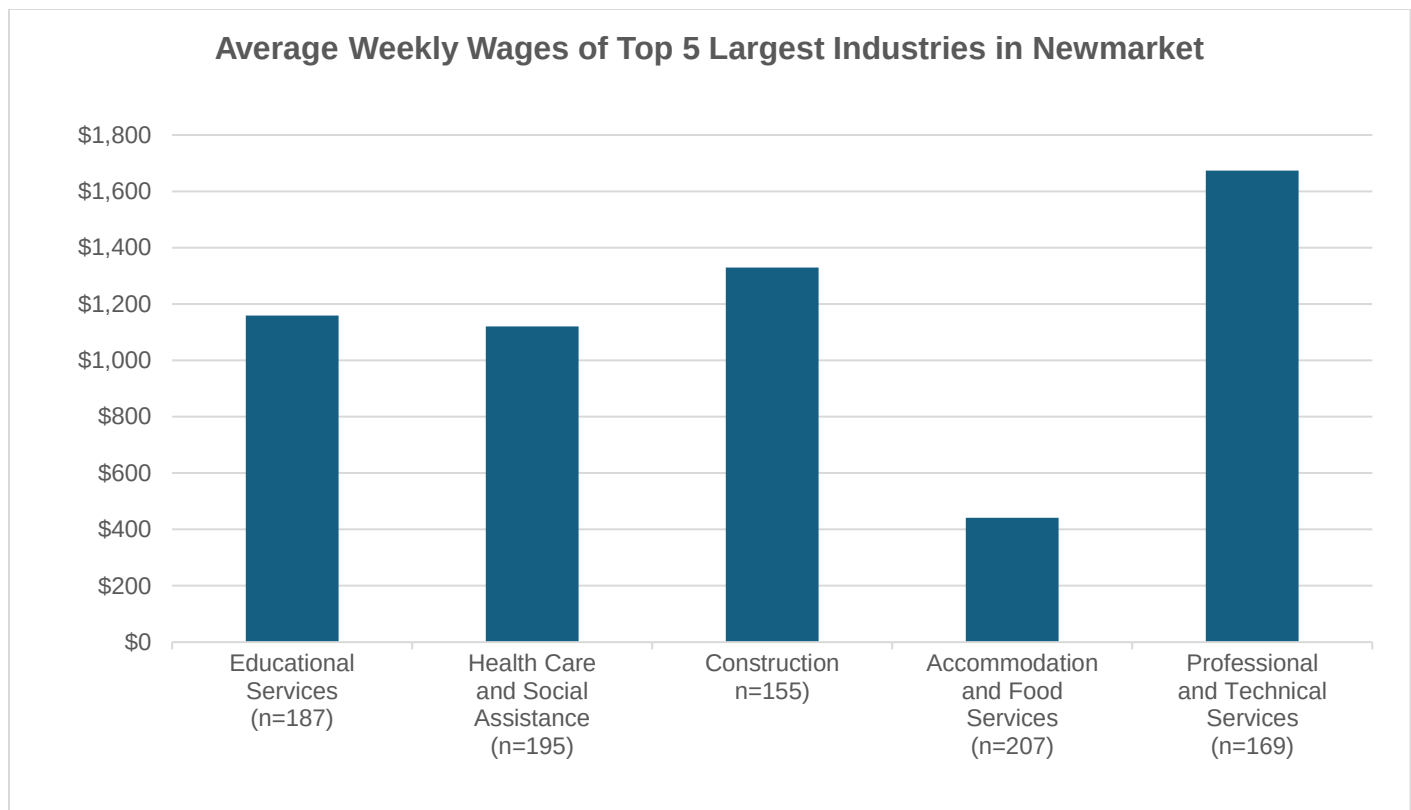


Figure 29: Average Weekly Wages in Newmarket's Largest Industries, 2021, NH Employment Security

*Note: NHES's data is from the Occupational Employment and Wage Statistics (OEWS) program which is a semiannual survey conducted by state employment security agencies in all 50 states. These values are from a different survey as the 2022 LODS Data, therefore show a different number of jobs, so they should not be discussed as though they are the same sample size or represent the same people.

The chart below shows trends in average weekly wages for the top 5 largest industries in Newmarket from 2016 to 2021.

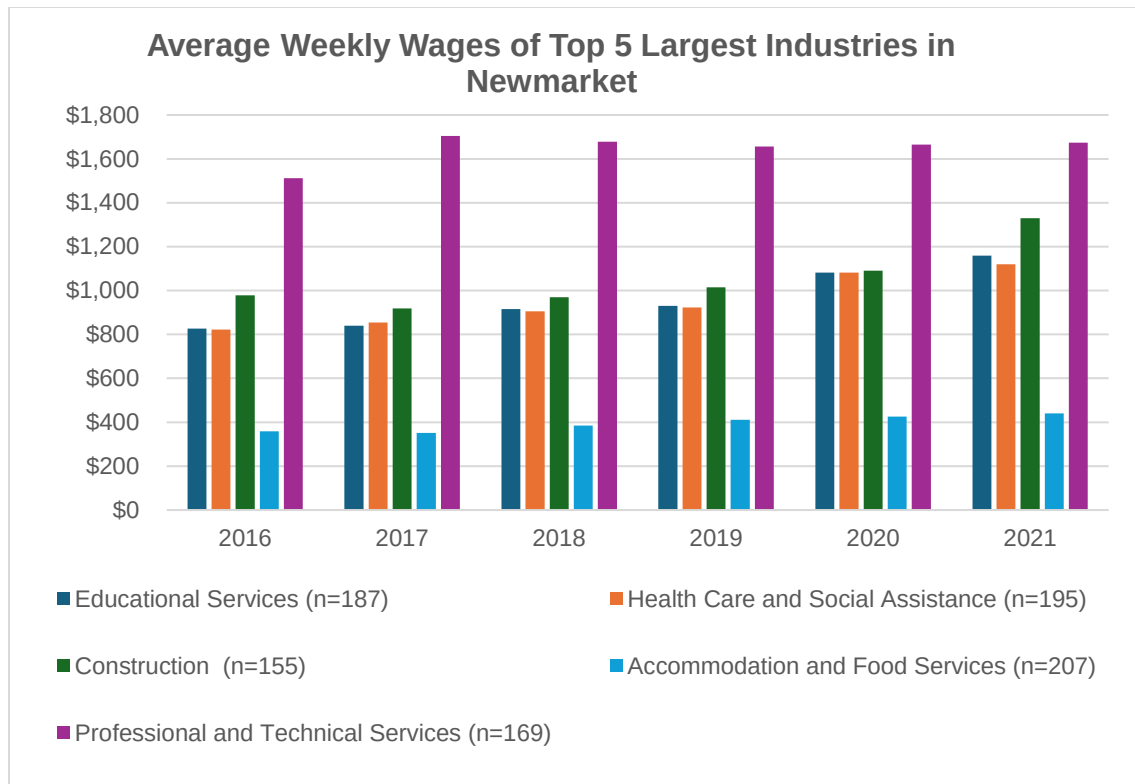


Figure 30: Average Weekly Wages in Newmarket's Largest Industries, 2016 - 2021, NH Employment Security

Median Household Income

The median household income (MHI) in Newmarket has increased steadily from 2013 to 2023. It is important to highlight that there is a large disparity in the median household income when broken down by household type (owners vs. renters), where the 2023 MHI for owner occupied households was \$123,750 compared to \$77,541 for renter occupied households.

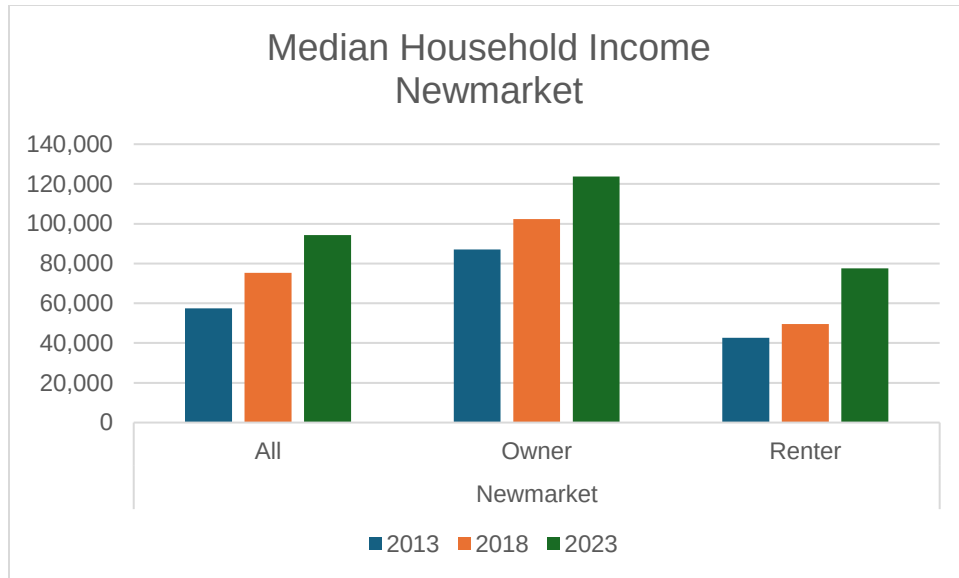


Figure 31: Newmarket Median Household Income, 2013, 2018, 2023 5-Year Estimates, Census American Community Survey

The table below shows how median household incomes in Newmarket compare to Rockingham County, Strafford County, and New Hampshire. In 2023, the Newmarket MHI of \$94,345 for all household types (owners and renters) was lower than Rockingham County's (\$113,927), about the same as New Hampshire's (\$95,628), and higher than Strafford County's (\$86,564).

Median Household Income				
		2013	2018	2023
Newmarket	All	57,429	75,290	94,345
	Owner	86,978	102,312	123,750
	Renter	42,575	49,628	77,541
Rockingham County	All	77,348	90,429	113,927
	Owner	90,316	106,355	132,238
	Renter	43,398	50,125	66,480
Strafford County	All	58,825	70,650	86,564
	Owner	75,720	87,654	114,593
	Renter	35,052	42,233	54,447
New Hampshire	All	64,916	74,057	95,628
	Owner	79,589	90,782	115,080
	Renter	37,326	42,486	56,305

Figure 32: Newmarket, Rockingham and Strafford Counties, and NH Median Household Income, 2013, 2018, 2023 5-Year Estimates, Census American Community Survey

Educational Attainment

The population in Newmarket has a high educational attainment. In 2023, 98.4% of individuals over 25 years held a high school diploma or higher, while 1.6% had no high school diploma. Of

that 98.4%, a little less than half (48.8%) had a high school diploma or higher, while 49.6% had a bachelor's degree, Master's, or PhD. Compared to Rockingham County, Strafford County, and NH, Newmarket's population has a smaller population with no high school diploma, and a higher population that is a high school graduate or higher.

Educational Attainment				
	Newmarket	Rockingham County	Strafford County	NH
	2023			
Population over 25	7,276	235,035	89,069	1,009,222
No High School Diploma	2.1%	3.9%	5.3%	5.9%
High School Graduate or Higher	97.9%	96.1%	94.7%	94.1%
High School or some college (less than 4-year degree)	48.2%	51.3%	56.2%	54.2%
Bachelor's or Higher	49.7%	44.8%	38.5%	39.8%

Figure 33: Educational Attainment in Newmarket, Rockingham and Strafford Counties, and NH, 2023, Census American Community Survey

79-E and TIF Districts

There are several tools that have been leveraged since then which have helped support community revitalization and provided opportunities for new businesses. In 2010, the Town approved a Community Revitalization Incentive Zone District under NH RSA 79-E, a state law that is designed to encourage investment in downtowns and village centers by providing a tax incentive for the redevelopment and rehabilitation of under-used buildings. Although it is a state law, the program must be adopted locally to go into effect. In Newmarket, this district included sections of the B-1, M-1 and M- 2 zoning districts along Route 108, from the Durham town line to New Road

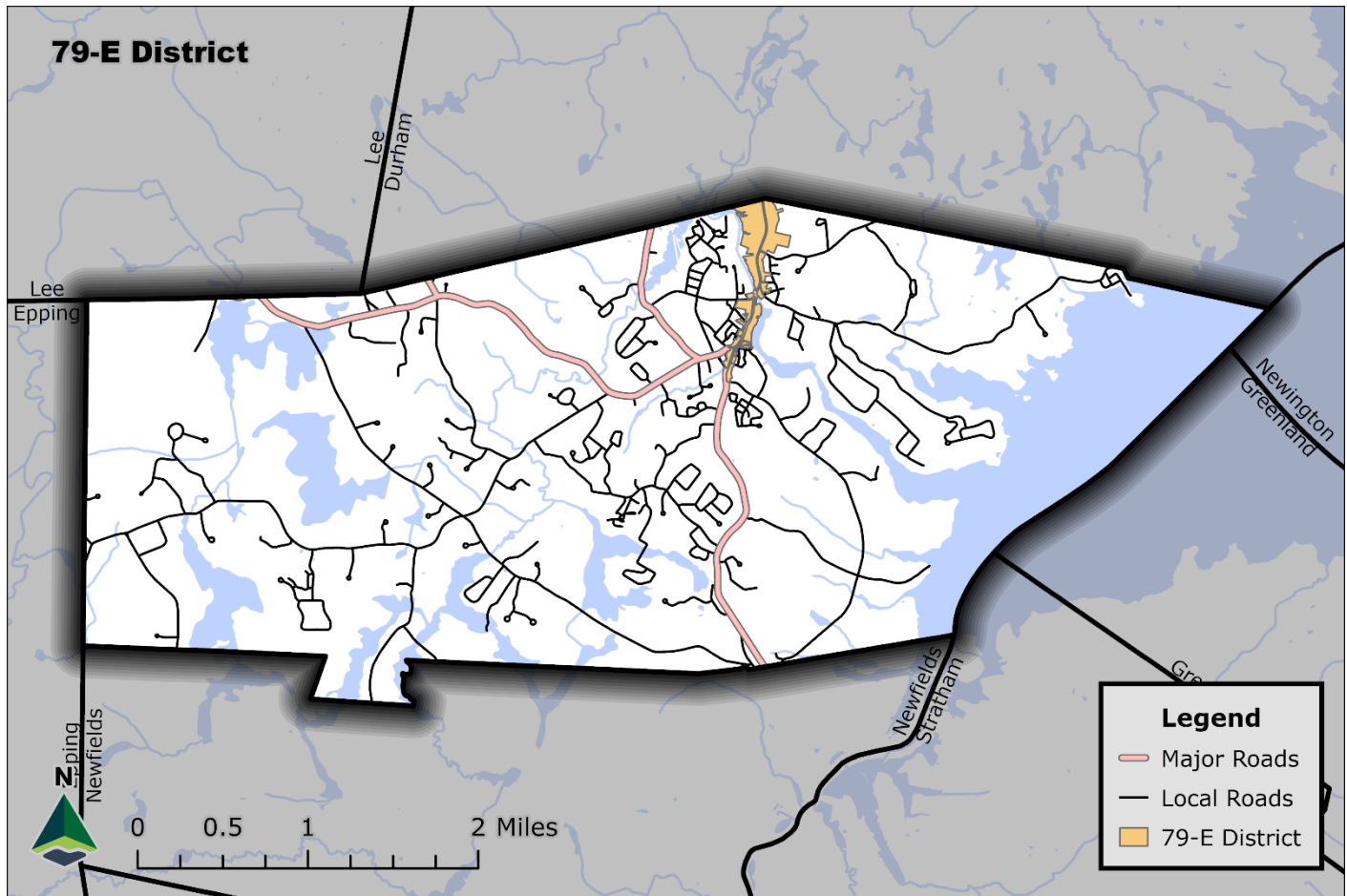


Figure 34: 79-E District, Newmarket. Source: SRPC and Town of Newmarket.

This incentive was key to promoting investment, providing improvements, and attracting economic activity in Town. Since its creation, projects that have been completed utilizing the 79-E in incentive in Newmarket include:

2012: 13 Water Street, Mixed-use development off from Water Street (7 residential units and office space)

2015: Newmarket Mills (112 residential units, 16 live/work lofts, 50,000-sf of commercial space, 5,400 sf- civic space)

2022: 4 Bay Road, Selectwood building (15 residential units)

2022: 86 Main Street, mixed-use building (with the addition of 6 residential units)



Furthermore, there were two Tax Increment Financing (TIF) districts in the Town of Newmarket, which have expired as of the time of this chapter update. One of these TIF Districts was the M-1 Mill Zone, located east of NH Route 108 in the downtown, incorporating what was known as the Downtown TIF District, which has been retired. As this zone was already built out before the TIF District was adopted and included all of the major mill structures, much of the work done included revitalizing mill space that went underutilized since the decline of the textile industry. This was a crucial component in turning this infrastructure around and helping shape the Town's once underutilized mill space, creating a unique space for residential and commercial activity. Since then, commercial spaces in the mill have welcomed various successful businesses. Implementing a TIF district proved to be a successful way to revitalize this key economic node in Town by making it financially attractive to developers to invest in an area that would've otherwise been overlooked, while preserving historic structures that are an integral part of Newmarket's character, historic town center, and main business district.

Beyond the Town Center/Village district, which is comprised of 76.16 acres, there are currently 842.89 acres (9.3% of Newmarket's total land) across Newmarket zoned for commercial, industrial, and mixed use, and looking for opportunities to utilize and/or enhance these areas are key to contributing to the Town's overall vibrancy. These include:

TIF Districts

A TIF district, or Tax Increment Financing district, is a specific geographic area where a municipality can use property tax revenue generated by development or redevelopment to finance public improvements within that area, thereby incentivizing development and revitalization. Typically, a TIF District will sunset at a pre-determined date, or once the development program is complete.

Zoning Categories	Acres	% of Town
Commercial	570.66	6.30%
Industrial/Commercial	262.54	2.90%
Mixed Use	9.69	0.10%
Recreation	148.23	1.60%
Residential	6,996.40	77.10%
Town Center / Village District	76.16	0.80%
Water	1,016.16	11.20%
Grand Total	9,079.84	100.00%

Major Transportation Corridors

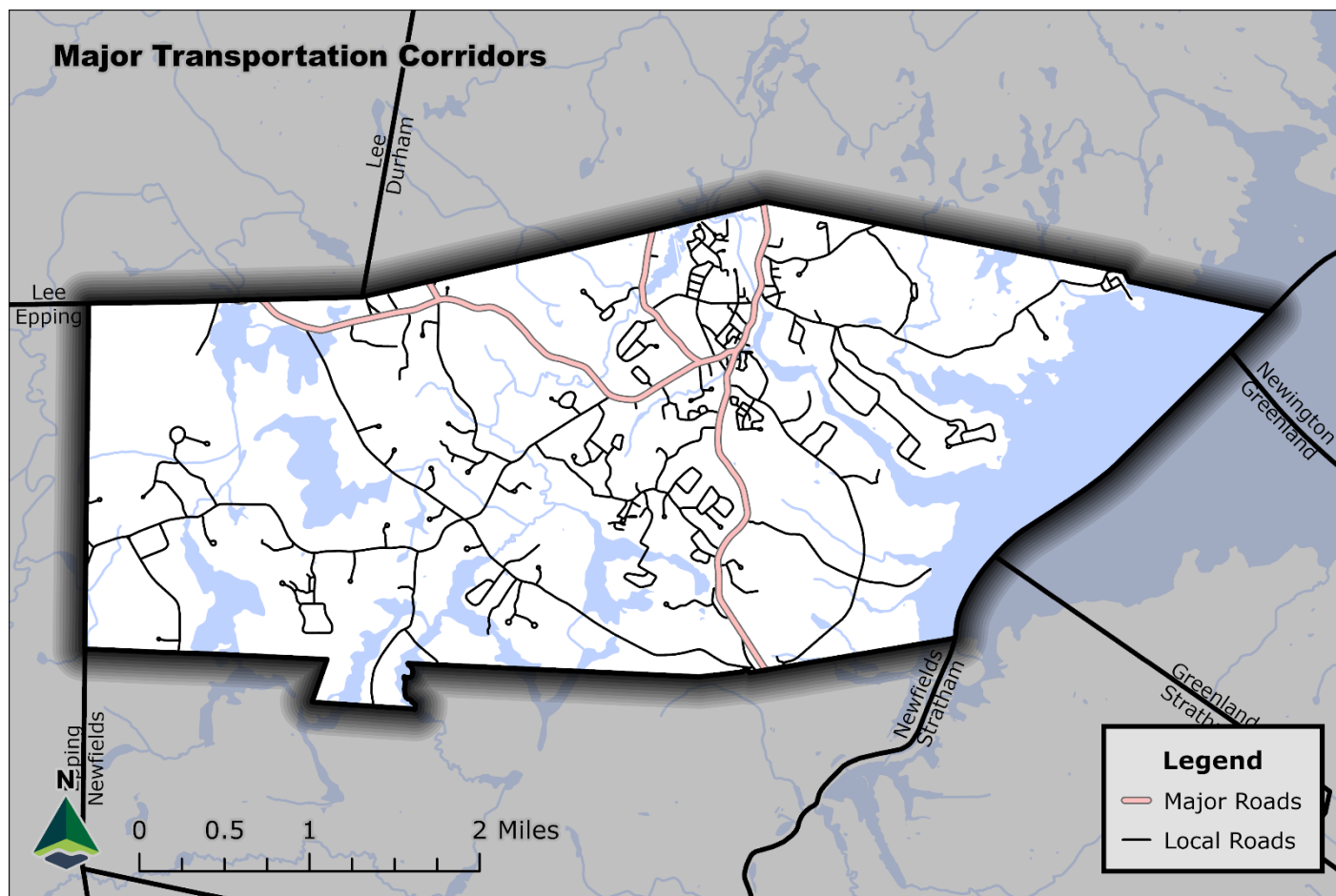


Figure 34: Major Transportation Corridors in Newmarket, 2025, SRPC

Travel Time to Work

In 2023, over half of Newmarket commuters (2,553 or 54%) were traveling 20-39 minutes to work, an increase from 2018 but slightly lower compared to 2013. About a third of Newmarket commuters (28%) traveled 0-19 minutes to work, and less than 20% had a commute of more than 40 minutes.

Newmarket Commuters		Percent of Commuters			Number of Commuters
		2013	2018	2023	2023
Commute time	0-19 min.	25%	31%	28%	1,331
	20-39 min.	57%	48%	54%	2,553
	40-59 min.	8%	11%	9%	409
	60-89 min.	7%	3%	7%	314
	90+ min.	3%	8%	3%	137

Figure 35: Average Travel Time to Work for Newmarket Commuters, 2013, 2018 2023 5-Year Estimates, Census American Community Survey

Partnerships to promote entrepreneurship, technology, and digital equity infrastructure

UNH Broadband Center of Excellence (BCoE) - Conducts research, provides consulting, shares information, and leverages UNH resources, research and technology expertise, and process and policy tools to support advances in broadband services and capabilities that will enable all – government, universities, communities and industry participants – to use broadband as a tool to create economic growth, societal improvements and business success

UNH Survey Center - Provides university researchers, government and business leaders, and private organizations with reliable information about public attitudes concerning important policy matters through clear, concise research

UNHInnovation - UNHInnovation manages, protects, and commercializes UNH's intellectual assets and serves as the first point of contact for companies looking to engage with UNH.

John Olson Center for Advanced Manufacturing - Focuses on advanced manufacturing technologies and a cross-curricular approach to engineering and manufacturing concepts

NH Small Business Development Center (NHSBDC) - Contributes to NH's economic vitality by providing its businesses and communities with the tools they need to reach their goals through confidential counseling, training programs, access to information and referral, and other specialized services

Center for Venture Research (CVR) - Conducts multidisciplinary research on early-stage equity financing for high growth ventures

Franklin Pierce Center for Intellectual Property - Brings together varied resources (including the only academic IP library in the United States), IP Center faculty, researchers, students, and partners to work at the intersections of law, business, and technology to improve the rate of innovation in the global economy

Center for Digital Health Innovation - Brings together faculty, staff, and students from across UNH with the shared goal of engaging cutting-edge technologies to enhance the health and well-being of individuals across the lifespan by serving as a hub providing support and coordination advancing research, practice, outreach and teaching activities

UNH InterOperability Laboratory (UNH-IOL) – Acting as a non-profit, independent test lab, UNH-IOL works with vendors of computer communication devices to resolve complex networking issues and to foster multi-vendor interoperability and/or conformance to standards while educating students for future employment.

Water and Sewer

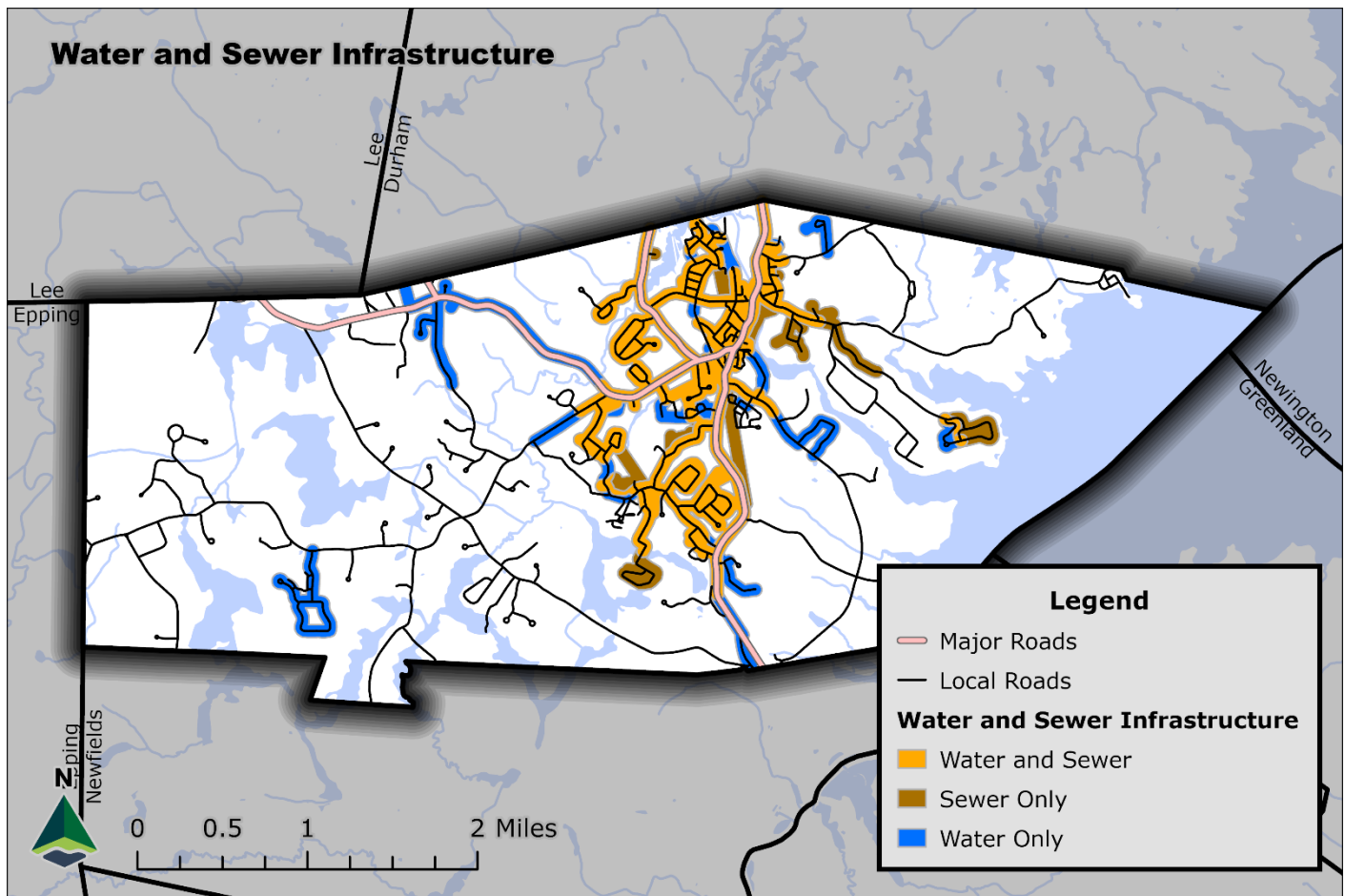


Figure 36: Water and Sewer Infrastructure in Newmarket, 2025, SRPC

Office Vacancy Rates

Land Use – Commercial, Industrial, and Mixed Use

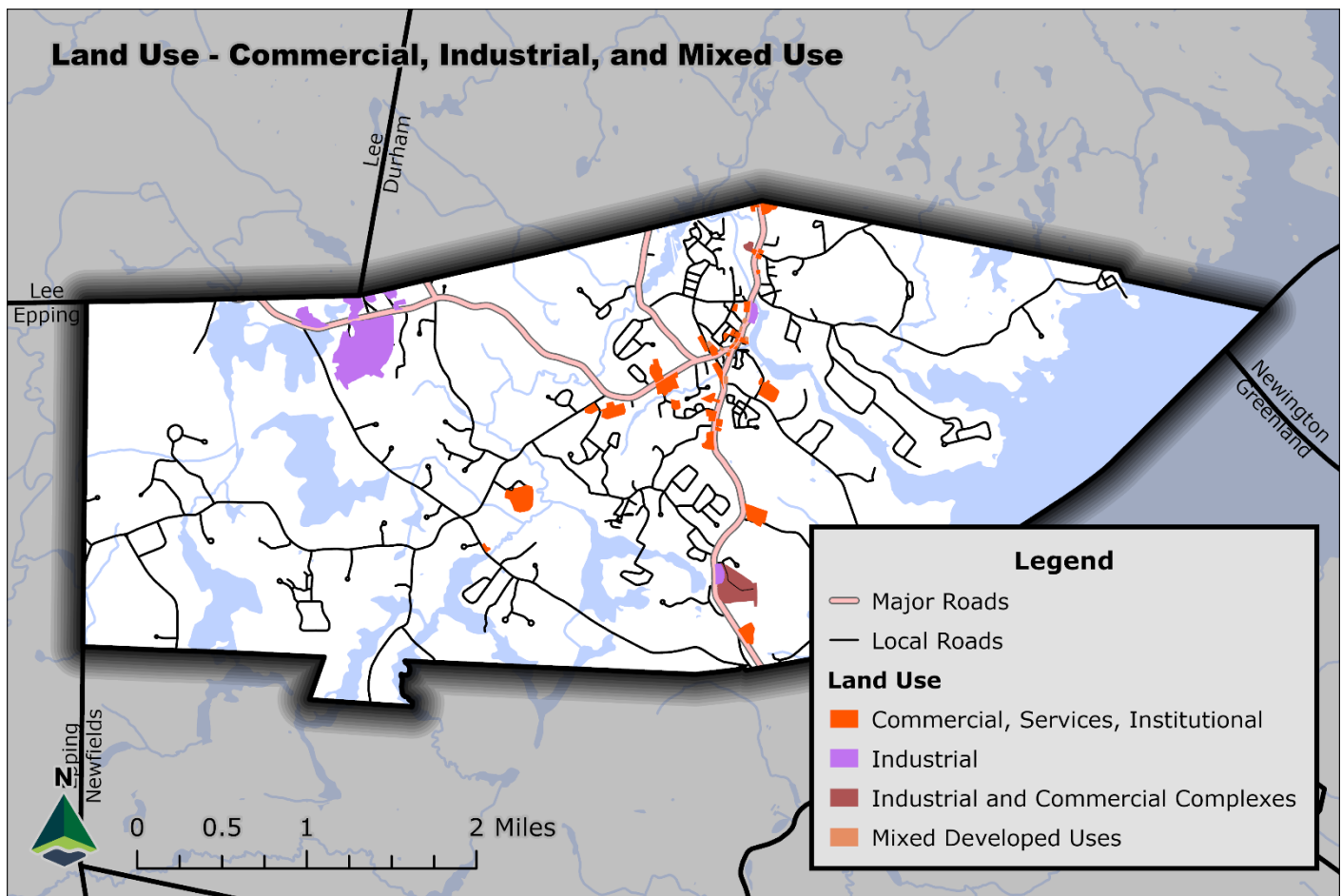


Figure 37: Land Use - Commercial, Industrial, Mixed Use, SRPC

Zoning – Commercial, Industrial, and Mixed Use

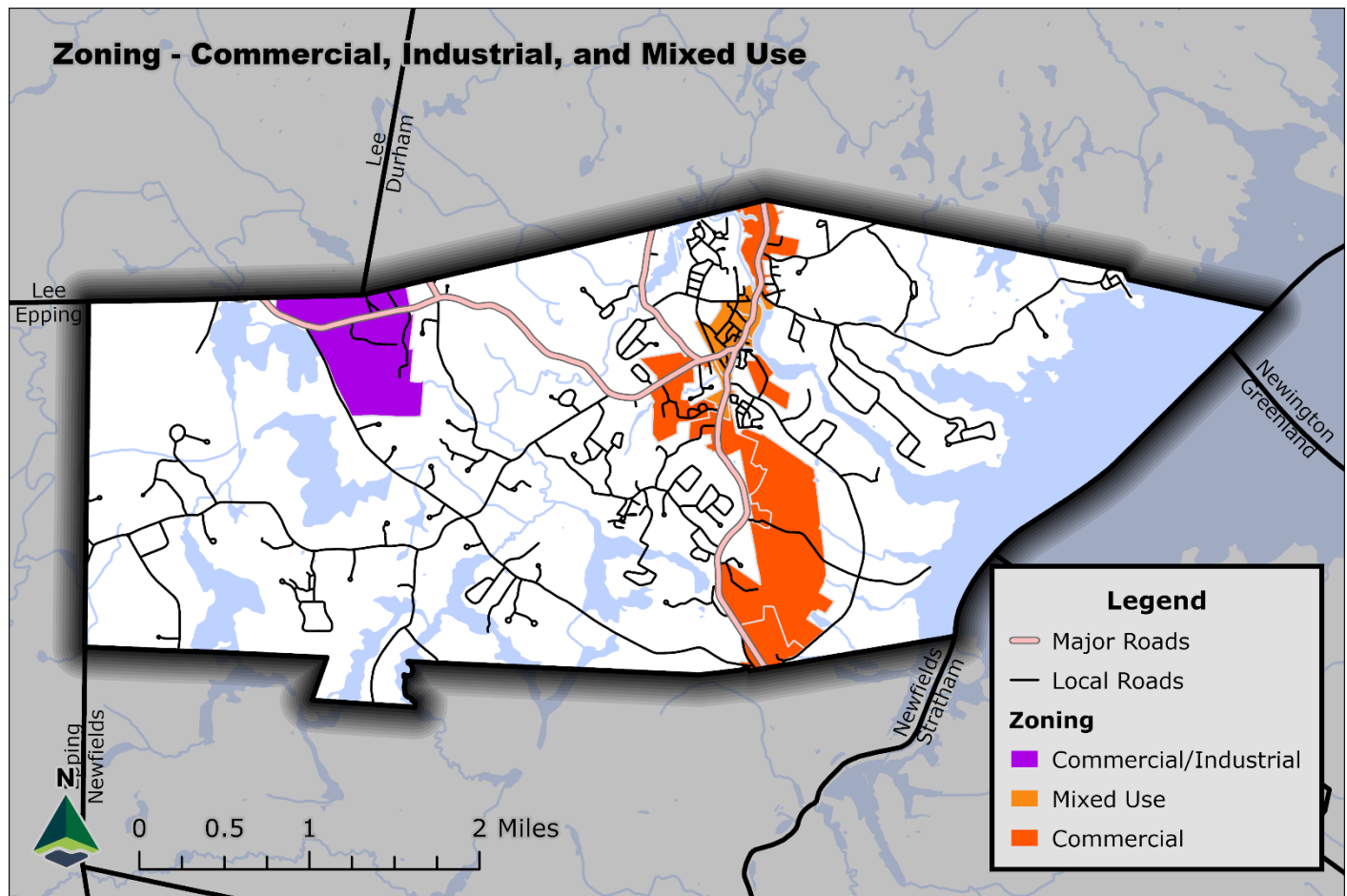


Figure 38: Zoning – Commercial/Industrial/Mixed Use, SRPC

Property Tax Rate

While New Hampshire has no personal income tax and no sales tax, it has one of the highest effective property tax rates in the country. The charts below show the changes in effective property tax rates from 2003 through 2022 and the comparison of Newmarket's 2022 rate to other neighboring communities, including Durham, Lee, and Newfields. Newmarket's total effective property tax rate, at \$26.99 in 2022, was lower than Durham's but higher than Lee's and Newfields'.

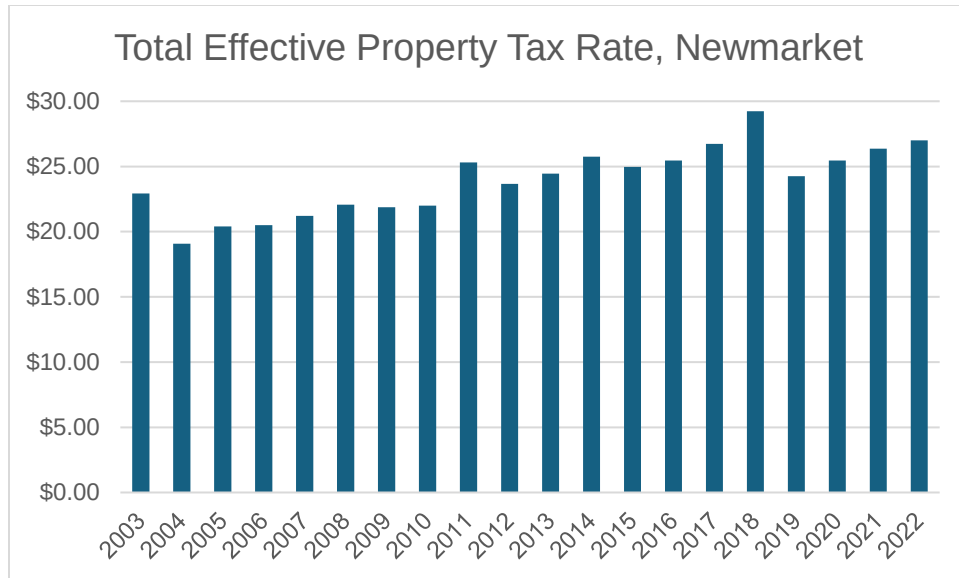


Figure 39: Total Effective Property Tax Rate in Newmarket, 2003 - 2022, NH Public Finance Consortium

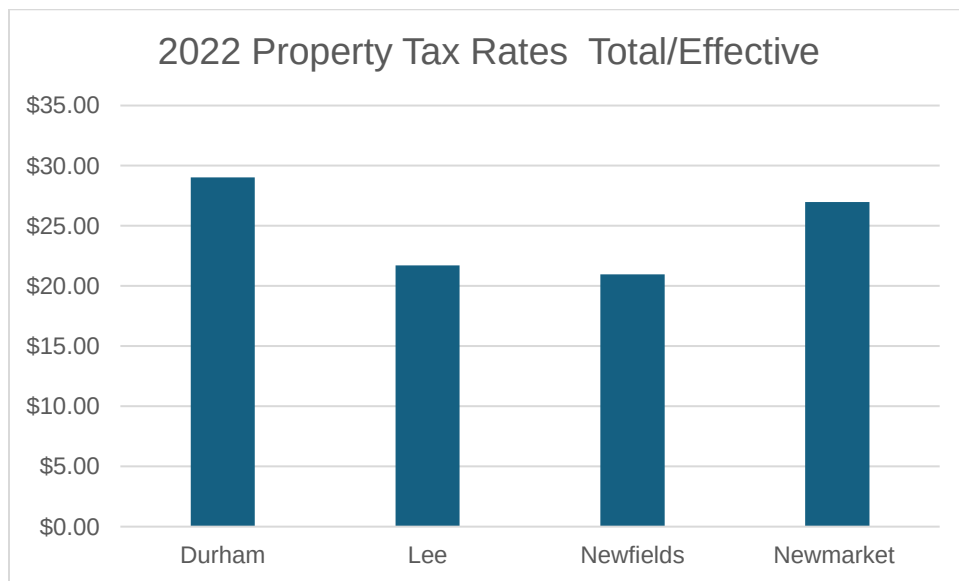


Figure 40: Total Effective Property Tax Rates in Newmarket and Neighboring Communities, 2022, NH Public Finance Consortium

Local and Regional Economic Development Organizations

- Newmarket Main Street Corporation
- Lamprey Arts and Cultural Alliance (LACA)
- Newmarket Community Development Corporation (NCDC)
- Newmarket Heritage and Cultural Center Committee, (NHCCC) – subcommittee of LACA
- Newmarket Business Association (NBA)
- Strafford and Rockingham Regional Planning Commissions
- UNH Cooperative Extension
- NH Department of Business and Economic Affairs

- Seacoast Small Business Development Center
- NH Small Business Administration
- Apprenticeship NH
- Regional Economic Development Center

Potential Footbridge Locations Connecting Heron Point to Downtown

A design charrette was conducted which led to the three following locations considered for a pedestrian bridge connecting downtown to Heron Point. Each has its advantages and disadvantages. Further outreach and a cost and feasibility study would be necessary as part of a continued discussion around this effort.

Option #1: Relatively few boats would be affected by this location. The large house on the hill owns most of the low-tide rock outcropping shown at the terminus of the measured line. The area on the downtown side is owned by Chinburg Properties, who has been amenable to collaborating with the Town to modify the pedestrian easement to allow for access.



Option #2: This would be the shortest span but is a little less central to the downtown area. Both sides of the river in this location are Town-owned and the topography lends itself to good clearances for boats.



Option #3: The final location is at Schanda Park. While the location is ideal, it's the biggest span and would take quite a bit of abutment structure to get the elevation needed for boats to pass under. Ideally, 15 feet of clearance was targeted to allow the larger style motorboats that use this portion of the water way. The length of the bridge could be slightly shorter if it began somewhere near the wastewater lift station paved area.



Figure 41: Potential Footbridge Locations, Downtown to Heron Point, Town of Newmarket

Sources

¹ https://strafford.org/uploads/documents/plans/rpc/masterplan_2024_newmarket_housing.pdf

¹ <https://www.nhhfa.org/wp-content/uploads/2020/10/NH-Urban3-Report-10.2020.pdf>

ⁱ NH Housing Finance Authority

ⁱⁱ NH Housing Finance Authority

ⁱⁱⁱ Colliers Q3 2024 NH Office Insight: <https://indd.adobe.com/view/0700e1a0-d58a-4222-a31e-d047dc7924f1>