Concord-Manchester Transit Feasibility Study

Final Report

March 17, 2014

STEADMAN HILL CONSULTING, INC.

NEW HAMPSHIRE SOUTHERN PLANNING COMMISSION

SNHPC

CNHRPC

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Introduction

This report presents the final results and recommendations of a feasibility study for transit service between Concord and Manchester, New Hampshire. Manchester is the largest city in New Hampshire (pop. 109,565), while Concord is the state capital (pop. 42,695). Both cities have substantial employment bases, including public and private sector workers, as well as large resident populations. They each also have local transit systems: Concord Area Transit (CAT), and the Manchester Transit Authority (MTA). These systems provide service largely within the respective city borders, mostly on hourly headways (trips once per hour). In recent years, there has been a small amount of service provided between the two cities, which are roughly 17 miles apart, by Concord Coach, as part of its larger intercity network, and by MTA, which ran two midday round-trips from Manchester to Concord prior to July 2013.

Impetus for the Study

Local and legislative leaders have long recognized the potential transit market between Concord and Manchester, but have not heretofore made a commitment to studying it and implementing new service. In addition to the two cities, the Manchester-Boston Regional Airport (MBRA), located at the southern edge of Manchester, is a major traffic generator. While MTA operates bus service from downtown Manchester to the airport, until July 2013 it was not possible to take a bus from Concord or other surrounding towns to MBRA. There was concern among officials that the lack of bus service to MBRA was discouraging local residents from using the airport, especially given the presence of express bus service to Boston's Logan Airport, operated by Concord Coach.

Thus, during the Spring of 2013, the two regional planning commissions covering the Concord-Manchester area, the Central New Hampshire Regional Planning Commission (CNHRPC) and the Southern New Hampshire Planning Commission (SNHPC), in cooperation with the New Hampshire Department of Transportation (NHDOT), jointly commissioned a study of transit service between Concord and Manchester, including MBRA. The stated goal of the study was to "develop a plan for proposed services that will most effectively and efficiently meet the transportation/transit needs of residents in the regions served by CNHRPC and SNHPC."

Pilot Operation on Route 4

At the same time, MTA identified some funding to operate a pilot service for one year connecting the two cities and the airport in order to help gauge the demand for this service. NHDOT provided matching funds in the form of toll credits so that MTA could draw down the federal funds without requiring additional cash from the State, the localities, or the airport. This pilot service, MTA's Route 4 Concord Express, began operation on July 1, 2013. The initial schedule included twelve trips per day. Two early morning trips, at 3:30 a.m. and 4:30 a.m. were intended to allow air passengers to reach the first flights in the morning departing from MBRA. Six trips in the morning peak, midday and afternoon peak served both airport trips and trips between the two cities. Finally, four hourly late trips, from 9:15

p.m. to 12:15 a.m., connected the airport to Concord, facilitating trips home or to hotels for passengers arriving on evening flights.

Ridership grew steadily during the first months of operation, from 695 passengers in July, to 992 in August and 975 in September. However, the ridership was not evenly distributed among the trips operated. Hardly anyone rode the 3:30 a.m. trip, and ridership was very light on the other early morning trips as well as the evening trips between the airport and Concord. About 66 percent of the riders on the route were traveling just between the two downtowns, mostly on the commuting hours and midday trips. In November, MTA cancelled the 3:30 a.m. trip due to poor patronage.

Ridership peaked in October at 1,148 passenger trips and dropped in November to 825 and in December to 786. This downward trend is more indicative of normal seasonal variation, experienced industry-wide, than of any particular problem with this route.

Following a meeting with legislative leaders in December (discussed in more detail below), MTA expressed the ability to reorient the route to better serve the downtown-to-downtown market. MTA held a public hearing in January to present a new schedule with seven trips just between downtown Manchester and downtown Concord. This new schedule was implemented on February 10, 2014.

Organization of the Study Team

The Concord-Manchester Transit Feasibility Study was conducted jointly by the staffs of the two planning commissions and Steadman Hill Consulting, Inc. (SHC). The planning commissions were responsible for assembling background materials, conducting new data collection, preparing maps, organizing meetings of a group of stakeholders, and overall project oversight, while SHC developed survey instruments for the data collection, performed analyses, developed service concepts, and presented findings to the stakeholders and policymakers. The list of stakeholders participating in the project is presented in the appendix. This report was prepared by Steadman Hill Consulting.

Market Analysis

The travel market between Concord, Manchester, and Manchester-Boston Regional Airport (MBRA) is an active one, serving many travel patterns and purposes. Prior to designing transit routes to try and capture some of that market, it is necessary to analyze the market and identify which segments of the market represent the best targets for transit service. This section of the report presents an overview of the travel market in the study area, considering household density, demographics, employment density, commuting patterns and travel patterns for non-work trips.

Residential Overview

While the present study is not concerned with a comprehensive look at local bus service in the Concord-Manchester region, it is useful to understand the basic characteristics of residential and employment patterns in the region to be able to design any type of new service. The maps on the next few pages illustrate the key features of development and demographics that are the most significant determinants of transit demand.

Prior to compiling data for analysis, the study team (consultant and RPC staff) defined a study area that would be used for mapping purposes. Concord, Manchester and the towns between the two cities would obviously be included, but the team decided to include one ring of towns around the central corridor as these other towns would be the most likely source of park-and-ride users. A total of 13 cities and towns comprise the study area, which is subdivided into 66 census tracts or 197 census block groups, depending on the data source.

Figure 1 shows the residential density of the study area in terms of households (HH) per acre. The transit industry generally considers a density of 3 households per acre—roughly equivalent to quarter-acre zoning—to be the minimum density needed to support regular local bus service. This map uses that threshold as the dividing line between urbanized areas and more rural-style development. Block groups with densities of 3 HH/acre and higher are restricted to the cities of Concord and Manchester, with the exception of the southeastern corner of Goffstown. Pembroke and Allenstown have moderate density along the US 3 corridor. Otherwise, the central portions of Concord and Manchester are clearly different from the rest of the study area, with much higher densities. Not coincidentally, these areas are the focus of the CAT and MTA systems.

Figure 2 below shows a close-up view of household density in the City of Manchester. Overlaid on this map is the local bus route system operated by the MTA, indicated by green lines. The local route network is most dense throughout the downtown area and surrounding neighborhoods where residential density is highest, exceeding 12 households per acre for several block groups. By many traditional measures, the densities in Manchester indicate that a higher level of service (with more than one bus per hour on regular local routes) could be operated and would attract more riders.

Transit studies usually consider various measures of "transit propensity" or, in other words, characteristics that indicate greater than average need for transit services. Typical

Figure 1: Household Density by Census Blockgroup (2010)

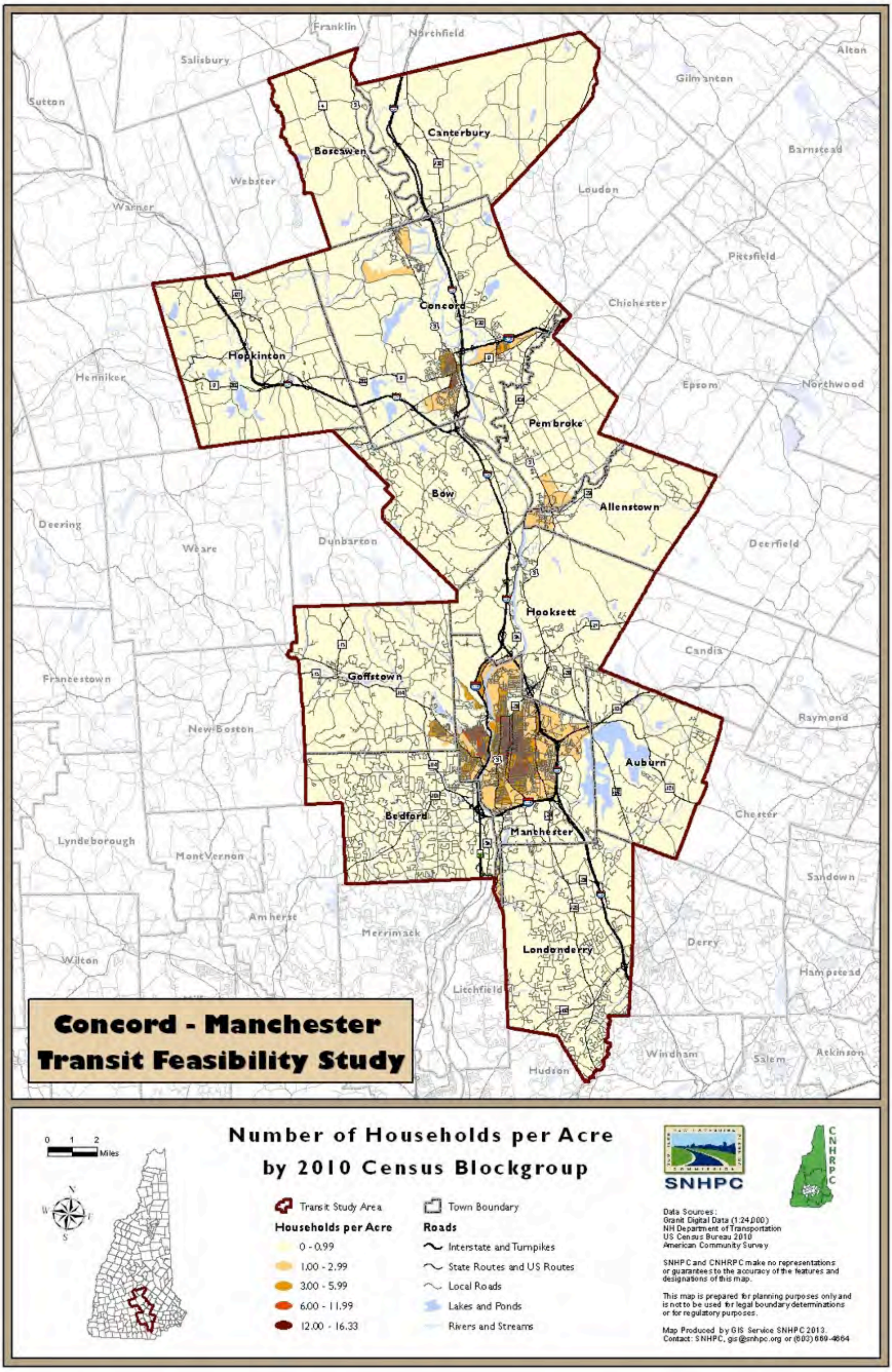
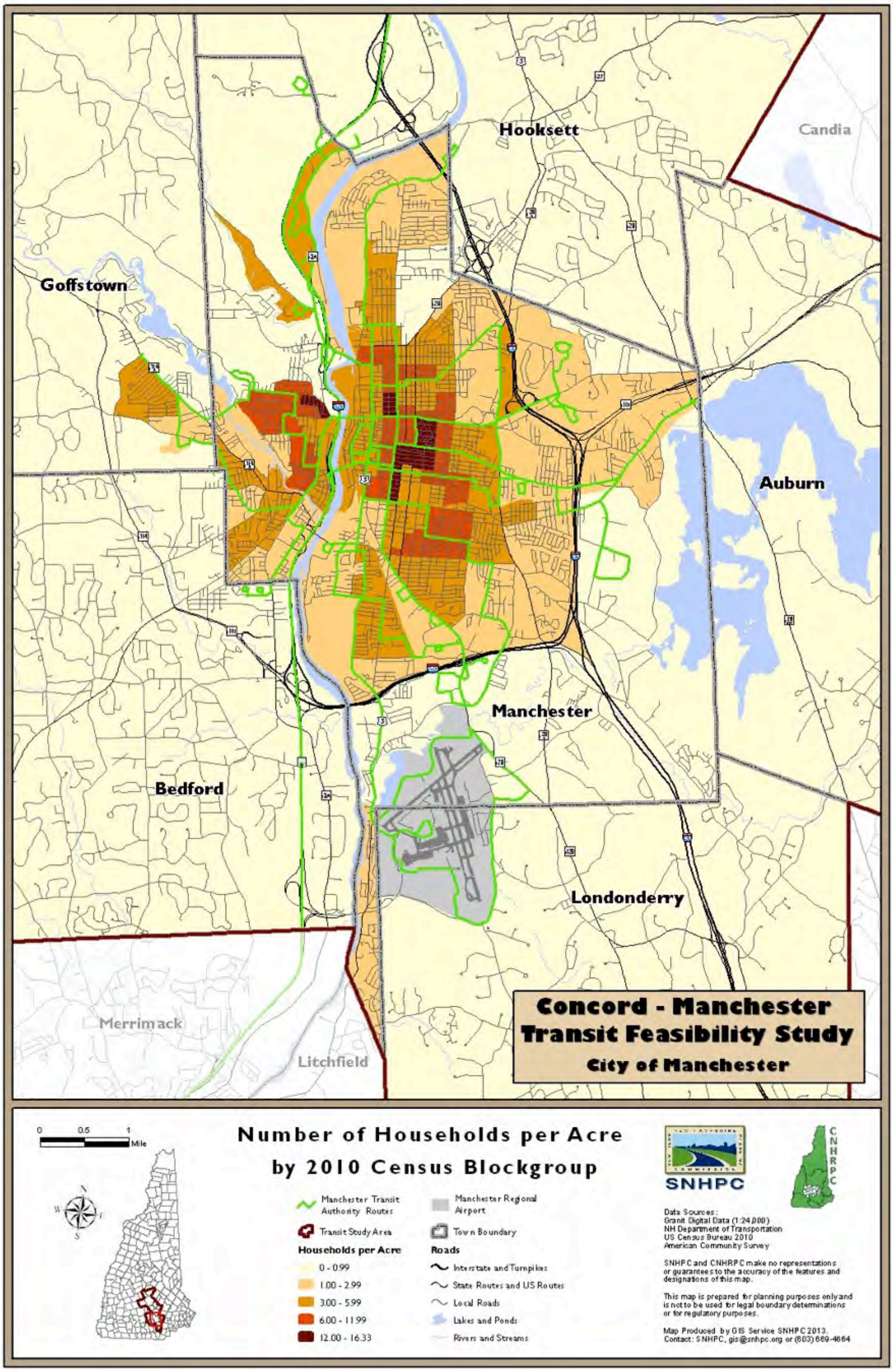


Figure 2: Household Density in Manchester by Census Blockgroup (2010)



measures include age (older adults, youths), income, automobile ownership, and other factors. For this study, two such maps are provided below. The first (Figure 3) is the percentage of older adults by block group, representing people 65 years and older.

It should be noted that the block groups with the highest residential density on Figures 1 and 2 are not the same as those with higher percentages of older adults. The densely developed downtown areas of Concord and Manchester are occupied more by younger families or single individuals. Housing developments for seniors, such as Havenwood in Concord, are located outside of the downtown. Some block groups in Bow, Boscawen, Goffstown and Bedford have the highest percentage of seniors, between 25 percent and 39 percent. To some extent, these high percentages reflect the overall lower number of people in these more rural areas, in that a small senior housing development could push up the percentage for the block group significantly.

Perhaps the single greatest indicator of need for transit is the percentage or number of people with zero vehicles available. This statistic is displayed in Figure 4.

With the exception of the block group in northwestern Concord that includes the Penacook neighborhood, all of the areas that have higher-than-average percentages of auto-less persons are located in or near the downtown areas of Concord and Manchester. Being close to the downtowns allows these residents to complete most or all of their trips (to work, shopping, etc.) by walking or taking local transit services.

The residential analysis has demonstrated that the downtown-to-downtown market for transit travel is potentially strong. There is transit-supportive density in both downtowns and significant numbers of people without cars available. While there are not large concentrations of older adults in the downtown areas, there are many near to the downtowns. These indicators show why local transit service is viable within both downtowns, but they also suggest that transit service between the two downtowns may also be viable, as will be established more directly below. As no transit services have yet been designed within this study, it is impossible to say to what extent riders would be expected to walk to stops in downtown areas or drive to park-and-ride lots near roadway interchanges, but it is clear that densely-developed downtown areas are essential for successful transit routes at the destination end, and strongly correlated with successful routes when they are at the origin end as well.

Employment Overview

Transit routes are most competitive to driving when they serve an area with many jobs located within a short walking distance of a single point. Not only does this development pattern allow for efficient bus route design (without a lot of meandering through low density office parks), but high-density job centers also typically have constrained parking with significant (more than a dollar or two) daily parking fees. As will be discussed later, parking cost and availability is a key factor in determining transit demand.

Figure 3: Percentage of Older Adults by Census Blockgroup (2010)

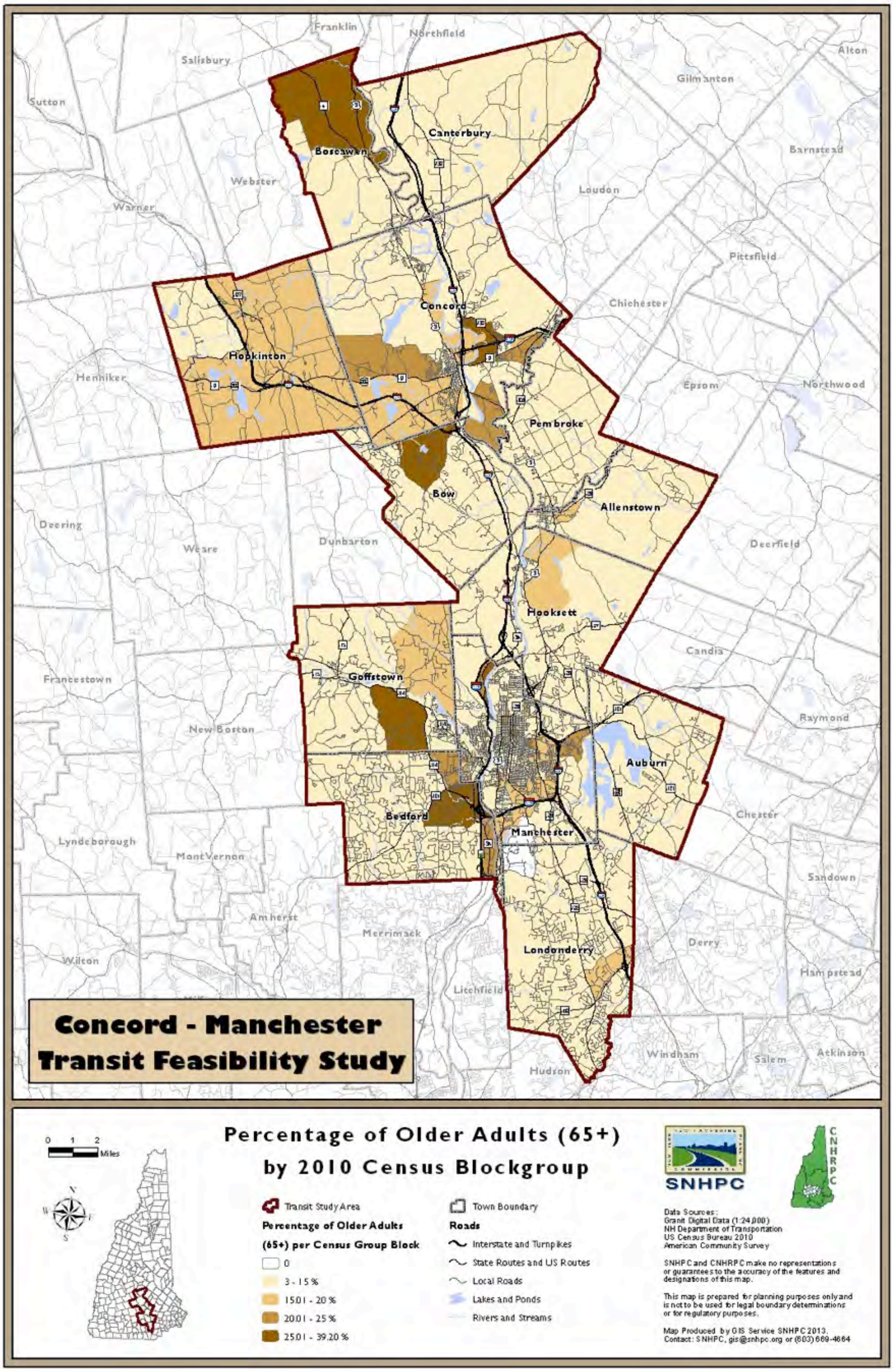
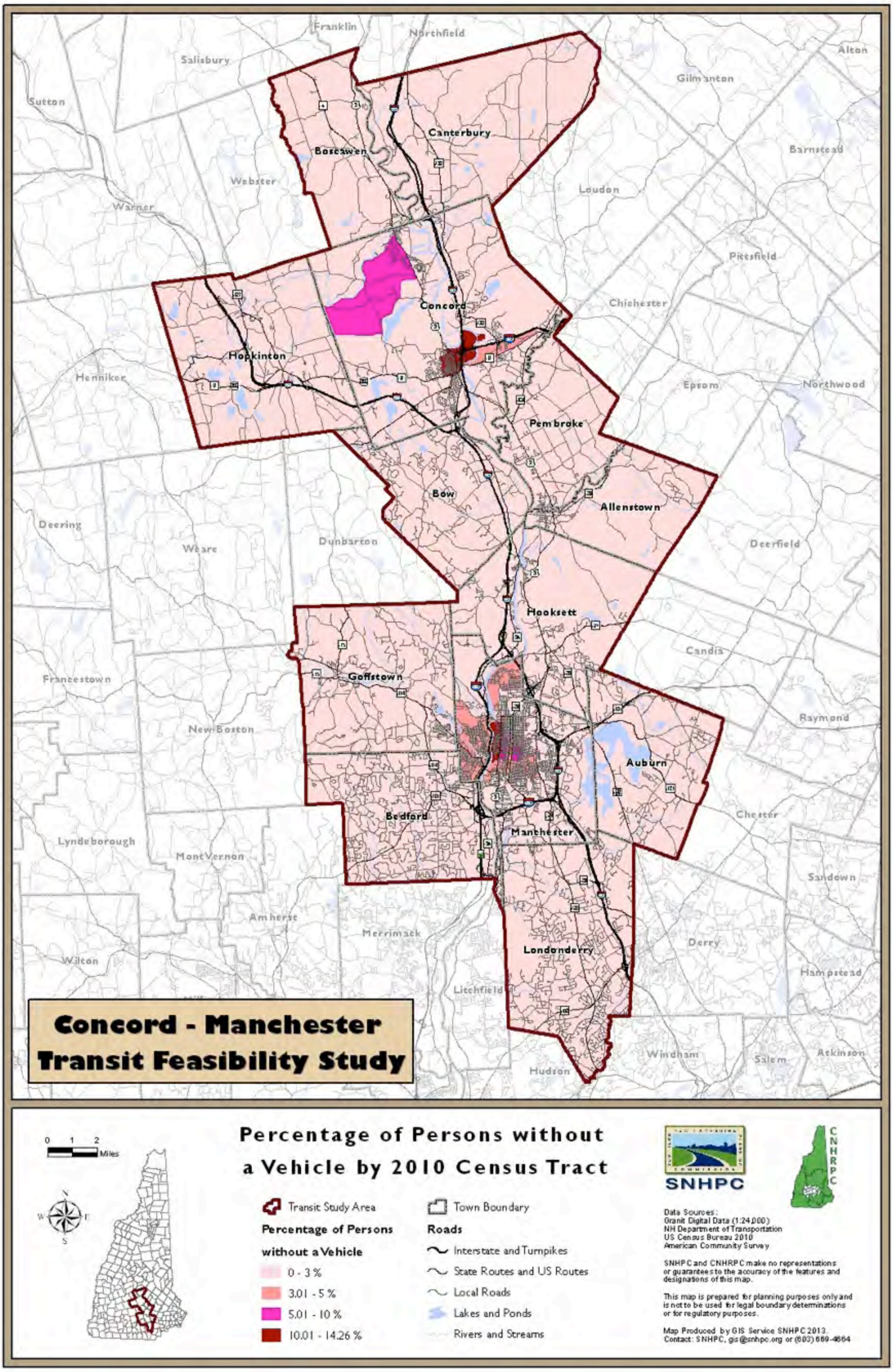
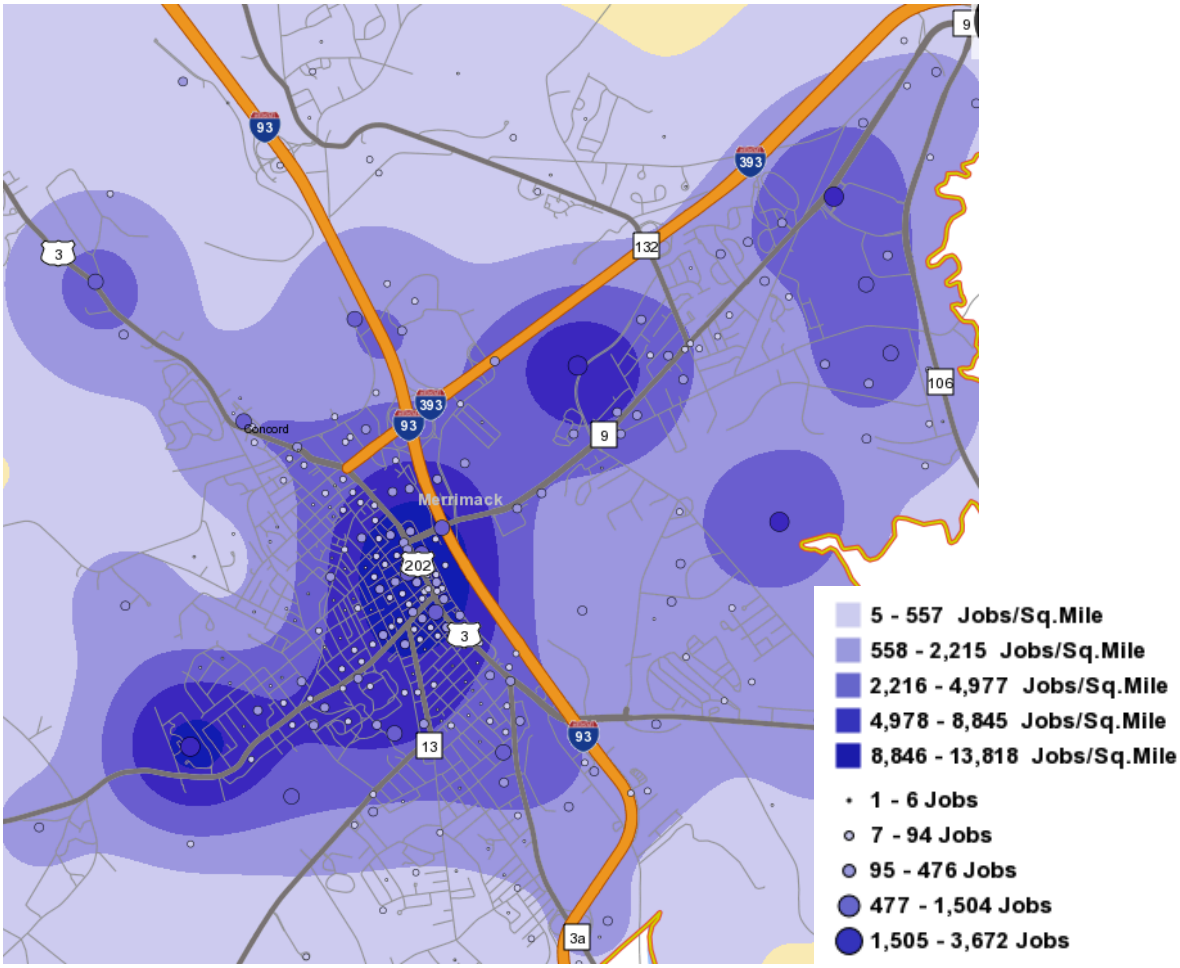


Figure 4: Percentage of Persons without a Vehicle by Census Blockgroup (2010)



The Longitudinal Employment-Household Dynamics (LEHD) database maintained by the US Census provides a wealth of data on the location of employment and its relationship to residences. The following maps, shown in Figures 5 and 6, display the employment density of the cities of Concord and Manchester. Darker colors show greater employment density.

Figure 5: Employment Density in Concord (2011)

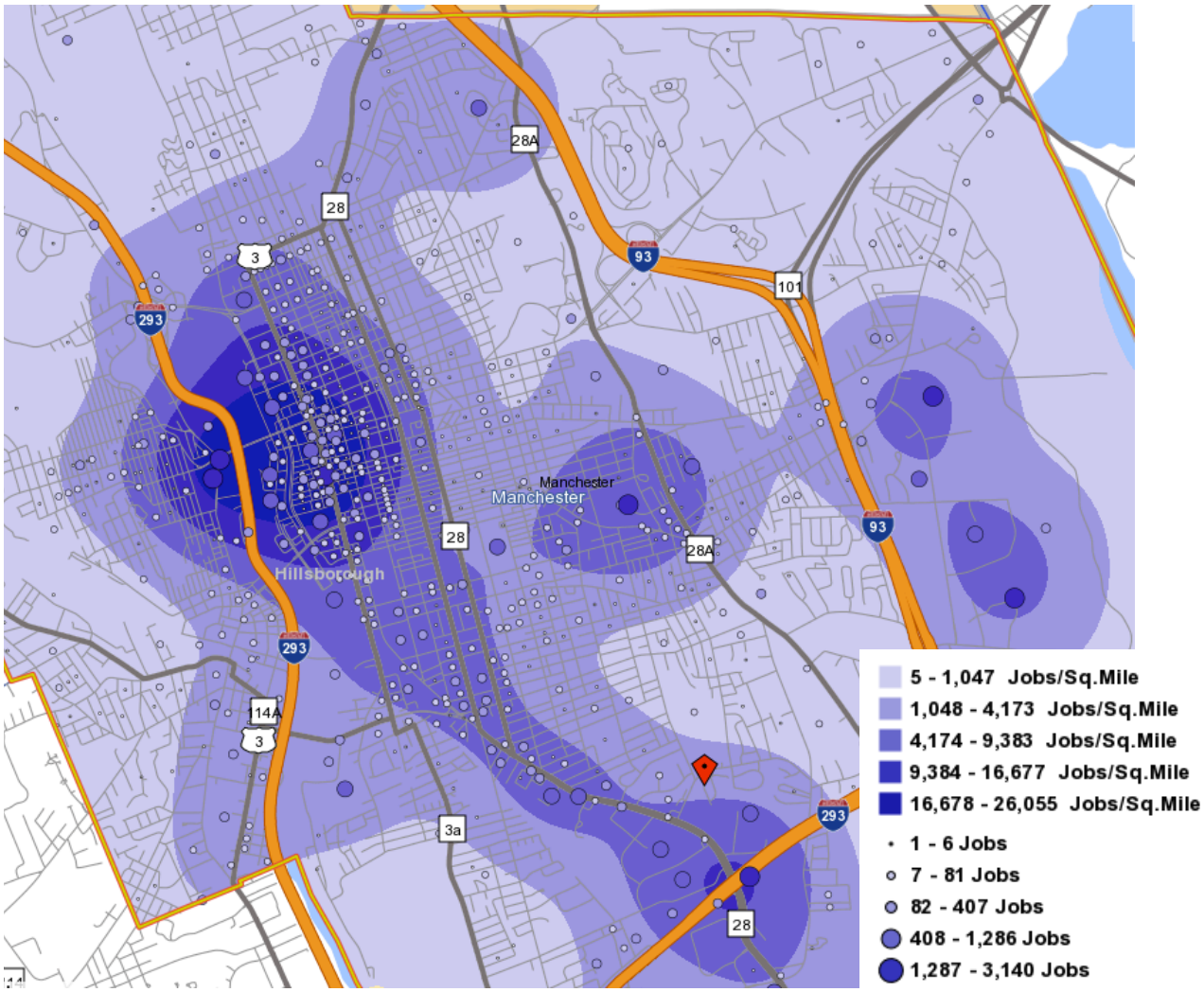


The highest concentration of jobs in Concord is the downtown area along and to the west of North Main Street, from Court Street in the north to Thorndike Street in the south. Much of the employment in this area consists of State offices and other public agencies. Other concentrations in Concord occur at Concord Hospital, at the State office complex on Hazen Drive, and along and south of Loudon Road, encompassing Steeplegate Mall plus other "big box" stores.

Figure 6 shows the employment density in Manchester. Like Concord, the highest density occurs in the downtown area, with approximately 20,000 jobs per square mile in the area spanning Elm Street (US 3) from Myrtle Street in the north to Lake Ave in the south. Outside of the downtown, Elliot Hospital is responsible for moderate density employment just west of Mammoth Rd, while various large employers along East Industrial Park Drive

create small clusters of high employment density. The last area worth mentioning is the Mall of New Hampshire at the intersection of NH 28 (South Willow Street) and I-293. Indeed, South Willow is a relatively continuous corridor of high employment density. MTA Route 8, which runs between downtown Manchester and the Mall of New Hampshire along South Willow Street, is MTA's highest ridership route, with between 200 and 250 boardings per day.

Figure 6: Employment Density in Manchester (2011)



Commuting Patterns

As is evident in the above figures, there are several concentrations of employment in Concord and Manchester. The OnTheMap tool, part of the LEHD program, allows an analyst to map out the origin (home) locations of workers commuting to any destination zone. For the purpose of this analysis, five destination zones were selected and drawn using the OnTheMap tool:

- Downtown Manchester
- Manchester Airport/Mall of New Hampshire

- Downtown Concord
- Concord Hospitals
- Concord Malls

Figures 7 through 11 illustrate the commuting patterns to these five employment zones. The maps show the density of residences of commuters (commuters per square mile) by Census tract. Density is used because the tracts vary widely in size, and a compact tract with fewer commuters is a better potential transit market than a very large tract with more commuters. Nonetheless, the maps do show which tracts send more than 100 commuters to the destination zone, as indicated by a red star.

The greatest concentration of commuters to the downtown area of Manchester is located in the set of tracts to the north and east of downtown. Indeed almost the entire city has a high density of commuters. Neighboring tracts in Hooksett and Goffstown have a moderate density of commuters, and tracts in surrounding towns to the east, west, and north all send more than 100 people to work in downtown Manchester every day. Outside of these close-in areas, though, the highest concentration of downtown Manchester commuters is located in downtown Concord. While these tracts in Concord do not have more than 100 commuters traveling to downtown Manchester, their relatively high density of commuters (compared to other outlying areas) means that downtown Concord represents a good transit commuting market.

The second job center, illustrated in Figure 8, includes the Mall of New Hampshire and MBRA. This job center has far fewer commuters than Downtown Manchester (2,700 residing within the study area, compared to 6,500 for Downtown) and so there are only a few tracts with more than 100 commuters. The highest concentrations of commuters are all located within the City of Manchester, except for one tract located in downtown Concord. Again, this concentration indicates some potential for a transit route connecting downtown Concord to the mall and airport.

For the third job center, Downtown Concord, shown in Figure 9, the highest densities occur in the tracts adjacent to downtown on the south and east. Outside of the City of Concord, the only other tracts with concentrations of commuters are located in downtown Manchester and across the river in the western part of the city. Similar to the reverse situation, these tracts in Manchester do not send more than 100 commuters to Concord, as do tracts in Bow, Pembroke, and Hopkinton, but they have higher concentrations, which make them a better target market for a commuter bus service. Overall, Downtown Concord is the third largest of the five job centers, with 3,300 jobs held by study area residents.

The “hospitals” area of Concord includes both Concord Hospital (HealthSouth Rehabilitation Hospital) and New Hampshire Hospital. There are also many doctors’ offices located in the area between the two hospitals. As shown in Figure 10, the same tracts within Concord that generated commuting trips to the downtown area also generated commuters for the hospitals area. Also, similar to Figure 9, the only concentrations of commuters outside of Concord are in the downtown area of Manchester. The hospitals area is the smallest of the five job centers, with about 2,300 jobs held by study area residents.

Figure 7: Commuters to Downtown Manchester (2011)

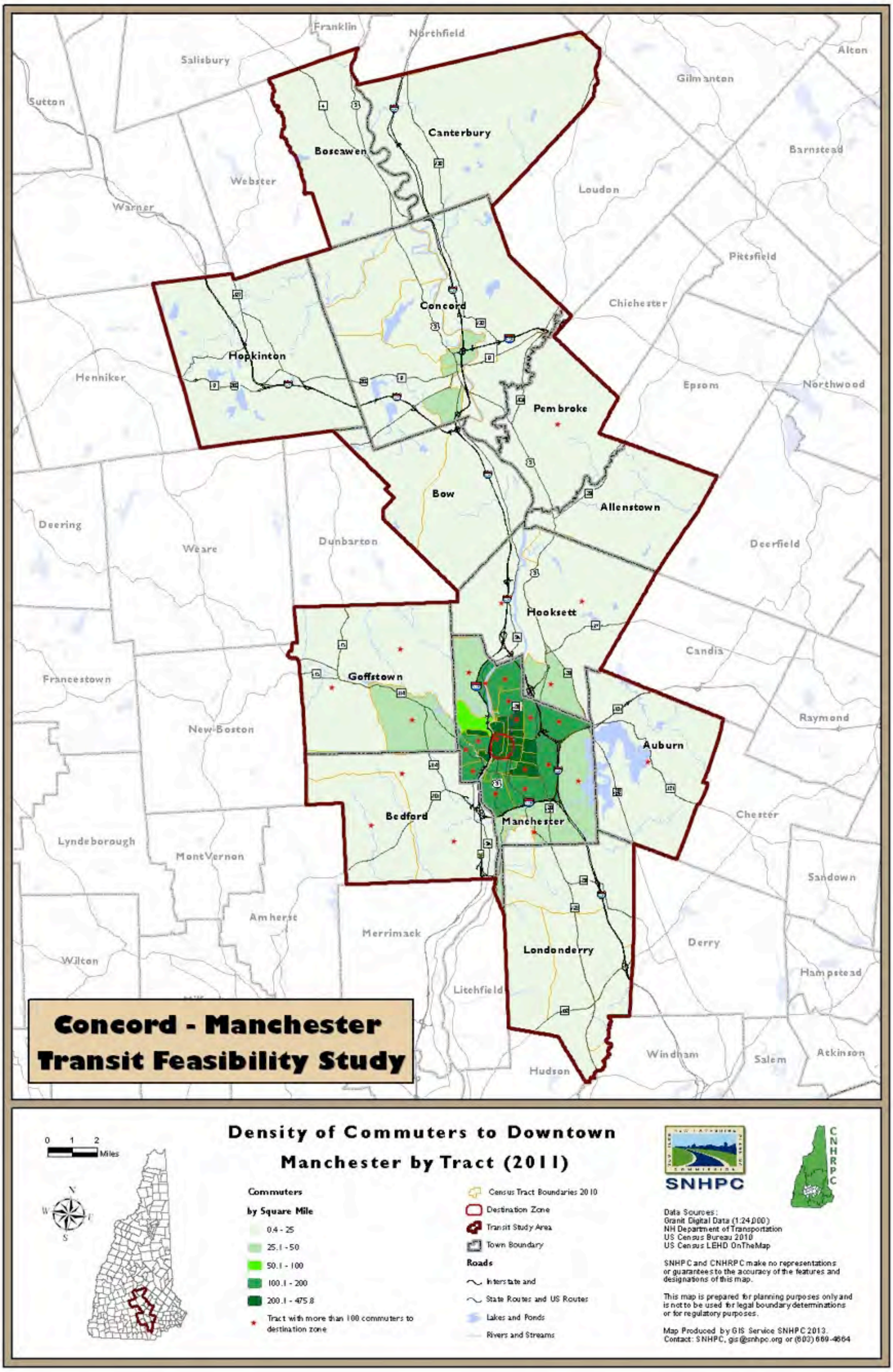


Figure 8: Commuters to Mall of New Hampshire and MBRA (2011)

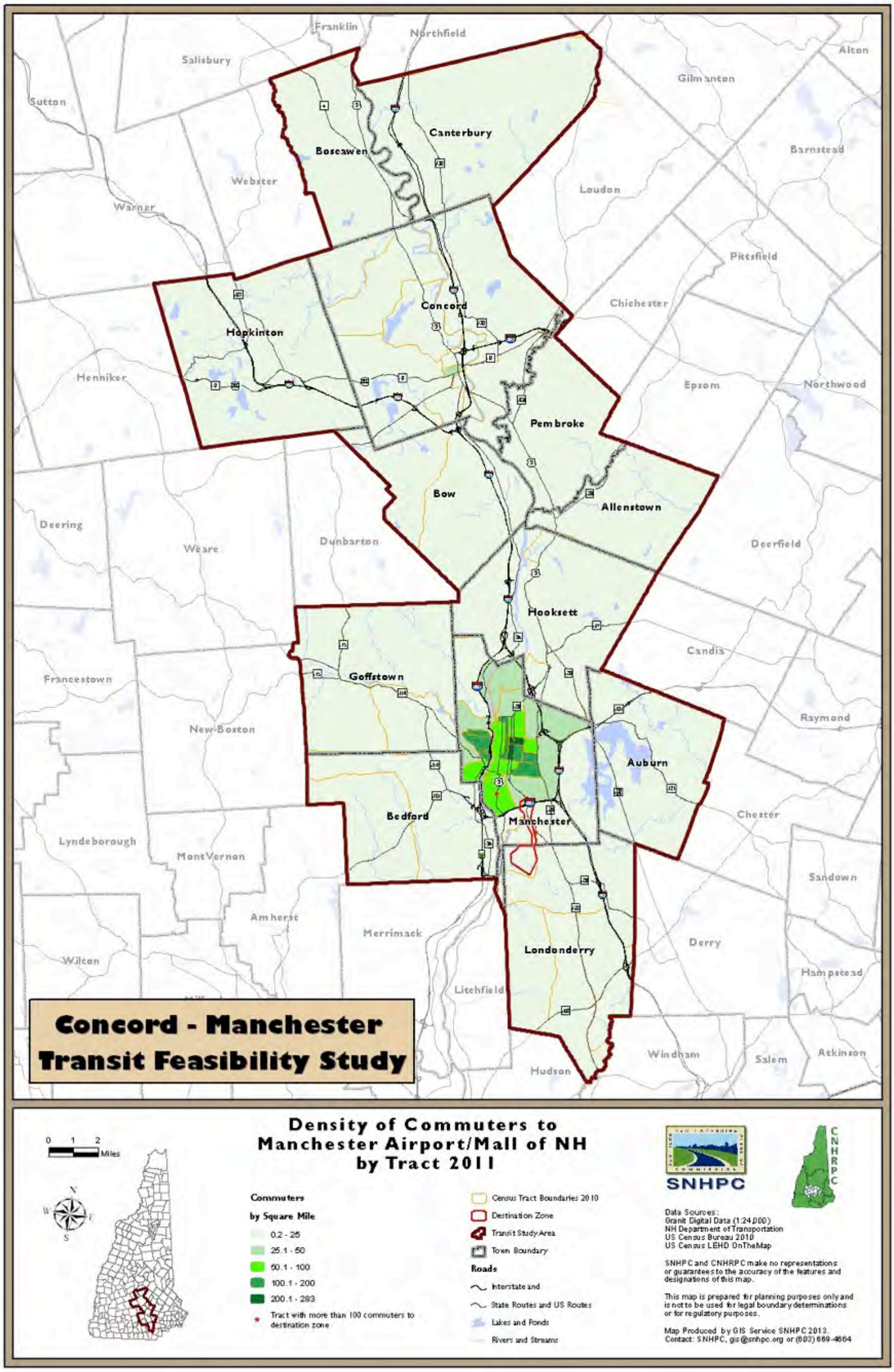


Figure 9: Commuters to Downtown Concord (2011)

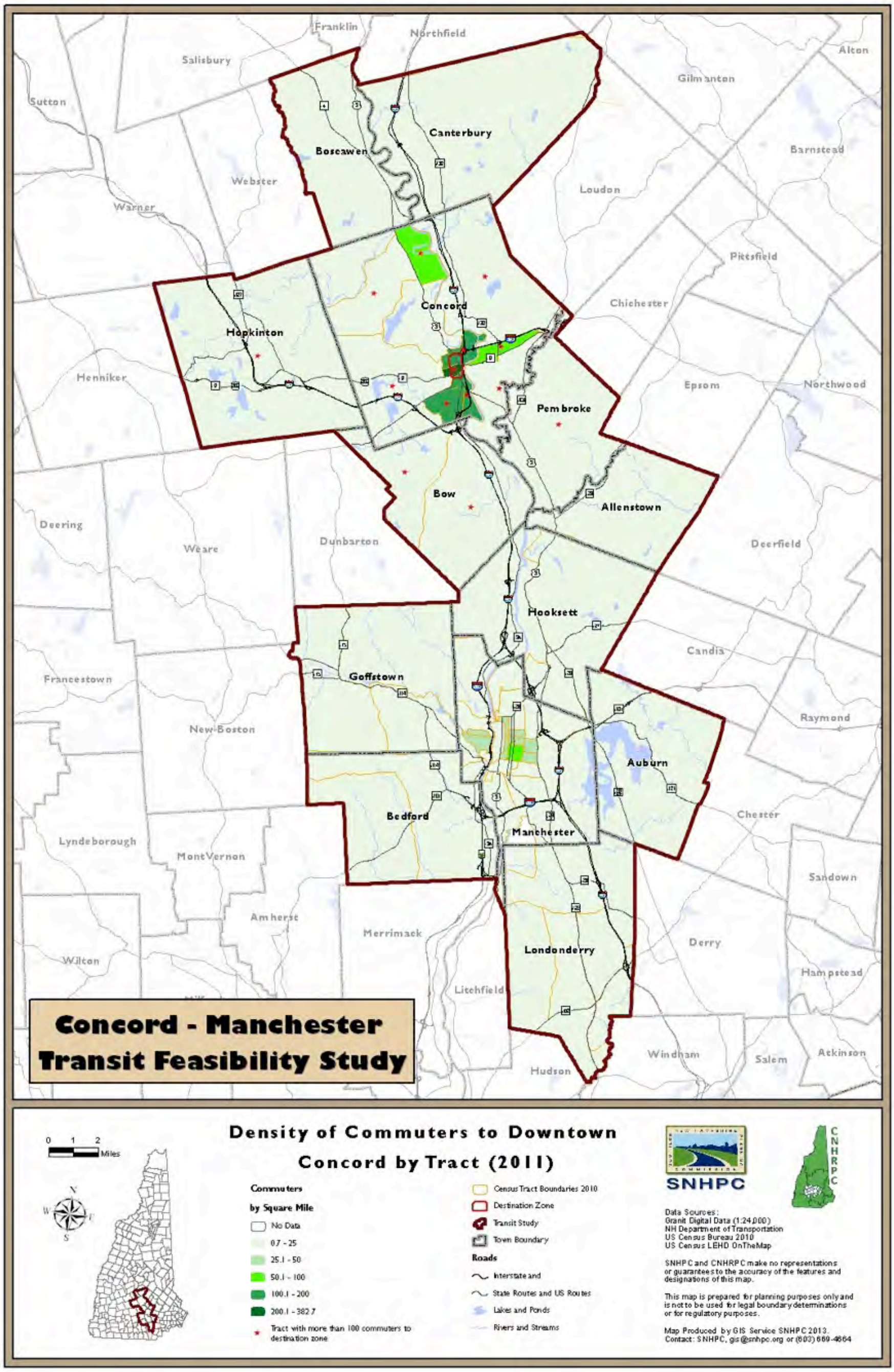


Figure 10: Commuters to Concord Hospitals (2011)

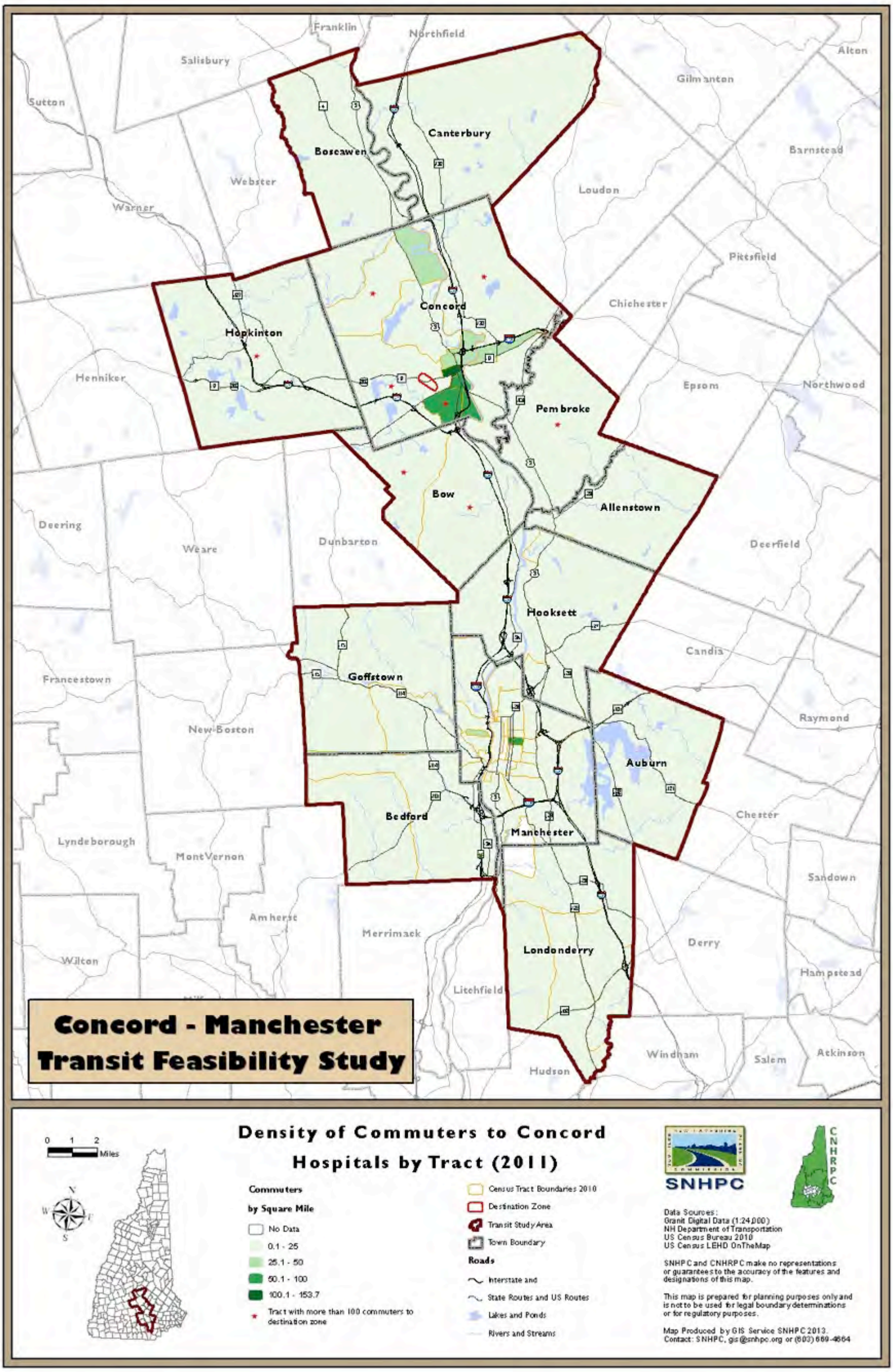
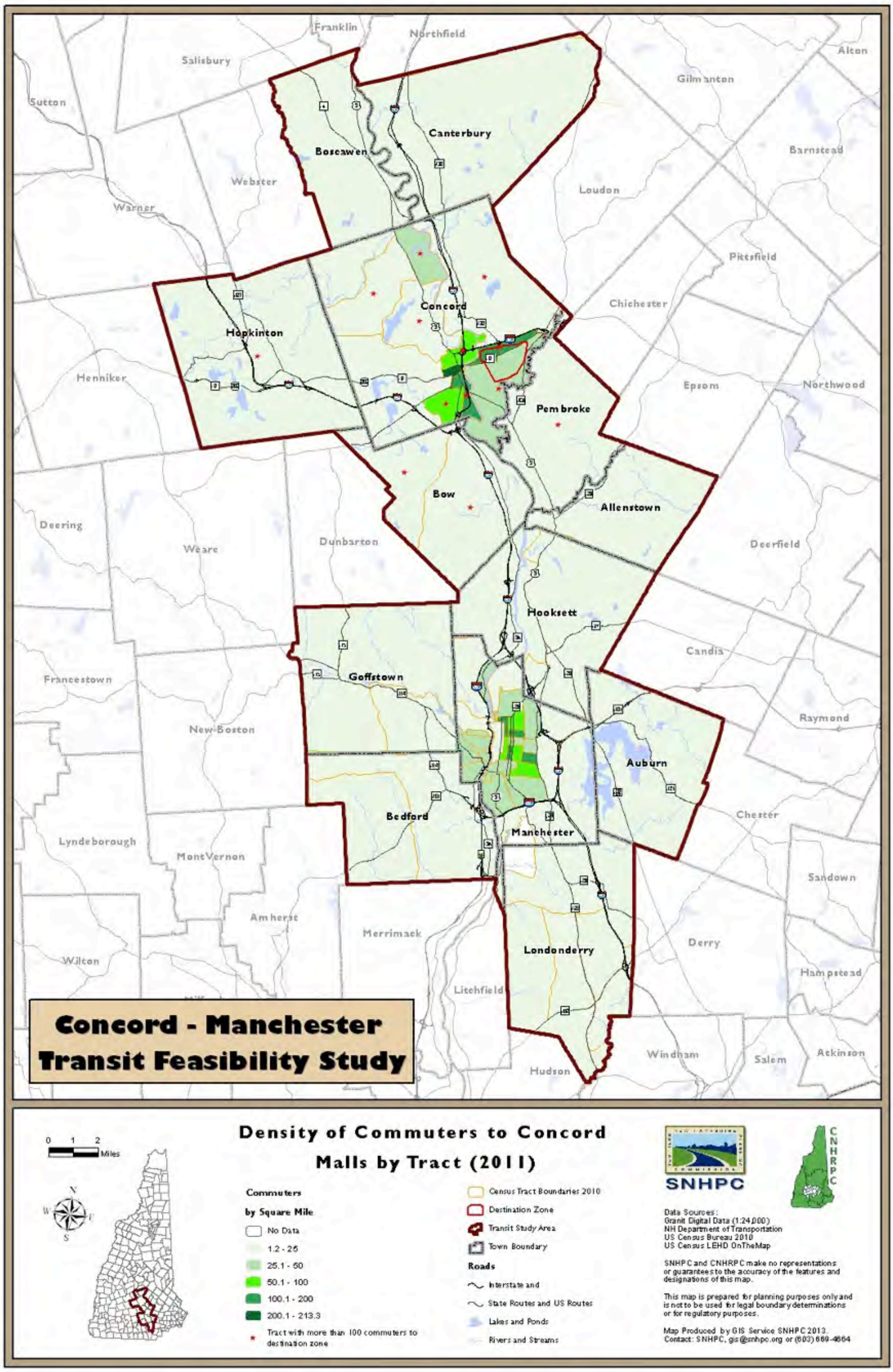


Figure 11: Commuters to Concord Malls (2011)



The final map in the series, Figure 11, shows the commuting pattern for the "malls" area of Concord, which includes the Thomson State Office Complex (Hazen Drive), Steeplegate Mall, and various big box stores south of Loudon Road. This area, generating 3,700 commuting trips from study area residents, has an even stronger association with downtown Manchester than other employment zones in Concord. While the City of Concord, particularly the southeastern quadrant, has high concentrations of workers in the malls area, many tracts within Manchester have more than 50, and four have over 100, commuters per square mile to the Concord malls zone.

The series of commuting maps has established that there is a strong commuting connection between the downtown areas of Concord and Manchester, and between those cities' downtowns and other job centers located within the municipal borders. While tracts in other towns may send higher absolute numbers of commuters to these job centers, a transit route works best when it serves a high density of demand so that people are able to walk a reasonable distance to reach the bus route. The service design phase of this study will determine whether a route connecting downtown Concord to downtown Manchester can also provide access from the surrounding areas to the downtowns via park-and-ride or local stops. The key trade-off will be between travel time/directness of service and the coverage/degree of access. Making more stops opens up the route to more potential riders, but at the same time makes the route less attractive to riders who want a fast, direct trip.

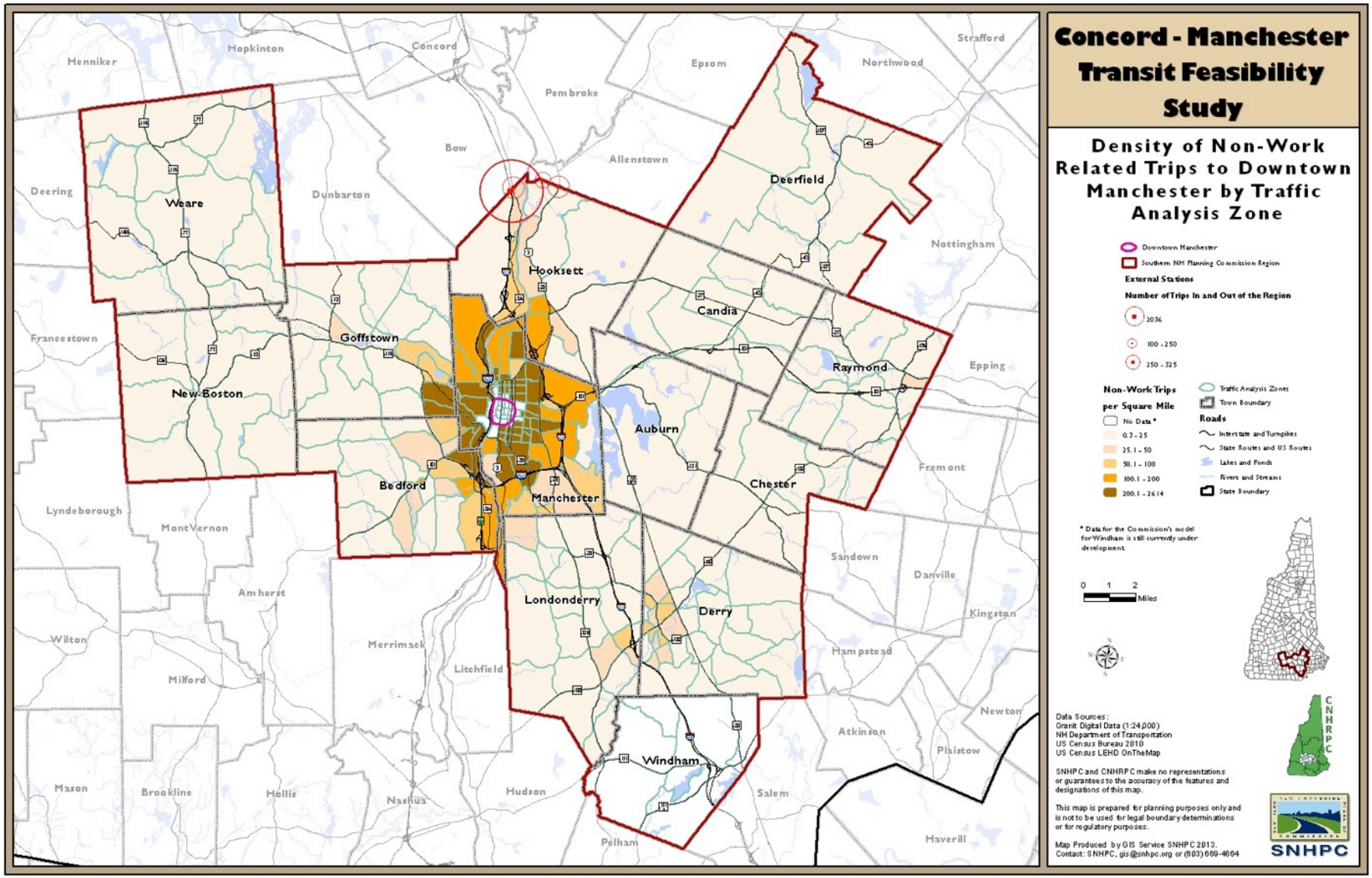
Non-work Travel

Of course, commuting to work is not the only type of travel in the region. The regional model maintained by SNHPC contains a table listing trips by various purposes, including shopping, social/recreational, school, and other. These trips each have an origin traffic zone and a destination traffic zone. There are approximately 270 traffic zones in the model. It is important to note that the model does not cover towns north of Hooksett, since that is the limit of the SNHPC region. Trips coming into the region from the north are represented by three "external" nodes (i.e., I-93, US 3, NH 3A.).

Figure 12 displays the origin locations of non-work trips destined to Downtown Manchester. This map combines the trip purposes of home-based shopping, social, and other. Home-based school trips and non-home-based trips were not included in this analysis as they were judged to be less susceptible to capture by a new transit service linking Concord and Manchester.

The highest densities of trip origins are within the City of Manchester and in the immediately adjacent zones in Bedford, Goffstown and Hooksett. Derry and Londonderry also show moderate densities of trip origins. While it is not possible to determine how many non-work trips come from Concord, the large circle, representing the external zone that accesses the Manchester region via I-93, shows that more than 2,000 non-work trips destined for downtown Manchester come from the north on that roadway. Based on the commuting analysis presented above, it is safe to assume that a significant number of those trips do come from the City of Concord.

Figure 12: Non-work Travel in Manchester Region (2010)



Survey Results

In addition to the analysis of data from the Census, LEHD, and the regional model, the project team collected new data as part of this study. Three surveys were undertaken:

- Survey of employees in Concord and Manchester
- Survey of young professionals in Concord and Manchester
- Survey of riders on MTA Route 4 (Concord Express)
- Survey of exiting passengers at MBRA

The goal of these surveys was to learn more about travel patterns in the region and to understand why these commuters and travelers make the transportation choices they do.

Employee Survey

A web-based survey was set up by SNHPC using Survey Monkey, and employees at State agencies and at private sector firms in Manchester and Concord were invited to participate. Nearly 400 individuals took the survey, residing in 77 communities, all but 3 of which were in New Hampshire. Manchester had by far the highest number of responses, with 116, followed by Concord with 36. Bedford, Hooksett, and Goffstown were in the range of 20 responses. In terms of workplace location, 290 respondents work in Manchester, and 88 work in Concord. The other respondents were scattered among 14 other towns. The specific workplace locations of survey respondents are shown below in Figure 13.

As can be seen in Figure 13, there were a significant number of work destinations in the downtown area of Manchester. Figure 14 below shows the home locations associated with these downtown Manchester workplaces. Each green dot represents a home location from which someone commutes to the workplaces represented by red dots. It can be seen that commuters to these downtown Manchester workplaces reside all over the region. Many reside in Manchester, and some reside in Concord, but practically every town on the map is represented with at least one commuter.

Respondents were asked several questions about their current commuting trips. The results are summarized below.

- 95 percent of respondents drive alone to work. There were only 4 individuals who indicated using public transportation to commute.
- 87 percent of respondents reported that they had a free parking space at work.
- Just over half of respondents (57 percent) said that they start and end work at pretty much the same time every day, and another 31 percent said the start and end times vary by up to a half hour.
- The most common start times were as follows
    - 8:00 a.m. (159 responses)
    - 7:00 a.m. (61 responses)
    - 7:30 a.m. (56 responses)
    - 8:30 a.m. (34 responses)
    - 9:00 a.m. (25 responses)

Figure 13: Workplace Locations of Employee Survey Respondents

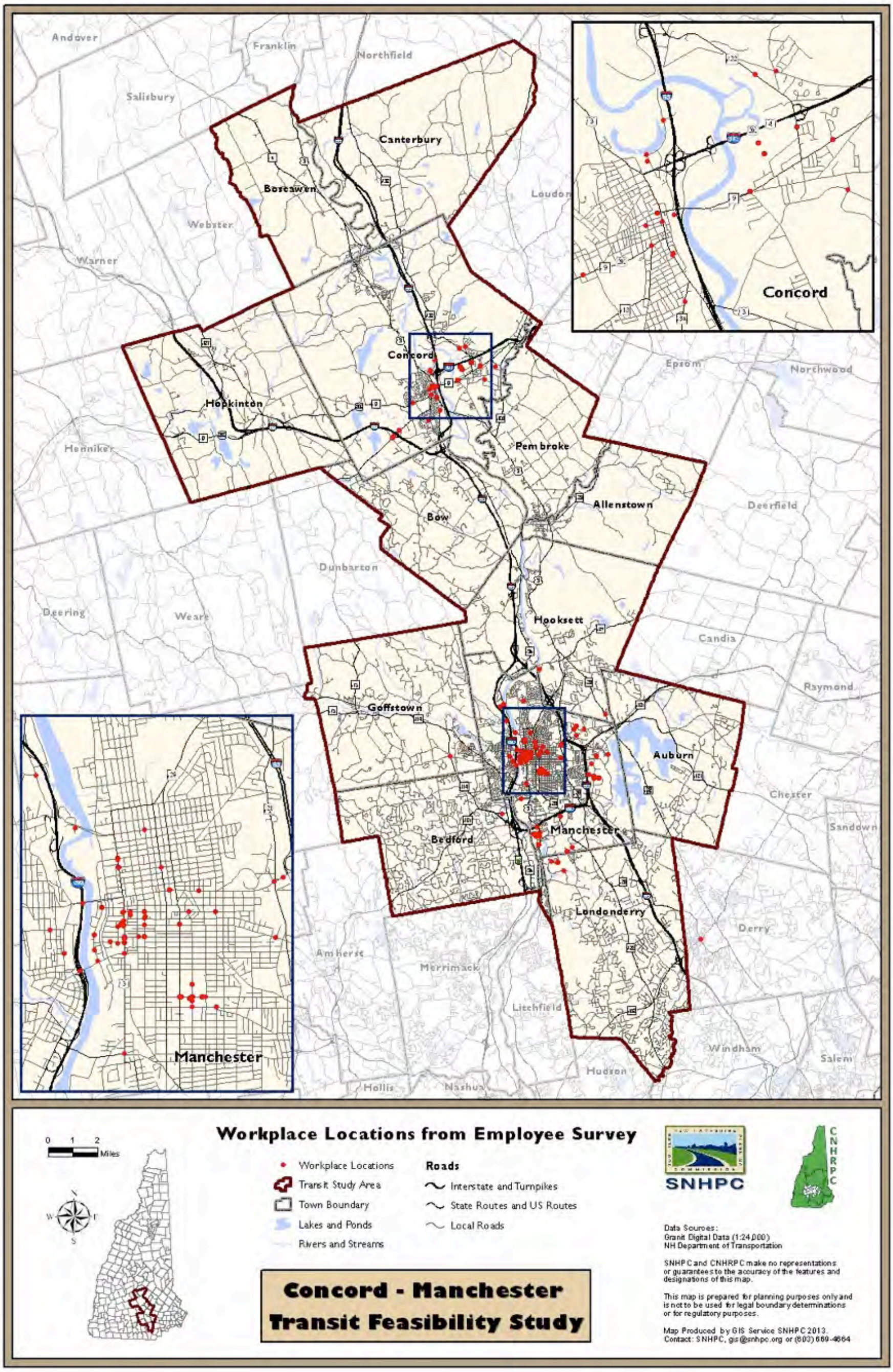
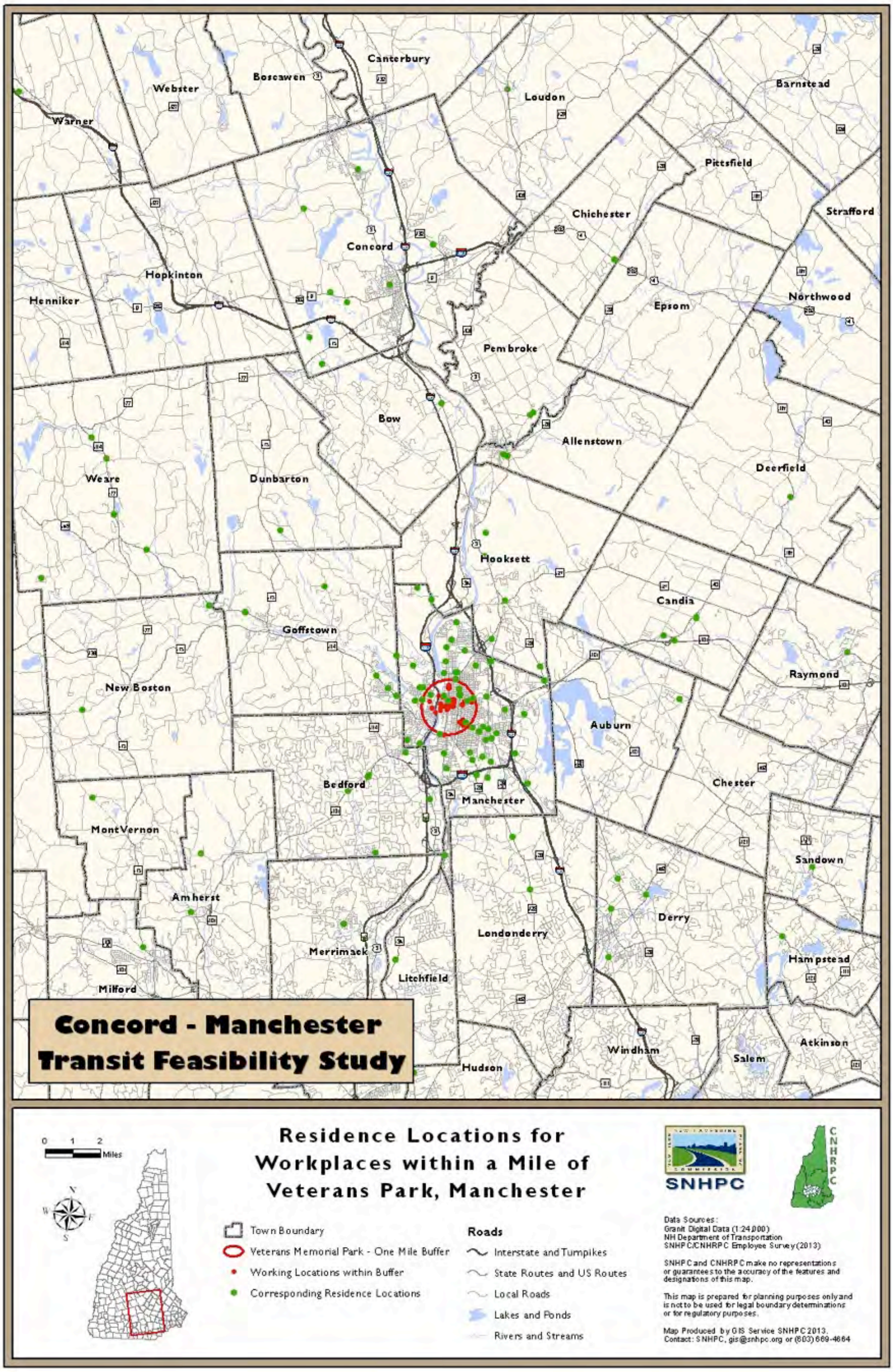
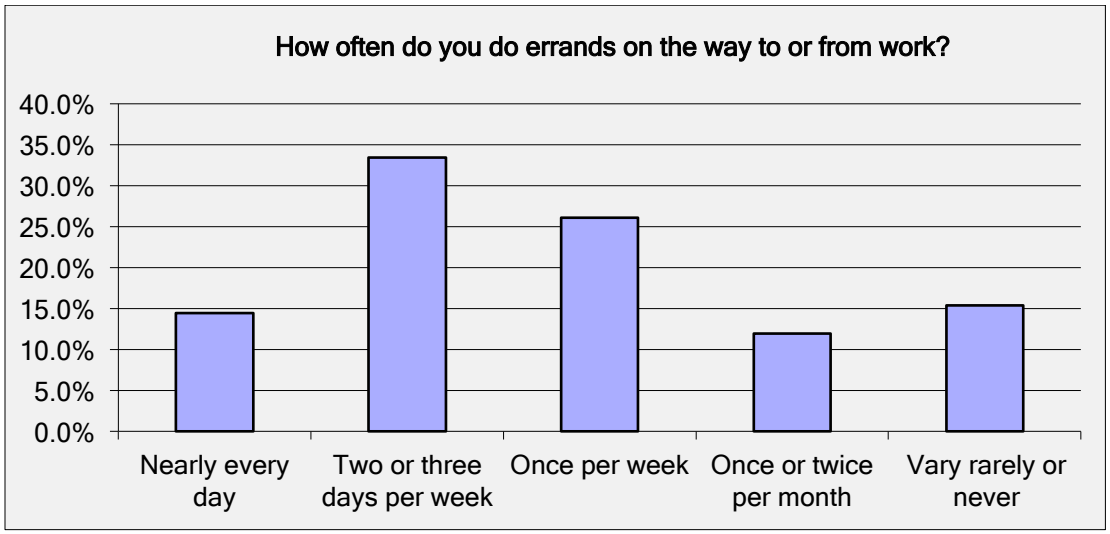


Figure 14: Home Locations of Commuters to Manchester in Employee Survey



- The most common end times were as follows
    - 5:00 p.m. (111 responses)
    - 4:00 p.m. (76 responses)
    - 3:30 p.m. (25 responses)
    - 3:00 p.m. (23 responses)
    - 5:30 p.m. and 6:00 p.m. (both with 21 responses)
- Only 27 percent of respondents said that they need a car during the day for work purposes.
- When asked about how often they do errands on the way to or from work, they gave a range of answers as illustrated in the graph below.



Consistent start and end times, and a relatively low percentage of people who need to do errands during the day are positive signs for potential transit use. However, widely available free parking is a major obstacle for transit.

The next group of questions concerned their attitudes toward a potential bus service connecting Manchester and Concord. The results for these questions are summarized below:

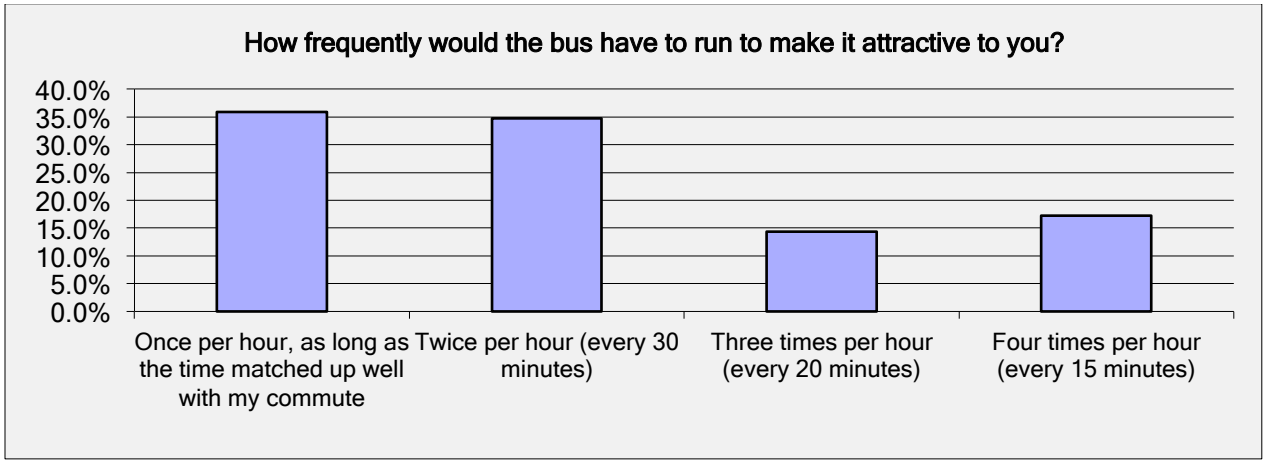
- When asked if they would use a "convenient" bus service to get to work, 61 percent of respondents said yes. About half of these said they would use it "some of the time", a third said they would use it "nearly every day", and the remaining sixth said they would use it "only occasionally."
- Among people who said they would use the service, 65 percent said they would be willing to drive to a park & ride lot to catch the bus.
- Within the same group, 55 percent said they would be willing to transfer to an MTA or CAT bus to reach their final destination.
- When asked what the maximum round-trip fare they would be willing to pay would be, the responses ranged from zero to $15. The most common answer was $5 (52

responses) but 110 people cited fares of between $1 and $4 as the maximum they would pay.

- In a hypothetical scenario where their employer paid the bus fare, 37 percent of respondents said they would "definitely ride frequently" while another 31 percent would ride "some of the time". The number of "no" responses dropped to 32 percent in this scenario.
- In another scenario where the employer offered a cash incentive to ride, 41 percent said they would ride frequently, 34 percent said they would ride some of the time, and only 25 percent said they would not ride.
- 40 percent of respondents said that they would use the route to get to the airport "unless it was really inconvenient." Another 41 percent said they might use it, "depending on the schedule."

The next group of questions considered service aspects of the bus route that would make it more or less attractive to the rider.

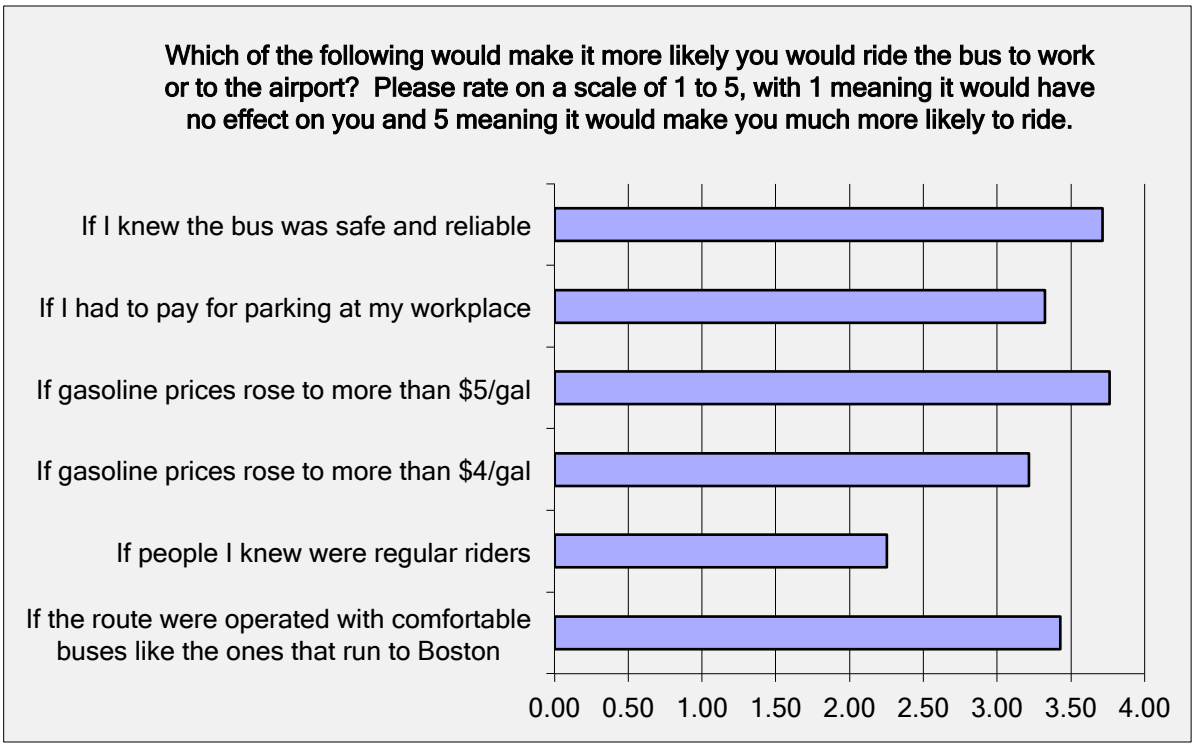
- Frequency of service is a key factor in the cost of operation as well as the attractiveness of service to the rider. Four potential service frequencies were offered to the respondents, and they were asked how frequently the bus would have to run to be attractive to them. The results are displayed in the graph below. A slight plurality indicated that hourly service would be sufficient, as long as the times lined up well with their schedules.



- Span of service is another critical component of service. Respondents were asked how late the bus would need to run to be attractive. 45 percent stated that 6:00 p.m. would be sufficient. The remaining 55 percent were divided relatively evening among 7:00 p.m., 8:00 p.m. and 10:00 p.m. as desirable ending times for the bus route.
- As to potential weekend service, only 4 percent of respondents said they would frequently use the route on Saturdays and Sundays, and another 34 percent said

they would occasionally use it on those days.

- Respondents were asked about six factors external to the service itself that might affect their usage of the bus. The results for each of these factors is shown in the graph below. Among the factors, a significant rise in the price of gasoline, to over $5 per gallon, achieved the highest rating, in terms of the factor that would most influence increased use of the bus. Confidence that the bus was safe and reliable was a close second. The factor that seems to be least important is whether other people they knew used the bus regularly. While respondents may discount this factor, word of mouth and the confidence factor that riding the bus is socially acceptable and even the "smart" thing to do among their peers are key to getting "choice" riders—that is, people who are able to choose between driving and taking public transit—to ride the bus.



The final questions on the survey had to do with demographic characteristics. The survey respondents skewed toward older and more affluent people, in general. The following summarizes these results:

- 60 percent of survey respondents were between 45 and 64 years of age. Only 32 percent were between 25 and 44.
- There were no respondents from a household that had no vehicles. 82 percent of respondents were in households with two or more vehicles. Similarly, 85 percent of households had two or more licensed drivers. Thus, access to an automobile did not

seem to be a significant issue for any of the respondents.

- Only 3 percent of respondents had annual incomes of under $30,000. 38 percent of respondents had incomes over $100,000 and another 50 percent had incomes of between $50,000 and $100,000.
- 51 percent of respondents were female.

Even though virtually all of the survey respondents currently drive to work, and the vast majority of them are relatively affluent, the survey did show positive attitudes toward public transportation. It is well known that stated preference surveys, such as this one, tend to overstate the potential use of future services because respondents like to give positive responses if they can. However, when it comes to actual choices to use the bus or not, people are often reluctant to try new things, and any negative aspect of the service may push them back to driving. The overall positive responses are a good sign for the potential success of future service, but it should not be assumed that the route would be an immediate success without a high-quality level of service and a significant marketing and education campaign.

Young Professionals Survey

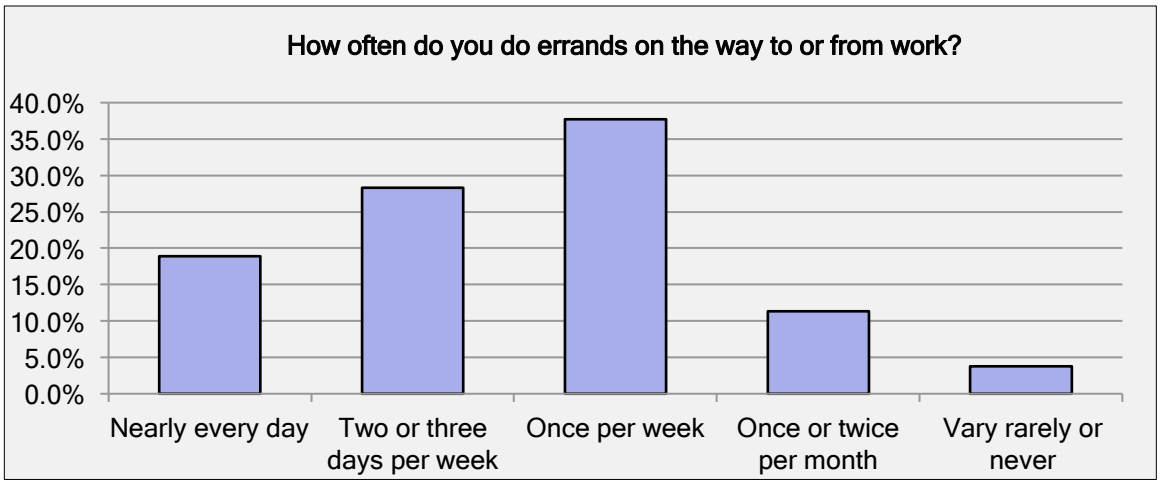
A second web survey was conducted in late October. Young professionals networks in Concord and Manchester were contacted through the chambers of commerce. Some 53 individuals responded to the survey, which largely mirrored the employee survey described above. Of the respondents 23 live in Concord and 7 live in Manchester. Similarly 35 work in Concord and 11 work in Manchester. Thus, this survey has a stronger bias toward Concord than the employee survey, which was more representative of Manchester.

The survey results are summarized below.

- 89 percent of respondents drive alone to work. Three people walked or biked and one person took public transportation.
- 92 percent of respondents reported that they had a free parking space at work.
- Only 28 percent said that they start and end work at pretty much the same time every day, about half the rate of the employee survey.
- The most common start times were as follows, generally skewed later than the employee survey results
    - 8:00 a.m. (13 responses)
    - 8:30 a.m. (12 responses)
    - 9:00 a.m. (12 responses)
    - 7:30 a.m. (2 responses)
- The most common end times were as follows
    - 5:00 p.m. (15 responses)
    - 5:30 p.m. (9 responses)
    - 6:00 p.m. (6 responses)
    - 4:00 p.m. (5 responses)
- Only 27 percent of respondents said that they need a car during the day for work

purposes.

- When asked about how often they do errands on the way to or from work, they gave a range of answers as illustrated in the graph below. These young professionals were more likely to be running an errand on any given day than the older workers in the employee survey.



The next group of questions concerned attitudes toward a potential bus service connecting Manchester and Concord. The results for these questions are summarized below:

- When asked if they would use a "convenient" bus service to get to work, 83 percent of respondents said yes. About 40 percent of these said they would use it "some of the time", a third said they would use it "nearly every day", and the remaining 27 percent said they would use it "only occasionally."
- Among people who said they would use the service, 73 percent said they would be willing to drive to a park & ride lot to catch the bus.
- Within the same group, 63 percent said they would be willing to transfer to an MTA or CAT bus to reach their final destination.
- When asked what the maximum round-trip fare they would be willing to pay would be, the responses ranged from zero to $15. The most common answer was $5 (8 responses) but 18 people cited fares of between $1 and $4 as the maximum they would pay. The average was just over $5.
- In a hypothetical scenario where their employer paid the bus fare, 45 percent of respondents said they would "definitely ride frequently" while anoter 36 percent would ride "some of the time".
- In another scenario where the employer offered a cash incentive to ride, 49 percent said they would ride frequently, 40 percent said they would ride some of the time, and only 11 percent said they would not ride.
- 80 percent of respondents said that they would use the route to get to the airport "unless it was really inconvenient." The other 20 percent said they might use it,

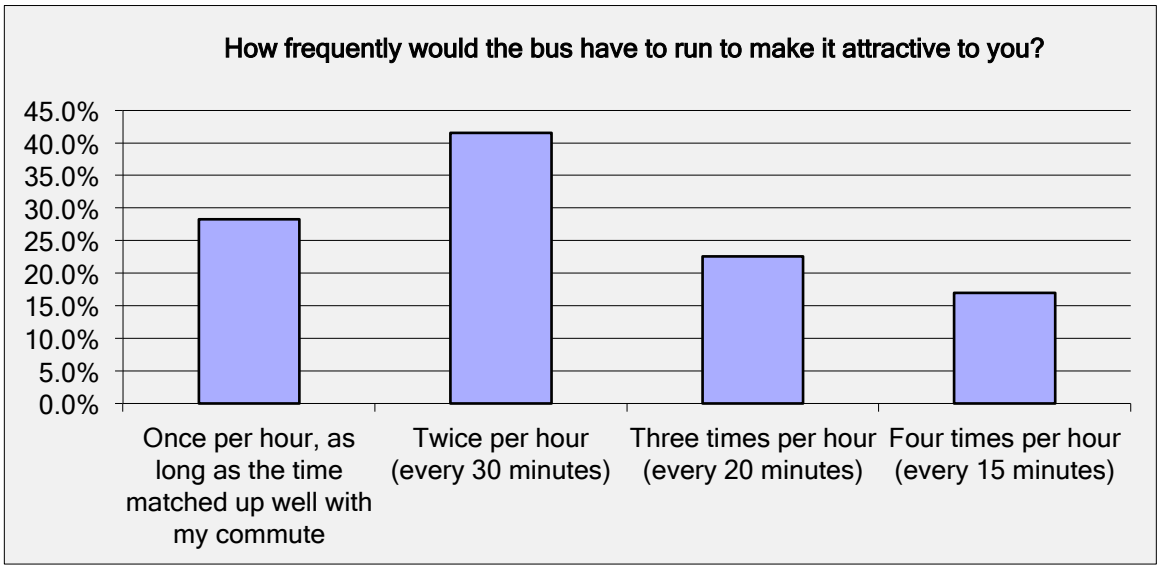
"depending on the schedule."

- The young professionals were asked about other types of trips:
    - 75 percent indicated they would use the bus route for meeting up with friends
    - 85 percent would use it to attend restaurants and bars
    - 75 percent would use it to attend cultural events

In addition to this high level of interest for evening and weekend service, the young professionals indicated a willingness to pay extra for this service, with an average maximum fare of $7 compared to $5 for commuting trips.

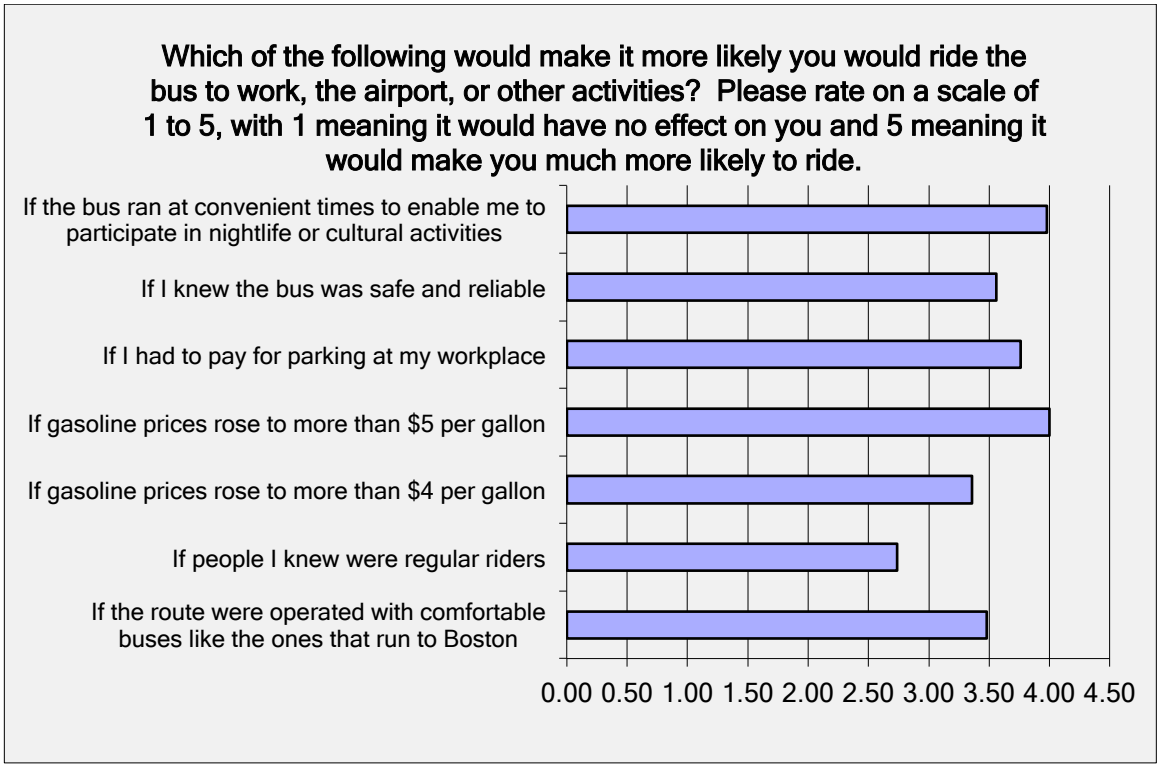
The next group of questions considered service aspects of the bus route that would make it more or less attractive to the rider.

- The young professionals were more sensitive to the frequency of service than the respondents to the employee survey, with higher percentages demanding better frequency.



- Span of service is another critical component of service. Respondents were asked how late the bus would need to run to be attractive. Only 15 percent stated that 6:00 p.m. would be sufficient (compared to 45 percent in the employee survey). A significant plurality (38 percent) wanted service at least until 8:00 p.m. and 32 percent wanted service until 10:00 p.m. or later.
- As to potential weekend service, 15 percent of respondents said they would frequently use the route on Saturdays and Sundays, and another 43 percent said they would occasionally use it on those days. These percentages were much higher than those for the employee survey.
- Respondents were asked about seven factors external to the service itself that might affect their usage of the bus. The results for each of these factors is shown in the

graph below. Among the factors, a significant rise in the price of gasoline, to over $5 per gallon, achieved the highest rating, in terms of the factor that would most influence increased use of the bus. Access to nightlife and cultural activities was a close second. Safe and reliable service, comfortable buses, and the prospect of paying for parking at the workplace were all relatively important factors.



The final questions on the survey had to do with demographic characteristics. As intended, the survey respondents were mostly young professionals. Auto ownership and income was slightly below that of the respondents to the employee survey, but this group is still relatively affluent. The following summarizes these results:

- 56 percent of survey respondents were between 25 and 34 years of age. Only 33 percent were over 35.
- There were no respondents from a household that had no vehicles. 75 percent of respondents were in households with two or more vehicles. Similarly, 73 percent of households had two or more licensed drivers. Thus, access to an automobile did not seem to be a significant issue for any of the respondents.
- Only 15 percent of respondents had annual incomes of under $40,000. 46 percent of respondents had incomes over $80,000.
- 58 percent of respondents were female.

The young professionals show a high degree of interest in public transportation options, both for regular commuting and social activities. They demand a somewhat higher level of service than do the older respondents in the employee survey. The sample size was relatively small and only seven respondents commuted between Concord and Manchester, but it seems that a service connecting the two cities may be attractive to this demographic.

Airport Passenger Survey

On September 24 and 25, RPC staff members conducted a survey of passengers exiting from the Manchester-Boston Regional Airport in order to understand how express service to Manchester and Concord might appeal to them. Over 90 interviews were completed, though only half of these were for people traveling from the airport to the study corridor. About 30 interviews were with people going to other towns in central New Hampshire or northern Massachusetts, and another 16 were with people traveling to the seacoast area of New Hampshire. The results presented here will focus on the 46 respondents traveling to the study area.

The City of Manchester was the most common destination for these exiting passengers, with most of the respondents being Manchester residents and a few traveling there on business or to visit family or friends. Nearly half of respondents had parked at the airport and would be driving their personal car home. About a third were being picked up by friends or family and about a sixth were planning to rent a car. Two respondents were planning to take a taxi and one was being picked up by a hotel shuttle. None of the respondents were planning to use public transportation to leave the airport.

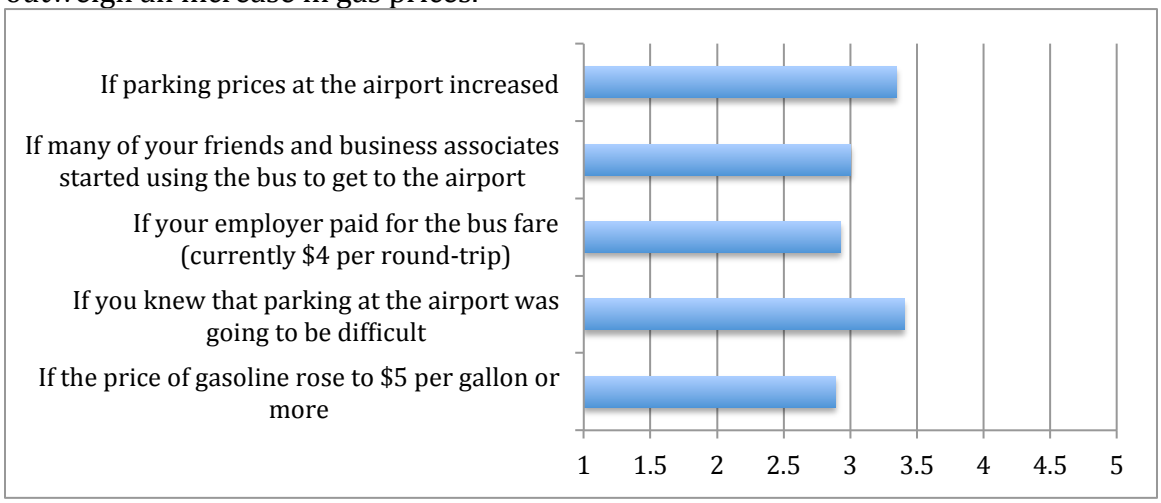
Respondents were asked if they were aware of the upcoming East-West bus service to the Portsmouth area, as well as the Route 4 Concord Express. Very few people were aware of the East-West bus (about 6 percent of the total, and none of the people who lived in the corridor that would be served by the East-West route). In contrast, about 20 percent of the respondents were aware of the Concord Express. Among those who were aware of the route, they had learned of it through various means including the radio (NHPR), the newspaper, word of mouth, and seeing the bus on the street.

When asked if they would use the Concord Express for future trips to/from the airport, about a quarter of respondents said yes and a fifth said maybe. Slightly more than half said no. The usage rate among the "yes" respondents was most commonly 4 to 6 times per year, though a few people said only once per year. Among people responding "maybe," the most effective improvement to encourage them to ride the bus would be to operate it on weekends.

Question 6 on the survey sought to gauge the effects of various scenarios on the likelihood someone will ride the Concord Express route. The results are illustrated in the figure below. A longer bar (higher score) means that scenario would make them more likely to ride.

Among these respondents, issues regarding parking at the airport seem to be the most decisive factors related to possible use of the bus. The cost of the bus fare and the cost of

gasoline are relatively less important than the cost of parking. This makes sense as the bus fare is relatively low, and most of the respondents are making relatively short trips between the airport and their local destination, so that an increase in parking cost would outweigh an increase in gas prices.



Overall, the airport survey indicates that this market may be more difficult to capture than the commuter market that was addressed in the employee survey. A smaller percentage of respondents indicated interest in using the bus route, and those that did said that they would use it only a handful of times per year. In order to build sufficient ridership, then, the route would have to achieve a high degree of awareness among the traveling public and offer trip times that were convenient for most travelers. Other issues for future airport service are discussed below.

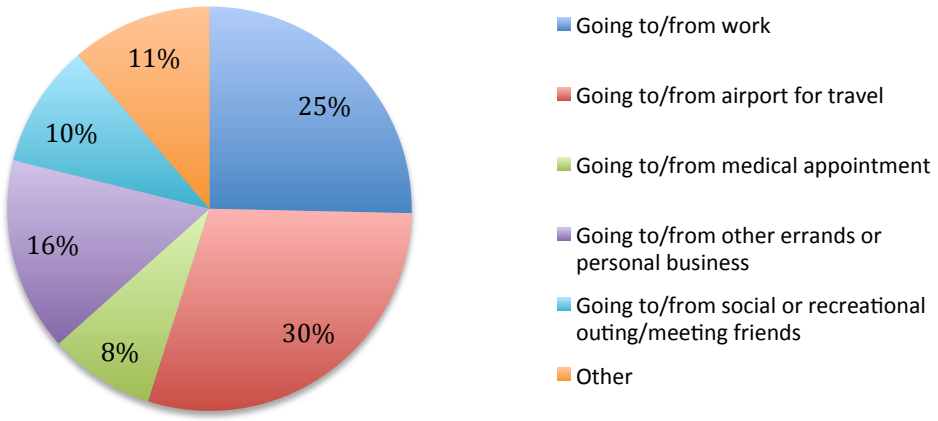
MTA Route 4 On-board Survey

MTA's pilot test of the Route 4 – Concord Express offers an opportunity to understand the characteristics of "early adopters" of the new service. In July 2013, the first month of operation, the average daily ridership was about 30 passengers. About 72 percent of these boardings occurred on the "commuting hours" trips: the ones departing at 8:15, 10:45, noon, 2:15 p.m. and 5:15 p.m. Another 8 percent of boardings occurred on the early commuting trip, departing at 5:45 from the airport and serving a Concord-to-Manchester trip at 6:20, arriving at 6:45.

In August, average daily ridership grew to 45 riders per day. The percentage occurring during the commuting and midday trips grew to about 75 percent of the total. The two very early trips and the four late trips carried an average of less than two passengers per trip. The early commuting trip leaving Concord at 6:20 a.m. carried about 3 passengers per day toward Manchester. Of the 500 boardings in Concord during the month, 300 passengers alighted in Manchester, while the other 200 alighted at the airport.

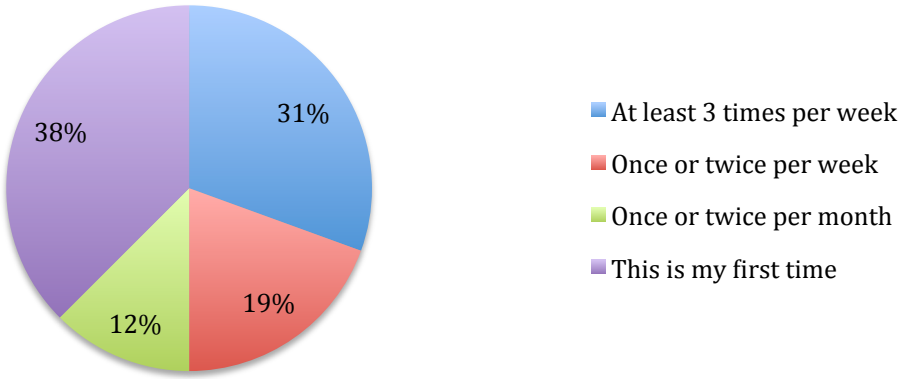
In September, ridership grew further, to 49 passengers per day, but the growth curve flattened significantly. Consistent with prior months, 74 percent of these trips occurred on the commuting and midday trips. The early and late trips continued to average two or fewer boardings per trip.

Finally, in October, average ridership grew to 59 passengers, a 20 percent increase over September. The early morning trip at 3:30 a.m. has been dropped due to poor patronage. The distribution of riders over the course of the day remains consistent with prior months. Passengers on Route 4 were surveyed during the first week of September. A total of 72 surveys were completed. The trip purposes as reported by these passengers are shown in the chart below.



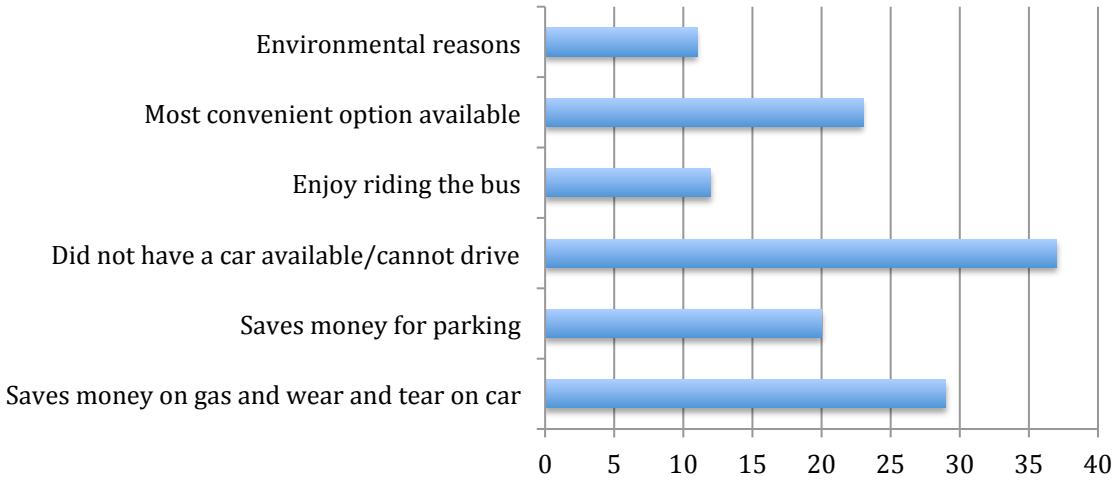
Given the ridership figures, it appears that airport passengers are overrepresented in the survey. Based on counts, boardings at the airport represent only about 10 percent of total boardings, though alightings at the airport represent about 22 percent of the total. In general, passengers seem to be using Route 4 to get to the airport about twice as often as they are using it to get home from the airport. In the survey, virtually everyone going to the airport had boarded in Concord.

Half of the riders on the Concord Express are regular users (riding at least once per week) of either the MTA or CAT local transit systems. Eleven respondents said they were regular users of both systems, while another 20 were regular MTA users. About a third of Route 4 riders use it multiple times per week, while nearly 4 in 10 of those surveyed were on the route for the first time. The distribution of usage rates is shown in the chart below:



Passengers were asked how they had learned of the bus route. More than half said they had found information on the MTA website and printed schedules. About a third of passengers had learned via word of mouth or seeing the bus on the street. About 10 percent of passengers saw an advertisement in the newspaper or heard about the route on the radio. Finally, a few passengers were referred to the route by Concord Coach.

When asked why they chose to ride the Concord Express, riders gave a number of reasons. The most common reason was that they did not have a car available or otherwise could not drive, followed by saving money. Several respondents chose more than one reason. The full results are shown in the chart below:



Of the 68 respondents who provided their home towns, 26 were from Manchester and 17 were from Concord. The others were from a variety of towns in New Hampshire, plus two from out of state who were using the bus to get from the airport to Concord.

The most common means of access to the bus was walking, followed by transferring from another bus route or being dropped off. These three means accounted for 77 percent of the responses. Only 12 percent of passengers drove and parked to catch the bus. Three passengers biked to reach the bus. Walking was even more common as a means of egress from the bus, accounting for more than half of the answers. Being picked up and transferring to another bus route accounted for all but two of the remaining responses.

The remainder of the survey sought input on ways to improve the service and any other comments. The most common response for a desired service improvement was service on weekends, with more than half of respondents asking for this improvement. The next most common response was more trips offered during the day. Specific times requested included the following:

- Between noon and 2:30 p.m.
- Between 5:30 a.m. and 7:30 a.m.
- Between 7:30 a.m. and 8:00 a.m.
- 4:00 or 4:30 p.m. trip from Manchester to Concord

- Trip at 10:00 a.m.
- Between 2:30 p.m. and 5:30 p.m.
- Pick up at the Radisson later in the evening (at least until 7:00 p.m.)

A few passengers asked for additional stops on the route, such as in intervening towns (Pembroke, Hooksett, Allenstown) and a stop in downtown Concord, at Eagle Square. Four passengers requested that a vehicle with a luggage rack be used for the route.

Overall, the general passenger comments about the route were positive. Some examples follow:

- "Was pleased with service, people very helpful."
- "I love it! I tell everyone I know about it! This has helped me continue to reduce my carbon footprint!"
- "Great service, please continue"
- "Please don't take it away"
- "Glad you're here!!"

Several passengers emphasized the need for weekend service, even if it was minimal (one or two trips).

Potential Markets and Service Goals

The demographic and travel pattern analysis, along with the survey results, all indicate that there is a market for a transit connection between Concord and Manchester and that it would be successful if operated in a way that is attractive to the potential riders. The sections below describe four market segments that could be the targets for new service.

Commuting Trips

Perhaps the strongest of the four markets is the commuting market. The data from OnTheMap, illustrated in Figures 7 through 11, demonstrate that many people commute between the two downtowns, and from one downtown to the peripheral employment centers in the other city. While it may not be possible to serve all of those connections conveniently with limited resources, some of the connections could certainly be made.

As mentioned on page 6, parking constraints and cost are a key factor in determining how large a share of the commuting travel market a transit route can capture. That is to say, even though there may be hundreds of people traveling from one area to another, few of them would choose to switch from driving to taking the bus if they know that they have a free and convenient parking space waiting for them. Very expensive gasoline can change the equation (as the employee survey showed), but parking costs seem to hit people more directly than gasoline costs when it comes to making choices about travel mode.

In the Manchester-Concord region, of the five employment centers examined earlier, only the downtown areas of Concord and Manchester charge for parking. On-street parking in Manchester costs $4 to $6 per day if one uses meters or $45 per month for a permit. Off-street parking in Manchester costs $50 per month for surface lots and $75 per month or $6 per day for the Victory garage.[1] Parking in downtown Concord is 50 cents per hour for on-street meters or the three downtown garages[2]; a commuter would expect to pay $4.50 for all-day parking. Of course, many employees in these downtown areas have free parking provided by their employers.

The hospitals and malls areas of Concord have free parking, and the Mall of New Hampshire has free parking as well. The airport charges a one-time $25 fee for most of the employees there, but in some cases, the employer is billed directly for this charge rather than the employee paying out of pocket. After paying this fee, parking is free on a daily basis. (Airport passengers, who do pay for parking, are discussed in the next section.) Free parking at the employment centers outside of the downtowns significantly diminish their potential as successful transit destinations. Of course, the parking rates in the downtown areas are not very high by urban standards, where parking can cost upwards of $15/day, but $5 per day may be noticeable enough to these commuters to have them consider other transportation options. Given the limited resources available for transit operations, further discussion of the commuting travel market will focus on the downtown areas of Concord and Manchester.

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[1] http://www.manchesternh.gov/Departments/Parking/OnStreetandOffStreetParking.aspx

[2] http://www.concordnh.gov/?nid=844

As mentioned earlier, a commuter route between the downtown areas of Concord and Manchester would need to balance two important factors: speed and access. Given widespread auto availability, the travel time on the bus would need to be close to the time for driving solo in order to be competitive. That suggests few or no stops between the two downtowns. It is also the case, however, that there are many other commuters who might like to use the route, but who do not live within walking distance of the downtowns. That suggests that additional stops at park & ride lots between Concord and Manchester would spur more ridership. In the route design phase of this study, different scenarios for operations will be considered and analyzed.

The employee survey provided excellent information on start and end times for work and the degree to which those times varied. This information will help in schedule design. Midday and evening service on a commuter-oriented route is desirable, but not necessary, especially for initial operations. Focusing more service in the peak travel periods rather than spreading it throughout the day would convince additional choice riders to use the service, since they are sensitive to travel flexibility (i.e., the frequency of service).

Airport Ground Access

A major impetus for the present study was the concern that large numbers of residents of the region were using express bus service to reach Logan Airport in Boston, but that other than people who live in downtown Manchester, residents of this region had little or no bus access to MBRA. The main question to be considered here is whether a bus service could be designed that would have the same attractiveness as the Concord Coach/Boston Express service to Logan Airport.

The Logan service uses comfortable coach buses with wifi available. The trip takes 95-125 minutes each way, depending on the time of day and costs $20 one way or $35 round-trip. The trip from Concord to Logan is about 70 miles each way and includes tolls. Not including parking costs at Logan, which are substantial, the operational cost for driving, using the federal mileage rate of 56.5 cents per mile, plus tolls, would be about $85 for the round-trip. Thus, the express bus offers a significant savings over driving, without even taking parking cost into account.[3] It also allows the traveler to ignore the frustration and anxiety associated with Boston area traffic.

For airport travelers to MBRA from Concord, the cost of driving is much less because the distance is only 25 miles each way. Using the same mileage rate and tolls, the operational cost for a round-trip from Concord to MBRA would be about $30. Traffic is not a major concern when traveling to MBRA.

Mode choice for airport travel is usually a trade-off between cost and convenience. Convenience includes both travel time flexibility and the avoidance of hassles. For trips to

[3] Note that this comparison portrays the situation for a business traveler, traveling alone for a short trip. For larger groups of people traveling together, the savings from using the bus would be less, but the longer the duration of the trip, the savings would be greater because of the avoidance of the parking fees at Logan Airport.

Logan, the express bus offers advantages in both cost and convenience because of the long travel times and Boston area traffic. Many travelers choose the bus even though it limits their flexibility, as it allows them to save money and avoid a long and frustrating driving trip. While a bus service to MBRA would save travelers money, the amount saved would be much less compared to the savings for Logan trips. Further, because the trip is relatively short and traffic-free, the convenience factor tends to work against bus service to MBRA rather than in favor of it. The flexibility-limiting factor of having to follow the bus schedule rather than going when you want overwhelms the advantages of not having to drive.

Concord Coach is able to offer frequent service to Logan Airport (hourly through much of the day) because those buses also carry passengers to downtown Boston. Indeed, some 87 percent of the ridership between Concord and the Boston area is destined for locations other than Logan Airport. Because of the huge draw of the Boston metro area, Concord Coach can operate frequent service that is attractive to the relatively small market of people going from Concord and surrounding towns to Logan (about 92 people per day according to a 2013 Logan Airport passenger survey). These passengers don't mind that the buses stop at South Station in Boston before getting to the airport (at least don't mind enough to not use the bus) since the extra time involved is insignificant compared to the total travel time.

The market for travel from Concord to MBRA is currently smaller than the market to Logan: about 40 passengers per day. Trying to combine travel from Concord to downtown Manchester with that from Concord to MBRA will not be attractive to people who have the option to drive to the airport, because the diversion from the highway into downtown Manchester will add a significant amount of time to a relatively short trip. With that diversion, the bus time from Concord to the airport would be twice the travel time by automobile. Also, the transit market from Concord to Manchester will never be as large as the transit market to Boston because it is too easy and inexpensive to drive the short distance between the two New Hampshire cities. In contrast, the cost savings and avoidance of traffic hassles by not driving to Boston makes transit a very appealing option for that much longer trip.

The discussion thus far has ignored parking cost. For the Boston situation, avoiding parking charges in and around Logan is a significant added benefit since the cost and convenience factors already weigh heavily in favor of the bus service. For MBRA, however, avoiding parking cost may be the key factor that convinces some people to accept the relative inconvenience of the bus over driving. Parking capacity is never an issue at MBRA, as additional long-term lots are opened during times of peak demand (holidays and winter/spring vacation weeks).

Designing a successful bus service to the airport oriented toward airport passengers requires that as many of the inconvenience factors of bus service as possible be overcome. The trips would need to be timed carefully to get passengers to the airport so that they would not worry about missing their flights on the way out, and so that they would not be sitting around for a long time when they return home. Of course, flight delays increase the difficulty of having the schedule be convenient for passengers and may require the bus to

offer assurance that it will meet passengers no matter how late their flight arrives. Given that planes are departing and arriving throughout the day, a high level of bus service would be needed to make sure that the majority of passengers have a convenient trip available to them.

Because most air passengers have luggage, the buses that go to the airport would need to be able to accommodate suitcases and other parcels easily. People are accustomed to airport shuttles having luggage racks, and even having assistance getting luggage on and off the bus. Few people would be expected to walk from their homes to a bus stop with a lot of luggage (unless they happened to live within a few hundred feet of the bus stop), so that park & ride or kiss & ride access to the airport bus would be essential. Given the early morning and late night times associated with air travel at MBRA, these access points would need to have very good lighting to provide a sense of security.

Air passengers are highly focused on getting to the airport on time and then getting home quickly. This factor makes it difficult to mix airport access travel with other trip purposes. A route that tries to take people to work downtown, or to shopping at the mall, "on the way" to the airport will probably lose most of the time-sensitive airport passengers back to driving. People are used to paying top dollar for customized and attentive service to airports. If they get that and a low fare, they will be happy, but a low fare with inconvenient service will not be attractive for most of this (relatively small) market.

In summary, the problem with trying to offer attractive transit service to MBRA from Concord is that the market is not large enough to support the frequency of service that would need to be operated to be attractive. Even if a bus route from Concord to MBRA were to capture 60 percent of the current passengers (40 per day on average) from Concord who use MBRA, and everyone from Concord who uses Logan Airport (about 72 per day on average), a percentage similar to what Concord Coach captures from Concord to Logan, that would only be 67 passengers per day. The bus would have to operate some 20 round-trips to be able to serve all of the times that those passengers need to travel, resulting in only about 3 people per trip. That level of ridership could not be viewed as a successful bus service.

Unlike the combined Boston metro and Logan markets that Concord Coach serves, it is difficult to combine the Manchester and MBRA markets into one route. People who have the option to drive would not accept the increase in travel time that would result. The only people for whom this route would be attractive are those who would prefer to avoid the parking fees at MBRA.

Non-work Travel

Although there is not as much data available about non-work travel between Concord and Manchester as there is about commuting travel, the traffic volumes between the two cities indicate clearly that this is a significant market. The question is how easy it would be for a bus service connecting the two cities to capture some of this market. While the ridership on the current MTA Route 4 is low overall, the midday trips that operate between 10:45 a.m

and 3:20 p.m. do as well or better than the trips that run during traditional commuting hours.

As part of a strategy toward building a successful transit connection between the two cities, it must be recognized that the non-work travel market is more difficult to capture than the commuter market. First of all, non-work trips tend to be taken less frequently than work trips, so that the route would have fewer regular daily passengers for these non-work purposes. Non-work trips also tend to be chained (with one errand following another), so that a bus service with long headways becomes an inconvenient way to get all of the errands completed. To accrue significant ridership in the non-work market, the awareness of the bus service has to be very broad. This type of awareness is easier to achieve once a route has been clearly established, and the easiest way to do that is to address the commuting market first.

A non-work trip relevant to many younger commuters is the trip to child care. Working mothers and fathers often drop their child or children off on the way to work and pick them up on the way home. Such trips are difficult to accomplish while riding a commuter bus service unless the child care center is within walking distance of either the home or the workplace of the parent. Otherwise the limited stops made by the commuter route, and the limited frequency of trips mean that it would be impossible for most parents to accomplish the daycare stop on the way to/from work using the commuter route.

Non-work trips can be grouped into two classes, which are mostly separated in time as well. Daytime non-work trips mostly comprise shopping, personal business (errands) and medical trips, while evening/night non-work trips tend to be focused on social and entertainment activities. While surveys usually show that many people appreciate having the option of the bus available for these trips, not many of them will actually make use of that bus service on a regular basis. As mentioned above, these non-work trips tend not to occur on a daily basis, and the inconvenience associated with transit compared to driving, as well as the insignificance of the cost savings for an occasional trip, means that most people will drive unless there is a compelling reason not to do so.

Bus routes serve non-work travel well when there is a core level of service that is supported by the daily commuting market. These regular users will sometimes use the bus for midday and evening trips, allowing the service span to be extended to times that non-work travelers will find convenient. Together, these combined markets will allow for a robust service, but it would not be possible without the regular daily riders.

Guidance from Policymakers

As indicated in the introduction to this report, key policymakers in the New Hampshire Legislature and at NHDOT were concerned with both the downtown-to-downtown market between Concord and Manchester, as well as access to MBRA from Concord. In December 2013, the findings-to-date in the study were presented to these policymakers in order to seek guidance on how to proceed toward study recommendations.

The legislators reported that they had heard from their constituents about the benefits of the downtown-to-downtown service, but relatively little about the airport access, reflecting the ridership disparity between the two markets. After a presentation summarizing the above discussion about the potential for the airport market, the policymakers endorsed the concept of focusing on the commuting market. Indeed, they recommended that the MTA Route 4 Concord Express be changed as soon as possible to make service better for commuters rather than continuing to operate poorly patronized trips to the airport. This directive was carried out by the MTA through the public hearing in January and the service change implemented in February. It is important to note that the new MTA schedule allows for Concord residents to reach the airport via a transfer in downtown Manchester to Route 3. While this option does not offer the same span of service that the Route 4 did until February, it does preserve airport access to the extent possible within the current regular span of service.

Initial Service Concepts

In October 2013, using the results of the market analysis described earlier in this report, Steadman Hill Consulting developed a series of initial service concepts for review by the stakeholders committee. Three alignments were developed as shown in the sections below.

Commuter Express

The alignment for the Commuter Express (see Figure 15), which would operate in the morning and afternoon peak periods, would connect Manchester residents to jobs in downtown Concord and at the Thomson State Complex on Hazen Drive, and Concord residents to jobs in downtown Manchester as well as other parts of Manchester accessible via other MTA routes (see Figure 15). Morning trips would stop at the Hooksett Park & Ride at Exit 11 to allow people from other towns to reach the express route; afternoon trips would stop there if a passenger on board the bus requested the drop off. People living in Hooksett Village Center would find this option to be appealing rather than having to drive into Concord or Manchester.

Stops in Concord would include the State House/Eagle Square, Stickney Ave Bus Station, various locations along Hazen Drive, and one or two additional stops on Main Street in Concord, such as Theatre Street, Pleasant Street and Washington Street. In Manchester, the route would stop on Granite Street at Canal Street to allow transfers to the intercity bus terminal, and terminate at the Radisson/Veterans Park.

Morning southbound trips would originate at Stickney Ave, head through downtown Concord and enter southbound I-93 at Exit 13, then stop at the Hooksett Park & Ride off Exit 11, continue south onto I-293 and then use Exit 5 in Manchester to reach Granite Street and Elm Street to Veterans Park. The bus would then turn around and retrace its path north, again via the Hooksett Park & Ride at Exit 11, and then north to Exit 13 in Concord. It would stop along Main Street and at Eagle Square before turning right on Loudon Road and then left onto Hazen Drive stopping at various State offices. At the end of Hazen Drive, the route would turn left onto East Side Drive and then use I-393 to return to the Stickney Ave Bus Station.

In the afternoon, the pattern would work in reverse. Southbound trips would start at Stickney Ave, but first serve Hazen Drive to pick up people leaving work. The route would use I-393 to return to North Main Street and then pick up passengers at the State House and other stops on Main Street. Entering I-93 at Exit 13, the route would stop at the Hooksett Park & Ride at Exit 11 on request only, and then use the same path into Manchester as the morning service. After turning around, the afternoon northbound trip would return to Stickney Ave via Exit 13 and Main Street, so that Concord residents who work in Manchester would have a direct trip home.

Two service levels were proposed for this initial concept:

- "Starter" Service
    - Two morning round-trips serving 7:00 a.m. and 8:00 a.m. work start times in both Concord and Manchester
    - Three afternoon round-trips serving 4:00 p.m. and 5:00 p.m. work end times,

plus a late bus after 6:00 p.m.

- "Enhanced" Service
    - Four morning round-trips serving 7:00, 7:30, 8:00 and 8:30 a.m. work start times in both Concord and Manchester
    - Seven afternoon/evening round-trips serving 3:30, 4:00, 4:30, 5:00, 5:30, and 6:00 p.m. work end times, plus a late bus at 7:00 p.m.

Midday Express

The initial service concept for a Midday Express route was to connect both downtowns with the major shopping areas in both cities: Steeplegate Mall and Walmart in Concord, and the Mall of New Hampshire in Manchester. As shown in Figure 16, this route begins southbound trips at Stickney Ave and running south on Main Street to enter I-93 at Exit 13. After using the same alignment as the Commuter Express to reach Veterans Park, the route would head east through Manchester on Lake Avenue to serve Elliot Hospital and then south on Mammoth Road and Huse Road to reach the Mall of New Hampshire. After serving the mall, the route would begin the northbound trip on I-293 southbound to I-93 north and follow it to Exit 13. After serving Eagle Square, the route would head east on Loudon Road and operate a loop through Steeplegate Mall and the "big box" stores before returning to Stickney Ave via Sheep Davis Road and I-393.

While this route would duplicate to some extent other services offered by MTA and CAT, the goal would be to dovetail the service with existing routes, so that the new route offered increased service to the retail areas rather than duplicative service. Thus, if the MTA and CAT services leave their respective downtowns at 30 past the hour, the Midday Express would leave the downtowns on the hour. It is proposed that this route operate four trips in the midday period, every two hours.

Local Route

In addition to the express routes that use I-93 and I-293 to traverse the distance between the two cities, a concept for a local route was developed that would serve people who live in towns between the two cities (see Figure 17). From the northern end at Stickney Ave, the route would run south on US 3 to Pembroke and then use Main Street to reach Suncook village. It would continue south through Hooksett on US 3/NH 28 to Veterans Park.

In the northbound direction, the route would retrace its steps southbound, but then add a loop through the Loudon Road retail area similar to the Midday Express. The concept here is to increase the service level to the Loudon Road corridor so that Manchester and Concord residents would have improved access to the jobs and shopping opportunities there. Within Manchester, MTA service is robust enough that people would be expected to transfer to other MTA routes if their trip destination is not in downtown Manchester.

It is proposed that service on this route be operated hourly from 6:30 a.m. to 6:30 p.m. to be consistent with other MTA routes. This service would require that ADA complementary paratransit be offered within 3/4 of a mile of the alignment. The express services, in contrast, would not require any ADA paratransit, since most of the route operates express on a limited-access highway.

Figure 15: Initial Commuter Express Alignment

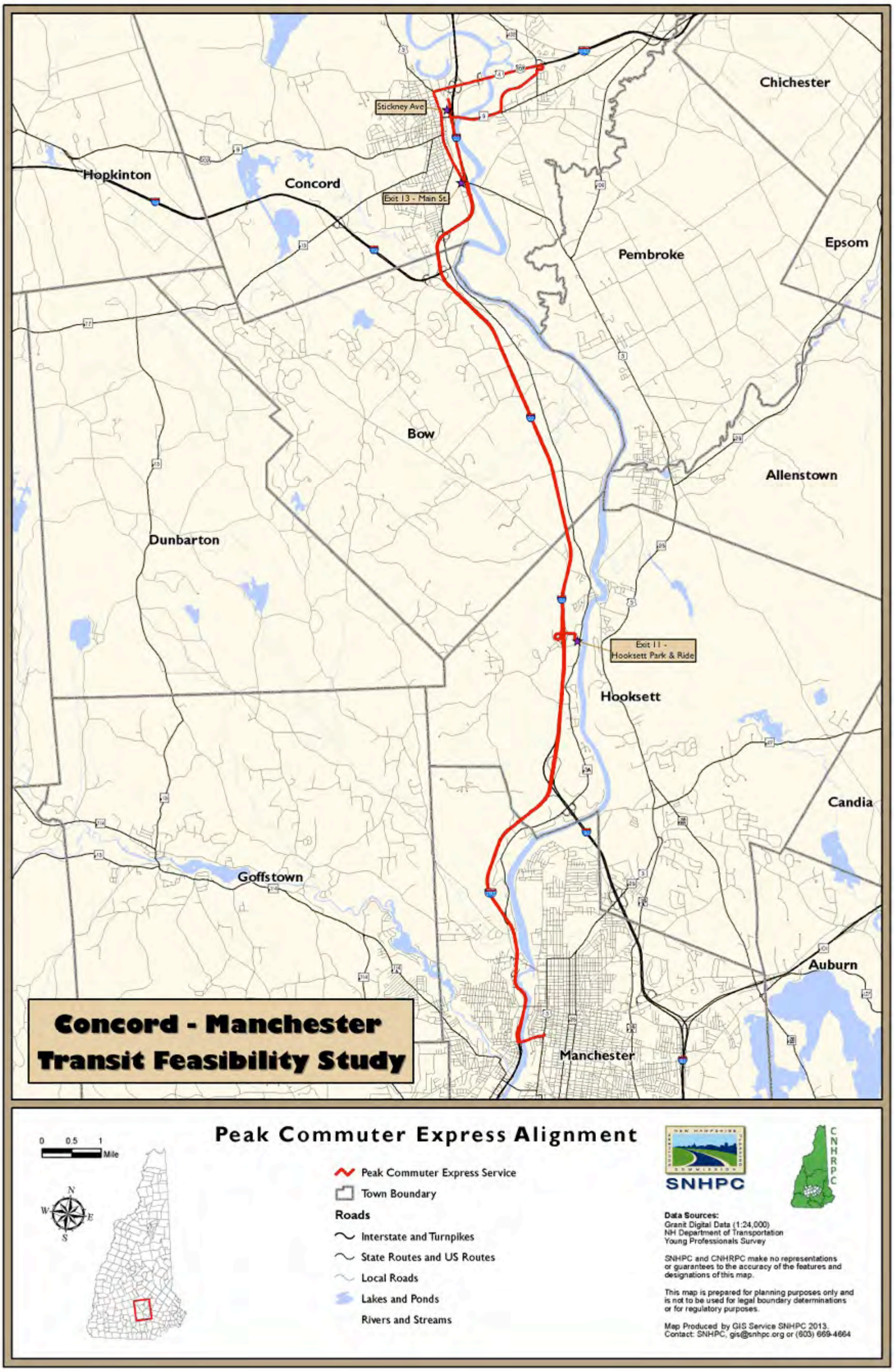


Figure 16: Initial Midday Express Alignment

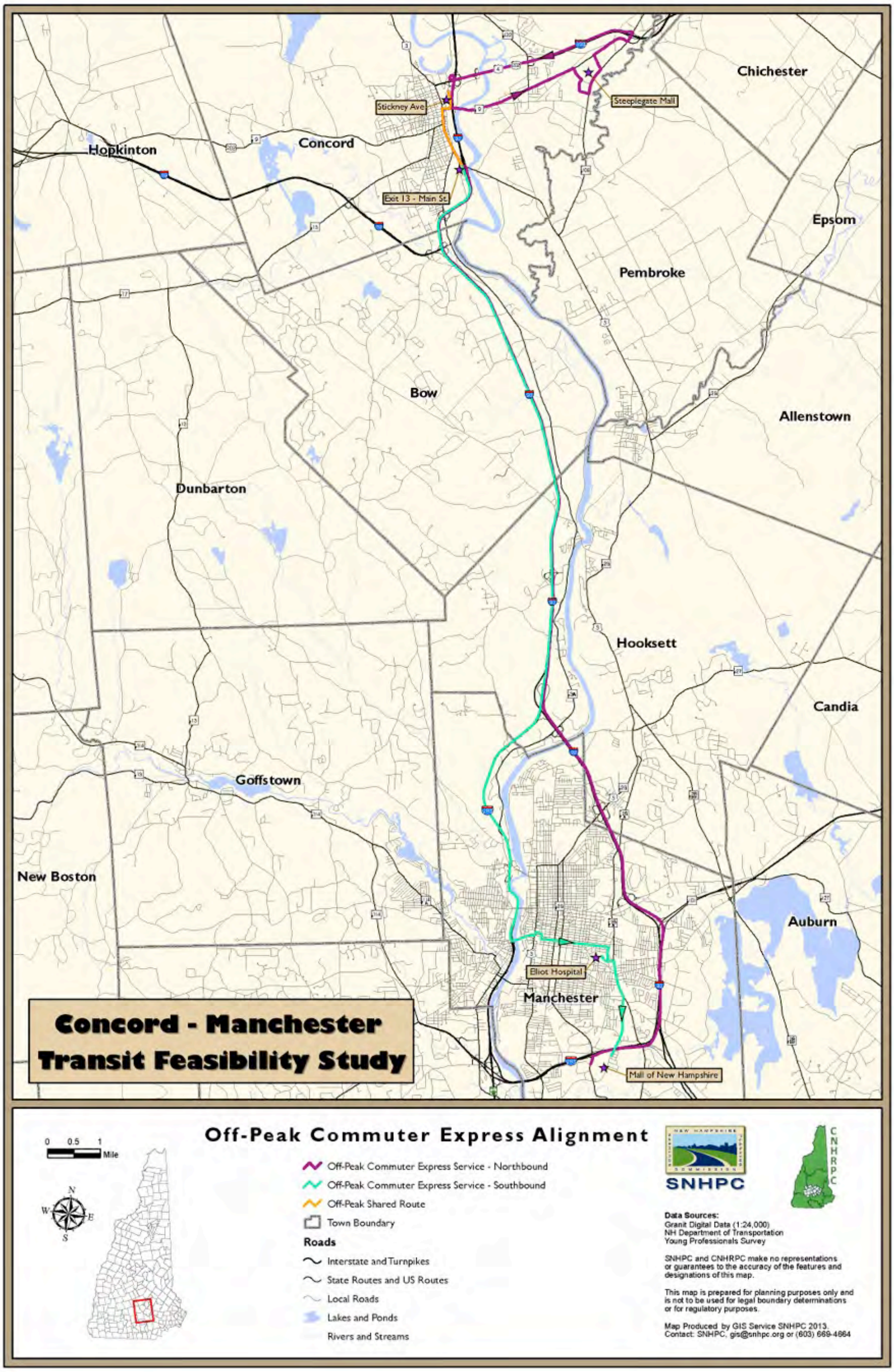
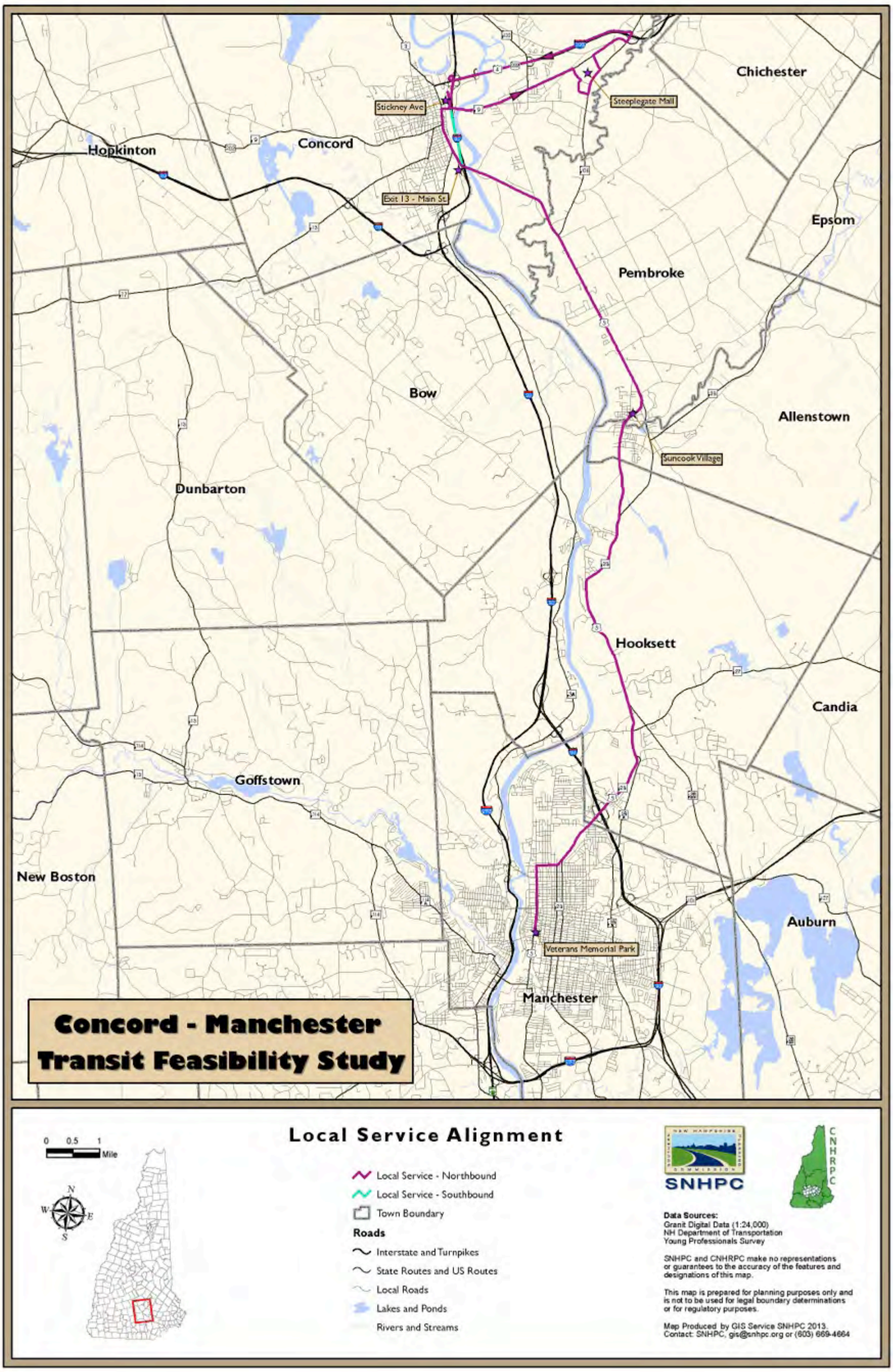


Figure 17: Initial Local Alignment



Preliminary Ridership and Cost

Detailed ridership and cost estimates were not developed for the initial service concepts, but some preliminary figures were estimated. The total commuting market between the two downtowns was calculated from the OnTheMap data used to produce Figures 7 through 11. For the year 2011 (most recent available), there were 445 people who live in the City of Concord working in downtown Manchester, and 371 people who live in the City of Manchester working in downtown Concord. Based on the experience of similar express routes in small urban areas, it was assumed that the route could capture 5.5% of these commuters with the Starter level of service, and up to 7% with the Enhanced level of service. In addition, it was assumed the route would capture a small number of Concord residents who work in other parts of Manchester and vice versa (who would have to transfer to MTA or CAT routes to reach their workplace destinations). The total number of such Concord commuters to Manchester is 1,364, and the number of Manchester residents working in Concord is 2,037. The percentage assumed was 0.5% for the Starter level and 1% for the Enhanced level. It was further assumed that each person would make two trips per day. Estimates for the Midday and Local service were based on expected productivities (passengers per trip or hour) rather than a specific market share.

Based on the experience of other similar express routes, there is significant potential for ridership growth over the longer term. For the Starter service, the growth is estimated at just under 50%, while higher growth is projected for the Enhanced service, of about 75%. Since the target market for this services is "choice" riders—those that have cars available—it will take time for the market to fully mature and for the express bus to be seen as the "smart" way to commute. This will be more true of the Enhanced service than the Starter service because of the former's higher level of convenience. The Midday service will also grow significantly in percentage terms, but by a smaller number in absolute terms. The Local service is not projected to grow as much as the express services, as the mostly transit-dependent population that would be riding it would learn about it relatively quickly and thus "max out" its potential sooner than the express service. The figures that result from these calculations and assumptions are presented in the following table.

Table 1: Initial Average Weekday Ridership Estimates

Route	Short Term (1-2 Years)	Longer Term (5-10 Years)
Commuter Express – Starter	125	180
Commuter Express – Enhanced	180	320
Midday Express	40	70
Local	220	250

The Local route would be the most expensive to operate, with some 31 service hours per day (in order to maintain the hourly headway specified above). The Starter service would require 10 service hours and the Attractive service would require about 18 hours. The Midday service would require roughly 7 service hours per day. In terms of cost-effectiveness, the Enhanced service level of the Commuter Express has the best ratio of riders to service hour over the longer term.

Recommended Service Plan

After presenting the initial service concepts to the stakeholders committee in November, 2013 and refining the ideas in cooperation with RPC and transit provider staff, a recommended service plan was developed. This plan is described in this section, with alignments, potential schedules, costs and ridership, as well as notes on coordinating service with existing transit routes operated by CAT and MTA.

Peak Alignment

The recommended alignment for peak period service is unchanged from the Commuter Express service described above and shown in Figure 15. The peak express route would link downtown Manchester to downtown Concord with a loop through the Thomson State Complex along Hazen Drive. Some trips would serve the Hooksett Park & Ride at Exit 11.

Midday Alignment

The midday express alignment has been streamlined compared to the initial service concept. Rather than trying to serve the major retail areas in both cities, the midday express is now presented as a connector just between the downtown areas. Access to the retail areas in each city would be provided by the local systems there via a transfer.

The new midday alignment is shown in Figure 18. It would have two primary stops: the State House in Concord and Veterans Park/Radisson in Manchester, though it could make one or two additional stops along Main Street in Concord and across from the Canal Street Bus Station in Manchester. Within Concord, the route would use Exit 13 on southbound trips to reach I-93, and Exit 14 on northbound trips to return to the local roads.

Weekend Alignment

The revised version of MTA's Route 4 Concord Express, which began service on February 10, 2014, introduced Saturday service between the two cities for the first time. Depending on available funding, Saturday service may not continue past the end of the pilot project in August. (It is not anticipated that the status of weekend service would have any significant effect on weekday ridership.) If Saturday service were to continue, it is recommended that it follow the alignment presented in Figure 19. This is a modified version of the Midday Express (Figure 16), with the loop through the retail area in Concord preserved, but the retail loop in Manchester discarded. The reasoning behind this proposal is that CAT operates no service in Concord on Saturdays, while MTA operates three routes connecting downtown Manchester to the Mall of New Hampshire. If this route were operated, Concord residents would have the benefit of new access to the Loudon Road retail area, even if they did not use the route to travel between Concord and Manchester.

Potential Schedules

As with the initial service concepts, two potential schedules are offered for the start of service on the peak Commuter Express route: a Starter service with a total of five round-trips, two in the morning and three in the afternoon; and an Enhanced service with a total of eleven round-trips, four in the morning and seven in the afternoon/evening. Both of these schedules assume that some buses would be based in Concord and others would be based in Manchester to eliminate long non-revenue (or minimal ridership) trips.

Figure 18: Recommended Midday Alignment

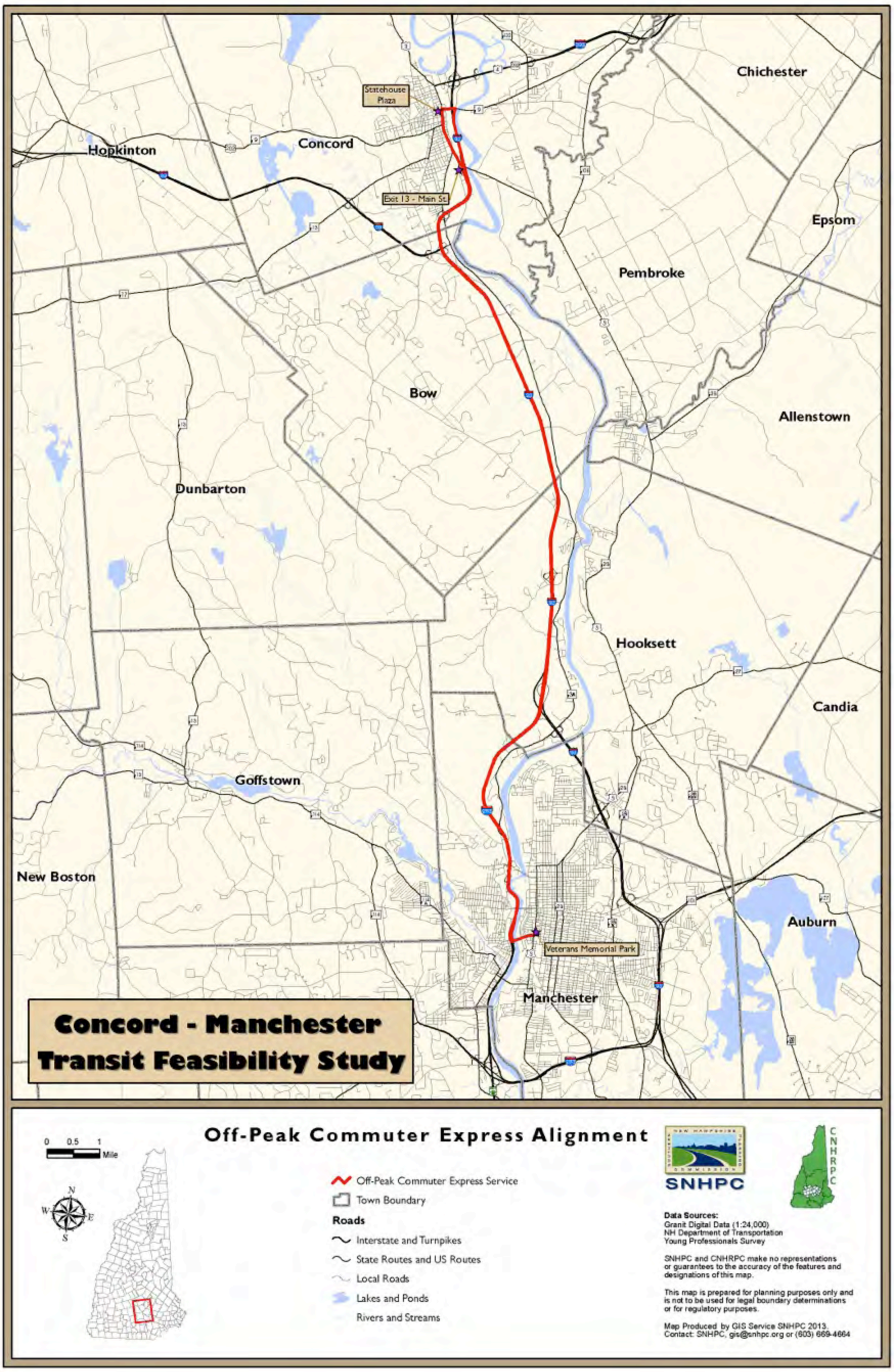
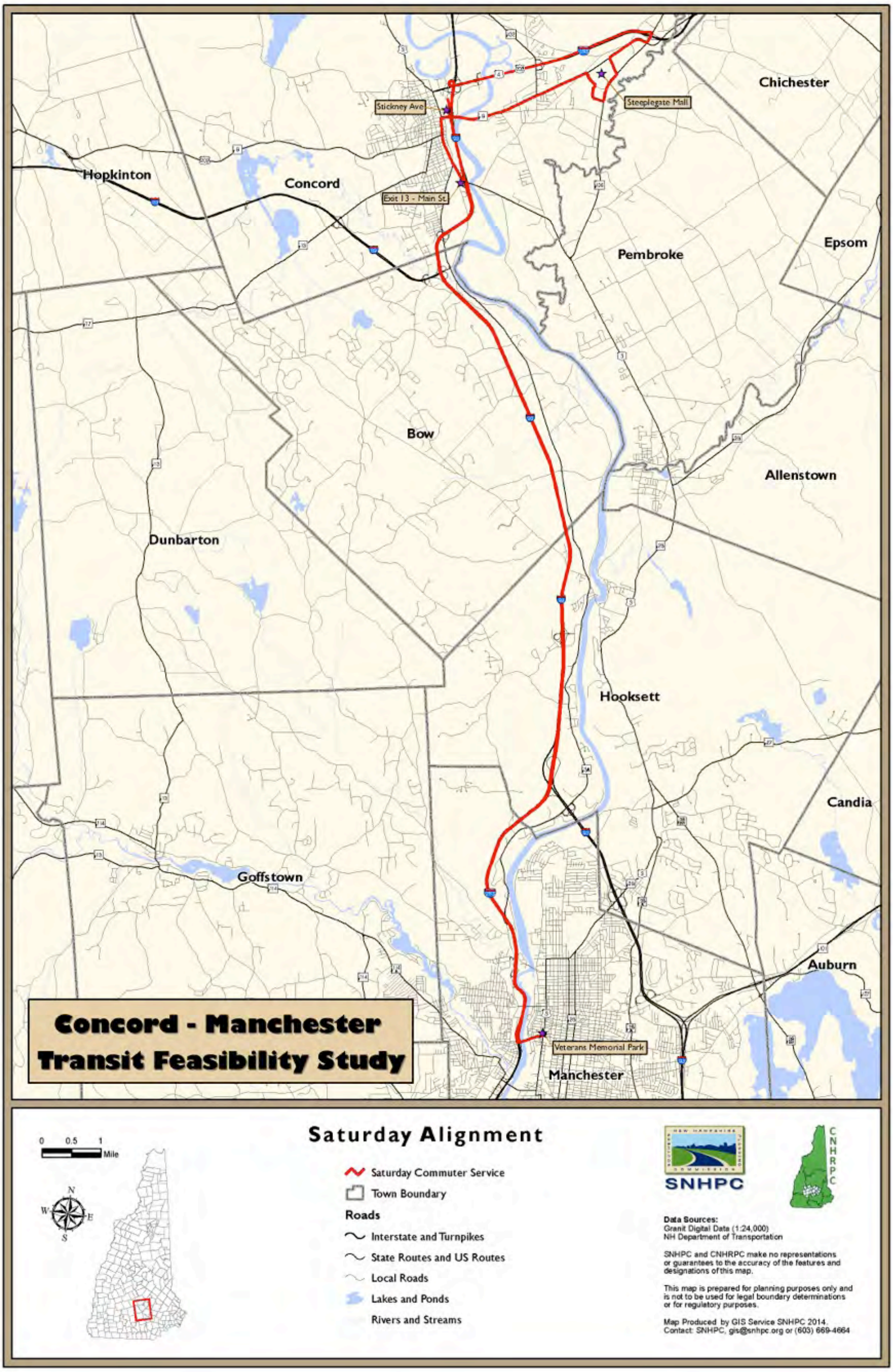


Figure 19: Recommended Weekend Alignment



Starter Commuter Service

Morning Service

Bus Based in	Stickney Ave	Exit 11 P&R	Veterans Park	Veterans Park	Exit 11 P&R	Eagle Sq	Hazen Dr	Stickney Ave
Manchester				6:20 AM	6:35 AM	6:50 AM	6:54 AM	7:00 AM
Concord	6:15 AM	6:30 AM	6:45 AM	7:05 AM	7:20 AM	7:40 AM	7:45 AM	7:52 AM
Manchester	7:15 AM	7:30 AM	7:45 AM					

Afternoon Service

Bus Based in	Stickney Ave	Hazen Dr	State House	Exit 11 P&R	Veterans Park	Veterans Park	Exit 11 P&R	Stickney Ave
Manchester						4:15 PM	R	4:45 PM
Concord	4:05 PM	4:10 PM	4:15 PM	R	4:45 PM	5:10 PM	R	5:40 PM
Manchester	5:05 PM	5:10 PM	5:15 PM	R	5:45 PM	6:10 PM	R	6:40 PM
Manchester	6:45 PM	6:50 PM	6:55 PM	R	7:20 PM			

R=On request

Enhanced Commuter Service

Morning Service

Bus Based in	Stickney Ave	Exit 11 P&R	Veterans Park	Veterans Park	Exit 11 P&R	Eagle Sq	Hazen Dr	Stickney Ave
Manchester				6:20 AM		6:40 AM	6:44 AM	6:50 AM
Concord	6:15 AM		6:40 AM	6:45 AM	7:00 AM	7:15 AM	7:19 AM	7:25 AM
Manchester	6:53 AM		7:16 AM	7:20 AM		7:45 AM	7:49 AM	7:55 AM
Concord	7:15 AM	7:30 AM	7:45 AM	7:45 AM	8:00 AM	8:15 AM	8:19 AM	8:25 AM
Manchester	7:55 AM		8:20 AM					

Afternoon Service

Bus Based in	Stickney Ave	Hazen Dr	State House	Exit 11 P&R	Veterans Park	Veterans Park	Exit 11 P&R	Stickney Ave
Manchester						3:40 PM	R	4:05 PM
Concord	3:30 PM	3:35 PM	3:40 PM	R	4:05 PM	4:15 PM	R	4:45 PM
Manchester	4:05 PM	4:10 PM	4:15 PM	R	4:40 PM	4:45 PM	R	5:10 PM
Concord	4:35 PM	4:40 PM	4:45 PM	R	5:10 PM	5:15 PM	R	5:40 PM
Concord	5:05 PM	5:10 PM	5:15 PM	R	5:45 PM	5:50 PM	R	6:15 PM
Manchester	5:30 PM	5:35 PM	5:40 PM	R	6:10 PM	6:15 PM	R	7:10 PM
Concord	6:05 PM	6:10 PM	6:15 PM	R	6:45 PM	7:00 PM	R	7:30 PM
Manchester	7:15 PM	7:20 PM	7:25 PM	R	7:55 PM			

R=On request

The schedules shown above were designed to be maximally convenient to riders, but not necessarily maximally efficient for operations. The morning arrival times in the two cities are intended to allow people to get to work comfortably if their start times are at 7:00 a.m. or 8:00 a.m. (for the Starter service) and also 7:30 a.m. and 8:30 a.m. for the Enhanced service. These were by far the most common start times cited in the employee survey described earlier in this report. The afternoon departure times conveniently serve work end times in both cities of 4:00 p.m. and 5:00 p.m., plus 6:00 p.m. in Manchester with a late bus for Concord workers (for the Starter service) and also 3:30 p.m., 4:30 p.m., 5:30 p.m. for both cities and 6:00 p.m. in Concord, plus a late bus for both cities, in the Enhanced service level.

It can be seen that in the Starter scenario, all morning trips would stop at Exit 11 Park & Ride, but that in the Enhanced scenario, only one southbound and two northbound trips stop there. The available capacity at the parking lot is not substantial enough to make it worthwhile for the Enhanced scenario to serve the lot with every trip, due to the extra running time it consumes. It is assumed that all afternoon trips in both scenarios would serve the lot only if a passenger on the bus requests a stop there.

The Starter service would require two vehicles in operation, one based in Manchester and one based in Concord. The Enhanced service would require three vehicles: one based in Manchester and two based in Concord. The schedule includes some long layovers of 20 to 25 minutes for some of the trips; this was necessary to ensure that the departure times meshed well with the work start and end times listed above. It would be possible to rework the Enhanced schedule to require only two buses and have shorter layovers, but then compromises would have to be made on the departure times. For the purpose of this report, the schedule was developed to be most attractive to the rider, not the minimal cost alternative.

Midday Service

During the midday period, service would run hourly, coordinated with the bottom-of-the-hour departure of most buses in Manchester. One bus would operate this service. Under the Enhanced scenario, this could be the same bus that completes the 7:55 a.m. departure from Stickney Ave, arriving in Manchester at 8:20 a.m.

Bus Based in	Radisson	State House	Radisson
Manchester	8:25 AM	8:50 AM	9:20 AM
Manchester	9:25 AM	9:50 AM	10:20 AM
Manchester	10:25 AM	10:53 AM	11:20 AM
Manchester	11:25 AM	11:55 AM	12:25 PM
Manchester	12:30 PM	12:59 PM	1:25 PM
Manchester	1:30 PM	2:00 PM	2:25 PM
Manchester	2:30 PM	3:00 PM	3:25 PM

Saturday Service

If service is operated on Saturdays, it could operate similar to the weekday midday service, with a simple hourly trip between the two downtowns. However, as discussed above, because CAT does not operate on weekends, it is recommended that the route connect directly to the retail area along Loudon Road. This would lengthen the round-trip time to about 90 minutes. A proposed schedule for this service is presented below.

Bus Based in	Radisson	Eagle Square	Walmart	State House	Radisson
Manchester	9:00 AM	9:25 AM	9:45 AM	10:00 AM	10:25 AM
Manchester	10:30 AM	10:55 AM	11:15 AM	11:30 AM	11:55 AM
Manchester	12:00 PM	12:25 PM	12:45 PM	1:00 PM	1:25 PM
Manchester	1:30 PM	1:55 PM	2:15 PM	2:30 PM	2:55 PM
Manchester	3:00 PM	3:25 PM	3:45 PM	4:00 PM	4:25 PM
Manchester	4:30 PM	4:55 PM	5:15 PM	5:30 PM	5:55 PM

Coordination with MTA and CAT Service

No matter who operates the proposed Concord-Manchester express service, it will be important to coordinate with existing local routes operated by CAT and MTA, at least during certain times of day. The morning and afternoon peak express service is intended to serve the concentrations of employment in the two downtowns and at the State complex on Hazen Drive. It is anticipated that most of the riders would be walking from the bus to their jobs rather than transferring to other routes. Thus, coordination with existing routes during the peaks is not essential.

During the midday period and on Saturday, coordination is much more important. The Midday Express is proposed to serve only the downtown areas. While there are numerous shopping and personal business opportunities in the downtowns, many of the trips taken in the midday and on Saturday may have ultimate destinations at the large retail areas in both of the cities, or at other locations. With CAT and MTA both operating local routes that connect their respective downtowns to the large retail areas and other destination, it makes sense to time the arrivals and departures of the express with those of the local routes.

In Manchester, MTA routes depart from the Radisson/Veterans Park at either the top of the hour (such as 2:00) or the bottom of the hour (such as 2:30). The Midday Express trips are proposed to leave from the Radisson at either 25 or 30 minutes past the hour, allowing for transfers to and from all of the MTA routes that leave at the bottom of the hour.

Concord Area Transit operates the “Heights” route—which serves the Loudon Road corridor—approximately once per hour, but not at precisely the same time each hour. The table below shows the currently scheduled departures of the Heights route from Eagle Square, and the proposed departure times of the Midday Express from the State House, which is across the street.

CAT Heights Route Departures	Proposed Express Arr/Dep
8:49 AM	8:50 AM
9:51 AM	9:50 AM
10:53 AM	10:53 AM
11:56 AM	11:55 AM
12:59 PM	12:59 PM
2:02 PM	2:00 PM
3:27 PM	3:00 PM

The departure at 8:49 a.m. may need to be slightly delayed until the Express bus arrives, but otherwise, the buses should be able to meet in downtown Concord and allow for transfers in both directions. It is strongly recommended that the operators of the Express and the Heights route be able to communicate with each other so that if there are passengers who want to transfer, both drivers are aware of this. The trip in the 3:00 p.m. hour is not well coordinated, as the CAT route has a gap of 85 minutes as it transitions to afternoon peak service.

On Saturdays, if the service were to be operated similar to weekday midday service—on a simple hourly headway—then it would depart the Radisson at the bottom of the hour, similar to other MTA routes. Under the schedule proposed above, with the expanded route running every 90 minutes, every other trip (10:30 a.m., 1:30 p.m., 4:30 p.m.) would be well coordinated with MTA service. While in the ideal situation all trips would be coordinated with other MTA routes, the benefits of offering service to the Loudon Road corridor in Concord outweigh the inconvenience for some passengers of having to wait 30 minutes to make a connection in downtown Manchester.

Cost, Ridership and Revenue

As will be discussed more in the next section, a final decision about which entity would operate this service has not been made. For the purpose of estimating the operating cost, however, it is assumed that the proposed schedules would be operated by a combination of MTA and CAT. Costs were estimated based on rates per platform hour, which includes revenue time and non-revenue (deadhead) time, but does not include other driver pay time such as pre-trip inspection or punch-in or punch-out time. In other words, platform hours include all of the time from when the bus leaves the garage to when it returns, excluding any unpaid breaks. MTA's rate per platform hour is $52, while the rate for CAT is slighly lower, assumed at $49.

A summary of the gross cost estimates for the various service levels is presented below in Table 2. Separate costs for CAT and MTA are shown, but again, it is important to emphasize that this does not presume that the route would be operated specifically by these agencies. These figures are provided for illustrative purposes. The platform hours figures represent the hours per day, while the cost figures represent the annual total.

Table 2: Estimated Gross Operating Costs

Service	CAT Platform Hours	CAT Ann. Operating Cost	MTA Platform Hours	MTA Ann. Operating Cost
Commuter Express – Starter	4	$49,980	4.83	$64,090
Commuter Express – Enhanced	9.33	$116,616	6.58	$87,295
Midday Express	0	0	7.17	$95,030
Saturday Express with Loudon Rd Loop	0	0	9.08	$24,561

The total gross annual operating cost for the Starter service would be $114,070, while the total cost for the Enhanced service would be $203,911. If the Starter service were operated with the recommended midday service, the total cost would be $209,100. It is important to note that these costs are exclusive of any capital costs for vehicles, passenger shelters or signage.

It is important to note that these costs do not account for tolls or commission fees for boardings at Stickney Ave. Current State policy exempts public transit operators (such as MTA and CAT) from paying tolls on I-93, but private operators (such as Concord Coach) do have to pay tolls. Conversely, MTA has been paying a commission fee to Concord Coach (the operator of the bus station) for Route 4 boardings at Stickney Ave to compensate for additional operating costs associated with passenger parking and the use of the station facility there. Depending on which entity operates the proposed service, there could be future toll costs or commission fees that are not included in this estimate, though they would represent only a slight increment to the costs listed above.

As the schedules were refined, so were the ridership estimates. Forecasts for the recommended services are provided below in Table 3. They are again divided into short term forecasts for the next two years and longer term forecasts for when the ridership market has fully matured. The basis and method for the forecasts is similar to that described above on page 44.

Table 3: Revised Average Day Ridership Estimates

Service	Short Term (1-2 Years)	Longer Term (5-10 Years)
Commuter Express – Starter	125	180
Commuter Express – Enhanced	180	380
Midday Express	60	120
Saturday Express with Loudon Rd Loop	60	110

It is important to note that future ridership can be strongly affected by several factors. To the extent that gasoline prices continue to rise, ridership can also be expected to rise. While drivers in the year 2005 would have been shocked by gasoline prices of $3.30 per gallon, today's drivers have become accustomed to that price level. If prices remain where they are or drop, ridership on the express route may take longer to mature. If prices rise to over $4.00 per gallon as the economy begins to heat up, then more people will look to alternatives to driving.

Marketing and information are essential to the success of any new service. Newsmedia coverage can help spread the word, but in order to be effective, information about the Commuter Express service needs to be disseminated by employers directly to their employees. State agencies in Concord and Manchester should work with the service provider and NHDOT to promote the route aggressively to commuters between the two cities. The Chambers of Commerce in Concord and Manchester should identify employers who could benefit from the service and work with them to promote it to their employees and customers. There are numerous examples of programs through which employers can help subsidize bus passes as an employee benefit; this can be a significant incentive to commuters.

The fare for the current Route 4 Concord Express is essentially $2 each way, as MTA requires that passenger purchase a day pass for $4 to be able to ride. For the future service, MTA should consider accepting $2 cash fares for boarding a trip. As more regular commuters use the service, they will want to have other fare options available, such as a monthly pass or a 10-trip ticket. MTA's current $50 monthly pass should not be valid on this route, as it would offer too much of a discount on the base fare. An appropriate price for the Express monthly pass would be in the range of $70. A 10-trip ticket could be sold for $20, offering no discount off of the base fare. MTA has the option of offering reduced fares for students and seniors, but is not required to do so on a commuter express route.

With this fare structure, annual revenue for the various service levels would be as shown in Table 4. This table assumes that up to one half of passengers would use a monthly pass costing $70 (resulting in an average fare of $1.83 per passenger).

Table 4: Potential Annual Revenue Estimates

Service	Short Term (1-2 Years)	Longer Term (5-10 Years)
Commuter Express – Starter	$57,500	$82,800
Commuter Express – Enhanced	$82,800	$174,900
Midday Express	$27,600	$55,200
Saturday Express with Loudon Rd Loop	$5,700	$10,500

As stated above, the gross operating cost for the Starter service is $114,070. If the route achieves the projected ridership within the first two years, it would recover just over 50 percent of its cost in fare revenue, substantially lowering the net cost of service. In the longer term, the ratio could rise to 73 percent ($82,800/$114,070), though nominal operating costs are likely to be significantly higher in five to ten years. The fare recovery ratio for the Enhanced service would be lower in the short term at about 40 percent, but in the longer term, it would rise to about 85 percent ($174,900/$203,911), though this ratio would only hold true if fares increased at the same rate as operating costs.

The fare recovery for midday and Saturday service would be quite a bit lower, at 29 percent and 23 percent, respectively in the short term and 58 percent and 42 percent in the longer term. Nonetheless, by small urban and rural standards, these fare recovery ratios are very good.

Implementation and Funding

The final section of this report discusses issues related to the implementation and funding of the recommended service. There are proposals and recommendations presented here, but all of the final decisions are at the discretion of NHDOT and its local and regional partners in Concord and Manchester.

Potential Operators and Funding Sources

The material presented in previous sections indicates that the proposed services could be jointly operated by CAT and MTA, but that is only one of several possibilities. The ultimate decision about who operates the service is integrally tied to the source of money used to fund the service.

One obvious choice for funding this new service is the Congestion Mitigation/Air Quality (CMAQ) Program. This is a funding program from the Federal Highway Administration first created by the federal transportation authorization in 1991 (called ISTEA). The CMAQ program has the flexibility to fund both highway improvements as well as transit programs, including capital and operating expenses. Many states have used the CMAQ program to fund three years worth of new transit service (the original time limit associated with the program for operating assistance). Unlike regular transit operating assistance, which requires a 50 percent local (non-federal) match, the CMAQ program funds 80 percent of the net cost of service, requiring only a 20 percent local match.

In the normal process, NHDOT would announce the availability of CMAQ funds through a request for proposals (RFP) and thus invite parties, including public agencies, private non-profits, and private for-profits, to bid on new services in the state. NHDOT then rates the proposals and awards the contract to the proposer with the best value offered.

Such a process could be used to fund the new service recommended in this report. The proposer would need to find a source for the 20 percent local match. There is some precedent in using toll credits for the local match (they are being used for the current Route 4 Concord Express pilot operation), but there is no guarantee that these credits would be available in the context of the CMAQ RFP. The toll credits do not come in the form of cash match, but they can be used to draw down federal funds as if they were cash.

An application to use CMAQ funds for this service need not cover the entire operating cost. Indeed, applications can be strengthened by bringing other funding sources to bear so that the CMAQ money is just a portion of the overall funding package.

One downside of CMAQ is that it has a time limit, and thus raises the question of how a new service will be funded once the CMAQ grant ends. It is unlikely that any public transit service will become self-sustaining through fare revenue, so an ongoing source of funds would need to be identified to replace CMAQ after three years.

MTA's transit service is funded in large part by the Federal Transit Administration's (FTA) Urbanized Area Funding Program, known as Section 5307. This type of funding requires a

50 percent match for operations, but it is an ongoing program that is included in the periodic federal transportation reauthorizations. During the course of this study, MTA has indicated that it has some 5307 funding available within its budget that it could use to operate the Express service, and that it has vehicles available as well. The challenge in operating the service would be to identify the local match.

CAT's transit service is funded in large part by FTA's Non-Urban Funding Program, known as Section 5311. This program is administered by NHDOT and distributed to all rural transit providers in the state. CAT has indicated that there is no excess 5311 funding available now or in the foreseeable future, as they recently had to accommodate a 10 percent cut in this funding. The 5311 program also requires a 50 percent local match. CAT has vehicles available to operate the service, but they are all small (16-passenger) cutaway vans, which may not have sufficient capacity, nor be appealing to commuters who would use the Concord-Manchester express route.

If NHDOT issues an RFP for this service, it could be bid on by MTA, CAT, a team of MTA and CAT, or any other entity that may be interested in operating the service. Concord Coach currently operates two trips between Concord and Manchester as part of its larger intercity network. In theory, that service could be expanded under a CMAQ grant, but this short-distance route does not fit well into Concord Coach's overall business model of longer-distance commuter and intercity routes. Other private companies might bid on the service, but it is difficult to see how a company without an existing base of operations in the region could run such a small amount of service profitably.

Another possibility would be a "piecemeal" approach to assembling this service. With the two trips operated by Concord Coach, whatever service MTA can afford within its budget, and some additional service funded through a CMAQ grant, it may be possible to put together enough service to be convenient for commuters. This approach should be a last resort because of the difficulty in making such a fragmented service comprehensible to the rider. Under this scenario, a rider could be using two completely different vehicles in the morning and afternoon, with different fare and transfer policies. It would be challenging to coordinate schedule information and to have the service become a recognizable "route" within the overall transit network.

Potential Barriers

Depending on the source of funding ultimately chosen for the service, the most significant barrier to service may be the availability of local match. In theory, the cities of Concord and Manchester could include funding for this service in their municipal budgets, but given the tight budgetary time, this seems unlikely in the short term. Once the route has begun operating and demonstrated that it is a viable service, it may be more possible to obtain some local funding.

The State of New Hampshire currently provides no State funds for transit operations. A few years ago, there was a small amount of funding available statewide ($100,000 - $188,000), but that program has not been funded since 2009. Unless that program was reinstated and

significantly expanded, there would not be enough available to fund the local portion of this route, given the many needs all over the state.

Any State involvement in funding the service, through the CMAQ program or other, would have to adhere to standard practices and procedures, given federal rules about contracting service. Funding would be granted through an open RFP process allowing private sector firms an equal chance to bid for the contract.

Another potential barrier worth mentioning relates to capital equipment and facilities. As mentioned above, CAT does not currently have a vehicle that would be appropriate for a commuter service once demand begins to increase. If CAT chooses to apply for funding for this project through CMAQ, it could include the capital cost of a mid-size bus in the application, but it would also need a source of local match for that funding. In addition the bus, passenger shelters would be desirable at bus stops served by the express route. Potential locations include Hazen Drive and Main Street in Concord. In some cases, there are barriers to installing shelters such as having available right-of-way and accessible pedestrian paths from the shelter to the street network or adjacent buildings. This study did not identify particular stop locations along Hazen Drive, but they would need to be chosen carefully to avoid these barriers.

Recommended Phasing and Funding Plan

With the service change that MTA implemented in February, 2014, funding for the pilot project on the Concord Express should last until August, 2014. At that point, to avoid an interruption in service, it is recommended that the Starter service level of the Commuter Express be implemented. If there is sufficient funding available, then some or all of the midday service should also be implemented.

Assuming the Starter service is successfully implemented, the region should seek to gradually add trips to the schedule over the three year period from 2015 to 2017, thereby moving toward the Enhanced service level, including full midday service. According to the timetables in this report, the new peak service would be based in Concord rather than Manchester, but the timetable could be altered to allow for new trips to be based in Manchester.

It should also be noted that a planning study for I-293 in Manchester has recommended a relocation of Exit 7 to the north. If this is implemented, it would create an opportunity for a new park & ride lot, improved access for residents of Goffstown and a more direct connection to Manchester Community College. At that time, it should be considered whether some trips on the express route can stop there without creating too much delay for through passengers.

The pilot service offers three trips on Saturday. If funding is available in 2014, that service can be maintained, but the region should strive to offer more robust Saturday service by 2018, covering the proposed schedule included in this report.

Evening service would be the next augmentation of service, with trips running as late as 9:00 p.m. on weekdays. Later evening service on Fridays and Saturdays, perhaps until midnight, would be desirable to cater to the "young professionals" market. These service increases could come in 2019 and later, depending on the level of demand in the core service and available funding.

In an ideal world, funding for the service to be implemented in August would come from a combination of MTA's Section 5307 funds and a CMAQ grant to CAT to cover its operating cost and the purchase of a new bus. Also, ideally the grant would come with an arrangement to use toll credits as local match for all of the funding (5307 and CMAQ) so that no additional local cash was required. As a point of reference, the cost for a new mid-size bus (30 passenger capacity) would be in the range of $100,000 to $160,000 depending on the model. The lower end of the range would be for a truck-based cutaway, while the higher end would be for a purpose-built transit bus. The cutaway would have an expected life of seven years, while the transit bus would have a 10-year expected life. None of these vehicles would compare to a heavy-duty transit bus that would have a 12-year life and cost upwards of $350,000. The grant would be written as a single cooperative project between CAT and MTA, so that the 5307 funds that MTA brings to the table strengthens the overall project.

If the ideal scenario is not possible, MTA could apply directly for CMAQ funding to supplement its 5307 funds and operate the route on its own. This would entail running some trips from Manchester to Concord either in non-revenue service, or running them at times when significant ridership would not be expected so that the Concord-to-Manchester commute could be served effectively. This application could also include a proposal to use toll credits for local match.

If CMAQ funding is not available for this project, MTA would need to seek local match from the City of Manchester and any other potential sources to try to maximize the use of its federal 5307 funds for the service. The scale of the service operated would need to be reduced, threatening its overall viability. If funding is limited, then service should be focused on the peak commuter runs with no Saturday and either no or very limited midday service.

Conclusion

The analysis of demographic, employment, and survey data has demonstrated the existence of a market for transit service between Concord and Manchester. The service developed and recommended in this study would address this market in an efficient and cost-effective way, with fare revenue potentially paying for more than half of the service cost.

There are some potential barriers to service implementation, including finding the right mix of funding and finalizing an operating plan that avoids wasted driver time and mileage. However, the endorsement of key policymakers in the concept of downtown-to-downtown service and the ongoing participation and support of the stakeholders indicate that the time for this transit link between the capital and New Hampshire's largest city may finally have arrived.

Appendix – Stakeholders

Manchester-Concord Transit Feasibility Study Advisory Committee Meetings
List of Participants

June 2013 – February 2014

Stakeholders
Carlos Baia, City of Concord
Harry Blunt, Concord Coach
Ken Hunter, Concord Coach
Mark Sanborn, Concord Coach
Kathy Braun, UNH
Steve Caccia, NHTI
Robin Comstock, Manchester C of C
Jamie Dowd, Flight Line
Joe Kasper, NE Delta Dental
Maureen Nagle, R8 RCC
Terri Paige, Concord Area Transit
Barbara Shaw, Manchester Aldermen
Ryan Smith, MTA
Mike Whitten, MTA
Mark Brewer, Manchester Airport
Fred Butler, NH DOT
Dominic Ciavarro, Concord Hospital
Susan Huard, Manchester Community Coll.
Tom Irwin, CCF
Ann Lawrence, Elliot Health
Kim Keegan, Manchester Community Coll.
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RPC Staff
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