New Hampshire DOT
Department of Transportation

Statewide Strategic Transit Assessment

with

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EXECUTIVE SUMMARY

The Strategic Statewide Transit Assessment (SSTA) is intended to be a guide toward a sustainable future for public transit in New Hampshire. Through more than a dozen separate tasks, the study team, led by Steadman Hill Consulting, Inc., worked with NHDOT's Bureau of Rail and Transit to take a comprehensive look at bus transportation in the state and consider ways that it could better meet the needs of New Hampshire residents. The study was cognizant of the role of demand response transportation and rail as well, but these modes were not the focus of the effort.

Policy

Until now, NHDOT has not had any official, explicit policy regarding public transit. In consultation with the stakeholders committee for the SSTA, the transit providers and the regional planning commissions, as well as taking public input into account, the following policies for operations and capital spending were developed. These are listed in descending order of priority.

Operations

- Basic mobility for transit-dependent people
- Access to employment for transit-dependent people
- Maximizing ridership and efficiency
- Supporting economic vitality
- Attracting millennials/choice riders

Capital

- Transit fleets must be in a state of good repair
- Passenger facilities are an essential part of the public transportation system
- Safe pedestrian access to and from bus stops is essential
- Maximize use of technology

While basic mobility should continue to be the primary goal of public transportation in the state, for future funding over and above the spending levels for currently-provided service, the amount of non-intercity 5311 funding spent on basic mobility should be reduced from 40% of the total to 33% of the total, with additional funds allocated to other policy goals, especially:

- Access to jobs;
- Maximizing ridership; and
- Supporting economic vitality.

Inventory of Existing Services and Capital

Table ES-1 Operating Statistics Summary (SFY 2019)

Service Type	No. of Services	Vehicle Revenue Hours	Vehicle Revenue Miles	Ridership	Operating Cost	Fare Revenue
Fixed Routes	60	196,543	2,680,848	3,196,246	$16,451,113	$1,416,786
Deviated Fixed	7	14,457	211,937	50,130	$815,152	$29,442
Demand Response	21	83,238	876,397	126,054	$5,145,286	$190,710
TOTAL	88	294,238	3,769,182	3,372,430	$22,411,551	$1,738,698

As of June 30, 2019, there were 197 transit vehicles in use by the ten transit providers in New Hampshire. Of those, 104 were small buses or cutaway vans of less than 30 feet in length, while the rest were medium- or heavy-duty transit buses of 30 or more feet in length. The average age of the fleet statewide is 6.1 years.

The inventory of facilities includes small items such as bus shelters and bike racks and large items such as maintenance and administration buildings. There are 128 bus shelters under the jurisdiction of the transit agencies. There are others owned by municipalities or private entities, but these were not included in the inventory. There are about 35 additional benches not associated with shelters, primarily in Concord and Durham. The Nashua Transit System and Advance Transit each have large combined administrative and maintenance facilities. COAST has operations offices and a maintenance garage in Dover and MTA has used its maintenance/administrative building since the 1970s. Tri-County CAP has a much smaller facility with a dispatch center, offices and a two-vehicle garage.

Needs and Gaps Analysis

A critical step in planning for a future sustainable transit system is identifying unmet needs and gaps in the current system. Chapter 4 describes the multi-pronged approach to gathering information about needs and gaps, including meetings with all nine of the regional planning commissions in New Hampshire, data analysis of residential density, employment density, transit propensity and commuting patterns, and examination of population forecasts. Common themes expressed by the regions included the following:

- **Local fixed route/deviated fixed route service**
  - Longer hours needed on weekday evenings
  - More service/some service needed on Saturdays and Sundays
  - Higher frequency of service would be of benefit to existing riders and help to attract new ones
  - Many towns have no service at all; need connections to nearby cities, shopping, and medical facilities
- **Regional service**
  - Commuter connections needed from towns 10-40 miles from major employment centers, such as Manchester, Concord, and Lebanon/Hanover
  - Better intra-state connections needed for other occasional trips, such as medical, court-related, social/recreational
  - East-west connections needed to cities and universities, plus Manchester airport
- **Intercity service**
  - Portions of the state have little or no access to the intercity network
  - North-south connections along the east side of the state—to Dover/Durham—are poor or non-existent
  - Access to intercity service at Portsmouth difficult because of lack of parking capacity
  - Current intercity service not well suited to intra-state travel, especially on I-89 corridor

The analysis identified 15 communities with unmet need for local service and 8 employment centers with missing commuter linkages from communities that are important sources of workers. Seven communities or pairs of communities were identified as lacking needed access to the intercity bus network. These places are listed on pages 23-24 of the main report.

Service Concepts

Although the SSTA is not primarily a service plan, Chapter 5 includes a series of service proposals for local, commuter and intercity routes to address the needs and gaps identified in Chapter 4. These proposals do

not include any suggested changes to existing bus routes, as evaluation of currently-operated services was not part of the scope of this project. These proposals are summarized in the following three tables.

Table ES-2 Summary of Local Service

Route	Headway	Days of Service	Annual Gross Cost	Urban/Rural	Priority Tier
Conway	30/60	100	$150,000	Rural	1
Laconia	60	255	$250,000	Rural	1
Suncook	60	255	$250,000	Urban	2
Milford	60	156	$105,000	Urban	2
Franklin/Tilton	60	255	$250,000	Rural	2
Exeter	60	255	$250,000	Urban	3
Plymouth	40	255	$250,000	Rural	3
TOTAL			$1,505,000		

Table ES-3 Summary of Commuter Service

Route	Annual Gross Cost	Annual Riders	Gross Cost/Rider	Priority Tier
Salem-Londonderry-Manchester	$211,000	42,000	$5	1
Claremont-Hanover	$260,000	26,000	$10	1
Hanover-Concord	$485,000	34,000	$14	2
Rochester-Concord	$312,000	23,000	$13	2
Portsmouth-Manchester	$349,000	26,000	$13	2
Salem-Nashua-Milford	$301,000	19,000	$15	3
Keene-Concord	$386,000	19,000	$21	3*
Laconia-Concord	$234,000	12,000	$19	3*
TOTALS	$2,538,000	201,000	$13	

*If no intercity service is implemented in these corridors, the commuter route should be promoted to Tier 1

Table ES-4 Summary of Proposed New Intercity Service

Route (one-way fare)	Annual Gross Cost	Annual Riders	Annual Subsidy	Priority Tier
Laconia – Concord ($6)	$145,000	7,200	$102,000	1
Claremont – Lebanon/WRJ ($6)	$128,000	6,500	$89,000	2
Hanover – Concord ($10)	$450,000	14,000	$310,000	2
Keene – Concord ($8)	$356,000	13,000	$252,000	2*
Portsmouth – Concord ($8)	$308,000	11,500	$216,000	3
Berlin – Dover ($30)	$778,000	8,000	$538,000	3

*Should be considered for Tier 1 if Keene–Nashua route is not expanded to daily service

Park & Ride

Park & Ride lots in New Hampshire play an essential role in providing access to intercity and other bus routes. The SSTA included a task, performed by RSG, Inc., for a comprehensive review of these lots and recommendations for investments in new capacity.

There are 33 official park & ride lots in New Hampshire. Of these, 27 are owned by NHDOT and the other 6 are owned by various municipalities. Three lots are filled to more than 90% of capacity and five more are at over 75% of capacity. These locations are high priorities for additional capacity (when feasible) or other management strategies.

A number of underserved areas have high residential density, proximity to major roadways, and are more than 10 miles from the nearest park-and-ride facility. These include Littleton (I-93), Berlin (NH 110/NH16), the area around North Conway, Claremont (NH 120/NH 103/NH 11), the Upper Valley (NH 120/US 4), Moultonborough (NH 25), Ossipee (NH 16/NH 25), and Wolfeboro (NH 28/NH 109).

Technology

The SSTA also recognized that technology is having and will continue to have a major impact on transit operations. Schweiger Consulting, LLC, as part of the study team, conducted an assessment of current technology deployment at New Hampshire transit agencies, and developed a hierarchy of technology applications that NHDOT can use as a guide to future investments. The statewide costs for these investments, separated into urban and rural areas, are shown in the following tables.

Table ES-5 Statewide Capital and O&M Costs by Goal Year for Urban Agencies

Goal Year	Total Capital Cost (min)	Total Capital Cost (max)	Total O&M Cost (min)	Total O&M Cost (max)
2021	$152,000	$269,000	$0	$0
2022	923,750	2,238,250	21,200	33,200
2023	1,136,250	2,331,750	228,023	442,240
2024	0	0	447,401	825,188
2025	1,149,000	2,402,000	447,401	825,188
2026	210,250	399,750	697,095	1,220,309
2027	0	0	762,858	1,320,847
2028	416,000	983,000	762,858	1,320,847
2029	507,000	1,194,000	853,371	1,486,297
2030	N/A	N/A	964,709	1,675,997
TOTAL	$4,494,250	$9,817,750	$5,184,916	$9,150,113

Table ES-6 Statewide Capital and O&M Costs by Goal Year for Rural Agencies

Goal Year	Total Capital Cost (min)	Total Capital Cost (max)	Total O&M Cost (min)	Total O&M Cost (max)
2021	$72,000	$162,000	$0	$0
2022	1,221,000	2,721,000	6,963	15,700
2023	1,230,000	2,788,000	270,308	509,205
2024	0	0	519,601	983,856
2025	368,750	737,250	519,601	983,856
2026	53,750	106,250	639,429	1,166,124
2027	302,500	570,500	670,992	1,212,487
2028	130,000	253,000	769,693	1,361,763
2029	914,000	2,159,000	801,518	1,407,763
2030	N/A	N/A	1,001,857	1,760,013
TOTAL	$4,292,000	$9,497,000	$5,199,962	$9,400,767

Performance Evaluation

While NHDOT's funding strategy, which generally applies only to its 5311 subrecipients, will always start with the presumption of continued funding for existing services, NHDOT must also ensure that the funding is being used as effectively as possible. It is therefore necessary for NHDOT to analyze the viability of existing services.

Even though NHDOT only manages the flow of Section 5311 funding, allowing Section 5307 funds to flow directly to the transit agencies in urbanized areas, a series of eight route classes cover all 88 routes and services in New Hampshire. Benchmarks for performance are then set for each class. The three main elements of performance are productivity (ridership per unit of service), cost efficiency (gross operating cost per unit of service), and cost effectiveness (gross or net cost per passenger). The initial benchmarks are set based on the FY19 performance for services in that class. In general, the benchmark separates the lowest performing or highest cost 20-30% of services from the rest of the class. These low ridership or high cost routes could benefit from analysis and planning that should help them improve their performance.

Funding and Sustainability

The sustainability of the transit system ultimately depends upon money and whether the benefits provided by transit services are sufficient to maintain support from decision-makers who control the flow of funding. A peer analysis and responses to the online survey conducted as part of the SSTA provide support for increased funding of public transit in New Hampshire.

With the exception of Advance Transit, all of the urban and rural transit systems in New Hampshire operate substantially less service than their national peers, in spite of the peers serving similar populations and land areas. Most of the urban systems operate about half of the service of the peer agencies, while MTA operates somewhat more than half. CART operates only about a fifth of the service that its urban peers do.

In the rural areas, TCC and SCT operate about a third of the service of their peers, while VNA-HCS in Keene and Concord Area Transit operate somewhat more than 50% of the peer service level. Advance Transit's high level of service, about triple that of the peer group, reflects its strong relationships with Dartmouth College and Dartmouth-Hitchcock Medical Center, its efforts at attracting philanthropic donations, as well as the higher level of financial support it receives from Vermont.

Conclusion

The SSTA has identified some of the most obvious unmet needs for transit service and proposed solutions to address those needs. Investments in new Park & Ride lots and transit technology will help to increase access to the transit system, improving its long-term sustainability. The policy goals articulated in Chapter 2 of this document are intended to help NHDOT and other decision-makers to pursue those investments that are most effective at achieving the priority objectives.

The transit system will not change overnight. This transformation will require a cooperative effort among NHDOT, urban and rural transit providers, regional planning commissions, advocacy organizations, New Hampshire elected officials, and the New Hampshire congressional delegation. A concerted effort to secure additional funding and successful implementation of new services and capital projects will promote the viability of the transit system and allow it to become the attractive travel option that most New Hampshire residents want it to be.

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1. INTRODUCTION

The New Hampshire Department of Transportation oversees ten public transit providers, as well as intercity bus transportation supplied by private companies. The transit systems range from those serving rural areas in the north and west to urban systems in the south and east. The providers range from private non-profit corporations, to community action programs, to city departments and authorities, to the University of New Hampshire in Durham. This diversity of operating environments and organizations presents a challenge when it comes to evaluating, coordinating, and funding public transportation at the statewide level.

The Strategic Statewide Transit Assessment (SSTA) is intended to be a guide toward a sustainable future for public transit in New Hampshire. Through more than a dozen separate tasks, the study team, led by Steadman Hill Consulting, Inc., worked with NHDOT's Bureau of Rail and Transit to take a comprehensive look at bus transportation in the state and consider ways that it could better meet the needs of New Hampshire residents. The study was cognizant of the role of demand response transportation and rail as well, but these modes were not the focus of the effort.

This report and its associated appendices are a compilation of the results of the SSTA. The report begins with a chapter on policy, laying out the priorities that will help guide future funding decisions for transit operations, capital investments, intercity bus service, and planning. While there is consensus that there should be continued emphasis on providing basic mobility and access to jobs for transit-dependent people, other objectives such as supporting high-ridership services, promoting economic development and attracting younger riders should receive consideration when allocating newly available funding.

One of the primary tasks in the first phase of the SSTA was to compile an inventory of transit services, vehicles and facilities among all ten providers. This inventory was first compiled for State Fiscal Year 2016 and then updated in three subsequent years. An inventory of transit technology was collected in 2019. A summary of these inventories is provided in Chapter 3.

A critical step in planning for a future sustainable transit system is identifying unmet needs and gaps in the current system. Chapter 4 describes the multi-pronged approach to gathering information about needs and gaps, including meetings with all nine of the regional planning commissions in New Hampshire, data analysis of residential density, employment density, transit propensity and commuting patterns, and examination of population forecasts.

Although the SSTA is not primarily a service plan, Chapter 5 includes a series of service proposals for local, commuter and intercity routes to address the needs and gaps identified in Chapter 4. These proposals do not include any suggested changes to existing bus routes, as evaluation of currently-operated services was not part of the scope of this project. Each section of the chapter includes a priority ranking of the proposed routes into three tiers.

Park & Ride lots in New Hampshire play an essential role in providing access to intercity and other bus routes. The SSTA included a task, performed by RSG, Inc., for a comprehensive review of these lots and recommendations for investments in new capacity. Chapter 6 provides the highlights of this analysis, which is presented in full in Appendix D.

The SSTA also recognized that technology is having and will continue to have a major impact on transit operations. Schweiger Consulting, LLC, as part of the study team, conducted an assessment of current technology deployment at New Hampshire transit agencies, and developed a hierarchy of technology applications that NHDOT can use as a guide to future investments. Chapter 7 includes specific recommendations, by transit provider, for technology procurement over the coming decade.

Proposals for new transit service in New Hampshire are developed in response to solicitations from NHDOT. The solicitations are the primary means the Bureau of Rail and Transit has to incorporate policy goals and performance measures into the process of service expansion. Chapter 8 describes changes to the solicitations and selection criteria to better integrate the policy objectives articulated in the SSTA and work toward improved performance in transit services statewide.

The sustainability of the transit system ultimately depends upon money and whether the benefits provided by transit services are sufficient to maintain support from decision-makers who control the flow of funding. Chapter 9 provides evidence that current funding levels for transit are inadequate to meet the needs for service, based on a comparison with peer agencies across the country. It also shows that there is substantial popular support for additional funding for transit, even among people who do not currently use the system.

Chapter 10 includes some concluding thoughts. A series of appendices, as listed in the table of contents, provide more detailed information for many of the topics covered in this summary report.

2. POLICY

NHDOT has many responsibilities regarding the public transit program in New Hampshire, but the primary one, especially in the non-urban portions of the state, is to decide how federal transit funding is to be spent. NHDOT is the designated recipient of funds from the Federal Transit Administration (FTA) for capital, operations and planning, while all of the rural transit operators in New Hampshire are its subrecipients.

On a year-to-year basis, the great majority—if not all of—the operations spending flowing through NHDOT is dedicated to continuing services that were operated the previous year. On the occasions when new funding becomes available, because of an expansion of federal appropriations or other special circumstances, NHDOT solicits proposals from transit operators for new services or service expansions. Likewise, when capital funding is available, NHDOT seeks proposals from its subrecipients for rolling stock or other projects to enhance the transit system. In such cases, it is useful to have a stated policy about which types of services and capital projects support the goals of NHDOT's transit program.

A policy statement could be codified in statute or it could just be included in the introductory material to a solicitation for service or capital projects. The function of the policy is to offer guidance to the transit providers as to which types of projects best promote the overall goals of the program. The policy can also be incorporated into the scoring of proposals, helping to make the project selection process more objective and transparent.

Until now, NHDOT has not had any official, explicit policy regarding public transit. In consultation with the stakeholders committee for the SSTA, the transit providers and the regional planning commissions, as well as taking public input into account, the following policies for operations and capital spending were developed. Planning funds will continue to be distributed on a case-by-case basis in response to requests from the regions, or otherwise be set aside for coordinated planning efforts, and thus should not be controlled by overall policy goals on operating and capital spending. As part of the process for soliciting proposals for new intercity service, a separate intercity policy was also developed. These policies are laid out below. The process for developing the operations and capital policies are documented in a separate memorandum, included in this report as Appendix A.

Operations

The funds controlled by NHDOT currently support a wide range of types of services across the state from demand response service in rural areas to urban local service and commuter express service. Planning documents on a statewide or regional basis look to a policy statement to provide guidance on how the system should grow; that is, what are the priority needs that should be addressed when new funding is available. The policy elements in descending order of priority are as follows:

- **Basic mobility for transit-dependent people** – This type of service is often called "lifeline" service as it provides mobility for essential needs such as grocery shopping, medical appointments, and other personal business. This service is often focused on people with disabilities, older adults, and low-income individuals, all of whom may be unable to drive or to afford a personal vehicle. For many people these needs are addressed by family members, friends, neighbors, or community volunteers, but some people have no access to such resources.
- **Access to employment for transit-dependent people** – Service that allows people who may not have a car or be able to drive to get to their jobs is extremely valuable to low-income households. Being able to commute to work is the key to upward mobility for these individuals. This policy element is related to basic mobility, but is more focused on the work trip and service during commuting hours.

- **Maximizing ridership and efficiency** – Public transportation works most efficiently in densely developed areas where many people are traveling in specific corridors. In such areas, frequent transit service becomes an attractive alternative to driving, drawing people out of their cars and reducing traffic congestion.
- **Supporting economic vitality** – The availability of public transportation allows for increased development without the need for increased parking. Compact urban design, facilitated by public transportation, is the most sustainable form of economic growth.
- **Attracting millennials/choice riders** – There is strong evidence that the current generation, in their 20s, are delaying purchasing automobiles and are more open to using public transportation. They are also more likely to live near city centers than older people. Providing a convenient alternative to driving for this generation could lead to long-term transit use as they age.

One more policy, which is qualitatively different from the others, but which will apply to all operating grants is as follows:

- **Use of the lowest cost mode** – There are many forms of public transportation and they have a wide range of cost per unit of service provided. A transit provider should seek to use the lowest-cost means of serving demand on a per-passenger basis. For rural areas, this will usually mean demand-response service with volunteer drivers. For small towns it is typically demand-response or deviated fixed-route service. For urban areas, it is likely fixed route service.

Capital

The State of New Hampshire has put an emphasis on investment in capital infrastructure, especially with regard to state-contracted commuter bus service. State policy regarding capital investments includes the following elements in descending order of priority:

- **Transit fleets must be in a state of good repair** – A large component of the public's perception of public transit is formed by the vans and buses that operate the service. In order to promote the concept that transit is for everyone, not just transit-dependent populations, vehicles must be well maintained, kept clean, and replaced in a timely manner. Enhanced amenities, such as comfortable seating, Wi-Fi, and noise reduction, may also be worthwhile investments.
- **Passenger facilities are an essential part of the public transportation system** – While providing the appropriate type and level of service is critical to the efficiency of the system, passenger facilities are essential to making the system attractive and visible to all members of the public. Riders must feel safe and comfortable at bus stops and transit stations. Investments in facilities make the system more visible to all, and help increase ridership by enhancing the passenger experience.
- **Safe pedestrian access to and from bus stops is essential** – Virtually all transit riders become pedestrians at one or both ends of their trip. Sidewalks, crosswalks, crossing signals, and safe places to wait for the transit vehicle are essential elements of a successful public transportation system. As facilities are constructed, provisions must be made for maintenance and snow-clearing during the winter months.
- **Maximize use of technology** – The proliferation of smartphones allows for information about transit operations to be disseminated to the riding public much more cheaply than was possible in the past. Transit providers should make maximum use of this technology to communicate with passengers about bus arrival times, delays, schedule changes, and demand response options. Trip planning software for riders is encouraged for all transit operations.

Intercity Service

Federal regulations governing intercity service specify three primary objectives of the Rural Intercity Bus Program:

1. Support connection between rural areas and the larger regional or national system of intercity bus service
2. Support services to meet the intercity travel needs of residents in rural areas
3. Support the infrastructure of the intercity bus network through planning and marketing assistance and capital investment in facilities.

These objectives comprise a large portion of NHDOT's goals with respect to intercity bus in New Hampshire, but not the entirety of those goals. The Rural Intercity Bus Program in New Hampshire is intended to support the development of a "seamless" network of transportation services linking local transit with intercity modes. Such services can include intercity services or feeder services from areas without intercity bus services. The routes and capital projects funded by the program will support riders traveling from or to rural areas, though the other end of their trips may be in urban areas. Projects will, in general, be funded in the following priority order:

1. Preservation of worthy existing intercity bus services, based on ridership and cost effectiveness
2. Implementation of new services
3. Provision of necessary and appropriate capital facilities and equipment.

Guidance for Future Expansion Funding

The process of drafting and reviewing potential policy goals for public transportation in New Hampshire indicates that there is a desire for an official policy regarding the use of federal funding. While there is not necessarily a consensus on how the money should be spent, there is recognition that different areas have different needs and that some guidance how the funds should be distributed would be helpful.

It seems appropriate that Basic Mobility should be the primary goal of public transportation in the state, and current spending allocations reflect the priority of that goal. The majority of the land area in the state has rural density and there are significant transportation needs in those areas. Under this goal, however, there should be two important provisions:

- Most basic mobility service in low-density rural areas should be targeted toward seniors and people with disabilities and funded with the 5310 program; and
- Service for non-5310 populations in rural areas should be operated with the lowest-cost mode available, specifically volunteer drivers, whenever possible.

For future funding over and above the spending levels for currently-provided service, the amount of non-intercity 5311 funding spent on basic mobility should be reduced from 40% of the total to 33% of the total, with additional funds allocated to other policy goals, especially:

- Access to jobs;
- Maximizing ridership; and
- Supporting economic vitality.

This budgeting and expenditure goal does not affect the allocation of funds for services currently in operation.

Attracting millennials, as a policy goal, received relatively less support than the other goals, and is most relevant to the urban portions of the state. Attracting millennials is a worthwhile goal, but perhaps should not be addressed by either the 5310 or 5311 programs. Instead, 5307-funded services more appropriately address this policy goal.

NHDOT reserves the right to reallocate funding from existing services if they consistently do not meet performance goals and there are no available means of improving service effectiveness. While existing services will be reviewed based on NHDOT's policy priorities once established, it is not NHDOT's intention to cut existing service in favor of a new service without first exhausting all reasonable means by which to improve the existing service.

Public Input on Policy

In the online public survey conducted as part of the SSTA during the early part of Summer 2019, respondents were asked to place a priority ranking on the five operational and four capital policy goals. (See Appendix G for all survey results.) The respondents assigned a rank from 1 to 5 for each of the operations policies and 1 to 4 for each of the capital investment policies, with 1 being the top rank. The average ranks for the operational policies were as follows (a lower number means a higher ranking):

- Basic mobility – 1.98
- Access to employment – 2.24
- Support economic development – 3.35
- Maximize ridership and efficiency – 3.48
- Attract millennials and choice riders – 3.94

The results show a relatively high degree of consensus among the responses, as basic mobility was rated as clearly more important than the three lowest-ranked options. In general, the public agreed with the priority ranking shown earlier in the chapter, though reversing the order of "support economic development" and "maximize ridership and efficiency." The ratings for those two goals were very close together, however, so there is no compelling reason to change the order in the policy statement.

The average ranks for the capital investment policies were as follows:

- More passenger facilities – 2.33
- New buses and vans – 2.40
- Better pedestrian access – 2.56
- More technology – 2.70

The rankings for the capital goals are in a much narrower range, indicating less consensus on which goals are the most important. In the public's view, these goals are somewhat equal in importance.

3. INVENTORY OF EXISTING SERVICES AND CAPITAL

One of the initial tasks of the SSTA was to compile an inventory of services, vehicles and facilities that together comprise the public transit system in New Hampshire. This inventory includes all local bus services plus demand response services operated by the state's transit providers. It does not include intercity bus operations nor demand response services operated by other entities.

With the cooperation of the ten agencies that operate local transit service in New Hampshire, data were first compiled for State Fiscal Year 2016 (which ended on June 30, 2016). The data set was subsequently updated each year for SFY 2017 through SFY 2019. The sections below present summaries of the results. More detailed information is presented in Appendix B.

Services

In SFY 2019, data for 88 distinct services were reported. By service type, these broke out as follows:

- 60 fixed route bus services
- 7 deviated fixed route services
- 21 demand response services

Deviated fixed route services (also known as "flex" routes), operated by Tri-County CAP, CART and Sullivan County Transit, have a designated alignment but also the operational flexibility to leave the route for a pick-up or drop-off within a predetermined buffer. The demand response services included ADA complementary paratransit services, non-emergency medical transportation, services oriented toward older adults and general public dial-a-ride service. Operational statistics by service type are shown in Table 1 below:

Table 1 Operating Statistics Summary (SFY 2019)

Service Type	Vehicle Revenue Hours	Vehicle Revenue Miles	Ridership	Operating Cost	Fare Revenue
Fixed	196,543	2,680,848	3,196,246	$16,451,113	$1,416,786
Deviated Fixed	14,457	211,937	50,130	$815,152	$29,442
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TOTAL	294,238	3,769,182	3,372,430	$22,411,551	$1,738,698

The majority of service included in this inventory is fixed route bus services, reflecting the comparatively large systems in Manchester and Nashua, as well as the smaller systems in the Upper Valley, Seacoast region and Concord. The higher productivity of the fixed route buses is also reflected in the statistics as the fixed route category accounts for 67% of the vehicle revenue hours and 71% of the vehicle revenue miles but 95% of the ridership and 81% of the fare revenue.

Just four systems—Manchester, Nashua, COAST, and Advance Transit—account for two thirds of the service operated in New Hampshire. They account for only 61% of the ridership, primarily because the Campus Connector route, operated by the UNH Wildcat system, with nearly a million boardings, by itself accounts for 28% of the statewide ridership total. If that route is excluded, the four largest systems would account for 85% of statewide ridership.

It is not possible to draw strong conclusions about the trends of service over the past three years because the inventories did not have comprehensive and consistent data for the same set of routes for the entire period. In general, ridership has dropped during the three-year span, following national and regional trends. The Campus Connector route on its own lost over 113,000 passengers because of shifting housing supply and travel demand on the UNH campus, accounting for 46% of the statewide loss in ridership. The amount of service operated has increased slightly (about 2% per year) and the total cost of service has risen by about 4% each year.

Vehicles

As of June 30, 2019, there were 197 transit vehicles in use by the ten transit providers in New Hampshire. Of those, 104 were small buses or cutaway vans of less than 30 feet in length, while the rest were medium- or heavy-duty transit buses of 30 or more feet in length.

The average age of the fleet statewide is 6.1 years. The agency with the oldest fleet (8.1 years on average) is the Manchester Transit Authority, but it also has a high percentage of heavy-duty buses in its fleet and those have longer lifespans (up to 14 years) than smaller buses and cutaway vans (7 to 10 years). All of MTA's Gillig heavy-duty buses were purchased in 2006 through 2008 and are due for replacement in the coming few years. Tri-County CAP has the second highest average age (at 7.5 years), but its fleet is entirely cutaway vans. It is likely that many of its vehicles will need to be replaced in the coming year or two.

The youngest fleet belongs to Sullivan County Transit at 3.8 years, while Advance Transit, with a fleet mostly consisting of heavy-duty buses has an average age of 4 years. Many of its buses were just replaced in the past three years, though it has three remaining large Gillig buses from 2007 that will need to be replaced in the next few years.

COAST has the largest fleet among the transit providers, with 44 vehicles, and it is a very diverse fleet with four MCI 55-passenger over-the-road coaches, 18 Gillig heavy-duty buses, 12 cutaways and medium-size buses, and 10 minivans. The diversity of COAST's fleet reflects the diversity of its operating environments over its sprawling service area. The oldest buses in the statewide fleet are the four MCI coaches used on COAST's commuter routes. These were purchased in 2000 and 2001 and are well past their useful life.

The second largest fleet belongs to the UNH Wildcat service. Among its 32 vehicles, the majority are 35-foot ElDorado EZ-Rider II buses, many of which carry the large number of passengers on the Campus Connector. The ages in that fleet range from brand-new buses put into service in 2019 to 13-year-old buses purchased in 2006. UNH tends to purchase buses in batches of four, retiring four old buses every two years and replacing them with four new buses.

Facilities

The inventory of facilities includes small items such as bus shelters and bike racks and large items such as maintenance and administration buildings. There are passenger terminals and transit centers in many locations in New Hampshire, but most of these are not owned nor managed by the transit providers. Only the Nashua Transit System includes a transit center among its capital facilities. The rest are primarily owned by the State of New Hampshire and managed and operated by private carrier bus companies such as Concord Coach and C&J Bus Lines, even though many of them are also served by local bus routes.

According to the inventory, there are 128 bus shelters under the jurisdiction of the transit agencies. There are others owned by municipalities or private entities, but these were not included in the inventory. There are about 35 additional benches not associated with shelters, primarily in Concord and Durham.

The Nashua Transit System and Advance Transit each have large combined administrative and maintenance facilities. The construction cost of each is in the range of $5 million and they were built or expanded within the last 12 years. COAST has operations offices and a maintenance garage in Dover with a total construction cost of about $2 million, but they are undersized for its current operation. MTA has used its maintenance/administrative building used since the 1970s. The estimated replacement cost is about $18 million. Tri-County CAP has a much smaller facility with a dispatch center, offices and a two-vehicle garage.

Other agencies either lease their space or share it with other parts of a larger organization (such as the University of New Hampshire in Durham or the Home, Healthcare and Hospice Community Services in Keene).

Technology

As part of a review of Transit Intelligent Transportation Systems (ITS) deployment in New Hampshire, an inventory of existing technology at New Hampshire's transit agencies was conducted. Paratransit scheduling software was installed at all agencies that operate demand response service, and all agencies had some form of communication system with their vehicles, such as a two-way radio.

The list below provides more detail on Transit ITS technology that each agency has procured:

Advance Transit

- Automatic vehicle location (AVL)
- Real-time bus arrival information for passengers
- Third-party smartphone application
- Security cameras
- Maintenance software (to track fleet maintenance)
- Accounting software (expected in 2020)

CART

- Maintenance software

Concord Area Transit

- Maintenance software
- Fuel management software
- Automated fare collection

COAST

- Computer-aided dispatch (CAD)/AVL
- Real-time bus arrival information for passengers
- Third-party smartphone application
- Automated vehicle announcements (AVA)
- On-board tablets for paratransit scheduling and dispatching
- Maintenance software

Manchester Transit Authority

- AVL
- AVA
- Maintenance software

Nashua Transit System

- Limited AVL
- AVA
- Automated fare collection

Sullivan County Transportation

- On-board security cameras (for new vehicles in 2020)

Tri-County CAP

- Maintenance software

UNH Wildcat Transit

- CAD/AVL
- Real-time bus arrival information for passengers
- Third-party smartphone application
- Automatic passenger counters
- Limited vehicle component monitoring
- Maintenance software

VNA-HCS Keene

- No technology beyond paratransit software

Chapter 7 contains a more comprehensive discussion of technology and recommendations for the State and the transit operators to invest in technology over the coming decade.

4. NEEDS AND GAP ANALYSIS

An important component of the Statewide Strategic Transit Assessment was the identification of needs for transit service and gaps in the current transit network. The focus of the study was on bus services rather than demand response transportation, but throughout the process, the role of demand response service in augmenting the coverage of bus routes was recognized.

Information about needs was gathered and compiled through several means. The first effort was a series of meetings with each of the regional planning commissions in New Hampshire to gather information from prior studies and to discuss the needs that RPC staff and other local stakeholders were aware of. The next phase of the analysis was to examine demographic data, primarily from the US Census, to identify areas that had indicators of transit need but no current bus service. Population forecasts were also considered to predict where need would increase over the coming decades. Finally, commuting data were analyzed to identify the most important commuting corridors in the state that had no transit options available.

All of the data inputs were considered for three primary types of transit service:

- Local bus routes
- Regional commuter routes
- Intercity bus routes

The results of each portion of the needs and gaps analysis is presented below and a summary of the identified needs is presented at the end of this chapter.

RPC Outreach

During the summer and fall of 2017, the project team conducted a series of meetings with each of the regional planning commissions in New Hampshire. These meetings were attended by the project manager, and usually another member of the team along with a representative from New Hampshire DOT. In addition to the transportation planner and often the executive director from each RPC, most meetings included representatives from the local transit agency and other organizations involved in demand response transportation. Appendix C contains a memorandum providing more details of the process and notes from each individual meeting.

Needs

In each region of New Hampshire, the transit agency and other organizations providing public transportation service all work to meet the needs of their community with limited resources. No agency feels that it has sufficient resources to address the needs it knows about, much less expand its role in the community so that it can serve as an attractive mobility option for all people. Common themes expressed by the regions included the following:

- **Local fixed route/deviated fixed route service**
  - Longer hours needed on weekday evenings
  - More service/some service needed on Saturdays and Sundays
  - Higher frequency of service would be of benefit to existing riders and help to attract new ones
  - Many towns have no service at all; need connections to nearby cities, shopping, and medical facilities
- **Regional service**
  - Commuter connections needed from towns 10-40 miles from major employment centers, such

as Manchester, Concord, and Lebanon/Hanover
    - Better intra-state connections needed for other occasional trips, such as medical, court-related, social/recreational
    - East-west connections needed to cities and universities, plus Manchester airport
- **Intercity service**
    - Portions of the state have little or no access to the intercity network
    - North-south connections along the east side of the state—to Dover/Durham—are poor or non-existent
    - Access to intercity service at Portsmouth difficult because of lack of parking capacity
    - Current intercity service not well suited to intra-state travel, especially on I-89 corridor

Demand Response Service

Although the focus of the SSTA is on bus services in New Hampshire, demand response service forms an integral part of the public transportation system. In rural areas, demand response may be the only form of transit available, but it plays a major role in urbanized areas as well. Every RPC meeting included at least one representative from an organization involved with demand response service, many of which are non-profit or volunteer-driven agencies.

A common theme across all regions was the difficulty in finding enough volunteer drivers to satisfy the demand for trips. All regions are forced to prioritize medical trips, and even though there are not enough resources to meet all of that demand, the providers recognize the lack of service to address their clients' other needs, such as for shopping and occasional social interactions and entertainment.

Most regions make efforts at coordinating rides, but they all recognize the challenges in doing so, including dealing with restrictions associated with siloed funding, the need to provide individual rides for some clients, and the high degree of communication necessary to achieve coordination. Many programs prefer to have transportation services tailored to their constituents, rather than sharing resources with other programs.

Demand response service is not yet available in all New Hampshire communities. In some regions, the transit provider covers a whole county or several counties, but in other regions, service is more of a patchwork, with several organizations and town-based services combining to offer partial coverage.

Scheduling and dispatch varies across the state. In some regions it is centrally organized by the transit provider. In the southwest region, there is an innovative online tool called Triplist that allows volunteer drivers to choose which trips they will operate. In the southeast region, the Alliance for Community Transportation (ACT) provides a highly-coordinated demand response service supported by 21 member organizations as well as NH Department of Transportation and NH Department of Health and Human Services. ACT operates a centralized call center called TripLink that serves the 38 cities and towns in the region and takes trip requests for six separate programs including the following:

- COAST's ADA paratransit service
- COAST's Route 7 On Demand service
- Portsmouth Senior Transportation
- Community Rides
- Ready Rides
- Rockingham Nutrition and Meals on Wheels.

Park & Ride

All of the meetings devoted part of the time to discussing existing and potential park & ride lots in the region. The Park & Ride Report, presented as Appendix D and summarized in Chapter 6, presents these findings in more detail, but most regions expressed a need for additional park and ride capacity and new lots in strategic locations. The most significant capacity issue occurs at the Portsmouth bus terminal where most of the C&J Bus Lines service originates. Several regions cited difficulties in siting and constructing new lots because of local opposition or ownership issues.

Demographic Analysis

The demographic analysis conducted for the SSTA consisted of an extensive analysis of existing conditions using data available from the US Census. As described below, the density of population and employment was calculated and mapped to identify areas that may be suitable for bus service, and characteristics of the population that are associated with a greater need for public transit were combined in a transit propensity index. Forecasts of population growth at the town level were then used to project need into the future.

Existing Demand

Prior to the compilation and analysis of demographic data for New Hampshire, the state was divided into six analysis regions. The boundaries of these regions coincide with the RPC region boundaries as they existed in 2018, though five regions in the southeastern portion of the state were merged to form two larger analysis regions. Specifically, the Central New Hampshire, Southern New Hampshire and Nashua regions were combined into the "Central Corridor" and the Rockingham and Strafford regions were combined into the "Coastal Region." The resulting regions are shown below in Figure 1.

For each of these regions, a series of three maps were produced:

1. Population density – people per square mile
2. Transit propensity – index based on four characteristics (described directly below)
3. Employment density – jobs per square mile

The population and employment density calculations are straightforward, but the transit propensity index requires more explanation. The four demographic characteristics used were as follows:

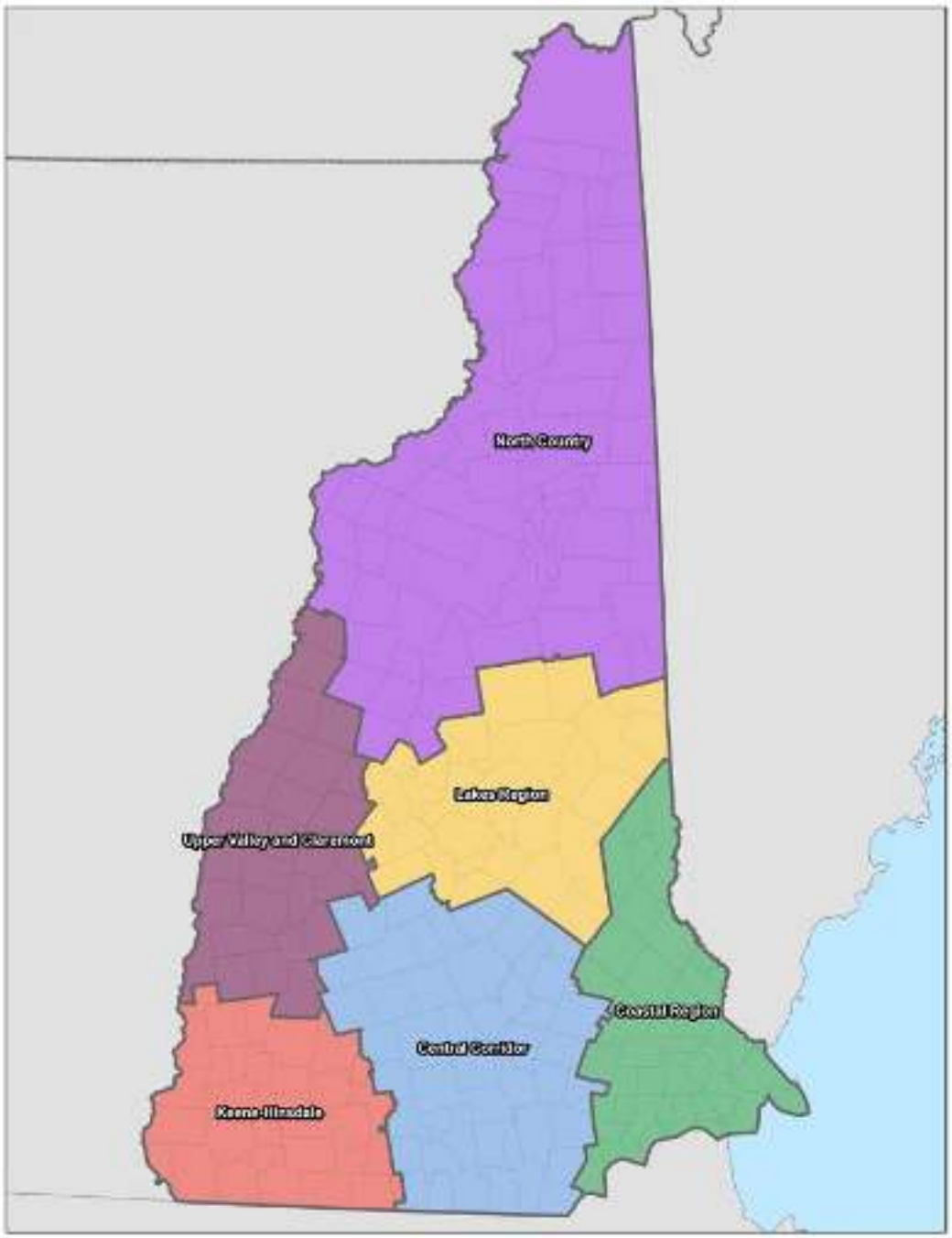
- Population over the age of 80
- People with a disability
- People below the poverty line
- Households with zero cars available

Rather than using the more typical age of 65 to distinguish older adults from the rest of the population, age 80 was used in this analysis. Surveys and anecdotal evidence suggest that most people continue to drive well into their 70s and even 80s until vision and reflexes begin to diminish enough to make driving unsafe. There is no clear demarcation age when people are more likely to stop driving, but there is evidence that that age is closer to 80 than it is to 65. It is also the case that the over-80 cohort will be the fastest growing cohort in the next 10-20 years.

The propensity index was a combination of these four characteristics, comparing the percentage of residents having each characteristic in that block group to the statewide average. A statewide map of transit propensity is shown in the section below on intercity bus analysis.

All of the regional maps and a more detailed explanation of the calculation of the transit propensity index are contained in Appendix E.

Figure 1 Demographic Analysis Regions



Forecast Demand

New Hampshire's Office of Strategic Initiatives produces population forecasts at the county level and then allocates that population to the cities and towns based on past trends. Although forecasts are available at 5-year intervals out to the year 2040, the SSTA considered just the forecast for the year 2030, approximately 10 years out from the present.

The maps below show the projected change in population, first in percentage terms and then in absolute terms. The blue shading in Figure 2 indicates a loss in population, while red shading indicates an increase in population. Grey shading indicates relative stability. According to the forecast, the North Country is

projected to lose residents, while the inland towns in the southeast corner of the state and a cluster of towns in eastern Grafton County (the towns south of Littleton) are projected to grow most quickly. These locations represented relatively undeveloped areas at the fringes of the Boston metro area and the Upper Valley region, respectively. The southeastern towns are, of course, also "suburbs" of Manchester, Nashua, Portsmouth and Concord, the largest job centers in New Hampshire. The southwestern portion of the state shows relative stability from the Massachusetts border through Keene and north toward Lebanon.

Figure 3 tells a slightly different story. While the areas referred to above will be growing most quickly, they are currently sparsely populated, so the absolute number of additional residents there will be small. In contrast, the places in New Hampshire with the greatest absolute numbers of additional residents will be the largest cities: Manchester, Nashua, and Concord, as well as Durham and a cluster of towns on the Maine border northwest of Portsmouth. Other than the Upper Valley and Laconia, all of the significant growth in population is in the southeast corner of the state. The losses in population in the North Country, while significant in percentage terms, are not large in absolute terms. Most of the central portion of the state is projected to attract new residents in the low hundreds in each town, while the southwest corner shows the same stability seen in the percentage change map.

Existing local bus routes are shown on both maps as thin green lines. It can be seen that few of the fastest growing towns show in Figure 2 have any bus service available, while the great majority of the cities and towns with large increases in population in Figure 3 do have existing bus service. The exceptions include Laconia, Franklin and Milford.

It is unlikely that the increase in population in presently rural areas will be significant enough to warrant bus service in the foreseeable future. To the extent that the population growth occurs in town and village centers, rather than being spread throughout the town, it will be easier to serve by future bus routes. The thousands of new residents forecast to live in the largest cities will help to justify increases in the level of service on existing systems and increase ridership on those routes as well.

Figure 2 Population Forecast 2030 by Percentage

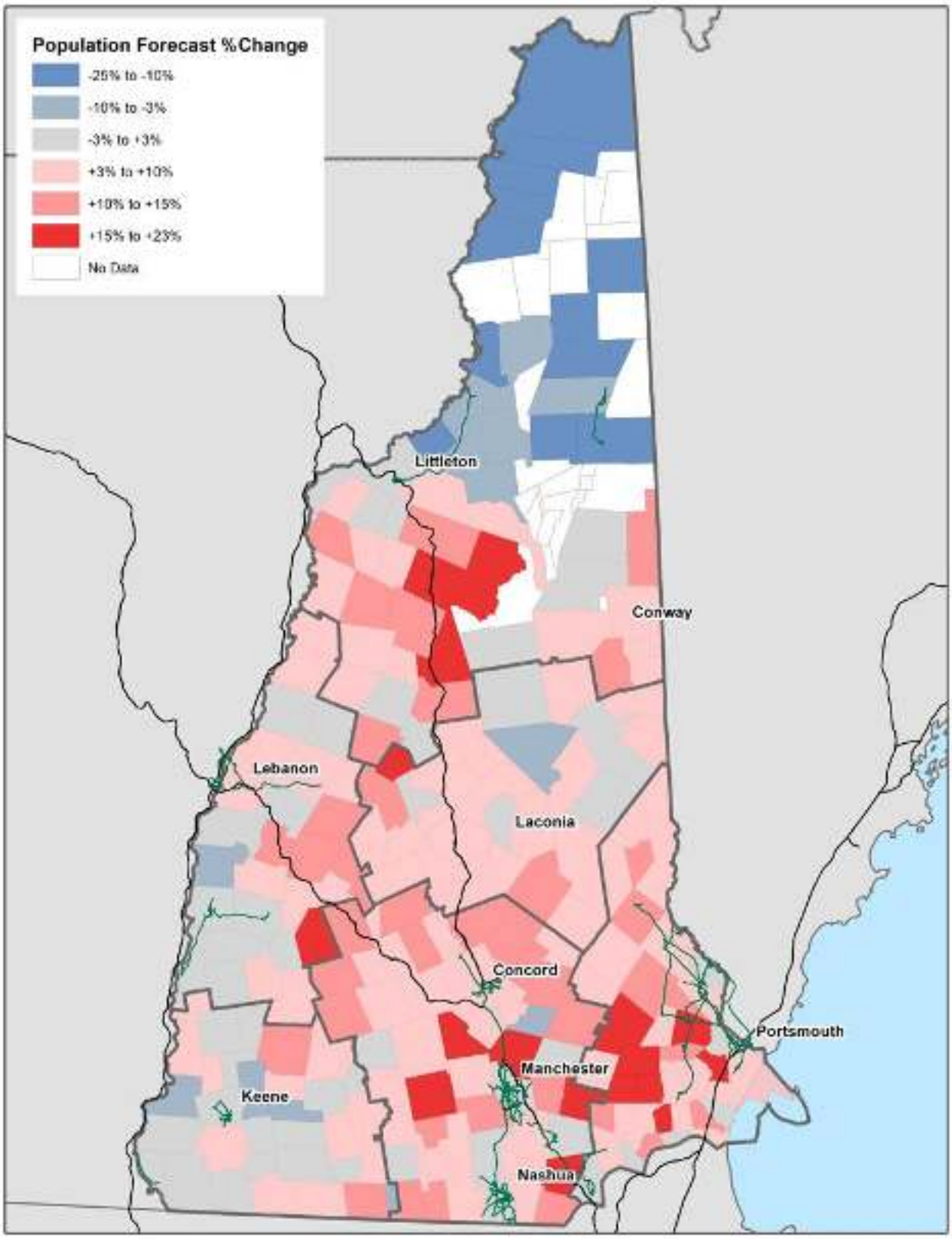
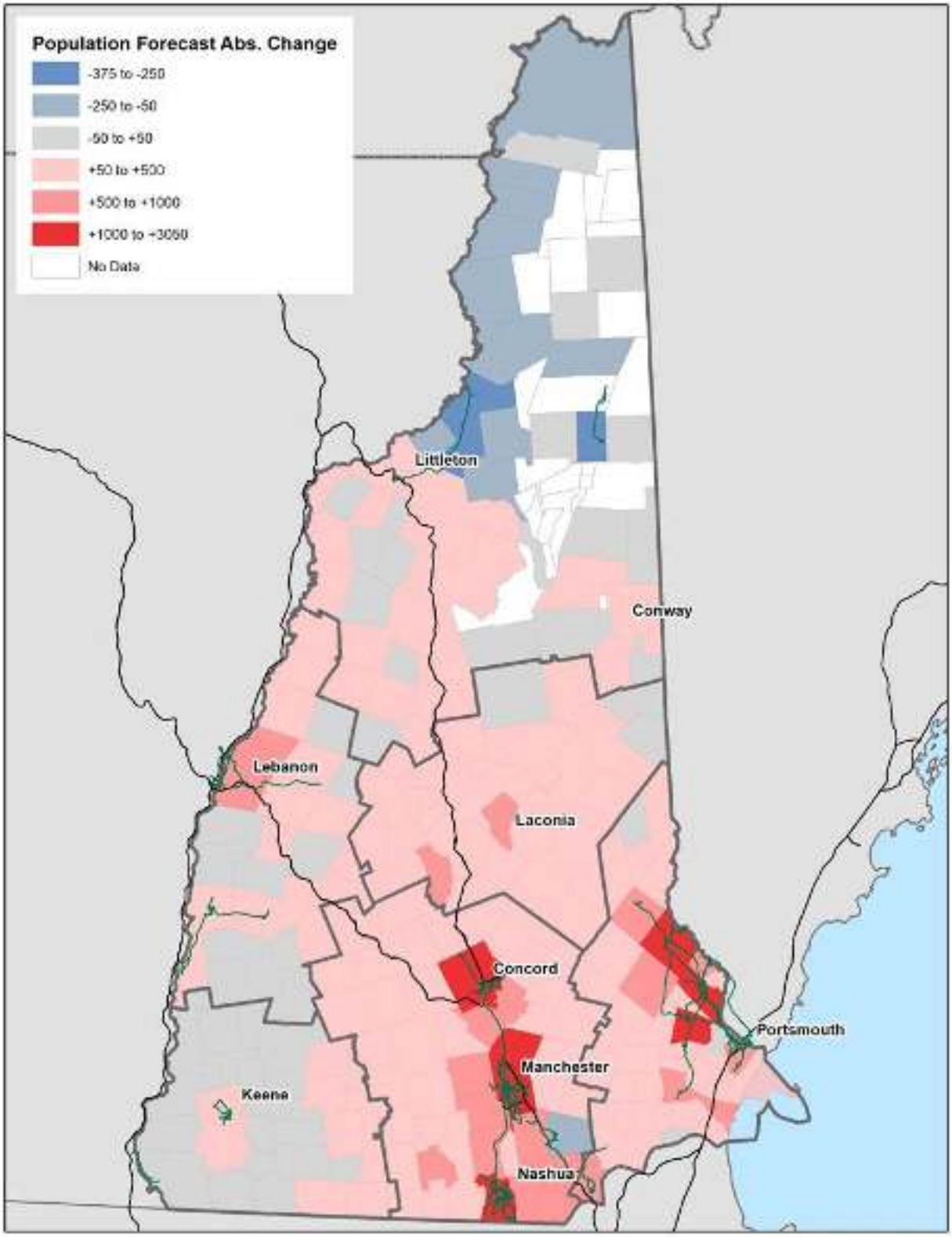


Figure 3 Population Forecast 2030 by Absolute Change



Commuting Analysis

In general, public transit routes tend to be designed around the commuting market, as workers making five round-trips from home to their job every week form the core of the ridership on most bus services. Of course, there are many other reasons that people ride buses, and many workers do not make daily trips to a workplace during "rush hour," but the traditional commuter nonetheless plays a very important role in bus route planning.

In addition to the demographic analysis described above, the SSTA included an analysis of commuting patterns in New Hampshire. Using data from the US Census, the 16 largest employment centers in the state were identified, all with 4,000 or more jobs. The six largest have more than 15,000 jobs. The job centers and their 2015 employment totals are shown in Table 2 below. Note that for the largest job centers and many of the smaller ones as well, the "employment zone" is a specific area within a city or town or an area spanning portions of adjacent towns, rather than a municipality as a whole.

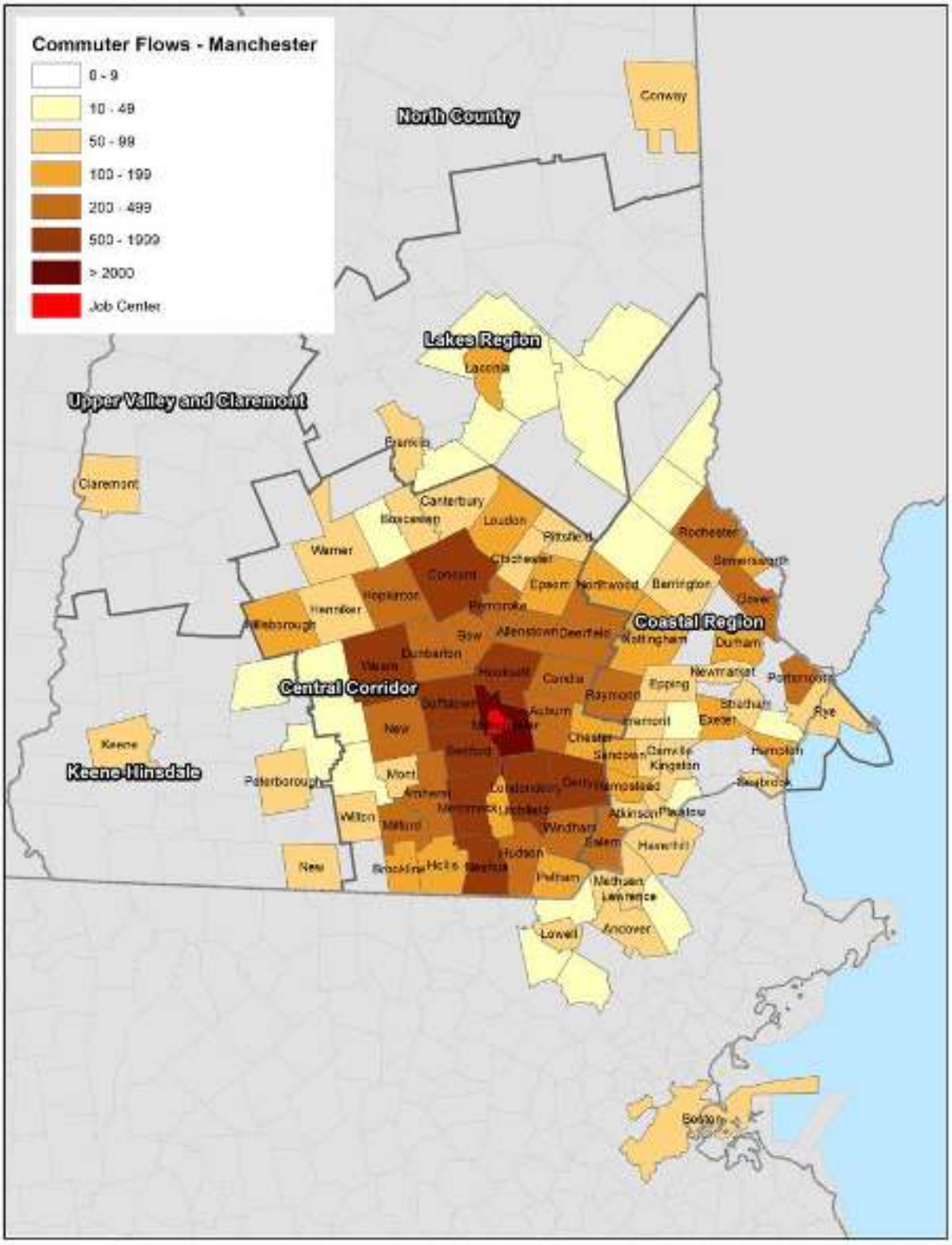
Table 2 New Hampshire Employment Centers

Employment Center	Jobs (2015)
Downtown Manchester	37,860
Downtown Concord	35,677
Upper Valley (Hanover-Lebanon-WRJ)	29,984
City of Keene	18,158
Downtown Nashua	17,201
Downtown Salem	16,920
Derry-Londonderry NH 102 Corridor	11,810
Town of Laconia	9,238
Town of Conway	7,282
Franklin-Tilton US 3 Corridor	6,224
Downtown Dover	6,222
Downtown Portsmouth/Shipyard	6,076
Town of Claremont	5,277
Downtown Durham	5,191
Town of Littleton	4,419
Town of Plymouth	4,099

Appendix F includes maps for each of these employment centers showing both the definition of the employment center and the number of people commuting to that employment center by municipality. An example for Downtown Manchester is shown below in Figure 4. Note that not every community sending workers to Manchester is shown on the map, but all of the ones sending significant numbers (more than 30) are displayed.[1]

[1] All of the commuting maps show the top 100 towns sending commuters to the employment center. For the larger employment centers, there are a number of towns with more than 10 commuters that are not shown, in spite of the indication in the legend.

Figure 4 Commuters to Downtown Manchester (2015)



Intercity Analysis

Within the context of the SSTA, the analysis of intercity travel proceeded separately from the rest of the study, since it was part of a prescribed consultation process as required in federal regulations. The analysis of needs was conducted in Spring 2018, leading up to the first meeting of the consultation process in June 2018. At that meeting, the project team presented a draft policy on intercity bus funding (see Chapter 2), existing conditions for rural intercity service, and a needs analysis.

The two most important components of the needs analysis were the tabulation of the transit propensity index (described above) and a listing of colleges and universities in New Hampshire, since college-age students generally form an important part of the intercity bus travel market. The statewide map of transit propensity is shown below in Figure 5. This map also shows existing intercity bus routes, overlaid in blue lines.

There are several block groups in New Hampshire with high or very high transit propensity that do not have easy access to an intercity bus route, including the following:

- Laconia
- Claremont
- Franklin
- Boscawen
- Rochester
- Farmington
- Exeter
- Raymond

In addition, while Keene has a daily intercity bus connection to Brattleboro and White River Junction, the connection to Nashua and Boston runs only on Fridays and Sundays.

Figure 6 shows the location of colleges and universities in New Hampshire, with the size of the circle indicating the number of students enrolled. Many of these campuses are already served by intercity bus routes, including all of the largest ones. Others have a limited number of residential students, who would be more likely to need intercity bus service than a student who commutes to classes each day. Among the 25 college and university campuses in the state, three were identified as having an unmet need for intercity bus service due to a sizable resident student population:

- Lakes Region Community College (Laconia)
    - Approximately 200 residential students
- Franklin Pierce University (Rindge)
    - Approximately 1,000 residential students without cars
- New England College (Henniker)
    - Approximately 500 residential students without cars

While some may argue that it should be up to these institutions to provide access to the intercity network for their students, it is also the case that providing a direct connection via intercity bus would attract more riders, and it is the ridership and associated fare revenue that makes the intercity bus system viable in the long term.

Figure 5 Transit Propensity by Block Group

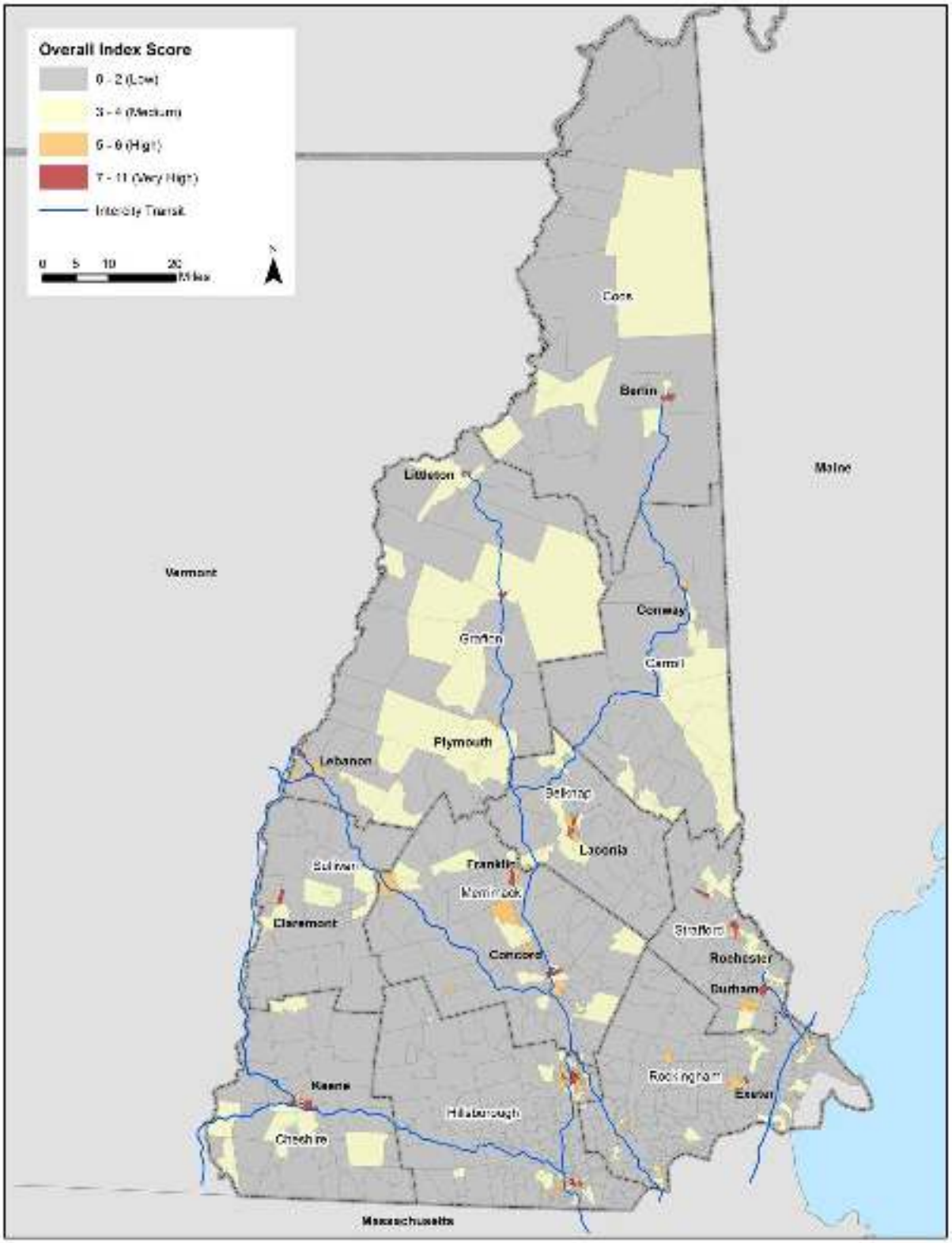
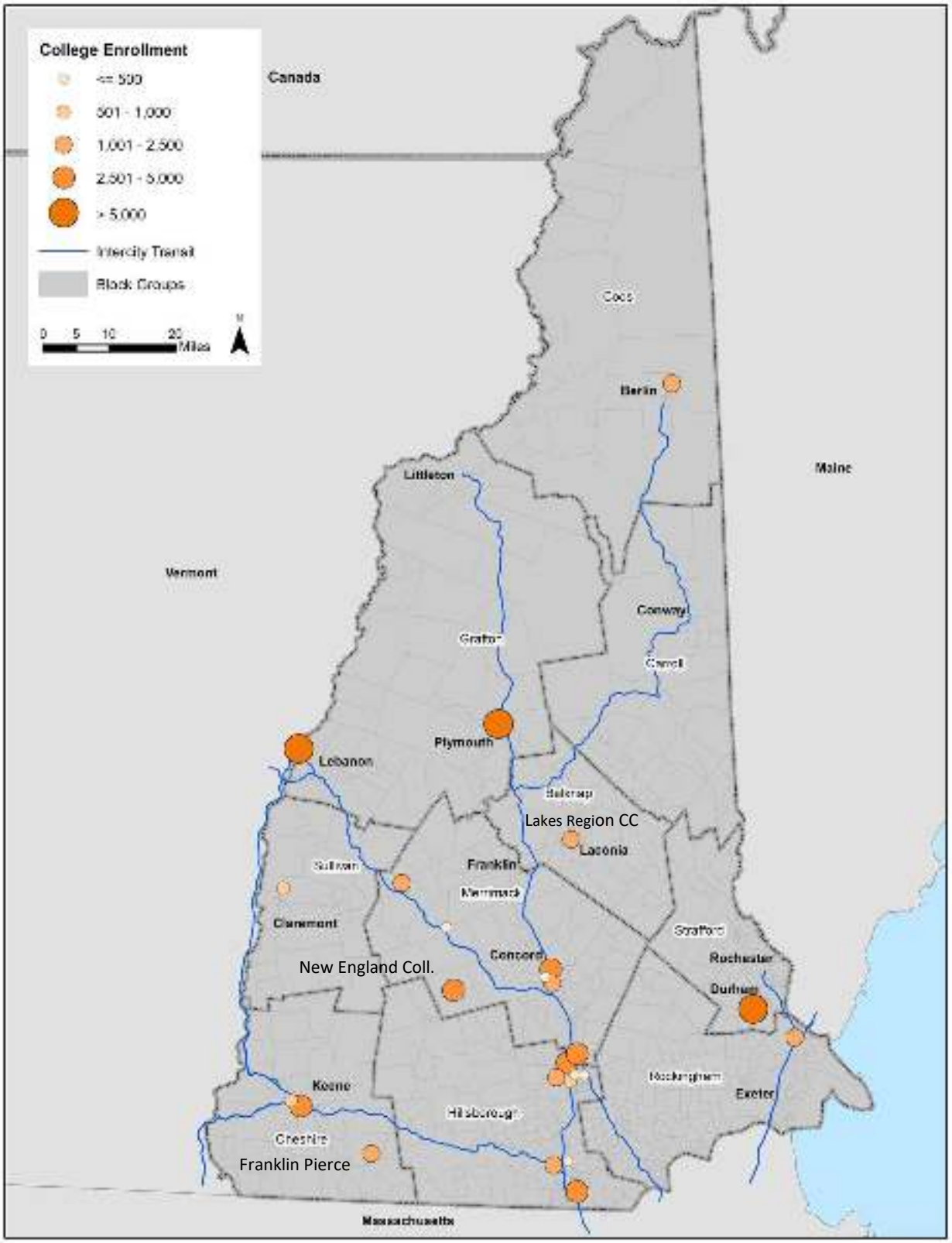


Figure 6 New Hampshire Colleges and Universities



Identified Needs and Gaps

Local

The analysis of residential development patterns and demographics resulted in the identification of the following locations that appeared to have ***significant need for public transit but no existing local bus service***. Note that many of these locations do have access to demand response service, either through transit agency vans or volunteer driver programs.

- North Country
  - Conway/North Conway
  - Plymouth
- Upper Valley/Claremont
  - New London
- Keene/Hinsdale
  - No areas of high need outside of Keene
- Central Corridor
  - Milford
  - Derry
  - Pembroke
  - Allenstown
  - Boscawen
  - Merrimack
- Coastal Region
  - Raymond
  - Hampton
  - Exeter
- Lakes Region
  - Laconia
  - Franklin
  - Tilton

All of these towns and cities had block groups with high or very high transit propensity, as well as moderate to high population and employment density. These indicators taken together suggest that local bus services may be successful in these communities.

It is important to note that some of these communities were served by local bus routes in the recent past. The Winnipesaukee Transit System served Laconia, Tilton, and Franklin until June 2017, and Carroll County Transit served Conway as part of its Blue Loon deviated fixed route. These services were poorly patronized and discontinued by the providers. Part of the reason for their lack of success was that the level of service was very low (only a few trips per day) and that the routes that served these communities were long and circuitous, also serving several other neighboring communities. These characteristics made the routes unattractive for most potential riders.

Commuter/Regional

The result of mapping the commuting patterns for all of the largest job centers was a list of unserved important commuter links. These are shown in Table 3 below.

Table 3 Commuter Linkages

Employment Center	Source Towns
Downtown Manchester	Weare, Goffstown; Portsmouth-Dover-Rochester; Derry-Londonderry
Downtown Concord	Keene, Laconia, Franklin, Rochester-Dover
Upper Valley	Claremont
Downtown Nashua	Milford, Manchester, Lowell
Keene	Manchester, Peterborough, Claremont
Downtown Salem	Nashua, Manchester
City of Laconia	Concord, Franklin
Town of Littleton	Bethlehem, Whitefield, Franconia

It is important to note that these are not the only commuter linkages that are unserved by bus routes, but they appear to have the largest commuting markets and thus offer the best candidates for new commuter bus services.

Intercity

As indicated in the prior section, the analysis of transit propensity and of college and university residential student populations identified several locations with an unmet need for intercity bus service. These locations include the following:

- Laconia (transit propensity and Lakes Region Community College)
- Claremont (propensity)
- Franklin/Boscawen (propensity)
- Rochester/Farmington (propensity)
- Exeter/Raymond (propensity)
- Henniker (New England College)
- Rindge (Franklin Pierce University)

Summary

The needs and gaps identified in this chapter served as the basis for the development of service concepts described in the next chapter. Several communities, most notably Laconia, showed up in more than one component of the analysis: local, commuter and intercity. As will be seen, the appropriate solution is not always a bus route, but investments in new services are well supported by the data and outreach to RPCs conducted in this phase of the SSTA.

5. SERVICE CONCEPTS

While the Statewide Strategic Transit Assessment is not intended to be a service planning study, the scope did include the development of specific service concepts to address gaps identified during the study. For local routes, only areas that had no existing bus service were considered, while for commuter and intercity routes, the only connections considered were those that had no current transit options. The SSTA did not include an assessment of unmet needs within the service areas of existing transit systems nor propose any changes to existing bus routes.

For all of the routes proposed in this chapter, no specific operator is assumed. The routes could be operated by existing transit providers, by the municipalities served, or by a private entity under contract to the State or a regional or local entity. For the purpose of estimating costs, a constant $75 per vehicle revenue hour rate was assumed for all local services. No assumptions were made about fare levels. Among the local routes, unless otherwise specified, it was assumed that the route would operate as a deviated fixed route with a ¼ mile buffer so that ADA complementary paratransit service would not be necessary. Commuter express and intercity routes are exempt from paratransit requirements.

For most proposed routes, a standard level of service is proposed here. Local routes would operate from 6:00 a.m. to 7:00 p.m. Monday through Friday, and commuter routes would operate two morning and two afternoon round trips. If any of these routes is selected for implementation, a closer study of the local market would be worthwhile, with the level of service tailored to the local demand.

Local Routes

Seven new local routes are proposed to serve communities identified in the previous chapter as needing public transit service. Not every community listed two pages prior received a recommendation for a new bus route. Those that did not include the following:

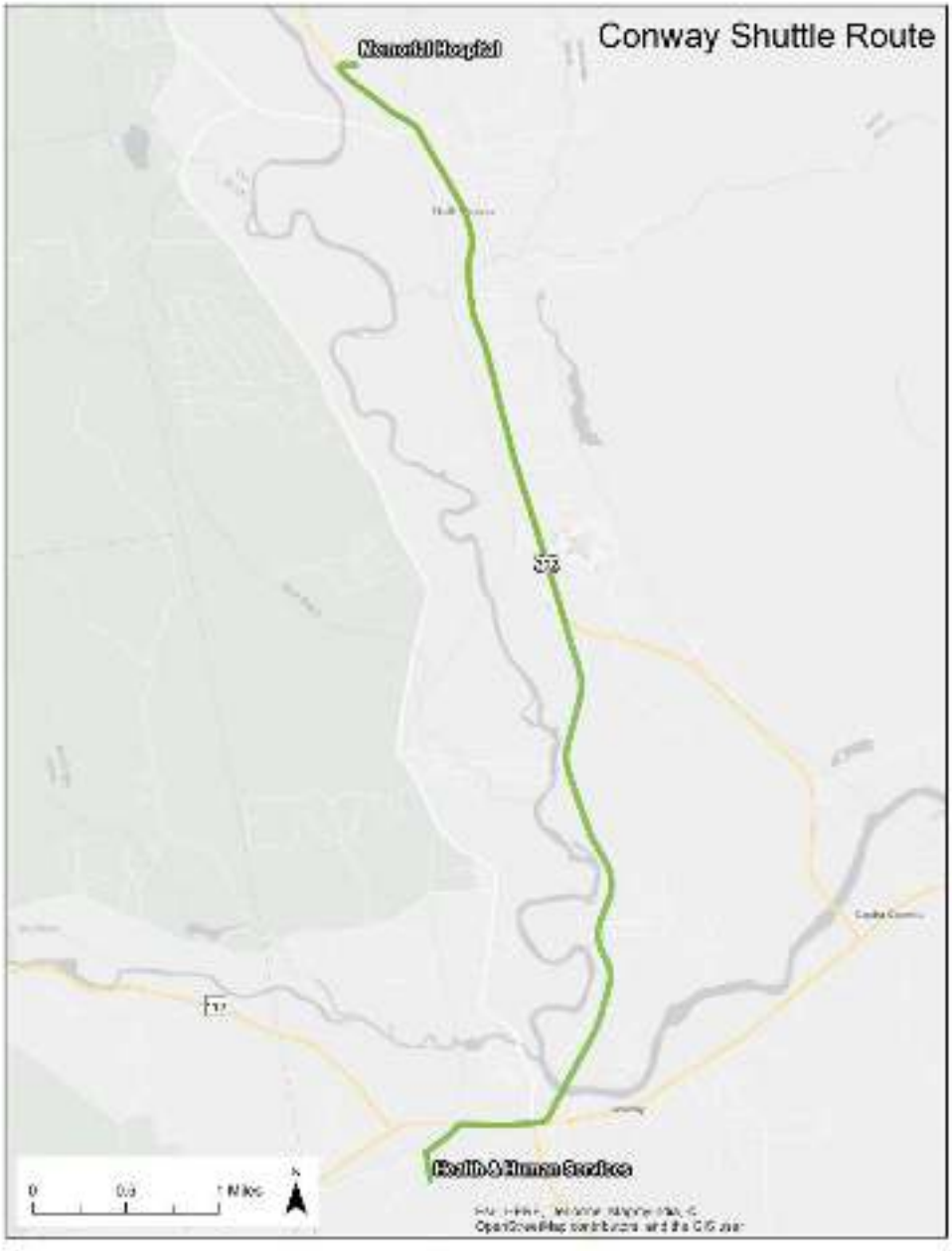
- New London – much of the need is based on the student population at Colby-Sawyer College and these students have access to the intercity network through the Dartmouth Coach stop at the New London Park & Ride.
- Derry – the suburban-style development in Derry does not lend itself to traditional bus routes. A commuter connection to Manchester and local microtransit service[2] would be more appropriate.
- Boscawen – most demand originating in Boscawen is oriented to Concord; thus the most efficient service would be an extension of the CAT Penacook route. Boscawen is also proposed to be served as part of the intercity route from Laconia.
- Merrimack – like Derry, Merrimack has suburban-style development that cannot be served well by a bus route. A commuter service or microtransit would be more appropriate.
- Raymond – in spite of a higher-than-average incidence of poverty, there are few households that do not have vehicles available. There is no obvious corridor or destination for a local bus route.
- Hampton – suburban-style development and an orientation to Boston commuting make Hampton inappropriate for local bus service. It is not close to any existing COAST routes. Microtransit service connecting to commercial areas on US 1 has some potential.

[2] Microtransit is a technology-enabled demand response service that is similar to ridehailing services operated by Uber and Lyft but operates as a shared ride service within a specific service zone. See https://www.apta.com/research-technical-resources/mobility-innovation-hub/microtransit/ for more information.

Conway Service

During the summer tourist season, Conway experiences high levels of traffic congestion. Areas of moderate population density and high transit need at the north end of town indicate the potential for ridership on a fixed route service operating on US 302 and NH 16 (see Figure 7). This route would serve low-income residents seeking to reach jobs at the many retail outlets on the corridor as well as Memorial Hospital and Health & Human Services. It is possible that tourists who do not want to drive in traffic may find the shuttle attractive. Deviations to reach nearby trailheads should also be considered at certain times of day.

Figure 7 Proposed Conway Shuttle



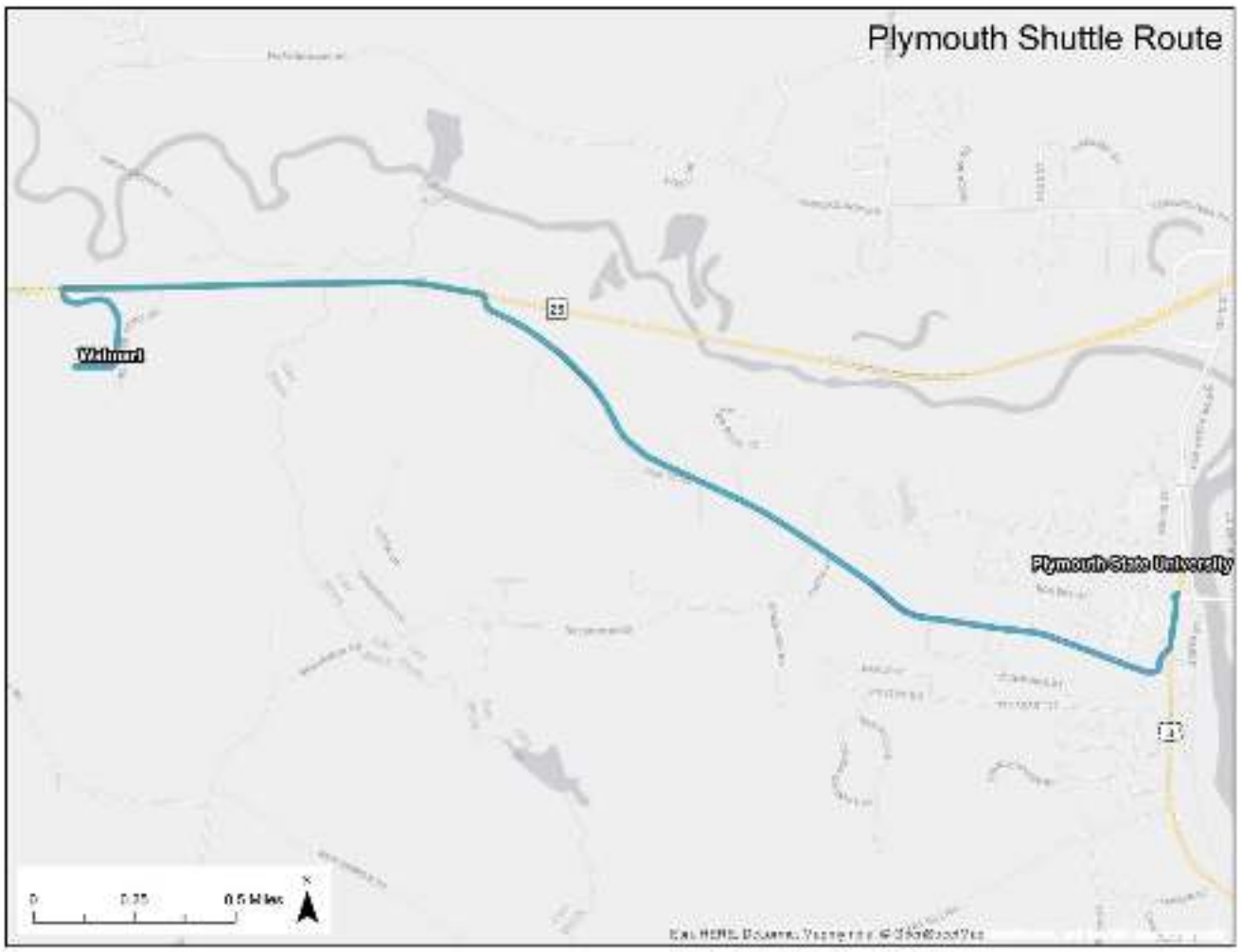
It is recommended that this route operate only from Memorial Day weekend through Labor Day (about 100 service days). During peak demand times, two buses would operate at a 30-minute headway and at off-peak times, one bus would operate at a 60-minute headway. It would operate daily from 6:00 a.m. to 10:00 p.m.

The total annual gross operating cost would be $150,000. If the route proves productive, it could be expanded to full-year service, but likely with only one bus operating during peak periods.

Plymouth Service

The center of Plymouth features moderately dense housing and a large number of Plymouth State University students. PSU already operates several student shuttles, but there is very limited service to the shopping available on the NH 25 corridor. It is proposed to operate a weekday shuttle in cooperation with PSU that connects the Town Common to Walmart, as shown in Figure 8.

Figure 8 Proposed Plymouth Shuttle



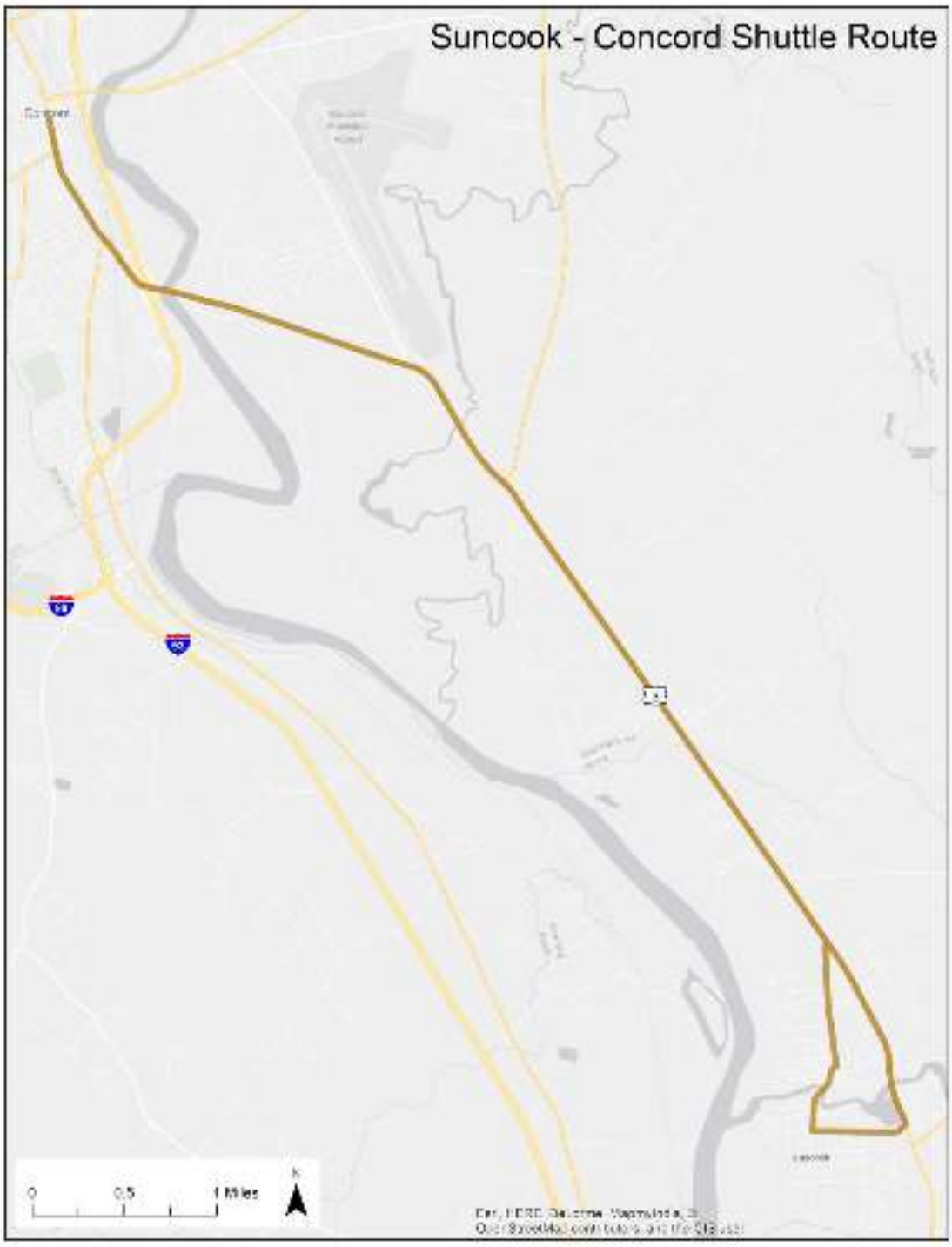
The route would operate with one bus in service running a round-trip every 40 minutes. The service would operate 6:00 a.m. to 7:00 p.m. weekdays only, with a total annual gross operating cost of $250,000.

Suncook Service

The Suncook neighborhood, which covers a portion of Pembroke and Allenstown, has dense residential development and a need for transit access. The shuttle proposed here would connect Suncook to downtown Concord via US 3 (see Figure 9). The Concord-Manchester Transit Feasibility Study from February 2014 recommended a local route from Concord to Manchester through Suncook, offering links to both large

cities. Although such a route would be more expensive to operate due to its length, it would have the benefit of providing access both north and south.

Figure 9 Proposed Suncook Service

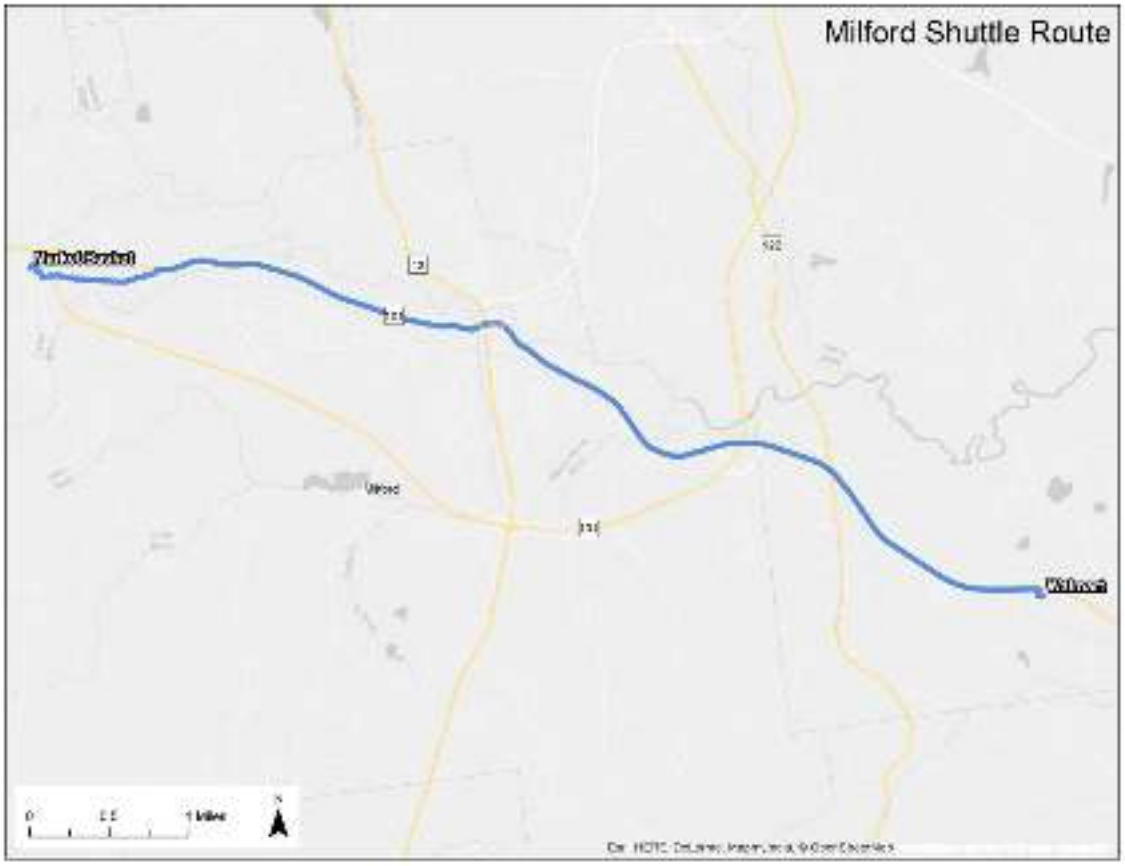


This short shuttle shown above would operate once per hour from 6:00 a.m. to 7:00 p.m. on weekdays only. The estimated total annual gross operating cost would be $250,000. If the long shuttle were operated with the same level of service, the operating cost would be at least twice as much.

Milford Service

The Nashua Transit System operates a route from downtown Nashua to the Walmart in Amherst on NH 101A. This route operates only Tuesdays, Fridays, and Saturdays. It is proposed that a fixed route be operated from the Market Basket in the western part of Milford through the center of Milford terminating at the Walmart in Amherst (see Figure 10). The route would be timed to meet the NTS route to offer convenient transfers into Nashua. This route could be considered an extension of the NTS route 10/10A, or it could be operated as a separate and connecting service. Note that Route 10 only runs as far as Westside Plaza in Nashua; another transfer to Route 2/2A would be necessary to get to downtown Nashua. Route 10A, which operates Tuesday and Friday evenings and all day on Saturday offers a one-seat ride to the center of Nashua. Ideally there would be a one-seat ride from Milford to downtown Nashua at all times, but that would be a very long route; the market first needs to demonstrate its viability with this limited service.

Figure 10 Proposed Milford Shuttle



Coordinated with the NTS 10/10A schedule, this route would operate from 9:00 a.m. to 6:00 p.m. on an hourly basis on Tuesdays, Fridays and Saturdays. The estimated total annual gross operating cost would be $105,000. Because of the length of this route, it could not operate as a deviated fixed route and still make reliable connections. ADA complementary paratransit service would need to be supplied, possibly using existing resources available at NTS's partner agency, SVTC.

Exeter Service

As of July 2018, COAST converted its prior bus route in Exeter to a fully demand-response service. An advance reservation is needed for all rides, though the route still has designated stops along its former

alignment and a ¾ mile buffer around that alignment. This demand-response service operates Monday, Wednesday, Thursday and Saturday from 9:30 a.m. to 5:15 p.m. and also serves Stratham and Newmarket.

This study proposes a deviated fixed route service focused on Exeter, with an alignment similar to that operated previously by COAST. As shown in Figure 11, the route would originate at the Exeter River Manufactured Home Park, serve downtown Exeter and the hospital before serving Hannaford and terminating at Market Basket.

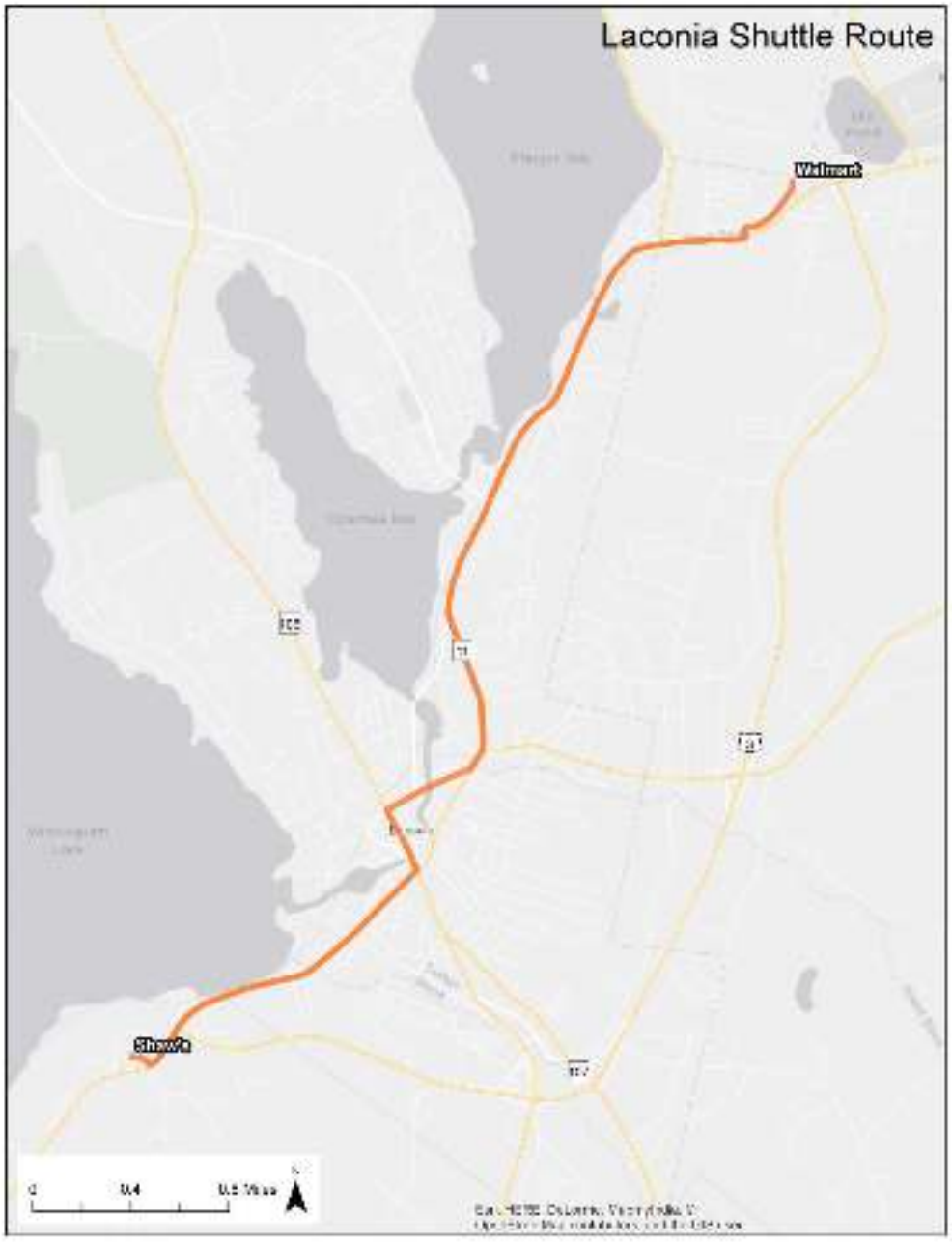
Figure 11 Proposed Exeter Shuttle

This route would operate one round-trip per hour from 6:00 a.m. through 7:00 p.m. on weekdays. The total annual gross operating cost would be $250,000.

Laconia Service

As noted earlier, Laconia had been served by the former Winnipesaukee Transit System until July 2017. The service level had been poor, however, with only four trips per day and alternating trips extended to Tilton and Franklin. The proposal in this study is for a focused service on Laconia with a higher level of service and a simpler and more direct alignment, as shown in Figure 12. The route would begin at the Shaw's in Belmont, serve downtown Laconia and then travel north to the Walmart in Gilford.

Figure 12 Proposed Laconia Shuttle



As with most of the other proposed local routes, it would operate one round-trip per hour from 6:00 a.m. to 7:00 p.m. on weekdays. It is intended to serve people commuting within Laconia as well as midday shopping trips and other errands. The total annual gross operating cost would be $250,000.

Franklin-Tilton Service

The proposed service in Franklin and Tilton restores another portion of the Winnipesaukee Transit System, but again in a more focused and direct way, and with a higher level of service. As shown in Figure 13, the route would have a small loop in downtown Franklin and then operate on US 3 to the Walmart and Market Basket in Tilton to the west of I-93. There is possible demand to the rest of the retail area in Tilton on the east side of I-93, but extending the route there may preclude operating it with one vehicle on a 60-minute cycle.

Figure 13 Proposed Franklin-Tilton Shuttle

As with other local routes, this one would operate one round-trip per hour from 6:00 a.m. to 7:00 p.m. on weekdays. It is intended to serve people commuting within Franklin and Tilton as well as midday shopping trips and other errands. The total annual gross operating cost would be $250,000.

Summary of Local Service

Table 4 below provides a summary of the operating statistics and estimated cost for each of the proposed local routes. As stated earlier, the costs are based on a simple $75 per revenue hour cost formula and do not assume any particular operator. Capital costs for operating these routes are not included.

Table 4 Summary of Local Service

Route	Headway	Days of Service	Annual Rev. Hrs	Annual Gross Cost	Urban/Rural
Conway	30/60	100	2,000	$150,000	Rural
Plymouth	40	255	3,315	$250,000	Rural
Suncook	60	255	3,315	$250,000	Urban
Milford	60	156	1,400	$105,000	Urban
Exeter	60	255	3,315	$250,000	Urban
Laconia	60	255	3,315	$250,000	Rural
Franklin/Tilton	60	255	3,315	$250,000	Rural
TOTAL				$1,505,000	

Public Input on Recommendations

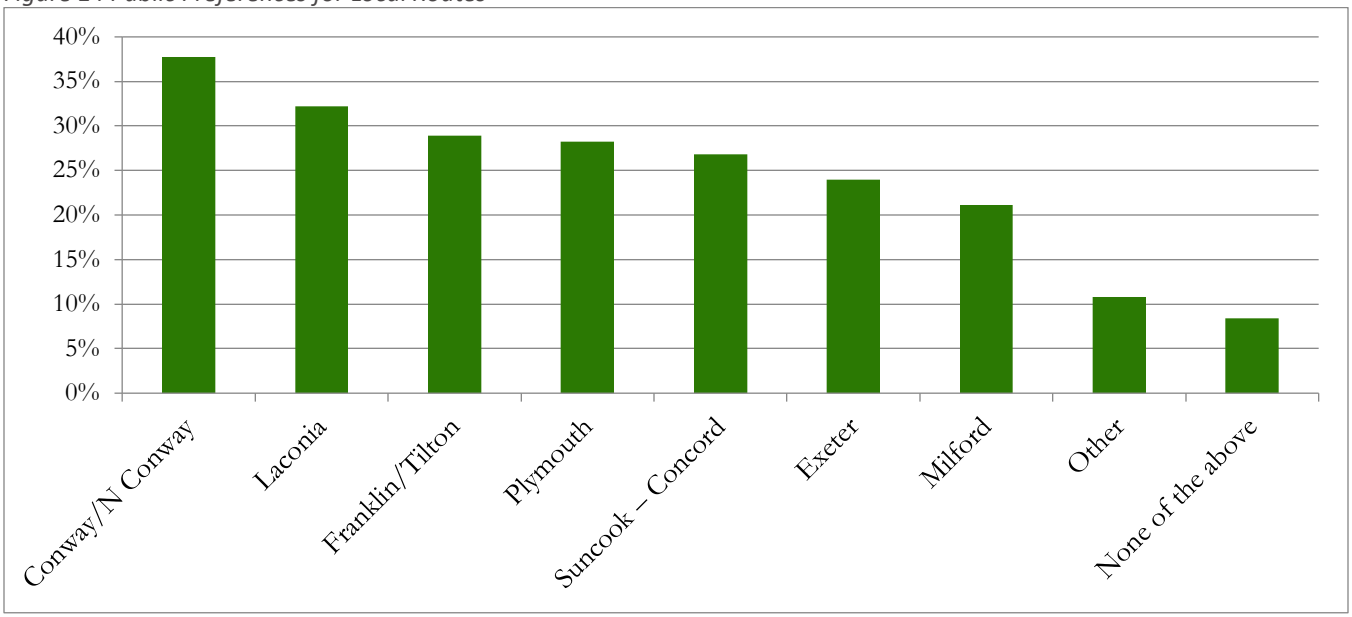
As part of general public outreach on the results of the SSTA, the study team asked New Hampshire residents, through an online survey, their opinions about the merits of the various local service proposals. This survey, conducted in Summer 2019, obtained nearly a thousand responses from a wide cross-section of residents.

Nearly two thirds of respondents said that more bus routes should be operated in parts of the state that currently have no bus service. Only 10% of respondents said service should stay the same or be reduced, and about 23% said that service should be increased on existing routes, rather than introducing new routes in unserved areas.

Respondents were asked to vote for which of the proposed local services should be considered for implementation. It must be noted that the survey was not a statistically valid sample and that preferences for routes likely reflect the number of people from a given region who happened to take the survey. In general, the northern part of New Hampshire was represented more strongly in the survey than the southern portion of the state: three northern planning commission regions (North Country Council, Lakes Region Planning Commission, and Central New Hampshire Regional Planning Commission) together accounted for 425 survey responses, while three southern regions (Southwest Regional Planning Commission, Southern New Hampshire Planning Commission and Rockingham Planning Commission) only accounted for 257 responses, in spite of having many more residents (nearly 550,000 vs. 330,000 for the northern regions).

Recognizing that geographic bias in the results, the proposed services in North Conway, Laconia and Franklin/Tilton were the most popular, while those in Exeter and Milford were less popular. Only 8% of respondents rejected all of the proposed options, and about 11% of respondents suggested other routes, most of which were expansions of service in cities and towns that already had bus service. The results for all of the options are shown in Figure 14 below.

Figure 14 Public Preferences for Local Routes



Priority Rankings of Local Services

Taking into account public preferences, the degree of need established in Chapter 4 and the relative costs of the route, the seven proposed local services are ranked in the following priority tiers:

- Tier 1
  - Conway
  - Laconia
- Tier 2
  - Milford
  - Franklin/Tilton
  - Suncook (to Concord and/or Manchester)
- Tier 3
  - Plymouth
  - Exeter

As additional 5311 funds become available for rural areas, and 5307 or other funds become available for urban areas, NHDOT should consider soliciting the transit agencies and other operators for proposals to implement the top priority routes.

Commuter/Regional Routes

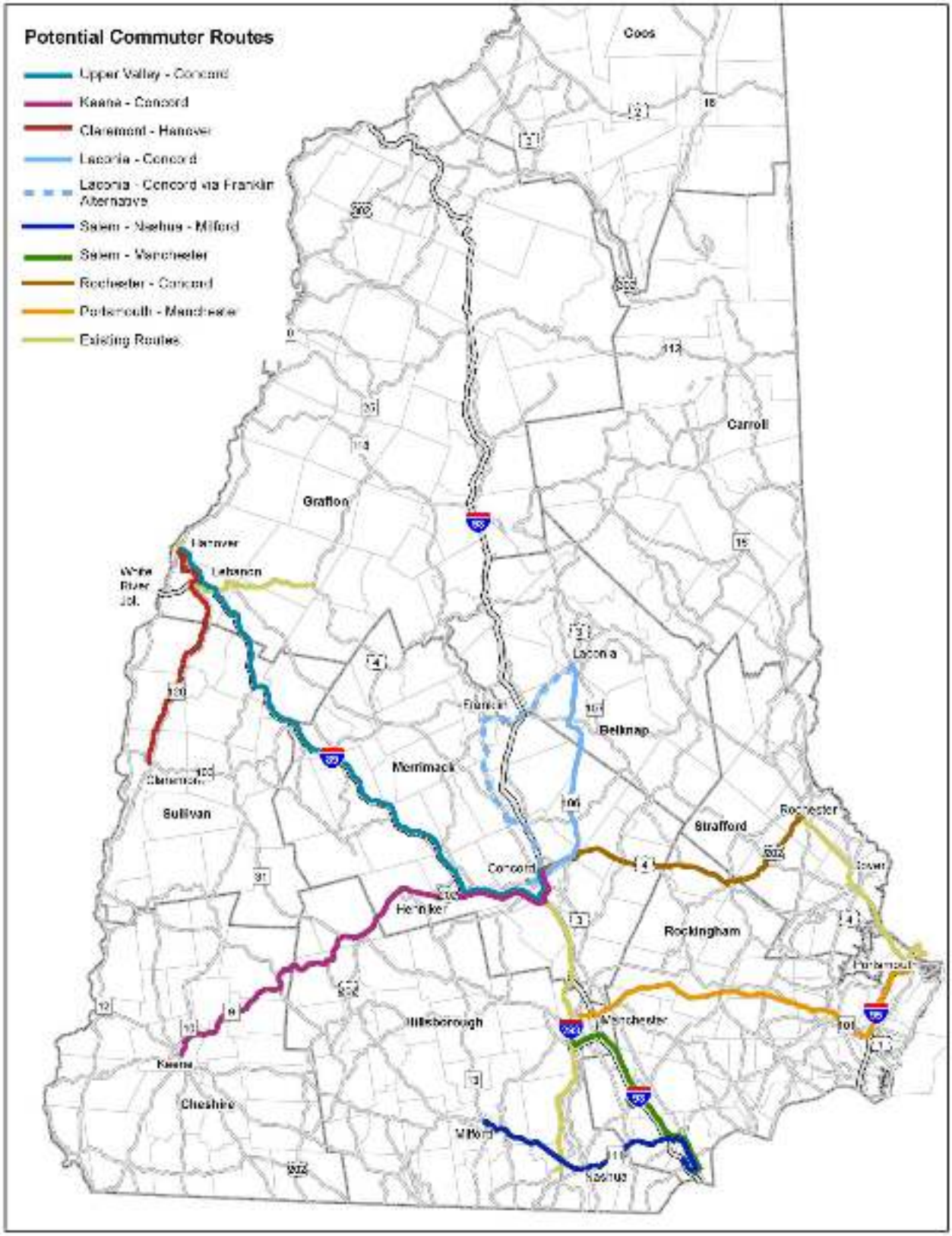
Among the commuting patterns illustrated in Appendix F and the missing links identified in Table 3, the study identified eight potential new commuter routes that should be considered for implementation. It must be noted that the low gasoline prices in effect at the beginning of 2020 make this an inauspicious time to start new commuter services, in spite of the mobility needs of people seeking access to employment. Commuter routes succeed when the cost of driving is high, either because of fuel prices or parking charges, when there are many jobs located near the bus stops at the employment center and there is a walkable environment so that bus passengers feel safe and comfortable getting from the bus stop to the workplace.

As mentioned earlier, the assumed level of service is two round-trips in each peak period. Given the length of the routes, a bus could only complete one round-trip in each peak, and thus two buses would be needed for each route. The estimated operating cost for each route is an average of costs based on $125 per vehicle revenue hour and $4 per vehicle revenue mile. No specific operator is assumed for any route. There are no assumptions regarding fares.

Ridership was estimated for each of the commuter routes based on the size of the commuting markets derived from the 2015 data from the Census Bureau (illustrated in Appendix F). For peak direction travel (toward the primary employment center), it was assumed that the route would capture 4% of the market. For reverse-peak travel and for adjacent communities, it was assumed that the route would capture 1% of the market. These market shares are based on experience with Vermont commuter routes serving similar commuting corridors.

The entire proposed commuter network is show below in Figure 15. Note that no commuter routes are proposed for the northern portion of New Hampshire. The North Country is connected to the southern part of the state by subsidized intercity routes, and there is not enough demand density, especially in an era of inexpensive gasoline, to support more service from sparsely-populated areas in the north to the larger cities in the south.

Figure 15 Proposed Commuter Network



Laconia–Concord Route

There is a significant bi-directional commuting market between Laconia and Concord, with 540 people commuting south to jobs in Concord and 252 people commuting north from Concord to Laconia. Two potential alignments are shown in Figure 16: a direct alignment via NH 106 and an indirect one via Tilton, Franklin and Boscawen. The indirect one would take longer to operate, but it would offer access to hundreds of additional commuters to get to jobs in either Concord or Laconia.

Figure 16 Proposed Laconia–Concord Commuter

The estimated travel time via the direct route is 55 minutes from end to end. In Concord, the route would serve the State offices on Hazen Drive, downtown Concord and Concord Hospital. The annual gross operating cost would be about $234,000 and the route would be forecast to attract 50 daily riders. The gross cost per rider would be roughly $19.

Rochester–Concord Route

The commuting market from the east along US 4 into Concord is surprisingly strong. The Census data show 402 people commuting from Rochester, 496 from Epsom, and 253 from Northwood. The proposed route shown in Figure 17 provides a direct connection from downtown Rochester and Park & Ride lots along the way to downtown Concord and Concord Hospital.

Figure 17 Proposed Rochester–Concord Commuter

The estimated travel time for this route end to end is 75 minutes. The annual gross operating cost would be about $312,000 and the route would be forecast to attract 90 daily riders. The gross cost per rider would be roughly $13.

Portsmouth–Manchester Route

In addition to data showing a strong commuting market from Portsmouth and the NH 101 corridor into downtown Manchester, the University of New Hampshire has been seeking to offer better connections between the main campus in Durham and the campus in Manchester. The East-West Express route that connected Portsmouth to Manchester from November 2013 to July 2016 was oriented more toward airline passengers seeking to fly out of Manchester-Boston Regional Airport than commuters based on the schedule and fares that were charged. The route proposed here and shown in Figure 18 would be specifically oriented to commuters, including the UNH Durham-Manchester market.

Some 203 Portsmouth residents work in downtown Manchester, joined by 146 Hampton residents and 323 in Raymond. This route would serve those markets by originating at Market Square in Portsmouth and making stops at the Portsmouth Transportation Center and Park & Rides in Hampton, Epping and

Raymond. It would serve downtown Manchester to connect with MTA routes at Veterans Park and then terminate at the UNH campus in Manchester.

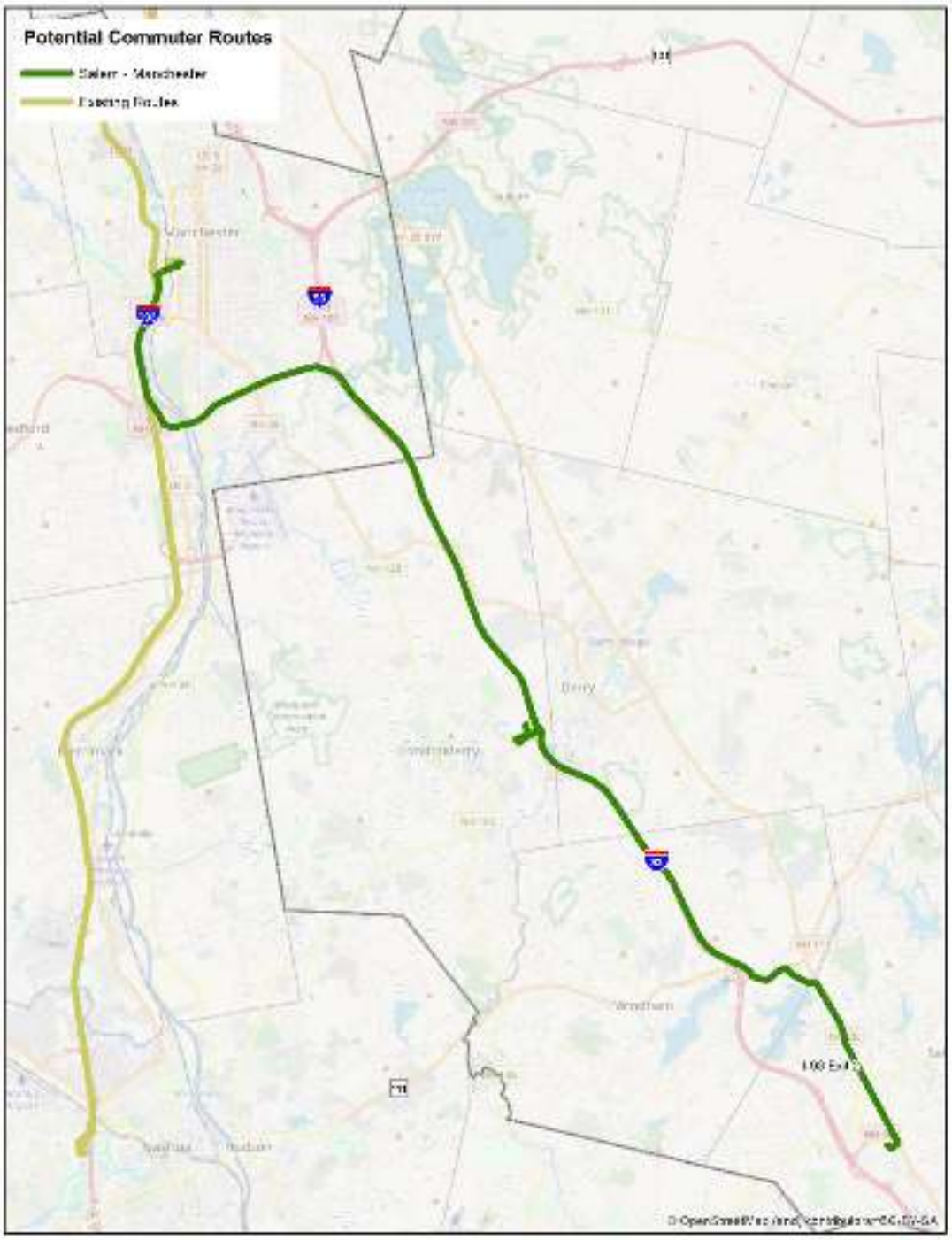
Figure 18 Proposed Portsmouth–Manchester Commuter

UNH students and faculty that wished to use transit to get from Durham to Manchester would need to use Wildcat Transit Route 4 (not shown in the figure) to get into Portsmouth and then transfer to the new commuter route at Market Square. The total mileage end to end is 47 miles and the estimated travel time is 75 minutes. The annual gross operating cost would be about $349,000 and the route is forecast to attract 100 daily riders. The gross cost per rider would be roughly $13.

Salem–Manchester Route via Windham and Londonderry

The commuter route with the greatest potential among those proposed here is a new service connecting Salem to Manchester via I-93 (see Figure 19). It would make two stops between the terminals: at the Exit Park & Ride in Windham and at the Exit 4 Park & Ride in Londonderry. This corridor already has a large commuting market with 367 Salem residents and 1,093 Londonderry residents working in downtown Manchester, but also 503 Londonderry residents and 973 Manchester residents working in Salem.

Figure 19 Proposed Salem–Manchester Commuter



The key to the future success of this route, however, is coordinating its implementation with major new developments in Salem and Londonderry. Tuscan Village in Salem and Woodmont Commons in Londonderry are large mixed-use developments with hundreds of new housing units. If bus service can be available for new residents as they move in, it will be easier to entice them onto the transit network rather than trying to draw them out of cars after they have established a habit of driving to work.

At 26 miles, this is one of the shorter proposed routes, with an estimated end-to-end travel time of 50 minutes. The annual estimated gross operating cost would be $211,000 and ridership could be as high as 160

daily riders. Indeed, if ridership develops as hoped because of the new developments, additional service would have to be operated because of crowding on the buses. This would raise the cost of service, but the cost per rider with the base level of service is only $5, making this by far the most cost-effective commuter route among those proposed in this study.

Salem–Nashua–Milford Route

East-west travel across the southern portion of the state is difficult to accomplish. Among Salem, Nashua and Milford, there are hundreds of commuters traveling in both directions, but no current transit options to carry them across municipal boundaries. The proposed route shown in Figure 20 would provide this connection. Although it has no mileage on express highways, it would operate in a limited-stop fashion rather than a local route. It would originate at the Exit 2 bus terminal, serve densely developed areas in Salem, including the new Tuscan Village development and then operate through the heart of Nashua to Milford. Peak service would be bidirectional given the large numbers of people commuting from Milford to Nashua (537) and from Nashua to Salem (1,011).

Figure 20 Proposed Salem–Nashua–Milford Commuter

This route is not very long, but it has an estimated end-to-end travel time of 85 minutes due to congested conditions on arterial roads. The estimated annual gross operating cost is $300,000 and estimated daily ridership is 75 passengers, resulting in a gross cost per rider of $15.

Keene–Concord Route

Stakeholders in the southwest region noted that Keene and other communities in the region are isolated from the rest of New Hampshire with regard to public transit. There is more service to Vermont destinations (two trips per day on Greyhound) than there is to any destination in New Hampshire. The route proposed in Figure 21 would link Keene to the capital city of Concord and a major hub of intercity transportation. The route would also serve stops in Hillsborough and Henniker along the way, each of which send about 325 commuters to Concord daily. Keene sends about 235 commuters to Concord, and

about 120 make the reverse commuting trip. Given the length of the route—about 53 miles—a commuter service could be attractive to these commuters to save wear and tear on their automobiles.

Figure 21 Proposed Keene–Concord Commuter

The estimated running time for this route is 80 minutes. The annual gross operating cost would be $386,000 and the ridership estimate, based only on the commuting figures is 75 trips per day. Given Keene's isolation, the other medical and governmental institutions in Concord, and the access to the intercity market this route would offer, it is possible that the route could attract non-commuters as well. Using the conservative estimate of commuters only, the gross cost per rider would be $21.

Claremont–Upper Valley Route

Transit advocates in Sullivan County have long advocated for a commuter route from Claremont into the Upper Valley employment center. In 2011, the Upper Valley Lake Sunapee Regional Planning Commission (UVLSRPC) conducted a feasibility study for such a service, but to date, no new service has been implemented. The analysis done as part of this project confirms a substantial commuting market, with 903 Claremont residents and 366 Plainfield residents working in the Upper Valley. Unlike several of the other corridors studied, this one does not have a substantial reverse-commute market. The proposed route, shown in Figure 22 would operate on NH 120 from Claremont through Plainfield into downtown Lebanon and then continue on NH 120 to Dartmouth-Hitchcock Medical Center, terminating in downtown Hanover.

Figure 22 Proposed Claremont–Upper Valley Commuter

The estimated travel time for this route is 68 minutes to travel the 28 miles from Claremont to Hanover. An estimated 100 passengers would ride daily on the route costing $260,000 per year, resulting in a gross cost per rider of $10, one of the more cost-effective routes in this study.

Upper Valley–Concord Route

Interstate 89 is an important commuting route for the western side of New Hampshire, carrying large numbers of commuters to the large employment centers that anchor the highway: Concord and the Upper Valley. The northern segment of this corridor was the subject of study conducted by UVLSRPC, looking at commuting from New London and points northwest into Hanover and Lebanon. At the southern end, more than 700 people commute to Concord from Hopkinton and nearly 300 from Warner. According to

the Census, 120 people commute all the way from Lebanon to Concord. Effectively, this route would be three services in one: a commuter service to the Upper Valley, a commuter service to Concord, and a quasi-intercity link between the two employment centers.

The alignment, shown in Figure 23 on the next page, begins in downtown Hanover serves downtown Lebanon and then runs on I-89 south toward Concord. The availability of Park & Ride lots will determine how many stops the bus would make in each direction. Morning southbound trips would not stop until New London at the earliest, though a courtesy stop could be made via on-board request. Similarly, morning northbound trips after leaving Concord would not begin stopping until New London. Note that the New London Park & Ride is already heavily used by intercity bus passengers and carpoolers, so that if this service were implemented, an expansion of that lot would be advisable.

The entire route is 69 miles long, significantly longer than any of the other seven routes described here. The estimated end-to-end running time is 95 minutes. The annual gross operating cost would be $485,000 and the estimated ridership would be 135 daily passengers. These figures result in a gross cost per rider of $14, about average compared to the other proposed commuter routes.

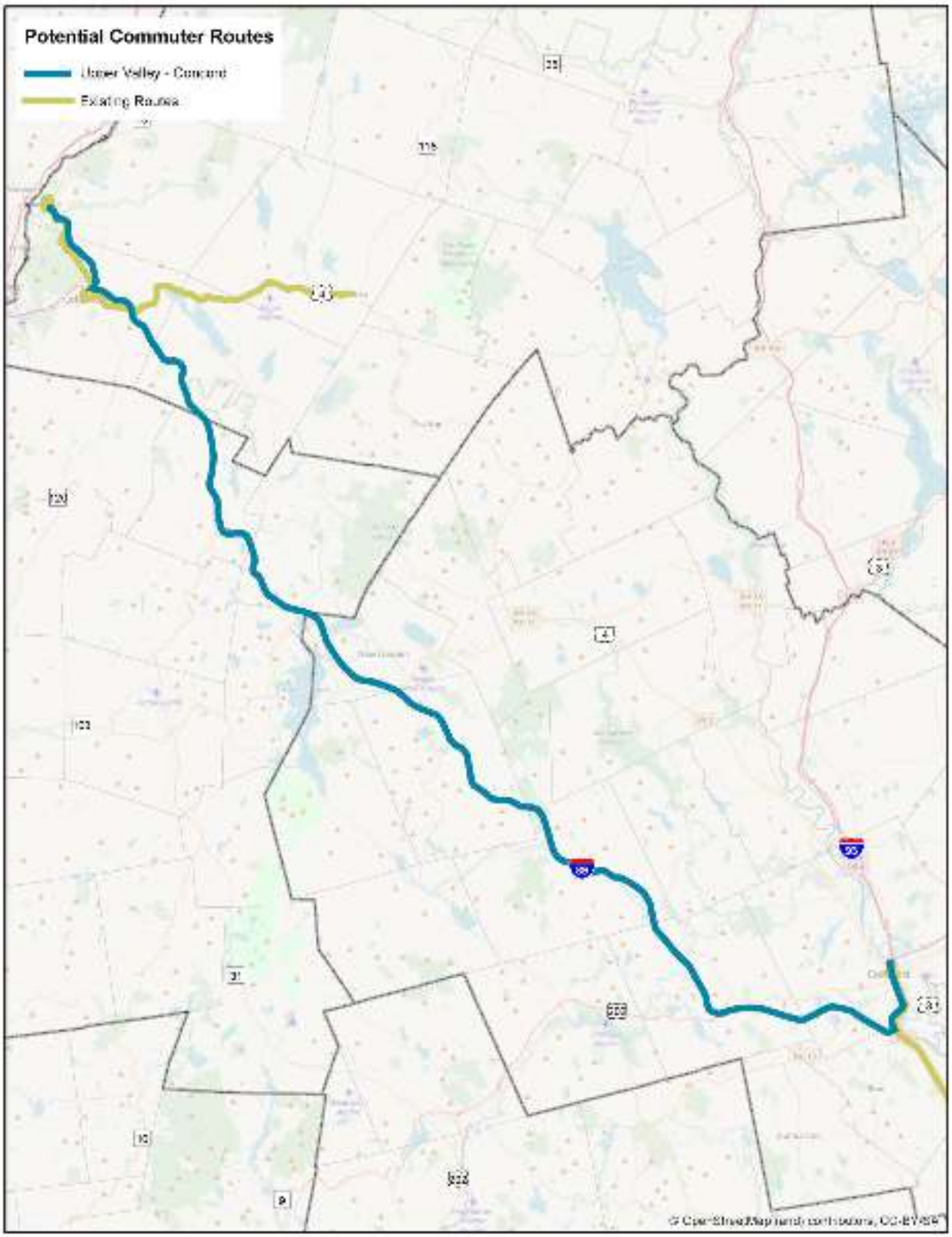
Summary of Commuter Service

Table 5 shows a summary of the commuter services presented above. No assumptions are made about fare revenue, nor about specific operators of the service.

Table 5 Summary of Commuter Service

Route	One-way Miles	Annual Gross Cost	Annual Riders	Gross Cost/Rider
Keene-Concord	53	$386,000	19,000	$21
Claremont-Hanover	28	$260,000	26,000	$10
Hanover-Concord	70	$485,000	34,000	$14
Laconia-Concord	29	$234,000	12,000	$19
Rochester-Concord	37	$312,000	23,000	$13
Portsmouth-Manchester	47	$349,000	26,000	$13
Salem-Londonderry-Manchester	26	$211,000	42,000	$5
Salem-Nashua-Milford	30	$301,000	19,000	$15
TOTALS		$2,538,000	201,000	$13

Figure 23 Proposed Upper Valley–Concord Commuter

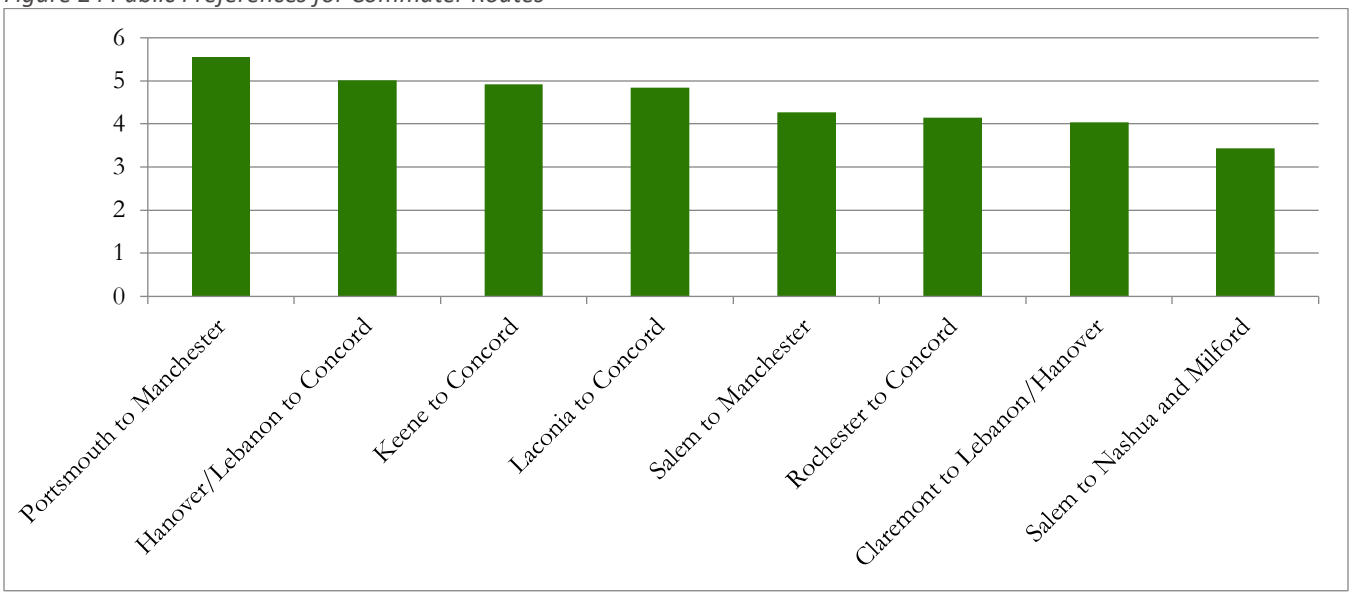


Public Input on Recommendations

In the online survey for the SSTA, only 8% of respondents rejected the concept of increased commuter bus service in New Hampshire. Over 50% endorsed the idea, and the remaining respondents said that they were not sure—that it depended on what service was being proposed. The respondents were then asked to rank their preferences for the eight proposed commuter routes. The top-ranked route would receive 8 points from that respondent, and the lowest-ranked route would receive 1 point.

The results of the ranking are shown in Figure 24 below. The route with the highest average ranking was the Portsmouth–Manchester commuter, followed closely by three commuter routes to Concord. The lowest-ranked route was the one connecting Salem and Milford to Nashua.

Figure 24 Public Preferences for Commuter Routes



Priority Rankings of Local Services

Taking into account public preferences, the ridership potential and the relative costs of the route, the eight proposed commuter routes are ranked in the following priority tiers:

- Tier 1
  - Salem–Londonderry–Manchester (coordinated with Tuscan Village and Woodmont Commons)
  - Claremont–Lebanon–Hanover
- Tier 2
  - Portsmouth–Manchester
  - Hanover–Concord
  - Rochester–Concord
- Tier 3
  - Laconia–Concord
  - Keene–Concord
  - Salem–Nashua–Milford

If intercity connections between Laconia and Concord and Keene and Concord are not implemented in the near term (see next section), those Tier 3 routes should be considered at the same time as the Tier 1 routes.

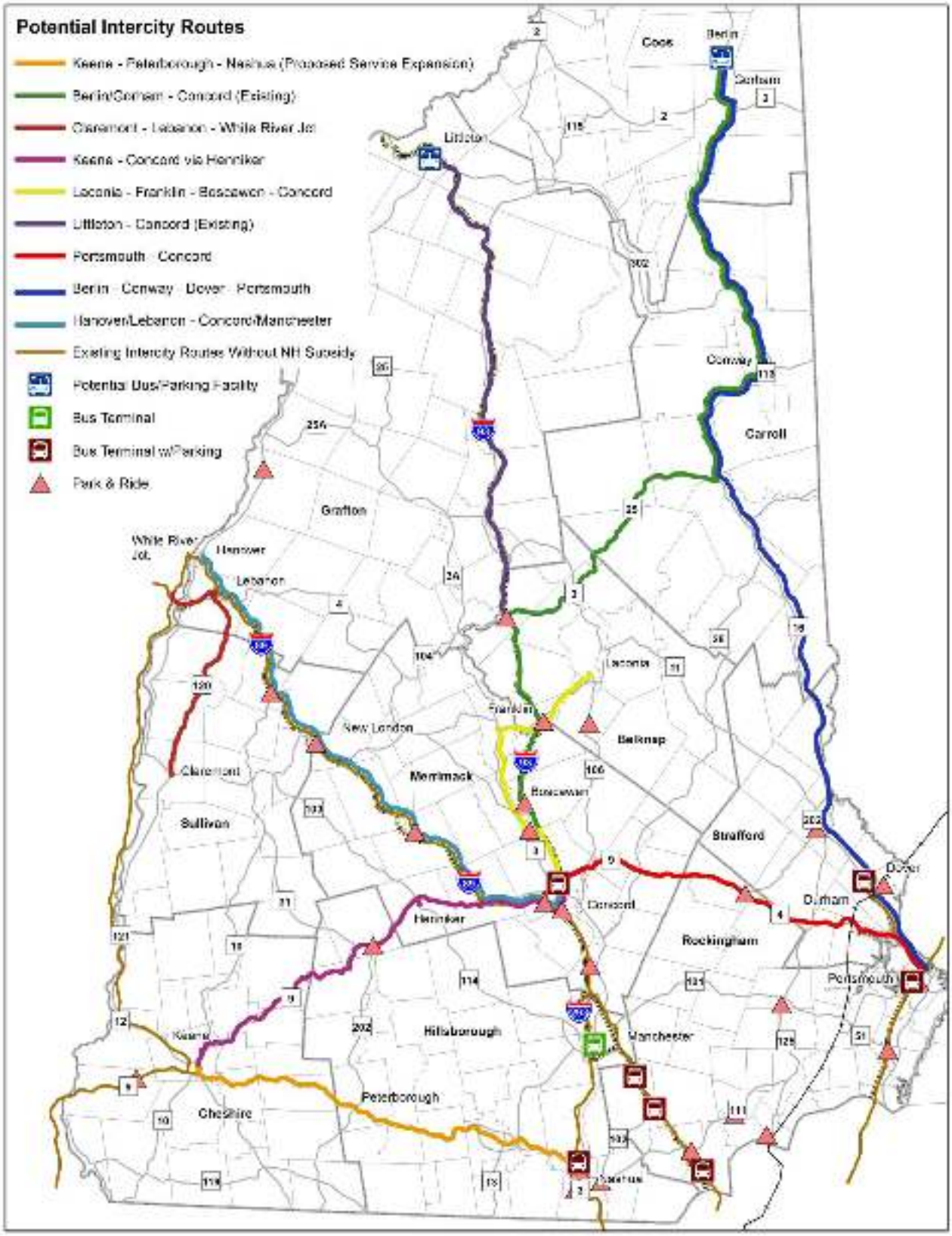
Intercity Routes

Planning for enhanced rural intercity bus services in New Hampshire proceeded on a separate track from the rest of the study, as a new solicitation for intercity service was due to be released by the end of 2018. As prescribed in Chapter VIII of FTA Circular 9040.1G, a formal consultation process was carried out from June through November 2018. Three meetings were held with key stakeholders including representatives of private carriers, regional planning commissions, and state agencies, including the State of Maine.

Route concepts for an enhanced intercity network were based on population density, transit propensity and college locations as described in Chapter 4. The study team took an expansive view of possible routes, considering intra-state line-haul services that connect larger cities within New Hampshire, ways to improve access from rural areas to the existing intercity bus network and shorter feeder routes to primary hubs. The potential intercity network is shown on the next page in Figure 25. The map shows existing intercity routes (both those with subsidy and without subsidy) and seven proposed new routes, one of which is an expansion of existing service between Keene and Nashua. Many of these routes are similar to the commuter routes described in the previous section. This study would recommend implementation of either the intercity link or the commuter link for these corridors, but not both. The existing and proposed subsidized routes are as follows:

- **Littleton–Plymouth–Concord** – This route, operated by Concord Coach, carries about 9,000 riders per year at a net cost of about $120,000. The subsidy per passenger is about $13.
- **Berlin–North Conway–Concord** – This route, also operated by Concord Coach, is two overlapping services that together carry around 7,300 passengers at a net cost of about $180,000. The subsidy per passenger is $33 for Berlin riders and $20 for North Conway riders.
- **Keene–Nashua–Boston** – Greyhound operates two round-trips per week (one on Friday and one on Sunday) between Brattleboro and Boston, serving the Keene to Nashua corridor on the way. These trips receive no subsidy from New Hampshire, but are subsidized by the Massachusetts DOT. This study proposed expanding the Keene-to-Nashua service to operate daily, connecting to Boston Express at the Exit 8 bus terminal in Nashua.
- **Laconia–Franklin–Concord** – This proposed route would be an intercity feeder service operating mainly on US 3 between Laconia and Concord. It is an expanded version of a route recommended in a transit feasibility study for the City of Franklin conducted by the Central New Hampshire RPC in 2017. It addresses high need areas in Laconia and Franklin and also service Lakes Region Community College. It would also serve the County Complex in Boscawen. This route is very similar to the "alternative" routing of the Laconia–Concord commuter route discussed above.
- **Claremont–Lebanon–White River Junction** – This proposed route would be an intercity feeder service on NH 120 and US 4 connecting Claremont and Plainfield to the intercity network in Lebanon and White River Junction. This route is similar to the Claremont–Upper Valley commuter route discussed above. An alternative to this intercity feeder would be to have the Greyhound route in Vermont divert from I-91 to serve Claremont and Charlestown in between the current stops of White River Junction and Bellows Falls.
- **Hanover/Lebanon–Concord** – This proposed route would provide an intercity connection between the Upper Valley and Concord since both of those areas already have excellent access to the intercity network. It is very similar to the Hanover–Concord commuter route proposed above.
- **Keene–Henniker–Concord** – The proposed route serves a high need area and provides intercity access to New England College in Henniker. It serves both intra-state connections and improves access to the intercity network (particularly access to Boston) for the Keene area. It is very similar to the Keene–Concord commuter route discussed above.

Figure 25 Potential Intercity Bus Network



- **Portsmouth–Durham–Concord** – This proposed route, like the Hanover–Concord route, would provide an intercity connection within the state, but both Portsmouth and Concord already have excellent access to the intercity network. A stop in Durham would be made to provide access to the large student population there.
- **Berlin–North Conway–Dover** – This proposed route provides service to the NH 16 corridor on the eastern edge of New Hampshire. It could operate all the way from Berlin, or it could originate in North Conway or West Ossipee to connect to the existing subsidized route from Berlin. It would provide access to health facilities and other activity in the Portsmouth region for residents of the North Country.

In order to estimate costs for these proposed route, it was necessary to make several assumptions:

- There would be a minimum of two round-trips per day for each route
- Routes would operate 360 days per year
- Feeder routes would use small buses (under 30 feet in length)
- Line-haul routes would use over-the-road coach buses
- The cost per mile for feeder buses would be $3.00 (including depreciation costs)
- The cost per mile for coach buses would be $4.50 (including depreciation costs)
- The fare recovery goal for all routes would be 30%

Most of these assumptions are based on the experience of the currently-subsidized routes from Littleton and Berlin to Concord. A summary of the key statistics and forecast costs and ridership for each proposed route are shown in Table 6.

Table 6 Summary of Proposed New Intercity Service

Route (one-way fare)	One-way Miles	Annual Gross Cost	Annual Riders	Annual Subsidy
Laconia – Concord ($6)	34	$145,000	7,200	$102,000
Claremont – Lebanon/WRJ ($6)	30	$128,000	6,500	$89,000
Hanover – Concord ($10)	70	$450,000	14,000	$310,000
Keene – Concord ($8)	55	$356,000	13,000	$252,000
Portsmouth – Concord ($8)	50	$308,000	11,500	$216,000
Berlin – Dover ($30)	120	$778,000	8,000	$538,000

Priorities

As a result of this analysis and input from the stakeholders on the consultation committee, the existing and proposed routes were divided into three priority tiers in order to guide the development of a solicitation for services to be funded with the intercity portion of federal funding for non-urban areas. All existing services were placed in the first tier, as these services perform well and there is a high policy priority on continuing existing routes. Two additional services were included in the first tier as being the top priorities for service expansion.

- Tier 1
  - Littleton – Concord (existing)
  - Berlin – N. Conway – Concord (existing)
  - Keene – Nashua (expansion of existing unsubsidized)
  - Laconia – Franklin – Concord
- Tier 2
  - Keene – Concord
  - Claremont – Lebanon/White River Junction
  - Hanover – Concord
- Tier 3
  - Portsmouth – Concord
  - Berlin – N. Conway – Dover

The solicitation that was released in early 2019 contained the two existing routes and the two new or expanded services in the first tier. The result of the solicitation was that Concord Coach was awarded continuing service of the Littleton and Berlin/North Conway routes, but no bids were received for the Keene–Nashua or the Laconia–Concord routes. NHDOT released a second solicitation for those service in the summer of 2019, but again received no bids on those services. These routes and those in the lower tiers are reserved for possible future solicitations.

The intercity analysis also identified needs for passenger and parking facilities in Berlin and Littleton, at the northern termini of the existing subsidized routes. These have not been funded but could be pursued in future years.

6. PARK & RIDE

Park & Ride lots are essential access points to the regional and intercity transit network in New Hampshire. Many parts of New Hampshire are too sparsely populated to support traditional bus routes and so parking lots are a convenient way to collect passengers from a wide area so that a transit route can operate efficiently in arterial corridors.

The SSTA included a separate task to inventory, evaluate, and prepare recommendations for park & ride lots statewide. The results of that task are contained in Appendix D, but a summary of the findings are presented here. This work was conducted by RSG, Inc.

Inventory

There are 33 official park & ride lots in New Hampshire (see Figure 26). Of these, 27 are owned by NHDOT and the other 6 are owned by various municipalities. Key features of these lots including amenities available, lot capacity, and typical utilization, are presented in

on the next page. Amenities at park & ride facilities provide benefits to users, whether they be transit riders or carpoolers. The primary amenities considered include:

- Lighting
- Bus shelters and transit service
- Surface condition and pavement markings
- Bicycle facilities

Park-and-ride facilities are public facilities, and therefore NHDOT must make reasonable accommodations to make them navigable for people with disabilities. In 2016, NHDOT completed a study (Americans with Disabilities Act Title II Transition Plan) to identify any improvements required on NHDOT facilities to comply with ADA requirements. This document provided a comprehensive review across all facilities, including the state park-and-ride facilities. Fourteen of the lots surveyed in the 2016 NHDOT ADA Transition Plan were found to be in compliance with ADA as noted on Table 7

Needs

As can be seen on the table, there are three lots that are filled to more than 90% of capacity and five more at over 75% of capacity. These locations are high priorities for additional capacity (when feasible) or other management strategies. Most of the highly-used lots are those served by intercity bus routes. This is especially true among the largest lots (over 300 spaces).

A number of underserved areas have high residential density, proximity to major roadways, and are more than 10 miles from the nearest park-and-ride facility. These include Littleton (I-93), Berlin (NH 110/NH16), the area around North Conway, Claremont (NH 120/NH 103/NH 11), the Upper Valley (NH 120/US 4), Moultonborough (NH 25), Ossipee (NH 16/NH 25), and Wolfeboro (NH 28/NH 109). These locations should be prioritized for evaluation for new lots as funding becomes available. Five locations have been identified that would serve as terminus locations for intercity transit service. Two of them (Littleton and Berlin) have also identified as areas of unmet need. The other three (Keene, Peterborough, and Laconia) have been added to the prioritization effort. These locations should be developed in conjunction with intercity transit service.

Figure 26 Locations of Park & Ride Facilities

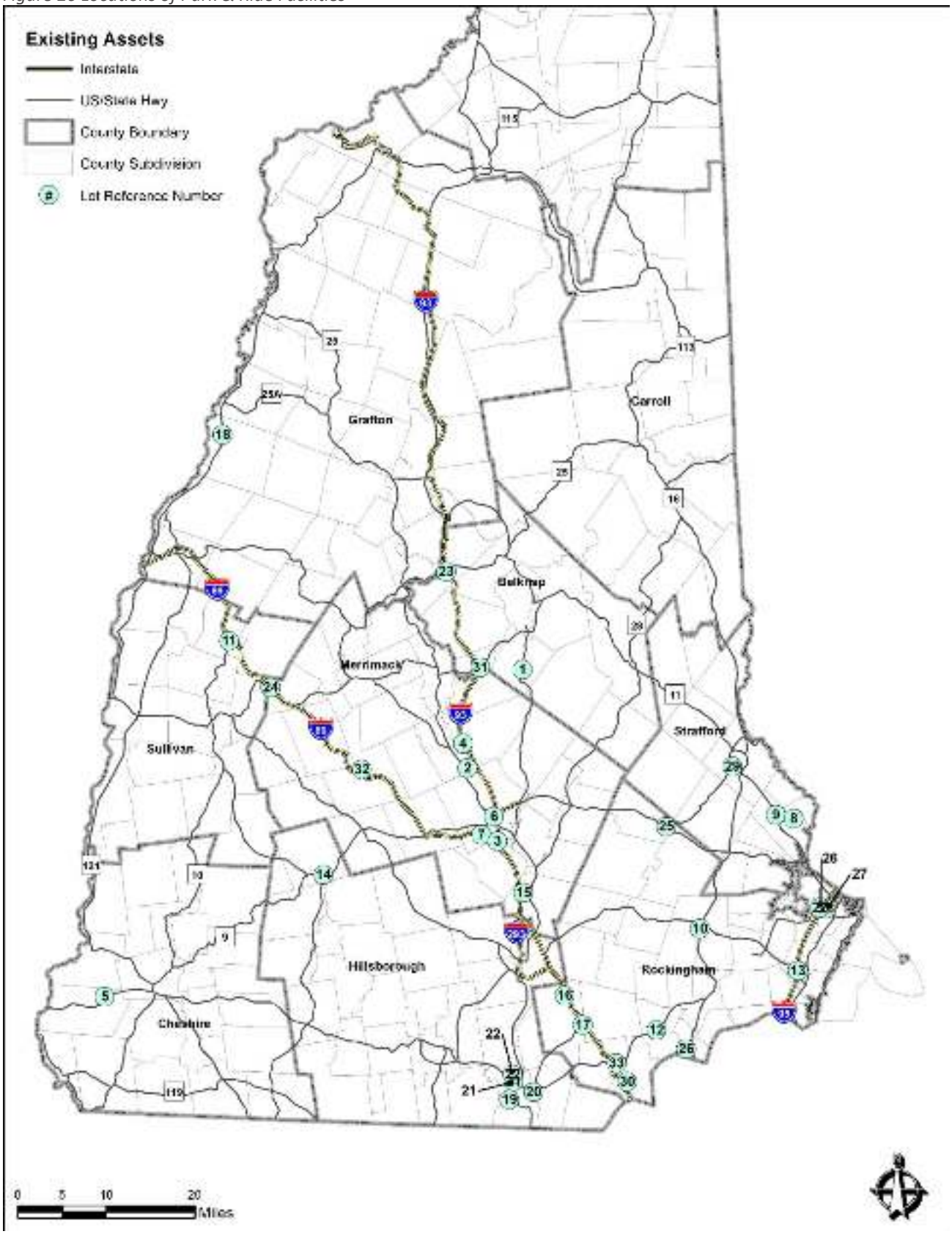


Table 7 Inventory of Park & Ride Facilities

ID	Municipality	Ownership	Bus Shelter	Bike Racks	Local Transit	Intercity Transit	Spaces	Utilization	ADA Compliant?
1	Belmont	Town of Belmont					42	52%	not available
2	Boscawen	NHDOT					42	50%	
3	Bow	NHDOT					60	95%	
4	Canterbury	NHDOT					10	70%	
5	Chesterfield	NHDOT					45	16%	
6	Concord (Clinton St.)	NHDOT					100	86%	
7	Concord (Stickney Ave.)	NHDOT					580	81%	
8	Dover (Ice Arena)	City of Dover					230	43%	not available
9	Dover (Rt. 16)	NHDOT					414	93%	
10	Epping	NHDOT					246	23%	
11	Grantham	NHDOT					53	21%	
12	Hampstead	NHDOT					104	3%	
13	Hampton	NHDOT					104	59%	
14	Hillsborough	NHDOT					106	9%	
15	Hooksett	NHDOT					45	51%	
16	Londonderry (north)	NHDOT					728	67%	
17	Londonderry (south)	NHDOT					452	29%	
18	Lyme	NHDOT					10	60%	
19	Nashua 5W	City of Nashua					10	26%	not available
20	Nashua (Crown St.)	City of Nashua					243	not available	
21	Nashua 7E	NHDOT					50	34%	
22	Nashua 8	NHDOT					377	84%	
23	New Hampton	NHDOT					111	36%	
24	New London	NHDOT					132	88%	
25	Northwood	Town of Northwood					39	21%	not available
26	Plaistow	NHDOT					275	15%	
27	Portsmouth (PTC)	NHDOT					1248	98%	
28	Portsmouth (Rt. 33)	City of Portsmouth					50	24%	not available
29	Rochester	NHDOT					200	34%	
30	Salem	NHDOT					476	72%	
31	Tilton	NHDOT					63	16%	
32	Warner	NHDOT					23	57%	
33	Windham	NHDOT					140	27%	

Recommended Investments

In order to relieve the capacity pressure at the eight over-utilized lots, expansions are recommended as shown in **Error! Not a valid bookmark self-reference.**. This table includes order-of-magnitude cost estimates for both surface lot expansions and structured parking.

To address the lack of park & ride facilities in underserved areas, for preliminary planning, medium-size lots of about 50 spaces, which are estimated to cost approximately $400,000 to construct, are recommended for four of locations of unmet need (Littleton, Berlin, Claremont, and the Upper Valley). Small lots of approximately 25 spaces are recommended for the remaining four areas of unmet need (North Conway, Moultonborough, Ossipee, and Wolfeboro). The small lots are estimated to cost approximately $200,000 to construct. The sizes of park-and-ride facilities constructed to support intercity transit should reflect analysis of probable ridership and associated parking demand.

Table 8 Recommended Investments at Over-Utilized Lots

Lot	ID	County	Current Utilization	Additional Spaces	Median Cost (Surface)	Median Cost (Garage)
Bow	3	Merrimack	95%	28	$210,000	$532,000
Concord (Clinton St.)	6	Merrimack	86%	33	$247,500	$627,000
Concord (Stickney Ave)	7	Merrimack	81%	143	$1,072,500	$2,717,000
Dover (Route 16)	9	Strafford	93%	179	$1,342,500	$3,401,000
Nashua 8	22	Hillsborough	84%	111	$832,500	$2,109,000
New London	24	Merrimack	88%	47	$352,500	$893,000
Portsmouth (PTC)	27	Rockingham	98%	634	$4,755,000	$12,046,000

7. TECHNOLOGY

The impact of technology on transit operations and the passengers' experience grows every year. Applications such as real-time bus arrival information, which in the past was affordable only to large transit systems in major metropolitan areas, has now become a feasible investment for small rural systems. Riders' expectations are also growing so that the transit industry needs to keep pace with new technological developments in information and convenience if it hopes to attract and retain younger riders.

Schweiger Consulting, LLC, part of the study team for the SSTA, produced two technical memoranda on technology. The first memorandum included an inventory of technology applications already deployed at New Hampshire transit providers, summarized in Chapter 3 above, and an overview of all available technologies for rural, urban and large urban transit properties. The second memorandum, which is included in this report as Appendix H, contains recommendations and cost estimates for future technology investments in New Hampshire. These results are summarized below.

Hierarchy of Investments

Table 9 is a brief listing of the range of technologies considered for deployment at transit agencies in New Hampshire. They have been organized into a hierarchy of investments divided into six tiers. Each of the tiers has a general theme:

1. Communications and operational/passenger information
2. Data collection, scheduling and security
3. Vehicle monitoring and maintenance
4. Fare collection
5. Operational reliability
6. Intelligent vehicle operations

Essential to any procurement of technology is an understanding of the dependency of any given application on other "core" technologies. The most important core technology is voice and data communication.[3] Figure 27 shows all of the core technologies and how they relate to each other.

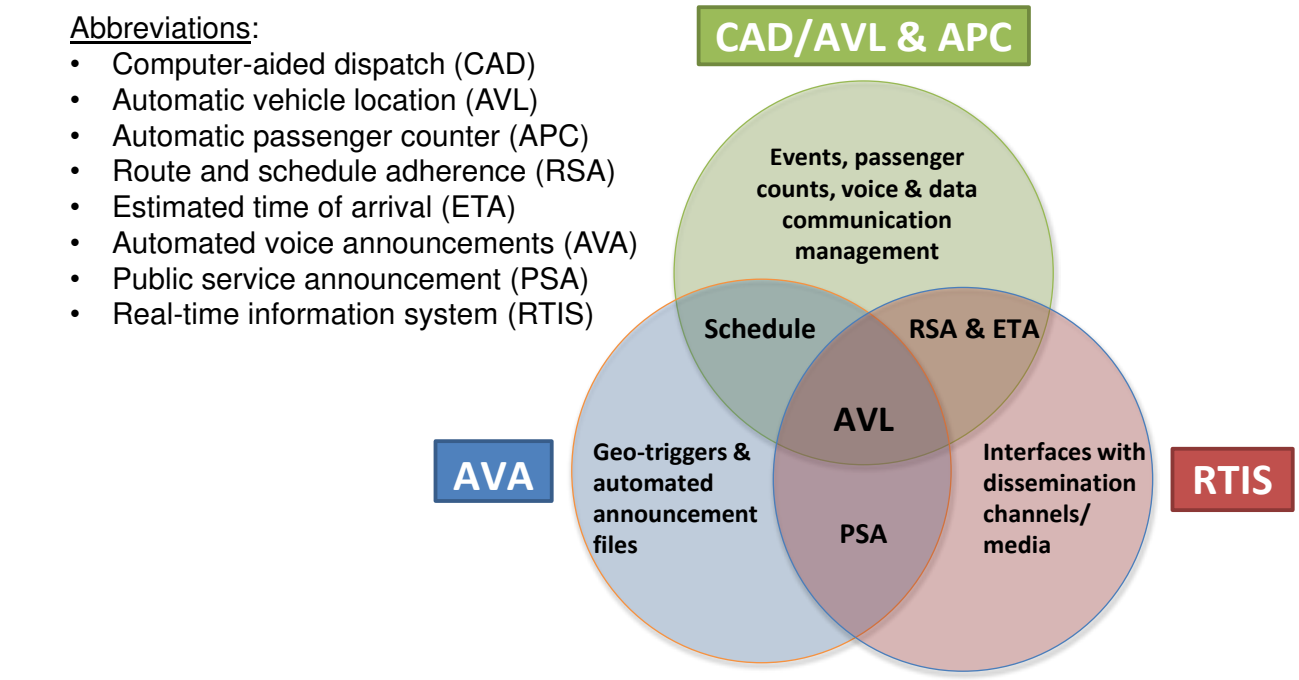
Table 9 Tier Technology Components

Tier	Technology Component
1	Communications technologies
1	Automatic vehicle location (AVL)
1	Computer-aided dispatch (CAD)
1	On-board automated voice announcements (AVA)
1	En-route/wayside traveler information, including real-time arrival/departure information in a variety of dissemination media
1	Technology integration
1	Third-party smartphone applications
1	Open data for third-party application development
2	Automatic passenger counters (APCs)
2	Scheduling (fixed-route and paratransit) systems

[3] Most NH agencies have this already, although a few agencies may be moving away from radio frequency (RF) communication and toward cellular communication.

2	Mobile (on-board and exterior) and fixed video surveillance
2	Covert emergency alarm and covert live audio monitoring
2	On-board digital video recorders
2	Geographic information system (GIS) application
2	Service coordination facilitated by technology (includes paratransit CAD/AVL)
3	Vehicle component monitoring (VCM)
3	G-force monitoring (EDRS)
3	Maintenance software to schedule and track scheduled and unscheduled maintenance activities, and manage parts inventory
3	On-board Internet access for passengers
3	511, 311 and 211 systems, and Google Transit
4	Automated fare media (e.g., magnetic stripe cards, contact smartcards, contactless smartcards and smartphone-based payment methods)
4	Automated fareboxes and faregates
4	Ticket vending machines
5	Transfer connection protection (TCP)
5	Transit signal priority (TSP)
5	Data management and reporting
6	Intelligent vehicle technologies (e.g., collision warning and precision docking)
6	Lane control technologies

Figure 27 Core Technology Dependencies



New Hampshire transit agencies that do not already have the core technologies shown in Figure 27 (most of Tier 1) should consider deployment of these specific technologies first, particularly CAD/AVL, which provides the backbone needed for the use of the other core technologies. Procuring the core technologies together can be less costly than purchasing them separately and having to integrate them. For example,

computing and providing real-time information to customers can only be accomplished when the system knows where transit vehicles are located (requiring AVL) and where they should be located according to the schedule (can require scheduling software for larger agencies). Once real-time information is available, it can be disseminated using a wide variety of media, such as websites or a third-party smartphone application.

Tier 2 technologies are mostly related to safety and security. On-board digital video surveillance, while not dependent on other technologies is often integrated with AVL in order to identify the specific location(s) where an event or events of note have taken place. Also, buses can be procured with camera systems already installed, which can be less expensive than procuring them later.

The next most desirable technologies (Tier 3) are in the Maintenance, Safety and Traveler Information categories. In the Maintenance category, there typically is no dependence on other technologies – technology integration with, for example, CAD/AVL, is not required. However, real-time vehicle component monitoring (VCM) requires integration with the on-board vehicle area network so that if on-board technologies experience out-of-tolerance conditions, the situation can immediately be communicated to dispatch/operations and maintenance.

Tier 4 consists of automated fare payment technology. With the advent of account-based and mobile fare payment, the cost of fare collection and payment has been reduced over the past five years. However, equity and accessibility issues must be addressed when utilizing technology-enabled fare payment. For example, customers who can only afford to pay on a trip-by-trip basis or do not have a smartphone will need a way to add cash to their fare payment media or pay using media other than a smartphone (e.g., smartcard).

The next group of technologies (Tier 5) relate to operational reliability. They include transfer connection protection (TCP) to facilitate customers' transfers between bus routes and transit signal priority (TSP). TSP can help reduce bus travel times in congested areas by allowing a bus to pass through a busy intersection via an extended green light. Overall it can improve reliability by reducing the variability of delay at intersections.

The final technologies to be considered for deployment (Tier 6) are intelligent vehicle technologies (e.g., collision warning) and lane control technologies. Collision warning is available for detecting side and front objects, as well as passenger detection when the vehicle is turning. Lane control technologies assist with vehicle operation on highway lanes, particularly when operating in a breakdown lane (which is less wide than a normal highway lane). These technologies may become standard in transit buses in the near future due to their standardization and deployment in the passenger car market.

Recommendations and Cost Estimates by Transit Agency

The following set of tables show the specific technology recommendations for each agency within the next 10-year period. It is assumed that budgets and procurement capacity will be consume with implementing tiers 1 through 3 during that span, and so there are no recommendations for technologies from tiers 4 through 6, with the exception of Advance Transit, which currently is interested in TSP at one location in Lebanon, NH. If a communications system is recommended, the cost of a communications system is not included in the figures because of the uncertain cost associated with communications systems. The technology components of a communications vary widely as do the operations and maintenance (O&M) costs.

A statewide cost summary by goal/deployment year is included in Table 20 for urban agencies and in Table 21 for rural agencies at the end of this section. Actual spending might happen in increments leading to the deployment year, but for the purpose of simplicity, all capital spending is assumed to be a lump sum in the deployment year. Annual O&M costs begin in the year after the deployment year.

Table 10 Advance Transit

Tier	Elements	Goal Year	Total Capital Cost (min)	Total Capital Cost (max)	Annual O&M Cost (min)	Annual O&M Cost (max)
1	• AVA • Open data • Technology Integration	2022	$118,000	$211,000	$20,000	$31,200
2	• APCs • Covert emergency alarm • Covert live audio monitoring	2025	107,250	196,750	33,488	49,688
3	• VCM • G-force monitoring • Fuel management	2029	257,000	607,000	55,688	95,000
5	• TSP[4]	2021	72,000	162,000	6,963	15,700

Table 11 COAST

Tier	Elements	Goal Year	Capital Cost (min)	Capital Cost (max)	Annual O&M Cost (min)	Annual O&M Cost (max)
1	• Open data • Technology Integration	2022	Not available	Not available	Not available	Not available
2	• APCs • Covert emergency alarm • Covert live audio monitoring • On-board video surveillance • GIS • Service coordination facilitated by technology	2025	$633,000	$1,236,000	$104,755	$164,935
3	• VCM • G-force monitoring • Fuel management	2029	268,000	631,000	56,850	97,400

[4] Assumes one intersection equipped with appropriate infrastructure. The infrastructure cost is included in the capital cost.

Table 12 MTA

Tier	Elements	Goal Year	Capital Cost (min)	Capital Cost (max)	Annual O&M Cost (min)	Annual O&M Cost (max)
1	• CAD • Traveler information • Open data • Technology Integration	2022	$395,750	$1,012,250	$101,148	$201,445
2	• APCs • Covert emergency alarm • Covert live audio monitoring • Fixed video surveillance	2025	76,250	143,750	32,388	47,788
3	• VCM • G-force monitoring • Fuel management	2029	250,000	585,000	55,488	94,400

Table 13 Sullivan County Transit

Tier	Elements	Goal Year	Capital Cost (min)	Capital Cost (max)	Annual O&M Cost (min)	Annual O&M Cost (max)
1	• Communications technology (see earlier note regarding the cost of this technology) • AVL • CAD • AVA • Traveler information • Third-party smartphone applications • Open data • Technology Integration	2023	$564,000	$1,282,000	$122,355	$232,468
2	• APCs • Covert emergency alarm • Covert live audio monitoring • Fixed video surveillance • GIS • Service coordination facilitated by technology[5]	2026	53,750	106,250	31,563	46,363
3	• VCM • G-force monitoring • Maintenance management	2029	407,000	962,000	89,563	163,450

[5] Included in CAD/AVL in Tier 1

	• Fuel management					

Table 14 Tri-County CAP

Tier	Elements	Goal Year	Capital Cost (min)	Capital Cost (max)	Annual O&M Cost (min)	Annual O&M Cost (max)
1	• Communications technology • AVL • CAD • AVA • Traveler information • Open data • Technology Integration	2023	$666,000	$1,506,000	$126,938	$242,183
2	• APCs • Covert emergency alarm • Covert live audio monitoring • On-board video surveillance • Fixed video surveillance • GIS • Service coordination facilitated by technology[7]	2027	92,250	170,750	32,938	48,738
3	• VCM • G-force monitoring • Fuel management	2029	250,000	590,000	55,088	93,800

Table 15 VNA –– Home Healthcare HCS

Tier	Elements	Goal Year	Capital Cost (min)	Capital Cost (max)	Annual O&M Cost (min)	Annual O&M Cost (max)
1	• Communications technology • AVL • CAD • AVA • Traveler information • Third-party smartphone applications • Open data • Technology Integration	2022	$585,000	$1,326,000	$123,265	$234,425
2	• APCs • Covert emergency alarm • Covert live audio monitoring • On-board video surveillance	2027	210,250	399,750	65,763	100,538

	• Fixed video surveillance • GIS • Service coordination facilitated by technology7					

Table 16 Nashua Transit System

Tier	Elements	Goal Year	Capital Cost (min)	Capital Cost (max)	Annual O&M Cost (min)	Annual O&M Cost (max)
1	• AVL • CAD • Traveler information (including a third-party smartphone application) • Open data • Technology Integration	2022	$528,000	$1,226,000	$105,675	$207,595
2	• APCs • Covert emergency alarm • Covert live audio monitoring • On-board video surveillance • Fixed video surveillance • GIS • Service coordination facilitated by technology7	2025	171,750	384,250	56,063	85,598
3	• VCM • G-force monitoring • Maintenance management • Fuel management	2028	416,000	983,000	90,513	165,450

Table 17 CART

Tier	Elements	Goal Year	Capital Cost (min)	Capital Cost (max)	Annual O&M Cost (min)	Annual O&M Cost (max)
1	• Communications technology • AVL • CAD • AVA • Traveler information • Third-party smartphone applications • Open data • Technology Integration	2023	$585,000	$1,326,000	$123,265	$234,425
2	• APCs • Covert emergency alarm • Covert live audio monitoring • On-board video surveillance • Fixed video surveillance	2026	210,250	399,750	65,763	100,538

	• GIS • Service coordination facilitated by technology[7]					
3	• VCM • G-force monitoring • Fuel management	2029	239,000	563,000	54,488	92,300

Table 18 Concord Area Transit

Tier	Elements	Goal Year	Capital Cost (min)	Capital Cost (max)	Annual O&M Cost (min)	Annual O&M Cost (max)
1	• AVL • CAD • AVA • Traveler information • Third-party smartphone applications • Open data • Technology Integration	2022	$518,000	$1,184,000	$120,080	$227,880
2	• APCs • Covert emergency alarm • Covert live audio monitoring • On-board video surveillance • Fixed video surveillance • GIS • Service coordination facilitated by technology[7]	2025	261,500	540,500	86,340	132,580
3	• VCM • G-force monitoring	2028	130,000	253,000	31,825	46,000

Table 19 UNH Wildcat Transit

Tier	Elements	Goal Year	Capital Cost (min)	Capital Cost (max)	Annual O&M Cost (min)	Annual O&M Cost (max)
1	• AVA • Open data • Technology Integration	2021	$152,000	$269,000	$21,200	$33,200
2	• APCs • Covert emergency alarm • Covert live audio monitoring • On-board video surveillance • Fixed video surveillance • GIS • Service coordination facilitated by technology	2023	551,250	1,005,750	96,113	148,523
3	• VCM • G-force monitoring	2025	268,000	638,000	56,488	96,800

	• Fuel management					

Table 20 Statewide Capital and O&M Costs by Goal Year for Urban Agencies

Goal Year	Total Capital Cost (min)	Total Capital Cost (max)	Total O&M Cost (min)	Total O&M Cost (max)
2021	$152,000	$269,000	$0	$0
2022	923,750	2,238,250	21,200	33,200
2023	1,136,250	2,331,750	228,023	442,240
2024	0	0	447,401	825,188
2025	1,149,000	2,402,000	447,401	825,188
2026	210,250	399,750	697,095	1,220,309
2027	0	0	762,858	1,320,847
2028	416,000	983,000	762,858	1,320,847
2029	507,000	1,194,000	853,371	1,486,297
2030	N/A	N/A	964,709	1,675,997
TOTAL	$4,494,250	$9,817,750	$5,184,916	$9,150,113

Table 21 Statewide Capital and O&M Costs by Goal Year for Rural Agencies

Goal Year	Total Capital Cost (min)	Total Capital Cost (max)	Total O&M Cost (min)	Total O&M Cost (max)
2021	$72,000	$162,000	$0	$0
2022	1,221,000	2,721,000	6,963	15,700
2023	1,230,000	2,788,000	270,308	509,205
2024	0	0	519,601	983,856
2025	368,750	737,250	519,601	983,856
2026	53,750	106,250	639,429	1,166,124
2027	302,500	570,500	670,992	1,212,487
2028	130,000	253,000	769,693	1,361,763
2029	914,000	2,159,000	801,518	1,407,763
2030	N/A	N/A	1,001,857	1,760,013
TOTAL	$4,292,000	$9,497,000	$5,199,962	$9,400,767

8. PERFORMANCE EVALUATION

Policy Context

NHDOT has a stated policy priority of maintaining existing services and recognizes the importance of ensuring all public transit systems are viewed as being reliable in order for the traveling public to trust the public transportation network. Any cessation/reduction of services must be avoided to the extent practicable to ensure that trust is not breached. As such, NHDOT's funding strategy, which generally applies only to NHDOT's 5311 subrecipients, will always start with the presumption of continued funding for existing services.

At the same time, NHDOT must also ensure that the funding is being used as effectively as possible. It is therefore necessary for NHDOT to analyze the viability of existing services. NHDOT will continue to collect annual data related to service cost and ridership as has been done during the SSTA. Any service that has cost ratios (cost per hour/mile/passenger) that far exceed those of its peers, or ridership (per hour or mile) that is far less than its peers, will be further analyzed to identify potential improvements.

Such analyses will be at NHDOT's discretion and will generally consist of NHDOT working with the affected Regional Planning Commission(s) to ensure funds are earmarked as necessary to conduct a detailed service study. After a study is conducted and recommended changes are implemented, the service will be further scrutinized for two additional years. If no significant performance improvements are seen, NHDOT will then consider reallocating the funding to maintain other existing services based on escalating costs, provide an opportunity for an expansion elsewhere, etc.

The same methodology for evaluating service performance may be used to determine funding priorities for other FTA-funded programs administered by NHDOT. It is worth noting that direct recipients of FTA Section 5307 funding will continue to be able to set their own performance measures and benchmarks for all services other than those funded via NHDOT.

Evaluation Framework

Traditional performance measures focus on productivity and cost efficiency. Productivity is the ratio of ridership (boardings) to the amount of service provided. Depending on the type of service operated, the unit of service provided could be a revenue hour, a revenue mile, or a revenue trip. Cost efficiency measures how much money it takes to operate the service. Again, depending on the service it could be best measured by cost per revenue hour, cost per revenue mile, or possibly administrative cost as a percentage of operating cost. A third measure, which combines the other two, is cost per passenger. It can be calculated either as the gross cost per passenger or the net cost per passenger, if fare revenue is taken into account. The more cost efficient a provider is, and the more productive its services are, the lower the cost per passenger will be.

It is one thing to calculate performance measures, but it is another to determine whether the resulting productivity and cost-efficiency are poor, acceptable, or successful. To allow for such ratings to be applied, benchmarks must be set; however, one set of benchmarks cannot be applied to all routes and services in New Hampshire. Bus routes in densely-developed urban areas would not be expected to have productivity comparable to routes in rural areas, much less demand response services.

A series of route classes are proposed below. Even though NHDOT only manages the flow of Section 5311 funding, allowing Section 5307 funds to flow directly to the transit agencies in urbanized areas, these route classes cover all routes in New Hampshire. As stated above, the primary use of the evaluation framework is to help identify transit services that would benefit from analysis and planning. As NHDOT has the ability to

distribute planning funds to any transit agency, or to provide planning services through a statewide contract, it is to the benefit of all providers to have the evaluation framework apply on a statewide basis.

The benchmarks for each route class do not represent a "make or break" threshold. They are rather intended to help separate underperforming routes, which could benefit from analysis and planning, from routes and services which are performing satisfactorily or successfully. That is not to say that planning would not be beneficial for all routes in the state, but rather that the priority focus of planning efforts should be on the poorest performers.

Route Classes

As the first step in this process, the 88 routes and services operated by the eleven transit systems in the state were grouped into a series of route classes. While each provider faces a unique set of circumstances in its area, it is nonetheless possible to create classes of roughly similar routes.

The proposed route classes are listed and defined below:

- **Urban** – Routes in the Urban class operate larger cities (population of 40,000 or more). This class contains most of the service operated by Manchester Transit Authority (MTA), Nashua Transit System (NTS), and Concord Area Transit.
- **Small Town** – Routes in smaller cities and towns of 10,000 to 40,000 population. This class contains routes operated by Advance Transit, those in Keene, and most of the COAST system.
- **Rural/Flexible** - Routes in towns with population of less than 10,000 or those lacking a significant trip generator, or those using flexible route service model. Services in this class include those operated by Sullivan County Transit, Tri-County CAP, and flex routes operated by Cooperative Alliance for Regional Transportation (CART).
- **Urban Demand Response** – All demand response services that are in areas served by routes in the Urban class.
- **Rural Demand Response** – All demand response services that are in areas served by Small Town and Rural routes.
- **Commuter** – Routes that operate primarily during peak commuting periods and are oriented toward work trips. These routes may have limited stops or express segments. This class contains routes in the COAST and MTA systems.
- **Circulator/Parking** – Routes that circulate in retail districts in cities or shuttle between parking lots and large employers or retail districts. This class contains routes operated by NTS, COAST, and Advance Transit.
- **Targeted Shuttles** – Routes that primarily serve college students or other special purpose routes. This class contains the UNH Wildcat routes, the Keene Campus Shuttle and seasonal and shopping routes operated by MTA.

It must be noted that there is some overlap in these classes, and there was some judgment involved in how to classify the existing routes and services. Many routes have more than one function or serve both more-developed and less-developed areas.

Three productivity measures and two cost measures were mentioned above. Rather than applying all of these measures to all of the route classes, it is proposed to choose one of each type of measure to apply, as most appropriate, to each route class. In general, for more urban areas dealing with traffic congestion, measures per mile are more appropriate, and for more rural areas, measures per hour are more appropriate. Boardings per trip are appropriate for commuter bus services with little ridership turnover.

The proposed measures by class are shown in the Table 22 below. In addition to these measures, all routes and services would be measured by cost per passenger.

Table 22 Route Classes and Measures

Class	*Productivity Measure*	*Cost Efficiency Measure*
Urban	Boardings per revenue mile	Cost per revenue mile
Small Town	Boardings per revenue hour	Cost per revenue hour
Rural/Flex	Boardings per revenue hour	Cost per revenue hour
Urban Demand Response	Boardings per revenue mile	Cost per revenue mile
Rural Demand Response	Boardings per revenue hour	Cost per revenue hour
Commuter	Boardings per trip	Cost per revenue hour
Circulator/Parking	Boardings per revenue mile	Cost per revenue mile
Targeted Shuttles	Boardings per revenue hour	Cost per revenue hour

Benchmarks

For each route class, a benchmark is set based on the FY19 performance for services in that class. In general, the benchmark separates the lowest performing or highest cost 20-30% of services from the rest of the class. As noted earlier, these benchmarks are intended to be used as a diagnostic tool to help identify routes and services that could benefit from analysis and planning. This applies both to services funded by NHDOT and services operated by urban agencies using their direct funding from FTA.

Table 23 shows the routes and services that are members of each of the classes and the proposed benchmarks for productivity and cost efficiency for each class. For cost effectiveness, benchmarks for both gross cost per passenger and net cost per passenger are proposed so that either measure can be used depending on an agency's fare policy.

Table 23 Route Class Members and Proposed Benchmarks

Class	System	Routes	Productivity	Cost-Efficiency	Gross Cost/Pass	Net Cost/Pass
Urban	NTS	1, 2, 2A, 4, 5, 6, 6A, 7, 8, 9, 10, North, South, Central	0.5 boardings per mile	$7 per mile	$11 per passenger	$10 per passenger
	MTA	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12				
	CAT	Heights, Penacook, Crosstown				
Small Town	AT	Blue, Brown, Orange, Red	7.5 boardings per hour	$100 per hour	$12 per passenger	$11 per passenger
	COAST	1, 2, 6, 33, 40/41				
	VNA-HCS	City Express Black & Red				
Rural/ Flex	TCCAP	Berlin-Gorham, Tri-Town	2.0 boardings per hour	$65 per hour	$20 per passenger	$20 per passenger
	SCT	Charlestown, Claremont, Newport				
	CART	Salem, Derry-Londonderry/ Hampstead				

Class	System	Routes	Productivity	Cost-Efficiency	Gross Cost/Pass	Net Cost/Pass
Urban Demand Response	NTS	ADA paratransit	0.12 boardings per mile	$8 per mile	$60 per passenger	$60 per passenger
	MTA	Rte 48, 49, ADA paratransit				
	CAT	ADA paratransit, Senior Transit				
Rural Demand Response	NTS/SVTC	Demand response	1.0 boardings per hour	$90 per hour	$50 per passenger	$50 per passenger
	AT	ADA paratransit				
	COAST	ADA paratransit, Route 7, Portsmouth Senior, NEMT				
	TCCAP-NCT	Senior Wheels, Freedom Express, LRH Care-a-van				
	TCCAP-CCT	Senior Wheels, Freedom Express				
	SCT	Dial-a-ride				
	CART	Demand response				
	VNA-HCS	Friendly Bus, Medical Express				
Commuter	COAST	Clipper Routes	7 boardings per trip	$140 per hour	$20 per passenger	$18 per passenger
	MTA	Concord Express, Nashua Express				
Circulator/ Parking	AT	Dartmouth/Downtown, DHMC Shuttles	.75 boardings per mile	$9 per mile	$10 per passenger	$10 per passenger
	COAST	Portsmouth Parking, Portsmouth Vintage Trolley				
	MTA	Green Dash				
	NTS	Downtown Connector				
Targeted Shuttles	MTA	42-45 Shoppers, 31 Hampton Beach, 32 Deerfield Fair	8 boardings per hour	$100 per hour	$10 per passenger	$10 per passenger
	NTS	Extra services				
	UNH	3, 4, 5, Campus Connector				
	VNA-HCS	Campus Shuttle				

Application of Evaluation Measures

As described above, NHDOT intends to use the evaluation framework as an ongoing tool to assist New Hampshire transit providers to improve their services. Additionally, these measures will be incorporated into grant application forms for new service proposals. Agencies will be asked to place their proposed service into one of the above classes and then demonstrate, through ridership and cost forecasts, that the service will achieve at least the minimum performance benchmarks within three years. A template for such a grant application is provided in Appendix I.

9. FUNDING AND SUSTAINABILITY

Excluding intercity bus services,[6] the total annual operating cost for bus service in New Hampshire operated by transit agencies is about $17 million. These agencies spend an additional $5 million on demand-response transportation.

To support that expenditure of $22 million, the state receives approximately $7 million in federal funding for operations in urban areas (section 5307) and $4 million in federal funding for non-urban areas (section 5311). Some 15% of the non-urban funding is set aside to support rural intercity bus service. There is an additional $1.1 million in federal funding for the Enhanced Mobility of Seniors and Individuals with Disabilities program, but that is mainly used for capital and purchase of service, rather than direct operating expenses. NHDOT also "flexes" about $800,000 in federal highway funding to the transit program for the purchase of additional demand response service. Federal operating funds need to be matched with non-federal funds at a one-to-one ratio (50/50 federal), but funds for capital and purchase of service require a match of only one non-federal dollar for each four federal dollars (80/20 federal).

Besides the federal funding, the transit service is paid for through fare revenue (about $1.7 million) and other forms of local financial support, including municipal contributions, institutional partnerships (such as with hospitals and universities), and other private sector donations from individuals or corporations. The University of New Hampshire pays directly for the service it operates, in the amount of $2,745,060 in SFY2019. In State FY2020, the New Hampshire legislature approved $200,000 in State funds to support transit operations after many years of spending no State dollars on transit.

Throughout the public outreach process in the SSTA, stakeholders and members of the general public asserted that the level of transit service in New Hampshire was inadequate, both in terms of there being large areas of the state with no service at all, and that the areas that do have service are underserved with buses not running long enough hours or frequently enough. The analysis and development of service concepts in chapters 4 and 5 addressed some of the most prominent geographic gaps in service. The next section compares the level of service operated by New Hampshire transit agencies to their peers across the nation.

Peer Analysis of Existing Service Levels

The goal of the peer analysis was to compare the amount of service operated by New Hampshire transit providers to other agencies in the US that serve areas with a similar population and geographic extent. The National Transit Database (NTD) provides information on the service area population and square mileage for all urban transit operators. While not all agencies calculate population and service area in exactly the same way, and another region with similar population and extent may not be a perfect analog for a portion of New Hampshire (because of development patterns and economic conditions), the comparisons using the NTD are the best available basis for judging the relative adequacy of transit service in New Hampshire.

The study team developed a separate set of peers for each of the four urban transit agencies in New Hampshire, and then developed a peer group for the three larger rural agencies and one more for the two smaller rural agencies. Tri-County CAP was treated as one transit agency, rather than two separate ones (North Country Transit and Carroll County Transit). A set of peers was not developed for UNH Wildcat service, since its operations are not funded through NHDOT, and it is also a university-focused system rather than one designed for the general public.

[6] The annual subsidy for Concord Coach is about $300,000 and the subsidy for Boston Express is about $1.5 million. The subsidy covers about 60% of Concord Coach's cost for the two North Country intercity routes (roughly $500,000). The operating cost for Boston Express is much higher, over $16 million, but fare revenue covers more than 90% of the cost.

While the peer comparisons for the three large urban systems are robust, with 17-20 peer systems in each group, the comparisons for CART and for the rural systems are more tenuous. CART is an unusual system for an urbanized area, and so only 9 peer systems were found. On the rural side, there were 10 peer systems found for each of the two groupings, but these peers are urban reporters, while the New Hampshire systems are rural reporters. The rural reporting status of the New Hampshire systems means that the service area and population needed to be estimated (and thus was not developed on the same basis as the NTD peers). The Rural NTD does not gather and publish enough information to allow for a direct comparison of New Hampshire rural systems to other rural systems on the basis of population and geographic area.

With those caveats in mind, the analysis nonetheless tells a consistent story about the level of investment in transit service in New Hampshire compared to the rest of the country. With the exception of CART, all of the statistics presented below concern bus service and exclude demand-response service. For CART, since a large portion of its service is demand response the peer data include both bus and demand response.

Manchester Transit Authority

A set of 19 peer agencies was selected for MTA. As can be seen in Table 24, the average service area size among the peers matches MTA's exactly and the population is within 8% of the Manchester figure. Despite those similarities, MTA operates only about 60% of the amount of service operated by the peers, in terms of peak vehicles and annual operating expense. The total vehicle revenue hours operated by MTA is closer to the peer average, nearly 80% of the peers.

Table 24 MTA Statistics and Comparison to Peers

Item	MTA	Peer Average
Service Area	63 sq. mi.	63 sq. mi
Population	135,366	124,996
Bus VOMS*	13	22
Annual VRH**	48,529	60,719
Annual Operating Expense	$3.29 m	$5.55 m

* Vehicles operated in maximum service
** Vehicle revenue hours

These comparisons indicate that MTA's service is more consistent through the day than the peer agencies, as it operates a higher number of hours per peak bus. Indeed, all of MTA's routes have a consistent headway for the entire day, with no boost in peak service. In addition, the cost per hour for MTA is somewhat lower than that of the peers: about $68/VRH vs. $91/VRH for the peers.

Agency	State
City of Huntsville	AL
Solano County Transit	CA
Mesa County	CO
Transfort	CO
Bay County Transportation Planning Org.	FL
Macon-Bibb County Transit Authority	GA
Sioux City Transit System	IA
Springfield Mass Transit District	IL
South Bend Public Transportation Corp.	IN
Topeka Metropolitan Transit Authority	KS
Greater Portland Transit District	ME
Duluth Transit Authority	MN
City of Columbia	MO
Town of Cary	NC
UNH - University Transportation Services	NH
Las Cruces Area Transit	NM
City of Murfreesboro	TN
City of Tyler	TX
Wichita Falls Transit System	TX

Nashua Transit System

A set of 17 peers was selected for NTS. As can be seen in Table 25, the average service area size among the peers is within 9% of the area of Nashua, and the population is within 3% of the Nashua figure. Despite those similarities, NTS operates only about 40% of the amount of service operated by the peers, in terms of peak vehicles and annual operating expense, and about 53% in terms of revenue hours of service. Thus, Nashua only operates about half as much service as its peers do. Among the 17 peers, only the City of Turlock operates fewer buses than Nashua does in peak service.

Table 25 NTS Statistics and Comparison to Peers

Item	Nashua	Peer Average
Service Area	32 sq. mi.	35 sq. mi
Population	86,933	89,207
Bus VOMS*	9	21
Bus WD VRH**	113	215
Annual VRH	32,981	62,284
Annual Operating Expense	$1.86 m	$4.99m

* Vehicles operated in maximum service
** Weekday vehicle revenue hours

Agency	State
City of Scottsdale - Scottsdale Trolley	AZ
City of Turlock	CA
Iowa City Transit	IA
Decatur Public Transit System	IL
Bloomington Public Transportation Corp.	IN
Gary Public Transportation Corporation	IN
City of Lawrence	KS
City of Plymouth	MN
St. Cloud Metropolitan Transit Commission	MN
ART (Asheville Redefines Transit)	NC
Mid Mon Valley Transit Authority	PA
Beaumont Municipal Transit System	TX
Cache Valley Transit District	UT
Greater Roanoke Transit Company	VA
Yakima Transit	WA
Eau Claire Transit	WI
Kenosha Transit	WI

As in Manchester, the fact that vehicle revenue hours operated is a bit closer to the peer average than VOMS or operating expense reflects the fact that Nashua's schedule does not have any additional service in peak periods, but rather consistent service throughout the day.

COAST

A set of 20 peers was selected for COAST. The service area for COAST sprawls over 368 square miles, by far the largest service area in New Hampshire. Many of the peer agencies are whole counties. As can be seen in Table 26, the average service area size among the peers is within 5% of COAST's area, and the population is within 3% of the COAST figure. Similar to Nashua, COAST operates only about half as much service as its peers do, on average. All of the statistics in the table are between 49% and 56% of the peer averages. Only three agencies operate fewer peak vehicles than COAST: Lebanon Transit Authority in Pennsylvania and Medina County and Delaware County in Ohio.

Table 26 COAST Statistics and Comparison to Peers

Item	COAST	Peer Average
Service Area	368 sq. mi.	351 sq. mi
Population	166,975	171,654
Bus VOMS*	14	29
Bus WD VRH**	154	276
Annual VRH	41,941	81,237
Annual Operating Expense	$3.82 m	$7.05 m

* Vehicles operated in maximum service
** Weekday vehicle revenue hours

Agency	State
Butte County Association of Governments	CA
Imperial County Transportation Commission	CA
Transit Joint Powers Authority for Merced County	CA
Southeast Area Transit	CT
Indian River County	FL
Chatham Area Transit Authority	GA
Madison County Transit District	IL
Berkshire Regional Transit Authority	MA
Cape Cod Regional Transit Authority	MA
County Commissioners of Charles County, MD	MD
Bay Metropolitan Transit Authority	MI
Cape Fear Public Transportation Authority	NC
Tompkins Consolidated Area Transit	NY
Delaware County Transit Board	OH
Laketran	OH
Medina County Public Transit	OH
Portage Area Regional Transportation Authority	OH
Beaver County Transit Authority	PA
County of Lebanon Transit Authority	PA
Chattanooga Area Regional Transportation Auth.	TN

CART

A set of 9 peers was selected for CART. The service area for CART is relatively large, but still only half that of COAST. As can be seen in Table 27, the average service area size among the peers is within 8% of CART's area, and the population is within 2% of the CART figure. Among all of the urban providers, CART operates the least amount of service in comparison to its peers. Even including both bus and demand-response service (for both CART and the peers), CART only operates 36% as many vehicles and 21% as many revenue hours. The total operating cost is also only 22% of the peer total.

Table 27 CART Statistics and Comparison to Peers

Item	CART	Peer Average
Service Area	172 sq. mi.	187 sq. mi
Population	112,897	110,873
Bus VOMS*	8	22
Annual VRH**	6,912	33,467
Annual Operating Expense	$539,811	$2,494,992

* Vehicles operated in maximum service
** Vehicle revenue hours

Agency	State
Tuscaloosa County Parking and Transit Auth.	AL
Peoria Transit	AZ
Douglas County Rideshare	GA
River Parishes Transit Authority	LA
Lake Erie Transit	MI
Cape May County Fare Free Transportation	NJ
Cleveland Area Rapid Transit	OK
Shenango Valley Shuttle Service	PA
Fredericksburg Regional Transit	VA

Larger Rural Systems

Three of the rural systems in New Hampshire were grouped as larger systems based on the estimated size of their geographic reach and service area population. These systems are Advance Transit, Tri-County CAP (including both North Country Transit and Carroll County Transit) and Sullivan County Transit. The estimated sizes are shown below in Table 28. These service areas and populations do not include territory served only by demand response transit (which for Tri-County CAP covers three entire counties). Overall, the 10 peer systems chosen have a somewhat smaller service area and a somewhat higher population; the resulting higher population density reflects the fact that the peers are urban systems rather than rural ones.

Among three New Hampshire rural systems, Advance Transit is clearly different from the other two, and indeed, Advance Transit is different from every other transit system in New Hampshire. While TCC and SCT operate about a third of the service of the 10 peer systems, Advance Transit operates 50% more peak vehicles, nearly three times as many revenue hours and spends almost 4 times as much in operating expenses.

Table 28 Larger Rural Systems Statistics and Comparison to Peers

Item	Peer Avg.	AT	TCC	SCT
Service Area	28 sq. mi	45 sq. mi.	45 sq. mi.	36 sq. mi.
Population	30,670	30,000	15,000	20,000
Bus VOMS*	12	18	4	6
Annual VRH**	15,011	43,068	5,782	4,127
Annual Operating Expense	$927,124	$3,698,664	$276,066	$254,981

Agency	State
Intracity Transit	AR
Citrus County Transit	FL
Liberty Transit	GA
Michigan City Transit	IN
Goldsboro-Wayne Transportation Auth.	NC
Municipality of Barceloneta	PR
Bristol Tennessee Transit System	TN
Asotin County PTBA	WA
Wausau Area Transit System	WI
Weirton Transit Corporation	WV

* Vehicles operated in maximum service
** Vehicle revenue hours

Smaller Rural Systems

The two rural systems grouped in the "smaller" category are VNA-HCS in Keene and Concord Area Transit. Compared to the set of 10 peers, Keene is smaller and Concord is larger, both geographically and in population. The service levels of both agencies are lower than the peers with both operating fewer than half the peak vehicles of the peers, but Keene operating about 60% of the service and Concord operating about 70% of the service.

Table 29 Smaller Rural Systems and Comparison to Peers

Item	Peer Avg.	VNA-HCS	CAT
Service Area	13 sq. mi	8 sq. mi.	18 sq. mi.
Population	25,120	20,000	30,000
Bus VOMS*	7	3	3
Annual VRH**	11,280	7,184	8,241
Annual Operating Expense	$822,186	$455,659	$531,026

Agency	State
Twin Cities Area Transportation Authority	MI
Southeast Missouri State University	MO
East Windsor Township	NJ
City of Kingston Citibus	NY
Watertown CitiBus	NY
Steel Valley Regional Transit Authority	OH
Anderson Transit Authority	SC
Bristol Virginia Transit	VA
City of Winchester	VA
City of Beloit Transit System	WI

* Vehicles operated in maximum service
** Vehicle revenue hours

Summary of Peer Findings

With the significant exception of Advance Transit, all of the urban and rural transit systems in New Hampshire operate substantially less service than their peers, in spite of the peers serving similar populations and land areas. Most of the urban systems operate about half of the service of the peer agencies, while MTA operates somewhat more than half. CART operates only about a fifth of the service that its urban peers do.

In the rural areas, TCC and SCT operate about a third of the service of their peers, while VNA-HCS in Keene and Concord Area Transit operate somewhat more than 50% of the peer service level. Advance Transit's high level of service, about triple that of the peer group, reflects its strong relationships with Dartmouth College and Dartmouth-Hitchcock Medical Center, its efforts at attracting philanthropic donations, as well as the higher level of financial support it receives from Vermont.[7]

Survey Results on Funding

The online survey conducted as part of the public outreach effort in the summer of 2019 included several questions aimed at gauging public support for an expanded transit system. While the survey was not a statistically valid sample, the respondents represented a broad cross-section of the state and not just transit advocates. Among the 988 total responses, some 200 cities and towns were represented, with somewhat higher representation among the counties in the northern tier and somewhat lower representation along the southern tier. Almost all of the respondents (92%) had a car available for their use, and most of the respondents (58%) had never used public transit in New Hampshire. Another 24% said they used some form

[7] An analysis similar to the one performed here shows that Vermont transit properties operate about double the amount of service compared to national peers. This is possible because of the $8 million in State funding that Vermont spends on transit as well as the nearly $20 million in federal highway funding that Vermont flexes into the transit program.

of public transit only once a year. Thus 82% of the respondents rarely or never use public transit services. Only 5% of respondents said they were frequent users of public transit (riding once a week or more).

Three specific questions related to the issue of public support for more transit service. Question 3 asked "What types of changes would you like to see to local bus services, either in your area or on a statewide basis?" As mentioned earlier in the section on proposed local routes, only 4% said that local service should be reduced and 6% said that the system should stay as it is. The other 90% of respondents supported an increase in service, either with more service on existing routes (23%) or wholly new bus routes in currently unserved areas (67%).

Question 9 asked more generally about the role of public transportation in New Hampshire. Respondents were given three options to choose from. The results are shown in Figure 28 on the next page. Only 12% of respondents felt that public transit should be limited to a role as a social service. Another 22% said that transit service should be mainly limited to urbanized areas. Two-thirds of respondents felt that public transit should be a viable option for all New Hampshire residents, even people living in rural areas.

The third question asked, "What should happen to government spending on public transportation in NH?" As shown in Figure 29, an overwhelming majority felt that spending should rise, and nearly a third of respondents felt that spending should rise significantly (more than 25%). Only 6% of respondents felt that spending should drop from current levels.

Taken together, these responses are strong evidence for public support of expanded service. Given that most New Hampshire transit systems are operating at about half the level of their national peers, a persuasive case can be made that increased investment in public transit would be a popular initiative and that transit is currently underfunded.

Figure 28 Role of Public Transit in New Hampshire

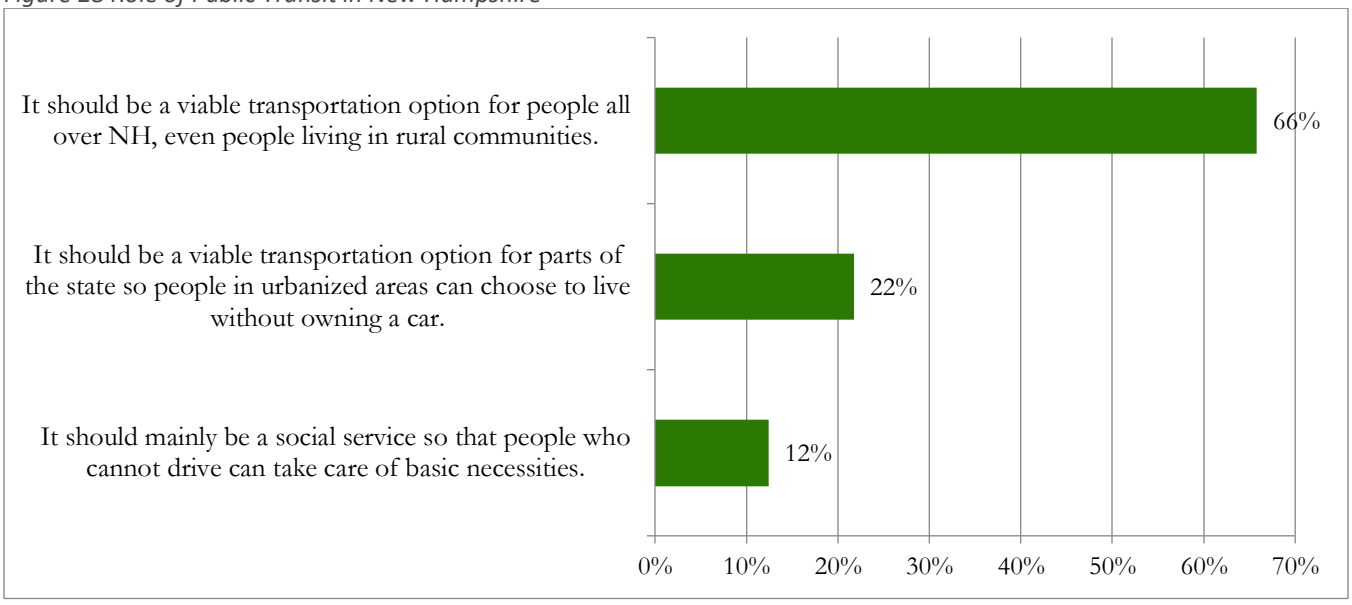
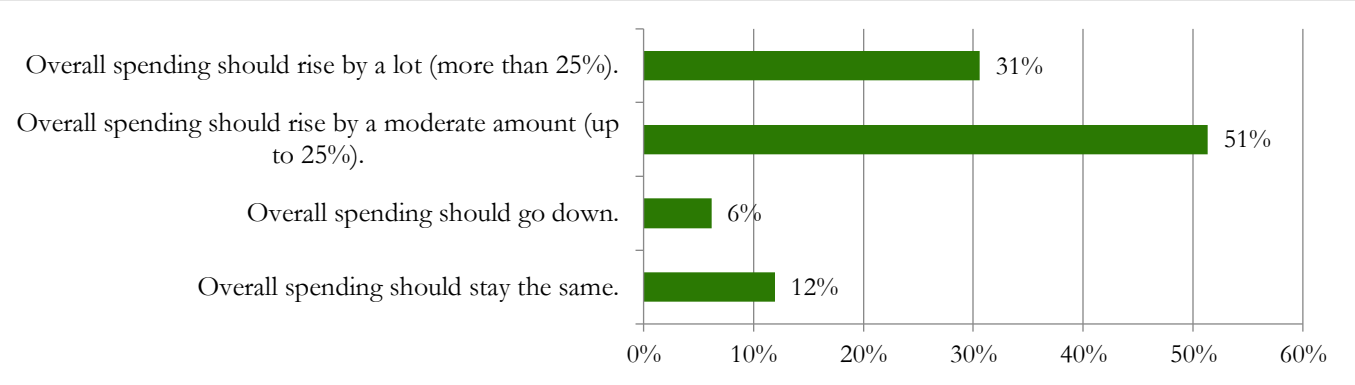


Figure 29 Future Spending on Public Transit in New Hampshire



Current Status of Funding

The operating budget of the public transit program in New Hampshire currently depends almost entirely on funds from the Federal Transit Administration (FTA), matched by local dollars as necessary. Some $800,000 is transferred from the federal highway program to support demand response transit service. For the first time in many years, New Hampshire allocated some State funds to support public transit, with $200,000 approved.

For the sake of comparison, Table 30 below shows the primary sources of public funding for transit in New Hampshire and its two closest peer states, Vermont and Maine. These figures for fiscal year 2019 exclude capital funding and planning funds and thus represent operational funding for bus and demand response service. The figures include subsidies for rural intercity bus routes. It is important to note that allocations from FTA are set by national formulas based on population and other factors. Other than through Congressional action, the states exert no control over the amounts of these allocations.

Table 30 Northern New England Operating Funding Comparison (FY 2019)

Funding Source	New Hampshire	Vermont	Maine
FTA Urban (5307)	$7,391,160	$3,396,472	$5,250,000
FTA Rural (5311)	$4,551,832	$3,650,000	$5,300,000
FHWA Flex (CMAQ, STP, Other)	$2,019,137	$15,057,613	$1,200,000
State	$200,000	$7,092,903	$900,000
Local	$5,850,000*	$6,080,720	$10,700,000
TOTAL	$20,012,129	$35,277,708	$23,350,000

*Estimated

State funding for public transit in Vermont comes from the Transportation Fund, which derives its revenue from motor fuels taxes, the purchase and use tax, and vehicle registration fees. The fund generates about $280 million annually; thus, about 2.5% of the fund pays for transit operations. State funding for public transit in Maine comes from a rental vehicle tax, which generates about $9 million annually; public transit thus gets about 13% of that revenue.

Local funding for all three states is a mixture of municipal funding and private sector and institutional funding. Municipal funds come either exclusively or primarily from property taxes depending on the state and municipality. In Vermont, some cities and towns have local option sales taxes that can generate revenue. Vermont communities also have the option of redirecting funds from the state-funded Town Highway

Program to public transit, but none currently do so. In New Hampshire, cities and towns collect vehicle registration fees and are permitted to add $5 to each fee to be kept by the town and used for transportation purposes, including funding public transit. As of the summer of 2017, some 34 communities chose to impose this fee, mostly at the $5 level and used a portion to support public transit. In Maine, property taxes are the sole source of municipal funding. In all three states, transit agencies work with hospitals, universities, employers and donors to generate additional local funding.

Options for Future Funding

NHDOT is currently pursuing an additional $2 million per year in flexible highway funding to be used for public transit in its Ten-Year Transportation Improvement Plan. Approval is anticipated later in 2020.

Every year, FTA releases Notices of Funding Opportunities for grant programs, many of which promote innovations and experimentation in new types of services. New Hampshire has applied for some of these and been successful, and should consider and pursue future opportunities as they come available. Few of these support direct operations, but many of them can be used for pilot projects.

A range of state and national studies have considered other options for funding public transit at the state and local level. Almost all of them include new taxes or fees of some type. A recent study in Vermont identified the following options:

- **Set-aside for transit from new statewide revenue source**
- **Member assessments from new regional transit authorities**
- **Dedicated regional sales or payroll tax**
- **Local vehicle registration fees**
- **Local mortgage recording tax**
- **Local development contributions**
- **Employer-based unlimited access programs**
- **Local option sales tax**

Of these, the local vehicle registration fee option is already available in New Hampshire, but most of the others would require enabling legislation from the New Hampshire legislature. All of these options are currently employed somewhere in North America.

10. CONCLUSION

The future of public transit in New Hampshire is up to the voters and their political leaders. There is ample evidence that transit is underfunded statewide, with low levels of service in the largest cities relative to their nationwide peers and significant gaps in service in the more rural parts of the state. While demand response service fills some of the gaps in the rural areas, it, too, according to input received during this project (see page 12), does not fully meet the needs of New Hampshire's vulnerable populations.

By a large majority, respondents to the online survey stated that public transit should not just be a social service, but should rather be a viable transportation option for all residents of the Granite State. They also voiced strong support for increasing the amount of spending on public transit.

The SSTA has identified some of the most obvious unmet needs for transit service and proposed solutions to address those needs. Further, investments in new Park & Ride lots and transit technology will help to increase access to the transit system, improving its long-term sustainability. The policy goals articulated in Chapter 2 of this document are intended to help NHDOT and other decision-makers to pursue those investments that are most effective at achieving the priority objectives.

The transit system will not change overnight. This transformation will require a cooperative effort among NHDOT, urban and rural transit providers, regional planning commissions, advocacy organizations, New Hampshire elected officials, and the New Hampshire congressional delegation. A concerted effort to secure additional funding and successful implementation of new services and capital projects will promote the viability of the transit system and allow it to become the attractive travel option that most New Hampshire residents want it to be.

Statewide Strategic Transit Assessment Appendices

with

RSG, Inc.

McFarland Johnson

Schweiger Consulting, LLC

January 31, 2020

APPENDIX A: MEMORANDUM ON NHDOT POLICY

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MEMORANDUM

To: **Fred Butler and Shelley Winters**

From: **Stephen Falbel**

Re: **NHDOT Public Transportation Policy**

Date: **May 11, 2018**

This memorandum presents the results of an analysis of a potential policy statement regarding public transportation for NHDOT. The analysis consists of three parts: the elements of policy for operational and capital spending; a tabulation of recent (FY2017) spending for each of the policy elements; and the results of a survey of ten transit providers regarding priorities among the policy elements. Following this analysis is a draft policy statement specifying recommended priorities. ***This document is intended to pertain to new projects under the purview of NHDOT that use FTA funding. The continuation of existing service is considered a priority.***

Policy Elements

Spending on Operations

The funds controlled by NHDOT currently support a wide range of types of services across the state from demand response service in rural areas to urban local service and commuter express service. Planning documents on a statewide or regional basis look to a policy statement to provide guidance on how the system should grow; that is, what are the priority needs that should be addressed when new funding is available. The policy elements in descending order of priority are as follows:

- **Basic mobility for transit-dependent people** – This type of service is often called "lifeline" service as it provides mobility for essential needs such as grocery shopping, medical appointments, and other personal business. This service is often focused on people with disabilities, older adults, and low-income individuals, all of whom may be unable to drive or to afford a personal vehicle. For many people these needs are addressed by family members, friends, neighbors, or community volunteers, but some people have no access to such resources.
- **Access to employment for transit-dependent people** – Service that allows people who may not have a car or be able to drive to get to their jobs is extremely valuable to low-income households. Being able to commute to work is the key to upward mobility for these individuals. This policy element is related to basic mobility, but is more focused on the work trip and service during commuting hours.
- **Maximizing ridership and efficiency** – Public transportation works most efficiently in densely developed areas where many people are traveling in specific corridors. In such areas, frequent transit service becomes an attractive alternative to driving, drawing people out of their cars and reducing traffic congestion.

- **Supporting economic vitality** – The availability of public transportation allows for increased development without the need for increased parking. Compact urban design, facilitated by public transportation, is the most sustainable form of economic growth.
- **Attracting millennials/choice riders** – There is strong evidence that the current generation in their 20s are delaying purchasing automobiles and are more open to using public transportation. They are also more likely to live near city centers than older people. Providing a convenient alternative to driving for this generation could lead to long-term transit use as they age.

One more policy, which is qualitatively different from the others, but which will apply to all operating grants is as follows:

- **Use of the lowest cost mode** – There are many forms of public transportation and they have a wide range of cost per unit of service provided. A transit provider should seek to use the lowest-cost means of serving demand on a per-passenger basis. For rural areas, this will usually mean demand-response service with volunteer drivers. For small towns it is typically demand-response or deviated fixed-route service. For urban areas, it is likely fixed route service.

Spending on Capital Infrastructure

The State of New Hampshire has put an emphasis on investment in capital infrastructure, especially with regard to state-contracted commuter bus service. State policy regarding capital investments includes the following elements in descending order of priority:

- **Transit fleets must be in a state of good repair** – A large component of the public's perception of public transit is formed by the vans and buses that operate the service. In order to promote the concept that transit is for everyone, not just transit-dependent populations, vehicles must be maintained well, kept clean, and replaced in a timely manner. Enhanced amenities, such as comfortable seating, Wi-Fi, and noise reduction, are also worthwhile investments.
- **Passenger facilities are an essential part of the public transportation system** – While providing the appropriate type and level of service is critical to the efficiency of the system, passenger facilities are essential to making the system attractive and visible to all members of the public. Riders must feel safe and comfortable at bus stops and transit stations. Investments in facilities make the system more visible to all, and show that transit riders are not considered second-class citizens compared to people who drive automobiles.
- **Safe pedestrian access to and from bus stops is essential** – Virtually all transit riders become pedestrians at one or both ends of their trip. Sidewalks, crosswalks, crossing signals, and safe places to wait for the transit vehicle are essential elements of a successful public transportation system. As facilities are constructed, provisions must be made for maintenance and snow-clearing during the winter months.
- **Maximize use of technology** – The proliferation of smartphones allows for information about transit operations to be disseminated to the riding public much more cheaply than was possible in the past. Transit providers should make maximum use of this technology to communicate with passengers about bus arrival times, delays, schedule changes, and demand response options. Trip planning software for riders has been available for several years and is encouraged for all transit operations.

Spending on Planning

Planning funds will continue to be distributed on a case-by-case basis in response to requests from the regions, and thus should not be controlled by overall policy goals on operating and capital spending. NHDOT currently expends all available planning funds on local or statewide studies, but stakeholders believe that additional planning work could result in the more effective use of operating funds, helping parts of the state with underperforming services to increase ridership and reduce the cost per rider.

Current Spending by Policy Element

Using FY2017 budget figures provided by NHDOT, Steadman Hill Consulting prepared an analysis of spending by federal program by policy element. As shown in the table below, the analysis covered five programs (or sub-programs) for operating expenses and three programs for capital expenses. The figures represent federal dollars, not including local match.

The allocation by policy element for operations was done primarily on the basis of geography. For the most part, spending in rural areas was categorized under basic mobility, while spending in more urbanized areas was placed under some of the other categories. Planning funds in Section 5305 were distributed based on the nature of the planning effort. While Section 5311—the largest funding program—was used by three of the five rural providers exclusively to provide basic mobility, the others split the 5311 funding in the following way: for the CNHRPC region (CAT), 50% of the funds were attributed to basic mobility while the other 50% were for access to jobs; for the Upper Valley region (Advance Transit), 20% of the funding was for access to jobs, 40% was for maximizing ridership, and the remaining 40% was for economic vitality. These splits were done in consultation with NHDOT, and while they are judgment calls, they reflect the environment and the stated policies of the transit operators.

FY 2017 Spending by Program and Policy Element (FTA Dollars)

Program	Basic Mobility	Access to Jobs	Maximize Ridership	Economic Vitality	Attract Millennials	Totals
5305 Planning	$44,708.45	$78,580.95	$115,412.80			$239,187.20
5310 POS	$917,282.08					$917,282.08
5310 RCC	$753,727.00					$753,727.00
5311	$1,418,864.00	$622,334.80	$652,139.60	$652,139.60		$3,345,467.00
5311(f)	$202,137.62					$202,137.62
Totals	$3,736,793.10	$701,315.75	$767,552.40	$652,139.60	$0.00	$5,357,800.85
	60%	13%	14%	12%	0%	100%

CAP TAL	Passenger Facilities	Access to Stops	Vehicles	Technology	Other (Ops Facility, service veh, equipmt)	Totals
5310 Capital			$403,750.00	$8,000.00	$8,000.00	$419,750.00
5339 Capital			$1,822,852.00	$14,000.00	$357,472.40	$2,174,324.40
5339 Bike-Ped	$27,329.60					$27,329.60
Totals	$27,329.60	$0.00	$2,226,602.00	$22,000.00	$365,472.40	$2,621,404.00
	1%	0%	84%	1%	14%	100%

It is important to note that this analysis does not include Section 5307 urban funds which pass directly from FTA to the urban regions in Manchester and the Seacoast. If the urban regions were

included, the four policy elements other than basic mobility would see higher percentages of the total, and attract millennials would have been attributed some funding.

The allocation by policy element for capital was simpler, because it was relatively easy to categorize the capital spending into one of the four elements, or to recognize that the spending was for something else that did not fit neatly into one of the elements (such as a maintenance facility or a service vehicle).

As can be seen in the table, about 60% of federal funds for operating expenses are spent on basic mobility, with three other categories accounting for about 13% each. For capital spending, the vast majority in FY2017 was for vehicles, with almost all of the rest going to miscellaneous items not covered by the four policy elements. The majority of this "miscellaneous" spending was for upgrades to the bus maintenance facility at UNH Wildcat transit.

Survey Results

In July, the policy elements listed above were distributed to all of New Hampshire's transit providers, and they were asked to respond to a short survey on Survey Monkey to indicate their policy preferences. Specifically, they were asked to rank the operations and capital policy elements (separately) in order of preference.

They were also asked about which measures should be used to determine how to cut funding, should that be necessary, and to rank four options in order for any potential new funding that might come available. The options for measures to use to prioritize spending cuts were cost per hour/mile, cost per passenger, ridership per hour/mile, or demographic characteristics of need. The options for investment of new potential funding were increased frequency on existing routes, increased span of service on existing routes, new routes, or funding to all regions for general public demand response service.

The results of the survey largely reflected the environment and the type of service operated in each region. The table below shows the results for the first two questions on ranking the operating and capital spending policies. Note that two responses were received from SCS (in the Claremont-Charlestown area), but only one response was received from the other regions. In order that the weighting be equal, the two SCS responses were averaged. The regions are generally listed in order from north to south and west to east, but not without exception. The most rural areas are listed first.

Survey Results for Operating Spending Priorities

Policy	TriCounty	SCS	VNA@HCS	AT	CNHRPC	MTA	CART	Nashua	UVLSRPC	COAST	Averages
Basic mobility	1	2	1	5	1	5	1	1	1	2	2.5
Access to employment	2	2.5	4	3	3	2	2	2	3	3	2.7
Maximizing ridership	4	5	2	2	2	1	3	4	1	5	3.1
Supporting economic vitality	5	1	3	1	4	4	3	5	5	1	3.2
Attracting millennials	3	2.5	5	4	5	3	4	3	2	4	3.6

Overall, basic mobility received the highest ranking statewide, and it was the number one priority for five regions and the number two priority at COAST. For the other four regions, it ranked last or second to last.

Access to employment received the next highest ranking, and it was the number two or three choice of almost all of the regions. Only the Keene region (VNA@HCS) ranked it as low as fourth.

Maximizing ridership was ranked high by five of the regions, but low by the other five; there was no middle ground for this options. It tended to be ranked more highly by the more urbanized areas, including Manchester, the Upper Valley, UNH, Keene and Concord.

Supporting economic vitality was the most important policy for three of the regions, but ranked low for the other regions. Finally, attracting millennials ranked lowest overall, but it was a relatively high priority in the UNH region, as well as in SCS, Nashua and Manchester, the last of which has a growing population of young professionals.

With regard to capital spending, there was much more consensus across the state. As shown in the table below, "vehicles" was the clear winner for priority, followed by technology. It should be noted that in the Concord region, the RPC answered the survey in place of CAT, and thus likely showed more interest in passenger accommodations (shelters and pedestrian access) and less interest in vehicles than the transit operator might have shown.

Survey Results for Capital Spending Priorities

Policy	T1County	SCS	VNA@~CS	AT	CNHRPC	MTA	CART	Nashua	UVx	COAST	Averages
Passenger facilities	4	3.5	4	4	1	3	4	4	4	4	3.4
Safe pedestrian access	3	3.5	2	2	2	4	2	3	3	3	2.8
Vehicles	1	2.5	1	1	4	1	1	1	1	2	1.6
Technology	2	2.5	3	3	3	2	3	2	2	1	2.4

For the remainder of the survey, there was some consensus that demographic characteristics of need should be the primary measure to determine where service cuts are made if necessary (seven votes), followed by ridership measures (four votes) and cost per passenger (three votes).

There was little consensus on the priorities for new spending, and as shown in the table below, three of the options came out with the same overall score. Spending on new routes came out slightly ahead of the others, but in general, the responses were highly varied.

Survey Results for New Spending Priorities

Policy	T1County	SCS	VNA@~CS	AT	CNHRPC	MTA	CART	Nashua	UVx	COAST	Averages
Increased frequency	3	3.5	4	1	3	2	3	4	1	1	2.6
Increased span	4	3	3	2	4	1	1	2	2	4	2.6
New routes	1	2.5	2	3	1	3	4	1	3	2	2.3
Diff funding	2	1	1	4	2	4	2	3	4	3	2.6

Respondents were also given the opportunity to offer any comments. The results are as follows:

- Please keep in mind that rural services have very different needs and priorities than the city and urban areas. Therefore the delivery of those services are very different.
- I think that having statewide policy is a good idea, I hope that it will be flexible enough to accommodate the vastly different demographics that we have here in NH. The issue of using population density to base funding decision could really hurt more rural areas of the state, unless a viable alternative transportation option for these areas is developed. VDP programs are helpful, but not the solution.
- Hopefully funding remains, at the very least, steady. Right now I think we do a good job in NH meeting transportation needs in a challenging region. If funding is cut we need to remember to focus on those who rely on public transportation to meet their basic needs.

- AT's focus on providing a viable way for people to commute to/from work has helped to focus resources, maximize ridership, attract "choice" riders, and at the same time assist more mobility dependent riders. All while lowering per trip cost and maximizing local revenue.
- NHDOT should focus on the highest ridership services and build success there to strengthen the second highest ridership and so on. In this way, a strong network across the state can be created with a vast array of supporters and stakeholders rather than a fragmented series of small services with little to no connection between communities or regions.
- Expanding volunteer driver program capacity will be key to providing basic lifeline transportation in many rural communities. Capacity to provide accessible service will be needed in tandem. Continued work to secure state funding is also needed, to provide a share of match requirements.

Consideration of 5310 and 5311 Programs

As was shown earlier, NHDOT allocates about 60% of its federal funding toward basic mobility. If one looks just at the 5311 program (excluding intercity funding), about 40% of that program is devoted to basic mobility, with about 20% going to access to jobs, maximizing ridership, and economic vitality.

The survey results support having basic mobility as the highest priority, though not, perhaps, by a ratio of 4:1 (overall) or 2:1 (within 5311) to the other policy objectives. It should be emphasized that the survey included urban direct recipients of 5307, while the spending analysis did not include that money, and thus it would be wrong to draw the conclusion that spending is out of line with the stated priorities of the transit providers. It is also the case that the providers were given one vote each, and these were not weighted by population or any other factors.

In our analysis, all 5310 money was attributed to basic mobility, and this is appropriate because the program is designed to provide lifeline service to older adults and people with disabilities. In New Hampshire, the intercity portion of 5311 is attributable to basic mobility, as 5311(f) is intended to provide access to the intercity network to those who would otherwise be excluded.

The main question, then, revolves around the distribution of non-intercity 5311 funding and whether more of it should be directed to policy goals other than basic mobility. In the recent past, NHDOT's pot of 5310 money has not been fully spent out, while there is great demand on the available 5311 funds. Prior to SAFETEA-LU in 2005, the State had the flexibility to transfer unused funds from 5310 into 5311, but that law removed that flexibility.

Federal regulations state that 55% of the funding under Section 5310 needs to be spent on capital projects that are considered "traditional" under this program, which means mainly the purchase of demand response vehicles, mobility management, and the cost of contracting for the provision of transit services for the target populations (NHDOT's Purchase of Service program fits this mold). The other 45% can be used to pay for operations that are designed to benefit seniors and people with disabilities.

Such services do not exclude people who are younger than 60 and do not have a disability, but the primary purpose of the service is for the intended populations. If a vehicle funded by section 5310 has available space, a non-senior or person without a disability can ride in that vehicle.

Some transit services (bus routes and demand response services) in rural areas that are funded by 5311 could potentially be recast as service that is designed for seniors and people with disabilities (and thereby funded with 5310), but be operated with an open door to allow others to ride. After all, if the current riders of these services are mostly seniors or people with disabilities, then it could be argued that the service is designed for that population.

Fixed routes and route deviated services would be required to be designed to meet the needs of seniors and individuals with disabilities and would be open-door to the general public so that all could ride. This may mean, for instance, that stops on fixed and deviated routes would include senior housing complexes, medical facilities, congregate meal sites, and grocery stores. Demand responsive services must also be designed to meet the needs of seniors and individuals with disabilities and would also be open door to the general public. Demand responsive services funded with 5310 funds may, for instance, not start until later in the morning to accommodate the transportation needs of seniors and individuals with disabilities seeking transportation services to medical appointments, congregate meals sites, hair appointments and the like and while the general public can utilize this service, its later start time may not be conducive to those seeking transportation to employment.

All 5310-funded projects must be included in a locally developed coordinated public transit–human services transportation plan and ensure that the service delivery and ridership continues to support a focus of providing service to the 5310-eligible population of seniors and individuals with disabilities. As such, these operations may require annual surveys to be conducted, or other similar measures, to document that the services are primarily serving and seniors and individuals with disabilities and support the continued use of 5310 funds.

In some cases, 5311 is used in rural areas to provide demand response service for non-5310 eligible individuals. When that service is operated by agency vehicles rather than a volunteer driver, it tends to be very expensive on a per-trip basis.[1] For example, the Freedom Express service operated by Carroll County Transit had an average cost per passenger of over $42 in SFY2017. This figure is almost ten times greater than the cost per passenger of Advance Transit's fixed route service.

Another potential area of flexibility is the funding of ADA-complementary paratransit service. FTA Circular 9070.1G states that an eligible capital expense for Section 5310 (part of the 55% portion) includes "acquisition of transportation services under a contract, lease, or other arrangement. This may include acquisition of ADA-complementary paratransit services when provided by an eligible recipient or subrecipient…Both capital and operating costs associated with the contracted service are eligible capital expenses." (page III-11) For example, the three "5311" agencies that provide paratransit service spend over $270,000 of 5311 funds on ADA-complementary paratransit service and it may be possible to fund those services with 5310 instead of 5311. The use of 5310 funds for ADA paratransit operations may require that 5311 agencies contract their paratransit service to a third party.

[1] In thinking about the "lowest-cost mode" policy shown on page 2 of this memo, NHDOT could stipulate that any 5311 money used in rural areas for demand response service must use volunteer drivers unless the agency can prove that it is infeasible to find a volunteer at the needed time. This could substantially reduce the cost of 5311 demand response service while not leaving current recipients of 5311 DR service with no mobility at all. It must be recognized that there is a shortage of volunteer drivers generally.

If some of the service now funded by 5311 could instead by funded by 5310 without violating federal rules, then more of the current 5311 money could be allocated to support policy goals other than basic mobility. This implies that more of the funding would go to bus routes in more densely-developed areas to maximize ridership, support economic vitality and improve access to jobs, as well as attracting millennials through a better quality of service.

Conclusion and Recommendation

The process of drafting and reviewing potential policy goals for public transportation in New Hampshire indicates that there is a desire for an official policy regarding the use of federal funding. While there is not necessarily a consensus on how the money should be spent, there is recognition that different areas have different needs and that some guidance how the funds should be distributed would be helpful.

It seems appropriate that Basic Mobility should be the primary goal of public transportation in the state, and current spending allocations reflect the priority of that goal. The majority of the land area in the state has rural density and there are significant transportation needs in those areas. Under this goal, however, there should be two important provisions:

- Most basic mobility service in rural areas should be targeted toward seniors and people with disabilities and funded with the 5310 program; and
- Service for non-5310 populations in rural areas should be operated with the lowest-cost mode available, specifically volunteer drivers, whenever possible.

For future funding over and above the spending levels for currently-provided service, the amount of non-intercity 5311 funding spent on basic mobility should be reduced from 40% of the total to 33% of the total, with additional funds allocated to other policy goals, especially:

- Access to jobs;
- Maximizing ridership; and
- Supporting economic vitality.

This budgeting and expenditure goal does not affect the allocation of funds for services currently in operation.

Attracting millennials, as a policy goal, received relatively less support than the other goals, and is most relevant to the urban portions of the state. Attracting millennials is a worthwhile goal, but perhaps should not be addressed by either the 5310 or 5311 programs. Instead, 5307-funded services more appropriately address this policy goal.

NHDOT reserves the right to reallocate funding from existing services if they consistently do not meet performance goals and there are no available means of improving service effectiveness. While existing services will be reviewed based on NHDOT's policy priorities once established, it is not NHDOT's intention to cut existing service in favor of a new service without first exhausting all reasonable means by which to improve the existing service.

APPENDIX B: INVENTORY STATISTICS

Key to Provider Abbreviations

AT = Advance Transit (Upper Valley)

CART = Cooperative Alliance for Regional Transportation (Salem–Derry–Londonderry area)

CAT = Concord Area Transit

COAST = Cooperative Alliance for Seacoast Transportation

MTA = Manchester Transit Authority

NTS = Nashua Transit System

SCT = Sullivan County Transportation

SVTC = Souhegan Valley Transportation Collaborative

TCCAP-NCT = Tri-County Community Action Program/North Country Transit

TCCAP-CCT = Tri-County Community Action Program/Carroll County Transit

UNH Wildcat Transit = University of New Hampshire, Durham

VNA-HCS Keene = Visiting Nurse Association–Home Healthcare, Hospice & Community Service

Service Operating Statistics – State Fiscal Year 2019

System	Route Name	Type of Route (Fixed/Deviated/DR)	Route Class	Vehicle Revenue Hours	Vehicle Revenue Miles	Ridership	Operating Cost	Fare Revenue
AT	ADA Paratransit	Demand Response	Rural Demand Response	4,295	47,878	6,458	$310,875	$0
AT	Blue	Fixed	Small Town	10,446	167,323	196,963	$1,148,217	$0
AT	Brown	Fixed	Small Town	1,995	24,715	22,695	$169,586	$0
AT	Dartmouth/Downtown Shuttle	Fixed	Circulator/Parking	6,618	54,890	74,404	$377,143	$0
AT	DHMC Shuttle	Fixed	Circulator/Parking	8,560	89,154	244,059	$611,766	$0
AT	Orange	Fixed	Small Town	2,101	31,141	52,302	$213,682	$0
AT	Red	Fixed	Small Town	5,653	73,914	161,145	$507,190	$0
CART	Derry-Londonderry/Hampstead	Flex	Rural/Flexible	3,421	51,710	6,109	$233,302	
CART	DR Service	Demand Response	Rural Demand Response	4,729	80,803	9,962	$364,562	$19,659
CART	Salem Shuttle	Flex	Rural/Flexible	608	7,828	1,982	$35,318	
CAT	ADA Paratransit	Demand Response	Urban Demand Response	2,753	32,103	4,842	$206,325	$4,813
CAT	Crosstown	Fixed	Urban	2,711	46,804	15,346	$174,760	$22,109
CAT	Heights	Fixed	Urban	2,807	31,542	27,874	$176,424	$22,109
CAT	Penacook	Fixed	Urban	2,723	48,919	26,868	$179,842	$22,109
CAT	SENIOR TRANSIT	Demand Response	Urban Demand Response	1,799	25,174	3,098	$125,407	$3,131
COAST	ADA Paratransit	Demand Response	Rural Demand Response	11,139	165,725	16,613	$1,138,582	$56,368
COAST	Clipper Routes	Fixed	Commuter	1,734	36,289	28,744	$332,192	$247,740

System	Route Name	Type of Route (Fixed/Deviated/DR)	Route Class	Vehicle Revenue Hours	Vehicle Revenue Miles	Ridership	Operating Cost	Fare Revenue
COAST	COAST NEMT (POS)	Demand Response	Rural Demand Response	625	9,332	611	$54,633	$0
COAST	Portsmouth Parking Shuttle	Fixed	Circulator/Parking	495	3,660	3,562	$32,904	$0
COAST	Portsmouth Senior Transportation	Demand Response	Rural Demand Response	1,878	27,808	5,871	$231,993	$10,342
COAST	Portsmouth Vintage Christmas Trolley	Fixed	Circulator/Parking	66	226	2,964	$6,739	$0
COAST	Route 1	Fixed	Small Town	5,437	74,452	67,785	$483,675	$76,096
COAST	Route 2	Fixed	Small Town	15,897	268,068	187,405	$1,422,406	$210,338
COAST	Route 33	Fixed	Small Town	2,074	24,032	13,687	$168,318	$15,340
COAST	Route 6	Fixed	Small Town	2,464	42,060	20,670	$257,262	$23,146
COAST	Route 7	Demand Response	Rural Demand Response	859	12,572	1,407	$97,304	$2,635
COAST	Trolley Routes (40/41)	Fixed	Small Town	10,643	147,595	77,704	$966,095	$87,043
MTA	1: Dartmouth/VA	Fixed	Urban	2,327	34,133	12,508	$208,297	$14,885
MTA	2: Hanover St	Fixed	Urban	3,653	39,348	31,464	$298,525	$37,442
MTA	3: Brown Ave/Manch Airport	Fixed	Urban	2,241	41,334	20,350	$217,492	$24,217
MTA	4: Target Bedford/Commerce Dr	Fixed	Urban	1,245	16,185	2,336	$107,286	$2,780
MTA	5: SNHU/River Rd	Fixed	Urban	3,113	45,661	29,889	$278,646	$35,568
MTA	6: Bremer St	Fixed	Urban	3,653	51,692	42,642	$323,189	$50,744
MTA	7: Bedford Grove	Fixed	Urban	3,103	24,824	26,953	$236,397	$32,074
MTA	8: S Willow/Mall	Fixed	Urban	3,653	29,224	56,252	$278,298	$66,940

System	Route Name	Type of Route (Fixed/Deviated/DR)	Route Class	Vehicle Revenue Hours	Vehicle Revenue Miles	Ridership	Operating Cost	Fare Revenue
MTA	9: Elliot Hosp	Fixed	Urban	1,245	6,225	5,153	$87,386	$6,132
MTA	10: Valley St/Mall	Fixed	Urban	3,653	40,848	40,768	$301,522	$48,514
MTA	11: Front/Hackett	Fixed	Urban	3,943	51,508	32,055	$340,279	$38,145
MTA	12: S Beech/Mall	Fixed	Urban	3,404	40,848	40,309	$286,533	$47,968
MTA	21: Concord Express	Fixed	Commuter	1,702	63,524	11,591	$229,380	$21,559
MTA	22: Nashua Express	Fixed	Commuter	1,453	48,551	7,290	$184,474	$13,559
MTA	31: Hampton Beach	Fixed	Targeted Shuttles	96	1,080	729	$7,193	$3,645
MTA	32: Deerfield Fair	Fixed	Targeted Shuttles	4	128	102	$852	$510
MTA	41: Green DASH	Fixed	Circulator/Parking	3,362	27,390	26,484	$257,085	$0
MTA	48: Demand response	Demand Response	Urban Demand Response	1,245	8,554	732	$56,970	$0
MTA	49: Demand response	Demand Response	Urban Demand Response	1,245	5,355	545	$35,664	$0
MTA	42-45: Shopper Shuttle	Fixed	Targeted Shuttles	1,040	9,569	7,243	$63,730	$0
MTA	ADA Paratransit	Demand Response	Urban Demand Response	7,812	82,387	10,192	$676,397	$40,768
NTS	ADA Paratransit	Demand Response	Urban Demand Response	6,569	85,553	13,725	$701,059	$28,957
NTS	Central	Fixed	Urban	1,252	20,416	6,107	$85,540	$2,818
NTS	Downtown Connector	Fixed	Circulator/Parking	3,136	26,473	8,213	$167,808	$856
NTS	Extra services/supplemental	Fixed	Targeted Shuttles	58	315	2,494	$2,772	
NTS	Holiday Circulator	Fixed	Circulator/Parking	35	200	124	$1,693	
NTS	North	Fixed	Urban	1,252	17,481	15,199	$80,006	$7,159
NTS	Other fare revenue: tickets, token transit							$101,760
NTS	Route 1	Fixed	Urban	1,861	23,751	22,781	$114,721	$6,592
NTS	Route 10 Walmart	Fixed	Urban	787	9,551	2,533	$47,583	$1,795
NTS	Route 2	Fixed	Urban	3,641	47,164	65,430	$225,815	$29,928
NTS	Route 2A	Fixed	Urban	3,028	39,319	48,324	$187,950	$24,516
NTS	Route 4	Fixed	Urban	1,732	29,444	16,478	$120,624	$6,455

System	Route Name	Type of Route (Fixed/Deviated/DR)	Route Class	Vehicle Revenue Hours	Vehicle Revenue Miles	Ridership	Operating Cost	Fare Revenue
NTS	Route 5	Fixed	Urban	1,861	28,275	30,018	$123,251	$11,238
NTS	Route 6	Fixed	Urban	3,669	45,119	68,448	$222,993	$36,482
NTS	Route 6A	Fixed	Urban	3,028	39,624	47,188	$188,524	$25,128
NTS	Route 7	Fixed	Urban	1,732	14,895	31,401	$93,193	$6,444
NTS	Route 8	Fixed	Urban	3,617	64,107	34,771	$256,840	$10,666
NTS	Route 9	Fixed	Urban	3,440	45,725	25,814	$215,509	$12,430
NTS	South	Fixed	Urban	1,252	18,374	19,267	$81,691	$11,413
SCT	Charlestown	Flex	Rural/Flexible	1,133	21,460	2,926	$109,427	$3,432
SCT	Claremont	Flex	Rural/Flexible	2,046	23,855	12,533	$131,312	$9,657
SCT	Dial-A-Ride	Demand Response	Rural Demand Response	560	7,106	2,333	$52,525	$2,323
SCT	Newport	Flex	Rural/Flexible	2,310	33,232	4,037	$144,443	$5,063
SVTC	Demand response	Demand Response	Rural Demand Response	2,853	56,251	4,358	$346,791	$6,273
TCCAP-CCT	Freedom Express	Demand Response	Rural Demand Response	6,499	37,007	2,620	$157,543	$2,162
TCCAP-CCT	Senior Wheels	Demand Response	Rural Demand Response	6,499	37,007	5,594	$117,827	$1,534
TCCAP-NCT	Berlin-Gorham Flex Route	Flex	Rural/Flexible	2,947	34,200	12,427	$75,693	$6,627
TCCAP-NCT	Freedom Express	Demand Response	Rural Demand Response	7,739	41,266	7,145	$89,976	$2,103
TCCAP-NCT	LRH Care-a-van	Demand Response	Rural Demand Response	2,717	32,369	3,549	$69,282	$0
TCCAP-NCT	Senior Wheels	Demand Response	Rural Demand Response	7,739	41,266	14,031	$160,454	$9,642
TCCAP-NCT	Tri-Town Flex Route	Flex	Rural/Flexible	1,992	39,652	10,116	$85,657	$4,663
UNH Wildcat Transit	3 - Dover	Fixed	Targeted Shuttles	3,544	60,101	55,113	$395,135	$9,461
UNH Wildcat Transit	4 - Portsmouth	Fixed	Targeted Shuttles	5,916	133,020	59,228	$751,846	$10,167

System	Route Name	Type of Route (Fixed/Deviated/DR)	Route Class	Vehicle Revenue Hours	Vehicle Revenue Miles	Ridership	Operating Cost	Fare Revenue
UNH Wildcat Transit	5 - Newmarket	Fixed	Targeted Shuttles	1,497	26,802	15,134	$170,899	$2,598
UNH Wildcat Transit	Campus Connector	Fixed	Targeted Shuttles	14,922	169,226	960,173	$1,427,180	n/a
VNA-HCS Keene	Campus Shuttle	Fixed	Targeted Shuttles	1,675	22,586	2,090	$91,526	$82
VNA-HCS Keene	City Express Black Rte	Fixed	Small Town	2,712	32,418	13,865	$139,319	$7,558
VNA-HCS Keene	City Express Red Rte	Fixed	Small Town	2,419	25,340	14,276	$126,059	$10,198
VNA-HCS Keene	Friendly Bus	Demand Response	Rural Demand Response	3,246	32,960	10,612	$115,821	$0
VNA-HCS Keene	Medical Express	Demand Response	Rural Demand Response	438	7,921	1,756	$35,296	$0

Service Operating Descriptions

System	Route Name	Span of Service	Headway (minutes)	Notes/Other Info
AT	ADA Paratransit	M-F 5:45 AM to 7:10 PM	n/a	both NH/VT
AT	Blue	Fixed M-F 5:45 AM to 7:10 PM	low as 15	Commuter M-F 6 Round trips daily 5:15 AM - 5:50 PM
AT	Brown	M-F 6:25 AM to 5:55 PM	50	both NH/VT
AT	Dartmouth/Downtown Shuttle	M-F 7 AM to 7 PM	10	all NH
AT	DHMC Shuttle	M-F 6 AM to 6 PM	10	all NH
AT	Orange	M-F 6:30 AM to 6:08 PM	60	both NH/VT
AT	Red	M-F 6:00 AM to 6:08 PM	30	all NH

System	Route Name	Span of Service	Headway (minutes)	Notes/Other Info
CART	Derry-Londonderry/Hampstead	Derry-Londonderry Shuttle M-F 10:00-3:45; Hampstead Shuttle M/W/F 8:00-4:30	NA	Fare free service
CART	DR Service	M-F 8:00-5:00	NA	Zoned fare system
CART	Salem Shuttle	M/W/F 9:15-2:30	60	Fare free service
CAT	ADA Paratransit	5:50a-6:39p		
CAT	Crosstown	5:50a-6:30p	60 (AM); 62-64 (PM)	
CAT	Heights	5:50a-6:39p	62-68	
CAT	Penacook	6:20a-6:06p	61-65	
CAT	SENIOR TRANSIT	8:30a-3:30p		
COAST	ADA Paratransit	comparable to FR service hrs/days	n/a	Complementary ADA paratransit service.
COAST	Clipper Routes	5:45a-6:45a & 3:30p-4:40p M-F	One AM & one PM commuter run	Complementary Guaranteed Ride Home Program for emergencies.
COAST	COAST NEMT (POS)	6:00a-5:00p M-F	n/a	Provided under contract with RPC & area VDPs
COAST	Portsmouth Parking Shuttle	12:00p-1:00a	12-15	Provided seasonally under contract.
COAST	Portsmouth Senior Transportation		n/a	Operated under contract with the City of Portsmouth
COAST	Portsmouth Vintage Christmas Trolley	1:30-10:30p Sat/Sun	15	Provided seasonally under contract. First 3 weekends of December.
COAST	Route 1	5:20a-7:50p M-F 6:30a-7:35p Sat.	65+ mins. M-F90 mins. Sat.	Interlines with Rte. 33
COAST	Route 2	5:25a-10:25p M-F 6:45a-11:05p Sat.	30+/60+ mins. M-F 90+/150+ mins. Sat.	30 min. headways SB during the am peak commuting hours. 30 min. headways NB during the pm peak commuting hours.
COAST	Route 33	6:25a - 5:30p M-F	70 mins. M-F	no service from 9:35a-10:55p

System	Route Name	Span of Service	Headway (minutes)	Notes/Other Info
COAST	Route 6	5:45a-7:15p M-F	90 mins. M-F	no service from 1:40p-3:55p
COAST	Route 7	9:30a-5:15p M/W/T/Sat		No service on Tues. & Fri. * Switched from a fixed route to a DR service on 7/2/2018.
COAST	Trolley Routes (40/41)	5:45a-9:25p M-F 7:05a-9:10p Sat.	30/60 mins. M-F 120/150 mins. Sat.	30 mins. headways during the peak commuting hrs.
MTA	1: Dartmouth/VA	7:15-17:55	45	
MTA	2: Hanover St	5:30-18:25	60	
MTA	3: Brown Ave/Manch Airport	5:25-9:25 & 13:25-18:25	60	
MTA	4: Target Bedford/Commerce Dr	7:45-5:55 irregularly	60	
MTA	5: SNHU/River Rd	7:00-21:35	45	
MTA	6: Bremer St	5:30-18:25, [18:30-21:30 Deviated]	60	
MTA	7: Bedford Grove	7:15-17:55	60	
MTA	8: S Willow/Mall	5:30-18:25	60	
MTA	9: Elliot Hosp	7:00-17:30	60	
MTA	10: Valley St/Mall	6:30-18:25	60	
MTA	11: Front/Hackett	6:30-18:25, [18:30-21:30 Deviated]	60	
MTA	12: S Beech/Mall	6:00-17:55	60	
MTA	21: Concord Express	5:30-18:25 irregularly	60	Zone 2
MTA	22: Nashua Express	5:30-17:25 irregularly	60	Zone 2
MTA	31: Hampton Beach	Seasonal	N/A	Zone 3
MTA	32: Deerfield Fair	Seasonal	N/A	Zone 3
MTA	41: Green DASH	7:20-21:50	30	Free Fare
MTA	48: Demand response	9:00-2:00 M, W, F	N/A	Free Fare, 5310 POS projects
MTA	49: Demand response	9:00-2:00 T, Th	N/A	Free Fare, 5310 POS projects
MTA	42-45: Shopper Shuttle	8:00-12:00 one day in each area	N/A	Free Fare, 5310 POS projects
MTA	ADA Paratransit	5:25-18:25	N/A	

System	Route Name	Span of Service	Headway (minutes)	Notes/Other Info
NTS	ADA Paratransit	6:00am - 6:00pm		Mon-Sat: Schedule Varies
NTS	Central	6:45pm - 10:40pm	60	Saturday 5:45pm-10:40pm
NTS	Downtown Connector	5:50am - 8:20pm	30	Additional 1/2 service in AM
NTS	Extra services/supplemental			
NTS	Holiday Circulator	1:40pm - 6:10pm	15	Seasonal
NTS	North	6:45pm - 10:40pm	60	Saturday 5:45pm-10:40pm
NTS	Route 1	6:15am - 6:40pm	60	Saturday 9:15am-5:40pm
NTS	Route 10 Walmart	8:20am - 9:10pm	30	Tue and Fri / 1 hour Sat
NTS	Route 2	6:05am - 6:40pm	60	Saturday 9:05am-5:40pm
NTS	Route 2A	6:15am - 6:10pm	60	Monday - Friday
NTS	Route 4	6:45am - 6:15pm	60	Saturday 9:45am-5:15pm
NTS	Route 5	6:15am - 6:40pm	60	Saturday 9:15am-5:40pm
NTS	Route 6	6:00am - 6:40pm	60	Saturday 9:00am-5:40pm
NTS	Route 6A	6:15am - 6:10pm	60	Monday - Friday
NTS	Route 7	6:45am - 6:15pm	60	Saturday 9:45am-5:15pm
NTS	Route 8	6:10am - 6:40pm	60	Saturday 9:10am-5:40pm
NTS	Route 9	6:15am - 7:10pm	60	Saturday 9:15am-5:10pm
NTS	South	6:45pm - 10:40pm	60	Saturday 5:45pm-10:40pm
SCT	Charlestown	7:15 am to 4:00 pm	3 trips per day	
SCT	Claremont	8:00 am to 4:30 pm	60	
SCT	Dial-A-Ride	9:00- 10:30 am & 12:30- 2:30 pm	Demand Response	
SCT	Newport	6:25:00 am to 4:45 pm	Five trips per day	
SVTC	Demand response	8:00am-6:00pm		Monday-Friday
TCCAP-CCT	Freedom Express	M-F 8 - 5		

System	Route Name	Span of Service	Headway (minutes)	Notes/Other Info
TCCAP-CCT	Senior Wheels	M-F 8 - 5		
TCCAP-NCT	Berlin-Gorham Flex Route	M-F 7-5 Sat 9-5	2 hours per run	
TCCAP-NCT	Freedom Express	M-F 8-4		
TCCAP-NCT	LRH Care-a-van	M - F 7 - 6		Free to Patients
TCCAP-NCT	Senior Wheels	M-F 8 - 4		
TCCAP-NCT	Tri-Town Flex Route	M-F 8 - 4	2 hours per run	
UNH Wildcat Transit	3 - Dover	6:40 AM to 8:40 PM weekdays; 9:00 AM to 9:00 PM weekends	70 weekday; 90 weekend	
UNH Wildcat Transit	4 - Portsmouth	6:35 AM to 11:00 PM weekdays; 10:00 AM to 10:30 PM weekends	Irregular (19 runs); Irregular (10 runs)	
UNH Wildcat Transit	5 - Newmarket	7:05 AM to 9:52 PM weekdays (no weekend service)	Irregular (10 runs)	
UNH Wildcat Transit	Campus Connector	7:00 AM to midnight weekdays; 10:00 AM to midnight weekends	Multiple routes with headways from 10 minutes to 30 minutes; 30-minute headway on weekends	
VNA-HCS Keene	Campus Shuttle	0730-1930	30	Contract - 141 days
VNA-HCS Keene	City Express Black Rte	0800-1700	60	255 days
VNA-HCS Keene	City Express Red Rte	0800-1600	60	255 days
VNA-HCS Keene	Friendly Bus	0800-1600		
VNA-HCS Keene	Medical Express	Varies by need		

Vehicle Inventory – As of June 30, 2019

System	Vehicle Make	Vehicle Model	Vehicle Year	Vehicle Length	Seating Capacity	Condition	Lifetime Mileage
AT	2007 Gillig Low Floor Bus	Low Floor	2007	>35	33	Poor	299,150
AT	2007 Gillig Low Floor Bus	Low Floor	2007	>35	33	Poor	301,504
AT	2007 Gillig Low Floor Bus	Low Floor	2007	>35	33	Poor	323,058
AT	Gillig Diesel Hybrid	G30B102N4	2011	>35	33	Good	232,177
AT	Gillig Diesel Hybrid	G30B102N4	2011	>35	33	Good	220,834
AT	Freightliner Bus under 30 feet, paratransit	Sprinter	2012	<30	8	Fair	112,023
AT	Gillig Diesel Hybrid	G30B102N4	2012	>35	33	Good	221,279
AT	ElDorado Aerolite 210/Chrevolet chassis	AEROLITE210	2014	<30	8	Fair	101,093
AT	ElDorado Aerotech 240/Chrevolet chassis	AEROLITE210	2014	<30	16	Fair	102,595
AT	2016 Gillig Low Floor Bus	Low Floor	2016	35	34	Good	72,217
AT	2016 Gillig Low Floor Bus	Low Floor	2016	35	34	Good	73,559
AT	2016 Gillig Low Floor Bus	Low Floor	2016	35	34	Good	75,685
AT	ElDorado Elite/Ford Chassis	Ford F550	2017	<30	19	Excellent	15,287
AT	ElDorado Elite/Ford Chassis	Ford F550	2017	<30	19	Excellent	20,927
AT	Freightliner Bus under 30 feet, paratransit	Sprinter	2017	<35	8	Excellent	24,806
AT	2018 Gillig Low Floor Bus	Low Floor	2018	35	33	Excellent	37,879
AT	2018 Gillig Low Floor Bus	Low Floor	2018	35	33	Excellent	36,620
AT	2018 Gillig Low Floor Bus	Low Floor	2018	35	33	Excellent	37,449
AT	2018 Gillig Low Floor Bus	Low Floor	2018	35	33	Excellent	38,924
AT	2018 Gillig Low Floor Bus	Low Floor	2018	35	33	Excellent	38,066

System	Vehicle Make	Vehicle Model	Vehicle Year	Vehicle Length	Seating Capacity	Condition	Lifetime Mileage
AT	2018 Ford F350 Pickup truck w/plow & service body	Ford F350	2018	n/a	n/a	Excellent	3,043
AT	2018 Ford Escape - Non Revenue Support	Ford Escape	2018	n/a	n/a	Excellent	6,285
AT	2019 Gillig Low Floor Bus	Low Floor	2019	<35	26	Excellent	5,913
AT	2019 Gillig Low Floor Bus	Low Floor	2019	<35	26	Excellent	5,195
AT	2019 Gillig Low Floor Bus	Low Floor	2019	<35	26	Excellent	6,488
AT	2019 Gillig Low Floor Bus	Low Floor	2019	<35	26	Excellent	5,254
CART	ARBOC	Spirit of Mobility	2009	21'	14	Fair	183,699
CART	ARBOC	Spirit of Mobility	2009	21'	14	Fair	149,510
CART	ARBOC	Spirit of Mobility	2009	21'	14	Ready for Disposition	163,940
CART	Glaval	Titan II	2012	24'	14	Good	150,220
CART	Dodge	Caravan SE	2016	16.9	5	Excellent	34,592
CART	Ford	Phoenix	2018	20	8	Excellent	3,373
CART	Ford	Phoenix	2018	21	14	Excellent	1,795
CART	Ford	Phoenix	2018	21	14	Excellent	4,705
CAT	ORION	V11	2003		32	Poor	
CAT	FORD	E350	2011	250"	10	Fair	177,413
CAT	FORD	E350	2011	250"	10	Poor	175,903
CAT	FORD	E350	2011	250"	10	Fair	182,794
CAT	FORD	E450	2011	303"	16	Poor	137,994
CAT	FORD	E450	2017	280"	12	Good	37,515
CAT	FORD	E450	2017	303"	16	Good	56,563

System	Vehicle Make	Vehicle Model	Vehicle Year	Vehicle Length	Seating Capacity	Condition	Lifetime Mileage
CAT	ELDORADO	PASSPORT	2018		27	Good	47,399
CAT	ELDORADO	PASSPORT	2018		27	Good	34,721
COAST	MCI	102DL3SS	2000	45	55	Past useful life	1,333,820
COAST	MCI	102DL3SS	2000	45	55	Past useful life	1,300,330
COAST	MCI	102DL3SS	2001	45	55	Past useful life	1,730,715
COAST	MCI	102DL3SS	2001	45	55	Past useful life	1,111,126
COAST	Dodge	Ram (pick-up)	2004	-	-	Past useful life	105,820
COAST	Gillig	Low-floor	2008	40	38		501,256
COAST	Gillig	Low-floor	2008	40	38		480,767
COAST	Gillig	Low-floor	2008	40	38		483,043
COAST	Gillig	Low-floor	2008	40	38		496,135
COAST	Ford	Escape	2008	-	-	Past useful life	178,162
COAST	Gillig	Low-floor	2011	35	31		348,055
COAST	Gillig	Low-floor	2011	35	31		341,141
COAST	Gillig	LF Trolley	2011	35	31		327,036
COAST	Gillig	LF Trolley	2011	35	31		354,510
COAST	Gillig	LF Trolley	2011	35	31		343,176
COAST	Ford	Transit	2011	-	-	Past useful life	65,516
COAST	Braun	Entervan	2012	17	4	Past useful life	193,317
COAST	Braun	Entervan	2012	17	4	Past useful life	197,633
COAST	Gillig	Low-floor	2012	29	26		271,942

System	Vehicle Make	Vehicle Model	Vehicle Year	Vehicle Length	Seating Capacity	Condition	Lifetime Mileage
COAST	Gillig	Low-floor	2012	29	26		263,847
COAST	Gillig	Low-floor	2012	35	31		260,029
COAST	Gillig	Low-floor	2012	35	31		266,613
COAST	Gillig	LF Trolley	2012	35	31		251,507
COAST	Gillig	LF Trolley	2012	35	31		278,789
COAST	Ford	Fusion	2012	-	-	Past useful life	45,006
COAST	Braun	Entervan	2013	17	4	Past useful life	193,793
COAST	Braun	Entervan	2013	17	4	Past useful life	197,777
COAST	Braun	Entervan	2015	17	4		27,406
COAST	Braun	Entervan	2015	17	4		108,802
COAST	Glaval	Universal	2015	26	18		18,462
COAST	StarTrans	Senator II	2016	22	8		71,492
COAST	StarTrans	Senator II	2016	22	8		55,871
COAST	StarTrans	Senator II	2016	22	8		49,310
COAST	StarTrans	Senator II	2016	22	10		46,457
COAST	StarTrans	Senator II	2016	22	10		27,925
COAST	Gillig	Low-floor	2016	40	38		192,731
COAST	Gillig	Low-floor	2016	40	38		183,251
COAST	Gillig	Low-floor	2016	40	38		167,083
COAST	Braun	Entervan	2017	17	4		67,505
COAST	Braun	Entervan	2017	17	4		56,078

System	Vehicle Make	Vehicle Model	Vehicle Year	Vehicle Length	Seating Capacity	Condition	Lifetime Mileage
COAST	Braun	Entervan	2017	17	4		53,546
COAST	StarTrans	Senator II	2017	22	8		28,835
COAST	Coach & Equipment	Phoenix	2018	22	10		20,907
COAST	Coach & Equipment	Phoenix	2018	23	12		18,810
COAST	Coach & Equipment	Phoenix	2018	23	12		15,318
COAST	Coach & Equipment	Phoenix	2018	23	12		16,468
COAST	Coach & Equipment	Phoenix	2018	25	14		16,710
COAST	Braun	Entervan	2019	17	4		52
MTA	Gillig	Low Floor	2006	30'	28	Good	418,707
MTA	Gillig	Low Floor	2006	30'	28	Good	419,729
MTA	Gillig	Low Floor	2006	30'	28	Good	415,561
MTA	Gillig	Low Floor	2006	30'	28	Good	402,202
MTA	Gillig	Low Floor	2006	30'	28	Good	405,178
MTA	Gillig	Low Floor	2006	30'	28	Good	403,871
MTA	Gillig	Low Floor	2007	30'	28	Good	374,716
MTA	Gillig	Low Floor	2007	30'	28	Good	379,224
MTA	Gillig	Low Floor	2007	30'	28	Good	369,747
MTA	Gillig	Low Floor	2008	30'	28	Good	338,811
MTA	Gillig	Low Floor	2008	30'	28	Good	339,354
MTA	Gillig	Low Floor	2008	30'	28	Good	335,076
MTA	El Dorado/Ford	Aerotech	2010	18'	12	Fair	238,673

System	Vehicle Make	Vehicle Model	Vehicle Year	Vehicle Length	Seating Capacity	Condition	Lifetime Mileage
MTA	Senator/Ford	E450 E-LO	2011	24'	12	Good	221,080
MTA	Senator/Ford	E450 E-LO	2011	24'	12	Good	231,683
MTA	Senator/Ford	E450 E-LO	2011	24'	12	Good	219,200
MTA	Dodge	Grand Caravan / Entervan	2014	12'	4	New	39,196
MTA	Dodge	Grand Caravan / Entervan	2014	12'	4	New	42,437
MTA	Glaval/Chevy	Express CA	2014	18'	12	New	124,371
MTA	Champion	Low Floor	2017	24'	12	New	54,800
MTA	New Flyer	Midi	2017	29'	27	New	56,794
MTA	Ford	E450	2018	24'	12	New	390
MTA	Alexander Dennis	Enviro 200	2018	29'	27	New	4,262
MTA	Alexander Dennis	Enviro 200	2018	29'	27	New	4,002
MTA	Alexander Dennis	Enviro 200	2018	29'	27	New	3,648
NTS	2005 Gillig Low Floor 35'	Low Floor	2005	35'	32	Poor	542,515
NTS	2009 ARBOC/CHEV	Chevrolet	2009	26'	14	Fair	192,489
NTS	2009 ARBOC/CHEV	Chevrolet	2009	26'	14	Fair	174,581
NTS	2009 ARBOC/CHEV	Chevrolet	2009	26'	14	Fair	234,680
NTS	2009 ARBOC/CHEV	Chevrolet	2009	26'	14	Fair	140,862
NTS	2009 ARBOC/CHEV	Chevrolet	2009	26'	14	Fair	200,012
NTS	2009 ARBOC/CHEV	Chevrolet	2009	26'	14	Fair	236,775
NTS	2009 ARBOC/CHEV	Chevrolet	2009	26'	14	Fair	166,906
NTS	2010 MOLLY FRHT TROLLEY	Freight	2010	30'	20	Fair	271,795

System	Vehicle Make	Vehicle Model	Vehicle Year	Vehicle Length	Seating Capacity	Condition	Lifetime Mileage
NTS	2010 MOLLY FRHT TROLLEY	Freight	2010	30'	20	Fair	265,106
NTS	2010 MOLLY FRHT TROLLEY	Freight	2010	30'	20	Fair	272,868
NTS	2014 Eldorado EZ Rider II	EZ Rider II Low Floor	2014	30'	31	Good	164,799
NTS	2017 GILLIG CNG 30'	Low Floor	2017	30'	24	New	75,732
NTS	2017 GILLIG CNG 30'	Low Floor	2017	30'	24	New	66,266
NTS	2017 GILLIG CNG 30'	Low Floor	2017	30'	24	New	71,377
NTS	2017 GILLIG CNG 30'	Low Floor	2017	30'	24	New	61,312
NTS	2017 GILLIG CNG 35'	Low Floor	2017	35'	31	New	71,132
NTS	2017 GILLIG CNG 35'	Low Floor	2017	35'	31	New	60,098
NTS	2017 GILLIG CNG 35'	Low Floor	2017	35'	31	New	72,395
NTS	2017 GILLIG CNG 35'	Low Floor	2017	35'	31	New	75,389
NTS	2018 FORD E450 VAN	Low Floor	2018	25'	14	New	14,164
NTS	2018 FORD E450 VAN	Low Floor	2018	25'	14	New	12,015
NTS	2018 FORD E450 VAN	Low Floor	2018	25'	14	New	7,798
NTS	2018 FORD E450 VAN	Low Floor	2018	25'	14	New	11,340
NTS	2018 FORD E450 VAN	Low Floor	2018	25'	14	New	9,734
NTS	2018 FORD E450 VAN	Low Floor	2018	25'	14	New	4,539
SCST	Ford	E-4FF	2010	25'	16/2 wc	Good	97,206
SCST	Ford	E-450SD	2013	25'	16/2 wc	Good	94,939
SCST	Ford	E-350	2016	21'	8/2 wc	Excellent	91,199
SCST	Ford	E-450 SD	2016	23'	12/2 wc	Excellent	60,744

System	Vehicle Make	Vehicle Model	Vehicle Year	Vehicle Length	Seating Capacity	Condition	Lifetime Mileage
SCST	Ford	E-450	2017	23'	12/2 wc	Excellent	61,531
SCST	Ford	E-450	2019	23'	12/2 wc	Excellent	21,862
TCCAP	FORD	E-350	2003	21' 6"	**8**	Fair	115,182
TCCAP	FORD	Aerolite	2010	21' 10"	8	Good	172,467
TCCAP	FORD	Aerolite	2010	21' 10"	8	Fair	156,558
TCCAP	FORD	Aerolite	2010	21' 10"	8	Fair	178,754
TCCAP	FORD	Aerolite	2010	21' 10"	8	Fair	183,436
TCCAP	FORD	E4FF	2010	25'	16	Fair	172,430
TCCAP	FORD	E4FF	2010	25'	16	Fair	189,727
TCCAP	FORD	E4FF	2010	25'	16	Fair	143,651
TCCAP	FORD	E-350	2011	21' 10"	8	Fair	170,624
TCCAP	FORD	e-350	2011	21' 10"	8	Fair	177,478
TCCAP	FORD	E-350	2013	21' 10'	8	Good	125,665
TCCAP	FORD	E-350	2016	21"	8	Good	51,029
TCCAP	FORD	E-350	2016	21"	8	Good	70,137
TCCAP	FORD	E-350	2016	21"	8	Good	52,427
TCCAP	FORD	E-350	2017	21"	8	Good	78,605
UNH	ElDorado	EZ-Rider II	2006	35'	39	3 - fair	242,268
UNH	ElDorado	EZ-Rider II	2006	35'	39	3 - fair	239,191
UNH	ElDorado	EZ-Rider II	2006	35'	39	3 - fair	274,808
UNH	ElDorado	EZ-Rider II	2006	35'	39	3 - fair	270,650

System	Vehicle Make	Vehicle Model	Vehicle Year	Vehicle Length	Seating Capacity	Condition	Lifetime Mileage
UNH	ElDorado	EZ-Rider II	2008	35'	39	3 - fair	174,256
UNH	ElDorado	EZ-Rider II	2008	35'	39	3 - fair	203,619
UNH	ElDorado	EZ-Rider II	2008	35'	39	3 - fair	231,094
UNH	ElDorado	EZ-Rider II	2008	35'	39	3 - fair	257,246
UNH	ElDorado	EZ-Rider II	2010	32'	32	2 - good	119,253
UNH	ElDorado	EZ-Rider II	2010	32'	32	2 - good	118,943
UNH	ElDorado	EZ-Rider II	2010	32'	32	2 - good	127,800
UNH	ElDorado	EZ-Rider II	2010	32'	32	2 - good	138,320
UNH	ElDorado	AeroTech	2011	25'	18	3 - fair	81,172
UNH	ElDorado	EZ-Rider II	2012	35'	39	2 - good	140,590
UNH	ElDorado	EZ-Rider II	2012	35'	39	2 - good	138,669
UNH	ElDorado	EZ-Rider II	2013	32'	32	2 - good	150,504
UNH	ElDorado	EZ-Rider II	2013	35'	39	2 - good	153,757
UNH	ElDorado	EZ-Rider II	2013	35'	39	2 - good	154,733
UNH	ElDorado	EZ-Rider II	2013	35'	39	2 - good	174,549
UNH	ElDorado	EZ-Rider II	2014	35'	39	2 - good	107,066
UNH	ElDorado	EZ-Rider II	2014	35'	39	2 - good	92,842
UNH	ElDorado	EZ-Rider II	2014	35'	39	2 - good	68,592
UNH	ElDorado	EZ-Rider II	2014	35'	39	2 - good	82,430
UNH	ElDorado	AmeriVan	2015	17'	5	1 - new	9,114
UNH	ElDorado	AmeriVan	2015	17'	5	1 - new	9,051

System	Vehicle Make	Vehicle Model	Vehicle Year	Vehicle Length	Seating Capacity	Condition	Lifetime Mileage
UNH	ElDorado	AeroTech	2016	25'	14	1 - new	18,256
UNH	ElDorado	AeroTech	2016	25'	14	1 - new	17,959
UNH	ElDorado	AeroTech	2016	25'	14	1 - new	17,508
UNH	ElDorado	EZ-Rider II	2019	35'	39	1 - new	90
UNH	ElDorado	EZ-Rider II	2019	35'	38	1 - new	80
UNH	ElDorado	EZ-Rider II	2019	35'	38	1 - new	87
UNH	ElDorado	EZ-Rider II	2019	35'	38	1 - new	192
VNA	Freightliner	Sprinter 3500	2009	25	8 + 3	Fair	73,478
VNA	Freightliner	Sprinter 3500	2013	25	8 + 3	Fair	60,693
VNA	Ford	E450	2013	25	16 +2	Good	68,352
VNA	Ford	E450	2016	25	16 +2	Excellent	71,402
VNA	Ford	E450	2016	25	16 +2	Good	47,328
VNA	Ford	E450	2016	25	16 +2	Excellent	48,096
VNA	Ford	E450	2017	25	16 +2	Excellent	59,175
VNA	Ford	E450	2017	25	16 +2	Excellent	49,749

Facilities and Infrastructure Inventory – As of June 30, 2019

System	Item	Quantity	Description	Initial Cost (Estimate if not available)	Condition	Notes/Add'l Info
AT	Bus Shelters	10	three wall structures w/benches	$4,000 each	good	
AT	Maintenance/Operations/ Administrative Building	1	Bus repair shop, bus wash, bus fuel island, bus storage, administrative offices and drivers' amenities	$4,651,392.44	very good	Expanded and rehabilitated with both an earmark FTA5309 and ARRA funding in 2009/2010
CAT	Administrative Building	1	leased dispatch and admin office	NA	fair	Facility is leased and in same building as BMCAP Inc.
CAT	Benches	8	Steeplegate Mall, Walmart, Penacook Family Phys., Granite Ave, Eagle Square, Federal Building, Pleasant St, Franklin St	NA	good	All benches are privately or publicly owned and maintained and not purchased or maintained by CAT
CAT	Bus Shelters	9	Concord Hospital x2, State House, Concord Christian Academy x2, NHTI, Abbott Rd, Pine St, Memorial field	NA	8 good 1 poor	All shelters were privately purchased and are privately owned or they are owned and maintaned by the City/State. One shelter at Christian Academy has lost all of the glass
CAT	Maintenance Facility	1	leased 2 bay garage	NA	fair	Facility is leased and in same vicinity as CAT admin office
COAST	Bus Shelters (w/benches)	40	Throughout service area	$7,000.00	Good to Excellent	Pursuing more due to advertising revenue potential
COAST	Maintenance Garage	1	42 Sumner Drive, Dover	$1,183,000	Adequate	Grossly undersized
COAST	Operations Offices	1	42 Sumner Drive, Dover	$871,000	Good	Grossly undersized
COAST	Parking Lot	1	42 Sumner Drive, Dover, NH	$440,000	Poor	Failing in Multiple Areas
MTA	Bus Shelters	18	shelters w/ ad frames	unknown	15 years old	Purchased by third party; MTA just assumed ownership last fall after completion of the 15 year contract.

MTA	Administrative/Maintenance Facility	1	All in 1 maint, admin, etc	unknown	1973	Replacement cost estimated at 18M
NTS	Bus Shelters	15	Outside along bus routes	$103,000	Good/Fair/Poor	
NTS	Administrative/Maintenance Facility	1	Garage	$5,000,000 COMBINED between Maint & Adm Bldgs	Good	Built 2007. Adm offices relocated with rehab in 2007
NTS	Transit Center	1	Passenger Bldg	$383,040	Fair	Built 1999 - outgrowing size of building
SCT	Administrative Building	1/3	One room office and some storage in an SCS owned building shared with two other programs	473.34 monthly	Good	Monthly fee charged for rent of the space
TCCAP	Administrative Building	1	Dispatch Ctr. & Offices	$102,127	Good	Single Story building with 6 offices, parking and
TCCAP	Maintenance Facility	1	2 vehicle garage	(Included with office bldg)	Good	Same location as office building w/ 1 lift
UNH	Administrative Building	1	UNH Admin Offices	Not available	Good	University owned Bldg
UNH	Benches	26	Benches inside the shelters	included in above cost	Good	1 bench per shelter
UNH	Bus Shelters	26	Daytech and Columbia Campus Stanrdard Shelters	$17,000 - $25,000	Good	UNH on-campus standard bus shelter $17,000 plus (if required) pad $6-$8k Bus shelter bike rack (lollipop) $300 bolted on existing concrete
UNH	Covered Bike Racks	15	Half-Arc Units accomodating 2 bicycles each	$1,600 each for a total of $ 24,000	Good	Required site work, concrete pad construction and installation of racks, 1 heavy duty stainless public bike pump. Total cost $ 45,000
UNH	Indoor Bike Racks	535			Good	
UNH	Maintenance Facility	1	UNH Vehicle Maintenance	Not available	Good	University owned Bldg
VNA	Administrative Building	1	HCS Main Office	500,000 est	Good	
VNA	Bus Shelters	10		5000 each	**Good**	
VNA	*parking garage*	1	holds 8 vehicles	rent $2080/mon	Fair	

APPENDIX C: SUMMARY OF RPC OUTREACH

6 First Avenue
Montpelier, VT 05602

STEADMAN HILL
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MEMORANDUM

To: **Frederick Butler**

From: **Stephen Falbel**

Re: **Summary of RPC Outreach**

Date: **March 27, 2018**

During the summer and fall of 2017, the Steadman Hill Consulting team conducted a series of meetings with each of the regional planning commissions in New Hampshire. These meetings were attended by the project manager and usually another member of the team, plus a representative from New Hampshire DOT. In addition to the transportation planner and often the executive director from each RPC, most meetings included representatives from the local transit agency and other organizations involved in demand response transportation.

This memorandum presents a summary of the findings from these outreach meetings. The body of the memorandum is followed by an appendix showing the attendance at each meeting and the notes that were recorded by the consultant team. The agenda for all of the meetings was essentially the same, including the following topics:

1. Overview of the Strategic Statewide Transit Assessment Study
2. Review of existing transit services for local, regional and intercity transportation
3. Discussion of unmet needs for local, regional and intercity transportation
4. Available data (in terms of surveys, prior studies or other information)
5. Demand response service in the region
6. Park & Ride resources, needs, and potential locations
7. Discussion of public outreach

The schedule of meetings was as follows:

- June 9 – Nashua Regional Coordinating Committee at Nashua RPC office
- July 7 – North Country Council
- July 11 – Upper Valley Lake Sunapee RPC
- July 25 – Rockingham Planning Commission
- July 26 – Southwest RPC
- July 26 – Central New Hampshire RPC
- September 6 – Lakes Region Planning Commission
- September 6 – Southern New Hampshire Planning Commission
- October 4 – Strafford RPC

Summary of Findings

Needs

In each region of New Hampshire, the transit agency and other organizations providing public transportation service all work to meet the needs of their community with limited resources. No agency feels that it has sufficient resources to address the needs it knows about, much less expand its role in the community so that it can serve as an attractive mobility option for all people. Common themes expressed by the regions included the following:

- **Local fixed route/flex route service**
  - Longer hours needed on weekday evenings
  - More service/some service needed on Saturdays and Sundays
  - Higher frequency of service would be of benefit to existing riders and help to attract new ones
  - Many towns have no service at all; need connections to nearby cities, shopping, and medical facilities
- **Regional service**
  - Commuter connections needed from towns 10-40 miles from major employment centers, such as Manchester, Concord, and Lebanon/Hanover
  - Better intra-state connections needed for other occasional trips, such as medical, court-related, social/recreational
  - East-west connections needed to cities and universities, plus Manchester airport
- **Intercity service**
  - Portions of the state have little or no access to the intercity network
  - North-south connections along the east side of the state—to Dover/Durham—are poor or non-existent
  - Access to intercity service at Portsmouth difficult because of lack of parking capacity
  - Current intercity service not well-suited to intra-state travel, especially on I-89 corridor

Available Data

All regions had at least some recent studies to offer as background for the SSTA, including passenger surveys, transit development plans, or broader transportation studies. These documents include the following:

- Transit Feasibility Study (North Country Council)
- Long Rang Transportation Plan (Rockingham Planning Commission)
- Coordinated Public Transit and Human Services Transportation Plan for the Southeast NH Region (RPC and SRPC)
- Coordinated Public Transit and Human Services Transportation Plan for the Greater Derry-Salem Region (RPC and SNHPC)
- I-89 Commuter Transit Service Feasibility Study (UVLSRPC)
- I-93 Corridor Multi-modal Transit Investment Study (NHDOT)
- NH 120 Claremont-Lebanon/Hanover Transit Planning Services (UVLSRPC)

- Nashua Transit System Comprehensive Plan 2016-2025
- Nashua Transit Survey Results
- University Transportation Campus Connection Survey (UNH)
- CAT Boarding and Alighting Study (CNHRPC)

Demand Response Service

Although the focus of the SSTA is on bus services in New Hampshire, demand response service forms an integral part of the public transportation system. In rural areas, demand response may be the only form of transit available, but it plays a major role in urbanized areas as well. Every RPC meeting included at least one representative from an organization involved with demand response service, many of which are non-profit or volunteer-driven agencies.

A common theme across all regions was the difficulty in finding enough volunteer drivers to satisfy the demand for trips. All regions are forced to prioritize medical trips, and even though there are not enough resources to meet all of that demand, the providers recognize the lack of service to address their clients' other needs, such as for shopping and occasional social interactions and entertainment.

Most regions make efforts at coordinating rides, but they all recognize the challenges in doing so, including dealing with restrictions associated with siloed funding, the need to provide individual rides for some clients, and the high degree of communication necessary to achieve the coordination. Many programs prefer to have transportation services tailored to their constituents, rather than sharing resources with other programs.

Demand response service is not yet available in all New Hampshire communities. In some regions, the transit provider covers a whole county or several counties, but in other regions, service is more of a patchwork, with several organizations and town-based services combining to offer partial coverage.

Scheduling and dispatch varies across the state. In some regions it is centrally organized by the transit provider. In the southwest region, there is an innovative online tool called Triplist that allows volunteer drivers to choose which trips they will operate.

Park & Ride

All of the meetings devoted part of the time to discussing existing and potential park & ride lots in the region. The Park & Ride Report, part of phase 4 of the SSTA, presents these findings in more detail, but most regions expressed a need for additional park and ride capacity and new lots in strategic locations. The most significant capacity issue occurs at the Portsmouth bus terminal where most of the C&J Trailways service originates. Several regions cited difficulties in siting and constructing new lots because of local opposition or ownership issues.

Public Outreach

The discussion of public outreach consisted mainly of a description of the outreach strategies and confirmation that the RPCs will be involved in spreading the word about outreach and helping to encourage participation.

Appendix: Detailed Meeting Notes

The following pages contain notes of the meetings, including a list of attendees and the key points they brought up. They are presented in the chronological order in which the meetings were held.

Nashua RPC (part of a regular Regional Coordinating Council meeting) – June 9, 2017

Attendees:
Carol Brooks, SVTC
Camille Pattison, NTS
Tom Young, Town of Litchfield
Rebecca Harris, Transport NH
Dennie Townsend, SVTC
Rebecca Crowther, SVTC
Beth Todgham, SNHS
Janet Langdell, SVTC
Eloise Carleton, SVTC
Matt Waitkins, NRPC
Karen Baker, NRPC
Stephen Falbel, Steadman Hill Consulting
Jennifer Zorn, McFarland Johnson

Recently completed Nashua Transit System (NTS) Comprehensive Plan outlined the needs most recognized through public outreach to the general public. The needs that came from that were bus service earlier on Saturdays, Sunday service, and Walmart trips. NTS is not a transit authority so they can't use Nashua taxpayer money for transportation to other communities, but they are looking into a pilot program and dovetailing it with the SVTC. Additionally, a big need was fixed routes to Merrimack and Hudson.

SVTC noted that a bus to work comes up a lot as an important transportation need as well as connections to Manchester, Exit 6 in Nashua and connections with commuter rail and bus service. There are requests for Nashua to Boston, Peterborough and some healthcare facilities in Wilton and some requests for SVTC to go to Keene. NRPC added that there are requests for service from Keene to Nashua for Boston Express.

Getting clients from Nashua to Lebanon for services that can't be done anywhere else is also a challenge. There is a need for services to the VA in Manchester and services of the VA in Hooksett.

Exit 8 Park n Ride would be expanded to include 25 extra spaces due to an upcoming repaving and re-aligning of the parking spots. The Flatley Company is paying for a van service from Alewife in MA up to Tara Heights Commons in NH. Alene Candles does something similar for workers from Lowell.

There are issues with transportation from Nashua to the Manchester Airport. NTS is operating new bus summer trips to the seacoast and looking into Canobie Lake trips for next year if this is

successful. She added that the first bus trip was this past Saturday. Merrimack has concerns on transportation issues as connections to Manchester and Route 3 Daniel Webster Highway for shopping and medical trips. Currently they have paratransit services with NTS. That was a need for Litchfield as well.

There is currently no service at all in Pelham, Mason, Lyndeborough, and Litchfield, adding that Lyndeborough does have access to FISH only for non-emergency medical and there is a limitation do to the availability of volunteers.

SVTC provides about 300 trips a month, Monday through Friday from 8:30-6:00ish. There have been requests for same day dial a ride services. Currently, the advance notice requirement is 2 days and the scheduling is done by NTS for SVTC.

With regard to park & ride needs, a member noted that she had heard that folks use the Kohl's off Exit 6 as one and there is a vanpool park n ride of Exit 5, which is on the DOT list.

North Country Council – July 7, 2017

Attendees:
Patsy Kendall, Transport Central
Doug Grant, Transport Central
Carole Zangla, Littleton Senior Center
Nick Altonaga, NCC
Fred Butler, NHDOT
Stephen Falbel, Steadman Hill Consulting
Follow-up discussion with Brenda Gagne, TCC

1) Existing transit in NCC region
    a. Local
        i. Senior Wheels – 5310 – senior demand response
        ii. Freedom Express (4 hrs/day) (0.6 riders/hour) 3% FRR – non-senior transportation door to door, comes through 5311, general public DAR; fare structure set up, distance based
        iii. LRH (Littleton Regional Healthcare) (11 hrs/day, 1.1 riders/hr) get $100K/yr (double the cost)
        iv. Berlin-Gorham (every 2 hours M-Sat 5 trips ends at 4:45) $2 (4 riders/hr) 10% FRR $11K/yr
        v. Tri-Town (3 trips M-F) ends at 3:45 – Littleton, Whitefield, Lancaster $3 (4.6 riders/hr) 6% FRR $8K/yr
        vi. GCSCC – d2d transport at 8 senior centers in Grafton County (total of 10 or 11 vehicles; 5310 funding) 40K rides per year; each center has a dispatcher
        vii. Plymouth State University bus system – open to everyone but it doesn't go very many places; need a PSU password to get information
        viii. TCC service areas:
            - Colebrook area (Pittsburg to North Stratford)
            - Berlin-Gorham area (Mylan to Randolph, Jefferson)

- Lancaster, Jefferson, Whitefield
- Lancaster to Littleton
- Littleton Hospital bus Franconia, Lyman other towns
- Carroll County , three separate service areas, connected by Blue Loon
- Blue Loon since 2010, d2d and flex route runs once/week. Talk about what to do with the flex routes. Was more productive when it first started.
- Carroll County is seasonal people. Need has switched to d2d service.

b. Regional connections – American Transport in Lancaster does a lot of Medicaid transport
c. Intercity 1 trip from Berlin and 2 trips from Littleton daily
    i. Run more when PSU is starting or ending sessions
    ii. TCC has had requests from people along flex route to connect to Concord Coach (works in the morning but not in the evening)

2) Perceived needs
    a. Local
        i. Transport to PSU
        ii. No weekend local service – churches want transportation
        iii. Seasonal needs in Conway for summer (Lakes Region)
        iv. Mt. Washington Omni has their own service for workers (seasonal)
        v. Long distance medical trips for seniors. Starting to work with VA. Upper Valley, Maine. Run out of money in 6 months. Use volunteer drivers. Separate pool from Transport Central. Have about 26 volunteers.
        vi. Opioid, mainly Medicaid, daily trip. A lot for the volunteers. Portsmouth and Rochester. Hoping for a treatment center in Lancaster.
        vii. Get requests from Woodsville and Haverhill for flex route into Littleton. Mainly medical trips. Had talks 6 or 7 years ago about setting up service. Fell apart when started Carroll County. Started talks again this year.
        viii. TCC has had requests about connecting to the RCT route to get to Lancaster; big disconnect to other services because of the distances.
    b. Regional connections
        i. Trips to Dartmouth for medical appts
        ii. Littleton to Concord (medical, shopping, recreation)
        iii. Seasonal (summer) service to Franconia Notch trailheads (reduce parking demand for hikers)
        iv. Have not heard of demand to Colebrook (VA there?)
        v. Berlin-Gorham to North Conway for commuting as well as medical and shopping; year round
        vi. Berlin-Gorham to Lancaster, work, shopping, medical
        vii. Theme parks in Glen, Conway area May through October; teens need to get to work
    c. Intercity
        i. Getting to dialysis center in St J (Norris Cotton)
        ii. Try to connect to Concord Coach.

3) Available data

a. Feasibility studies for Carroll County and Tri-town route; 2010 from Nelson\Nygaard

4) Demand response
   a. Service
      i. Transport Central; volunteer driver org. Staff of 2; 20-25 volunteers; 5310 used to be only source, now Medicaid; CTS is the broker (non-profit); almost all medical trips; a few shopping trips; they have their own dispatcher for Medicaid, 5310 and VA
         - 25% of rides to Concord; most of those drug related
         - 12% of rides to Dartmouth
         - Big change from 4 years ago because took on Medicaid
         - Dialysis trip rationed; 3 one-way trips
      ii. TCC coordinates with Littleton Senior Center; has helped VT passengers get to Colebrook hospital
5) Park & Ride
   a. Unmet needs
      i. Location in Plymouth invites people to park (paid) with 24-hour meters
      ii. Littleton is doing a parking study/some talk of a P&R perhaps create terminal for Concord Coach – Brenda thinks this is the best
      iii. Parking congestion at PSU in Plymouth
      iv. Berlin and Gorham a lot of summer traffic for ATV riders; trails
6) Means of public engagement
   a. Local, in cooperation with NCC
      i. Had a well attended meeting for N/N study, held at senior center; 14-member advisory council who helped generate publicity and attendance
      ii. Local access channel in Plymouth Pease Public Library
   b. Mobility Manager is a designer, uses Facebook and other social media
   c. Regional/statewide

Upper Valley Lake Sunapee RPC – July 11, 2017

Attendees:
Fred Butler, NHDOT
Pat Crocker, UVLSRPC
Steven Schneider, UVLSRPC
Van Chesnut, Advance Transit
Stephen Falbel, Steadman Hill Consulting
Terri Paige, SCST (by phone)

1) Existing transit in UVLSRPC region
   a. Local
      i. AT
         1. Updating TDP this year

2. Housing crunch at Dartmouth College – building on existing parking lots
3. Sachem Village shuttle – hoping Dartmouth will fund this, connecting grad student housing to the campus
4. List of improvements in last TDP not yet implemented
5. Only change was to double service on the Green Line
6. Orange Line under pressure
7. Grad students reliant on transit—more experienced with transit
8. Fledgling Uber service in town; may alleviate some pressure for weekend and evening service
9. Priority to increase frequency on Blue Line
10. 15-minute midday service thanks to contributions between Lebanon and Hanover medical campuses
11. Expect big increase in ridership if offer 15-min service
12. Route 120 group concerned about congestion on Rt 120 corridor, backs up on I-89 in the morning
13. Hubs are limited – no room to add more buses; library and city hall in Lebanon
14. Intention is to keep it fare free; contributions from institutions and private donors

ii. SCST
1. Claremont – 8 trips, sort of hourly 8 to 4
2. Newport – 3 or 4 trips?
3. Charlestown – 2 trips then demand response in lull
4. Volunteer driver program
5. Working with CTAA and UVLSRPC to create a short term transit plan; marketing and branding process
6. Has been run as human service transit; municipalities and funders want to focus on commuter market; will need to look at creative ways to grow the system and partner with surrounding agencies

b. Regional connections
i. Stagecoach and The Current; a lot of service coming into the east entrance at the hospital; need to develop more capacity for buses
ii. Claremont to Lebanon study (commuter plus midday)
1. People didn't want to ride to P&R in Ascutney
iii. New London to Lebanon study
1. Nursing school in New London
2. P&R maxed out in New London (potential to expand it)
iv. Desire to have a route to Concord (especially for people in New London); commuting and other purposes; go to a hearing; governmental business; medical purposes
v. Dartmouth Coach not interested in running a commuter service (want consistent equipment)
vi. Claremont to Keene; HCS runs a bus from Keene to Lebanon every Monday. Would like to connect to that in Charlestown. Bus to VA in WRJ.
vii. Current sends a bus into Claremont once per week.

c. Intercity
    i. Dartmouth Coach
    ii. Greyhound
    iii. Amtrak
    iv. Vermont Translines goes from Hanover to Rutland

2) Perceived needs
    a. Local
        i. Weekend and evening service for AT
        ii. Claremont/Newport to New London for medical trips
        iii. Sunapee to more populated areas; vacationers in the summer (recreational connections)
        iv. Commuters include choice riders; also trying to fill jobs for second and third shifts
        v. Route 120 rezoning to allow for housing development in Centerra Park area; 5,000 employees in that area; close to DHMC
        vi. Blue Route not on 120, new convention center being built, Alteria will have several thousand employees there
    b. Regional connections
        i. Connections to Plymouth; 118 to US 4 very congested
            1. People from there parking at Methodist church at end of the Blue Line
        ii. Manchester airport
    c. Intercity
        i. Poor pedestrian connection between Blue Line and Dartmouth Coach terminal; but convention center development will help
3) Available data
    a. Various studies on RPC website
    b. Development proposals
        i. River Park Route 10 north of West Leb – mixed use, lab space, residential, retail (on Orange Line) 800K sq ft
            1. Potential spot for a new bus hub (to replace library, but library likes hub)
        ii. WRJ multi family and apt complexes Sykes Ave, new assisted living
        iii. Iron Horse park in Lebanon (big box stores) may not happen; might be an industrial park instead
        iv. Route 12A; cycle of redevelopment
        v. Claremont industrial park
4) Demand response
    a. Service
        i. 11 vehicles for DR service
        ii. 3 vehicles and a spare at Senior Center in Lebanon, others spread at various towns
            1. trying to coordinate with AT's ADA service
            2. seeking tech service to coordinate
            3. AT bending the curve on ADA demand
                a. Prob 27K rides mostly in Lebanon

iii. 40K rides per year; dispatch decentralized; volunteer dispatchers; 40% medical, 25% shopping, rest nursing home and senior center
iv. Below 50 vol drivers
v. SCST has 11 drivers and adding 3 more; majority from Newport/Claremont area; 80% of the rides going to Dartmouth; dialysis and cancer treatments

b. Needs
i. Many human service agencies are along the bus routes

5) Park & Ride
a. Unmet needs
i. Intermodal Study on RPC website
b. Potential locations
i. There was a proposed lot at exit 17, Lebanon said no
ii. Exit 17 (different parcel)
iii. Exit 16 – money was in the DOT budget to develop a property police chief in Enfield didn't like it – costs for policing it. Took money for developing Exit 13 instead. There's an unofficial lot at exit 16 used by legislators
iv. Exit 13 now at capacity

6) Means of public engagement
a. Local, in cooperation with UVLSRPC
i. Coordinate with TDP outreach for AT and short range plan for Claremont

7) Now legal to use TSP for transit buses; doing a study on that

Rockingham Planning Commission – July 25, 2017

Attendees:
Rad Nichols, COAST
Patricia Quinn, NNEPRA,
Cliff Sinnott, RPC Director
Scott Bogle, RPC
Fred Butler, NHDOT
Jennifer Zorn, McFarland-Johnson
Stephen Falbel, Steadman Hill Consulting

1) Existing transit in RPC region
a. Local
i. COAST; tries to focus on NE corner of the region; would like to connect to others; frequent opportunities rather than timed transfers; not looking at connections to MA or ME
ii. CART – no fixed route service
iii. UNH Wildcat (Portsmouth and Newington)
b. Regional connections
i. Tried East-West, built around the airport but then enplanements dropped
ii. Used to be far more connections to MA; 3 rail connections; eastern, main line and Lawrence-Salem

iii. MVRTA does a little service into Plaistow; has talked about coming to mall in Salem; the mall didn't support it
iv. Redevelopment of Rockingham Park (Tuscan Village); 2-3M sq ft, mixed use; rail line goes through the property
v. Health care access into MA a problem
vi. CART used to provide access to three hospitals in MA, still provide some DR

c. Intercity
i. Plenty of access to Boston

2) Perceived needs
a. Local
i. COAST
1. Connect downtowns and main corridors; don't serve internally in many communities
2. Serve Portsmouth pretty well but still large swaths without coverage.
3. At best every 30 min (CMAQ funded) probably going back to hourly after 3 years. Saw a big jump when went to 30 minutes. Would like to maintain 30-min peak service and expand coverage.
4. Want to have seasonal service Portsmouth to Hampton and Seabrook, then Exeter to Hampton/Seabrook;
5. Commuter services Epping to Portsmouth and Pease;
6. Route 1 corridor commuter and other needs
ii. Need for maintenance and administrative facility at COAST; can only garage 6 vehicles currently
iii. New medical facilities in Seabrook; there was a medical bus on Friday in conjunction with Lamprey to hospital; they do shopping shuttles (Lamprey Senior Center)

b. Regional connections
i. Commuters on the Downeaster; want more frequency
ii. Parking a challenge especially in Exeter
iii. Dover has available capacity but Durham is full; hard to use the parking for train
iv. Reliability is an issue; infrastructure needs; NNEPRA funds the maintenance in NH
v. Last mile issue; especially in Exeter. Need wayfinding. COAST connects to rail well in Dover.
vi. Peak hour trains are full; 5 cars on trains; have plans to add a 6th round trip
vii. Have multi-ride passes; to $319 from $299 (cheaper than MBTA)
viii. COAST-Wildcat fare reciprocity
ix. Concord and C&J have ticket agreements with Amtrak
x. Derry-Salem connection to Manchester
xi. I-93 Study – Feeder service from towns to major corridors (TDM coalition); plan called for BOS on I-93 (2012)

c. Intercity
i. A stop for IC service on I-95, a stop between Portsmouth and Newburyport;

   ii. COAST fixed route down Route 1, not cost effective because of local match; Hampton selectmen decided they didn't want a P&R in downtown (bus fumes); not much land at I-95/101 interchange.
   iii. C&J looking at P&R at exit 57 in Newburyport
3) Available data
   a. 2013 Telephone survey had some broad questions on transportation needs; redoing the survey this summer
   b. Development proposals
      i. Woodmont Commons at Exit 4
      ii. Rockingham Park – near to Exit 2 ; shopper shuttle by CART (deviated fixed route)
      iii. 7-8K employed at Pease
4) Demand response
   a. Service – in home aging elderly- highlighted in long range plan, medical appts
      i. Insufficient funds to start any comprehensive programs
      ii. Volunteer driver programs most cost effective; challenge for accessible vehicles through vol drivers; have one minivan
      iii. Not a lot of van providers in eastern Rockingham county
      iv. CART covers Salem and Hampstead
      v. RCC tries to coordinate, but a lot of players; DHHS is not at the table
      vi. COAST does 5310 and Medicaid service as part of RCC; does not have an internal volunteer driver program
      vii. TASC based in Hampton; ride scheduling through COAST (45-50 volunteers, 30 active)
      viii. Ready Rides (southern Strafford) (about the same size)
      ix. Dialysis in Exeter (most of TASC trips go there), also Londonderry, Salem and Portsmouth
5) Park & Ride
   a. Unmet needs
      i. Exeter train station – capacity constraint
      ii. Portsmouth transportation center (used as a remote airport parking lot for Logan); free parking there; used by locals during winter ban; study of pricing ongoing; Jim Jalbert talking about P3 there to charge for parking
      iii. New P&R in Hampton, Route 1 and 101 for intercity
   b. Commute Smart Seacoast – ridesharing initiative TMA; 40-50 firms (covering 11K employees); get participation during challenges; over 400 carpools established

Southwest RPC – July 26, 2017

Attendees:
Ellen Avery, CVTC – mobility manager and volunteer driver coordinator
JB Mack, SWRPC
Mike Acerno – manager for City Express
Mari Brunner, SWRPC
Stephen Falbel, Steadman Hill Consulting
Erica Wygonik, RSG

1) Existing transit in SWRPC region
    a. Local
        i. City Express
            1. Ridership down because of Keene State; enrollment down, Keene state offers parking; Pumpkin Fest disaster; trying to educate students, Go Green use the bus; try to make it easier for them to ride. KSC now allows freshmen to park
            2. Get zero money from the hospital
            3. Get zero money from municipal $5 fee on registrations
            4. Complete streets in Keene, Hinsdale, Walpole, Swanzey
            5. Buses are 16 pass + 2 wc
        ii. Brattleboro Blue route to Hinsdale; Winchester and Hinsdale the neediest communities; seems to be sustainable; ridership increasing
        iii. Monadnock Alliance for Sustainable Transportation (advocacy group) college and hospital participate
        iv. Healthy Monadnock; money that used to go to transit went to this initiative
        v. A few Hinsdale people/day, Walmart gets decent numbers
    b. Regional connections
        i. Hard to get anywhere in NH from SWRPC region
    c. Intercity
        i. Friday and Sunday Greyhound service from Boston through Keene to Brattleboro (funded by MA); was interest in Peterborough; tried to establish a P&R there; owner of plaza not interested
        ii. Struggled with trying to get people to Boston; now have to go through Springfield. Getting home you have to sleep in WRJ or Springfield
        iii. Local Time Exchange; requests to get a ride to Manchester airport, Logan or Brattleboro
2) Perceived needs
    a. Local
        i. Hospital in Peterborough
        ii. Winchester to Keene (cheaper to live there); commuter connection needed. Route 10 study done 8-9 years ago; a lot of subsidized and senior housing in Winchester; town doesn't have a lot of money. West Swanzey-low income area
        iii. Town Rec departments have vans
        iv. Transportation Center; used to have one Gilbo Ave (still used), converted to restaurants; interest in a new one with waiting area, rest room, parking; trying to make it functional for local transit; services are currently disjointed; study just starting; local bus, intercity, bike/ped, carsharing; no long-term parking to use intercity bus service; looking at airport in Swanzey or downtown
        v. Methadone clinic in Swanzey. Looked at running service there, not enough numbers
        vi. Info in Google maps, but not yet live feed due to cost for GPS in busses
        vii. City, college interested in helping with technology
    b. Regional connections
        i. Keene-Brattleboro

ii. Keene-Peterborough (Ringe, Jaffrey 202 spine)
iii. Connections to Fitchburg/Gardner

c. Intercity
i. People use Rt 9 to get to Manchester, Concord and Portsmouth (rather than 101). Access point at intersection of Rt 9 and I-89 P&R and/or transit service (suggested Dartmouth Coach stop). Underused lot in Hillsborough.
ii. Feeder connection?
iii. Nashua region wanted Greyhound but wanted bus stop in Milford
iv. Coordination with MA and VT with regard to intercity service; looking for support, routes through region funded by MA & VT
v. Hard to get to Manchester Airport
vi. Need long term parking to be able to use intercity service

3) Demand response
a. Service; CVTC has 80 active drivers, avg number driving per month is 52; would like to have a pot in each town. Of 33 towns, 22 towns have drivers; two coordinators in Peterborough. plus online trip mgmt system called Triplist – riders call, no online system; 5310 POS, non-emergency medical and social service appts are primary purposes, but not Medicaid (refer trips out to Medicaid provider). Also do shopping and pharmacy and personal business; started in 2008. Drivers select from Triplist rather than being dispatched. 90% take reimbursement. Absorbed Red Cross program (these didn't take reimbursement). 41 cents/mile
b. Take non E&D. Only 7% are younger than 60. Do fundraising to carry those riders. Do solicitations among riders
c. Served 291 individuals in 2016; avg monthly around 600
d. Will go as far as Boston and Lebanon, but most go to Monadnock Hospital and Cheshire. Dialysis patients in Keene, some trips to Nashua, Greenfield. 2 hour max
e. Needs
i. Any trip that was not selected by a driver; under 8%

4) Park & Ride
a. Unmet needs
i. Only 1 location in region, Chesterfield Rt 9 @ state park Gorge, no intercity bus service
ii. Greyhound passes by it Keene → Brattleboro
iii. 10-hour limit at Transportation Center, no long term parking to support intercity bus
b. Potential locations
i. was interest in Peterborough; tried to establish a P&R there; owner of plaza not interested
ii. Access point at intersection of Rt 9 and I-89 P&R and/or transit service.
iii. Reviewed in PnR toolkit
1. On Keene Bypass System (ideally intercity bus & local)
2. Peterborough 202 & 101, got funds to develop
iv. Looked at community center
v. Not in region but something in Hopkinton Rt 9 @ 89 would serve the region
vi. VT has covered the 91 corridor (Brattleboro, Westminster, Rockingham), what's lacking is to the west.

vii. Informal lots
1. 202 & 101 Peterborough plaza, Job Lot
2. Keene so many places they can park
3. Antioch commute in cluster, classes in 2 days
4. Peterborough 202 up to 9, complex Brady's, Dunkin Donuts
5. On bypass 9, 12, 101
6. PnR limited access highway on/off visible
7. large workforce going elsewhere, highest concentration?
8. Around gas station on 9? HIllsboroguh small

5) Available data
a. Can provide links to studies, surveys to assess need.
b. No phone studies.
c. UNH did a statewide study (Rebecca Harris Scott Bogle) regional glimpse of attitudes, priorities, spend $
d. MM: ridership counts, customer satisfaction surveys, can send most recent.

6) Public engagement
a. For MRCC mtgs: town reps/leadership, state reps, 4 areas.
b. Don't use Facebook, hear about, use to get the word out
c. 3 committees: regional coordinating council, TAC, MAST. All would take interest, could bring together, or help with messaging, materials, collect info send on.
d. CCP committee.
e. intermodal trans center, overlap future of transportation in the region
f. Facebook: City Express, MAST, Friendly bus: send certi, gold stars.

Central New Hampshire RPC – July 26, 2017

Attendees:
Michael Tardiff, CNHRPC
Dean Williams, CNHRPC
Jim Sudak, CAT
Erica Wygonik, RSG
Sam Durfee, CNHRPC
Stephen Falbel, Steadman Hill Consulting
Fred Butler, NHDOT

1) Existing transit in CNHRPC region
a. Local
i. CAT
ii. Trying to take care of WTS riders with other services

2) Perceived needs
a. Local
i. Ran Saturday service in November (5 weeks) started strong the first year; 2011-2013, then declined
ii. People want weekend service and later hours
iii. Manchester St

iv. NHTI donation of $2700 annually

b. Regional connections
   i. Franklin-Concord
   ii. Hillsborough-Concord
   iii. Henniker
   iv. Tilton (prep school) buses into Concord
   v. Pittsfield (low income) – some large employers there, a farm there, van brings people out
   vi. Chichester (seniors)
   vii. Durham-Concord, workers and students Rte 4
   viii. Pembroke/Allenstown to Hooksett; informal P&R at Sully's 28/3 (part of Manch UZA now); Allenstown low income elderly got into Concord; have looked at corridors
   ix. I-89 corridor: Warner (has Market Basket, Liquor store and P&R) Exit 2 P&R, Market Basket is informal lot
   x. Loudon Route 106 (not much of a market)

c. Intercity
   i. Feeder service I-89; how connect Lebanon-Concord-Manchester, Franklin
   ii. Littleton some get off in Concord, Tilton PnR
   iii. Montreal is desired destination

3) Development
   a. Walmart planned for Hillsborough on 202
4) Demand response
   a. Service
      i. Volunteer program in Hillsborough, 50/50 going to Concord and Manchester, run by CAP, a few hundred/year
      ii. Covers the entire region: Concord #1, Hillsborough #2; mostly medical and food. Only available weekdays
      iii. 46 in the region; 10 in Hillsborough, rest in Laconia, Franklin, Concord
      iv. Other volunteer driver program in Contoocook and Hopkinton (Dial a Ride)
      v. Another in Henniker White Birch
      vi. RSVP in Merrimack County
      vii. Friends
      viii. American Cancer Society
      ix. Future in Sight (for the blind)
      x. Senior Bus into Suncook 1/wk, Salisbury 1/wk, ADA service in town
      xi. Other 5310: Bradford, Alton, Laconia, Pittsfield, Meredith, Franklin (all come out of senior)
      xii. Call center tracks ridership in Excel
   b. Needs
      i. Biggest problem is finding drivers
      ii. Dunbarton has low ridership and no drivers
5) Park & Ride
   a. Unmet needs
      i. Keene to Concord/Manchester
      ii. Hillsborough – informal one at the Shaws, more use than official one

iii. Henniker 202-127 intersection Old Concord Road informal PnR lot behind Dunkin Donuts
iv. Expanding Bow P&R
v. 129 & 106 informal PnR

b. Potential locations
i. Pittsfield, was going to be developed, 107/28 (not developed yet) using CMAQ funds
ii. 6 or 7 locations
iii. Exit 18 in Canterbury (10 spots)
iv. Epsom traffic circle, informal parking at Care pharmacy, open asphalt, but no obvious bus terminal
v. No good options in Chichester
vi. Old rest area Northwood town border, former rest area goes to surplus
vii. Informal PnR at Sullys (28 & 3 in Pembrook)
viii. Tilton PnR underused, informal at McDonalds, Outlets

Lakes Region Planning Commission – September 6, 2017

Attendees:
David Jeffers, LRPC
Ann Sprague, Interlakes Community Caregivers
Larisa Djuvelek-Ruggiero, BMCAP
Jeff Hayes, LRPC
Doris Dryer, Carroll County RSVP
Mary Carey Seavey, Carroll County RSVP

1) Existing transit in LRPC region
   a. Local
      i. Former WTS
      ii. Blue Loon Flex route
         1. Very complicated – deviations, fees; doesn't seem to serve needs – does it really work?
         2. Used to run Ossipee to Laconia for commuting
         3. Focus was senior housing, grocery, hospitals
      iii. TCC effective in Conway
   b. Regional connections
   c. Intercity
      i. People drive to Concord to get to Boston
2) Perceived needs
   a. Local
      i. Needs among people who don't qualify for other programs
      ii. Employment/jobs access – volunteer drivers can help for a few days but not indefinitely
      iii. "public transit does not exist in Carroll County" – Blue Loon is good intention but not functional; it could serve a great function

iv. No place for people to live in Conway – all of that mall development; have to live in surrounding towns but they don't have transportation
v. Needs increasing because of aging population
vi. Needs to get to court
vii. Access into and out of Laconia for work and classes

b. Regional connections
i. From Conway to get to Dover, Portsmouth and seacoast area; a lot of that is medical related
ii. Franklin-Concord (parallel study)
iii. Larisa provided a log of trip needs for the mid-state region

c. Intercity
i. Route 16 to Dover and coast

3) Available data
a. Coordinated HSTP (2010): http://www.lakesrpc.org/ckfinder/userfiles/files/Misc/2010%20coordinated%20plan.pdf

4) Demand response
a. Service
i. RSVP
ii. Caregivers
b. Needs

5) Park & Ride
a. Potential locations
i. West Ossipee (unofficial McDonalds parking lot)
ii. Town of Warner
iii. 16/28
iv. 28/140/11 (Alton)
v. Meredith has public lot behind Aubuchon

Southern New Hampshire Planning Commission – September 6, 2017

Attendees:
Mike Whitten, MTA
Adam Hlasny, SNHPC
Sylvia von Aulock, Director, SNHPC
Nate Miller, SNHPC
Fred Roberge, CART
Fred Butler, NHDOT
Stephen Falbel, Steadman Hill Consulting
Erica Wygonik, RSG

1) Existing transit in SNHPC region
a. Local
i. MTA

   ii. CART
b. Regional connections
   i. Seasonal service to the beach
   ii. Concord more of a terminal
   iii. MTA has Concord Express & Nashua Express
c. Intercity
   i. Limited Greyhound through Manchester
   ii. Concord Coach and Boston Express at P&R lots

2) Perceived needs
   a. Local
      i. Evening service in Manchester – two routes now going to 9:30
      ii. Higher frequency (South Willow) – time to start enhancing the core
      iii. More specialized services to deal with aging population (D2D)
      iv. Making it easier to work with specialized services (MTA with CART, for example)
      v. Can get to medical but not food shopping, recreation
      vi. Derry and Londonderry fast growing – CART provides DR service there and route deviation service (Derry-Londonderry Shuttle); will need a fixed route service connecting to Manchester – Woodmont Commons at exit 4 – retail, housing, assisted living; one of the largest development proposals in NH. (Another large dev't in Salem Tuscan Village)
   b. Regional connections
      i. Nothing up the 93 corridor connecting to Manchester from Salem and Windham
      ii. Nashua to 93 corridor via 111
      iii. Have CART do excursion type trips to avoid charter issues for MTA
      iv. Link to rail trails
      v. Better enforcement of charter rule to avoid frivolous claims to block MTA from running shuttles for excursions
   c. Intercity
      i. Connectivity to Manchester airport
      ii. East-West service weak because transit systems weak on either side
      iii. Concord-Maine-Portsmouth big draw Christmas
      iv. Docking fee at Stickney Avenue even though state-owned facility

3) Demand response
   a. Service
      i. CART in 5 towns; demographics pointing to additional needs; Londonderry has approved funding for additional service; have not been using all of the 5310 funds because of lack of match; expand membership (Windham and Plaistow), get more match
      ii. Northern area fund service provided by Easter Seals; Goffstown/Hooksett share a vehicle
      iii. MTA provides shopper shuttles; match by grocery stores
      iv. Eastern and western areas have only volunteer service
      v. HHS Title IIIB money funds $10/trip, but a lot of restrictions; no one-way trips

vi. Do a lot of adult day
vii. Need a lot more coordination; consolidation of funding sources
viii. CART participates in Medicaid; causes a loss; but not MTA

b. Needs
i. Only have DR service in 7 of 14 communities
ii. Nate thinks DR service should be rated as to service hours per month or per community rather than based on ridership
iii. Look at State Coordination Plan

4) Park & Ride
a. Unmet needs
i. Exit 3 P&R as connection point between NTS and I-93 corridor
b. Potential locations
i. Manchester satellite lots.
1. PnR for transit into town. Mill Buildings parking. Private company PnR off highway, trolley system;
2. Coordinate off exits with community college
3. Queen City/Elm, realistic location, limited passenger rail
ii. Derry very popular area, Windham Boston Express

Strafford RPC – October 4, 2017

Attendees:
Rad Nichols, COAST
Michael Williams, COAST
Dirk Timmons, UNH Wildcat (by phone)
Steve Pesci, UNH Wildcat (by phone)
Colin Lentz, SRPC
Stephen Falbel, Steadman Hill Consulting
Jennifer Zorn, McFarland Johnson
Erica Wygonik, RSG

1) Existing transit in Strafford region
a. Local
i. New GTFS for COAST
ii. Some parallel service Newington to Portsmouth between COAST and UNH
iii. The agencies split in 1998, then flourished
iv. Wildcat – last 5 years there have been changes in the housing market; increase in student housing in Durham; students moved in from surrounding communities; Campus Connector has grown while other Wildcat routes have dropped; 100% of operating money comes from University; much of capital fleet from CMAQ and ARRA, university pays the match
1. Little Bay Bridge project
2. Service to Rochester, some money from CMAQ, plans to terminate Rochester 125 service in May
v. Wildcat has had Nextbus for three years
b. Regional connections

i. Greatest mix of modes in the state
ii. Room for improving the intermodal connections
iii. Talk of ferry service in and out of Portsmouth
iv. Connections for Wildcat
    1. Degraded with intercity service over the years because intercity providers have changed service
    2. Intercity providers left downtown Dover to go to Exit 9
    3. Do not connect with intercity service at Pease – have to transfer to COAST to get to intercity
    4. Have connections to Greyhound in downtown Portsmouth
v. COAST connects with Amtrak, Greyhound, Wildcat, Pease, but few customers make those transfers; schedules set for local needs rather than connections
vi. COAST/Wildcat serve different markets; have fare reciprocity

c. Intercity
i. COAST connects to C&J terminals; hourly service, but not trying to make a tight connection.
ii. No sharing of data from the intercity side to the local providers
iii. Exit 9 connection on the way to County Complex
iv. C&J has sporadically served Durham, but not for a few years
    1. But Durham is served by Amtrak

2) Perceived needs
a. Local
i. COAST – run later at night; most end between 6 and 9:30 p.m.; not studied yet to determine how much later things would need to run to serve service sector employees
ii. Some requests for Sunday service
iii. Rt 7 goes between Newmarket and Exeter (separate from rest of COAST, but can connect to Wildcat). Hard to get from Exeter to Portsmouth
iv. Do a good job connecting communities, but only serve the main streets; there's a lot of Rochester, say, that is not covered; want more intracity service within some of the communities
v. Significant capital needs; ITS and fleet; inadequate federal funding and inadequate local match
    1. TSP was enabled this summer; COAST looking to incorporate TSP for transit
    2. Want real-time info for passengers
vi. Wildcat – do productivity studies; biggest need is capital fleet replacement

b. Regional connections
i. Hear from parents because Freshman can't have cars; need East-West service; connection to Manchester (downtown and the campus)
ii. University would like to connect to Manchester and Concord (other campuses)
iii. Connectivity to beaches from Portsmouth or out of Exeter; not just in summer; transient population in the winter

iv. Have looked into going into Alton and New Durham; hard to build something new

c. Intercity
   i. C&J growing like crazy; parking is their major issue. Portsmouth and Dover
   ii. Built in conflict at general state P&R that also have intercity service; the operator doesn't want to see non-riders there. Some Portsmouth residents use the P&R lots for their garage

d. Rail
   i. Exeter train station issue same as C&J

3) Available data
   a. Transit surveys
      i. COAST has 2015 survey
      ii. UNH has plenty of surveys
         1. Transit user survey in Spring 2014
         2. Macro survey every 6 years; a number of transit questions
      iii. SRPC did a survey in 2015 for regional plan; support for public transit expansion in top 3
4) Demand response
   a. Service
      i. Recently updated HSTCP for RCC region (along with RPC)
   b. Needs
      i. Hear a lot of needs from E&D and people from outside ADA service area; there are some providers in rural areas 5310; Ready Rides, large volunteer driver org
      ii. COAST has regional call center; book rides for three agencies (adding a fourth)
5) Park & Ride
   a. Unmet needs
      i. Land use issues about P&R lots using land at primary sites (33&I-95)
      ii. What is the purpose of the lots, for commuters? For airline passengers?
   b. Potential locations
      i. Lee traffic circle; which leg of the intersection? Transit service ending in May
      ii. 108 South of Durham to serve route 5
      iii. Route 4 in Northwood (small) at US 202
      iv. Route 2, 3, 101 deal with Care Pharmacy/CVS in Dover near exit 8
      v. Something in Somersworth along High Street
      vi. New Durham Route 11, some unofficial spots used by ATVs and snowmobilers, see a need for a future P&R there
         1. COAST route 6 has no logical terminus; a P&R would be a good terminal
      vii. Issue of free parking at all of the park & ride lots
      viii. On route to shipyard, could be in Maine to relieve pressure: Berwick, Somersworth
      ix. Exeter PnR capacity, lots at rail overcapacity, alternatives
      x. Fox Run Mall (informal)
      xi. Newmarket library

APPENDIX D: PARK & RIDE REPORT

FINAL REPORT

STATEWIDE STRATEGIC TRANSIT PLAN: PARK-AND-RIDE FACILITIES

AUGUST 2019

RSG
the science of insight

PREPARED FOR:
NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

SUBMITTED BY:
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1.0 INTRODUCTION

This report documents an assessment of the state of the New Hampshire Department of Transportation (NHDOT) Park-and-Ride facilities and guides future investment in them. This report examines current demand, identifies any deficiencies, and projects future needs. It examines over-utilized lots and areas of unmet demand and suggests a method to prioritize investments in them based on specific, objective criteria identified from the literature.

2.0 INVENTORY OF PARK-AND-RIDE FACILITIES

The inventory of park-and-ride facilities is focused in two areas – amenities and capacity. Amenities make the park-and-ride experience safer and more comfortable, and they encourage the public to use park-and-ride lots. Capacity focuses on the demand and availability for park-and-ride spaces throughout the state.

The inventory includes details on thirty-three lots in the New Hampshire Park-and-Ride system. They are illustrated in Figure 1. Table 1 follows and outlines key features of each. As illustrated in Figure 1, the existing facilities are generally along major highways – often interstates or turnpikes, and most of the facilities are in the southern third of the state. As will be discussed below, these locations correspond with best practices given their proximity to major roads and their coverage of most areas with high population density. The following sections will review what amenities are provided in each location, and any gaps in capacity in the system. The capacity review will examine areas of unmet demand and where demand outstrips capacity.

FIGURE 1: REFERENCE MAP FOR NHDOT PARK-AND-RIDE FACILITIES

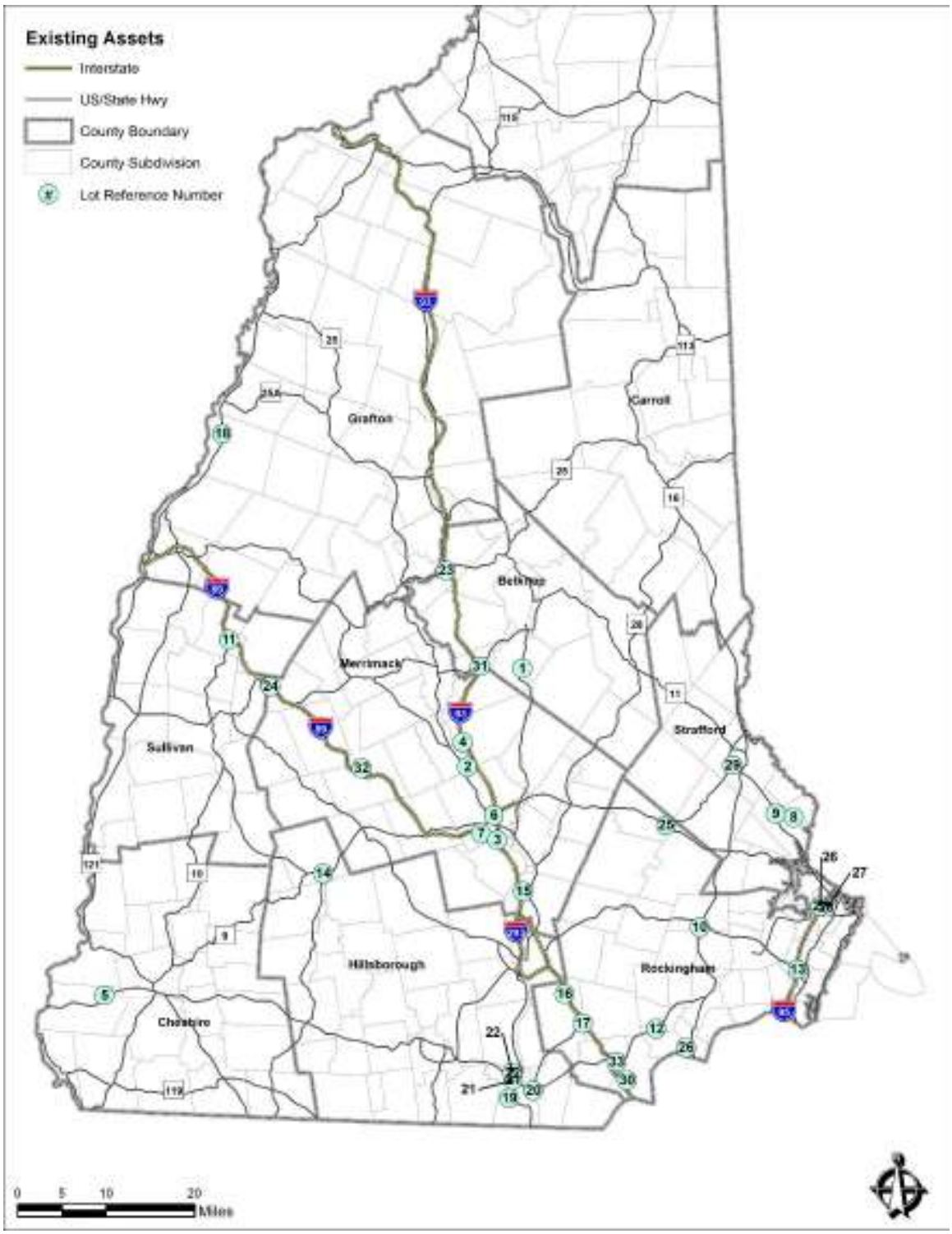


TABLE 1: INVENTORY FOR NEW HAMPSHIRE PARK-AND-RIDE FACILITIES

ID	Municipality	Ownership	Bus Shelter	Bike Racks	Local Transit	Intercity Transit	Spaces	Utilization	ADA Compliant?
1	Belmont	Town of Belmont					42	52%	not available
2	Boscawen	NHDOT					42	50%	
3	Bow	NHDOT					60	95%	♿
4	Canterbury	NHDOT					10	70%	
5	Chesterfield	NHDOT					45	16%	
6	Concord (Clinton St.)	NHDOT		🚲			100	86%	
7	Concord (Stickney Ave.)	NHDOT	🚏	🚲	🚌	🚌	580	81%	
8	Dover (Ice Arena)	City of Dover					230	43%	not available
9	Dover (Rt. 16)	NHDOT	🚏	🚲	🚌	🚌	414	93%	♿
10	Epping	NHDOT	🚏	🚲			246	23%	
11	Grantham	NHDOT	🚏				53	21%	♿
12	Hampstead	NHDOT					104	3%	♿
13	Hampton	NHDOT					104	59%	
14	Hillsborough	NHDOT					106	9%	♿
15	Hooksett	NHDOT					45	51%	
16	Londonderry (north)	NHDOT	🚏	🚲		🚌	728	67%	♿
17	Londonderry (south)	NHDOT	🚏	🚲		🚌	452	29%	♿
18	Lyme	NHDOT					10	60%	♿
19	Nashua 5W	City of Nashua					10	26%	not available
20	Nashua (Crown St.)	City of Nashua					243	not available	♿
21	Nashua 7E	NHDOT					50	34%	♿
22	Nashua 8	NHDOT	🚏	🚲	🚌	🚌	377	84%	♿
23	New Hampton	NHDOT					111	36%	♿
24	New London	NHDOT	🚏			🚌	132	88%	♿
25	Northwood	Town of Northwood					39	21%	not available
26	Plaistow	NHDOT					275	15%	
27	Portsmouth (PTC)	NHDOT	🚏	🚲	🚌	🚌	1248	98%	♿
28	Portsmouth (Rt. 33)	City of Portsmouth		🚲			50	24%	not available
29	Rochester	NHDOT	🚏		🚌		200	34%	♿
30	Salem	NHDOT	🚏	🚲		🚌	476	72%	
31	Tilton	NHDOT					63	16%	♿
32	Warner	NHDOT					23	57%	
33	Windham	NHDOT	🚏				140	27%	♿

2.1 | AMENITIES AND IMPROVEMENTS

Amenities at park-and-ride facilities, such as bus shelters and lighting, provide benefits to park-and-ride users. The sections below summarize the presence of amenities at NHDOT lots and include:

- Lighting
- Bus Shelters and Transit Service
- Pavement Markings
- Surface Condition
- Bicycle Amenities

Additionally, this section considers what improvements are necessary to meet ADA requirements.

Lighting

Lighting increases the safety at park-and-ride facilities as well as the perception of safety. It can also make using the lot more pleasant and easier to navigate. Lighting should be installed at all new park-and-ride facilities, and lighting guidelines should follow the 2004 AASHTO *Park-and-Ride Guide*. **All existing New Hampshire Park-and-Ride facilities have lighting.**

Bus Shelters and Transit Service

Shelters make lots more comfortable, but generally do not increase park-and-ride usage. They require maintenance and cleaning so as not to become an eyesore. Figure 2 illustrates the location of park-and-ride facilities with transit service, and Figure 3 illustrates the location of park-and-ride facilities with shelters. **There are three lots with shelters but no public transit service (Table 2).**

TABLE 2: PARK-AND-RIDE LOTS WITH A SHELTER AND NO TRANSIT ACCESS

Lot Name	ID	Capacity	Utilization
Epping	10	246	23%
Grantham	11	53	21%
Windham	33	140	27%

NHDOT should include shelters where transit use justifies them. Agencies with policies about bus shelter installation require at least 25 transit boardings per day in rural locations or those with infrequent service. In more urban locations, at least 40 transit boardings per day are required[1]. Transit amenities may be used by other service providers, including schools and recreation departments, and these uses should also be considered. For example, a charter school provides transportation to students at the Epping Park-and-Ride lot. Other important factors include use by passengers with limited mobility, local input and preferences, and any history of potential challenges in the area such as vagrancy, graffiti, or illegal dumping. The State may also want to consider guidelines for decommissioning shelters at locations that do not provide transit access to reduce maintenance costs

[1] These agencies include MetroTransit in the Twin Cities area of Minnesota; TriMet serving the Portland, Oregon area; and WMATA serving the Washington DC Metro area. Policies require between 40 and 50 boardings per day in urban areas, and 25 to 35 boardings per day in more rural areas.

and limit potential management concerns. Evaluation criteria to decommission a shelter should include any history of management challenges, current or anticipated use, and the user population.

FIGURE 2: PARK-AND-RIDE LOTS WITH TRANSIT ACCESS

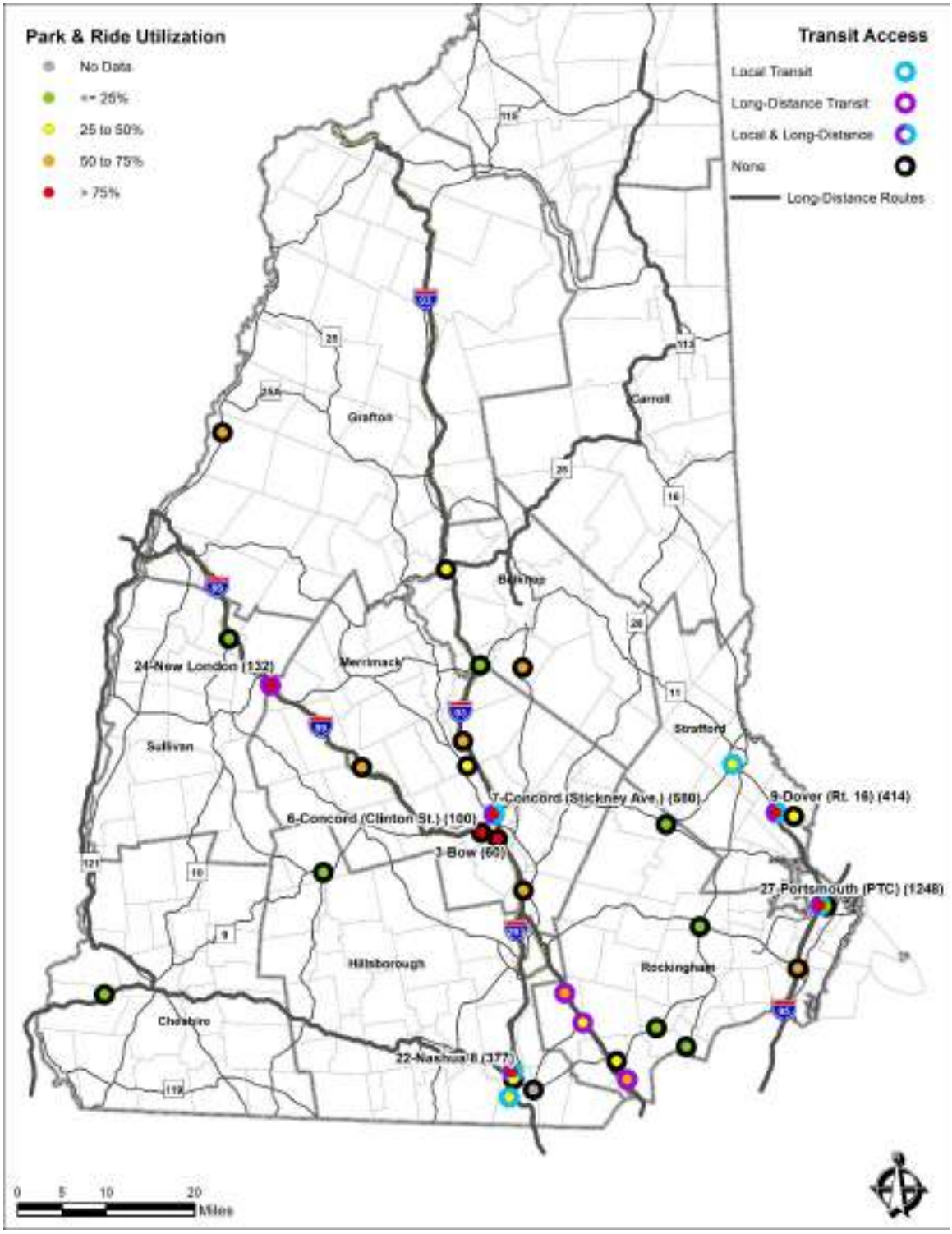
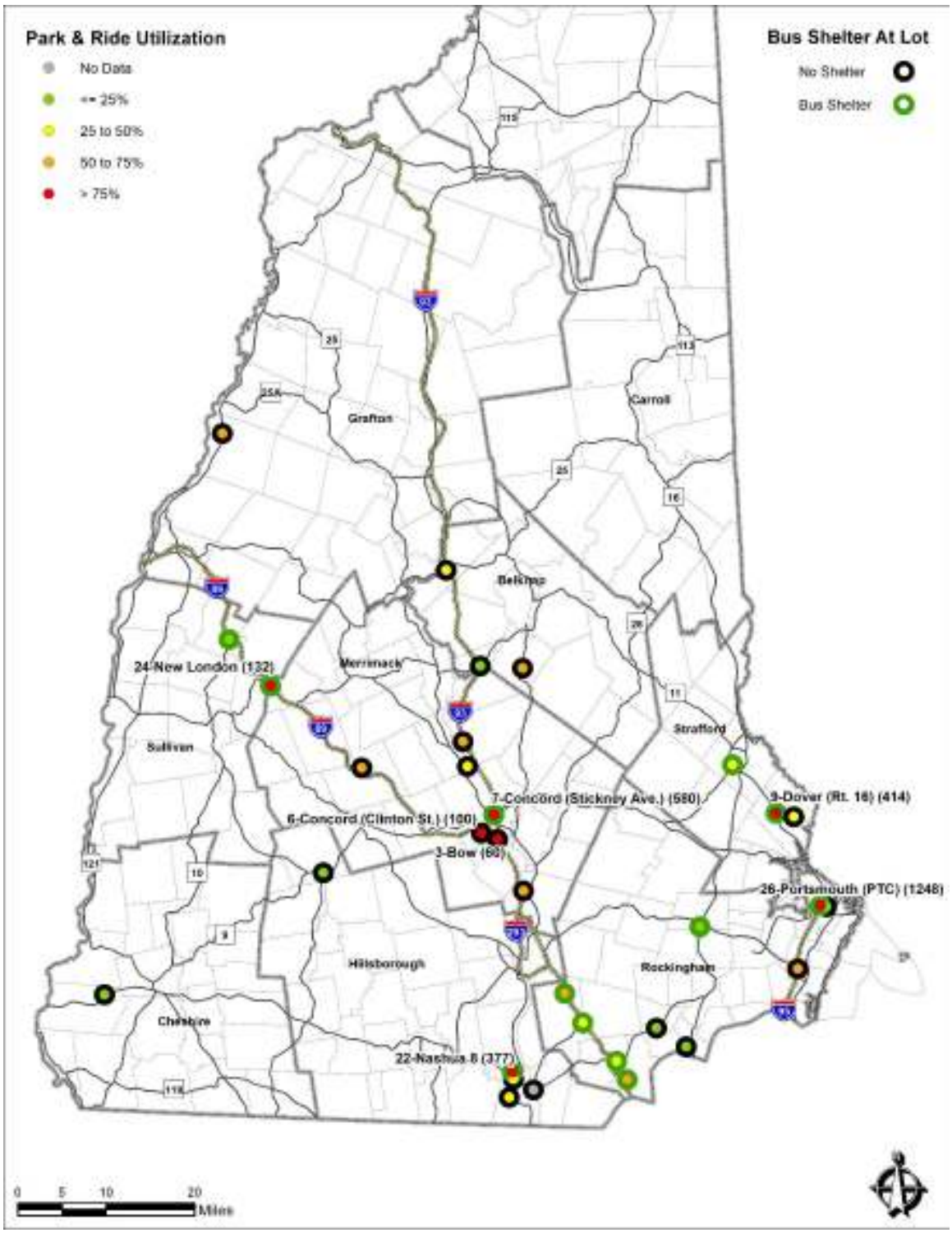


FIGURE 3: PARK-AND-RIDE LOTS WITH BUS SHELTERS



Surface Type, Surface Condition, and Pavement Markings

All park-and-ride facilities in New Hampshire are paved. **A review of pavement condition at lots suggest most have "good" or "fair" surface conditions.** The State is maintaining pavement conditions at park-and-ride lots. It should continue to monitor lots for pavement problems and repair them as necessary.

Bicycle Amenities

All of the park-and-ride lots can be accessed by bicycle, but **only 31 percent of the park-and-ride lots contain bicycle racks** (see Figure 4 for a map of lots with bicycle parking). Bicycle access can provide important extension to the utility of transit services and park-and-ride facilities, especially for those without cars, and bicycle racks are low-cost improvements. Bicycle racks should be prioritized at park-and-ride lots with observed bicycle use, with transit service, with easier bicycle access, or in areas with a higher potential for bicycle-dependence. Bicycle lockers provide additional security for bicycle riders and should be prioritized at park-and-ride lots in close proximity to higher density population centers, those with higher frequency public transit service, and those with lower-stress bicycle access.

Americans with Disabilities Act (ADA) Requirements

Park-and-ride facilities are public facilities, and therefore NHDOT must make reasonable accommodations to make them navigable for people with disabilities. In 2016, NHDOT completed a study (Americans with Disabilities Act Title II Transition Plan) to identify any improvements required on NHDOT facilities to comply with ADA requirements. This document provided a comprehensive review across all facilities, including the state park-and-ride facilities. **Fourteen of the lots surveyed in the 2016 NHDOT ADA Transition Plan were found to be in compliance with ADA.** Table 3 includes information from the 2016 Transition Plan regarding improvements needed at the noncompliant facilities. Noncompliant lots had missing or noncompliant van parking, larger than acceptable grades, and missing or faded signs or striping. Addressing slopes requires more effort than new striping or signage.

FIGURE 4: PARK-AND-RIDE LOTS WITH BIKE RACKS

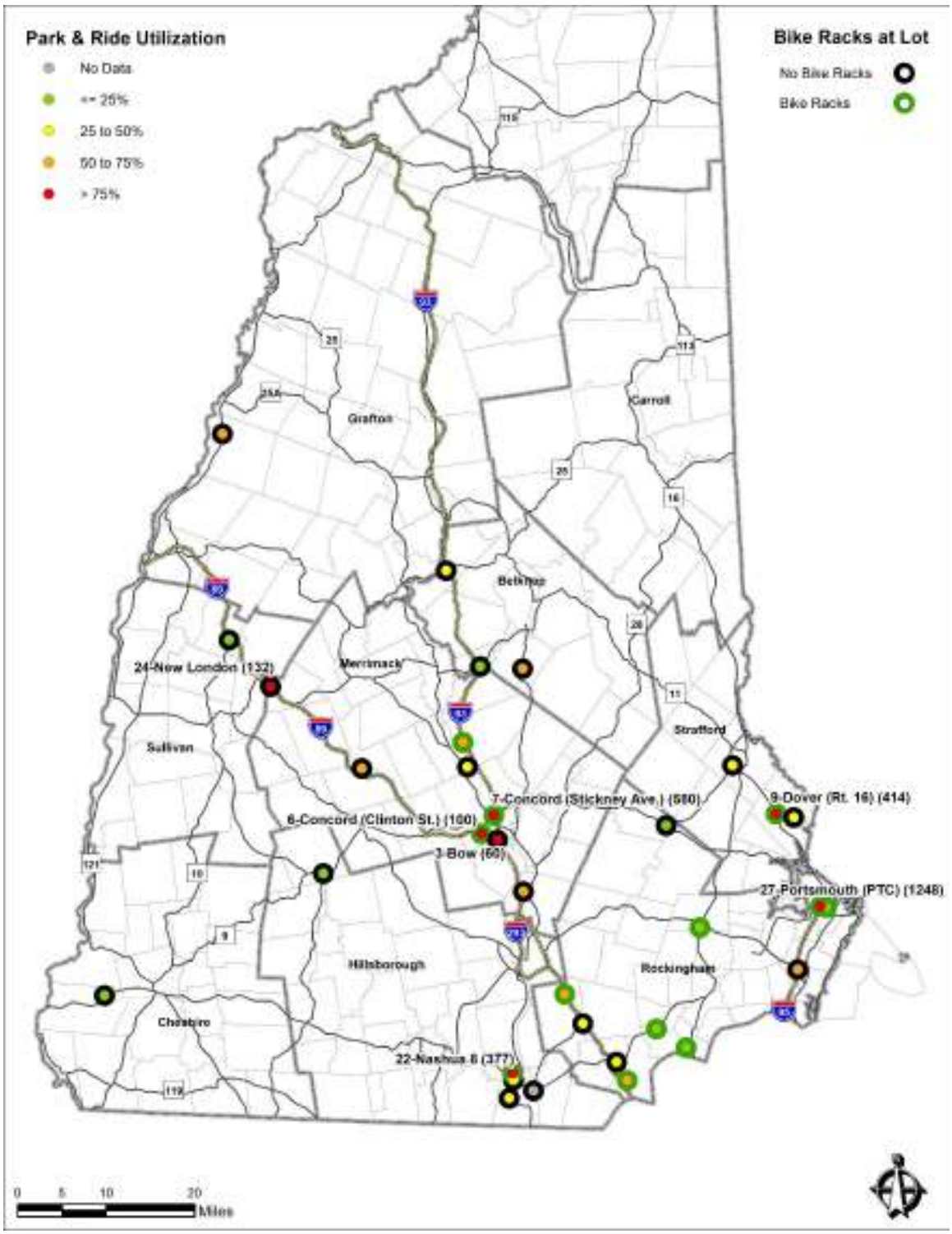


TABLE 3: ADA COMPLIANCE AT PARK-AND-RIDE LOTS (FROM THE 2016 NHDOT AMERICANS WITH DISABILITIES ACT TITLE II TRANSITION PLAN)

ID	Municipality	Compliance?	Comments	Signs Needed
1	Belmont	not included		
2	Boscawen	No	No wheelchair pavement markings, 2.7% slope, missing sign, sign that was there read "handicapped".	Need (2) R7-8, (1) R7-8a
3	Bow	Yes		
4	Canterbury	No	4% slope.	
5	Chesterfield	No	Missing R7-8a, signs faded.	Need (2) R7-8, (1) R7-8a
6	Concord (Clinton St.)	No	Van access aisle is 64" wide, needs to be 96" wide.	
7	Concord (Stickney Ave.)	No	Needs signage at each space, van access aisle is 84" wide, needs to be 96" wide.	Need (8) R7-8, (2) R7-8a
8	Dover (Ice Arena)	not included		
9	Dover (Rt 16)	Yes		
10	Epping	No	Needs another van accessible space, markings and signs faded. No posted bus schedule.	Need (8) R7-8, (2) R7-8a
11	Grantham	Yes		
12	Hampstead	No	3% slope. Unknown spaces due to faded paint. One extra can sign. "Handicapped" verbiage.	
13	Hampton	No	Van access aisle is 87" wide, needs to be 96" wide.	
14	Hillsborough	Yes	3% slope in some areas	
15	Hooksett	No	No striping or signs.	
16	Londonderry (north)	Yes		
17	Londonderry (south)	Yes		

ID	Municipality	Compliance?	Comments	Signs Needed
18	Lyme	Yes		Need (1) R7-8a
19	Nashua 5W	not included		
20	Nashua (Crown St.)	Yes		
21	Nashua 7E	Yes	"Handicapped" verbiage. Signs partially knocked over, one unreadable, blocked by leaves and trash.	
22	Nashua 8	Yes	If cars pull too far forward access aisle can be blocked. "Handicapped" verbiage.	
23	New Hampton	Yes		
24	New London	Yes		
25	Northwood	not included		
26	Plaistow	No	Phone is 6" too high. Disused bus stop has tree blocking entrance.	
27	Portsmouth (PTC)	Yes	Overflow lot missing 2 van signs, terminal missing 2 van signs, side of terminal missing 3 van signs	
28	Portsmouth (Rt. 33)	not included		
29	Rochester	Yes	Two glass panels broken on shelter.	
30	Salem	No	Van access aisle is 69" wide, needs to be 96" wide.	
31	Tilton	Yes	Could not count total spaces due to faded striping. Signs faded.	
32	Warner	No	3% slope in a few areas.	Need (1) R7-8a
33	Windham	yes		

3.0 CURRENT CAPACITY AND FUTURE NEEDS

3.1 | CURRENT USE

While parking lots in general are typically considered overcapacity at 85 percent utilization, research suggests users will avoid park-and-ride lots around 70 to 80 percent utilization.[2] This lower threshold at park-and-ride lots is due to the need to find parking within a time constraint (in the case of boarding a transit service) or to know a carpool partner can find a necessary spot at a designated meeting time. For these reasons, this study uses 75 percent as the threshold park-and-ride utilization. A lot whose utilization is over 75 percent is considered over-utilized.

Park-and-ride locations are meeting points for carpools and vanpools as well as access points for transit. To justify the time cost of interrupting a commute with a stop at a park-and-ride facility, either to meet another commuter or to wait for and board a bus, personal savings in time or money must be realized. For some, this can mean avoiding parking costs or the hassle of parking at their employment location, for others this can mean avoiding the cost of fuel used on their commute, and for others this can mean gaining productive time by being a passenger. As such, park-and-ride lots tend to serve those with longer commutes or making long-distance trips. Consistent with that tendency, the literature indicates park-and-ride lots are ideally situated at least 10 miles from the primary activity center to justify the cost of changing modes[3]. The literature also suggests at least 50 percent of riders live within 5 miles of a park-and-ride facility and about 85 to 90 percent live within 10 miles[4].

Proximity of a park-and-ride facility to major travel corridors can affect its use as increased visibility improves lots' safety and encourages drivers to use the lots. Studies support this, suggesting park-and-ride facilities should be within a visible distance of major travel corridors, which can include freeways, highways, or major arterials[5]. Reviewing the existing park-and-ride locations in New Hampshire and their utilization rates, over-utilized lots tend to be along or upstream from interstate highways or turnpikes, and under-utilized lots tend to be far from them. Figure 5 shows park-and-ride utilization rates with the 7 over-utilized lots labeled. These over-utilized lots are all along major roadways.

Once someone gets on a limited access road, they are less likely to get off it to carpool or board transit[6]. Thus, capturing potential parkers before they enter highways maximizes lot use. Ideally, park-and-ride lots are placed at access points to the highway system, so commuters can be "captured" before beginning the longer distance portion of their trip.

In examining the conditions of the existing facilities, a theme emerges that park-and-ride utilization is correlated to the presence of transit service. Seven existing facilities are over-utilized, and 5 of those

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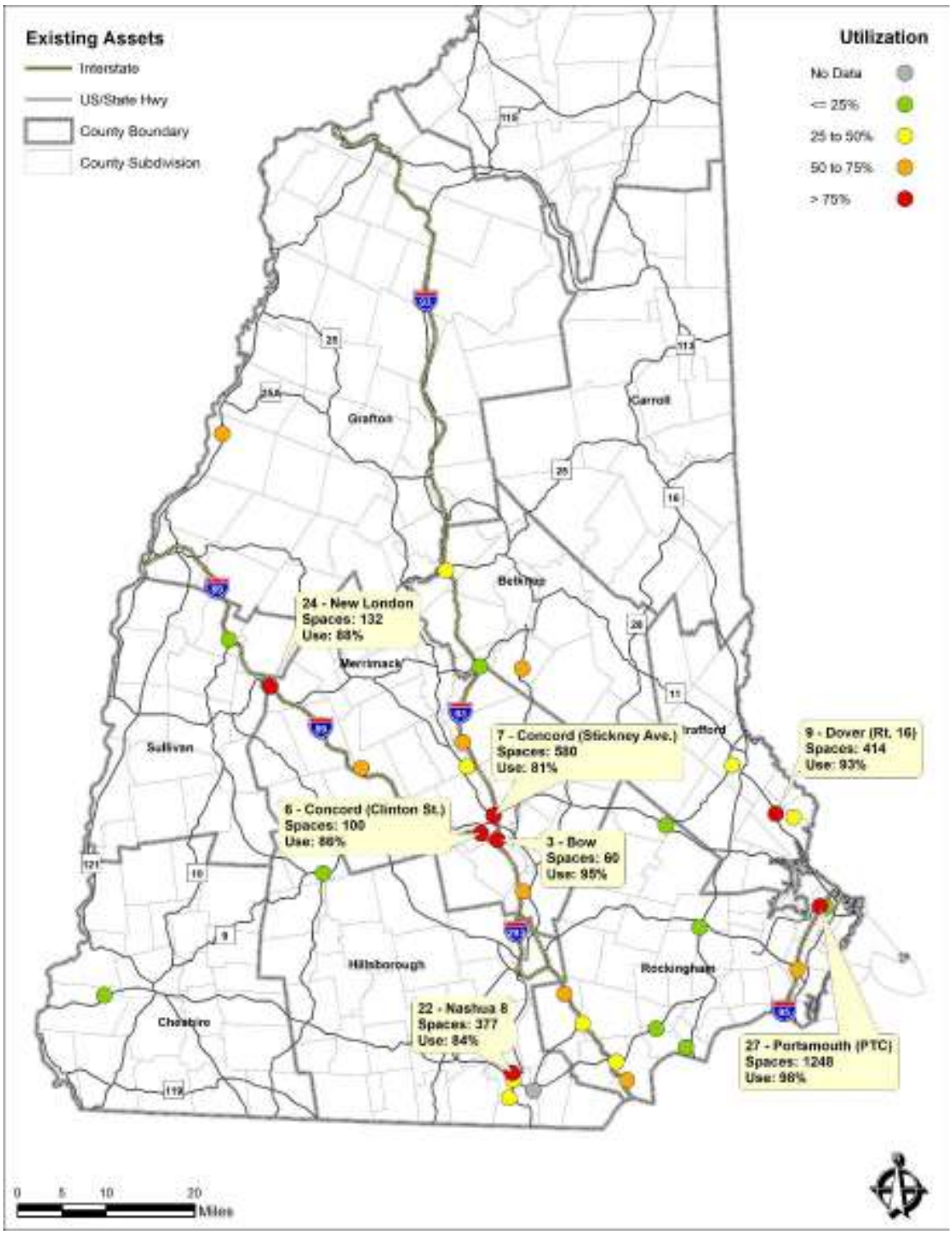
[2] Community Transit Long Range Transit Plan – Appendix V. 2010 stated that users will begin to avoid lots if utilization rates are above 70% or 80%.
[3] Holguín-Veras, Jose, et. al. 2012. "New York City Park and Ride Study." Rensselaer University Research Center.
[4] *Ibid.*
[5] American Association of State Highway and Transportation Officials. 2004. *Guide for Park-and-Ride Facilities.*
[6] Overcoming the delay and psychological barrier of getting off a limited access road to carpool or use transit does occur, especially when the remaining trip distance is long or the parking fees at the destination are high.

have transit service. Of the 15 that have occupancy rates above 50 percent, 7 have transit service. Table 4 illustrates the relationship between utilization and the presence of transit service at park-and-ride lots.

TABLE 4: UTILIZATION AND TRANSIT ACCESS AT PARK-AND-RIDE FACILITIES

Utilization Rate	Total in Category	Number with transit	Local Transit	Intercity Transit	Percent with Transit
No Data	1	0	0	0	0%
≤ 25%	9	0	0	0	0%
25 to 50%	8	3	2	1	38%
50 to 75%	8	2	0	2	25%
≥ 75%	7	5	4	5	71%

FIGURE 5: OVER-UTILIZED PARK-AND-RIDE LOTS



3.2 | ADDITIONAL CAPACITY

Park-and-ride lots currently cover most of the state, so current park-and-ride usage largely approximates demand. Therefore, this study focuses on the capacity needs at existing over-utilized park-and-ride lots and areas that are not currently served. Other situations may warrant construction of a park-and-ride facility, such as when lots are required as part of environmental mitigation related to a highway construction project. Those lots are also important to the overall transportation system but are developed outside of the processes covered in this document.

ADDRESSING DEMAND

Determining Additional Capacity Needed at Existing Lots

Over-utilized park-and-ride lots are well located and familiar to the people who use them. Many already have transit service. For these reasons, expanding the existing lots where possible is recommended before building new lots. Expanding existing lots avoids the need to add new stops on transit routes, which can make routes less efficient and schedules harder to maintain. This strategy may also reduce maintenance costs since these costs are driven by the number of lots more than the number of spaces in individual lots.

Expanding existing lots may not always be feasible. Existing park-and-ride lots may not have adequate available land to build the needed capacity, or nearby intersections may not be able to accommodate additional traffic. In such cases, NHDOT will need to find alternative locations for additional park-and-ride capacity. When an existing over-utilized park-and-ride lot cannot be expanded, the State should look for new park-and-ride locations within the catchment area of the over-utilized lot. Ideally, this new lot should be located near the intersection of major roads, within five to ten miles of major residential areas, have transit access, and be visible from major roads. Park-and-ride facilities will be most effective if they are between a higher-density residential area and a major road.

For lots where expansion is feasible, NHDOT should increase capacity to meet current and future demand. While an expansion of any size will ameliorate over-utilization, due to the effort and investment required to complete an expansion, capacity increases should aim to expand the lots so they would be less than 60 to 70 percent full under normal use conditions. Aiming for a 65 percent occupancy under current use would allow for future growth and enable the lot to address current unmet need. Table 5 shows the number of spots that would be needed at each over-utilized lot to bring it down to a 65 percent utilization level. As shown, significant amounts of parking would be required to address all existing overcapacity demand through construction. While this approach may be appropriate at the smaller lots, alternative approaches should also be considered at the larger lots, especially given the large amount of parking required and the high cost of constructing parking.

Not including soft costs, land acquisition, or special site work, surface lots cost between $5,000 and $10,000 to build per space, and basic garages cost between $15,000 and $25,000 to build per space. Building below ground, adding special features, or building on a challenging site can raise the price of garage construction upwards of $35,000 per space. Using the median of these costs to develop planning estimates indicates meeting the demand through lot expansion would cost on the order of

10 to 25 million dollars. Table 5 includes the estimated cost to expand each lot to the recommended capacity, using median per space construction costs.

TABLE 5: ADDITIONAL SPACES RECOMMENDED AT OVER-UTILIZED LOTS AND ESTIMATED COST TO BUILD ADDITIONAL CAPACITY

Lot	ID	County	Current Utilization	Additional Spaces	Median Cost (Surface)	Median Cost (Garage)
Bow	3	Merrimack	95%	28	$210,000	$532,000
Concord (Clinton St.)	6	Merrimack	86%	33	$247,500	$627,000
Concord (Stickney Ave)	7	Merrimack	81%	143	S1,072,500	$2,717,000
Dover (Route 16)	9	Strafford	93%	179	$1,342,500	$3,401,000
Nashua 8	22	Hillsborough	84%	111	$832,500	$2,109,000
New London	24	Merrimack	88%	47	$352,500	$893,000
Portsmouth (PTC)	27	Rockingham	98%	634	$4,755,000	$12,046,000

Recommended Locations for Alternative Management Options

Expanding capacity can address need for many park-and-ride lots. However, alternative management options should also be considered for larger over-utilized lots and lots in locations where alternatives strategies would be more likely to succeed.

Locations with Contracted Operators

Of the 8 over-utilized park-and-ride lots, four are notably large – 7:Concord Stickney Ave (580 spaces), 22:Nashua 8 (377 spaces), 27:Portsmouth PTC (1248 spaces), and 9:Dover Rt. 16 (414 spaces) – and are managed by contracted operators who provide bus service and staffing and operation of the terminals at the locations. C & J Bus Lines runs intercity transit service from 9:Dover Rt. 16 and 27:Portsmouth PTC to Boston and New York City. Concord Coach manages the terminal at 7:Concord Stickney Ave from which it provides service to Boston and New York City. Boston Express manages and operates 22:Nashua 8, 17:Londonderry (south), 16:Londonderry (north), and 29:Salem and provides service to Boston from these locations. Concord Coach stops at 22:Nashua 8 on its way to New York City. Parking is free at all of these locations, though C & J Bus Lines offers valet service to its lease lots off site at Dover Rt. 16 and Portsmouth PTC for a flat fee of $7. Dartmouth Coach has management responsibilities at the 24:New London lot and provides service to Boston and from the Upper Valley from this location.

These facilities are similar to the privately-owned and operated terminal maintained by Dartmouth Coach in Lebanon. Dartmouth Coach outgrew its terminal on Old Etna Road and opened a new facility on Labombard Road in 2016. This location has a new terminal building and 400 parking

spaces, and Dartmouth Coach charges $4 per day for parking. Anecdotally, the users of the parking lot are not limited to those riding Dartmouth Coach, and the lot is also serving park-and-ride demand. Despite charging for parking, Dartmouth Coach is looking to expand its parking capacity and is working to acquire and develop a proximate location for 250-300 additional parking spaces[7].

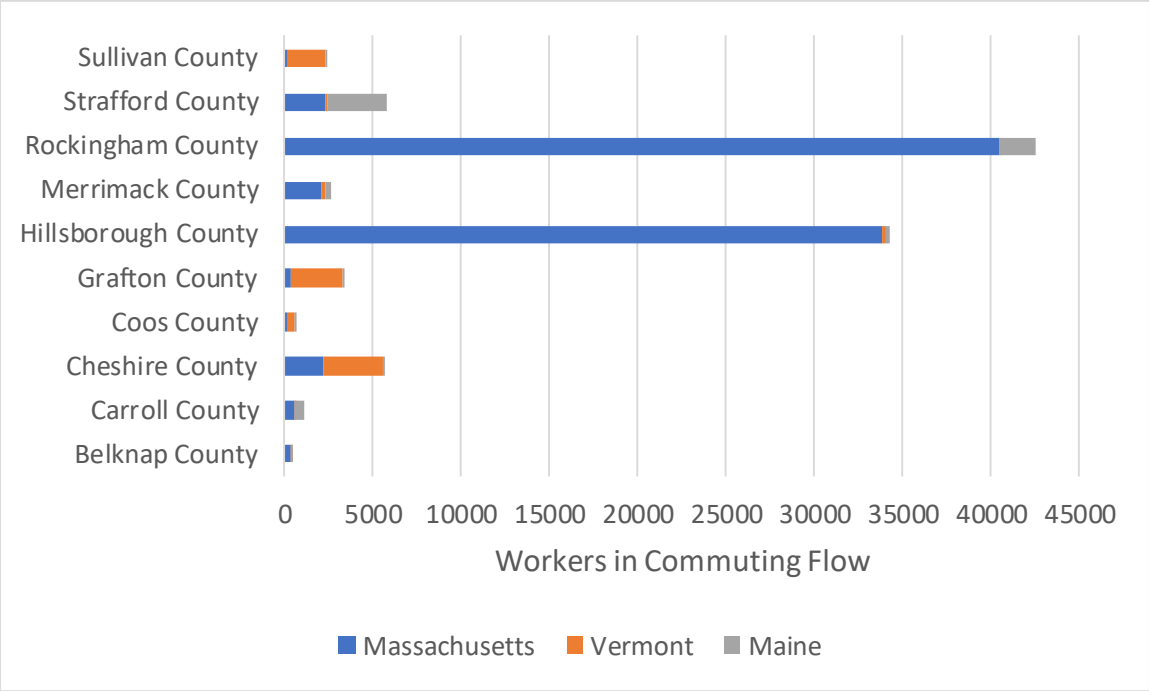
The contracted operators at NHDOT park-and-ride facilities can be considered successes by many measures: they are well utilized and connected to robust transit services. The contract arrangements achieve various transportation goals. However, the constraints of the current agreements are limiting the success of these locations. The contracts are not long enough for the contracted operators to finance improvements. Free parking limits the operators' ability to manage demand and expand parking and transit service. NHDOT should evaluate the potential to charge for parking at these locations and evaluate the risks and benefits to the state of long-term lease agreements. The state should also continue to support the local transit services that serve these locations.

Long-Distance Commuter Counties

While approximately 85 percent of the workers in New Hampshire work in state[8], two counties in the southern portion of the state (Hillsborough and Rockingham) send many workers to Massachusetts (Figure 6). This large commuter population contributes to different park-and-ride and transit use characteristics than the rest of the state. Due to the dense land use development that has already occurred in these counties along key roadways and the large number of additional spaces that would be required to meet demand, expansion of existing lots or identification of suitable new ones may be challenging. Further, due to the longer travel distances typically involved in commuting out of state, workers may be more incentivized to use alternative modes and more willing to pay for parking. Paying for parking can fund expansion and can manage demand. Over-utilization of park-and-ride lots in these counties should be addressed through a combination of capacity expansion, parking fees, and local transit feeder service.

[7] http://www.vnews.com/Dartmouth-Coach-Buys-Elks-Property-Proposed-New-Building-16749473
[8] Source: 2009-2013 5-Year American Community Survey Commuting Flows, Table 1. County to County Commuting Flows for the United States and Puerto Rico: 2009-2013 ; https://www.census.gov/data/tables/time-series/demo/commuting/commuting-flows.html

FIGURE 6: NEIGHBORING WORK STATE FOR NEW HAMPSHIRE WORKERS, BY COUNTY (SOURCE: AMERICAN COMMUNITY SURVEY JOURNEY TO WORK COMMUTE FLOWS)



Locating and Sizing New Lots in Underserved Areas

In addition to expanding lots that are over utilized, some parts of the state are not currently served by a park-and-ride lot. New park-and-ride lots in these areas may be appropriate. Research indicates most park-and-ride users will live within 10 miles of the lot, and they use lots along their existing route to work. As shown in Figure 7, several high residential density areas in the State are more than 10 miles to a park-and-ride: Littleton (I-93), Berlin (NH 110/NH16), the area around North Conway, Claremont (NH 120/NH 103/NH 11), the Upper Valley[9] (NH 120/US 4), Moultonborough (NH 25), Ossipee (NH 16/NH 25), and Wolfeboro (NH 28/NH 109). These locations should be prioritized for evaluation for new lots as funding becomes available.

Other locations identified by local and regional representatives should also be evaluated for state funding, but they may not have many of the characteristics associated with robust park-and-ride use. As such, they may be best served by a locally-owned park-and-ride facility, which are often smaller and centrally located. These are sometimes shared facilities with churches or municipal buildings. These smaller or shared lots are better matches when demand is likely to be lower to avoid unnecessary land consumption and the creation of management challenges.

Estimating the appropriate size for each of these new lots without a detailed analysis of each location is difficult. As proximity to residential density is one factor for a successful park and ride, the underserved areas are divided into two groups for preliminary planning based on their residential densities. Based on the lot sizes of existing park-and-rides, the lots proximate to the highest

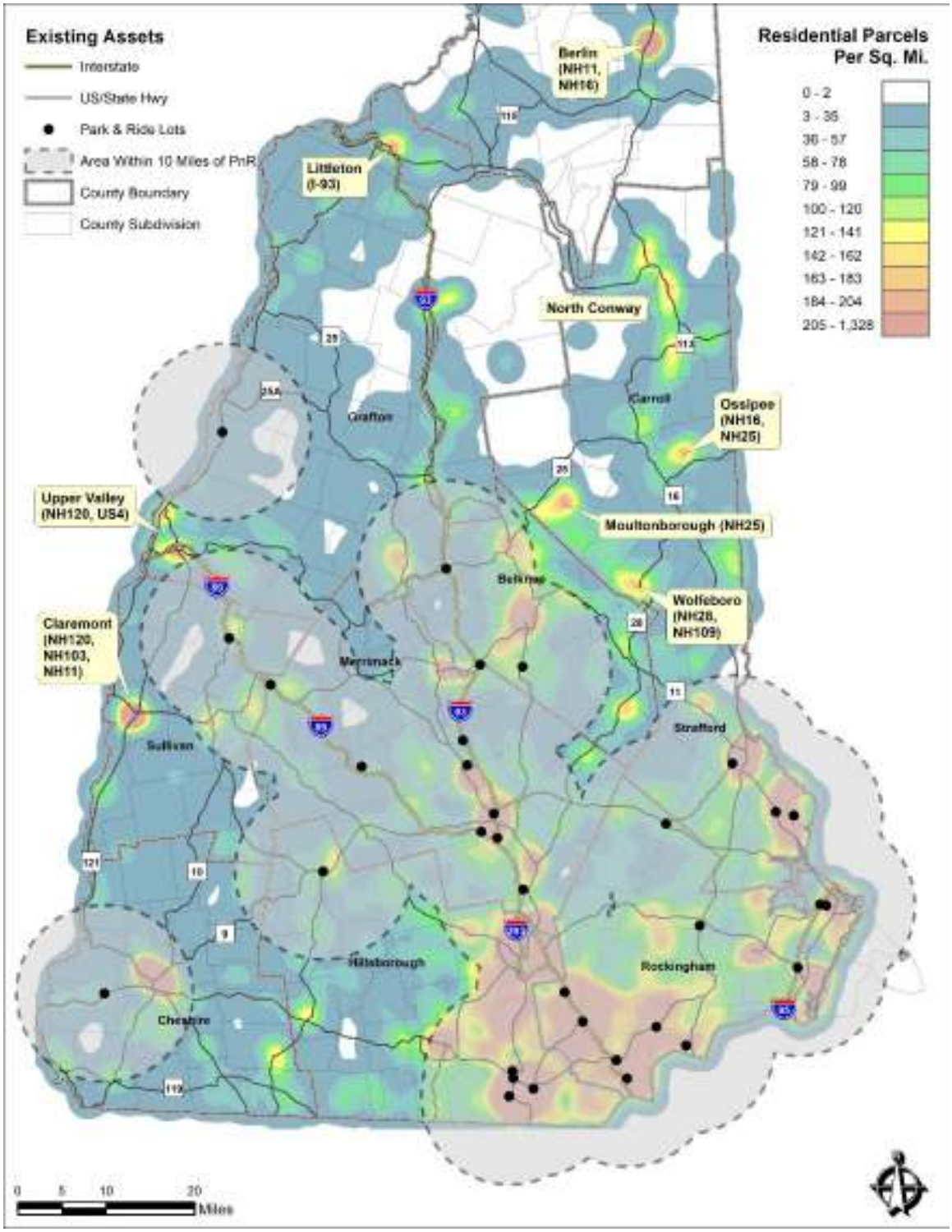
[9] While the Upper Valley does not have an official state park-and-ride facility, the Dartmouth Coach bus terminal includes a large parking lot, open to the public. This lot is well utilized, despite a daily fee.

residential densities would be planned as medium-sized lots, roughly 50 spaces. These locations include Littleton, Berlin, Claremont, and the Upper Valley. At this time, small lots (~20 spaces) are anticipated for the other prioritized locations, including North Conway, Moultonborough, Ossipee, and Wolfeboro. Specific site conditions including the availability of suitable land, the specific location of that land, and the ability to coordinate with local and long-distance transit service will affect the sizing. Using the average cost per space of surface lot construction, the medium-sized lots would cost approximately $400,000 to develop. The small lots would cost approximately $160,000 to develop.

These locations are general recommendations about areas of unmet need and do not include recommendations for specific site locations. NHDOT would need to perform additional analysis to determine the best site for the park-and-ride lots within these areas. Determining the specific location for lots relies on insight into the predominant direction of travel. The maps in Appendix A illustrate the proportion of New Hampshire workers from each county traveling to other counties in the state. Staff should consider the criteria in Table 6 as well as comments from RPC and local officials.

Of the areas identified through the spatial analysis as locations consistent with successful park-and-ride usage, Littleton, Berlin, the Upper Valley, and Ossipee/West Ossipee were identified in outreach conversations with the RPCs throughout the state as locations of unmet demand. A summary of those conversations is provided in Appendix B.

FIGURE 7: AREAS OF NEW HAMPSHIRE NOT SERVED BY A PARK-AND-RIDE LOT



Integrating with Intercity Transit Service

An important component of transit service in New Hampshire is the Intercity Bus Program, which serves to link rural areas to urban areas with regularly scheduled service open to the public. An evaluation of the Intercity Bus Program has identified four routes to be continued or initiated to serve demand in the state. These routes include:

- Continuing service: Littleton to Concord
- Continuing service: Berlin/North Conway/Concord (either or both of two segments)
- New service: Laconia to Concord
- New service: Keene to Nashua

While existing park-and-ride facilities with bus terminals exist in Concord and Nashua, having clearly identified arrival and departure locations for the terminus points and other key locations for these routes is important to their success. As such, new park-and-ride facilities with transit amenities would be needed to support the existing and proposed Intercity Bus services. The locations with Intercity service proposed without existing facilities include:

- Littleton
- Berlin
- Keene
- Peterborough
- Laconia

These locations are included in the capacity investment prioritization. Specific facility locations have not been identified as part of this process, but their locations should be consistent with park-and-ride facility success: they should be located downstream of population density, proximate to major roadways and commute routes. Their locations should be chosen to minimize travel time for the intercity routes. Coordination with intercity providers and, when present, local transit providers is important to ensure they can serve the proposed locations.

Prioritizing Capacity Investments

After reviewing the literature around park-and-ride utilization[2-5], the following criteria are recommended to evaluate capacity investments:

- Proximate residential density
- Utilization levels
- Proximity to major roadways
- Transit presence and frequency of service
- Location along commuter route
- Site availability

Specific projects are prioritized by assigning points to each of these categories in a way that upholds policy decisions. For underserved areas, the location should receive 5 points in the utilization category. Transit proximity refers to distance to a local, fixed route or distance to an existing intercity bus stop or to support a new intercity service. Preliminary point allocations are shown in Table 6 and

can be refined to align with policy goals. The project with the largest number of points should be the highest priority.

TABLE 6: PROPOSED METHODOLOGY PRIORITIZING CAPACITY INVESTMENTS

Points	Max Utilization (existing lots)	Residential Density (max w/in 2 mi)	Major Roadway Proximity	Transit/ Intercity Proximity	Commute Route Location	Site Feasibility
0	0-50%	<50	None	None	Upstream of travel flow	Multiple barriers
1	50-75%	100-200	Within 1 mile of State highway	Within 1 mile	Center of residential density	
2		200-400	Within 0.25 mi of State highway	Within 0.5 mi	Downstream of residential density, along state highway	State or muni owned, physical/ environmental constraints
3		>400	On State highway	Within 0.25 mi	At junction of State highways	
4			Visible from Ramp	Within 0.25 mi/ 15 min service	At Interstate interchange	
5	>75%		Visible from Interstate	On existing route	At junction of Interstates	State/Muni owned, no physical/ environmental constraints

The existing over-utilized park-and-ride lots, the areas of unmet need, and the locations identified to support intercity service were evaluated using a version of the prioritization methodology recommended in Table 6. As specific projects are not currently being evaluated, the site feasibility measure cannot be considered. The other measures were evaluated. Further, as specific locations have not been identified for the areas of unmet need, optimal locations with regards to the criteria were identified in each area. These locations are not necessarily constructible, and once specific potential sites are identified they should be evaluated.

Using Littleton as an example demonstrates how the scores are developed. As an area of identified unmet need, it receives 5 points for the utilization category. With a maximum residential density between 100 and 200 residences per square mile, it receives 1 point for the residential density category. As Littleton has been identified as a potential terminus of intercity transit service, Littleton

receives 5 points for proximity to transit. Because it is an area of unmet need, a park-and-ride facility in Littleton does not have a specific location. The scores for the remaining categories assume the best scores the area can achieve. With a major interstate passing through, the recommended location for a park-and-ride facility in Littleton would be proximate to the ramps, and 4 points are assigned for roadway proximity. Littleton receives 4 points for the commute route category, as a lot could be located proximate to the interstate. As potential buildable sites are identified, they should be evaluated against these criteria.

Table 7 summarizes the results of the analysis and includes a prioritized ranking of potential projects.

TABLE 7: PRIORITIZED FUTURE FACILITY NEEDS

ID	Municipality	Utilization	Residential density	Roadway Proximity	Transit Proximity	Commute Route	Total
7	Concord (Stickney Ave.)	5	3	5	5	5	23
26	Portsmouth (PTC)	5	3	4	5	5	22
22	Nashua 8	5	2	4	5	4	20
9	Dover (Rt. 16)	5	2	3	5	4	19
24	New London	5	1	4	5	4	19
	Berlin	5	3	3	5	3	19
	Littleton	5	1	4	5	4	19
	Keene	5	3	3	5	3	19
	Upper Valley	5	2	4	3	4	18
	Laconia	5	3	3	5	2	18
	Claremont	5	2	3	4	3	17
3	Bow	5	2	4	0	5	16
6	Concord (Clinton St.)	5	3	4	0	4	16
	Peterborough	5	1	3	5	2	16
	Ossipee	5	1	3	2	3	14
	Moultonborough	5	1	3	2	3	14
	North Conway	5	1	3	2	2	13
	Wolfeboro	5	1	3	0	3	12

Maintenance Costs and Responsibilities

Constructing park-and-ride facilities is one component of a park-and-ride system. Operating and maintaining them must also be planned for. Agencies differ in their structures for maintenance and operations, and few keep detailed records that track the costs of maintaining and operating park-and-ride facilities separately.

Most agencies have responsibilities for at least some of the park-and-ride facilities in their systems, and these are typically managed by district garages. In these cases, several factors contribute to the cost of operating and maintaining the facilities. The distance from the district garage and the location of the lot relative to other district facilities contributes significantly. If a lot, for example, is on a plowing route, it can be maintained at a lower cost than one requiring a dedicated trip, especially if that trip is long. The physical layout of the lot will also factor into the cost, as a lot that can be maintained by the same equipment used for other proximate facilities will have lower costs than those requiring special equipment and its associated dedicated trip. Other factors such as the nature of the landscaping can contribute to costs. While a larger lot will require some additional time to maintain than a smaller lot with all the same design characteristics and location, in practice the other factors contribute more to the overall cost. As such, those maintaining the lots should be consulted on any proposed new lot or lot expansion to minimize unnecessary maintenance costs. The best available information suggests annual operating and maintenance costs of approximately $25,0000 to $50,000 on average per lot.

Agencies have other methods for managing their park-and-ride facilities. In some cases, they are leased to transit operators, who may take on specific maintenance and operation responsibilities. In these relationships, the specific roles must be outlined clearly, and expectations for service quality should be articulated. In other cases, agencies develop public-private partnerships with other lot owners, ranging from houses of worship to retail establishments. Those contracts can involve the agencies taking on maintenance of private facilities or the agencies lease the space and the private owner provides maintenance. Relationships with municipalities can have a similar structure. Sometimes private developers include park-and-ride capacity in their projects as a component of their mitigation. In these cases, the state can take on management or those responsibilities can remain with the project owner.

3.3 | ONGOING MONITORING

The evaluations provided in this analysis are based on the best available data. Utilization is calculated based on the maximum count at each lot. In some cases, count data has been collected one time while other locations have been counted more frequently. Weather or seasonal events may also be influencing the counts. Different count data could lead to the conclusion that more or less than the identified 1177 additional spaces are needed.

To ensure reliable, actionable data, NHDOT should maintain its systematic count program, especially at lots that are over-utilized or nearly so. The count program should be consistent across lots and from year to year. The counts should be recorded in a standardized template and should note:

- Weekday
- Time of day
- Weather
- Number of vehicles parked
- Number of vehicles parked in accessible spaces (if applicable)
- Number of bicycles parked
- Presence of trash and/or vandalism

While counting the vehicles in the lots, the counter should also take inventory of the condition of the lot. Issues to note should include:

- Lighting availability
- Burnt out lightbulbs
- Shelter availability
- Shelter condition (if applicable)
- Pavement/Surface condition
- Noticeable problems (potholes, etc.)
- Walkway conditions (if applicable)

NHDOT should also consider enlisting District staff to perform counts and inventory deficiencies. By using a simplified checklist, the District staff would be able to quickly record the needed information, and the operations staff will be able to quickly enter it into a database. A more efficient option would be to have the District staff enter count data directly to the count database with a smart phone or tablet, but that method will require more setup. While the literature suggests typical catchment areas and behaviors of park-and-ride users, periodic user surveys would better define the users' characteristics and distribution.

4.0 SUMMARY OF FINDINGS

This study has investigated existing conditions of the New Hampshire park-and-ride system. It has inventoried existing amenities and calculated utilization rates. It has also explored areas where the park-and-ride system will need additional capacity and alternate strategies to address these needs.

4.1 | INVENTORY

As part of this effort, the presence of amenities at New Hampshire park-and-ride lots have been reviewed. All New Hampshire park-and-ride lots have lighting and acceptable pavement condition; ten lots have transit service. Four lots have shelters but no transit service. NHDOT should include shelters where transit or other use justifies them, typically between 25 and 40 boardings per day. The State may also want to consider guidelines for decommissioning shelters at locations that do not provide transit access to reduce maintenance costs and limit potential management concerns.

Only 41 percent have dedicated bicycle parking, which is a low-cost improvement that can increase access to carpooling and transit.

Fourteen of the park-and-ride lots surveyed in the 2016 Americans with Disabilities Act Title II Transition Plan were in compliance with ADA requirements. Those that were not had missing or noncompliant van parking, larger than acceptable grades, and missing or faded signs or striping. Table 3 includes information from the 2016 Transition Plan regarding improvements needed at the noncompliant facilities.

4.2 | CAPACITY NEEDS

Based on the available literature, a threshold of 75 percent utilization is used for this study to determine over-utilized conditions. Eight lots are over-utilized, and four where contracted operators are in place should be evaluated in detail for either expansion or alternative management strategies, including pricing and continued investment in local transit feeder services. These strategies should be developed in conjunction with a review of the contracted operators' agreements. Lots in Rockingham and Hillsborough counties should also be evaluated for their suitability for different management strategies, including pricing and increased local transit service, in addition to expansion. Table 5 illustrates the number of new spaces recommended at each over-utilized lot to address over-utilization strictly through construction. The estimated cost of addressing these needs through surface and garage parking is also included.

A number of underserved areas have been addressed that have high residential density, proximity to major roadways, and are more than 10 miles from the nearest park-and-ride facility. These include Littleton (I-93), Berlin (NH 110/NH16), the area around North Conway, Claremont (NH 120/NH 103/NH 11), the Upper Valley (NH 120/US 4), Moultonborough (NH 25), Ossipee (NH 16/NH 25), and Wolfeboro (NH 28/NH 109). These locations should be prioritized for evaluation for new lots as funding becomes available. Five locations have been identified that would serve as terminus locations for intercity transit service. Two of them (Littleton and Berlin) have also identified as areas of unmet need. The other three (Keene, Peterborough, and Laconia) have been added to the prioritization effort. These locations should be developed in conjunction with intercity transit service.

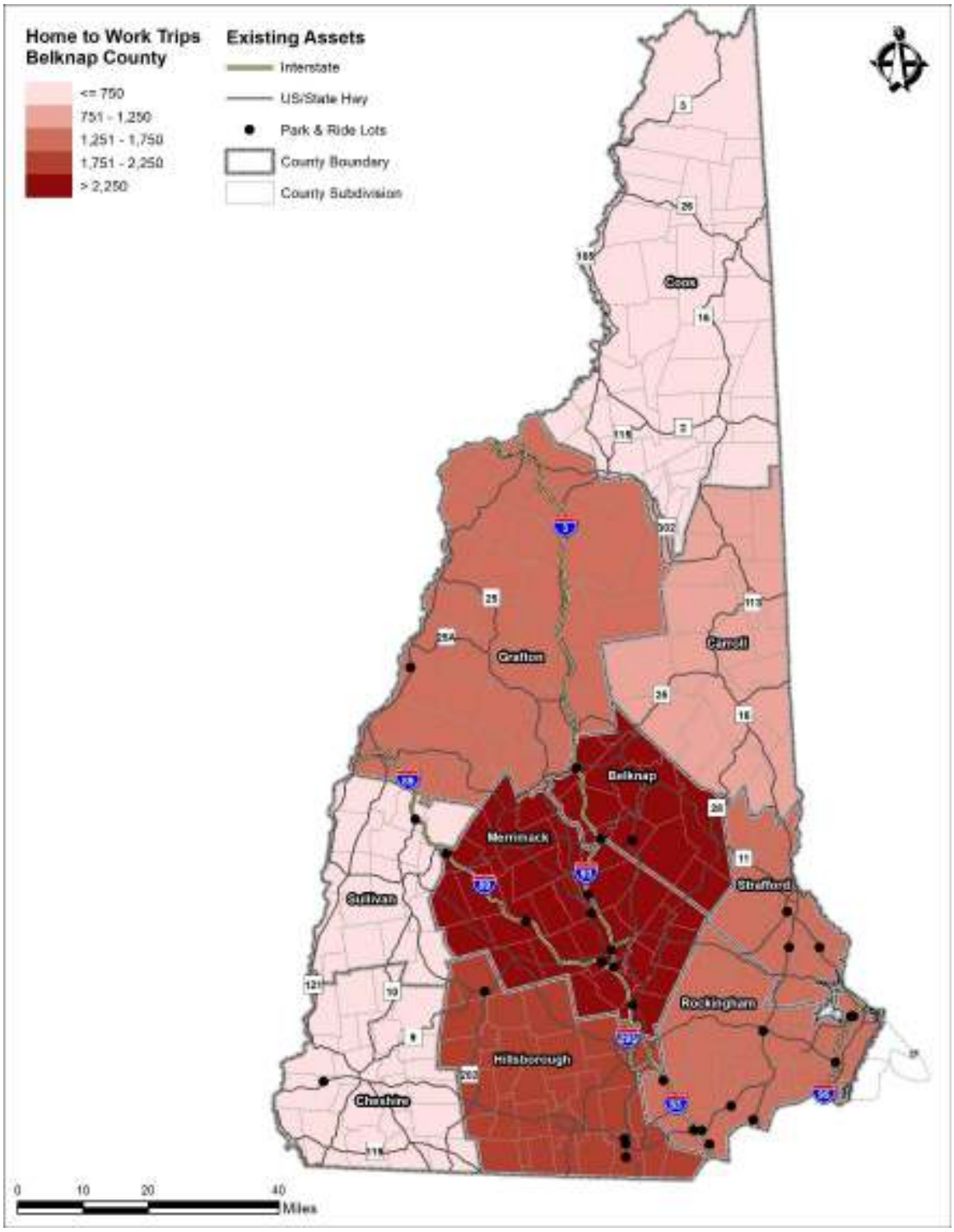
Any other proposed locations to serve an area of unmet need should also be evaluated. Those that do not score highly through the prioritization method would be better served by a municipally-owned park-and-ride facility.

For preliminary planning, medium-size lots of about 50 spaces, which are estimated to cost approximately $400,000 to construct, are recommended for four of locations of unmet need (Littleton, Berlin, Claremont, and the Upper Valley). Small lots of approximately 25 spaces are recommended for the remaining four areas of unmet need (North Conway, Moultonborough, Ossipee, and Wolfeboro). The small lots are estimated to cost approximately $200,000 to construct. The sizes of park-and-ride facilities constructed to support intercity transit should reflect analysis of probable ridership and associated parking demand.

As funds are available for new lots, they should be prioritized in accordance with the features the literature suggests are factors in park-and-ride utilization: locations between a residential hotspot and commute destination on the upstream side, close to a major roadway, and with presence of transit service. In addition, the ease of development should also be considered. Table 6 illustrates a proposed prioritization method based on the findings from the literature. Table 7 illustrates the prioritization method for over-utilized lots and areas of unmet need.

APPENDIX A. WORK COUNTY FOR NEW HAMPSHIRE WORKERS, BY COUNTY[10]

[10] Source: LEHD Origin-Destination Employment Statistics, aggregated by county https://lehd.ces.census.gov/data/#lodes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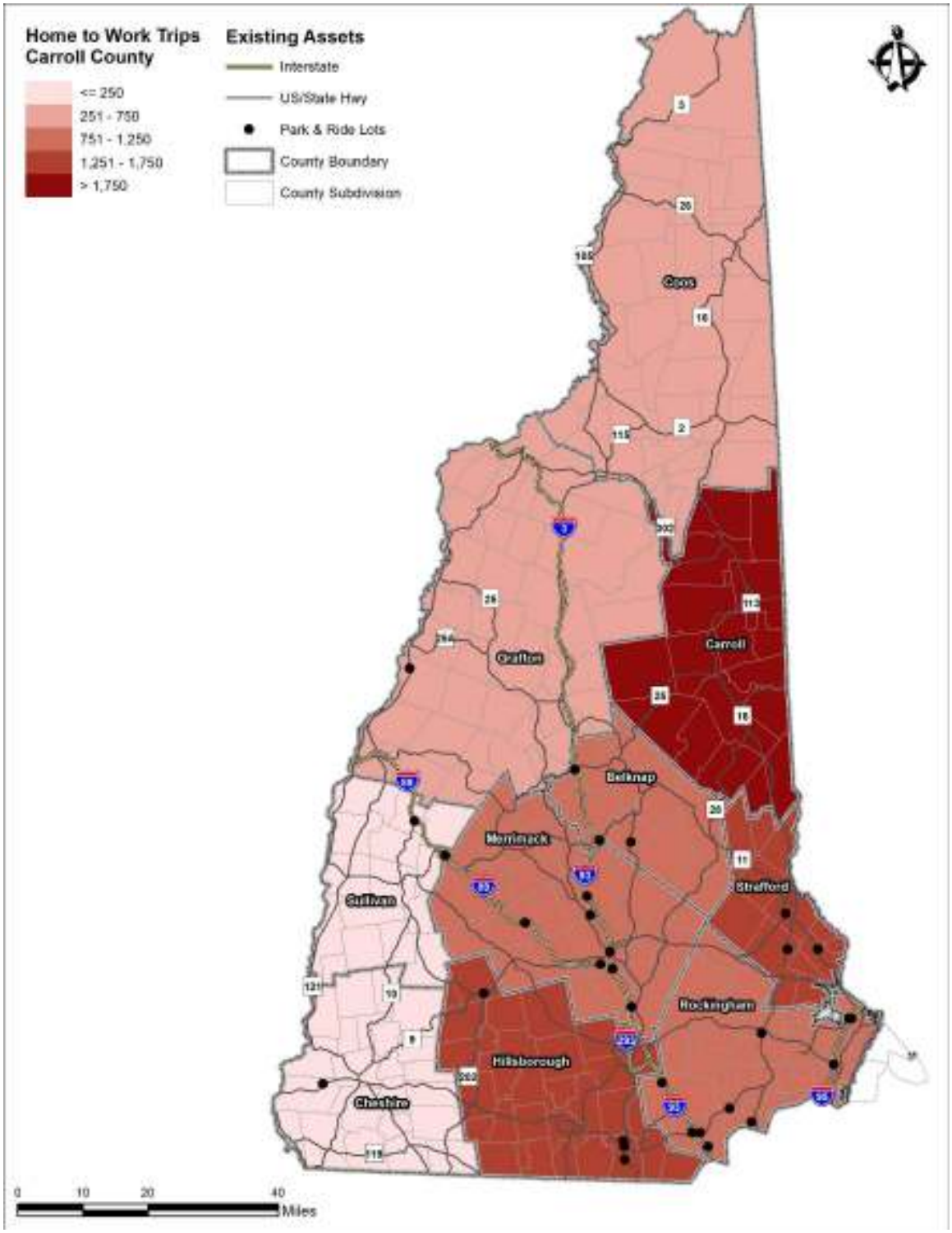
1,251 - 1,750
1,751 - 2,250
> 2,250
Existing Assets
Interstate
US/State Hwy
Park & Ride Lots
County Boundary
County Subdivision
Coos
Grafton
Carroll
Belknap
Merrimack
Sullivan
Strafford
Rockingham
Hillsborough
Cheshire
0
10
20
40
Miles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751 - 1,250
1,251 - 1,750
> 1,750
Existing Assets
Interstate
US/State Hwy
Park & Ride Lots
County Boundary
County Subdivision
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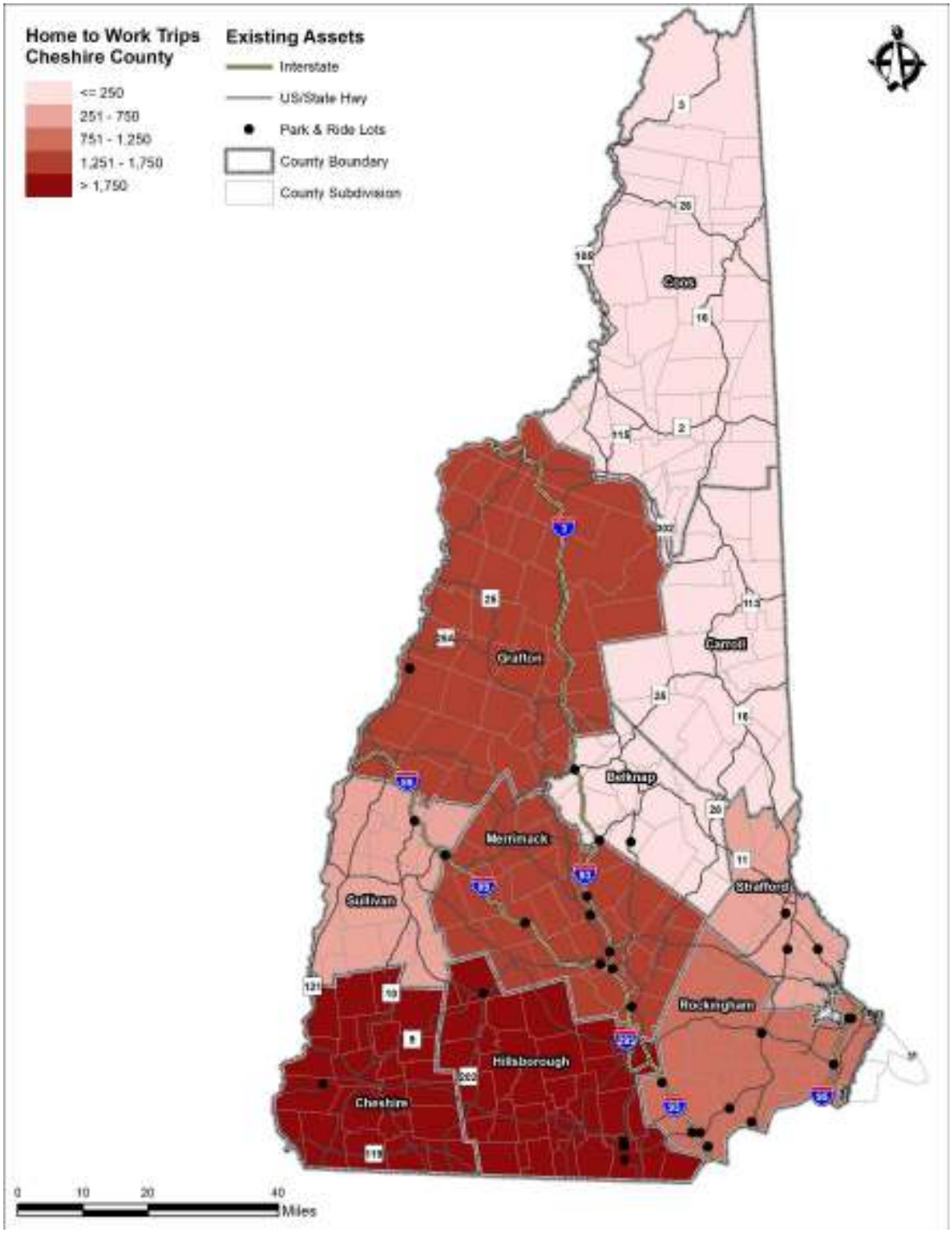
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751 - 1,250
1,251 - 1,750
> 1,750
Existing Assets
Interstate
US/State Hwy
Park & Ride Lots
County Boundary
County Subdivision
Coos
Carroll
Grafton
Belknap
Merrimack
Sullivan
Strafford
Rockingham
Hillsborough
Cheshire
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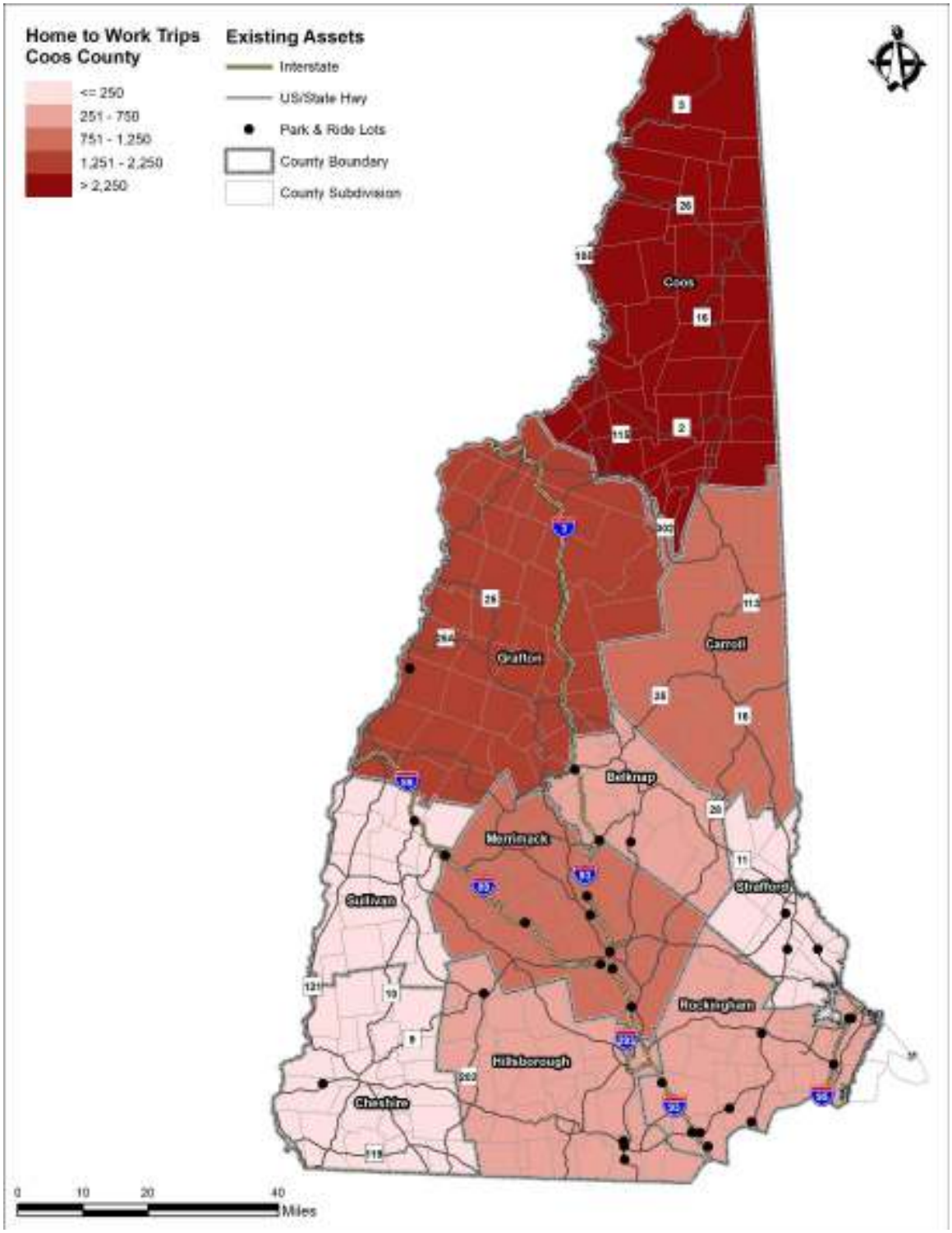
Miles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251 - 750
751 - 1,250
1,251 - 2,250
> 2,250
Existing Assets
Interstate
US/State Hwy
Park & Ride Lots
County Boundary
County Subdivision
Coos
Grafton
Carroll
Belknap
Merrimack
Sullivan
Strafford
Rockingham
Hillsborough
Cheshire
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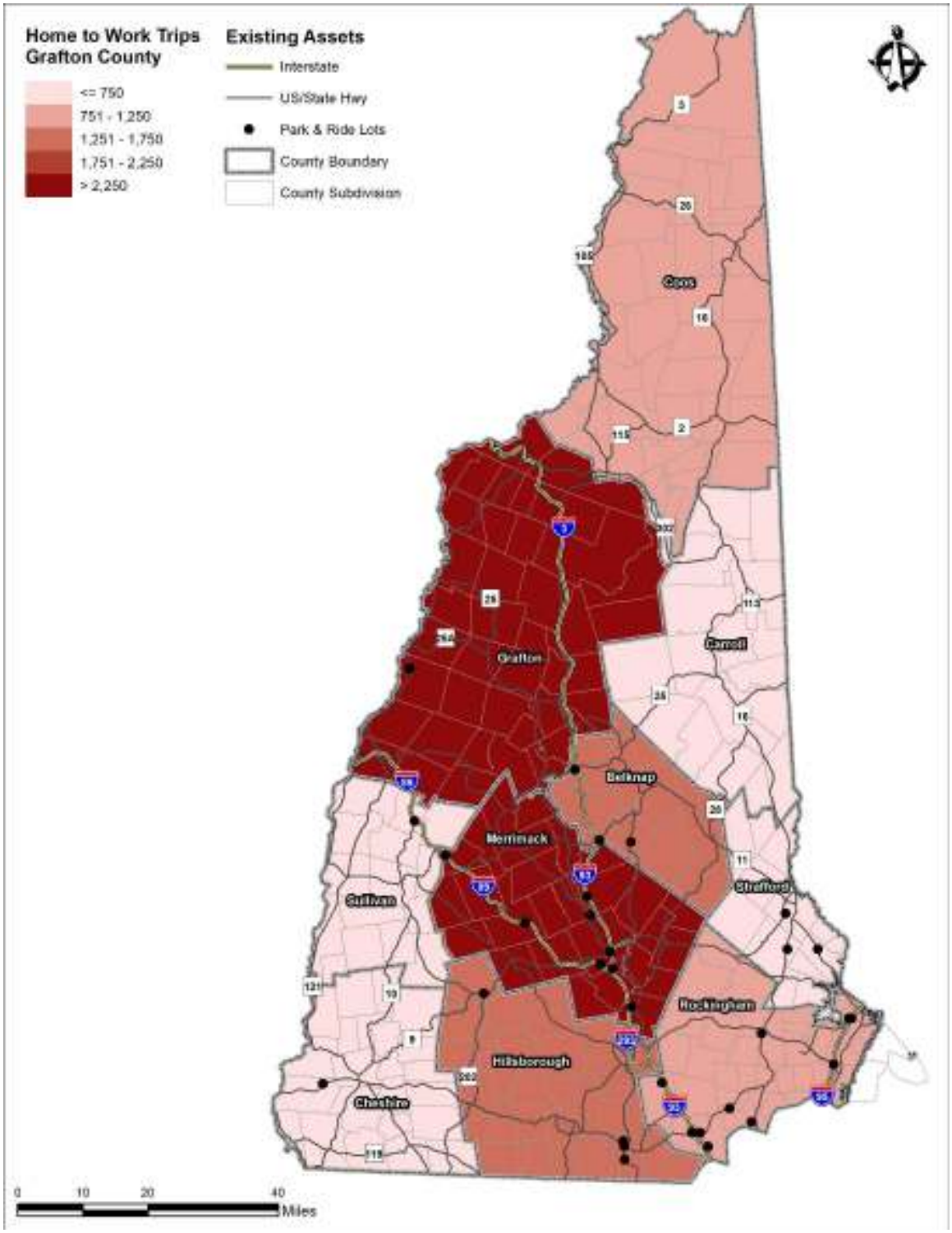
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1,251 - 1,750
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> 2,250
Existing Assets
Interstate
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Park & Ride Lots
County Boundary
County Subdivision
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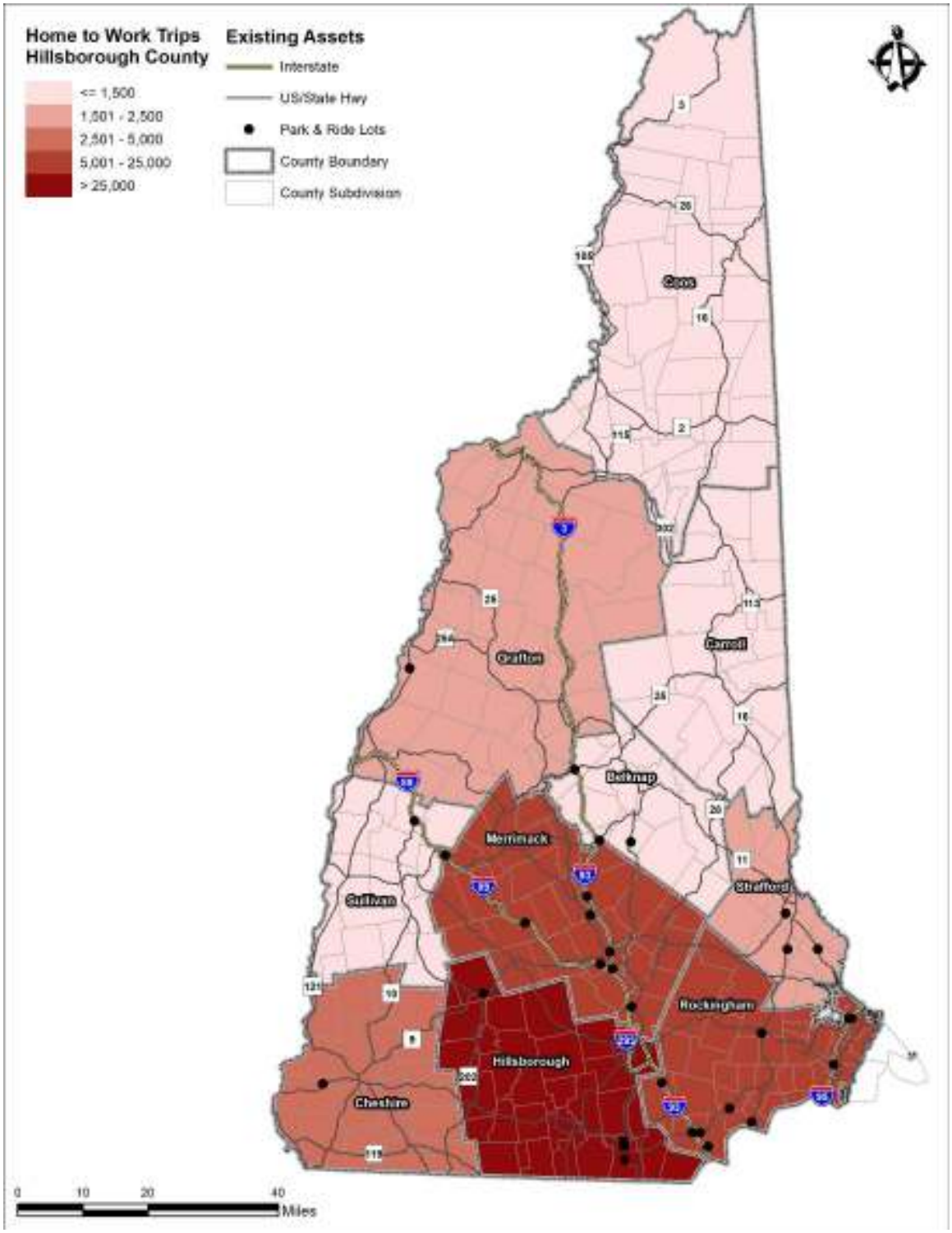
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2,501 - 5,000
5,001 - 25,000
> 25,000
Existing Assets
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US/State Hwy
Park & Ride Lots
County Boundary
County Subdivision
Coos
Grafton
Carroll
Belknap
Merrimack
Sullivan
Strafford
Rockingham
Hillsborough
Cheshire
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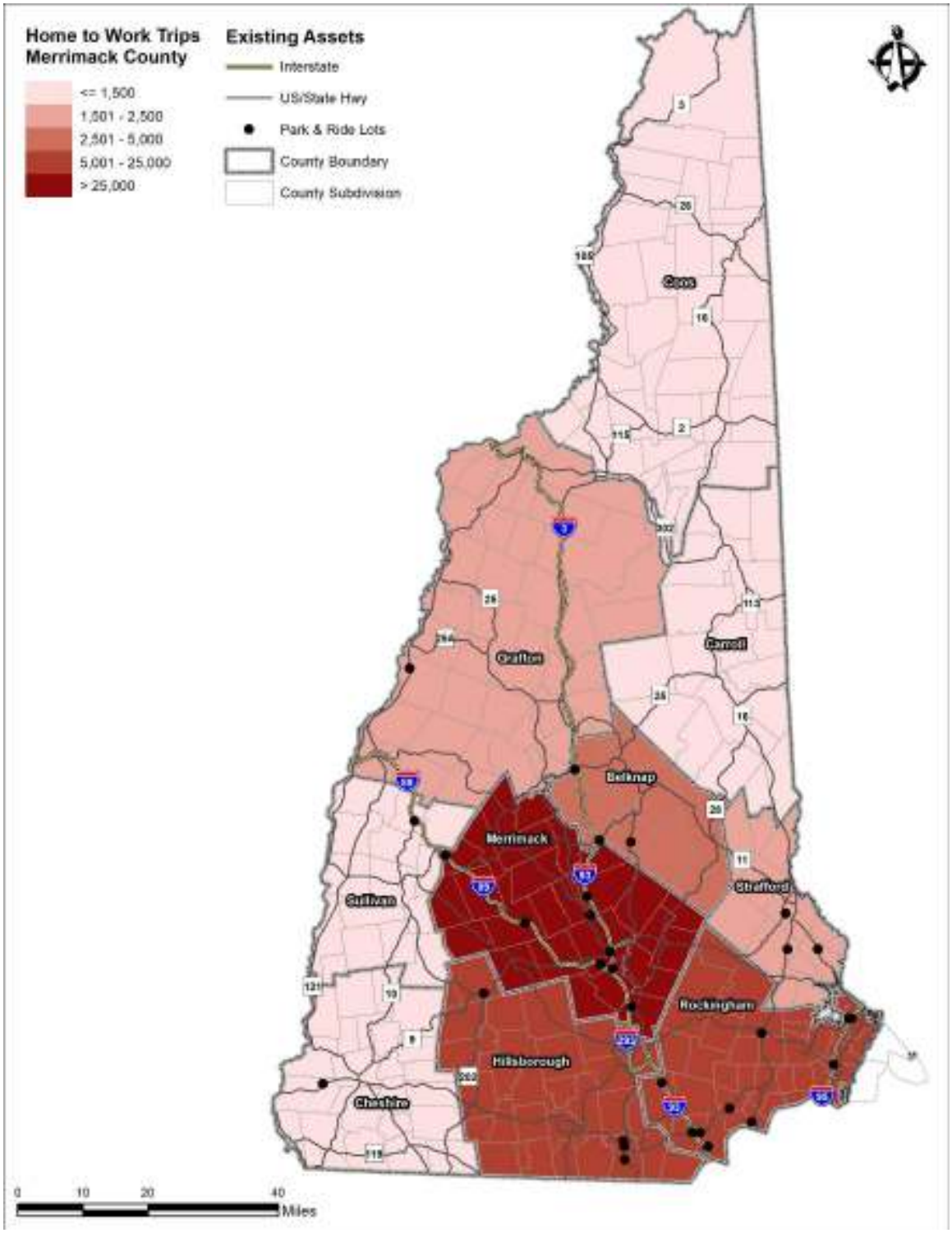
Miles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5,001 - 25,000
> 25,000
Existing Assets
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US/State Hwy
Park & Ride Lots
County Boundary
County Subdivision
Coos
Carroll
Grafton
Belknap
Merrimack
Sullivan
Strafford
Rockingham
Hillsborough
Cheshire
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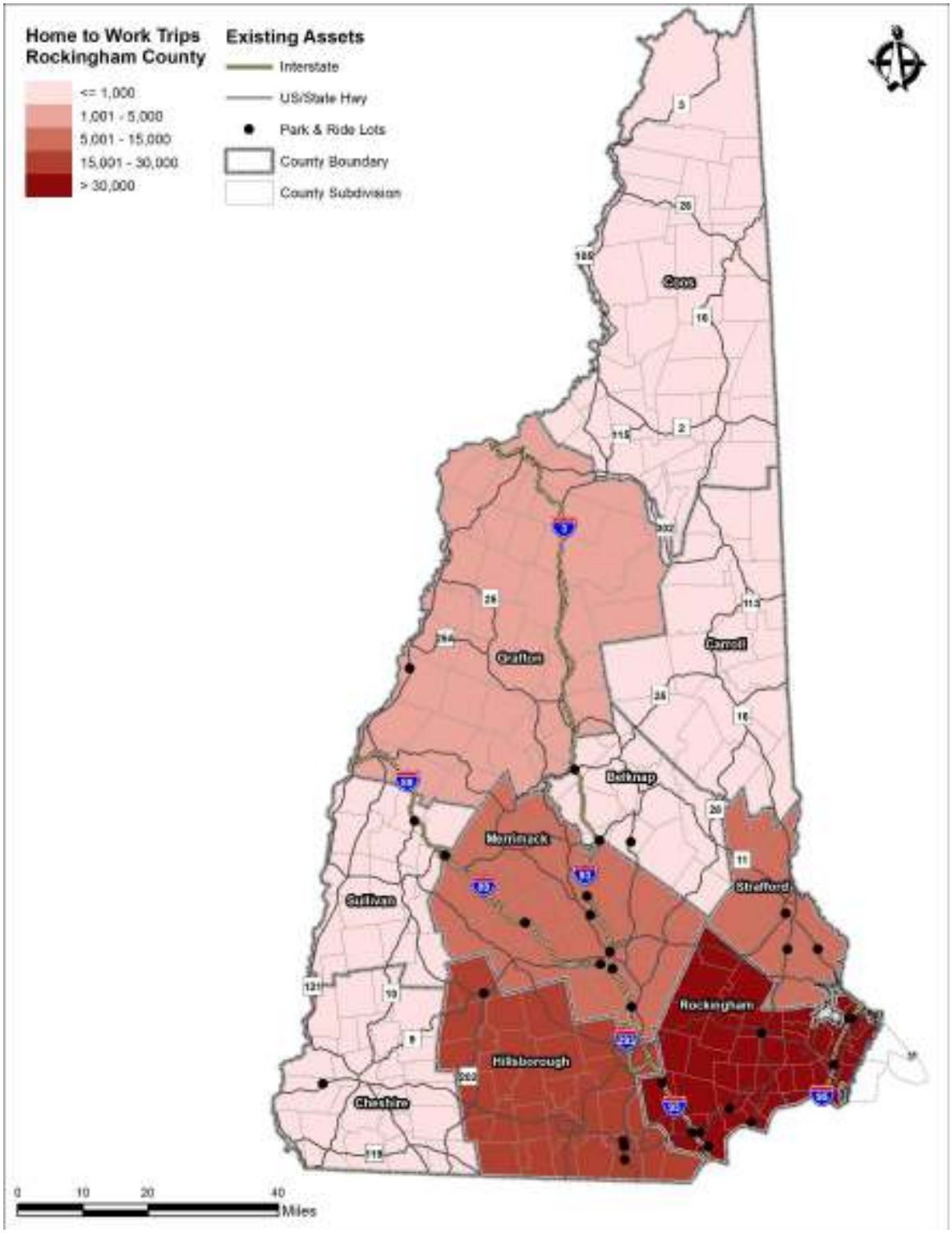
Miles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5,001 - 15,000
15,001 - 30,000
> 30,000
Existing Assets
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Park & Ride Lots
County Boundary
County Subdivision
Coos
Grafton
Carroll
Belknap
Merrimack
Sullivan
Strafford
Rockingham
Hillsborough
Cheshire
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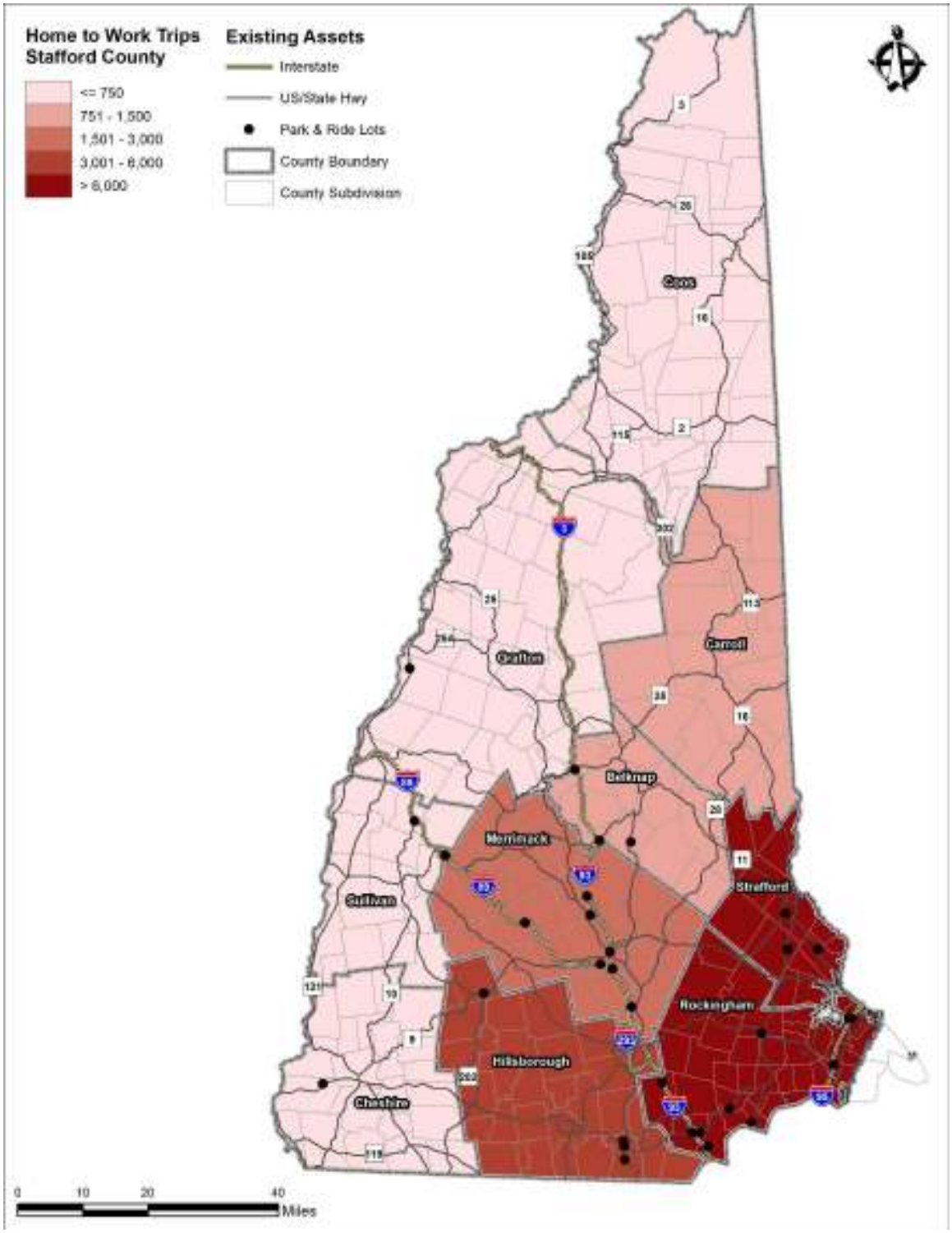
Miles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751 - 1,500
1,501 - 3,000
3,001 - 6,000
> 6,000
Existing Assets
Interstate
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Park & Ride Lots
County Boundary
County Subdivision
Coos
Grafton
Carroll
Belknap
Merrimack
Sullivan
Strafford
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Cheshire
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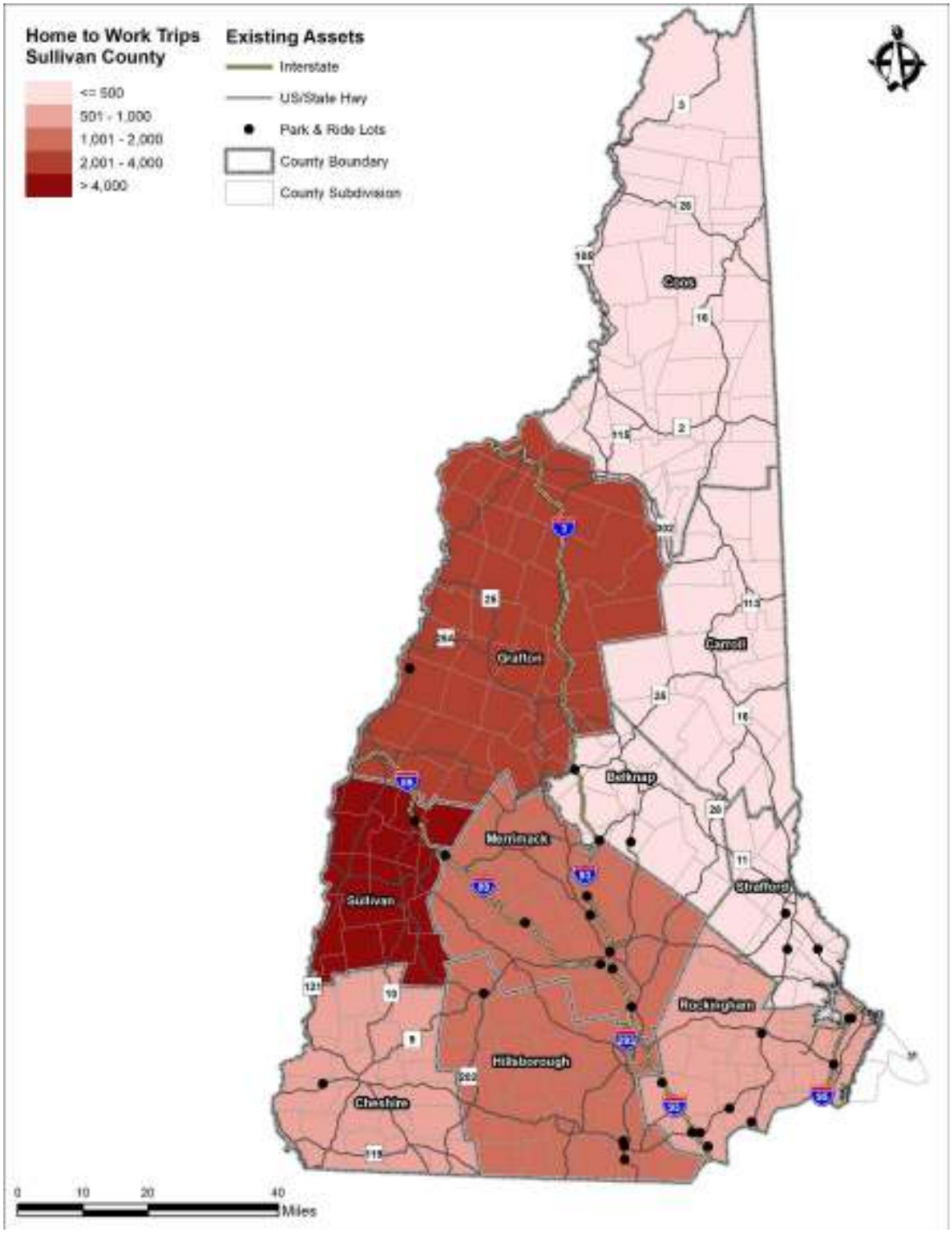
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1,001 - 2,000
2,001 - 4,000
> 4,000
Existing Assets
Interstate
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County Subdivision
Coos
Carroll
Grafton
Belknap
Merrimack
Sullivan
Strafford
Rockingham
Hillsborough
Cheshire
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Miles

APPENDIX B. SUMMARY OF NOTES FROM OUTREACH WITH THE REGIONAL PLANNING COMMISSIONS

NCC

- Location in Plymouth invites people to park (paid) with 24-hour meters
- Littleton is doing a parking study/some talk of a P&R perhaps create terminal for Concord Coach (CC now stops at a gas station in Littleton) – Brenda thinks this is the best opportunity
- Parking congestion at PSU in Plymouth
- Berlin and Gorham have a lot of summer traffic for ATV riders; trails

UVLSRPC

- Exit 17 (different parcel); there was a proposed lot at Exit 17 but Lebanon said no
- Exit 16 – money was in the DOT budget to develop a property police chief in Enfield didn't like it – costs for policing it. Took money for developing Exit 13 instead. There's an unofficial lot at exit 16 used by legislators
- Exit 13 now at capacity
- New London lot is maxed out
- Intermodal study from 2010: https://lebanonnh.gov/DocumentCenter/Home/View/909

RPC

- Exeter train station – capacity constraint
- Portsmouth transportation center (used as a remote airport parking lot for Logan); free parking there; used by locals during winter ban; study of pricing ongoing; Jim Jalbert talking about P3 there to charge for parking
- New P&R in Hampton, Route 1 and 101 for intercity - a stop for IC service on I-95, a stop between Portsmouth and Newburyport; COAST fixed route down Route 1, not cost effective because of local match; Hampton selectmen decided they didn't want a P&R in downtown (bus fumes); not much land at I-95/101 interchange. C&J looking at P&R at exit 57 in Newburyport

LRPC

- West Ossipee (unofficial McDonalds parking lot)
- Town of Warner
- 16/28
- 28/140/11 (Alton)
- Meredith has public lot behind Aubuchon

SNHRPC

- Unmet needs
  - Exit 3 P&R as connection point between NTS and I-93 corridor
- Potential locations

  - Manchester satellite lots.
    - PnR for transit into town. Mill Buildings parking. Private company PnR off highway, trolley system;
    - Coordinate off exits with community college
    - Queen City/Elm, realistic location, limited passenger rail
  - Derry very popular area, Windham Boston Express

SRPC

- Unmet needs
  - Land use issues about P&R lots using land at primary sites (33&I-95)
  - What is the purpose of the lots, for commuters? For airline passengers?
- Potential locations
  - Lee traffic circle; which leg of the intersection? But transit service ending in May
  - 108 South of Durham to serve route 5
  - Route 4 in Northwood (small) at US 202
  - Route 2, 3, 101 deal with Care Pharmacy/CVS in Dover near exit 8
  - Something in Somersworth along High Street
  - New Durham Route 11, some unofficial spots used by ATVs and snowmobilers, see a need for a future P&R there
    - COAST route 6 has no logical terminus; a P&R would be a good terminal
  - Issue of free parking at all of the park & ride lots
  - On route to shipyard, could be in Maine to relieve pressure: Berwick, Somersworth
  - Exeter PnR capacity, lots at rail overcapacity, alternatives
  - Fox Run Mall (informal)
  - Newmarket library

CNHRPC

- Unmet needs
  - Keene to Concord/Manchester
  - Hillsborough – informal one at the Shaws, more use than official one
  - Henniker 202-127 intersection Old Concord Road informal PnR lot behind Dunkin Donuts
  - Expanding Bow P&R
  - 129 & 106 informal PnR
- Potential locations
  - Pittsfield, was going to be developed, 107/28 (not developed yet) using CMAQ funds
  - Exit 18 in Canterbury (10 spots)
  - Epsom traffic circle, informal parking at Care pharmacy, open asphalt, but no obvious bus terminal

- No good options in Chichester
- Old rest area Northwood town border, former rest area goes to surplus
- Informal PnR at Sullys (28 & 3 in Pembroke)
- Tilton PnR underused, informal at McDonalds, Outlets

SWRPC

- Unmet needs
  - Only 1 location in region, Chesterfield Rt 9 @ state park Gorge, no intercity bus service
  - Greyhound passes by it Keene → Brattleboro
  - 10-hour limit at Transportation Center, no long-term parking to support intercity bus
- Potential locations
  - was interest in Peterborough; tried to establish a P&R there; owner of plaza not interested
  - Access point at intersection of Rt 9 and I-89 P&R and/or transit service.
  - Reviewed in PnR toolkit
    - On Keene Bypass System (ideally intercity bus & local)
    - Peterborough 202 & 101, got funds to develop
  - Looked at community center
  - Not in region but something in Hopkinton Rt 9 @ 89 would serve the region
  - VT has covered the 91 corridor (Brattleboro, Westminster, Rockingham), what's lacking is to the west.
  - Informal lots
    - 202 & 101 Peterborough plaza, Job Lot
    - Keene so many places they can park
    - Antioch commute in cluster, classes in 2 days
    - Peterborough 202 up to 9, complex Brady's, Dunkin Donuts
    - On bypass 9, 12, 101
    - PnR limited access highway on/off visible
    - large workforce going elsewhere, highest concentration?
    - Around gas station on 9? Hillsborough small

APPENDIX E: DEMOGRAPHIC MAPS BY REGION

This appendix contains a set of three maps for each of the six analysis regions. The three maps are:

1. Population density – people per square mile
2. Transit propensity – index based on four characteristics
3. Employment density – jobs per square mile

The transit propensity map is a composite of the following four demographic characteristics:

- Population over the age of 80
- People with a disability
- People below the poverty line
- Households with zero cars available

All of these statistics come from the American Community Survey for 2012-2016, which is an ongoing survey conducted by the US Census. In order to produce reliable data at a fine level of geography, the Census creates a five-year running average of the survey results by Census block group. Block groups in New Hampshire contain between 180 and 4,850 residents (though there are a few with zero residents), with the average size being 1,445 people. Geographically, block groups range from small portions of the larger cities (literally groups of city blocks in Nashua and Manchester) to relatively large swaths of territory in rural areas, sometimes combining two or more towns.[1]

For each of the four transit propensity measures, the percentage of people living in that block group who had that characteristic (such as being over the age of 80) was calculated. In addition, the statewide percentage for each of the four characteristics was calculated. These statewide percentages were as follows:

- Over age of 80: 3.96%
- With a disability: 6.10%
- Below poverty line: 4.97%
- Zero vehicles available: 5.27%

The next step was to compare the percentage in each block group with the statewide average. Points were then assigned depending on how the percentages compared:

- At or below statewide average: 0 points
- Between statewide average and double: 1 point
- Between double and triple statewide: 2 points
- More than triple statewide average: 3 points

The points across the four categories were then added together to produce a composite score. The scores were then grouped into the following categories:

- Low: 0 to 2 points
- Medium: 3 or 4 points
- High: 5 or 6 points
- Very High: 7 to 11 points

Finally, one adjustment was made to the scores prior to mapping them. Of the 922 block groups in the state, there were 23 that had scores of 5 or above but that very few people in them, with population densities of

[1] There are a total of 922 block groups in New Hampshire ranging in land area from 0.026 square miles (in Manchester with a population density of 30,305 people per square mile) to 349 square miles (encompassing Errol, Cambridge, Dummer, Millsfield, Wentworth, Dixville and other rural area in the northeastern corner of the state with a population density of 2 people per sq. mi.).

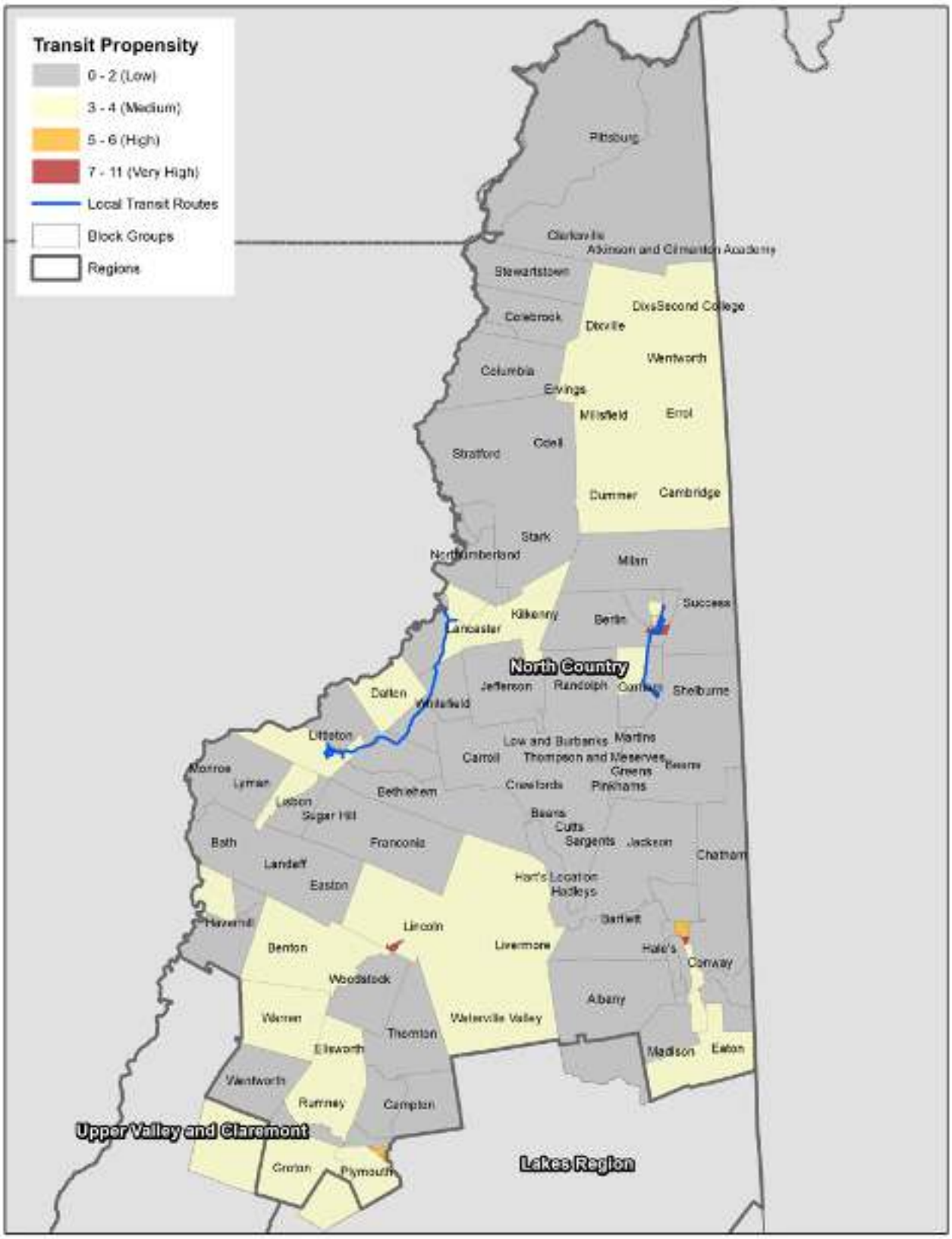
160 people per square mile or less. Several of these also had large land areas because they covered several towns. In order not to provide a misleading image on the map—that there were large swaths of territory with significant needs, when in fact the absolute numbers of people there were very small,—the scores for these block groups were changed to zero.[2] On the other hand, there were 21 block groups that had triple the state average for one of the demographic characteristics, but did not score highly enough on the others to add up to a total of 5 or more points. These block groups were "promoted" to the High category so as not to lose the "very high" percentage of one of the characteristics.

The regions are presented in counterclockwise order, beginning with the North Country. Each map includes an overlay of the local bus routes operated by regional transit providers. The areas of most interest are those with high residential or employment density, or with high or very high transit propensity, and no current local bus service.

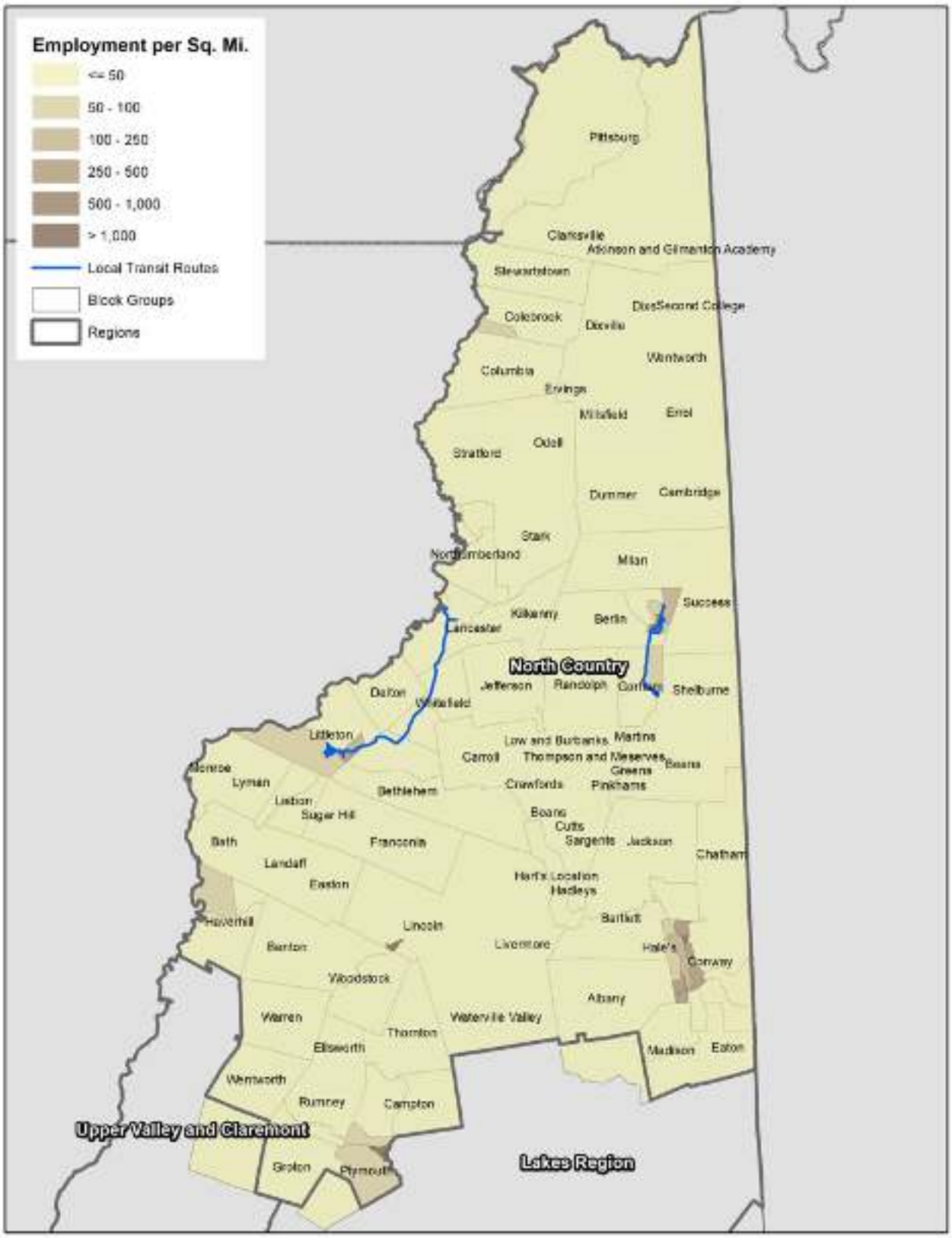
[2] There were three additional block groups with somewhat higher densities that were also considered too sparsely populated to include, as they had fewer than 100 people in any of the four demographic categories.

North Country – Population Density

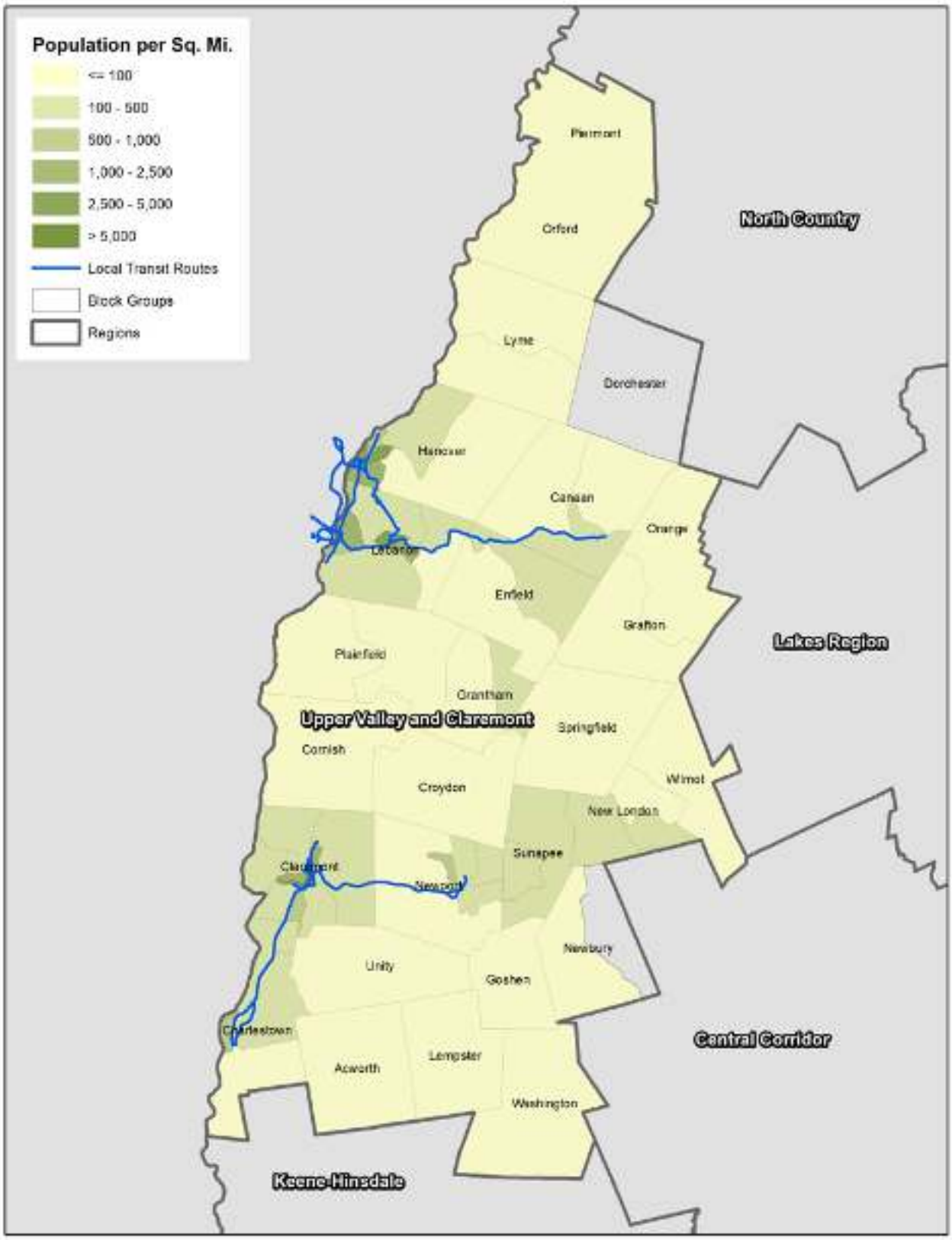
North Country – Transit Propensity



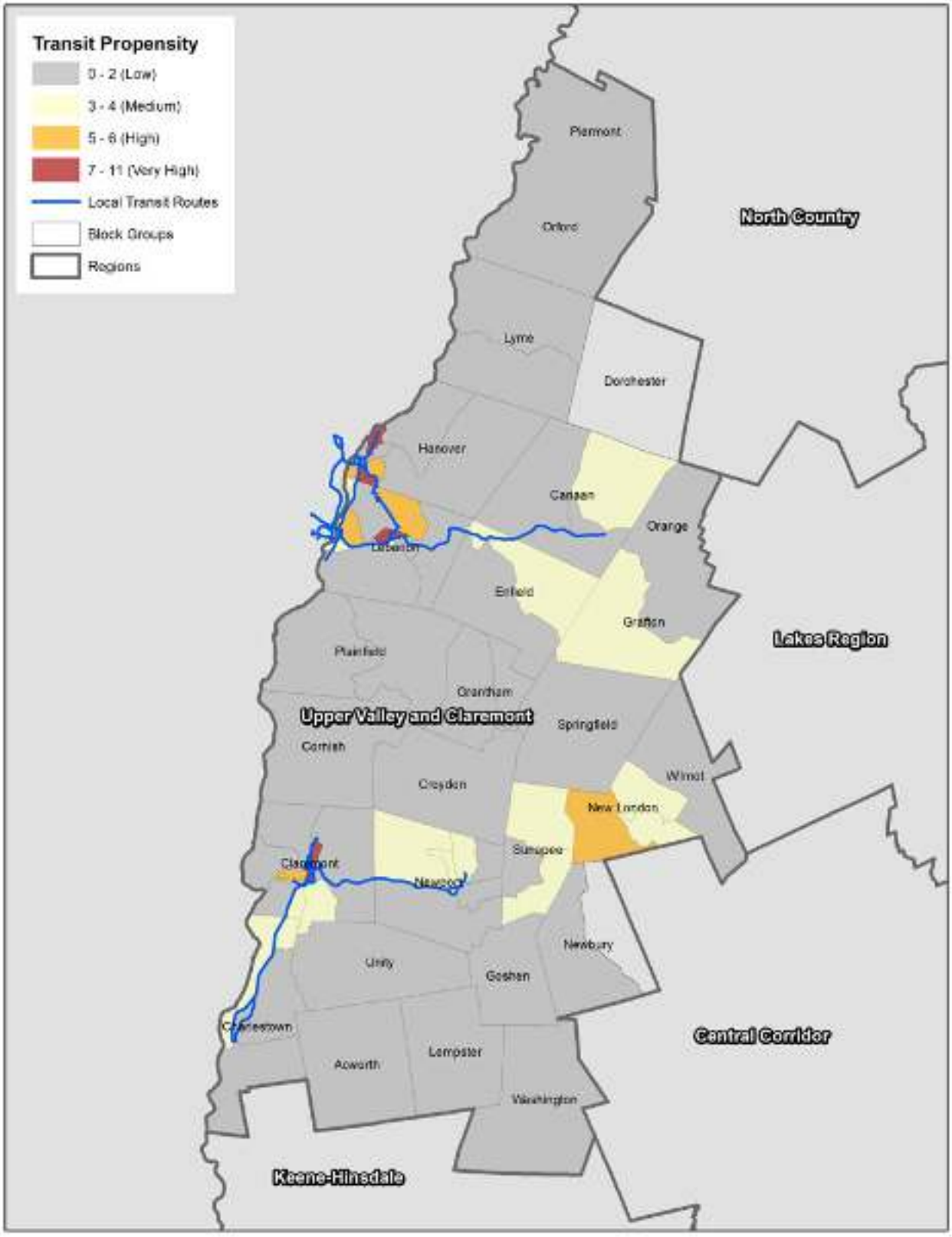
North Country – Employment Density



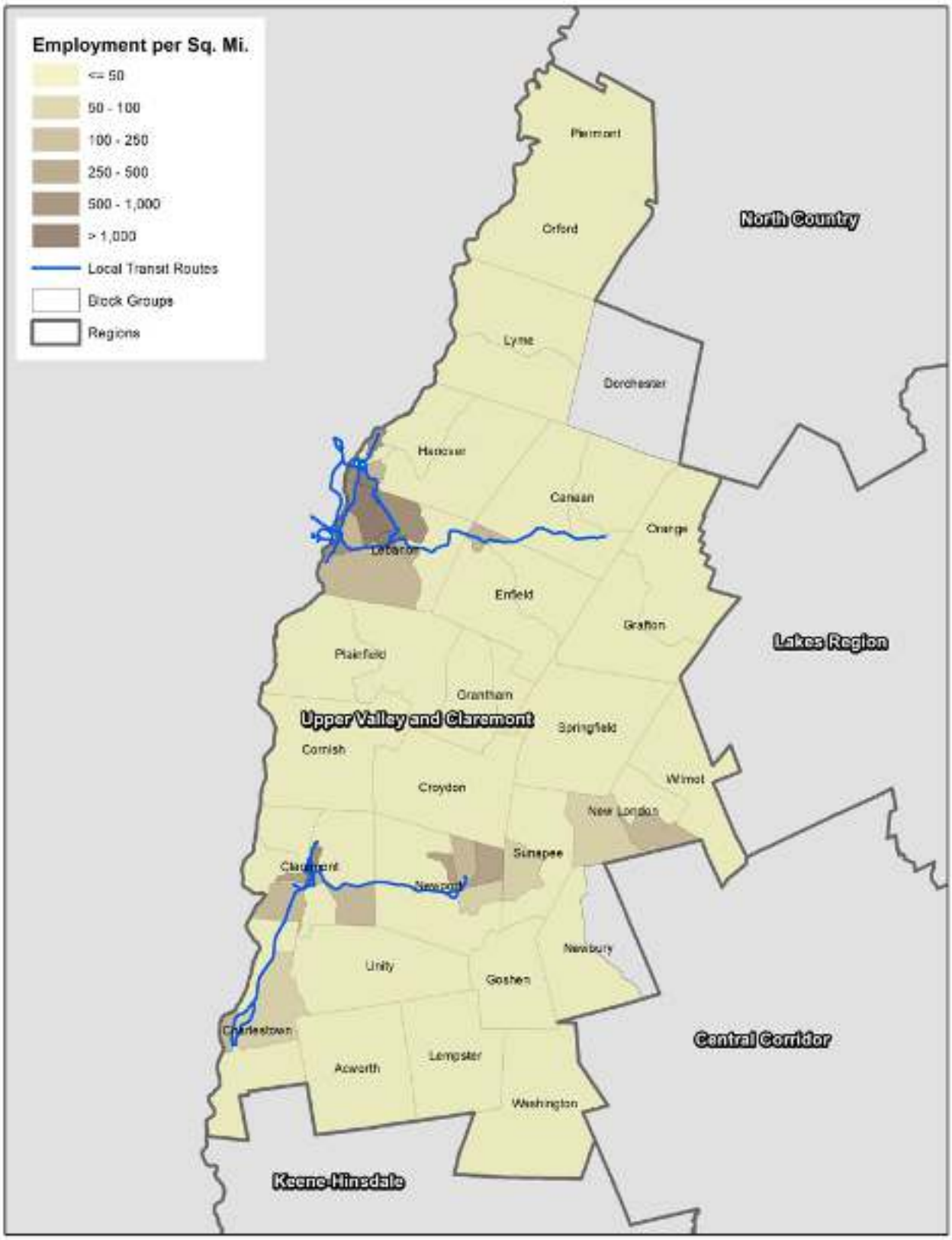
Upper Valley/Claremont – Population Density



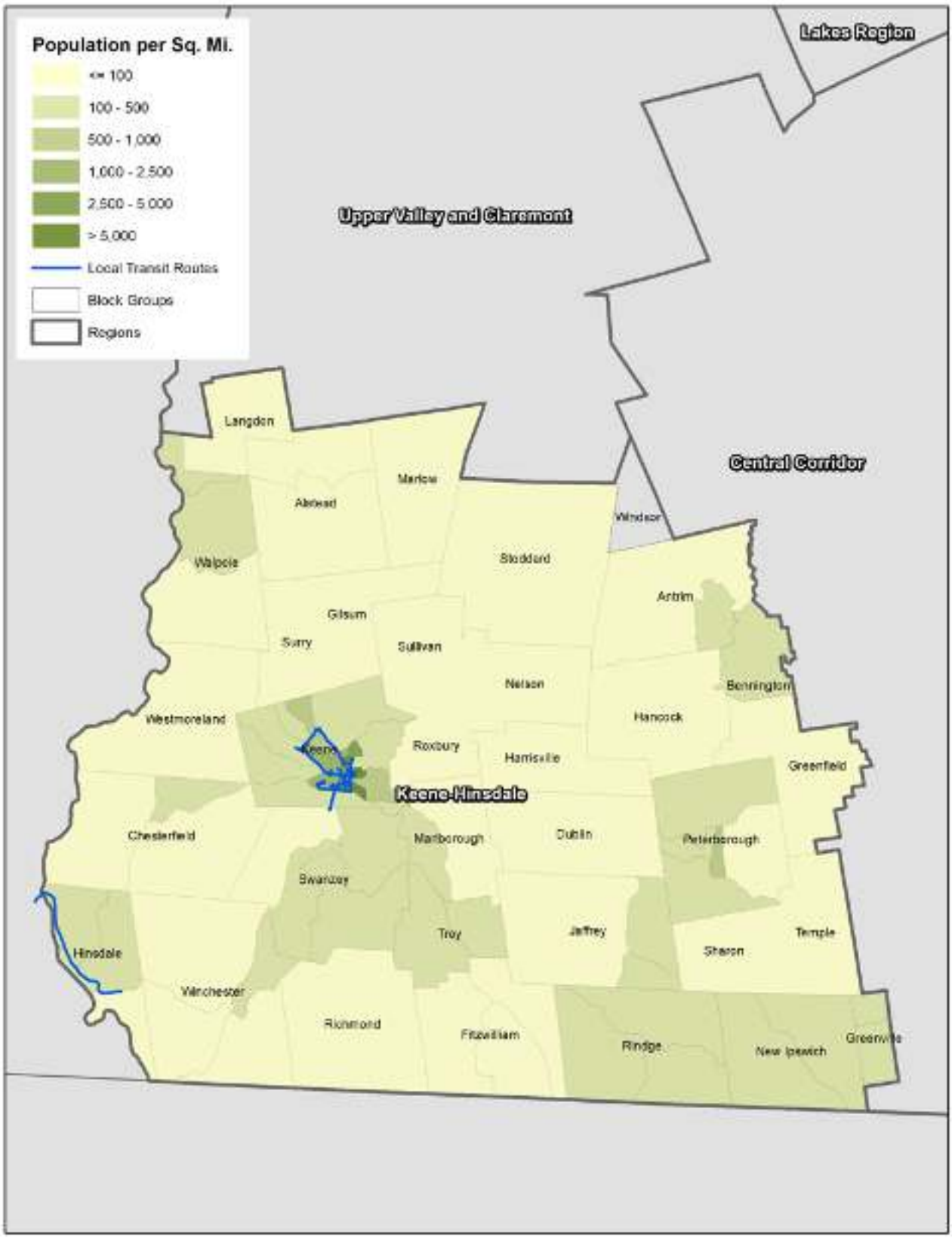
Upper Valley/Claremont – Transit Propensity



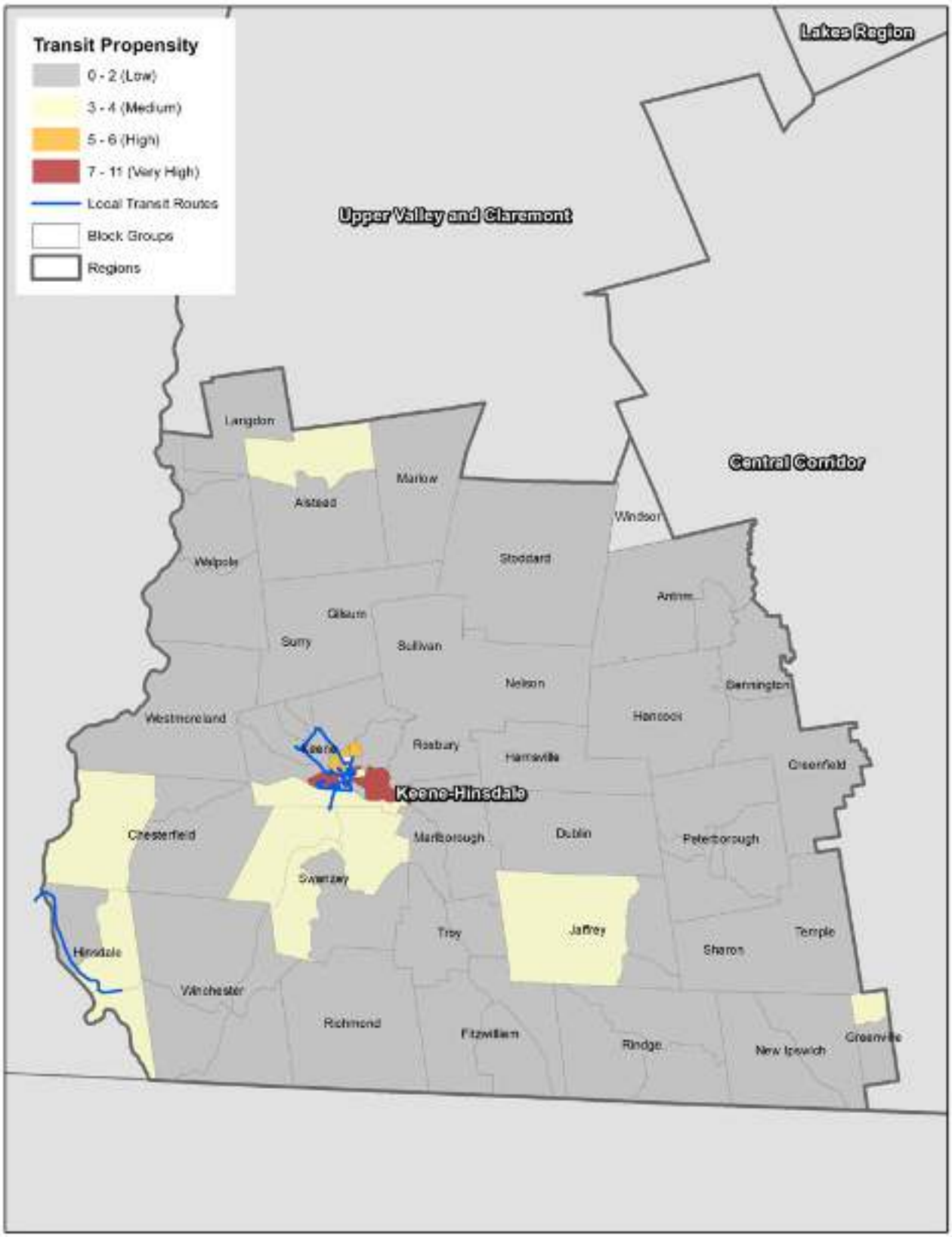
Upper Valley/Claremont – Employment Density



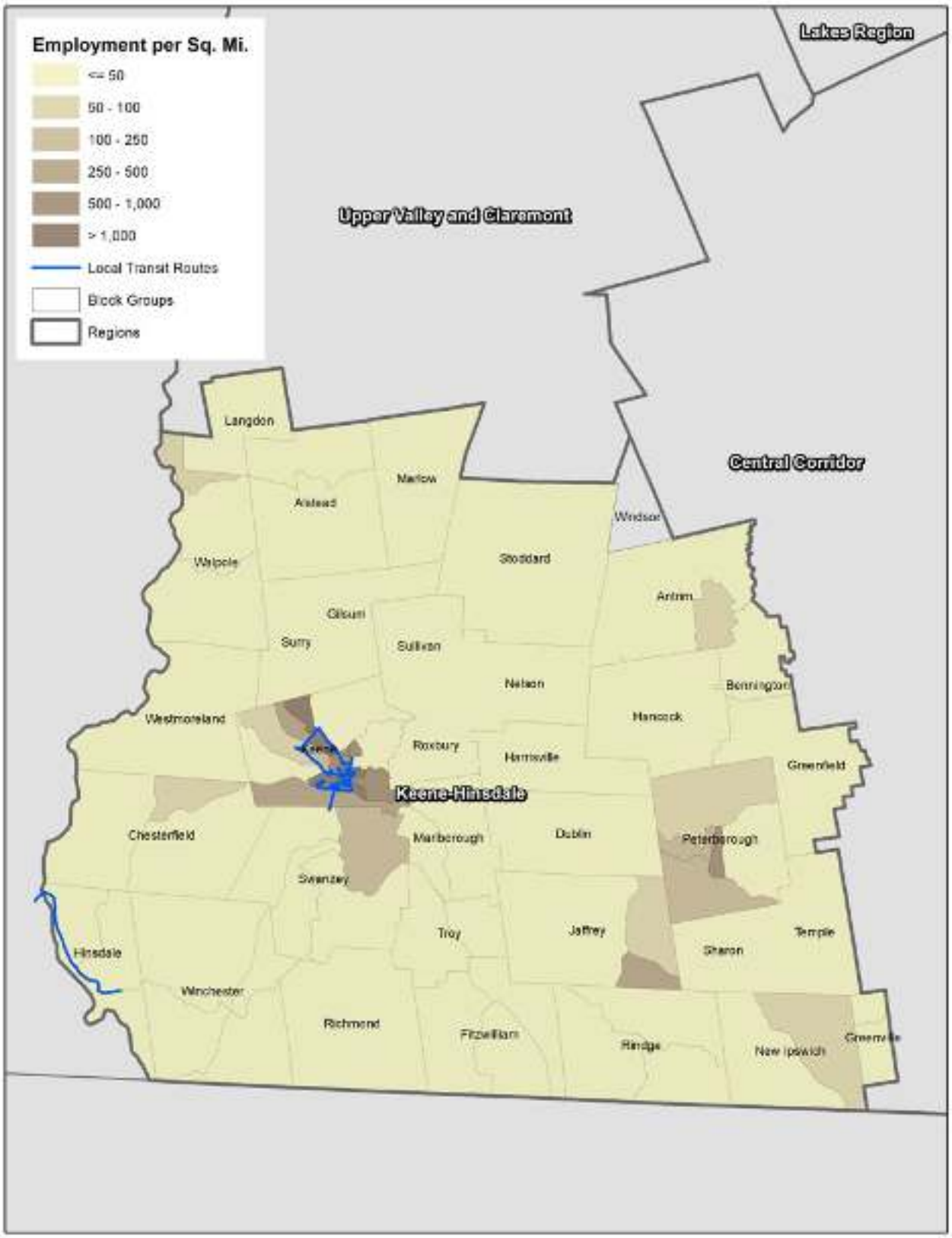
Keene-Hinsdale – Population Density



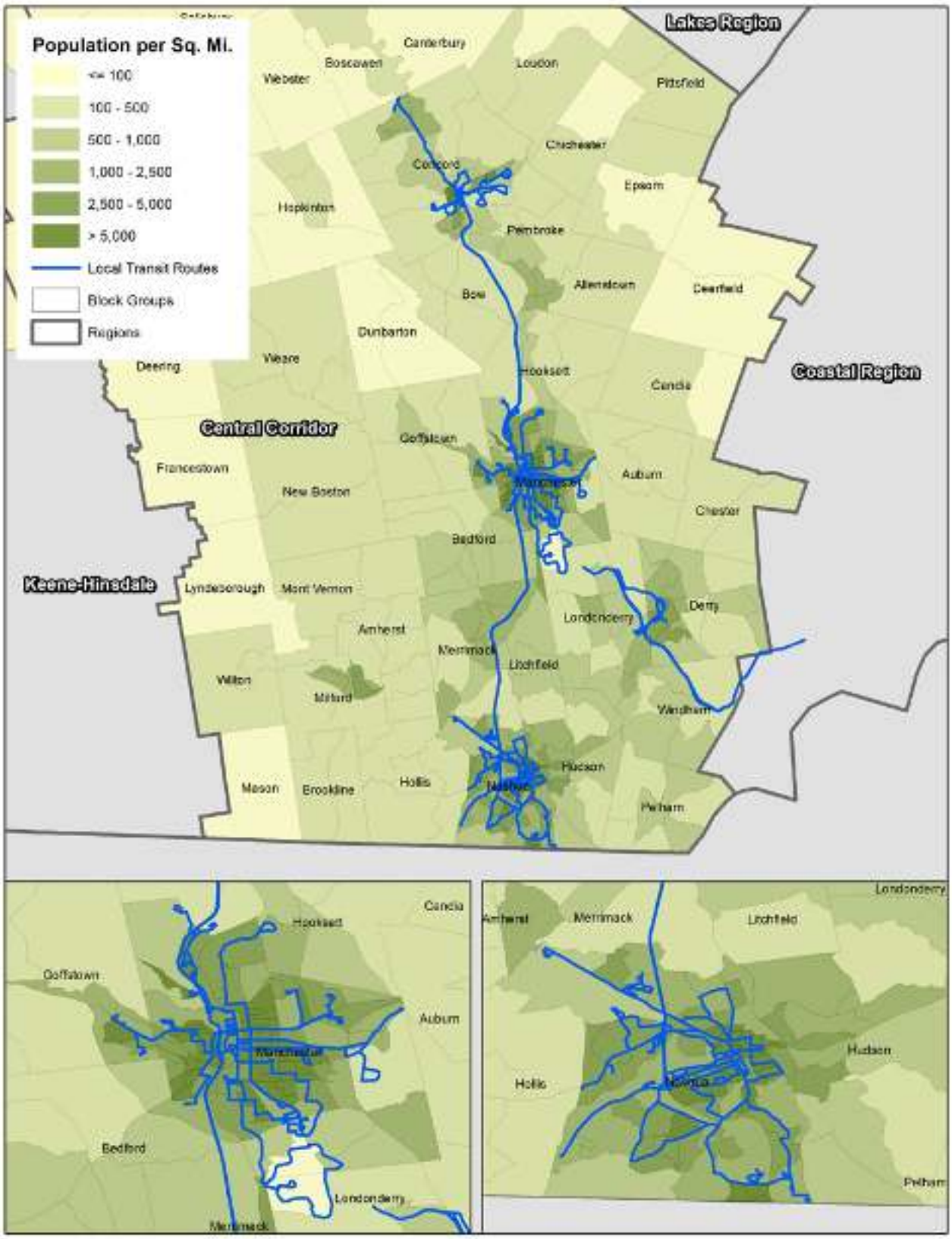
Keene-Hinsdale – Transit Propensity



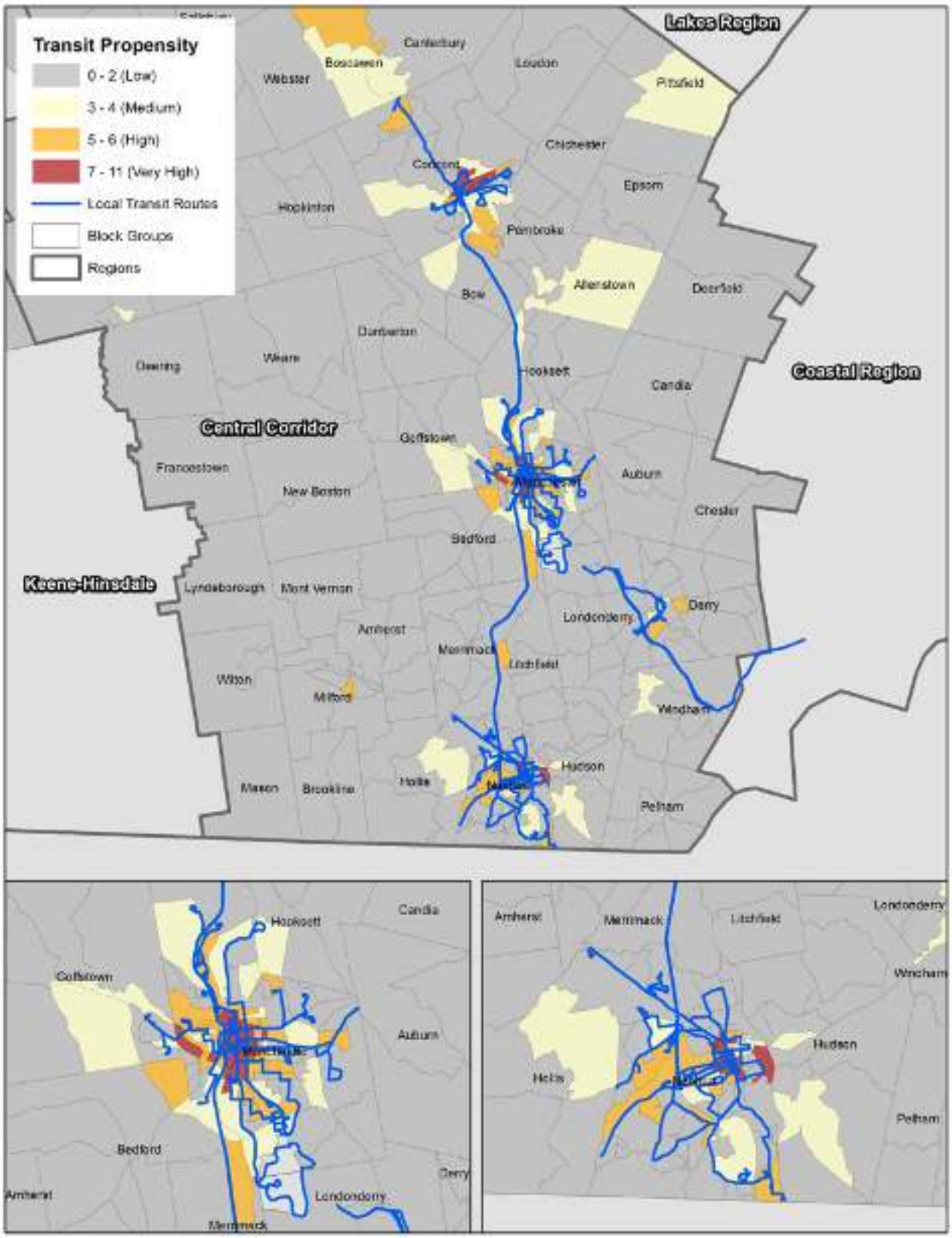
Keene-Hinsdale – Employment Density



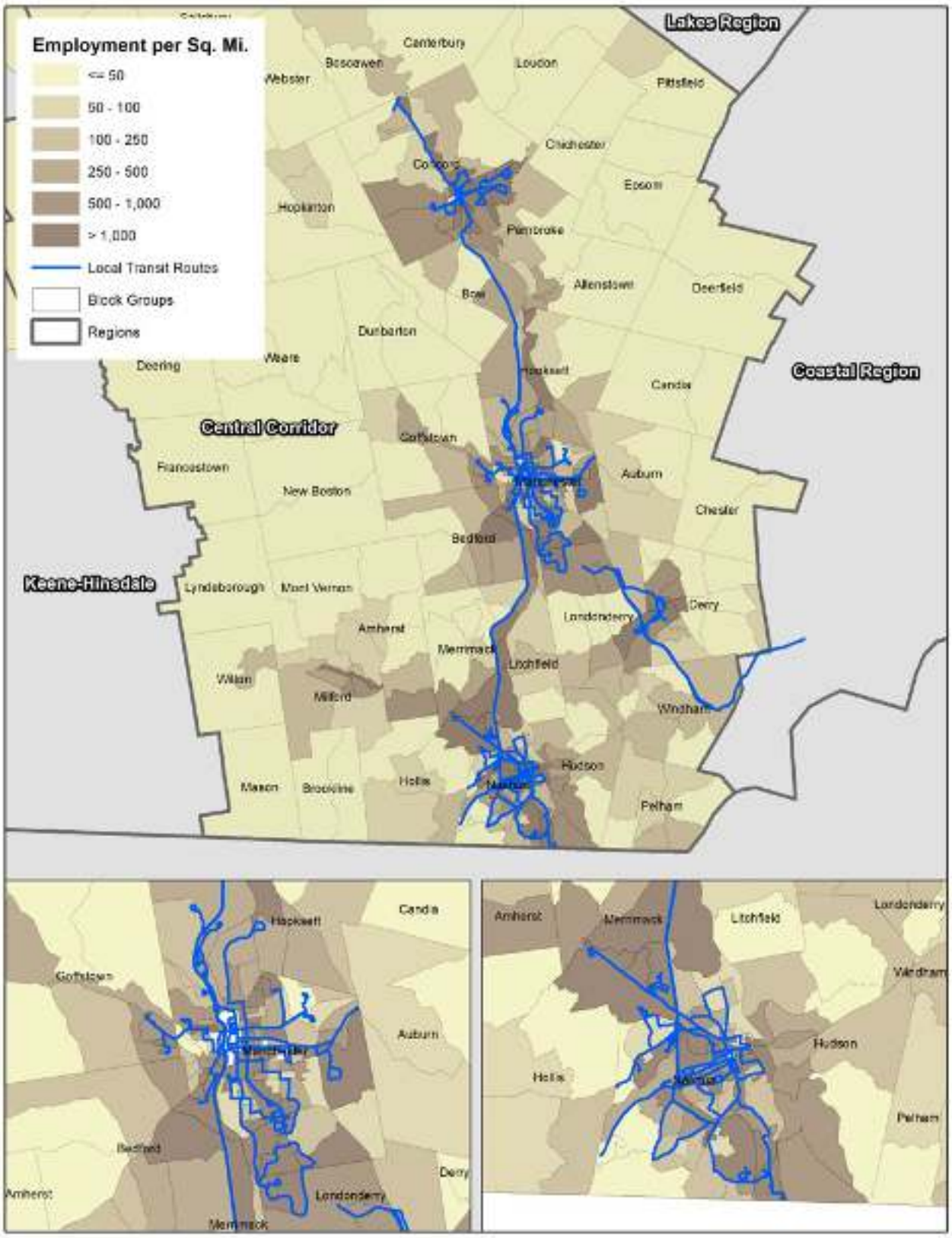
Central Corridor – Population Density



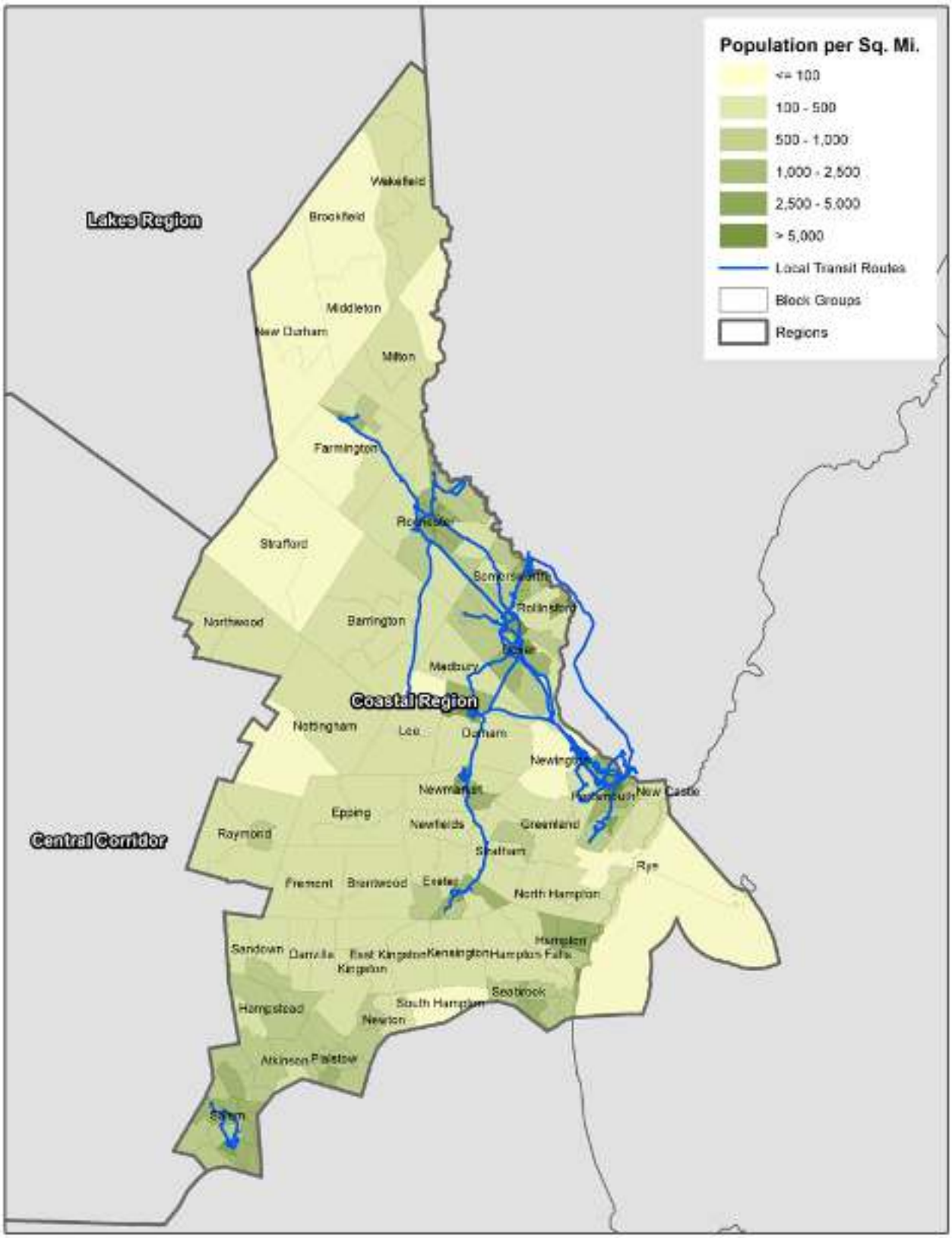
Central Corridor – Transit Propensity



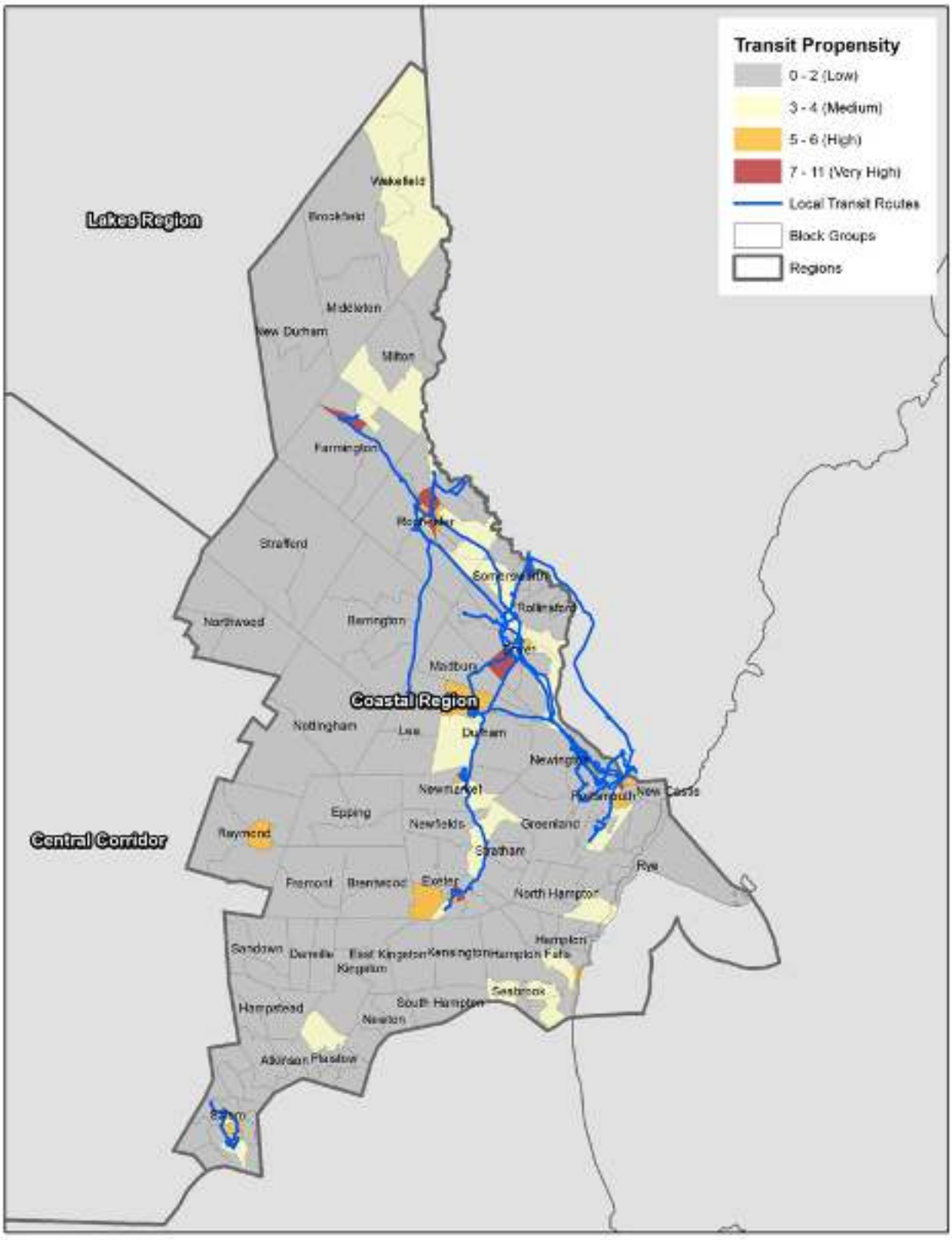
Central Corridor – Employment Density



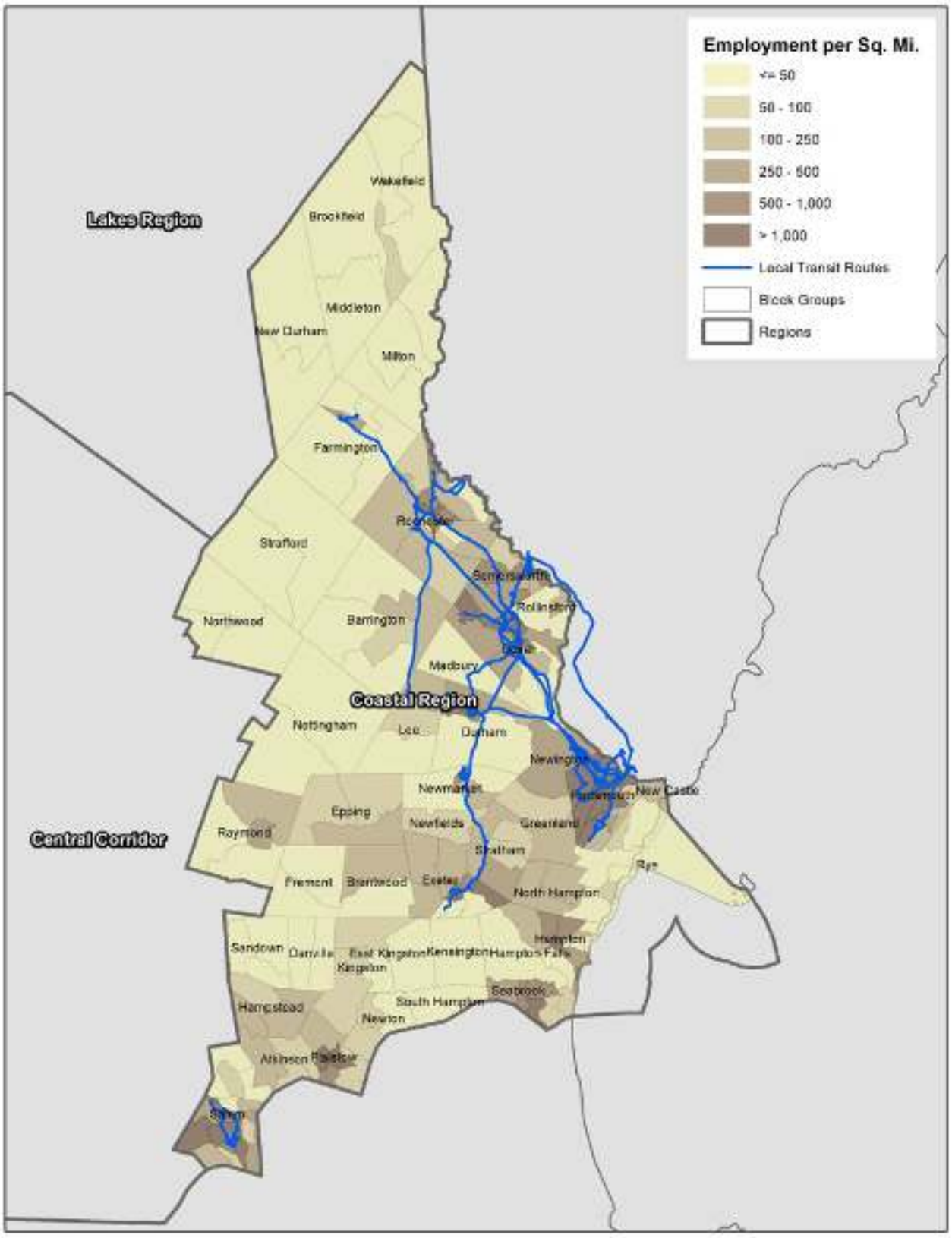
Coastal Region – Population Density



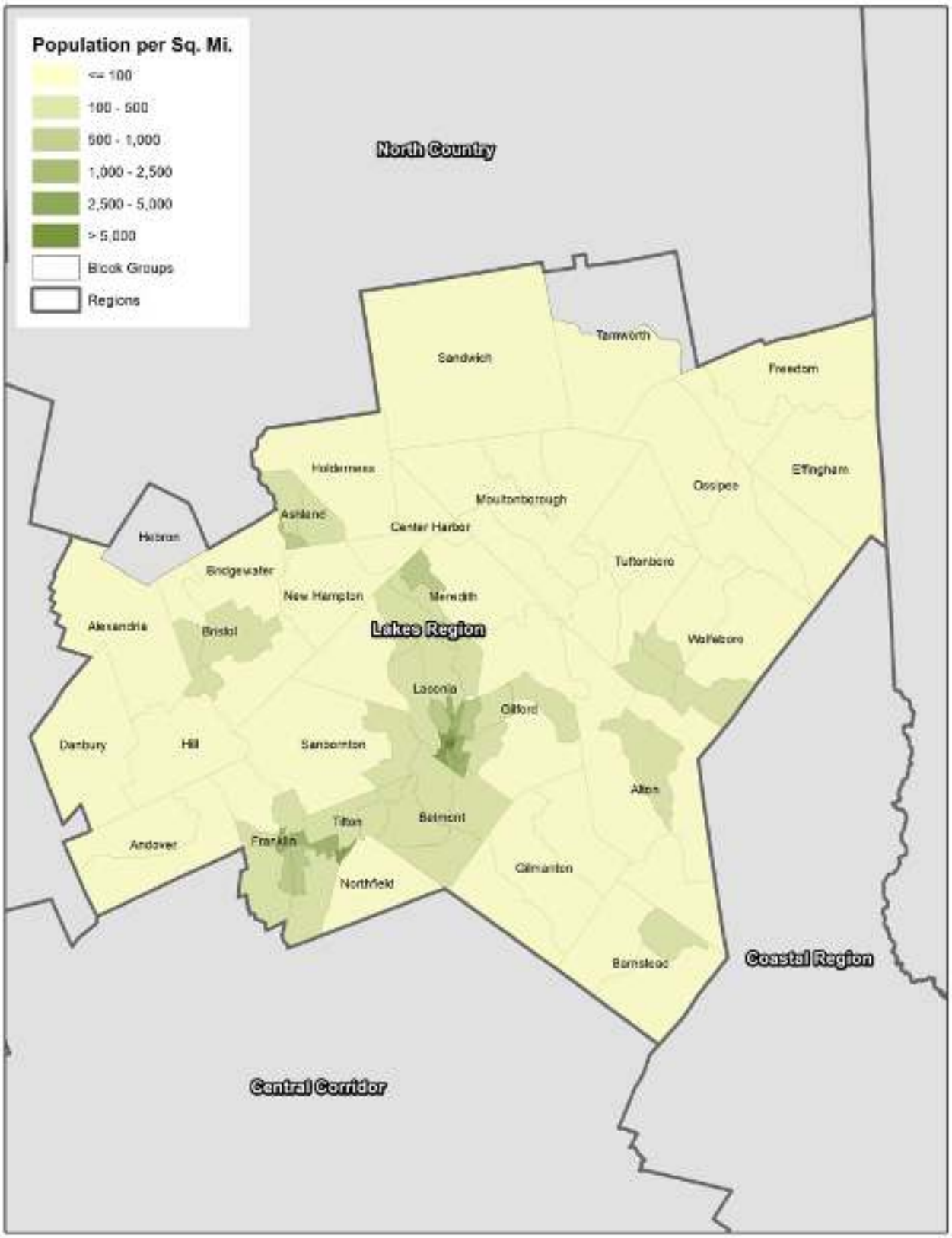
Coastal Region – Transit Propensity



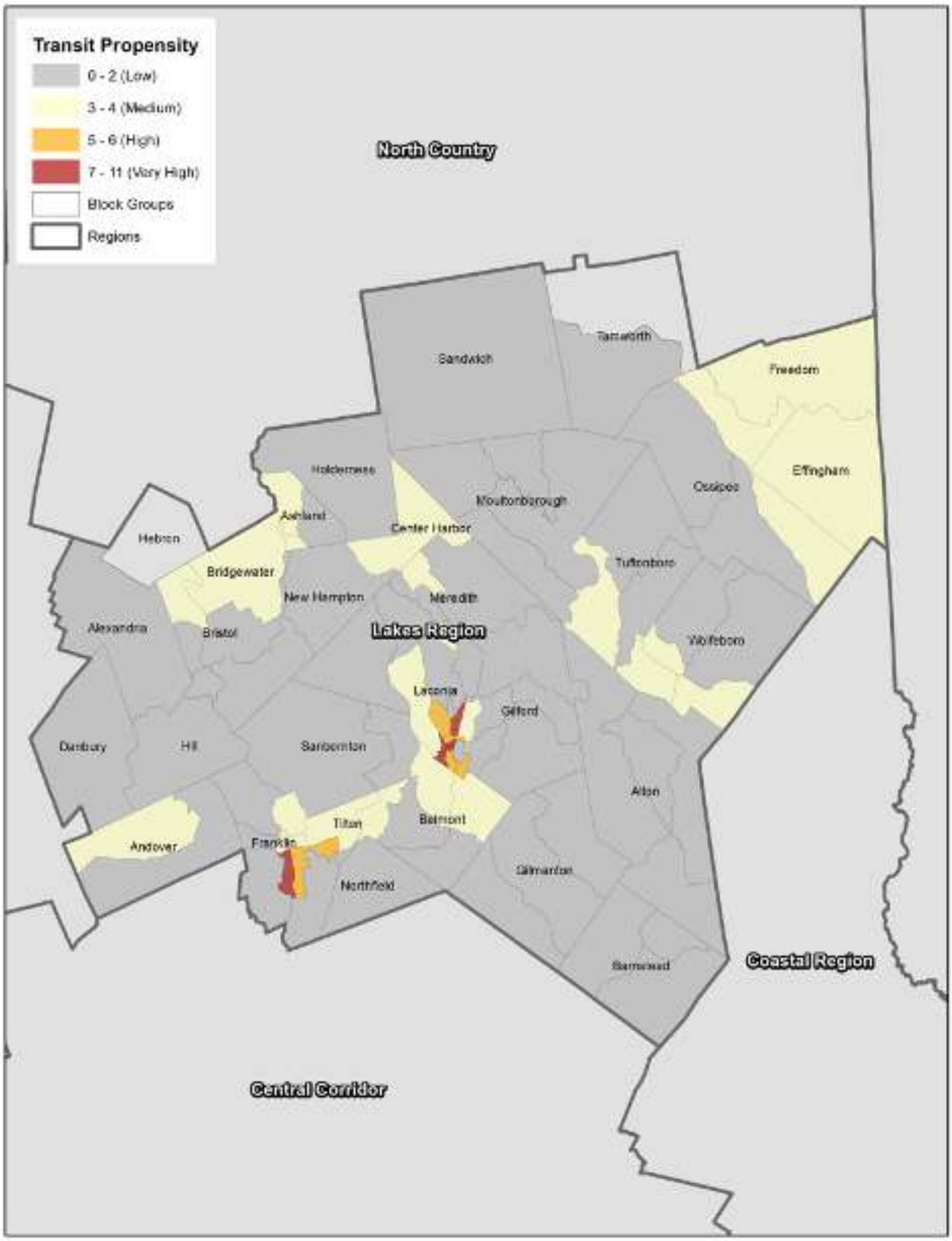
Coastal Region – Employment Density



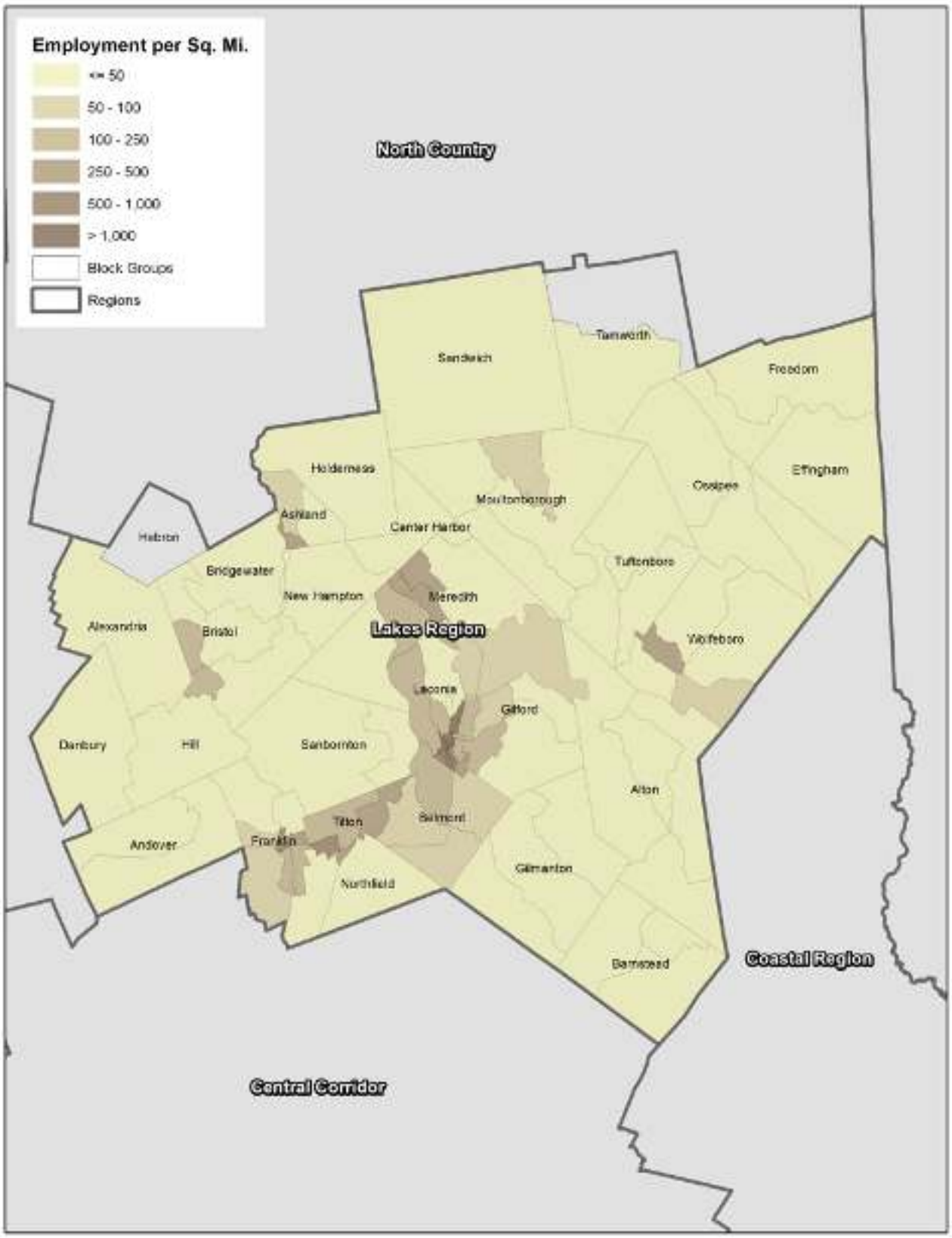
Lakes Region – Population Density



Lakes Region – Transit Propensity



Lakes Region – Employment Density



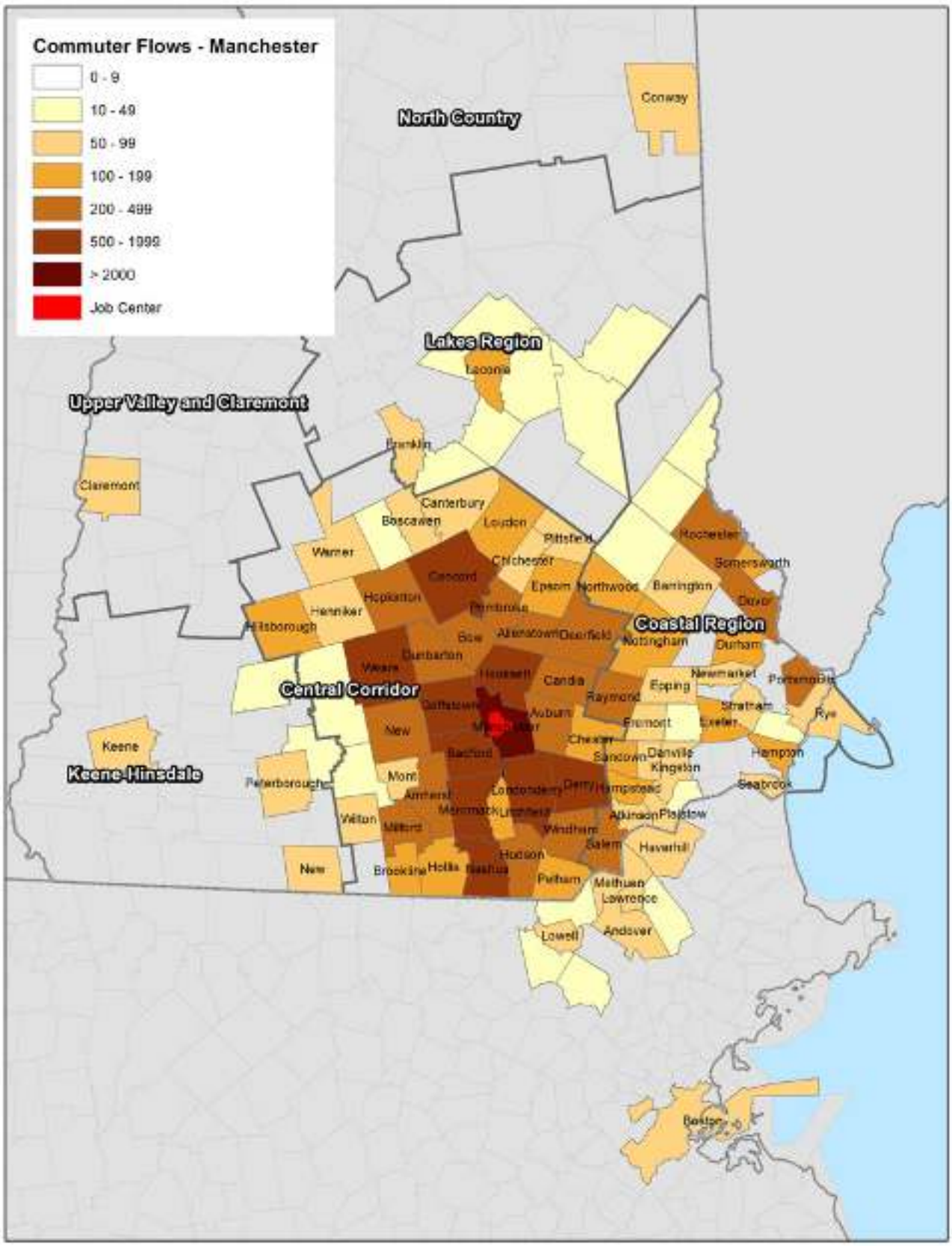
APPENDIX F: COMMUTING MAPS BY EMPLOYMENT CENTER

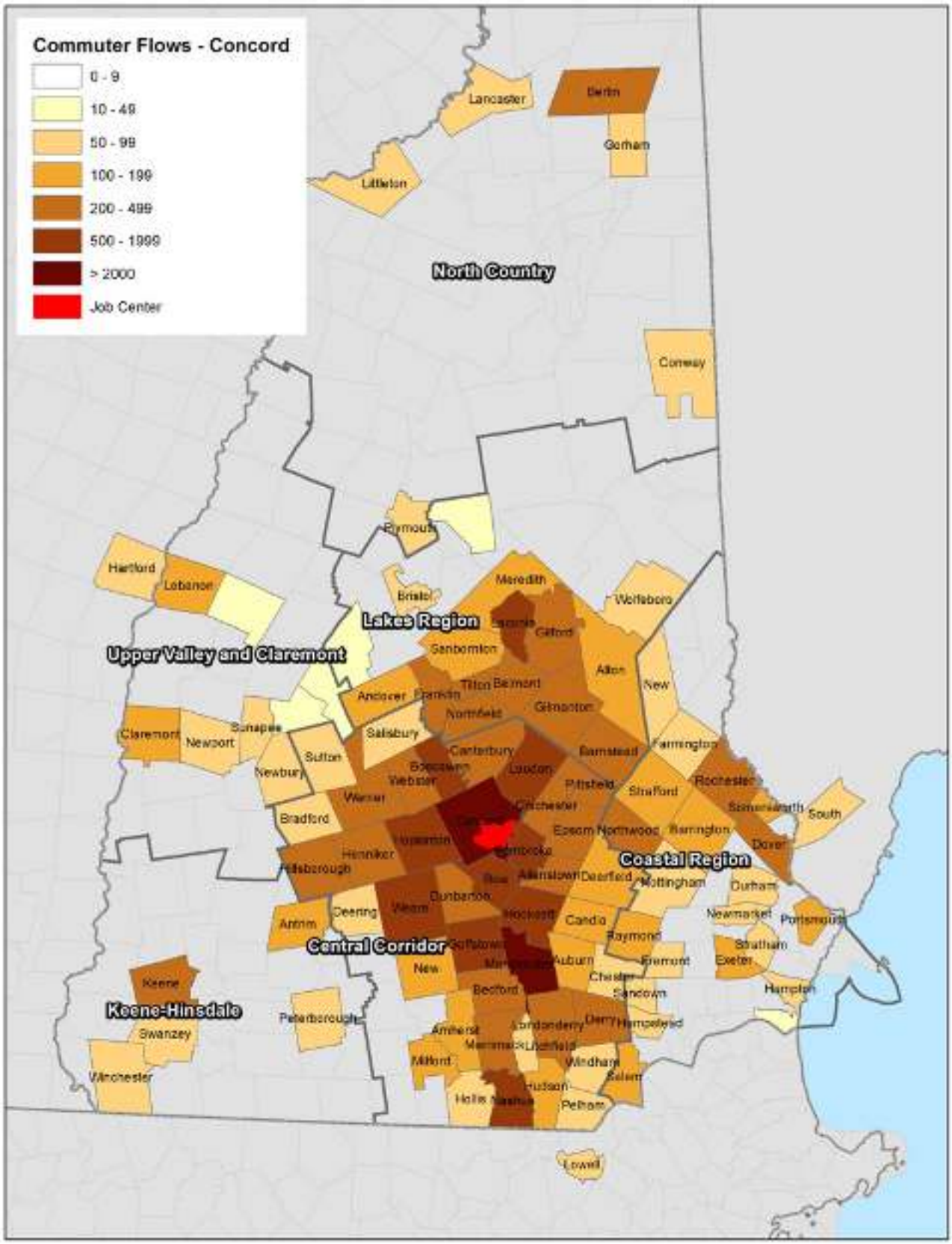
The maps in this appendix present commuting data from the Longitudinal Employer-Household Dynamics (LEHD) database, a product of the US Census. The LEHD derives commuting flow data by linking home locations to employment locations through Social Security numbers. Employers filing unemployment insurance reports to their state governments must list the SSNs of their employees. The Census Bureau has developed agreements with states to supply this information, which it then links to the home addresses in the Social Security database. The data are then aggregated at the census block level, and data are suppressed when necessary to avoid privacy concerns. Figures for 2015 were the most recent available when the analysis was done.

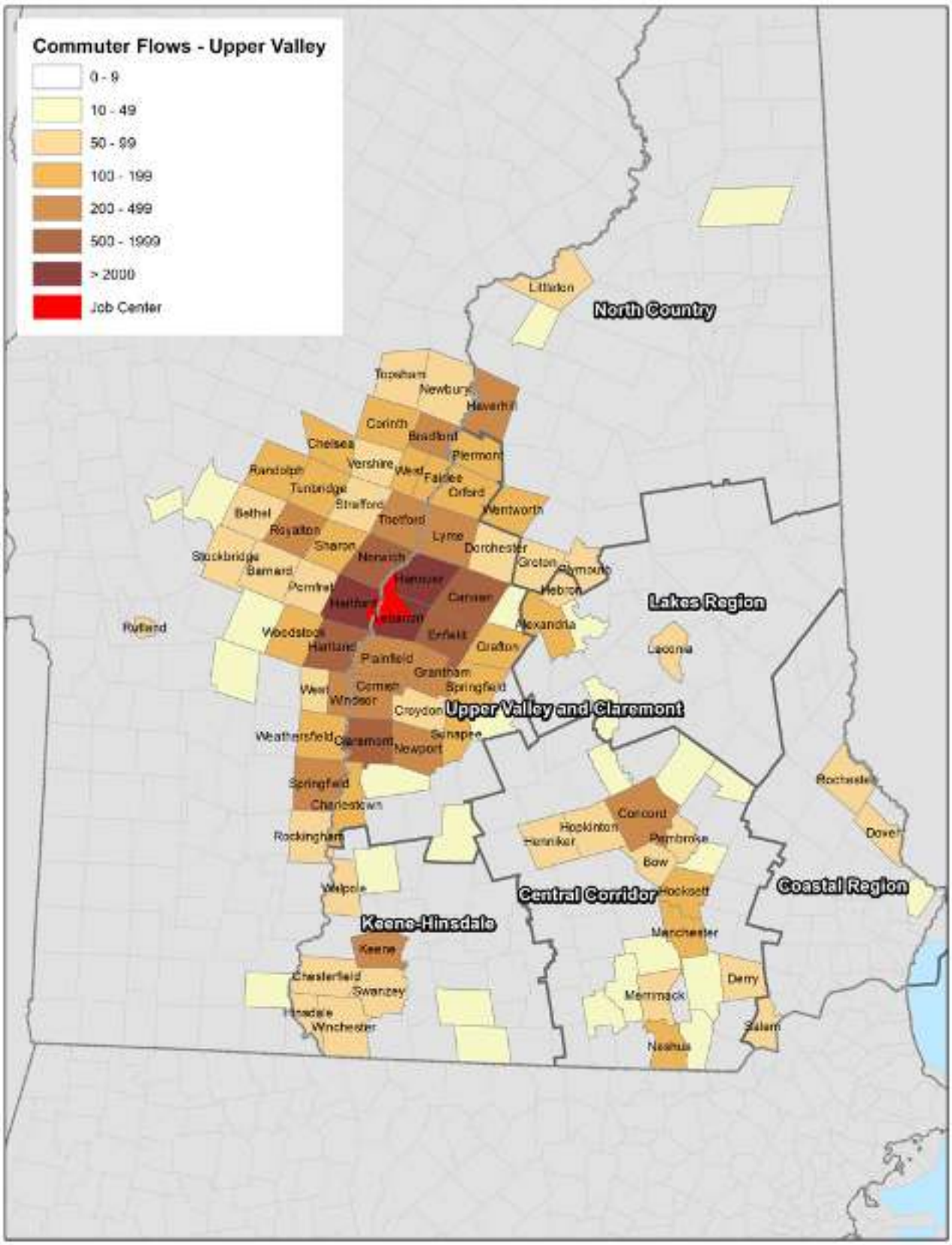
As discussed in the main report, the sixteen employment centers shown here are the largest in New Hampshire. The job centers and their 2015 employment totals are shown in the table below. Note that for the largest job centers and many of the smaller ones as well, the "employment zone" is a specific area within a city or town or an area spanning portions of adjacent towns, rather than a municipality as a whole.

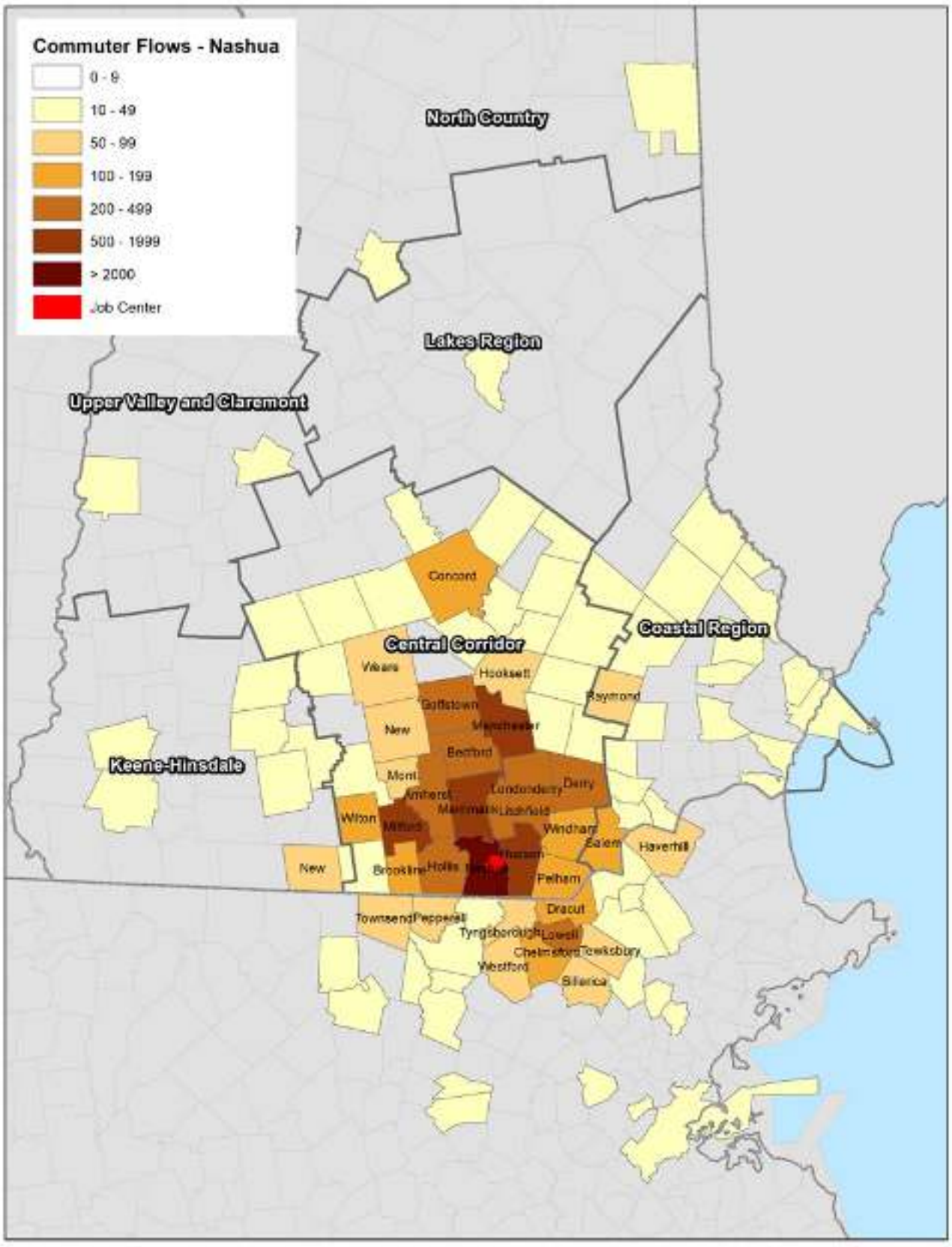
Employment Center	Jobs (2015)
Downtown Manchester	37,860
Downtown Concord	35,677
Upper Valley (Hanover-Lebabon-WRJ)	29,984
City of Keene	18,158
Downtown Nashua	17,201
Downtown Salem	16,920
Derry-Londonderry NH 102 Corridor	11,810
Town of Laconia	9,238
Town of Conway	7,282
Franklin-Tilton US 3 Corridor	6,224
Downtown Dover	6,222
Downtown Portsmouth/Shipyard	6,076
Town of Claremont	5,277
Downtown Durham	5,191
Town of Littleton	4,419
Town of Plymouth	4,099

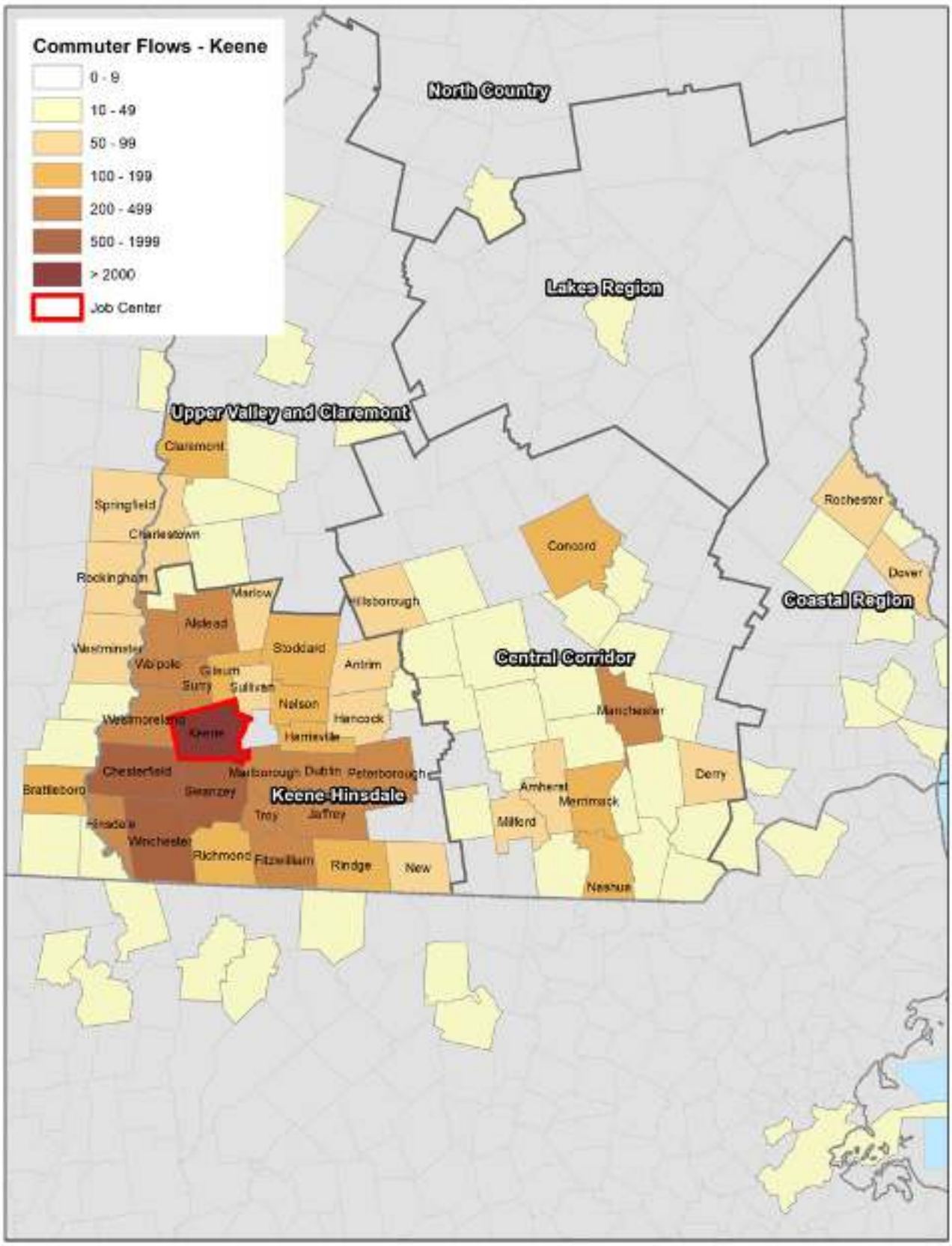
The employment zone is shown in red on each map. If the zone is a municipality as a whole, the town is outlined in red. All of the commuting maps show the top 100 towns sending commuters to the employment center. For the larger employment centers, there are a number of towns with more than 10 commuters that are not shown, in spite of the indication in the legend.

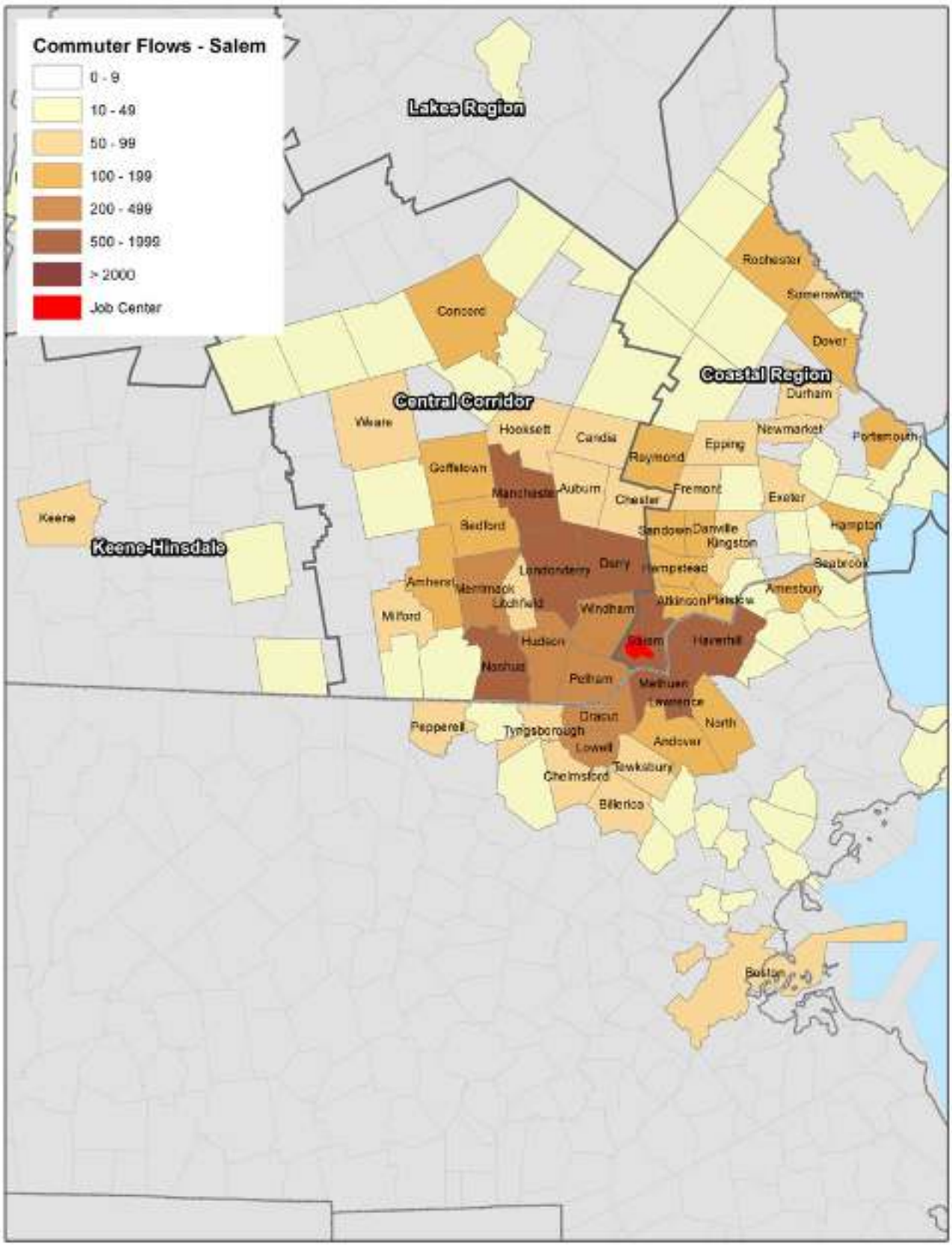

Commuter Flows - Manchester
0 - 9
10 - 49
50 - 99
100 - 199
200 - 499
500 - 1999
> 2000
Job Center
North Country
Lakes Region
Upper Valley and Claremont
Coastal Region
Central Corridor
Keene-Hinsdale
Conway
Laconia
Claremont
Franklin
Canterbury
Boscawen
Loudon
Pittsfield
Rochester
Somersworth
Warner
Chichester
Concord
Epsom
Northwood
Barrington
Dover
Hopkinton
Pembroke
Henniker
Hillsborough
Bow
Allenstown
Deerfield
Nottingham
Durham
Dunbarton
Weare
Hooksett
Candia
Raymond
Epping
Newmarket
Portsmouth
Goffstown
Auburn
Manchester
Exeter
Rye
New
Chester
Fremont
Keene
Bedford
Sandown
Danville
Kingston
Hampton
Peterborough
Mont
Amherst
Londonderry
Derry
Hampstead
Seabrook
Merrimack
Litchfield
Atkinson
Plaistow
Milford
Windham
Salem
Haverhill
Hudson
Brookline
Hollis
Nashua
Pelham
Methuen
Lawrence
Lowell
Andover
Boston

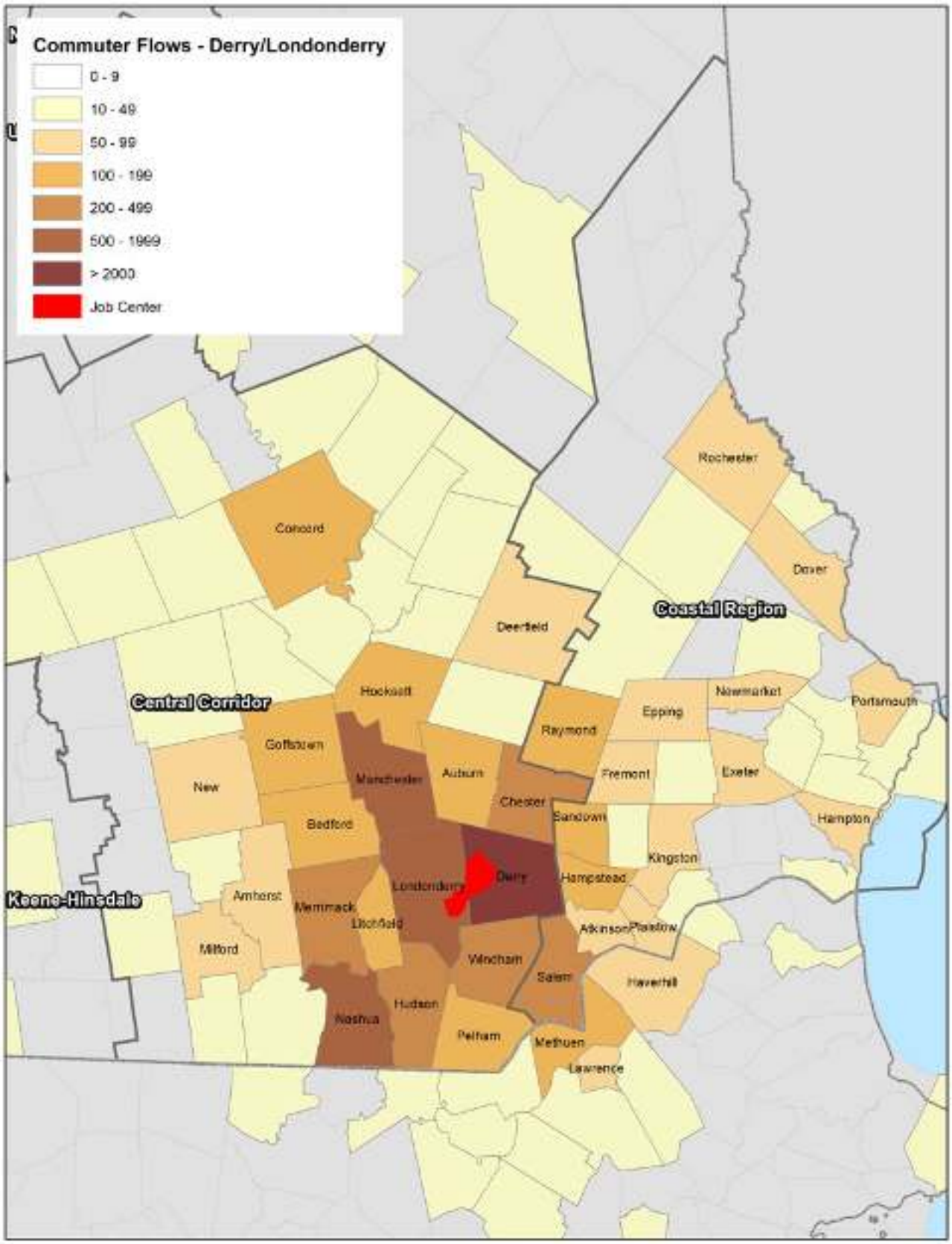

Commuter Flows - Concord
0 - 9
10 - 49
50 - 99
100 - 199
200 - 499
500 - 1999
> 2000
Job Center
North Country
Lakes Region
Upper Valley and Claremont
Coastal Region
Central Corridor
Keene-Hinsdale
Lancaster
Berlin
Gorham
Littleton
Conway
Plymouth
Hartford
Lebanon
Bristol
Meredith
Wolfeboro
Gilford
Sanbornton
Alton
New
Andover
Franklin
Tilton
Belmont
Northfield
Gilmanton
Claremont
Newport
Sunapee
Salisbury
Sutton
Newbury
Canterbury
Barnstead
Farmington
Boscawen
Webster
Loudon
Pittsfield
Strafford
Rochester
Warner
Chichester
Somersworth
South
Bradford
Epsom
Northwood
Barrington
Dover
Hopkinton
Concord
Henniker
Hillsborough
Allenstown
Deerfield
Nottingham
Durham
Dunbarton
Bow
Hooksett
Candia
Newmarket
Portsmouth
Antrim
Deering
Weare
Raymond
Goffstown
Auburn
Fremont
Exeter
Strafham
New
Manchester
Chester
Sandown
Hampton
Keene
Bedford
Peterborough
Amherst
Londonderry
Derry
Hampstead
Swanzey
Litchfield
Milford
Windham
Salem
Winchester
Hudson
Hollis
Nashua
Pelham
Lowell

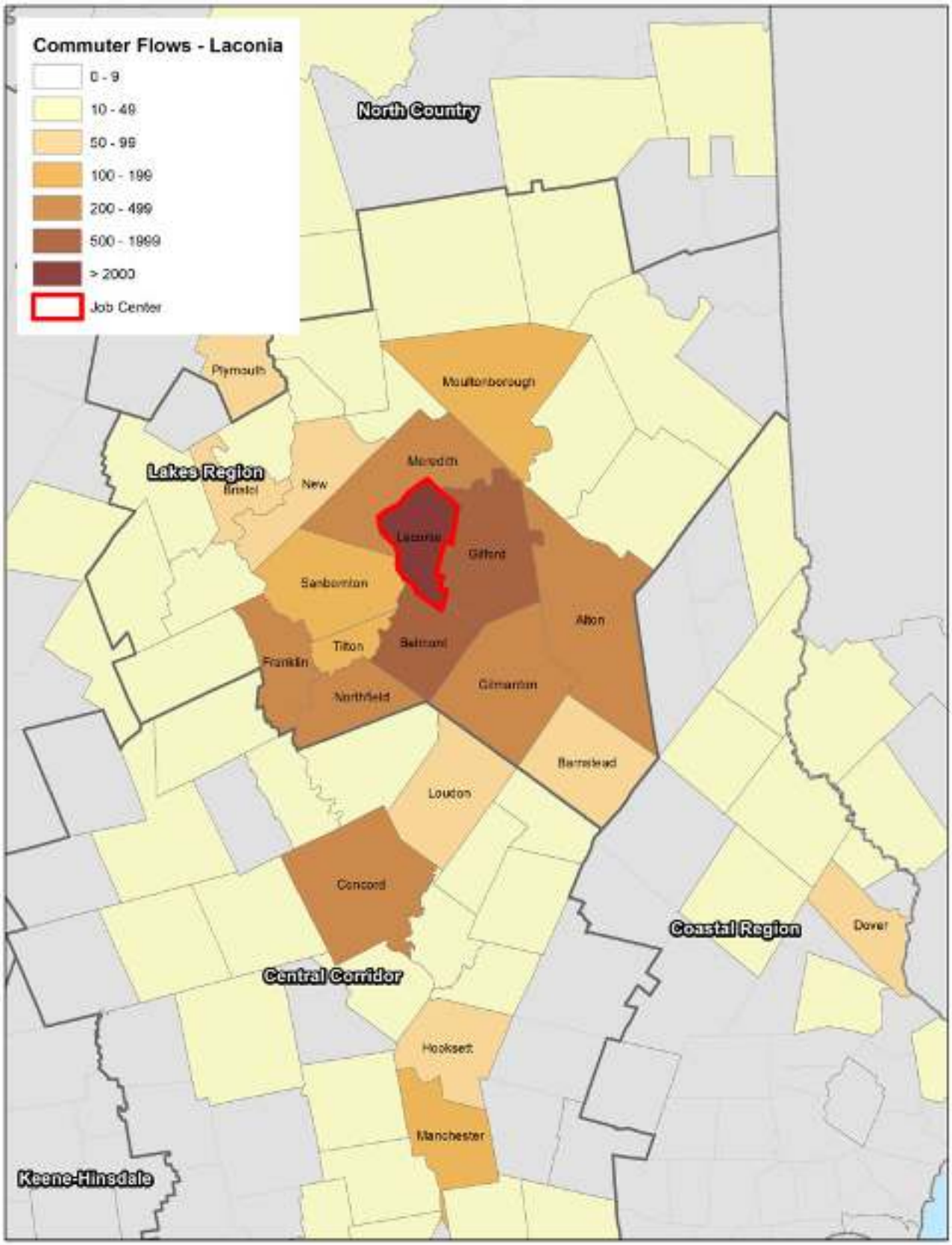

Commuter Flows - Upper Valley
0 - 9
10 - 49
50 - 99
100 - 199
200 - 499
500 - 1999
> 2000
Job Center
North Country
Lakes Region
Upper Valley and Claremont
Central Corridor
Coastal Region
Keene-Hinsdale
Littleton
Topsham
Newbury
Haverhill
Corinth
Bradford
Chelsea
Vershire
Piermont
Randolph
Tunbridge
Orfield
Strafford
Wentworth
Bethel
Thetford
Royalton
Lyme
Sharon
Dorchester
Stockbridge
Norwich
Hanover
Barnard
Pomfret
Cornish
Hebron
Rutland
Woodstock
Hartland
Enfield
Alexandria
Laconia
Plainfield
Grantham
Springfield
Windsor
Croydon
Weathersfield
Claremont
Newport
Rochester
Concord
Hopkinton
Pembroke
Dover
Bow
Hooksett
Manchester
Rockingham
Charlestown
Keene
Chesterfield
Swanzey
Winchester
Derry
Merrimack
Salem
Nashua

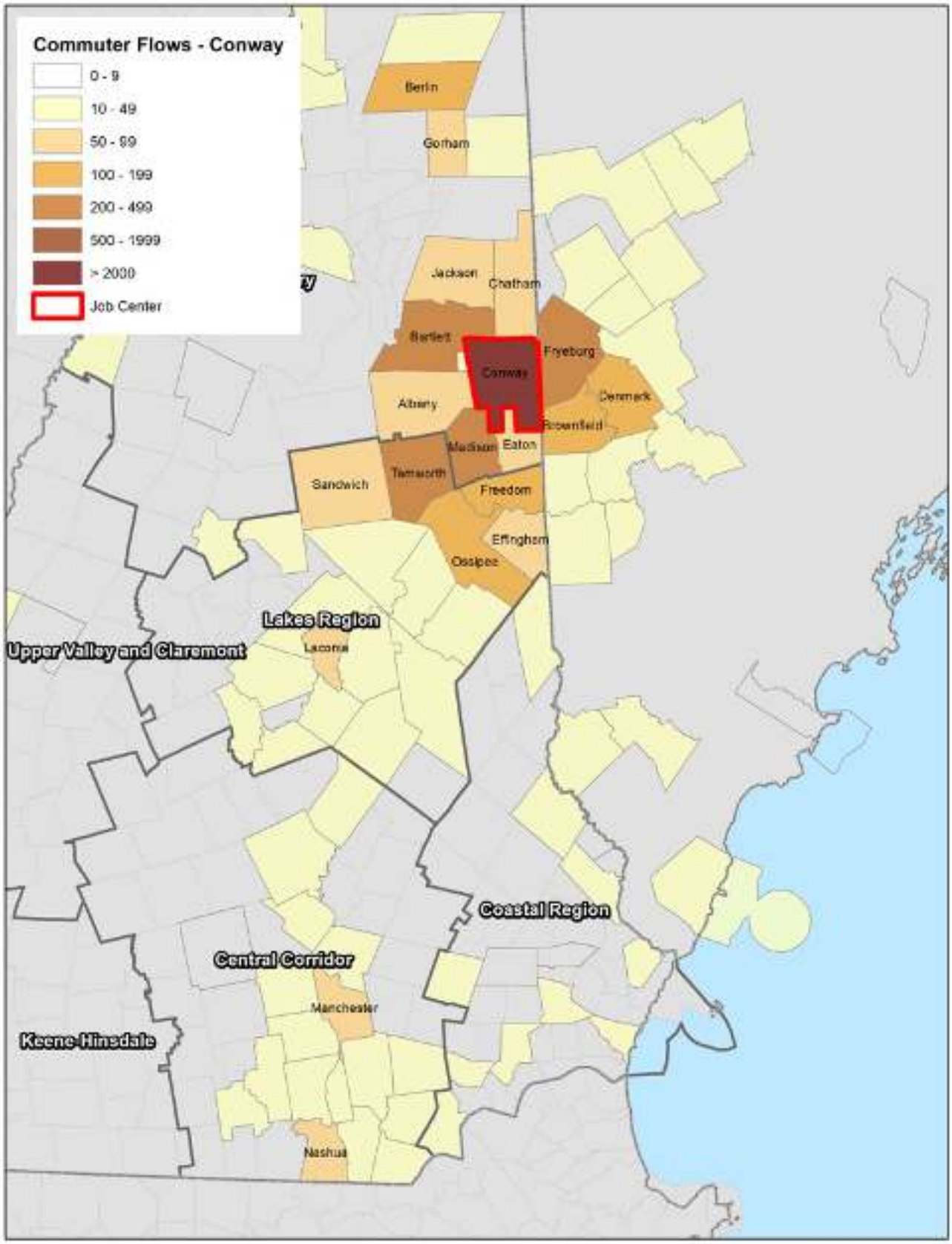

Commuter Flows - Nashua
0 - 9
10 - 49
50 - 99
100 - 199
200 - 499
500 - 1999
> 2000
Job Center
North Country
Lakes Region
Upper Valley and Claremont
Keene-Hinsdale
Central Corridor
Coastal Region
Concord
Hooksett
Raymond
Goffstown
Manchester
Bedford
Londonderry
Derry
Windham
Salem
Haverhill
Pelham
Dracut
Tyngsborough
Lowell
Tewksbury
Billerica
Westford
Hollis
Brookline
Wilton
Amherst
Litchfield

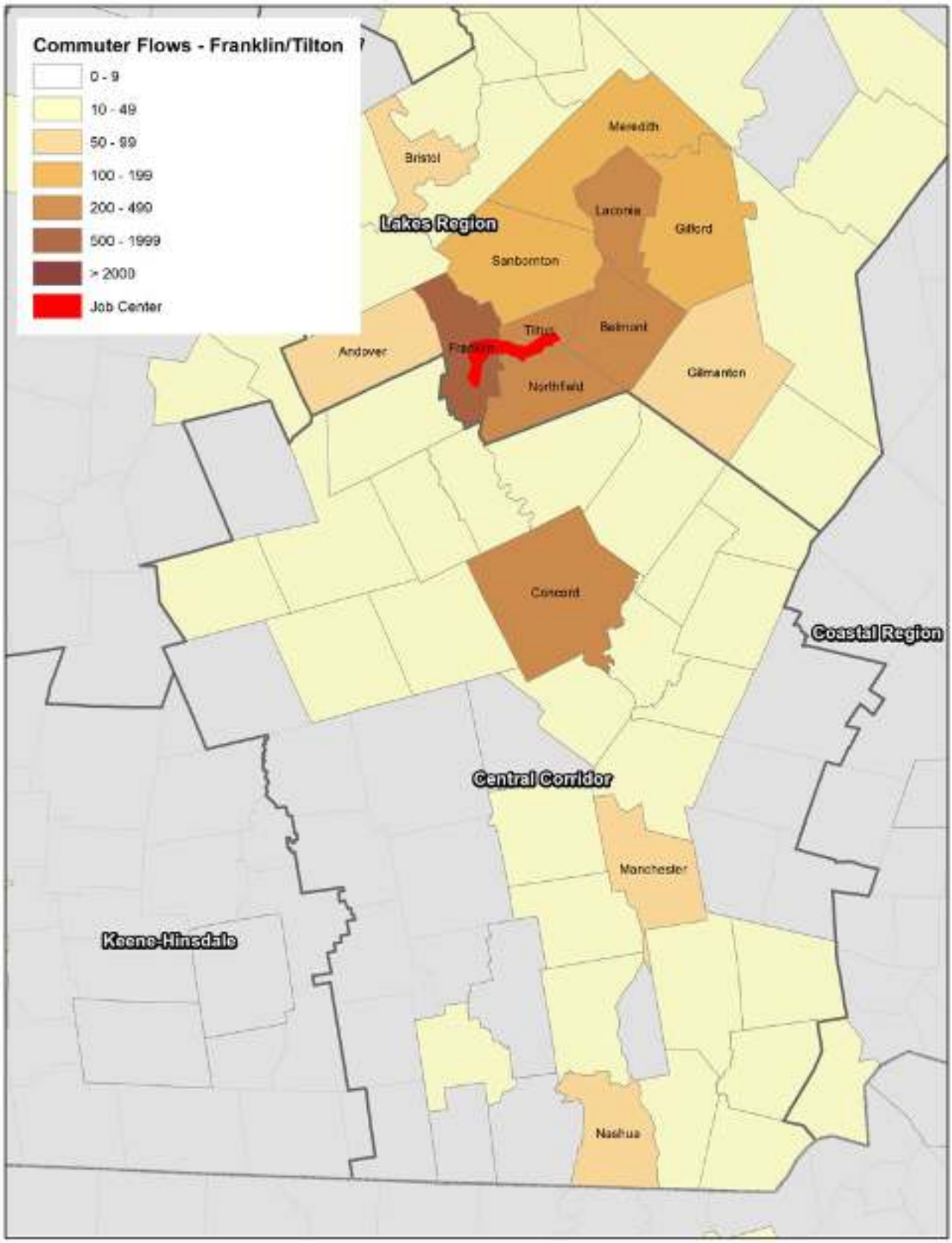

Commuter Flows - Keene
0 - 9
10 - 49
50 - 99
100 - 199
200 - 499
500 - 1999
> 2000
Job Center
North Country
Lakes Region
Upper Valley and Claremont
Central Corridor
Coastal Region
Keene-Hinsdale
Claremont
Springfield
Charlestown
Rockingham
Marlow
Alstead
Westminster
Stoddard
Walpole
Gilsum
Surry
Sullivan
Nelson
Antrim
Hancock
Westmoreland
Keene
Harrisville
Chesterfield
Marlborough
Dublin
Peterborough
Brattleboro
Swanzey
Troy
Jaffrey
Winchester
Richmond
Fitzwilliam
Ridge
New
Concord
Hillsborough
Manchester
Amherst
Merrimack
Milford
Nashua
Derry
Rochester
Dover

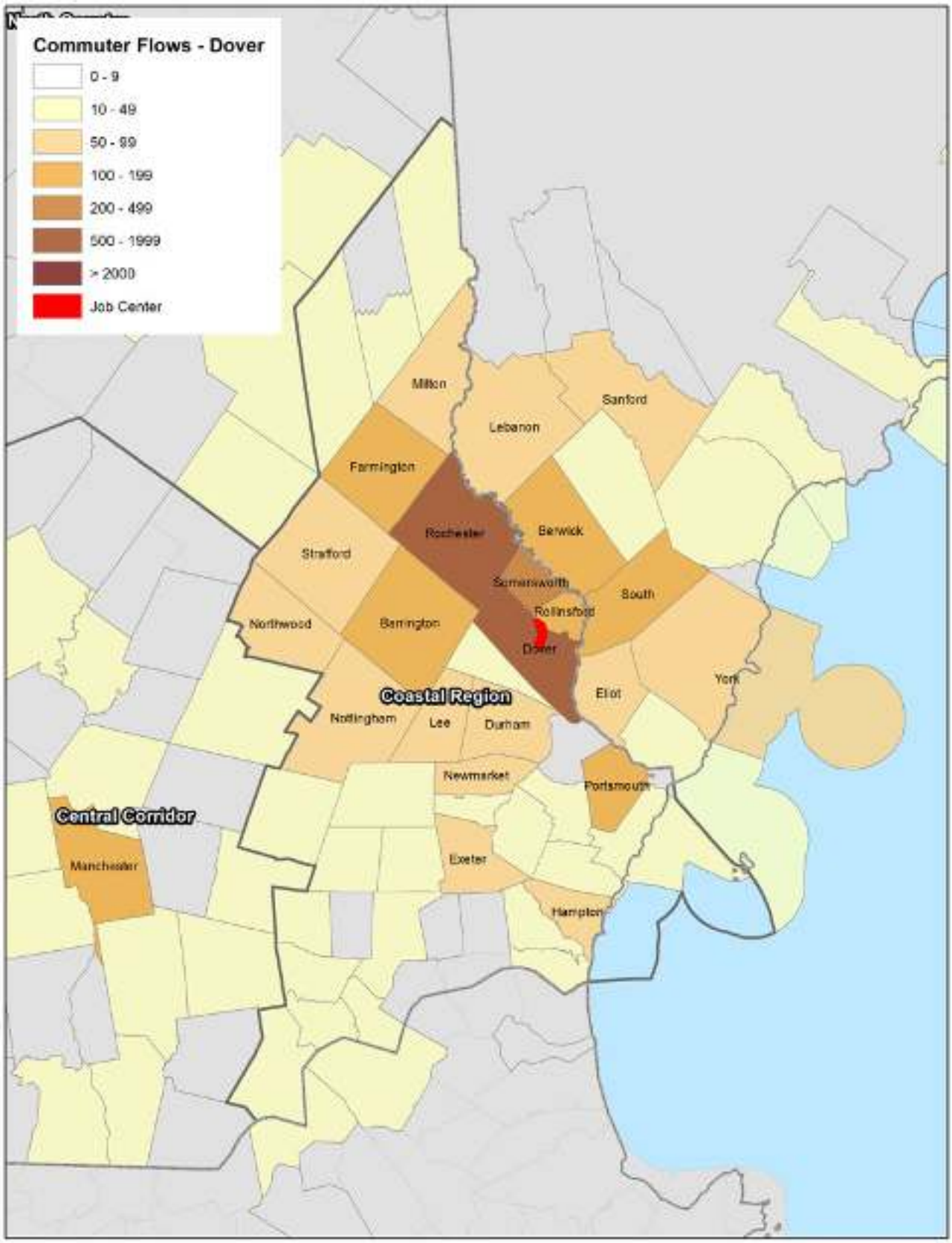

Commuter Flows - Salem
0 - 9
10 - 49
50 - 99
100 - 199
200 - 499
500 - 1999
> 2000
Job Center
Lakes Region
Central Corridor
Coastal Region
Keene-Hinsdale
Concord
Rochester
Somersworth
Dover
Durham
Newmarket
Portsmouth
Epping
Raymond
Hooksett
Candia
Weare
Goffstown
Manchester
Auburn
Chester
Fremont
Exeter
Hampton
Seabrook
Amesbury
Kingston
Danville
Sandown
Bedford
Londonderry
Derry
Hampstead
Amherst
Merrimack
Litchfield
Windham
Atkinson
Plaistow
Milford
Hudson
Salem
Haverhill
Nashua
Pelham
Methuen
Lawrence
Pepperell
Tyngsborough
Dracut
Lowell
North Andover
Tewksbury
Chelmsford
Billerica
Keene
Boston

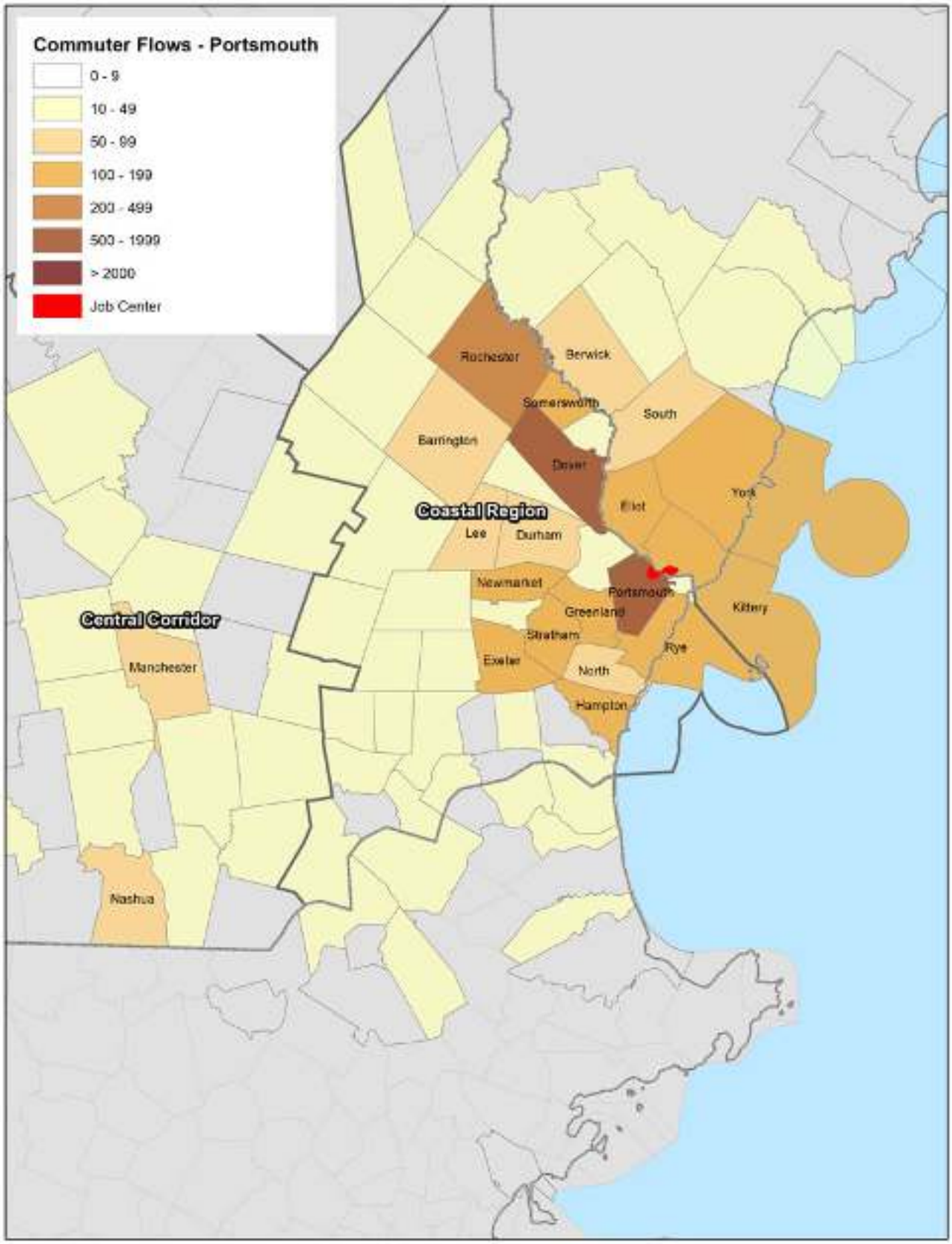

Commuter Flows - Derry/Londonderry
0 - 9
10 - 49
50 - 99
100 - 199
200 - 499
500 - 1999
> 2000
Job Center
Central Corridor
Coastal Region
Keene-Hinsdale
Concord
Rochester
Dover
Deerfield
Hooksett
Goffstown
New
Manchester
Auburn
Raymond
Epping
Newmarket
Portsmouth
Fremont
Exeter
Chester
Sandown
Bedford
Hampton
Kingston
Londonderry
Derry
Hampstead
Amherst
Merrimack
Litchfield
Atkinson
Plaistow
Milford
Windham
Salem
Haverhill
Hudson
Nashua
Pelham
Methuen
Lawrence

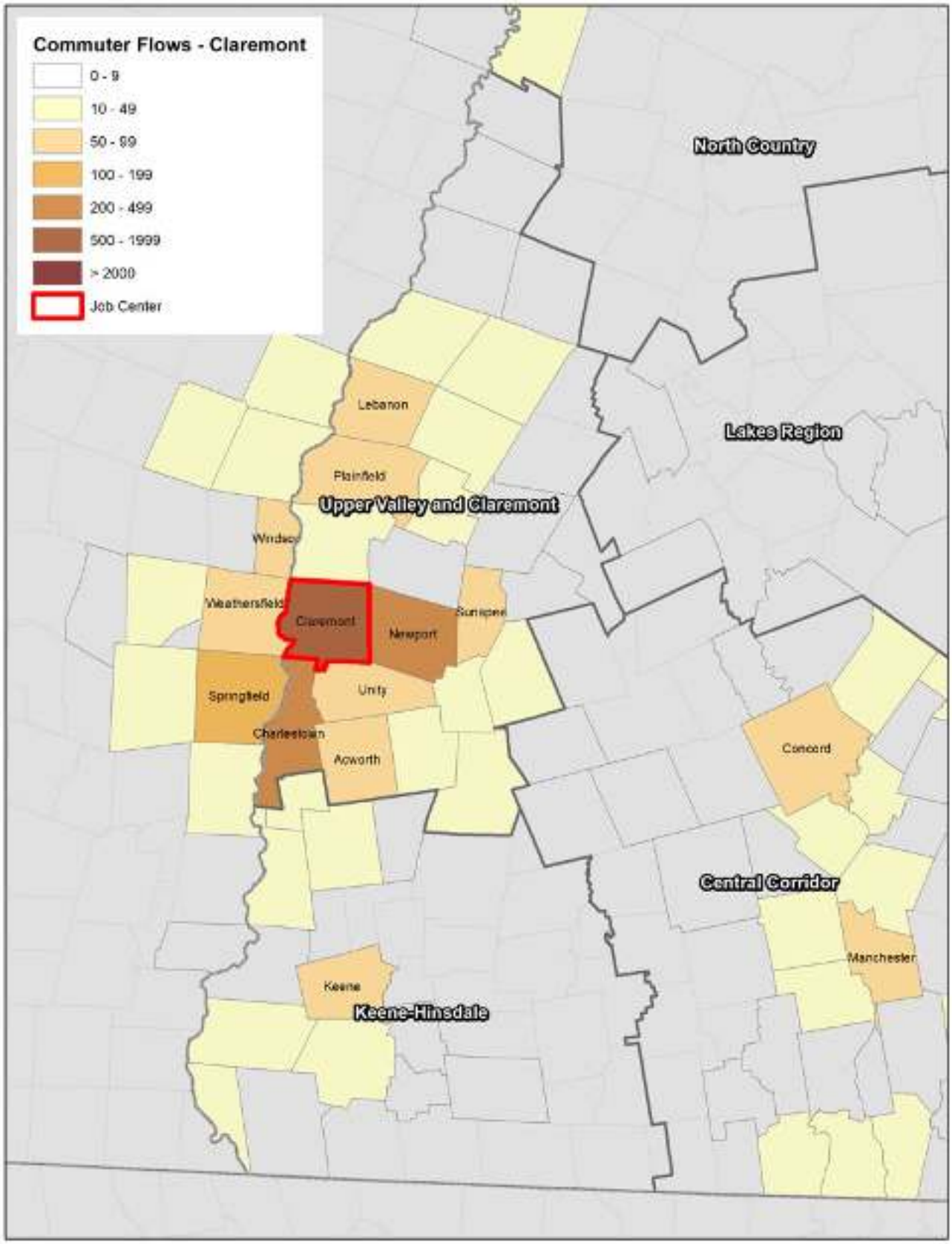

Commuter Flows - Laconia
0 - 9
10 - 49
50 - 99
100 - 199
200 - 499
500 - 1999
> 2000
Job Center
North Country
Plymouth
Moultonborough
Meredith
Lakes Region
Bristol
New
Laconia
Gilford
Sanbornton
Alton
Tilton
Belmont
Franklin
Northfield
Gilmanton
Barnstead
Loudon
Concord
Coastal Region
Dover
Central Corridor
Hooksett
Manchester
Keene-Hinsdale

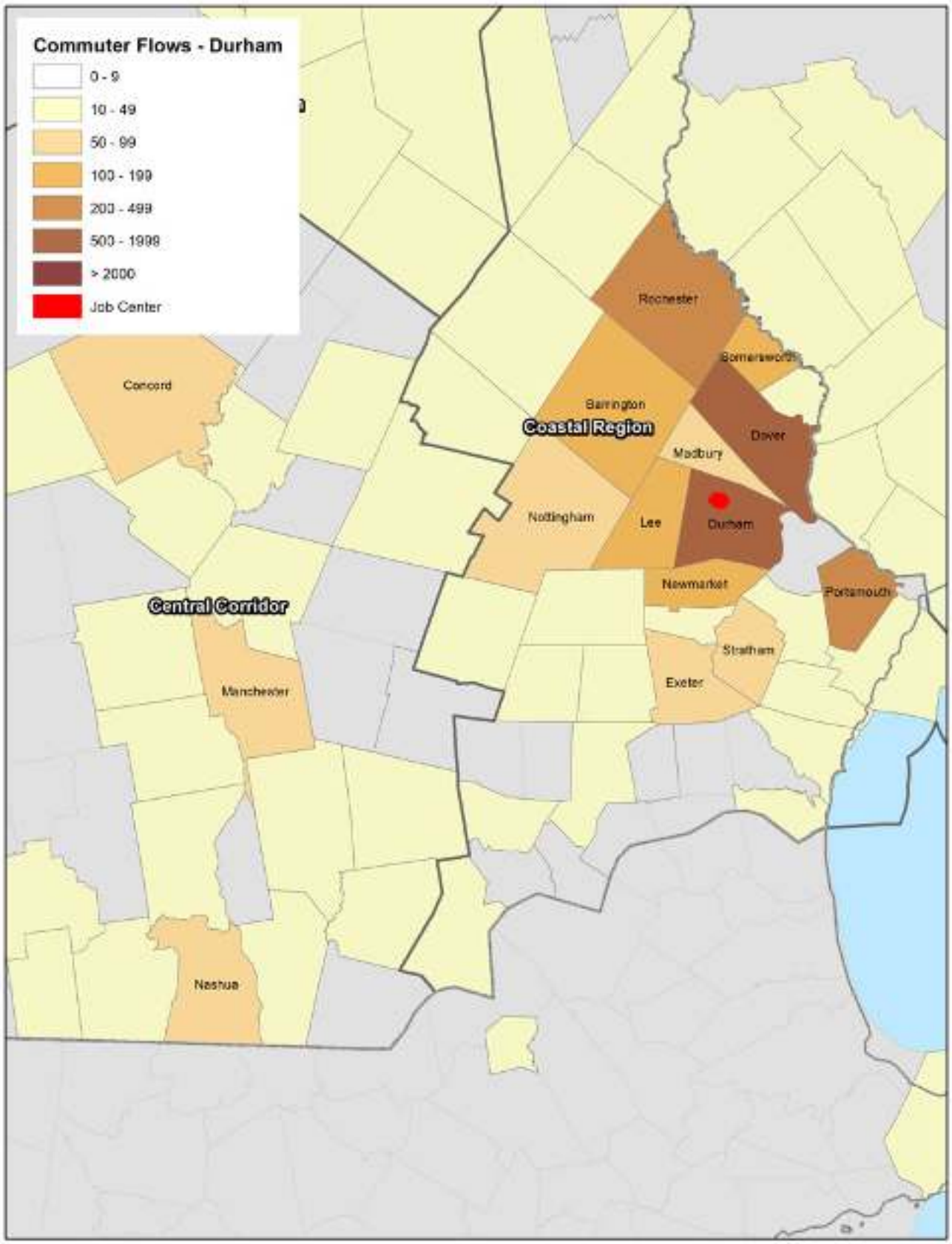

Commuter Flows - Conway
0 - 9
10 - 49
50 - 99
100 - 199
200 - 499
500 - 1999
> 2000
Job Center
Berlin
Gorham
Jackson
Chatham
Bartlett
Fryeburg
Conway
Albany
Denmark
Brownfield
Madison
Eaton
Tamworth
Sandwich
Freedom
Effingham
Ossipee
Lakes Region
Lacona
Upper Valley and Claremont
Coastal Region
Central Corridor
Manchester
Keene-Hinsdale
Nashua

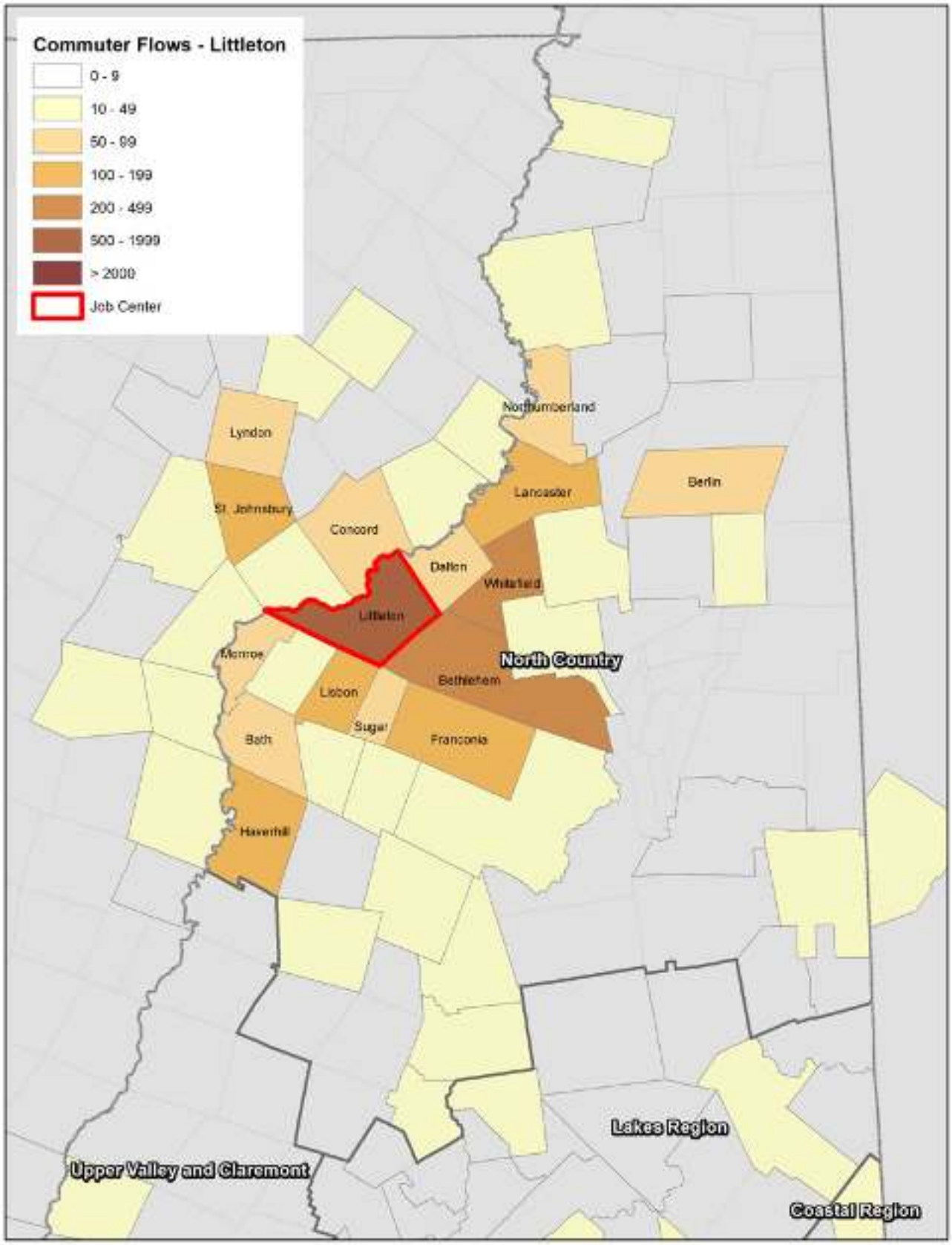

Commuter Flows - Franklin/Tilton
0 - 9
10 - 49
50 - 99
100 - 199
200 - 499
500 - 1999
> 2000
Job Center
Meredith
Bristol
Laconia
Gilford
Lakes Region
Sanbornton
Belmont
Tilton
Andover
Franklin
Northfield
Gilmanton
Concord
Coastal Region
Central Corridor
Manchester
Keene-Hinsdale
Nashua

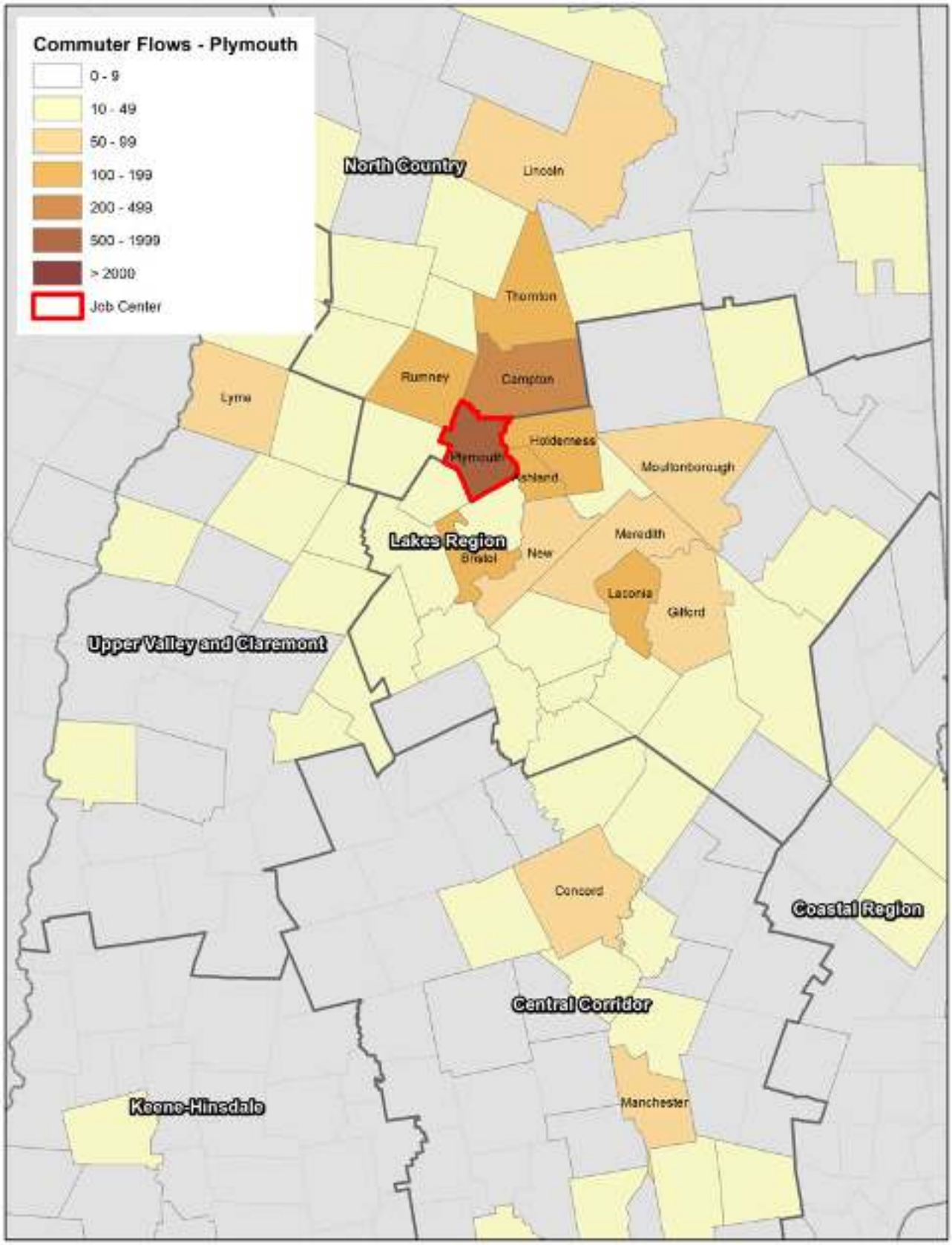

Commuter Flows - Dover
0 - 9
10 - 49
50 - 99
100 - 199
200 - 499
500 - 1999
> 2000
Job Center
Milton
Sanford
Lebanon
Farmington
Rochester
Berwick
Strafford
Somersworth
South
Rollinsford
Northwood
Barrington
Dover
York
Coastal Region
Eliot
Nottingham
Lee
Durham
Newmarket
Portsmouth
Central Corridor
Manchester
Exeter
Hampton


Commuter Flows - Portsmouth
0 - 9
10 - 49
50 - 99
100 - 199
200 - 499
500 - 1999
> 2000
Job Center
Rochester
Berwick
Somersworth
South
Barrington
Dover
York
Eliot
Coastal Region
Lee
Durham
Newmarket
Portsmouth
Greenland
Kittery
Central Corridor
Stratham
Rye
Exeter
North
Manchester
Hampton
Nashua


Commuter Flows - Claremont
0 - 9
10 - 49
50 - 99
100 - 199
200 - 499
500 - 1999
> 2000
Job Center
North Country
Lakes Region
Upper Valley and Claremont
Central Corridor
Keene-Hinsdale
Lebanon
Plainfield
Windsor
Weathersfield
Claremont
Newport
Springfield
Unity
Charlestown
Acworth
Concord
Manchester
Keene


Commuter Flows - Durham
0 - 9
10 - 49
50 - 99
100 - 199
200 - 499
500 - 1999
> 2000
Job Center
Rochester
Somersworth
Barrington
Coastal Region
Dover
Madbury
Nottingham
Lee
Durham
Newmarket
Portsmouth
Central Corridor
Strafham
Exeter
Manchester
Nashua
Concord


Commuter Flows - Littleton
0 - 9
10 - 49
50 - 99
100 - 199
200 - 499
500 - 1999
> 2000
Job Center
Lyndon
St. Johnsbury
Concord
Northumberland
Lancaster
Berlin
Dalton
Whitefield
Littleton
Monroe
North Country
Bethlehem
Lisbon
Sugar
Bath
Franconia
Haverhill
Lakes Region
Upper Valley and Claremont
Coastal Region


Commuter Flows - Plymouth
0 - 9
10 - 49
50 - 99
100 - 199
200 - 499
500 - 1999
> 2000
Job Center
North Country
Lincoln
Thornton
Rumney
Campton
Lyme
Holderness
Plymouth
Ashland
Moultonborough
Lakes Region
Bristol
New
Meredith
Laconia
Gilford
Upper Valley and Claremont
Concord
Coastal Region
Central Corridor
Manchester
Keene-Hinsdale

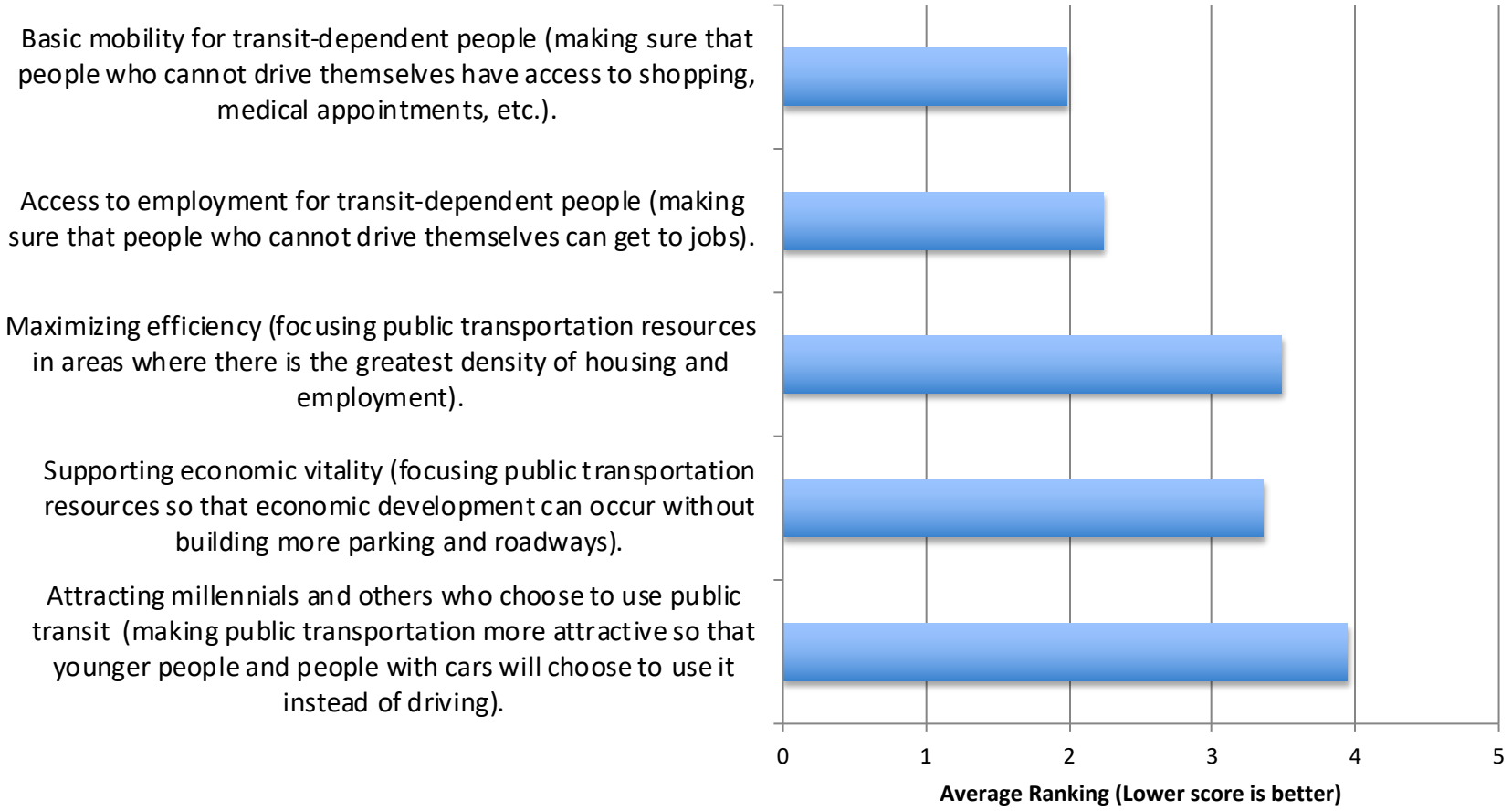
APPENDIX G: SURVEY RESULTS

The following pages present the results of the public survey taken in Summer of 2019. The results are in a presentation format with the question and possible responses shown with the frequency of responses for each option.

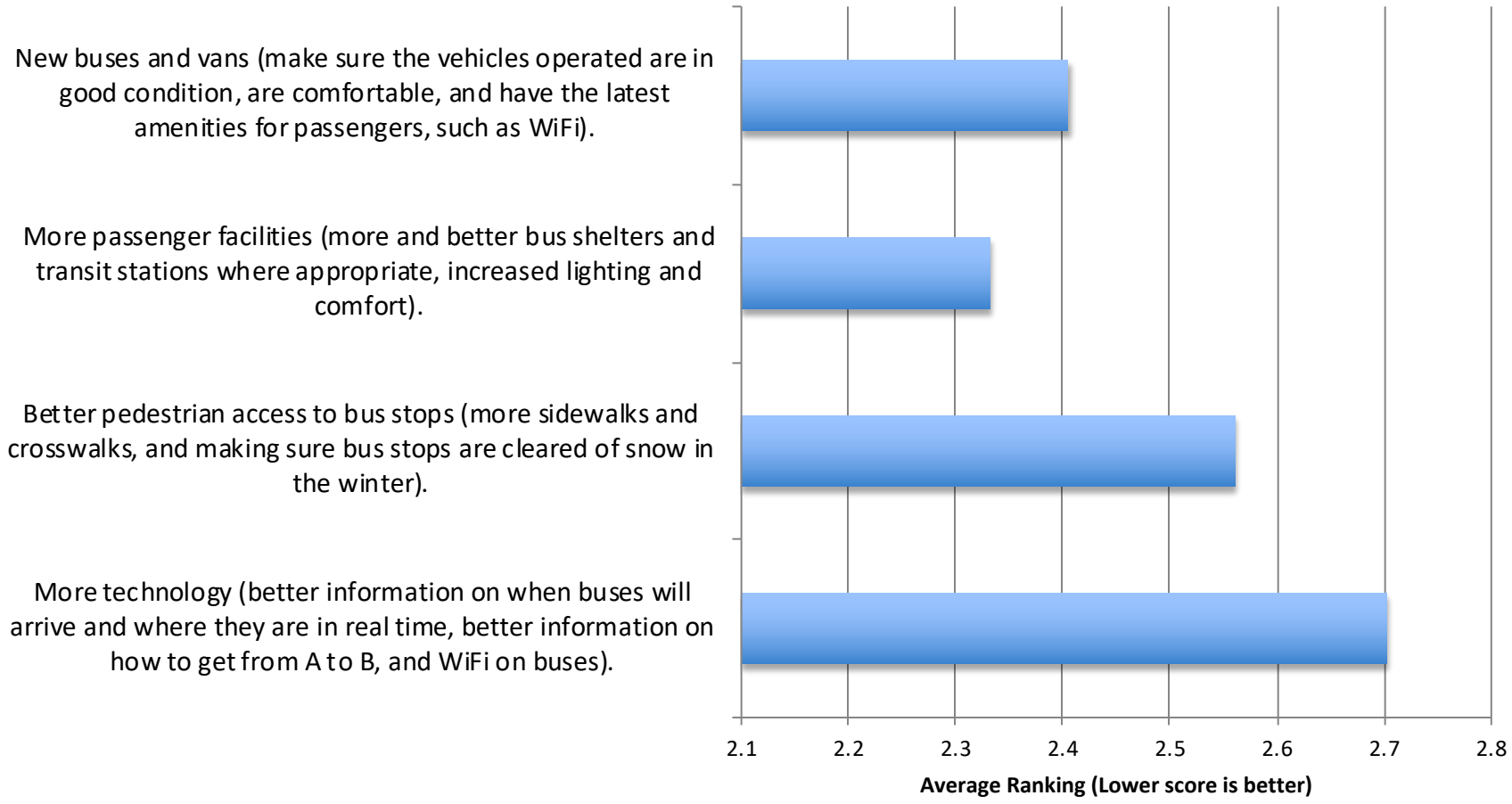
Survey Response Overview

- Survey conducted in June and July 2019
- 988 total responses
- 202 New Hampshire communities represented
- Hundreds of comments received in open-ended questions

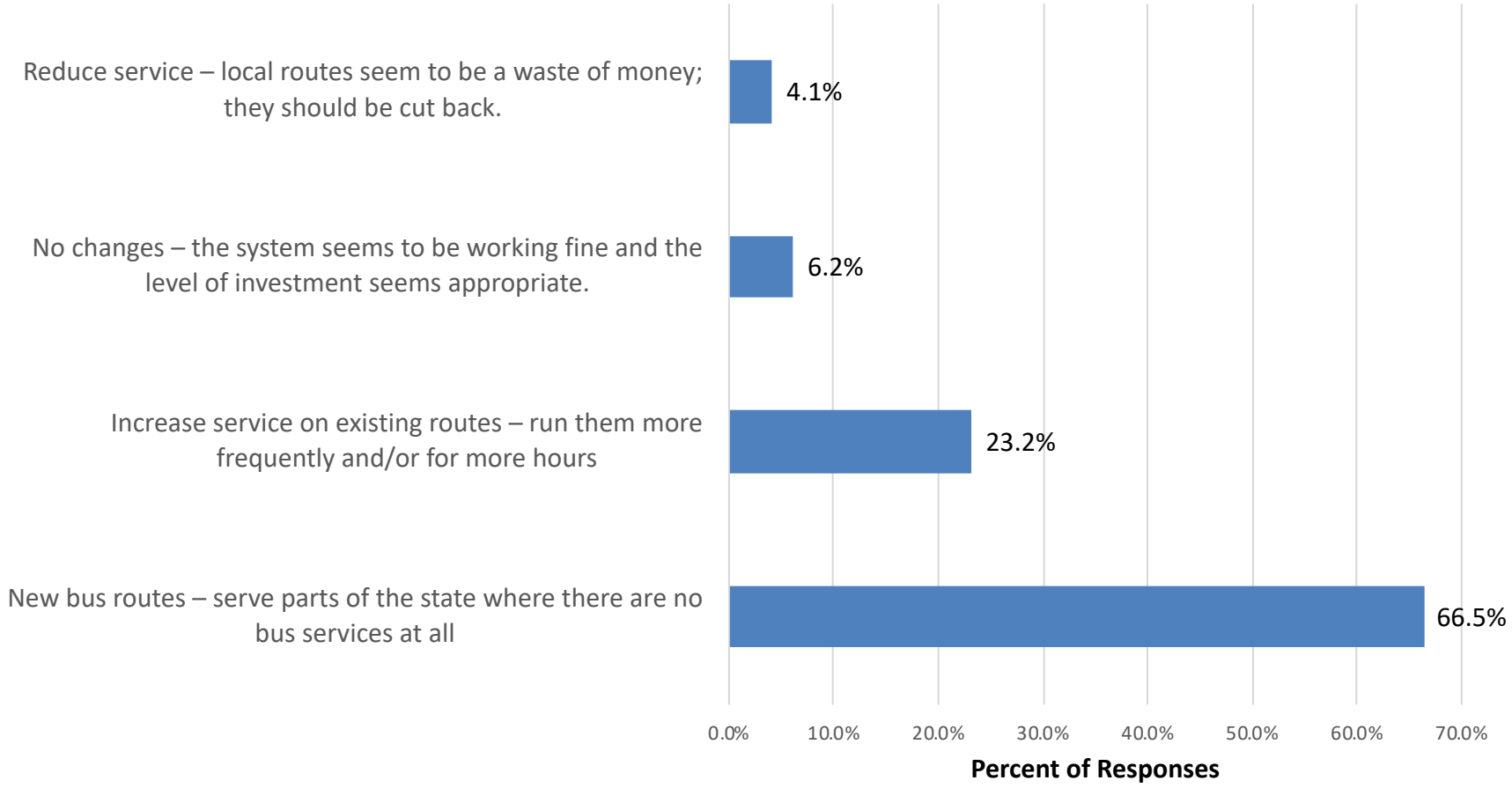
Q1 Public transportation in NH can help different groups of people in different ways. What are the most important roles for public transportation to play? Please rank the following from 1 to 5, with 1 being the most important, 5 being the least important



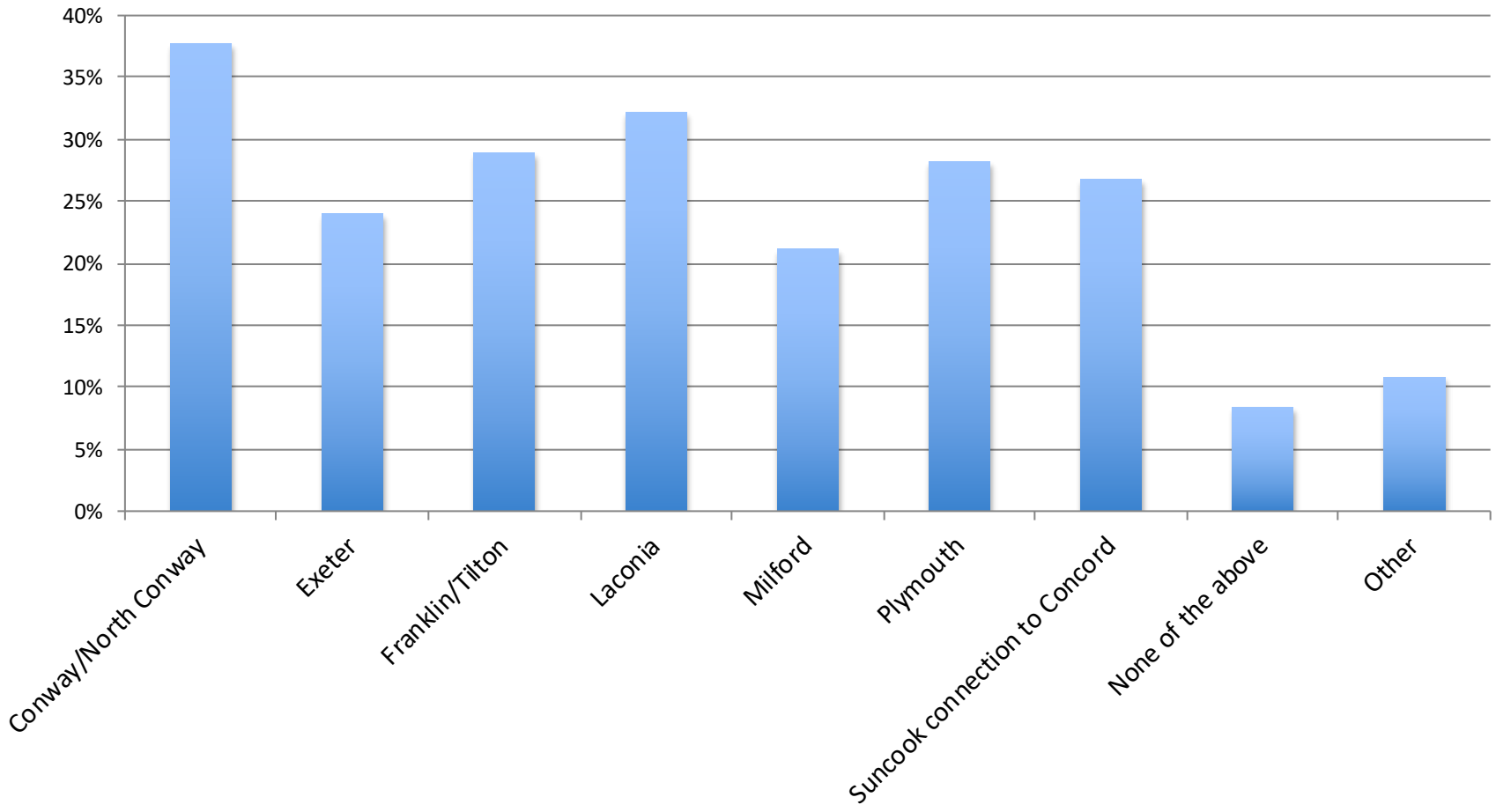
Q2 Capital funds can be invested in various ways. What are the most important investments that NH can make so that the public transportation system will be more attractive and easier to use? Please rank the following from 1 to 4, with 1 being the most important, 4 being least important.



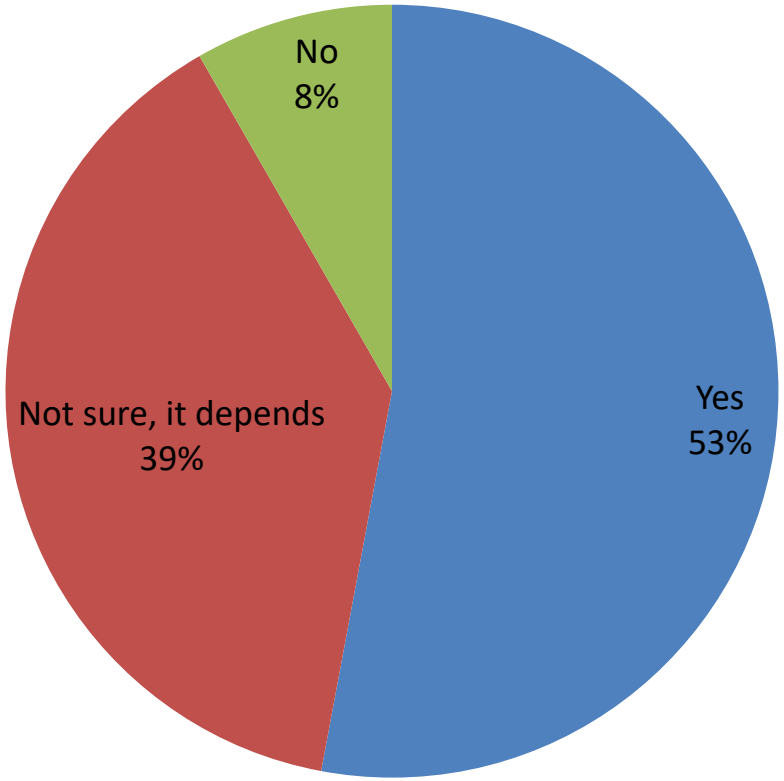
Q3 What types of changes would you like to see to local bus services, either in your area or on a statewide basis?



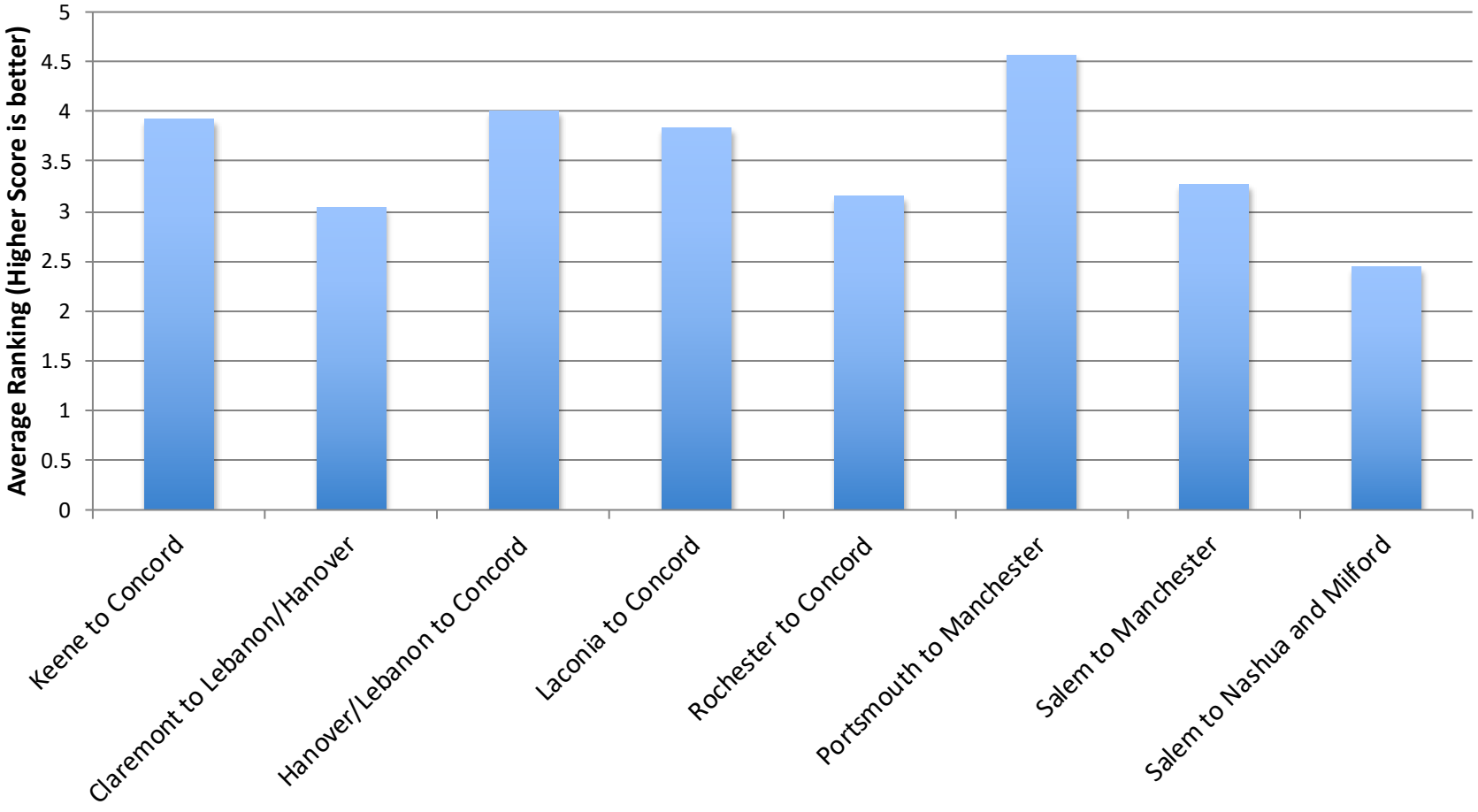
Q4 Which of these areas that currently have no bus service should be considered for new local bus service?



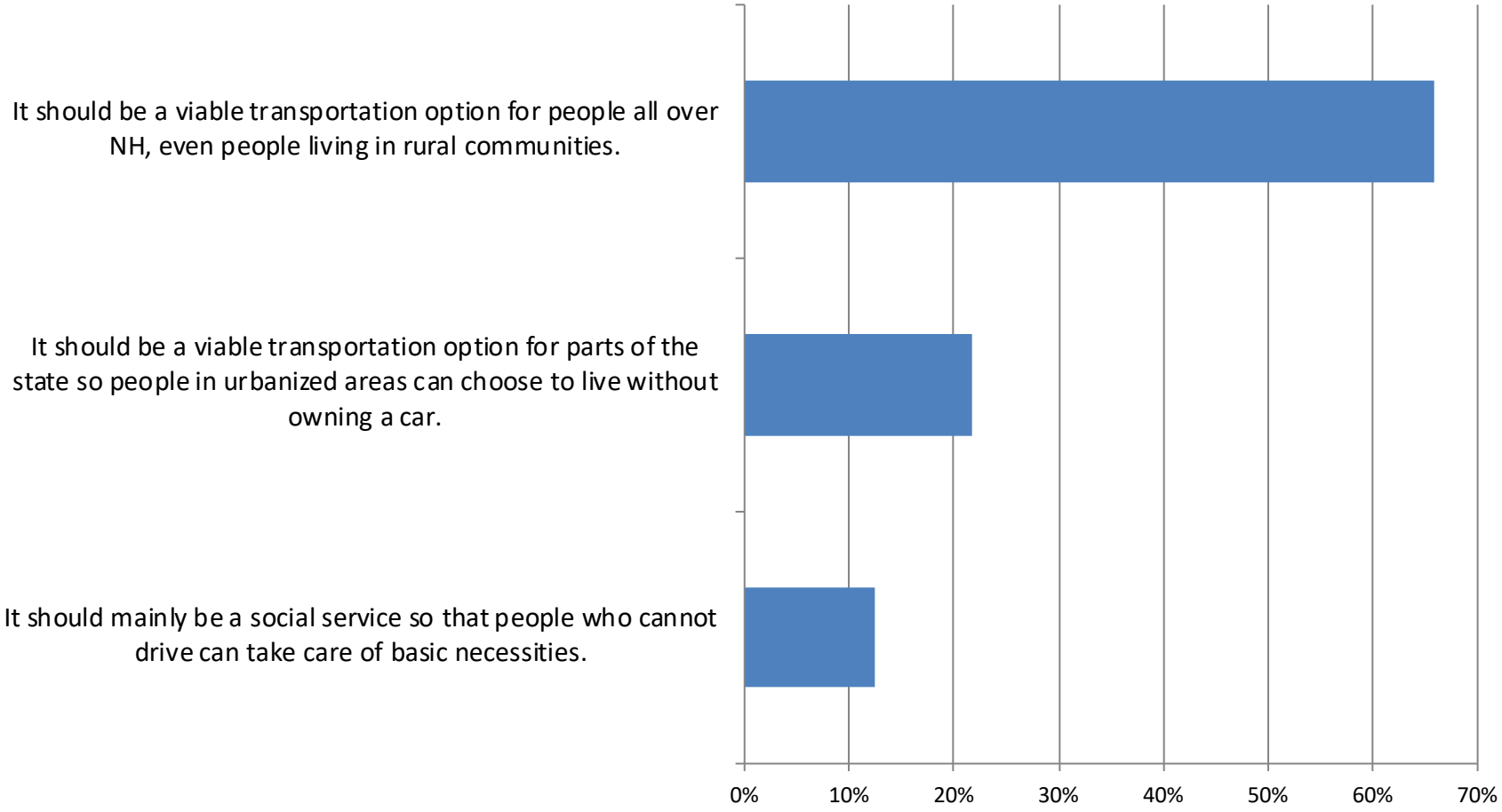
Q6 Do you think NH needs a network of commuter or regional routes to help people make longer commuting trips within the state?



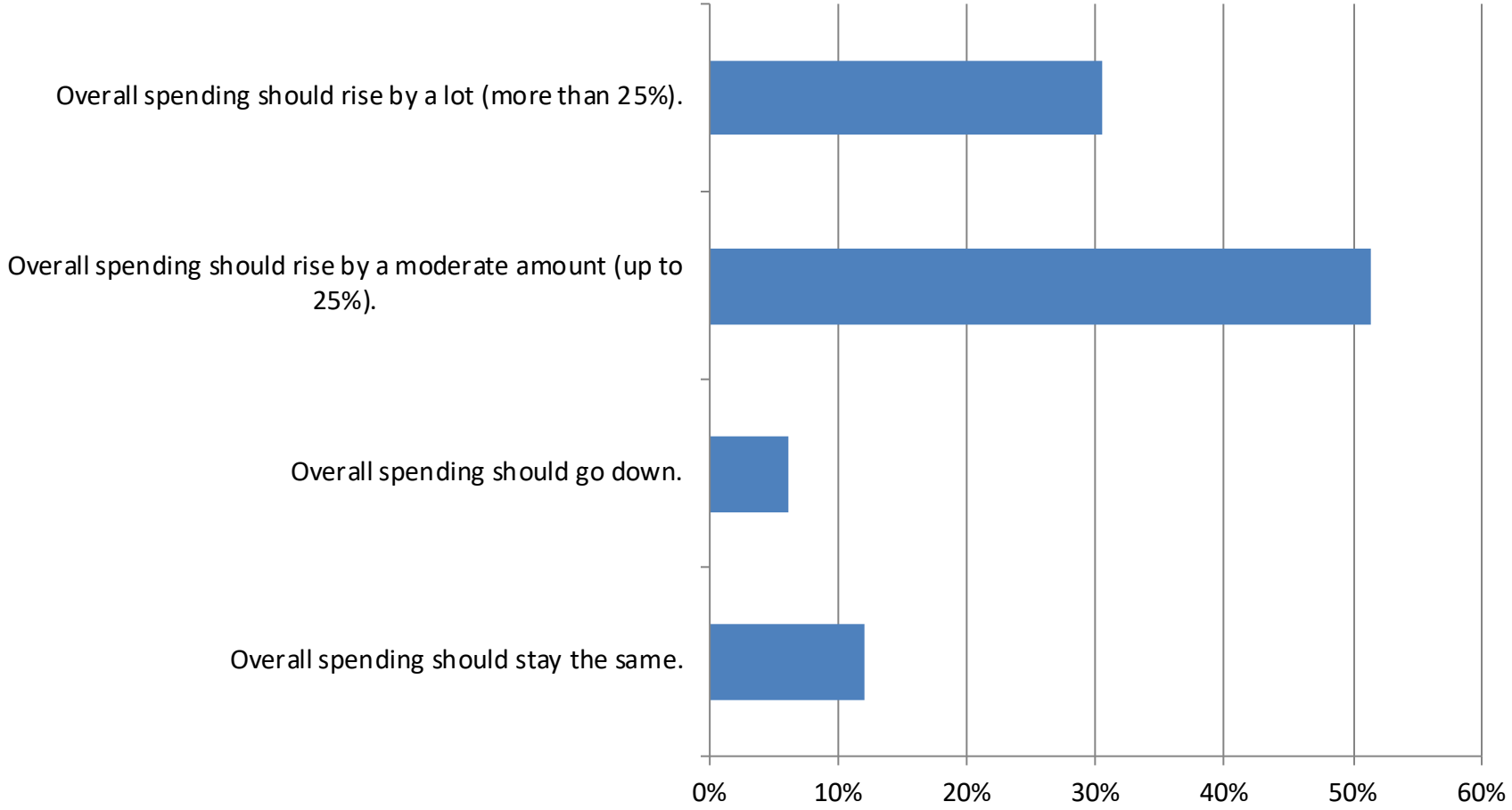
Q7 Which of the following possible commuter/regional routes should be considered for implementation? These routes would run in both directions and likely only during rush hour. Rank from 8 to 1, with 8 being the top choice.



Q9 What do you think is the proper role for public transportation in NH?



Q10 What should happen to government spending on public transportation in NH?

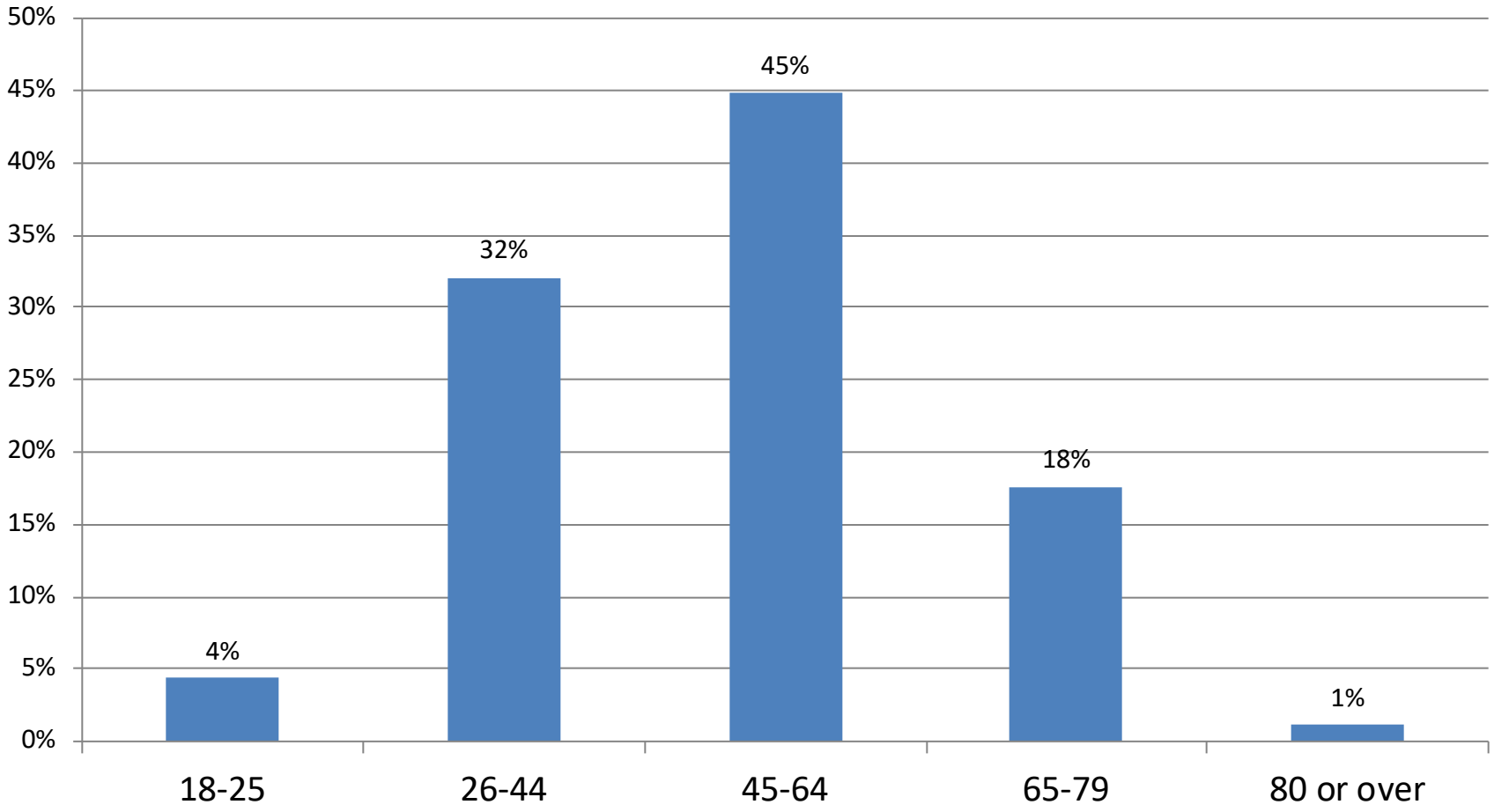


Q12 Survey Responses by Municipality and Regional Planning Council Region (Top 15 Municipalities Shown)

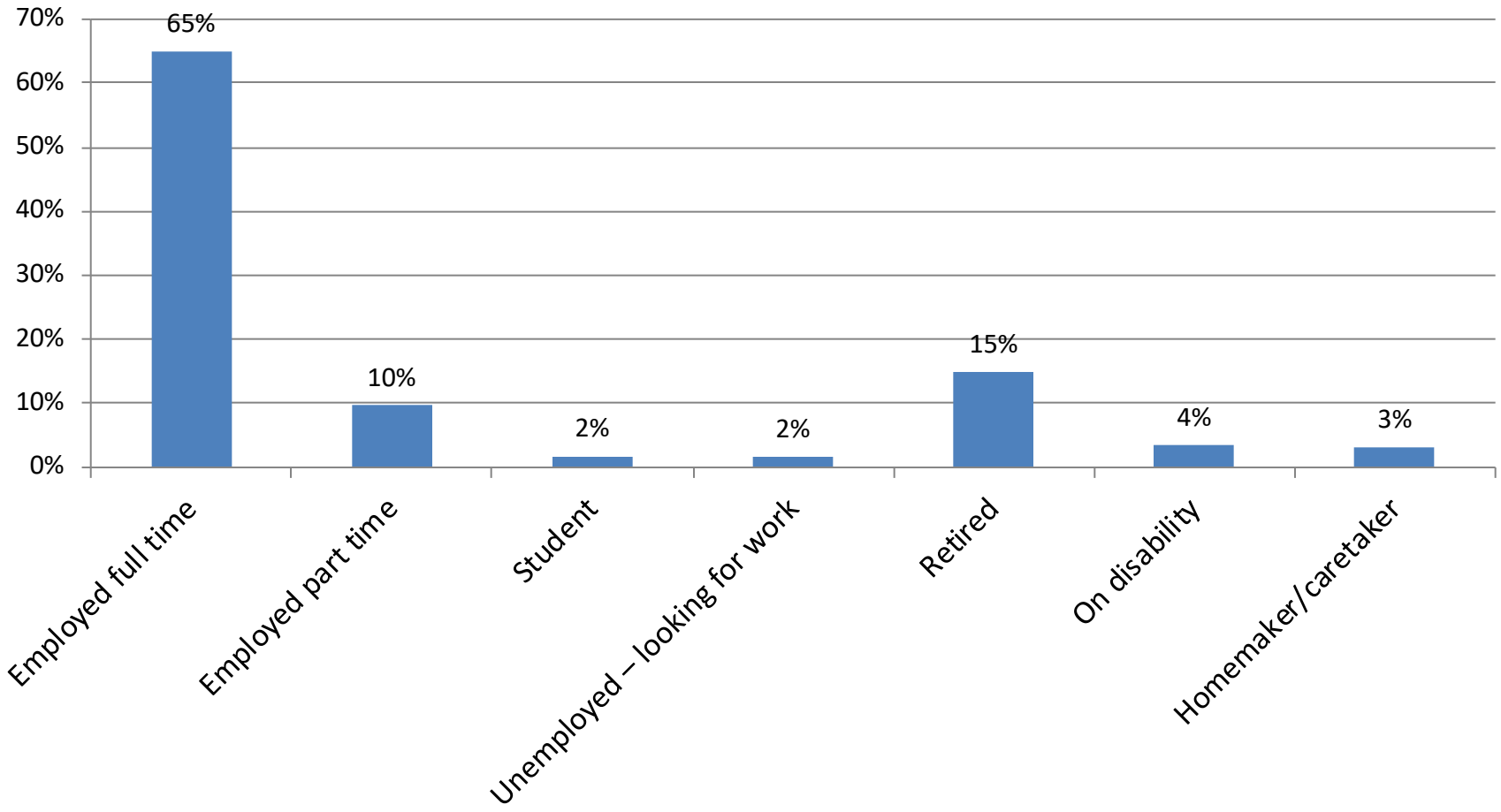
City/Town	Responses
Nashua	74
Concord	68
Manchester	65
Dover	40
Keene	19
Laconia	17
Bethlehem	16
Merrimack	16
Rochester	16
Conway	15
Hopkinton	13
Franklin	13
Londonderry	13
Lebanon	12

RPC Region	Responses	2016 Population	Participation
NCC	134	89,082	0.15%
CNHRPC	169	129,386	0.13%
LRPC	122	113,208	0.11%
UVLSRPC	70	89,476	0.08%
SRPC	100	149,848	0.07%
NRPC	128	207,903	0.06%
SWRPC	60	100,518	0.06%
SNHPC	141	256,538	0.06%
RPC	56	191,544	0.03%

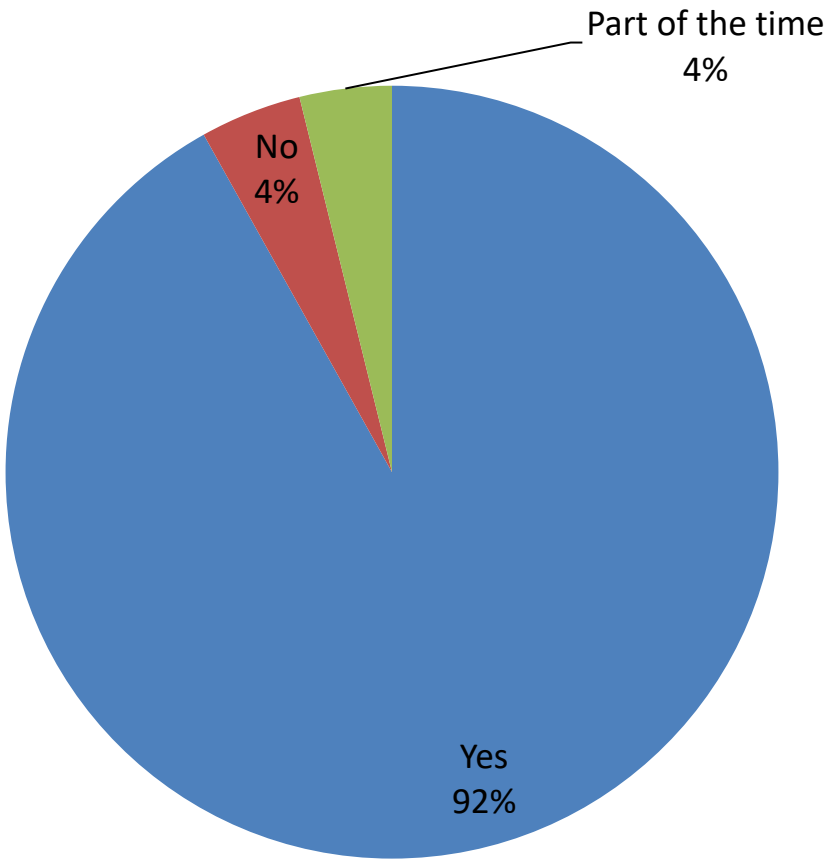
Q13 Survey Responses by Age



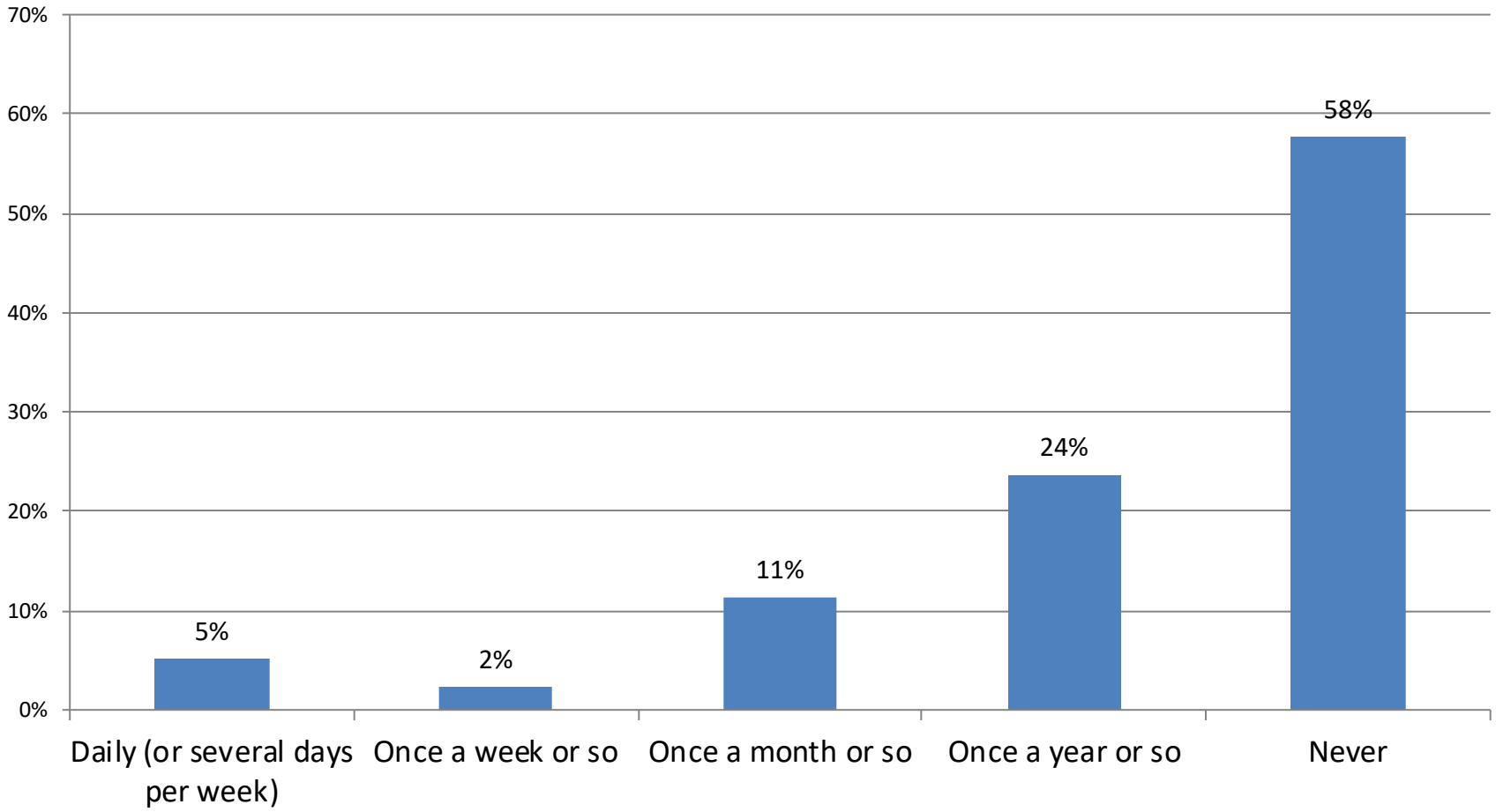
Q14 Survey Responses by Employment Status



Q15 Do you have a motor vehicle available for your use?



Q16 How often do you use public transportation to travel within NH?



APPENDIX H: TECHNOLOGY RECOMMENDATIONS

MEMORANDUM

To:	Stephen Falbel, Steadman Hill	**From:**	Carol Schweiger, Schweiger Consulting
Date:	September 10, 2019	**Subject:**	Technology Task – Subtasks 3 and 4
CC:			

Purpose of the Memo

The New Hampshire Department of Transportation (NHDOT), Bureau of Rail and Transit, tasked Steadman Hill Consulting to identify appropriate technology investments for the coming ten-year period, and document how technology investments could help lead to the success of existing transit/paratransit services (e.g., possibly encourage ridership), and how they would be used to facilitate any new proposed transit/paratransit services. In order to accomplish these subtasks, Schweiger Consulting determined the relative priority of technologies that are relevant to urban and rural transit agencies in NH. Further, Schweiger Consulting determined the cost of these technologies that could be deployed in the future so that the most appropriate investments can be identified.

1. Review Appropriate Technologies and Their Interactions

In Technical Memo 1, the technologies shown in Table 1 were identified as being applicable to fixed-route, paratransit and flexibly-routed services in NH, as shown in Table 1.

Table 1. Technology Applicability

Category/Component	Applicability (R=Rural, U=Urban and LU=Large Urban[1])
Fleet Operations and Management:	
Communications technologies	R, U, LU
Automatic vehicle location (AVL)	R, U, LU
Computer-aided dispatch (CAD)	R, U, LU
Automatic passenger counters (APCs)	R, U, LU
Scheduling (fixed-route and paratransit) systems	U, LU
Transfer connection protection (TCP)	U, LU
Transit signal priority (TSP)	U, LU
Yard management	LU
Intelligent vehicle technologies (e.g., collision warning and precision docking)	R, U, LU
Lane control technologies	R, U, LU

[1] There are no Large Urban transit operations in NH, but we still provide a description of the technologies that are only applicable to Large Urban operations.

Category/Component	Applicability (R=Rural, U=Urban and LU=Large Urban[1])
Traveler Information:	
On-board automated voice announcements (AVA)	R, U, LU
En-route/wayside traveler information, including real-time arrival/departure information in a variety of dissemination media	R, U, LU
On-board Internet access for passengers	R, U, LU
511, 311 and 211 systems, and Google Transit	R, U, LU
Third-party smartphone applications	R, U, LU
Safety and Security:	
Mobile (on-board and exterior) and fixed video surveillance	R, U, LU
Covert emergency alarm and covert live audio monitoring	R, U, LU
On-board digital video recorders	R, U, LU
G-force monitoring (aka electronic data recording system [EDRS])	R, U, LU
Automated Fare Payment:	
Automated fare media (e.g., magnetic stripe cards, contact smartcards, contactless smartcards and smartphone-based payment methods)	R, U, LU
Automated fareboxes and faregates	U, LU
Ticket vending machines	U, LU
Maintenance:	
Engine and drivetrain systems monitoring (aka vehicle component monitoring [VCM])	R, U, LU
Maintenance software to schedule and track scheduled and unscheduled maintenance activities, and manage parts inventory	R, U, LU
Other:	
Data management and reporting	R, U, LU
Technology integration	R, U, LU
Geographic information system (GIS) application	R, U, LU
Service coordination facilitated by technology	R, U, LU
Open data for third-party application development	R, U, LU

Further, Table 2 shows the dependencies among the technologies.

Table 2. Dependencies Among Transit ITS Technologies

Category	System/Technology	Dependent on
Fleet Operations and Management	Communications technologies	Public/private voice and data communication backbones
	Computer-aided dispatch (CAD)	• Voice and data communications technologies • Automatic vehicle location (AVL) system • Route and vehicle schedule data

Category	System/Technology	Dependent on
	Automatic vehicle location (AVL)	• Data communications technologies • Global positioning system (GPS) or other location enabling technologies, such as WiFi
	Automatic passenger counters (APCs)	• AVL system • Route and vehicle schedule data
	Scheduling (fixed-route and paratransit) systems	Stop database (contains data such as stop name, location, routes that stop at this stop, direction of travel from this stop, list of amenities available at this stop)
	Transfer connection protection (TCP)	• AVL system • CAD system
	Transit signal priority (TSP)	• AVL system • CAD system (when TSP used based on schedule adherence status) • Roadside signal infrastructure
	Yard management	Indoor positioning systems (e.g., radio frequency identification [RFID]-based, WiFi-based)
	Intelligent vehicle technologies (e.g., collision warning and precision docking)	Varies by technology application and deployment
	Lane control technologies	• AVL system • CAD • Virtual mirror • Lane guidance systems • Roadside signal infrastructure
Traveler Information	On-board automated voice announcements (AVA)	• AVL system • Route and vehicle schedule data
	En-route/wayside traveler information, including real-time arrival/departure information in a variety of dissemination media	• Route and vehicle schedule data • AVL system • CAD system • Data communications technologies
	On-board Internet access for passengers	Data communications technologies
	511, 311 and 211 systems, and Google Transit	Open data
	Third-party smartphone applications	Open data

Category	System/Technology	Dependent on
Safety and Security	Fixed video surveillance	Data communications technologies
	Covert emergency alarm and covert live audio monitoring	• Voice and data communication technologies • CAD system • AVL system
	On-board digital video surveillance	No dependence on other systems
	G-force monitoring (EDRS)	AVL system
Automated Fare Payment	Automated fare media (e.g., magnetic stripe cards, contact smartcards, contactless smartcards and smartphone-based payment methods)	Fare media processing units
	Automated fareboxes	No dependence on other systems
	Automated faregates	Data communications technologies
	Ticket vending machines (TVMs)	Data communications technologies
Maintenance	Vehicle component monitoring (VCM)	OBD-II[2] or Society of Automotive Engineers (SAE) J1708/J1939 compatibility of on-board computers within engine and drivetrain
	Maintenance software to schedule and track scheduled and unscheduled maintenance activities, and manage parts inventory	No dependence on other systems
	Fuel Management System	No dependence on other systems
Other	Enterprise database/ data warehouse and reporting	• Open databases • Data dictionary
	Technology integration	Multiple dependencies[3]
	Geographic information system (GIS) application	Spatial data recording and management systems
	Service coordination facilitated by technology	• CAD/AVL systems shared across participants • Voice and data communications technologies
	Open data for third-party application development	Standard format for data such as General Transit Feed Specification (GTFS) and GTFS-real time

[2] OBD-II is a standard that monitors engine, chassis, body and accessory devices in a vehicle
[3] To be defined later in this memo

2. Hierarchy/Level of Technologies

In order to determine the relative priority among these technologies for deployment in NH transit agencies, it is important to identify the "core" technologies and their relationships (see Figure 1). Please note that Table 3 summarizes the technology hierarchy and components of each tier.

Abbreviations:

- Computer-aided dispatch (CAD)
- Automatic vehicle location (AVL)
- Automatic passenger counter (APC)
- Route and schedule adherence (RSA)
- Estimated time of arrival (ETA)
- Automated voice announcements (AVA)
- Public service announcement (PSA)
- Real-time information system (RTIS)

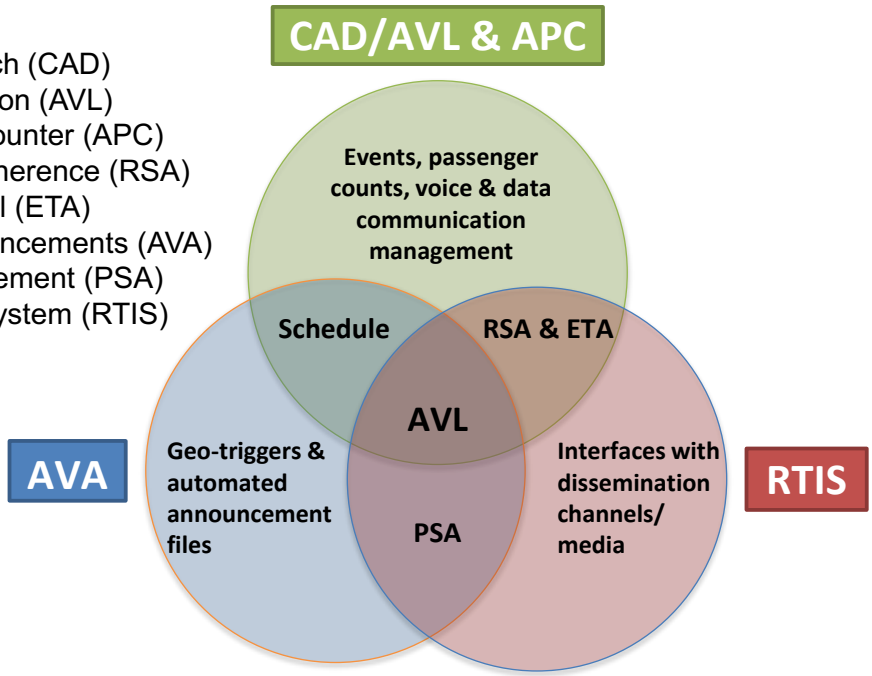


Figure 1. Core Technology Dependencies

The most important backbone technology that enables these core technologies is voice and data communication. Most NH agencies have this already, although a few agencies may be moving away from radio frequency (RF) communication and toward cellular communication. In any case, voice and data communication is the number one priority for all NH transit agencies.

NH transit agencies that do not already have the core technologies shown in Figure 1, which bridge the Fleet Operations and Management, and Traveler Information categories, should consider deployment of these specific technologies first (Tier 1), particularly CAD/AVL, which provides the backbone needed for the use of the other core technologies. Procuring these technologies together can be less costly than purchasing them separately and having to integrate them separately. For example, computing and providing real-time information to customers can only be accomplished when the system knows where transit vehicles are located (requiring AVL) and where they should be located according to the schedule (can require scheduling software for larger agencies). Once real-time information is available, it can be disseminated using a wide variety of media as indicated in the Traveler Information technology category.

Another example is automatic passenger counters (APCs). The implementation of this technology is typically less expensive if implemented at the same time as CAD/AVL. Also, APCs are typically integrated with CAD/AVL so ridership counts are tagged with a location, date and time. However, this technology is considered a Tier 2 priority, so we will identify the cost if this item is procured separately from CAD/AVL technology.

Another Tier 1 technology is a third-party smartphone application. If an agency wishes to have a mobile traveler information application developed by a third-party, it is highly recommended that the agency provides its operational data to the public (a.k.a. open data, which is in the Other technology category). This requires staff effort to "clean" the data that is being made available to the public. While there are several resources available to transit agencies that are considering opening their operational data to the public, one background document that could be helpful is TCRP Synthesis 91 "Use and Deployment of Mobile Device Technology for Real-Time Transit Information."[4]

One other technology that is in the Other technology category should be considered as Tier 1 as well: technology integration. Technology integration is required among the Tier 1 on-board technologies as well as among some centrally-located technologies (e.g., CAD integrated with AVL).

The next most desirable technologies (Tier 2) are mostly in the Safety and Security category. As shown in Table 2, a covert emergency alarm and covert live audio monitoring is dependent, in part, on CAD/AVL. On-board digital video surveillance, while not dependent on other technologies is often integrated with AVL in order to identify the specific location(s) where an event or events of note have taken place. Also, buses can be procured with camera systems already installed, which can be less expensive than procuring them later. Finally, fixed video surveillance, such as that installed at a bus stop or terminal location requires data communication in order to be remotely monitored.

Two technologies in the Other category that should be considered in Tier 2 are GIS and service coordination facilitated by technology (including paratransit CAD/AVL). GIS greatly facilitates data analysis. Rather than procure GIS, NH transit agencies may be able to access and use GIS software from the Regional Planning Commission in their area.

The next most desirable technologies (Tier 3) are in the Maintenance, Safety and Traveler Information categories. In the Maintenance category, there typically is no dependence on other technologies – technology integration with, for example, CAD/AVL, is not required. However, real-time VCM requires integration with the on-board vehicle area network (VAN) so that if on-board technologies experience out-of-

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[4] Carol Schweiger, "Use and Deployment of Mobile Device Technology for Real-Time Transit Information," TCRP Synthesis 91, Transportation Research Board, 2011, https://www.pcb.its.dot.gov/t3/s120626/tcrp_syn_91.pdf

tolerance conditions, the situation can immediately be communicated to dispatch/operations and maintenance.

In the Safety category, G-force monitoring, which measures sudden acceleration and deceleration (and is often associated with an event data recording system [EDRS]), is dependent on the AVL system.

In the Traveler Information category, the Tier 3 technologies are on-board Internet for passengers; 511, 311 and 211 systems; and Google Transit (or similar third-party itinerary planners). In terms of on-board Internet for passengers, the following should be considered when determining whether or not on-board Internet should be procured:

- If multiple on-board technologies are integrated using a mobile router or wireless gateway platform, on-board passenger Internet can be added easily for a small marginal cost;
- For longer bus routes, on-board Internet for passengers should be considered;
- On-board Internet for passengers can enhance the rider experience, attract choice riders and reward loyal riders;
- If college and university students are a significant portion of an agency's ridership, on-board Internet should be considered; and
- Current cellular providers are providing more large data plans at very reasonable prices, meaning that riders may not take advantage of on-board Internet, particularly if the passenger has to pay for Internet access.

The next most desirable technologies (Tier 4) are in the Automated Fare Payment category. With the advent of account-based and mobile fare payment, the cost of fare collection and payment has been reduced over the past five years (see next section). However, equity and accessibility issues must be addressed when utilizing technology-enabled fare payment. For example, customers who can only afford to pay on a trip-by-trip basis or do not have a smartphone will need a way to add cash to their fare payment media or pay using media other than a smartphone (e.g., smartcard).

The next group of technologies (Tier 5) are in the Fleet Operations and Management, and Other categories. These are as follows:

- **Transfer connection protection (TCP)** – this functionality can facilitate customers' transfers between bus routes. While this functionality has been in existence for many years, it has not always been successfully deployed. Agencies wishing this technology should examine current deployments to determine the feasibility and benefits of TCP.
- **TSP** – There are several types of TSP, including the following:
  - Passive priority: "Passive priority does not require the hardware and software investment of active and adaptive priority treatments. Passive priority operates continuously, regardless, based on knowledge of transit route and ridership patterns, and does not require a transit detection / priority request generation system. In general, when transit operations are predictable with a good

understanding of routes, passenger loads, schedule, and/or dwell times, passive priority strategies can be an efficient form of TSP."[5]

  - Active Priority: "Active priority strategies provide priority treatment to a specific transit vehicle following detection and subsequent priority request activation. Various types of active priority strategies may be used if available within the traffic control environment, including a green extension and early green.

- **Enterprise database/ data warehouse and reporting** – these are strategies to facilitate the storage, use and reporting of data generated by transit technologies. "Data warehousing is defined as a technique for collecting and managing data from varied sources to provide meaningful business insights. It is a blend of technologies and components which aids the strategic use of data. It is electronic storage of a large amount of information by a business which is designed for query and analysis instead of transaction processing."[6]

The final technologies to be considered for deployment (Tier 6) are two Fleet Operations and Management technologies, intelligent vehicle technologies (e.g., collision warning) and lane control technologies. Collision warning is available for detecting side and front objects, as well as passenger detection when the vehicle is turning. Lane control technologies assist with vehicle operation on highway lanes, particularly when operating in a breakdown lane (which is less wide than a normal highway lane). Please note that these technologies may become standard in transit buses in the near future due to their standardization and deployment in the passenger car market.

Table 3 summarizes the technology hierarchy and components of each tier.

Table 3. Tier Technology Components

Tier	Technology Component
1	Communications technologies
1	Automatic vehicle location (AVL)
1	Computer-aided dispatch (CAD)
1	On-board automated voice announcements (AVA)
1	En-route/wayside traveler information, including real-time arrival/departure information in a variety of dissemination media
1	Technology integration
1	Third-party smartphone applications
1	Open data for third-party application development
2	Automatic passenger counters (APCs)
2	Scheduling (fixed-route and paratransit) systems
2	Mobile (on-board and exterior) and fixed video surveillance

[5] Harriet R. Smith, Brendon Hemily, PhD and Miomir Ivanovic, ***Transit Signal Priority (TSP): A Planning and Implementation Handbook***, prepared for the United States Department of Transportation, May 2005, https://nacto.org/wp-content/uploads/2015/04/transit_signal_priority_handbook_smith.pdf

[6] https://www.guru99.com/data-warehousing.html

Tier	Technology Component
2	Covert emergency alarm and covert live audio monitoring
2	On-board digital video recorders
2	Geographic information system (GIS) application
2	Service coordination facilitated by technology (includes paratransit CAD/AVL)
3	Vehicle component monitoring (VCM)
3	G-force monitoring (EDRS)
3	Maintenance software to schedule and track scheduled and unscheduled maintenance activities, and manage parts inventory
3	On-board Internet access for passengers
3	511, 311 and 211 systems, and Google Transit
4	Automated fare media (e.g., magnetic stripe cards, contact smartcards, contactless smartcards and smartphone-based payment methods)
4	Automated fareboxes and faregates
4	Ticket vending machines
5	Transfer connection protection (TCP)
5	Transit signal priority (TSP)
5	Data management and reporting
6	Intelligent vehicle technologies (e.g., collision warning and precision docking)
6	Lane control technologies

3. Technology Costs

The unit costs of the technologies that comprise each tier are defined in this section. Capital costs and operations and maintenance costs are included, as well as agency labor/staff costs, implementation management costs (for agency staff and the vendor) and contingency costs. Further, we provide a cost range for each technology. The cost estimates are based on actual procurements of these technologies by a variety of transit agencies across the US over the past five years.

Table 4 shows a summary of available unit costs (in 2019 dollars). The detailed components of the unit costs are shown in Appendix A. Within Table 4, the reader can use the hyperlink in the second column to go to the specific table in Appendix A that contains the detailed components. These costs assume "one of each" component and appropriate interfaces to other technologies as are presented in Appendix A.

Table 4. Available Technology Unit Costs

Tier	Technology (hyperlinked to relevant Appendix A table)	Capital Unit Cost (low)	Capital Unit Cost (high)	Annual Operations and Maintenance Cost (low)	Annual Operations and Maintenance Cost (high)
1	CAD/AVL (including MDT) Unit Costs	$298,000	$599,000	$52,818	$98,493
1	AVA Unit Costs	31,000	67,000	17,000	26,200
1	Real-time Information System Unit Costs (including one of each of three types of dynamic message signs and IVR)	379,000	953,000	74,750	160,450
2	APC Unit Costs	30,000	66,000	30,725	44,900
2	On-board Surveillance Unit Costs	78,000	166,000	31,400	49,525
2	Paratransit Scheduling Software Unit Costs	131,000	313,000	14,120	37,620
2	Service coordination facilitated by technology (Paratransit CAD/AVL Unit Costs)	38,000	62,000	18,185	27,065
3	VCM and EDRS Unit Costs	128,000	250,000	31,788	45,900
3	Maintenance Management Unit Costs	170,000	406,000	35,250	71,550
3	Fuel Management Unit Costs	100,000	284,000	22,100	45,000
4	Automated Fare Payment Unit Costs	950,000		107,090	
5	TCP Unit Costs	288,000	497,000	7,746	11,620
5	TSP Unit Costs	22,000	72,000	6,063	13,450

4. Current Technology Status of NH Transit Agencies

As identified in the first memorandum, several NH transit agencies already have some of the technologies described previously. The following table shows which tier each agency has already reached.

Table 5. Current Technology Status[7]

Agency Name	Tier Reached

Advance Transit	• Part of Tier 1:
	  ○ Communications system
	  ○ AVL
	  ○ Real-time information
	  ○ Third-party smartphone applications
	• Part of Tier 2:
	  ○ Paratransit scheduling software
	  ○ Security cameras (later in 2019)
	• Part of Tier 3:
	  ○ Maintenance software
	  ○ Accounting and maintenance software (expected in 2020)

Cooperative Alliance for Seacoast Transportation (COAST)	• Part of Tier 1:
	  ○ Communications system
	  ○ Computer-aided Dispatch (CAD)/AVL
	  ○ Real-time information
	  ○ Third-party smartphone applications
	  ○ AVA
	• Part of Tier 2: Paratransit scheduling and dispatching and on-board tablets
	• Part of Tier 3: Maintenance software

Manchester Transit Authority (MTA)	• Part of Tier 1:
	  ○ Communications system
	  ○ AVL
	  ○ AVA
	• Part of Tier 2: Paratransit scheduling software is HBSS
	• Part of Tier 3: Maintenance software

Sullivan County Transportation (SCT)	• Part of Tier 2:
	  ○ Paratransit scheduling software
	  ○ On-board security cameras (on new vehicle to be delivered in 2020)

Tri-County Community Action Program (CAP) Transit	• Part of Tier 2: Paratransit scheduling and dispatching software • Part of Tier 3: Maintenance software

[7] Please note that if an agency that indicated that they had a communications system through the email survey conducted on April 3, this was listed in Table 5.

Agency Name	Tier Reached
Visiting Nurse Association (VNA)- Home Healthcare, Hospice & Community Services (HCS)	• Part of Tier 2: Paratransit scheduling software from RouteMatch

Nashua Transit System	• Part of Tier 1:
	  ○ Limited AVL
	  ○ AVA
	• Part of Tier 2: Paratransit scheduling software
	• Part of Tier 4: Automated fare collection

Cooperative Alliance for Transportation (CART)	• Part of Tier 2: Paratransit scheduling software • Part of Tier 3: Maintenance software

Concord Area Transit (CAT)	• Part of Tier 1: Communications system
	• Part of Tier 2: Paratransit scheduling software
	• Part of Tier 3:
	  ○ Maintenance software
	  ○ Fuel management software
	• Part of Tier 4: Automated fare collection

UNH Wildcat Transit	• Tier 1:
	  ○ Communications system
	  ○ CAD/AVL
	  ○ Real time information
	  ○ Third-party smartphone applications
	• Part of Tier 2: APC
	• Part of Tier 3:
	  ○ Limited maintenance/VCM
	  ○ Maintenance tracking

5. Recommended Minimum Level of Technology: 2020 through 2029

In examining the current level of technology in each NH transit agency and the relative technology priorities identified earlier in this memorandum, the following table identifies the minimal level of technology that should be considered for deployment at each agency within the next ten years. The capital cost includes the cost of spares at a 10% level.

Please note that the recommendations for deploying Tier 4, 5 and 6 technologies are considered after the next ten years, with the exception of Advance Transit, which currently is interested in TSP at one location in Lebanon, NH.

Further, please note that if a communications system is recommended, the cost of a communications system is not included in the figures because of the uncertain cost associated with communications systems. The technology components of a communications vary widely as do the operations and maintenance (O&M) costs.

Finally, a statewide cost summary by goal/deployment year is included in Table 16 at the end of this section. Please note that the actual spending might happen in increments leading to the deployment year, but for the purpose of simplicity, all capital spending is assumed to be a lump sum in the deployment year. Further, Annual O&M costs begin in the year after the deployment year.

Table 6. Advance Transit

Tier	Elements	Goal Year	Total Capital Cost (min)	Total Capital Cost (max)	Annual O&M Cost (min)	Annual O&M Cost (max)
1	• AVA • Open data • Technology Integration	2022	$118,000	$211,000	$20,000	$31,200
2	• APCs • Covert emergency alarm • Covert live audio monitoring	2025	107,250	196,750	33,488	49,688
3	• VCM • G-force monitoring • Fuel management	2029	257,000	607,000	55,688	95,000
5	• TSP[8]	2021	72,000	162,000	6,963	15,700

Table 7. COAST

Tier	Elements	Goal Year	Capital Cost (min)	Capital Cost (max)	Annual O&M Cost (min)	Annual O&M Cost (max)
1	• Open data • Technology Integration	2022	Not available	Not available	Not available	Not available

[8] Assumes one intersection equipped with appropriate infrastructure. The infrastructure cost is included in the capital cost.

Tier	Elements	Goal Year	Capital Cost (min)	Capital Cost (max)	Annual O&M Cost (min)	Annual O&M Cost (max)
2	• APCs • Covert emergency alarm • Covert live audio monitoring • On-board video surveillance • GIS • Service coordination facilitated by technology	2025	$633,000	$1,236,000	$104,755	$164,935
3	• VCM • G-force monitoring • Fuel management	2029	268,000	631,000	56,850	97,400

Table 8. MTA

Tier	Elements	Goal Year	Capital Cost (min)	Capital Cost (max)	Annual O&M Cost (min)	Annual O&M Cost (max)
1	• CAD • Traveler information • Open data • Technology Integration	2022	$395,750	$1,012,250	$101,148	$201,445
2	• APCs • Covert emergency alarm • Covert live audio monitoring • Fixed video surveillance	2025	76,250	143,750	32,388	47,788
3	• VCM • G-force monitoring • Fuel management	2029	250,000	585,000	55,488	94,400

Table 9. SCT

Tier	Elements	Goal Year	Capital Cost (min)	Capital Cost (max)	Annual O&M Cost (min)	Annual O&M Cost (max)
1	• Communications technology (see earlier note regarding the cost of this technology) • AVL • CAD • AVA • Traveler information • Third-party smartphone applications • Open data • Technology Integration	2023	$564,000	$1,282,000	$122,355	$232,468

Tier	Elements	Goal Year	Capital Cost (min)	Capital Cost (max)	Annual O&M Cost (min)	Annual O&M Cost (max)
2	• APCs • Covert emergency alarm • Covert live audio monitoring • Fixed video surveillance • GIS • Service coordination facilitated by technology[9]	2026	53,750	106,250	31,563	46,363
3	• VCM • G-force monitoring • Maintenance management • Fuel management	2029	407,000	962,000	89,563	163,450

Table 10. Tri-County CAP Transit

Tier	Elements	Goal Year	Capital Cost (min)	Capital Cost (max)	Annual O&M Cost (min)	Annual O&M Cost (max)
1	• Communications technology • AVL • CAD • AVA • Traveler information • Open data • Technology Integration	2023	$666,000	$1,506,000	$126,938	$242,183
2	• APCs • Covert emergency alarm • Covert live audio monitoring • On-board video surveillance • Fixed video surveillance • GIS • Service coordination facilitated by technology[7]	2027	92,250	170,750	32,938	48,738
3	• VCM • G-force monitoring • Fuel management	2029	250,000	590,000	55,088	93,800

[9] Included in CAD/AVL in Tier 1

Table 11. VNA — Home Healthcare HCS

Tier	Elements	Goal Year	Capital Cost (min)	Capital Cost (max)	Annual O&M Cost (min)	Annual O&M Cost (max)
1	• Communications technology • AVL • CAD • AVA • Traveler information • Third-party smartphone applications • Open data • Technology Integration	2022	$585,000	$1,326,000	$123,265	$234,425
2	• APCs • Covert emergency alarm • Covert live audio monitoring • On-board video surveillance • Fixed video surveillance • GIS • Service coordination facilitated by technology[7]	2027	210,250	399,750	65,763	100,538

Table 12. Nashua Transit System

Tier	Elements	Goal Year	Capital Cost (min)	Capital Cost (max)	Annual O&M Cost (min)	Annual O&M Cost (max)
1	• AVL • CAD • Traveler information (including a third-party smartphone application) • Open data • Technology Integration	2022	$528,000	$1,226,000	$105,675	$207,595
2	• APCs • Covert emergency alarm • Covert live audio monitoring • On-board video surveillance • Fixed video surveillance • GIS • Service coordination facilitated by technology[7]	2025	171,750	384,250	56,063	85,598
3	• VCM • G-force monitoring • Maintenance management • Fuel management	2028	416,000	983,000	90,513	165,450

Table 13. CART

Tier	Elements	Goal Year	Capital Cost (min)	Capital Cost (max)	Annual O&M Cost (min)	Annual O&M Cost (max)
1	• Communications technology • AVL • CAD • AVA • Traveler information • Third-party smartphone applications • Open data • Technology Integration	2023	$585,000	$1,326,000	$123,265	$234,425
2	• APCs • Covert emergency alarm • Covert live audio monitoring • On-board video surveillance • Fixed video surveillance • GIS • Service coordination facilitated by technology[7]	2026	210,250	399,750	65,763	100,538
3	• VCM • G-force monitoring • Fuel management	2029	239,000	563,000	54,488	92,300

Table 14. CAT

Tier	Elements	Goal Year	Capital Cost (min)	Capital Cost (max)	Annual O&M Cost (min)	Annual O&M Cost (max)
1	• AVL • CAD • AVA • Traveler information • Third-party smartphone applications • Open data • Technology Integration	2022	$518,000	$1,184,000	$120,080	$227,880
2	• APCs • Covert emergency alarm • Covert live audio monitoring • On-board video surveillance • Fixed video surveillance • GIS • Service coordination facilitated by technology[7]	2025	261,500	540,500	86,340	132,580
3	• VCM • G-force monitoring	2028	130,000	253,000	31,825	46,000

Table 15. UNH Wildcat Transit

Tier	Elements	Goal Year	Capital Cost (min)	Capital Cost (max)	Annual O&M Cost (min)	Annual O&M Cost (max)
1	• AVA • Open data • Technology Integration	2021	$152,000	$269,000	$21,200	$33,200
2	• APCs • Covert emergency alarm • Covert live audio monitoring • On-board video surveillance • Fixed video surveillance • GIS • Service coordination facilitated by technology	2023	551,250	1,005,750	96,113	148,523
3	• VCM • G-force monitoring • Fuel management	2025	268,000	638,000	56,488	96,800

Table 16. Statewide Capital and O&M Costs by Goal Year for Urban Agencies

Goal Year	Total Capital Cost (min)	Total Capital Cost (max)	Total O&M Cost (min)	Total O&M Cost (max)
2021	$152,000	$269,000	$0	$0
2022	923,750	2,238,250	21,200	33,200
2023	1,136,250	2,331,750	228,023	442,240
2024	0	0	447,401	825,188
2025	1,149,000	2,402,000	447,401	825,188
2026	210,250	399,750	697,095	1,220,309
2027	0	0	762,858	1,320,847
2028	416,000	983,000	762,858	1,320,847
2029	507,000	1,194,000	853,371	1,486,297
2030	N/A	N/A	964,709	1,675,997
TOTAL	$4,494,250	$9,817,750	$5,184,916	$9,150,113

Table 17. Statewide Capital and O&M Costs by Goal Year for Rural Agencies

Goal Year	Total Capital Cost (min)	Total Capital Cost (max)	Total O&M Cost (min)	Total O&M Cost (max)
2021	$72,000	$162,000	$0	$0
2022	1,221,000	2,721,000	6,963	15,700
2023	1,230,000	2,788,000	270,308	509,205
2024	0	0	519,601	983,856
2025	368,750	737,250	519,601	983,856
2026	53,750	106,250	639,429	1,166,124
2027	302,500	570,500	670,992	1,212,487
2028	130,000	253,000	769,693	1,361,763
2029	914,000	2,159,000	801,518	1,407,763
2030	N/A	N/A	1,001,857	1,760,013
TOTAL	$4,292,000	$9,497,000	$5,199,962	$9,400,767

6. Next Steps

As each agency considers technology deployment, they will need a technology strategy that summarizes the results of a business and technical needs assessment, identifies technology integration needs, and reconfirms a suite of technologies which addresses the agency's goals, objectives and needs. Further, the relative priorities of each recommendation presented in this memorandum should be re-evaluated.

Finally, while deployment is not recommended specifically in 2020, agencies should be pursuing funding opportunities immediately at the Federal, state and local level to cover the recommended technology investments. Funding from non-traditional sources should be considered in addition to traditional funding programs, including the American Association of Retired Persons (AARP), National Aging and Disability Transportation Center (NADTC), National Center for Mobility Management (NCMM) and health foundation grants (e.g., Tufts Health Plan Foundation).

7. List of Abbreviations and Acronyms

APC	Automatic passenger counter/counting
ASA	Automatic stop announcement
AVA	Automatic voice announcement
AVL	Automatic vehicle location
CAD	Computer-aided dispatch
CAP	Community Action Program
COAST	Cooperative Alliance for Seacoast Transportation
CART	Cooperative Alliance for Transportation
CAT	Concord Area Transit
DMS	Dynamic message sign
DVR	Digital video recorder
EDRS	Event data recording system
GIS	Geographic information system
GPS	Global positioning system
GTFS	General Transit Feed Specification
HCS	Home Healthcare, Hospice & Community Services
IVR	Interactive voice response
LAN	Local area network
MDC	Mobile data computer
MDT	Mobile data terminal
MTA	Manchester Transit Authority
NHDOT	New Hampshire Department of Transportation
RF	Radio frequency
RTIS	Real-time Information System
SCT	Sullivan County Transportation
TCP	Transfer connection protection
TSP	Transit signal priority
TVM	Ticket vending machine
VCM	Vehicle component monitoring
VNA	Visiting Nurse Association
WAN	Wide area network
WLAN	Wireless local area network

Appendix A. Unit Cost Details

A.1 Tier 1

The costs associated with the Tier 1 technologies are shown in Table 18 through Table 20. The costs associated with providing open data and technology integration are not provided in this table due to the wide range of costs associated with these two items. For example, providing open data typically requires more labor resources than software or hardware. The costs associated with technology integration typically is included in the costs of on-board hardware. However, when procuring services to integrate on-board technologies, agencies should always require that potential vendors/contractors identify costs in addition to on-board hardware or central software, such as technology integration.

A.2 Tier 2

The costs associated with the Tier 2 technologies are shown in Table 21 through Table 24. No cost is identified for GIS as it is available to all transit agencies through the regional planning commissions. The cost of paratransit service coordination is a combination of the costs for paratransit scheduling software and paratransit CAD/AVL.

A.3 Tier 3

The costs of maintenance and safety technologies are shown in Table 25 and Table 27.

A.4 Tier 4

The costs associated with automated fare payment is shown in Table 28.

A.5 Tier 5

The costs associated with TCP and TSP are shown in Table 29 and Table 30. The TSP costs assume that roadside TSP infrastructure exists at a cost of $25,000 per intersection.

The costs of deploying an enterprise database/ data warehouse and reporting functionality varies widely depending on the amount of data that needs to be managed and stored as well as how many reports and the type of reports that are needed.

A.6 Tier 6

The costs associated with technologies in this tier are not available currently. Costs for collision avoidance items were identified by USDOT in 2007, but have not been updated since then. At that time, the estimated cost of acquiring a Forward Collision Warning System for a Transit Bus was $1,500 per unit and $141 in annual operations and maintenance.

Table 18. CAD/AVL (including MDT) Unit Costs

Components	Unit Cost (low)	Low-end features	Unit Cost (high)	High-end features	Annual O&M Cost (low)	Annual O&M Cost (high)	% for O&M
Onboard computer (fixed-route vehicles)							
Data modem and wireless interface	$250	Cellular and WLAN data only	$1,000	Cellular, WLAN or radio data	$13	$50	5%
Operator interface with logon/logoff, AVL, RSA and event management	$1,000	Tablet; limitations in software (e.g., Android app)	$2,000	High-end software features and management	$50	$100	5%
Vehicle logic unit and vehicle area networking	$1,000	Feature not available	$2,500	VLU to enable communication over data radio and connectivity with DVRs; ability to read smartcards.	$0	$0	0%
Closed-mic and covert alarm	$250		$750		$13	$38	5%
Odometer interface		GPS odometer used-no interface	$500	Dash odometer used	$0	$25	5%
Maintenance network interface (needed for VCM)	$250		$500		$13	$25	5%
Farebox interface	$250		$500		$13	$25	5%
Headsign interface	$250		$500		$13	$25	5%
WLAN	$250	Built in tablet	$500	Separate modem and antenna	$13	$25	5%
DVR interface	$250		$1,000	Only high-end feature since VLU needed	$13	$50	5%
Central CAD/AVL Software	$100,000	100 hours for low-end CAD/AVL interface	$250,000	200 hours for high-end CAD/AVL interface	$20,000	$50,000	20%
Wireless data transfer system (includes 2 access points and data transfer software)							
Access Points	$2,500	May not be rated for heavy duty outdoor use	$5,000	Heavy duty outdoor use equipment	$0	$350	7%
Central software	$5,000	Mostly manual process of preparing and transfering data over wireless network	$25,000	Sophisticated process of preparing and transfering data to vehicles over wireless network	$1,000	$5,000	20%
Servers and SAN-based storage (includes 2 units each [for redundancy] of communications, CAD/AVL, and database servers), and workstations					$4,000	$4,920	4%
H/W and S/W Subtotal	**$204,250**		**$412,750**		**$25,138**	**$60,633**	
Agency Labor/Staff Cost							
Training	$2,400		$4,000				
Operations and Maintenance (0.5 FTE)					$27,500	$37,500	
Cellular Data					$180	$360	
Vendor implementation management	**$20,425**		**$41,275**				
Project Implementation	**$20,425**		**$41,275**				
Contingency	**$50,000**		**$100,000**				
Grand Total	**$298,000**		**$599,000**		**$52,818**	**$98,493**	

Table 19. AVA Unit Costs

Components	Unit Cost (low)	Low-end features	Unit Cost (high)	High-end features	Annual O&M Cost (low)	Annual O&M Cost (high)	% for O&M
Onboard (fixed route vehicles):							
DMS and on-board interfaces	$500	Cost varies by vendor	$1,000	Cost varies by vendor	$25	$50	5%
AVA controller and interface with MDT/VLU and PA system	$2,500	Mostly support just text-to-speech audio announcements	$4,000	Both text-to-speech and pre-recorded audio announcements supported	$125	$200	5%
Central AVA Software: trigger location management, announcement file creation and management	$15,000	Limitations in the interface used to prepare announcements and create triggers	$35,000	Sophisticated interface to prepare announcements and create triggers	$3,000	$7,000	20%
Central AVA Software workstation	$2,500	Cost varies by vendor	$5,000	Cost varies by vendor	$100	$200	4%
H/W and S/W Subtotal	**$20,500**		**$45,000**		**$3,250**	**$7,450**	
Agency Labor/Staff Cost							
Training	$1,200		$2,000				
System operations and maintenance (0.25 FTE)					$13,750	$18,750	
Vendor implementation management	**$2,050**		**$4,500**				
Project Implementation	**$2,050**		**$4,500**				
Contingency	**$5,000**		**$11,000**				
Grand Total	**$31,000**		**$67,000**		**$17,000**	**$26,200**	

Table 20. Real-time Information System Unit Costs

Components	Unit Cost (low)	Low-end features	Unit Cost (high)	High-end features	Annual O&M Cost (low)	Annual O&M Cost (high)	% for O&M
Real-time information Software							
Arrival prediction	$25,000	Very basic AVL- based "correction" scheduled arrivals; no prediction to account for anomalies	$100,000	Sophistcated algorithm to account for anomalies	$5,000	$20,000	20%
Information dissemination control	$10,000	Limitations in controling media and how information is pushed out.	$50,000	Sophisticated interface for managing information push and pull	$2,000	$10,000	20%
Interface with CAD/AVL and scheduling	$15,000	Cost varies based on complexity	$30,000	Cost varies based on complexity	$3,000	$6,000	20%
Dissemination via dynamic message signs (DMS)							
DMS at the hub (outdoor LCD with 42" screen)	$7,500	H/w cost varies by vendor depending on longevity and ability to monitor remotely	$15,000	H/w cost varies by vendor depending on longevity and ability to monitor remotely	$525	$1,050	7%
DMS at stations (outdoor LCD with 42" screen)	$7,500	H/w cost varies by vendor depending on longevity and ability to monitor remotely	$15,000	H/w cost varies by vendor depending on longevity and ability to monitor remotely	$525	$1,050	7%
DMS at bus stops with shelters (outdoor LED with 3 lines)	$10,000	H/w cost varies by vendor depending on longevity and ability to monitor remotely	$15,000	H/w cost varies by vendor depending on longevity and ability to monitor remotely	$700	$1,050	7%
Dissemination via web and mobile devices							
Website integration	$25,000	Very limited customization Limited flexiblity	$50,000	Embedded in agency website High flexibility	$5,000	$10,000	20%
Google Transit integration	$0	Basic interface; limited support	$15,000	Address both mandatory and optional requirements; provide assistance with Go-live	$0	$3,000	20%
Regional integration	$25,000		$50,000		$5,000	$10,000	20%
Subscription alerts (advanced and real-time)	$10,000	Cost varies by vendor	$25,000	Cost varies by vendor	$2,000	$5,000	20%
Dissemination via IVR							
IVR software	$50,000	DTMF (touchtone) only	$150,000	Includes speech recognition	$10,000	$30,000	20%
IVR software interface with phone system	$15,000	Cost varies based on complexity	$25,000	Cost varies based on complexity	$3,000	$5,000	20%
IVR software interface with prediction system and RTIS	$15,000	Cost varies based on complexity	$25,000	Cost varies based on complexity	$3,000	$5,000	20%
IVR software interface with Routematch	$25,000	Cost varies based on complexity	$50,000	Cost varies based on complexity	$5,000	$10,000	20%
Subcription alerts (advanced and real-time)	$10,000	Cost varies by vendor	$25,000	Cost varies by vendor	$2,000	$5,000	20%
1 server and 1 workstation	$12,500	Cost varies by vendor	$20,000	Cost varies by vendor	$500	$800	4%
H/W and S/W Subtotal	**$262,500**		**$660,000**		**$47,250**	**$122,950**	
Agency Labor/Staff Cost							
Training	$1,200		$2,000				
System operations and maintenance (0.5 FTE)					$27,500	$37,500	
Vendor implementation management	**$26,250**		**$66,000**				
Project Implementation	**$26,250**		**$66,000**				
Contingency	**$63,000**		**$159,000**				
Grand Total	**$379,000**		**$953,000**		**$74,750**	**$160,450**	

Table 21. APC Unit Costs

Components	Unit Cost (low)	Low-end features	Unit Cost (high)	High-end features	Annual O&M Cost (low)	Annual O&M Cost (high)	% for O&M
Onboard (fixed route vehicles): APC sensors and controller	$2,500	Door mounted sensors-upto 90% accurate counts	$4,000	Overhead sensors-upto 97% accurate	$125	$200	5%
Central Software:APC data processing, management and reporting	$15,000	Limited post-processingand reporting	$35,000	Sophisticated post-processing and reporting	$3,000	$7,000	20%
1 workstation (CAD/AVL and database servers to be used)	$2,500	Cost varies by vendor	$5,000	Cost varies by vendor	$100	$200	4%
H/W and S/W Subtotal	**$20,000**		**$44,000**		**$3,225**	**$7,400**	
Agency Labor/Staff Cost							
Training	$1,200		$2,000				
System operations and maintenance (0.5 FTE)					$27,500	$37,500	
Vendor implementation management	**$2,000**		**$4,400**				
Project Implementation	**$2,000**		**$4,400**				
Contingency	**$5,000**		**$11,000**				
Grand Total	**$30,000**		**$66,000**		**$30,725**	**$44,900**	

Table 22. On-board Surveillance Unit Costs

Components	Unit Cost (low)	Low-end features	Unit Cost (high)	High-end features	Annual O&M Cost (low)	Annual O&M Cost (high)	% for O&M
Onboard (fixed route vehicles): 8 cameras and one DVR per vehicle	$5,000	Low-end cameras and DVRs have limited capabilities; WLAN download allowed	$8,000	High-end cameras and DVRs are sophisticated WLAN download allowed	$250	$400	5%
Onboard (paratransit vehicles-directly operated): 4 cameras and one DVR per vehicle	$3,500	Low-end cameras and DVRs have limited capabilities	$5,500	High-end cameras and DVRs are sophisticated	$175	$275	5%
Central Playbak and Streaming Software	$5,000	Only playback capabilities	$20,000	Both playback and streaming capabilities	$1,000	$4,000	20%
Wireless data transfer							
Access points	$2,500	May not be rated for heavy duty outdoor use	$5,000	Heavy duty outdoor use equipment	$175	$350	7%
Data Transfer software	$5,000	Mostly manual process of preparing and transfering data over wireless network	$25,000	Sophisticated process of preparing and transfering data to vehicles over wireless network	$1,000	$5,000	20%
1 server, SAN-based storage and 1 video playback workstation	$32,500	Cost varies by vendor	$50,000	Cost varies by vendor	$1,300	$2,000	4%
H/W and S/W Subtotal	**$53,500**		**$113,500**		**$3,900**	**$12,025**	
Agency Labor/Staff Cost							
Training	$1,200		$2,000				
System operations and maintenance (0.5 FTE)					$27,500	$37,500	
Vendor implementation management	**$5,350**		**$11,350**				
Project Implementation	**$5,350**		**$11,350**				
Contingency	**$13,000**		**$28,000**				
Grand Total	**$78,000**		**$166,000**		**$31,400**	**$49,525**	

Table 23. Paratransit Scheduling Software Unit Costs

Components	Unit Cost (low)	Low-end Features	Unit Cost (high)	High-end features	Annual Operations and Maintenance Cost (low)	Annual Operations and Maintenance Cost (high)	% for O&M
Central CAD/AVL Software Interface	$15,000	100 hours for low-end CAD/AVL interface	$30,000	200 hours for high-end CAD/AVL interface	$3,000	$6,000	20%
Scheduling software	$50,000		$150,000		$10,000	$30,000	20%
Scheduling software MDT/AVL Module	$1,000		$1,500		$200	$300	20%
Hosting/Servers and workstations	**$23,000**		**$33,000**		$920	$1,320	4%
H/W and S/W Subtotal	**$89,000**		**$214,500**		**$14,120**	**$37,620**	
Agency Labor/Staff Cost							
Training	$2,400		$4,000				%
Vendor implementation management	**$8,900**		**$21,450**				10%
Project Implementation	**$8,900**		**$21,450**				10%
Contingency	**$22,000**		**$52,000**				20%
Grand Total	**$131,000**		**$313,000**		**$14,120**	**$37,620**	

Table 24. Paratransit CAD/AVL Unit Costs

Components	Unit Cost (low)	Unit Cost (high)	Annual O&M Cost (low)	Annual O&M Cost (high)	% for O&M
Onboard computer (directly operated vehicles)					
Data modem and wireless interface	$500	$1,000	$25	$50	5%
Operator interface with logon/logoff, AVL, and event/manifest management	$1,000	$2,000	$50	$100	5%
Vehicle logic unit and cabling		$1,500	$0	$0	
Closed-mic and covert alarm		$1,000	$0	$50	5%
Odometer interface		$500	$0	$25	5%
WLAN interface		$500	$0	$25	5%
DVR interface		$500	$0	$25	5%
Servers and workstations	$23,000	$33,000	$920	$1,320	4%
H/W and S/W Subtotal	**$24,500**	**$40,000**	**$4,195**	**$7,895**	
Agency Labor/Staff Cost					
Training	$2,400	$4,000			
System operations and maintenance (0.25 FTE)			$13,750	$18,750	
Cellular Data					
Directly operated vehicles			$240	$420	
Vendor implementation management	**$2,450**	**$4,000**			
Project Implementation	**$2,450**	**$4,000**			
Contingency	**$6,000**	**$10,000**			
Grand Total	**$38,000**	**$62,000**	**$18,185**	**$27,065**	

Table 25. VCM and EDRS Unit Costs

Components	Unit Cost (low)	Low-end features	Unit Cost (high)	High-end features	Annual O&M Cost (low)	Annual O&M Cost (high)	% for O&M
On-board hardware							
Event data recorder/G-force sensor (cheaper to purchase with surveillance system)	$250	H/w cost varies by vendor depending on longevity	$500	H/w cost varies by vendor depending on longevity	$13	$25	5%
Interface with maintenance gateway adaptors	$500	Number of alarms that can be tracked are limited	$1,500	Upto 25 alarms in real-time and several other can be tracked offline	$25	$75	5%
Central VCM Management Software	$75,000	Filtering, processing and reporting capabilities are limited	$150,000	Filtering, processing and reporting capabilities are comprehensive.	$3,750	$7,500	5%
1 server and 1 workstation (could also use same hardware as CAD/AVL system)	$12,500	Cost varies by vendor	$20,000	Cost varies by vendor	$500	$800	4%
H/W and S/W Subtotal	$88,250		$172,000		**$4,288**	**$8,400**	
Agency Labor/Staff Cost							
Training	$1,200		$2,000				
System operations and maintenance (0.5 FTE)					$27,500	$37,500	
Vendor implementation management	**$8,825**		**$17,200**				
Project Implementation	**$8,825**		**$17,200**				
Contingency	**$21,000**		**$42,000**				
Grand Total	**$128,000**		**$250,000**		**$31,788**	**$45,900**	

Table 26. Maintenance Management Unit Costs

Components	Unit Cost (low)	Low-end features	Unit Cost (high)	High-end features	Annual O&M Cost (low)	Annual O&M Cost (high)	% for O&M
Maintenance software	$75,000	User interface is basic but basic features are available.	$200,000	User interface is high-end. Advanced features such as interface with financial and accounting software is available.	$15,000	$40,000	20%
Interface with fuel management system	$15,000	Cost varies based on complexity	$30,000	Cost varies based on complexity	$3,000	$6,000	20%
Interface with CAD/AVL	$15,000	Cost varies based on complexity	$30,000	Cost varies based on complexity	$3,000	$6,000	20%
1 server and 1 workstation	$12,500	Cost varies by vendor	$20,000	Cost varies by vendor	$500	$800	4%
H/W and S/W Subtotal	**$117,500**		**$280,000**		**$21,500**	**$52,800**	
Agency Labor/Staff Cost							
Training	$1,200		$2,000				
System operations and maintenance (0.25 FTE)					$13,750	$18,750	
Vendor implementation management	**$11,750**		**$28,000**				
Project Implementation	**$11,750**		**$28,000**				
Contingency	**$28,000**		**$68,000**				
Grand Total	**$170,000**		**$406,000**		**$35,250**	**$71,550**	

Table 27. Fuel Management Unit Costs

Components	Unit Cost (low)	Low-end features	Unit Cost (high)	High-end features	Annual O&M Cost (low)	Annual O&M Cost (high)	% for O&M
Central fuel management software	$30,000	User interface is basic but basic features are available.	$100,000	High cost tied to high-end equipment at the fuel island	$6,000	$20,000	20%
Automatic vehicle identification (AVI) hardware (for only DO vehicles)	$250	Very basic identification - authentication process not completely automated	$500	Completely automated authentication	$50	$100	20%
Fuel pump station hardware	$25,000	Low-end Features Limitations on fuel/fluid that can be tracked	$75,000	High-end pumping and fuel/fluid tracking hardware Vide variety of fuel/fluid that can be tracked	$1,750	$5,250	7%
1 server and 1 workstation	$12,500	Cost varies by vendor	$20,000	Cost varies by vendor	$500	$800	4%
H/W and S/W Subtotal	**$67,750**		**$195,500**		**$8,300**	**$26,150**	
Agency Labor/Staff Cost							
Training	$1,200		$2,000				
System operations and maintenance (0.25 FTE)					$13,750	$18,750	
Vendor implementation management	**$6,775**		**$19,550**				
Project Implementation	**$6,775**		**$19,550**				
Contingency	**$17,000**		**$47,000**				
Grand Total	**$100,000**		**$284,000**		**$22,050**	**$44,900**	

Table 28. Automated Fare Payment Unit Costs

Components	Unit Cost	Annual O&M Cost		% for O&M
Farebox	$ 14,350	$1,005		7%
Portable Probe	$ 18,500	$1,295		7%
Cash/Credit Card TVM	$ 63,900	$4,473		7%
Test Bench	$ 13,900	$556		4%
Back Office/Central System	$ 68,000	$13,600		20%
Smart Cards	$ 4.50	$0		0%
Interface to CAD/AVL/APC	$ 18,000	$900		5%
Point of Sale Terminal	$ 16,500	$1,155		7%
Ticket Office Terminal	$ 16,500	$1,155		7%
Mobile Payment (with no transaction fees)	$ 227,000	$45,400		20%
Fixed Vault	$ 39,500	$2,765		7%
Portable Vault	$ 11,000	$770		7%
POS Software License and Support	$ 79,000	$15,800		20%
Smart Card Handheld Validator	$ 3,800	$266		7%
TVM Services	$ 25,000	$0		0%
Wireless Local Area Network (LAN) Access Points and Data Transfer Software	$ 42,000	$4,200		10%
H/W and S/W Subtotal	**$ 656,955**	**$ 93,340**		
Agency Labor/Staff Cost				
Training	$3,500			
System operations and maintenance (0.25 FTE)		$13,750		**%**
Vendor implementation management	**$65,695**			10%
Project Implementation	**$65,695**			10%
Contingency	**$158,000**			20%
Grand Total	**$950,000**	**$107,090**		

Table 29. TCP Unit Costs

Components	Unit Cost (low)	Unit Cost (high)	Annual O&M Cost	Annual O&M Cost (high)		% for O&M
Operating System	$1,000	$1,200	$200	$240		20%
Database License	$1,900	$12,000	$76	$480		4%
System Development	$151,000	$252,000	$0	$0		0%
Server and Related Equipment	$6,000	$10,000	$420	$700		7%
Operator Interface	$3,000	$5,000	$150	$250		5%
Operator Console	$20,000	$35,000	$1,400	$2,450		7%
H/W and S/W Subtotal	**$ 182,900**	**$ 315,200**	**$ 2,246**	**$ 4,120**		
Agency Labor/Staff Cost						
Training	$21,000	$36,000				
System operations and maintenance (0.1 FTE)			$5,500	$7,500		%
Vendor implementation management	**$18,290**	**$31,520**				10%
Project Implementation	**$18,290**	**$31,520**				10%
Contingency	**$48,000**	**$83,000**				20%
Grand Total	**$288,000**	**$497,000**	**$7,746**	**$11,620**		

Table 30. TSP Unit Costs

Components	Unit Cost (low)	Low-end features	Unit Cost (high)	High-end features	Annual O&M Cost (low)	Annual O&M Cost (high)		% for O&M
On-board hardware (emitters)	$1,000	Limited ability to be controlled by MDTs	$2,500	Several rules can be setup on how to emit priority requests	$50	$125		5%
On-board interface with CAD/AVL (typically over Ethernet or J1708)	$250	Cost varies by vendor	$500	Cost varies by vendor	$13	$25		5%
Central configuration software (typically part of CAD/AVL)	$0	Basic features are in the CAD/AVL software	$25,000	Advanced features such as intersections, stops, MDt configuration management etc are available	$0	$5,000		20%
1 server and 1 workstation	$12,500	Cost varies by vendor	$20,000	Cost varies by vendor	$500	$800		4%
H/W and S/W Subtotal	**$13,750**		**$48,000**		**$563**	**$5,950**		
Agency Labor/Staff Cost								
Training	$1,200		$2,000					
System operations and maintenance (0.1 FTE)					$5,500	$7,500		
Vendor implementation management	**$1,375**		**$4,800**					
Project Implementation	**$1,375**		**$4,800**					
Contingency	**$4,000**		**$12,000**					
Grand Total	**$22,000**		**$72,000**		**$6,063**	**$13,450**		

APPENDIX I: GRANT APPLICATION TEMPLATE FOR NEW SERVICE

XXX PROGRAM OPERATING FUNDS APPLICATION
SFY 20XX-20XX (JULY 1, 20XX – JUNE 30, 20XX)

****Complete one application for each <u>NEW OR EXPANDED SERVICE</u> you are requesting assistance for. ****

(Example would be two entirely different systems, new services, etc.)

SECTION I - AGENCY INFORMATION
1. CONTACT INFORMATION
Legal Name of Applicant Agency: Click here to enter text.

2. TYPE OF SERVICE EXPANSION	
Operating Request ✓ appropriate space(s) below	
New service area or route	☐
Changed/expanded alignment of existing route	☐
Additional hours of service on existing route	☐
Additional frequency on existing route	☐
Other	☐

3. SERVICE DESCRIPTION
a. Please provide a brief description of the proposed service or provide a link to the relevant webpage or map. Click here to enter text.
b. What towns are served by this project? Please provide a list below. Click here to enter text.
c. How many vehicles are used in peak service for the project? Click here to enter text.

d. Please indicate which of NHDOT's standard route classes the proposed service fits into:

Route Class	Definition of Class	
Urban	Fixed route service that operates in larger cities (population of 40,000 or more)	☐
Small Town	Fixed route service that operates in smaller cities and towns of 10,000 to 40,000 population.	☐
Rural/Flexible	Fixed routes in towns with population of less than 10,000 or those lacking a significant trip generator, or flexible route deviation services.	☐
Urban Demand Response	Demand response services in cities with population of 40,000 or more	☐
Rural Demand Response	Demand response services in cities or towns with population under 40,000	☐
Commuter	Routes that operate primarily during peak commuting periods and are oriented toward work trips. These routes may have limited stops or express segments.	☐
Circulator/Parking	Routes that circulate in retail districts in cities or shuttle between parking lots and large employers or retail districts.	☐
Targeted Shuttle	Routes that primarily serve college students or other special purpose routes. Can include seasonal services or shopping routes.	☐

e. Explain your agency's commitment to continue this project beyond the availability of the requested grant resources. Click here to enter text.

f. Provide evidence of public support for the project from municipal, regional, institutional and/or private sector partners. Describe your efforts to leverage funds from these partners or other sources to support this project. Click here to enter text.

4. SERVICE DATA

a. PROJECT SERVICE LEVEL INFORMATION - Provide the service level information for the proposed funding. Passenger Trips: Total of one-way trips (individual passenger boardings). Operating Cost: Total gross operating cost including allocated share of administrative expenses.

	Year 1	Year 2	Year 3
Service span (beginning and end times for weekday, Saturday and Sunday service)	Click here to enter text.	Click here to enter text.	Click here to enter text.
Service headways (by time period if variable)	Click here to enter text.	Click here to enter text.	Click here to enter text.
Annual Vehicle Revenue Hours (VRH)	Click here to enter text.	Click here to enter text.	Click here to enter text.
Annual Vehicle Revenue Miles (VRM)	Click here to enter text.	Click here to enter text.	Click here to enter text.
Annual One-way Vehicle Revenue Trips (VRT)	Click here to enter text.	Click here to enter text.	Click here to enter text.
Annual Passenger Trips	Click here to enter text.	Click here to enter text.	Click here to enter text.
Boardings per VRH	Click here to enter text.	Click here to enter text.	Click here to enter text.
Boardings per VRM	Click here to enter text.	Click here to enter text.	Click here to enter text.
Boardings per VRT	Click here to enter text.	Click here to enter text.	Click here to enter text.
Annual Operating Cost	Click here to enter text.	Click here to enter text.	Click here to enter text.
Annual Fare Revenue	Click here to enter text.	Click here to enter text.	Click here to enter text.
Annual Net Operating Cost	Click here to enter text.	Click here to enter text.	Click here to enter text.
Gross Cost/Passenger	Click here to enter text.	Click here to enter text.	Click here to enter text.
Net Cost/Passenger	Click here to enter text.	Click here to enter text.	Click here to enter text.

b. How were your above service level projections developed? Provide detail on the sources of information and assumptions used for cost and ridership projections Click here to enter text.

c. Is the project described in an agency or local plan? Please provide the plan details below.

Plan Name: Click here to enter text.

Date of Adoption: Click here to enter a date.

Link to plan webpage (if applicable): Click here to enter text.

Page(s) on which each project is listed: Click here to enter text.

d. Describe how the proposed service addresses one or more of NHDOT's Policy Goals for Public Transportation. (Draft policy can be found on Statewide Study website.)
Click here to enter text.

e. Describe any specific populations in these towns that are the target for this service. Provide statistical evidence of this using Census (American Community Survey) or other data. If service is for the entire population in general, applicants may simply provide total population statistics.
Click here to enter text.

f. Performance goals by Route Class are listed below. Indicate how the proposed service will exceed the productivity benchmark and operate below the cost benchmarks for the relevant route class by Year 3 and then on a sustainable basis thereafter. Click here to enter text.

Class	Productivity	Cost-Efficiency	Gross Cost per Passenger	Net Cost per Passenger
Urban	0.5 boardings per mile	$7 per mile	$11	$10
Small Town	7.5 boardings per hour	$100 per hour	$12	$11
Rural/Flexible	2.0 boardings per hour	$65 per hour	$20	$20
Urban Demand Response	0.12 boardings per mile	$8 per mile	$60	$60
Rural Demand Response	1.0 boardings per hour	$90 per hour	$50	$50
Commuter	7 boardings per vehicle trip	$140 per hour	$20	$18
Circulator/ Parking	.75 boardings per mile	$9 per mile	$10	$10
Targeted Shuttles	8 boardings per hour	$100 per hour	$10	$10

5. ELIGIBILITY/LIMITATIONS

a. Describe any eligibility limitations on passengers for the proposed service. (e.g., is it for seniors only?) Click here to enter text.

b. Describe any trip purpose limitations or priorities on services that you are requesting operating funds for. (e.g., is it for medical appointments only or do medical appointments have priority over grocery trips?) Click here to enter text.

6. COORDINATION

a. List agencies with which you have coordination agreements, and indicate the type of coordination activity: (check all that apply & list partner agencies for each)

✓	#	Coordination Activity	Partnering Agencies
☐	**1.**	Purchasing of vehicle parts	Click here to enter text.
☐	**2.**	Maintenance services	Click here to enter text.
☐	**3.**	Marketing, grant writing or fund-raising	Click here to enter text.
☐	**4.**	Dispatching or scheduling of trips	Click here to enter text.
☐	**5.**	Purchase of vehicle insurance	Click here to enter text.
☐	**6.**	Fuel purchasing	Click here to enter text.
☐	**7.**	Training of drivers or other staff	Click here to enter text.
☐	**8.**	Financial management or billing	Click here to enter text.
☐	**9.**	Sharing of vehicles with other agencies	Click here to enter text.
☐	**10.**	Other: (list) Click here to enter text.	Click here to enter text.
☐	**11.**	Other: (list) Click here to enter text.	Click here to enter text.
☐	**12.**	Other: (list) Click here to enter text.	Click here to enter text.

b. Please provide details regarding the above or other coordination efforts with other transportation providers in the service area (public, non-profit, and for-profit) click here to enter text.

7. SUPPLEMENTAL INFORMATION

Provide any additional information that may help explain your project or elaborate on previous answers.

Click here to enter text.

SECTION II – DOCUMENTATION		
8. ATTACHMENTS CHECKLIST		
Please attach each of these additional items to the emailed application. PLEASE LABEL EACH ATTACHMENT ACCORDING TO THE LABEL NUMBER PROVIDED.		
APPLICATION DOCUMENTATION		
✓	**Label**	**Description**
☐	**1.**	Budget "Attachment A" form completed ▪ Must show breakdown of how funds will be utilized
☐	**2.**	**Source & verification of required matching funds** - Letters of commitment of matching funds • Cash match requires letters noting match commitment from the agency that will provide the cash match
☐	**4.**	**Indirect Cost Allocation Plan** If applicable (see 2d above): Indirect Cost Allocation Plan approved by Cognizant Agency • If plan has not been approved, or is not current, a draft of the plan is to be provided. If project is awarded funding, a final, approved version must be submitted prior to reimbursement of any indirect costs
☐	**5.**	**Public Notice of grant application**, e.g., a scanned copy of the notice published in a newspaper of regional significance • Note: operating assistance requests must provide an opportunity for public hearing • NHDOT requires copy of notice as published in periodical of regional significance (e.g., Keene Sentinel for service in Keene area), such as a scan of the page •
☐	**6.**	**Agency's approved Title VI/Civil Rights plan**
☐	**7.**	**Additional information** related to transportation services: • Include marketing materials that are used to notify potential customers/riders about the availability of service • These materials may include brochures, advertisements, website screen shots, letters, etc.
The following items are for NEW applicants only		
☐	**8.**	**Service Area map** with clear demarcation of towns & cities included in proposed project service area OR a listing of all town & cities to be included in service area • Indicating population density for project area(s) Map may be obtained from regional planning agencies
☐	**9.**	**Public transit operator certification -** shall indicate that the public transit operator in the project area, if one exists, is unable to provide the service proposed under this application
☐	**10.**	**Vehicle inventory** - for vehicles intended to be used for project identified in application
☐	**11.**	**Most recent financial audit (URL if available online)**
☐	**12.**	**List of Board of Directors** – with affiliations, if any
☐	**13.**	**Bus Schedule and fare information**

9.SIGNATURE

I certify that to the best of my knowledge the information in this application is true and accurate and that this organization has the necessary fiscal, legal, and managerial capability to implement and manage the project associated with this application.

Agency: Click here to enter text.

**Authorized Agency Representative, Title: Click here to enter text.

**Signature: _____ Date: Click here to enter a date.

***Must be signed by someone with authority to sign contracts on behalf of your organization.*

EMAIL COMPLETED APPLICATION AND ATTACHMENTS TO
frederick.butler@dot.nh.gov