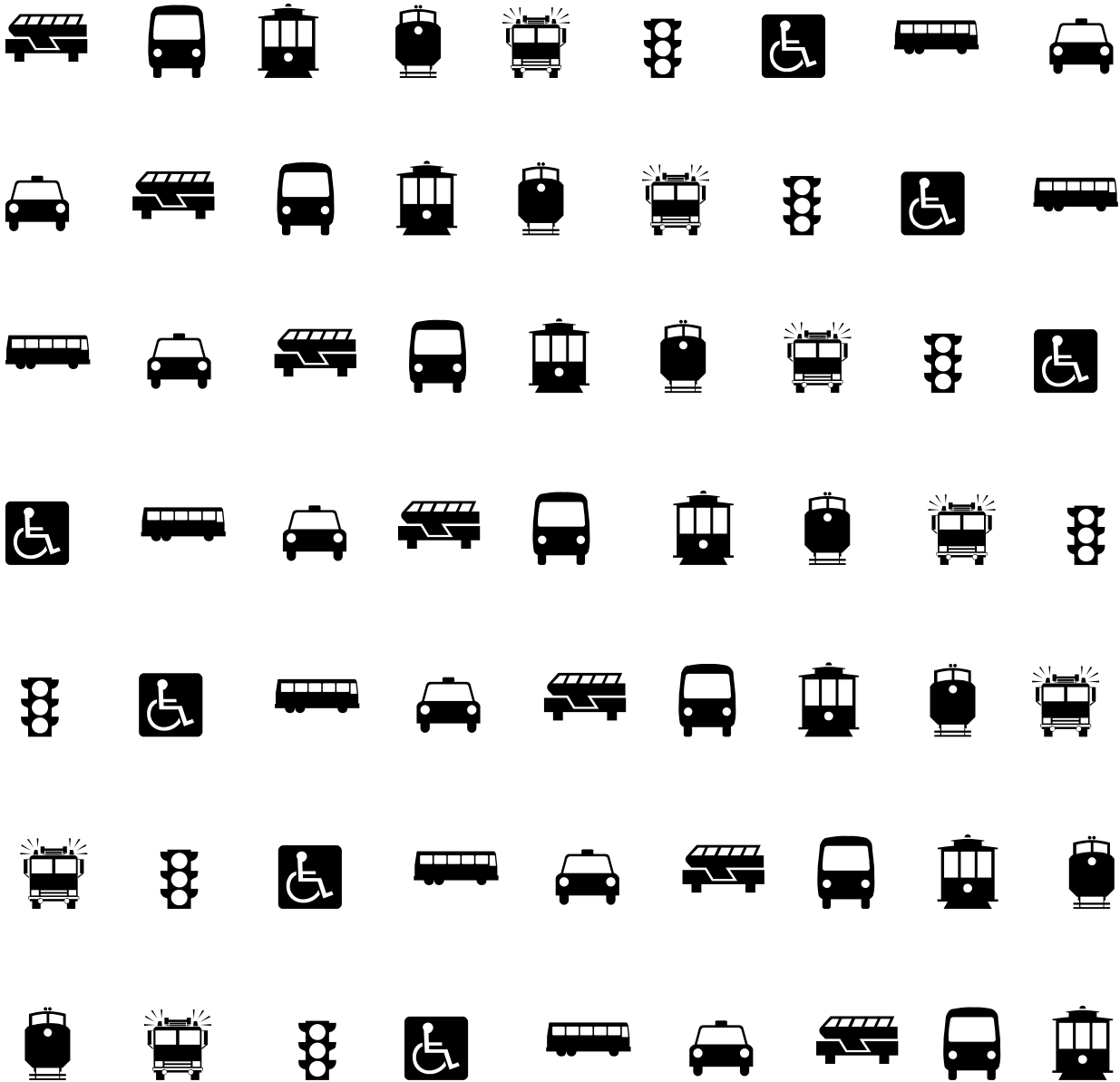




Chapter V

Goals and Implementation Plan



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V. GOALS AND IMPLEMENTATION PLAN

A. INTRODUCTION

Chapter Five utilizes the analysis in Chapters Three and Four to develop the goals for the Transit Plan. Chapter Three described the existing transit service in the region, its riders and issues that have been identified as needing improvement. Chapter Four described in detail the areas of the region that have the highest need for transit services due to the presence of high numbers of low income households, households without enough vehicles available to meet their own transportation needs, persons with disabilities, and senior citizens or young people who can't yet drive. Based on this information Chapter Four identified the areas of the region that can most benefit from transit service. Chapter Five sets out 12 goals for the improvement of transit service in the region and specific steps to implement each goal. The goals cover the following categories: service frequency, Nashua service area, regional service area, affordability, passenger amenities, safety, education, intermodal network, air quality/environment, demand response, transit system efficiency and regionalization. The proposed transit services listed under each goal are proposals only and specific transit service options would be further developed during the planning period. Proposed transit service extensions are dependent upon local financial participation from the participating towns.

B. GOALS FOR FIXED ROUTE AND DEMAND RESPONSE SERVICE

Below are twelve goals for the improvement of transit service in the NRPC region in the next 20 years. These goals were developed by NRPC with the input and assistance of Nashua Transit System and the NRPC Transportation Technical Advisory Committee. The goals are based on the issues and needs that have been identified in Chapters Three and Four.

1. Service Frequency – Decrease headways and extend service hours on existing routes to improve convenience, decrease wait times, and facilitate access to employment, education and retail sites.
2. Service Area - City of Nashua – Extend transit service to portions of the City of Nashua that can feasibly support transit and are currently underserved. This includes service to employment, education and retail sites, as well as future commuter rail stations.
3. Service Area - NRPC Region – Improve regional mobility by providing transit connections in the region and between regions with connections to other destinations within New Hampshire and Massachusetts.
4. Affordability – Maintain cost effectiveness and affordable fares, by securing dedicated funding and gaining ongoing public support for expanded services.
5. Passenger Amenities – Operate clean and well maintained buses and facilities, while developing additional amenities such as bus shelters and updated bus stop signs with schedule information and lighting.
6. Safety – Provide continuous mandatory and optional staff training to ensure passenger and facility safety and security through driver training, emergency preparedness, and conflict resolution while promoting interagency connections for emergency situations.
7. Education – Provide continuous education to existing and potential riders using marketing and public outreach through rider information services regarding benefits of using public transportation.



8. Intermodal Network - To assist commuters with improved access to both local and distant employment destinations through the development of an intermodal transportation network including transportation demand management measures, access to park and ride lots, future commuter rail stops and express routes specifically designed for compatibility with peak commuter schedules.
9. Air Quality/Environment – Continue to improve the environment by participating in Air Quality Action Days and replacing outdated buses with reduced emission models.
10. Demand Response - To provide cost effective demand responsive transportation to disabled persons within the City of Nashua and to complementary demand-response service areas within the region, as required by the Americans with Disabilities Act.
11. Transit System Efficiency - Use current and available technology to make transit service as convenient, safe and cost effective as possible including, Intelligent Transportation System technologies and the purchase of up to date vehicles, software, amenities and components.
12. Regionalization – Promote inter-regional mobility by providing transit connections between regions with connections to other destinations within New Hampshire, including Manchester, Concord, Keene and Derry/Salem, as well as sites in Massachusetts.

C. IMPLEMENTATION AND COST ANALYSIS

The following section describes in detail the implementation plan and associated costs that have been identified to accomplish each of the above goals. In the case of several of these goals, particularly expansion of the service area and increases in the frequency of service, the goals have been listed as a series of steps. This has been done for several reasons. One is that time is required to build the market for transit services and educate the public in regard to its availability. As a result, it is usually not wise to introduce a new transit service at the level that is expected to be needed to satisfy the ultimate need. Rather, new transit services are developed in steps over the course of time as the public indicates a need for the improvements. Introducing transit services slowly over the course of time also gives local governments the opportunity to slowly phase in the costs over the course of time and build acceptance of those costs in the budgeting process. Finally, the implementation of new transit services is not a sure thing. Phased implementation of transit services allows the local governments to back away from the services with a minimum of disruption to the public if the service does not meet expectations.

For clarification purposes, the goals listed above have been listed again in this section followed by specific implementation steps for each goal. Each goal and the associated costs have been included in the following tables. The tables provide descriptions of the proposed service or item in the left column while the remaining columns contain information on operating costs, capital costs and total costs. The proposed services cover a twenty-year time frame and are dependent upon local financial participation. Costs are based on current cost factors and have not been adjusted to compensate for future inflation. Costs have not been adjusted for inflation because the actual date of implementation for any of the proposed service improvements is unknown at this time. Stating all costs in current dollars allows policy makers and members of the public to directly compare the costs of all proposed service improvements and draw conclusions about their relative priority. However, prior to implementation, an up to date cost estimate should be determined as part of the budgeting process.

Nashua Transit System utilizes a base set of cost factors to determine the anticipated costs of proposed transit services. Some of these cost factors have been provided by the National Transit



Database. NTS is required to provide annual statistical information such as vehicle miles traveled, revenue figures and accident data to the Federal Transit Administration’s National Transit Database program. The National Transit Database tracks statistical information on over 600 transit providers nationwide. This information is used in planning for future transit services and provides a means of comparison between transit agencies.

The following table displays the factors used in developing costs for the proposed transit services discussed in this section.

Table 5-1: Cost Factors

| Service | Cost per Hour for Service | Cost per Vehicle Mile | Overhead Fixed Cost per Year per Vehicle |
|--------------------------|---------------------------|-----------------------|--|
| In-City Bus Service | \$22.90 | \$0.61 | \$13,787 |
| In-City Van Service | \$19.51 | \$0.66 | \$13,787 |
| In-City Demand Response | \$19.51 | \$0.66 | \$13,787 |
| Regional Bus Service | \$22.90 | \$0.61 | \$13,787 |
| Regional Van Service | \$19.51 | \$0.66 | \$13,787 |
| Regional Demand Response | \$19.51 | \$0.66 | \$13,787 |
| Operating Support | \$50 | N/A | N/A |

GOAL #1 - SERVICE FREQUENCY

Decrease headways and extend service hours on existing routes to improve convenience, decrease wait times, and facilitate access to employment, education and retail sites.

I. Nashua Routes

- A. Decrease headways on all Citybus routes to ½ hour headways. Citybus currently operates six routes within the City of Nashua. All of these routes have hour long headways, with the exception of Route 5, which already operates on a half hour headway. Routes 3 and 7 are half hour runs with one hour headways, so these two routes will only require one additional bus, while routes 2, 6, and 8 are hour long runs and will each require an additional bus. Two additional buses will be required in phase 1 and phase 2, for a total of four additional buses. Phase 1 will include routes 2 and 6, and Phase 2 will include routes 3, 7, and 8.

Table 5-2: Decreased Headway Costs

| Decreased Headways | Annual Operating Cost* | Capital Cost** |
|---------------------------------|------------------------|--------------------|
| ½ hour Headways on Route 2 | \$123,000 | \$300,000 |
| ½ hour Headways on Route 6 | \$123,000 | \$300,000 |
| ½ hour Headways on Routes 3 + 7 | \$123,000 | \$300,000 |
| ½ hour Headways on Route 8 | \$123,000 | \$300,000 |
| Total | \$492,000 | \$1,200,000 |

**The Operating Cost is an annual cost for the proposed service, while the ** Capital Cost is a one time cost to purchase vehicles.*



B. Provide evening service within the City of Nashua in the following stages:

- 1.) Provide limited evening service, Monday through Saturday, from 6:45 pm to 10:45 pm, in the form of two hour long routes, one serving south Nashua and one serving north Nashua. Both routes will meet at the transit center and provide transfers between the two routes. No capital costs are associated with this project because existing buses will be available for evening service.

Table 5-3: Evening Service Costs

| Evening Service | Annual Operating Cost* | Capital Cost** |
|--------------------------------|------------------------|----------------|
| Evening Service 1 Day per Week | \$40,000 | \$0 |
| Evening Service Monday-Friday | \$200,000 | \$0 |
| Evening Service Saturday | \$48,200 | \$0 |

**The Operating Cost is an annual cost for the proposed service, while the **Capital Cost is a one time cost to purchase vehicles.*

- 2.) Eventually operate all six existing routes between the hours of 5:00 am and 11:30 pm, Monday through Saturday. These costs are in addition to the current costs for existing service. Such cost estimates assume the purchase of four additional buses and are calculated based on a total of nine buses. This service would replace the evening service costs listed above.

Table 5-4: All Day Service Costs

| All Day Service | Annual Operating Cost* | Capital Cost** |
|------------------------------|------------------------|----------------|
| All Routes One Day | \$112,000 | \$0 |
| Run All Routes Monday-Friday | \$560,000 | \$0 |
| Run All Routes Saturday | \$232,000 | \$0 |

**The Operating Cost is an annual cost for the proposed service, while the **Capital Cost is a one time cost to purchase vehicles.*

- 3.) In the Fall of 2003, NTS will receive CMAQ funding to extend service hours. Obtaining passenger input on preferred service hour extensions, through a preference survey, would assist in planning extension hours. With limited funds additional service hours will be prioritized and phased in at different times.

II. Milford Route

- A. Increase Route 9 service to Milford to a fixed route full day of service with one hour headways operating from 5:30 am to 6:00 pm, with ADA complementary demand response service within ¼ miles of either side of route 9. Route 9 currently operates as a commuter service with limited designated stops and does not require complementary ADA demand response service.

Deviated fixed route picks up passengers along the route as well as within ¼ miles of the route. Implementing deviated fixed route service will provide all day service from 9:00 am to 5:00 pm while preventing the need for separate demand response service. This is a cost effective measure that continues to build ridership by providing increased service hours and incrementally increasing service costs.

Commuter service provides six runs per day; three in the morning and three in the afternoon, designed to meet the needs of commuters traveling to and from employment



sites. Deviated midday service could accompany the commuter service by providing door to door service, within Milford, between the commuter periods. This service would fill the need for late morning and early afternoon trips to shopping, personal, and medical destinations.

Once additional funding has been successfully secured and ridership increases, it may be appropriate to operate fixed route service with one hour headways, from 5:30 am to 6:00 pm, Monday through Friday. This would require the addition of 1.5 vans to accommodate demand response service that will be offered within ¾ miles of the fixed route. As ridership increases a new bus will eventually be needed to accommodate additional passengers. If a bus is purchased at the start of the fixed route service the existing van could be utilized for demand response trips reducing the capital cost by \$75,000.

Table 5-5: Milford Service Costs

| Milford Service | Annual Operating Cost* | Capital Cost** |
|------------------------------|------------------------|----------------|
| Milford Deviated Fixed Route | \$118,000 | \$0 |
| Milford Commuter Service | \$118,000 | \$0 |
| Milford Fixed Route | \$330,000 | \$112,500 |
| New Bus | \$0 | \$300,000 |

**The Operating Cost is an annual cost for the proposed service, while the **Capital Cost is a one time cost to purchase vehicles.*

GOAL #2 - SERVICE AREA, CITY OF NASHUA

Extend transit service to portions of the City of Nashua that can feasibly support transit and are currently underserved. This includes service to employment, education and retail sites, as well as future commuter rail stations.

I. Daniel Webster Highway Circulator:

Implement the Daniel Webster Highway Circulator to transport people between major shopping destinations along Daniel Webster Highway between the Pheasant Lane Mall and Poisson Avenue (located just north of Best Buy). This could typically run on Saturdays and operate on additional days and evenings during the busy holiday season. People could park anywhere along the service area and access the bus at designated stops or on a flag policy. Ideally, support from local merchants and local businesses would provide the local match for this type of service. This retail corridor is one of the most congested areas in the region and this service could reduce the number of motor vehicles making multiple stops along the corridor while increasing shopper convenience.

A demand response van could be utilized for this service as long as the hours correlated with availability. This would be most effective with evening and Saturday hours. A trolley should be considered for this service. Although the cost is much higher than a van, a trolley would easily identify this service and may have more appeal to shoppers leading to an increased ridership.



Table 5-6: Daniel Webster Circulator Costs

| Daniel Webster Circulator | Annual Operating Cost* | Capital Cost** |
|----------------------------|------------------------|----------------|
| 3 Months Monday -Saturday | \$60,000 | \$0 |
| Saturdays Only | \$18,000 | \$0 |
| 6 Months Monday - Saturday | \$115,000 | \$0 |
| 6 Months Saturday Only | | |
| Trolley | \$0 | \$350,000 |

**The Operating Cost is an annual cost for the proposed service, while the **Capital Cost is a one time cost to purchase vehicles.*

II. Service to Daniel Webster College and Nashua North High School

- A. Establish service to Daniel Webster College, and to the extent possible, schedule service to correspond with class schedules.
- B. Provide fixed route bus service to Junior and Senior High Schools, and to the extent possible, schedule service to correspond with class times.

The proposed Daniel Webster College/Nashua North High School Route would start at the Nashua Mall and serve both the college and high school. Service would only run during the peak hours in the morning and afternoon at the start and end of classes.

Table 5-7: Daniel Webster College/Nashua North High School Costs

| Daniel Webster College/Nashua North High School | Annual Operating Cost* | Capital Cost** |
|---|------------------------|----------------|
| Six hours/day Monday-Friday | \$50,000 | \$37,500 |

**The Operating Cost is an annual cost for the proposed service, while the **Capital Cost is a one time cost to purchase vehicles.*

III. Develop a route concept that provides for additional transfer points throughout the City in addition to the main transfer point at the transit center.

IV. Provide transit connections to **future commuter rail stations as necessary.** This service should be catered to commuters with the highest levels of service in the early morning and late afternoon and coordinate with train schedules.

GOAL #3 - SERVICE AREA NRPC REGION

Improve regional mobility by providing transit connections in the region and between regions with connections to other destinations within New Hampshire and Massachusetts.

I. Provide Service to Amherst, Brookline, Hollis, Milford and Wilton.

- A. Establish demand response and/or deviated fixed route service in Amherst, Wilton, and Milford.
- B. Establish demand response and/or deviated fixed route service between Hollis, Brookline and Nashua.

The proposed service will provide deviated fixed route service to all five towns, one route traveling from Brookline and Hollis to Nashua and another route serving Amherst, Milford



and Wilton. Each community would pay a share of the cost if participating in the service. Milford's current commuter service operates on an hour long route which does not provide sufficient time to extend or vary this trip. A separate hour long route could be established to provide service between Amherst, Milford, and Wilton. This proposed route would have the capability to transfer to route 9 in Milford and continue on to Nashua.

A suitable shared schedule would be developed amongst the interested communities. For instance, service could be provided three days per week in Amherst, Milford and Wilton, and two days per week in Brookline and Hollis. Sharing the service and costs amongst the towns is a cost effective means to establish service in these communities and share the initial capital cost of the van. Service expansion is dependent upon local financial participation.

Table 5-8: Western Regional Service Costs

| Brookline/Hollis & Amherst/Milford/Wilton | Annual Operating Cost* | Capital Cost** |
|---|-------------------------------|-----------------------|
| Deviated Fixed Route Monday – Friday 9:00 am-5:00 pm | \$89,000 | \$75,000 |
| Cost per Town | \$17,800 | \$15,000 |

**The Operating Cost is an annual cost for the proposed service, while the **Capital Cost is a one time cost to purchase vehicles.*

II. Establish Service to Merrimack

- A. Establish demand response and fixed route service between Nashua and Merrimack to the high transit need areas along Daniel Webster Highway. Providing deviated fixed route service is a cost effective means to establish transit service. Service Expansion is dependent upon local financial participation.
- B. As ridership increases and towns would like more permanent public transportation, commuter service to Merrimack could run Monday through Friday replacing the limited deviated fixed route service. Commuter service provides six runs per day; three in the morning and three in the afternoon, designed to meet the needs of commuters traveling to and from employment sites. Deviated midday service could accompany the commuter service by providing service between the commuter periods and pick up passengers along and within ¾ miles of the route. This service would fill the need for late morning and early afternoon trips to shopping, personal and medical destinations.
- C. The highest level of service is fixed route service, operating Monday through Friday, from 5:30 am to 6:00 pm. Fixed route service operates on one-hour headways and requires complementary ADA demand response service. An additional van is required to provide the demand response service.



Table 5-9: Service to Merrimack Costs

| Merrimack to Nashua | Annual Operating Cost* | Capital Cost** |
|-----------------------------|------------------------|----------------|
| Deviated Fixed Route M – F | \$111,000 | \$75,000 |
| Commuter Service M-F | \$66,000 | \$75,000 |
| Deviated Midday Service M-F | \$45,000 | \$0 |
| Fixed Route M-F | \$243,000 | \$75,000 |
| Fixed Route Saturday | \$31,000 | \$0 |
| Upgrade to Bus | \$0 | \$300,000 |

**The Operating Cost is an annual cost for the proposed service, while the **Capital Cost is a one time cost to purchase vehicles.*

III. Establish Service to Hudson

- A. Establish demand response and fixed route service between Hudson and Nashua in a three-phase process. Providing deviated fixed route service is a cost effective means to establish transit service. Service Expansion is dependent upon local financial participation.
- B. As ridership increases and Hudson would like more permanent public transportation, a commuter service would provide service to Hudson Monday through Friday replacing the limited deviated fixed route service. Commuter service provides six runs per day; three in the morning and three in the afternoon, designed to meet the needs of commuters traveling to and from employment sites. Deviated midday service could accompany the commuter service by providing service between the commuter periods and pick up passengers along and within ¼ miles of the route. This service would fill the need for late morning and early afternoon trips to shopping, personal, and medical destinations.
- C. The highest level of service is fixed route service, operating Monday through Friday, from 5:30 am to 6:00 pm. Fixed route service operates on one-hour headways and requires complementary ADA demand response service. An additional van is required to provide the demand response service.
- D. Once ridership is established on a one bus fixed route schedule a second bus could be added. Ideally a Nashua route could be expanded to cross the Taylor Falls and Veteran’s Bridges, travel to a Hudson transfer point, then north to the Hudson Mall and return to Nashua. The original Hudson bus would then operate solely within the town limits traveling north and south along Lowell Road with connections to the Nashua bus at a downtown Hudson transfer point. This ultimate level of service would provide excellent in-town service and connections to downtown Nashua.

Table 5-10: Service to Hudson Costs

| Hudson to Nashua | Annual Operating Cost* | Capital Cost** |
|--------------------------------|------------------------|----------------|
| Deviated Fixed Route M - F | \$111,000 | \$75,000 |
| Commuter Service M-F | \$66,000 | \$75,000 |
| Deviated Midday Service M-F | \$45,000 | \$0 |
| Fixed Route M-F | \$243,000 | \$75,000 |
| Fixed Route Saturday | \$31,000 | \$0 |
| Upgrade to Bus | \$0 | \$300,000 |
| Fixed Route 1.5 Buses M-F | \$306,000 | \$150,000 |
| Fixed Route 1.5 Buses Saturday | \$47,000 | \$0 |

**The Operating Cost is an annual cost for the proposed service, while the **Capital Cost is a one time cost to purchase vehicles.*



IV. Spare Vehicles and Additional Staff

As additional services are provided, NTS will have an increased need for spare vehicles and additional staff. Spare vehicles should be maintained at a 20% spare ratio. NTS anticipates additional staffing needs to include a mechanic, two operations supervisors, a part time revenue controller and a service worker. The additional vehicles and staffing would need to be added to maintain current service standards as the system grows.

Table 5-11: Additional Capital and Staff Costs

| Additional Capital and Staff | Annual Operating Cost* | Capital Cost** |
|-------------------------------------|-------------------------------|-----------------------|
| Spare Buses | \$0 | \$300,000 |
| Spare Vans | \$0 | \$75,000 |
| Mechanic | \$43,000 | \$0 |
| Operations Supervisor | \$38,000 | \$0 |
| Revenue Controller | \$17,000 | \$0 |
| Service Worker | \$32,000 | \$0 |

**The Operating Cost is an annual cost for the proposed service, while the **Capital Cost is a one time cost to purchase vehicles.*

GOAL #4 - AFFORDABILITY

Maintain cost effectiveness and affordable fares, by securing dedicated funding and gaining ongoing public support for expanded services.

- I. Prepare for the transition from small urbanized area to large urbanized area designation after the 2010 Census. Securing dedicated funding for operating expenses will be essential.
- II. Present Milford with an explanation of service needs and an estimated cost to continue the existing service from Milford to Nashua once the JARC funding period ends.
- III. Continue marketing and outreach efforts to increase awareness of existing bus service.
- IV. Work with communities such as Amherst, Brookline, Hollis, Hudson, Merrimack, Milford, and Wilton, to explain the costs of transit service, develop local support and secure funding sources such as dedicated state funding and/or motor vehicle registration fees.
- V. Periodically review fares and adjust rates accordingly to cover overall operating costs.
- VI. Identify additional funding opportunities for new services and facilities such as lighted bus stop signs.

GOAL #5 - PASSENGER AMENITIES

Operate clean and well maintained buses and facilities, while developing additional amenities such as bus shelters and updated bus stop signs with schedule information and lighting.

- I. Maintain capacity and equipment to operate clean and well maintained buses and facilities.
- II. Locate bus shelters using a combination of public and private funds. A contract with a company that installs and maintains shelters in exchange for advertising space may be an ideal solution to this issue and warrants further analysis.
- III. Update bus stop signs with new technologically advanced signs. These solar powered bus stop signs incorporate overhead lighting for safety, a flashing light for bus flagging and schedule



information. LED screens located at bus stops display arrival times of approaching buses. This is particularly useful for passengers making connections and coordinating multiple schedules. Such signs would be a beneficial improvement to the existing signs.

- IV. Voice Annunciation System technology provides automatic annunciation of bus stop names as the bus travels along the route. LED screens inside the bus will also display the name of upcoming bus stops. These features are especially beneficial for hearing and visually impaired passengers.

Table 5-12: Passenger Amenity Costs

| Passenger Amenities | Individual Cost* | Total Number** | Total Cost |
|---|--------------------------|----------------|-------------------|
| Bus Stop Sign Pilot Program | \$1,000 | 20 | \$20,000 |
| Bus Stop Sign Installation | \$1,000 | 100 | \$100,000 |
| LED Screens at Bus Stops | | | To Be Determined. |
| Voice Annunciation/On-board LED Screens | \$10,000 per fixed route | | |

**The Operating Cost is an annual cost for the proposed service, while the **Capital Cost is a one time cost to purchase vehicles.*

GOAL #6 - SAFETY

Provide continuous mandatory and optional staff training to ensure passenger and facility safety and security through driver training, emergency preparedness, and conflict resolution while promoting interagency connections for emergency situations.

- I. Continue implementing performance policies and on-the-road monitoring as well as regular driver training sessions.
- II. Implement a security plan that addresses the safety of staff and riders as well as infrastructure including vehicles, buildings, and operations such as cash control.
- III. Transit Vehicle Information Systems technology provides interagency communication and coordination regarding traffic and incident response. In the event of a significant weather event, interagency weather reports may also be utilized.
- IV. Video security camera installation on transit vehicles and public locations, such as the transit station, promotes the safety of passengers and drivers. Information can also be transmitted to NTS headquarters and if needed to police and fire dispatch as well.

Table 5-13: Safety Costs

| Safety | Individual Cost* | Total Number** | Total Cost |
|-------------------------------------|------------------|----------------|-------------------|
| Security Cameras | \$2,500 | | |
| Transit Vehicle Information Systems | | | To Be Determined. |

**The Operating Cost is an annual cost for the proposed service, while the **Capital Cost is a one time cost to purchase vehicles.*



GOAL #7 EDUCATION – Provide continuous education to existing and potential riders using marketing and public outreach through rider information services regarding benefits of using public transportation.

- I. The mobility manager will increase public outreach to social service agencies, local businesses and government agencies.
- II. Provide mobility training to potential Citybus riders.
- III. Provide public outreach and mobility training to schools and educational facilities including junior and senior high schools and colleges.
- IV. Develop a marketing plan outlining strategies to publicize the transit system and promote ridership.
- V. Provide outreach and specialized training to various ethnic groups and diverse populations.
- VI. Provide outreach materials and rideguides in additional languages.
- VII. Continue to meet new Americans with Disabilities Act requirements on training and accessibility, including web page specifications.
- VIII. Provide sensitivity training to NTS drivers.

GOAL #8 - INTERMODAL NETWORK

To assist commuters with improved access to both local and distant employment destinations through the development of an intermodal transportation network including transportation demand management measures, access to park and ride lots, future commuter rail stops and express routes specifically designed for compatibility with peak commuter schedules.

- I. Ensure existing bus routes provide service to park and ride facilities while accommodating the peak travel times of commuters.
- II. Provide commuter buses to most efficiently provide connections between future commuter rail stops and park and ride facilities to the transit center.
- III. Develop a public and private partnership with rail and bus operators to coordinate trip schedules.
- IV. Ensure connections with pedestrian and bike facilities and trails.
- V. Provide bike racks on all fixed route buses, and bike stands at the Transit Center, Park and Ride Lots, Commuter Rail Stations, Milford Oval, Hudson Transfer Point, Trail Heads, pedestrian destinations and other prominent origins and destinations.

Table 5-14: Bike Rack Costs

| Bike Racks | Individual Cost* | Total Number** | Total Cost |
|--------------------------|-------------------------|-----------------------|-------------------|
| Bike Racks on Buses | \$1,000 | 15 | \$15,000 |
| Free Standing Bike Racks | \$600 | (holds 9 Bikes) | |

**The Operating Cost is an annual cost for the proposed service, while the **Capital Cost is a one time cost to purchase vehicles.*



VI. Transportation Demand Management (TDM) incorporates a wide array of measures that work independently and/or in combination to improve mobility, and reduce air pollution and negative environmental consequences. TDM aims to change travel mode choices by decreasing single occupancy motor vehicle trips and encouraging more sustainable travel modes.

A. TDM tactics can be employer based, policy driven, and government supported. These measures must have a significant enough benefit to passengers to change their current commuting patterns from the single occupant vehicle to other transportation modes including carpooling and vanpooling. Some of these benefits include convenience, monetary reimbursements and stress relief. Regions facing increasing growth pressures and traffic congestion are likely to benefit from TDM measures aimed at improving the overall transportation system. The following is a list of common TDM measures:

- Vanpooling Programs
- Carpooling Programs
- Guaranteed Ride Home
- Flexible Scheduling

1.) Vanpool programs assist riders in joining a vanpool suitable to meeting their transportation needs. Vanpools often meet at Park and Ride facilities or empty parking lots where riders are permitted to park their cars for the day. Vans typically take riders to one work site or a central destination. Incentives for vanpooling include reduced private vehicle costs, employer based vanpool subsidies, priority parking and compensating vanpool drivers with personal van use.

2.) Carpool programs provide assistance in locating riders and establishing carpools. Carpools may provide some additional flexibility compared to vanpools due to the limited number of participants in each vehicle. Incentives include reduced private vehicle costs, reduced parking fees and priority parking.

3.) Guaranteed Ride Home programs guarantee a ride home, via taxi or some other means to vanpool and carpool participants. This program is intended for emergency purposes only, such as needing to reach a sick child at school, and is provided at no cost to the participant.

4.) Flexible scheduling includes compressed work weeks and varied work and travel times.

B. The State of New Hampshire currently operates a carpool program, and provides assistance to a significant number of Nashua area residents who participate in the program. Caravan, a Massachusetts ridematch service, operates three vanpools from Nashua to Boston. Each vanpool holds between 10-14 passengers. Vermont Transit also operates a commuter bus to Boston with stops at the Transit Center in downtown Nashua and the park and ride facility near F.E. Everett Turnpike at Exit 5. Massachusetts also has a number of Transportation Management Associations (TMAs) that work with the business community to assist in vanpool/carpool programs and other means to reduce traffic congestion and pollution.

The Nashua region is one of the fastest growing parts of New Hampshire and this plan provides an ideal opportunity to outline TDM options. Establishing TDM measures now, as the region continues to grow, will lead to a more sustainable transportation system in the



future. A need appears to exist in the region for vanpools traveling to destinations other than Boston, specifically towns along I-495 and I-95 (SR 128). Currently New Hampshire lacks locally based vanpools, and the few that do serve the area travel directly to Boston. The Nashua region would likely benefit from a regional vanpool program and additional marketing of the state carpool program. Marketing these programs and any additional TDM related measures will increase public awareness and play a key role in its success.

- C. A successful TDM/Vanpool program could be established with the following measures:
- 1.) Develop a Transportation Demand Management System Plan for the region.
 - 2.) Research and develop a local vanpool program for commuters traveling within the region and outside of the region to southern and northern points, especially to employment sites along routes I-495 and I-95. This service could work in conjunction with current services provided by Caravan.
 - 3.) Provide advertising for new vanpool services and the state's existing carpool program.
 - 4.) Identify common destinations and employers for potential vanpool/carpool destinations both within and beyond the region.
 - 5.) Work with Massachusetts employers and programs to identify potential employment sites for vanpool/carpool sites.

GOAL #9 - AIR QUALITY/ENVIRONMENT

Continue to improve the environment by participating in Air Quality Action days and replacing outdated buses with reduced emission models.

- I. Analyze available technology in preparation for vehicle replacements.
- II. Research clean diesel technology and pursue the purchase of clean diesel buses.
- III. Participate in the Ride Free – Breath Free Program on state declared Air Quality Action Days.

GOAL #10 - DEMAND RESPONSE

To provide cost effective demand responsive transportation to disabled persons within the City of Nashua and to complementary demand-response service areas within the region, as required by the Americans with Disabilities Act.

- I. Development of a three-tiered fee schedule for demand response trips. This fee schedule would more accurately reflect the actual cost of demand response service by charging fees based on the towns traveled between to reach origin and destination points. For instance trips within one town would be one fee while trips between two towns may be a greater fee.
- II. Continue mobility training to encourage and promote the freedom associated with utilizing fixed route service rather than demand response service.



GOAL #11 - TRANSIT SYSTEM EFFICIENCY

Use current and available technology to make transit service as convenient, safe and cost effective as possible including, Intelligent Transportation System technologies and the purchase of up to date vehicles, software, amenities and components.

- I. Goal Number 11 discusses the topic of transit system efficiency and the desire to make transit service as convenient, safe and cost effective as possible through, amongst other means, the use of Intelligent Transportation System (ITS) technologies. An intelligent transportation system is any technology or combination of technologies that works to improve the overall safety and efficiency of surface transportation.

ITS technologies implemented by NTS should be integrated with the regional Intelligent Transportation System Plan for the Greater Nashua region. The United States Department of Transportation (USDOT) maintains the National ITS Architecture that establishes a national guide for use in the development of state, regional and local ITS plans. The National Architecture is an excellent framework and can serve as a reference to gain information on how local improvements will work within the scope of the regional model.

Nashua Transit System currently implements a number of ITS Technologies. Buses are equipped with silent alarms for driver and passenger safety and also have LED route signs on bus fronts for passenger assistance. NTS buses are connected by a citywide radio system, which has the capacity to provide emergency communications with police and fire. A new demand response software was implemented in January of 2003 to perform scheduling and billing functions as well as monitor all demand response trips.

NTS would like to build upon these existing capabilities with additional ITS technologies to achieve a modern and well-integrated bus system for maximum efficiency, safety, and convenience. The following is a list of the technologies NTS would like to implement in the future. The Automatic Vehicle Locator (AVL) is a key ingredient to a successful system, and should be implemented first and will serve as a base for additional technologies.

A. Traffic Signal Priority

Traffic Signal Priority gives priority, in certain situations, to travel lanes containing public transit vehicles. Automatic prioritization occurs when buses reach a certain capacity or if they operate behind schedule. This allows buses to travel at greater efficiencies and maintain schedules during the peak periods when they tend to exceed capacity and fall behind schedule.

B. Transit Vehicle Tracking

Automatic Vehicle Locator (AVL) is a Global Positioning System (GPS) to provide NTS headquarters with automatic updates on the location of each vehicle in the fleet. Eventually this technology could be directly linked to the web-site for added passenger capabilities. Vehicle Monitoring is another feature linked to the AVL system that sends automatic updates on mechanical indicators such as oil and fuel levels to NTS mechanics. Automatic monitoring could prevent delays due to mechanical failures, and decrease maintenance costs.



C. Electronic Fare Boxes

Electronic fare boxes automatically count change and accept dollar bills. Depending on the technology they may also accept other types of non-cash fare media including magnetic card readers. Advanced versions of these systems can also be used to establish variable fares based on rider characteristics (disability status, age, etc.). This type of technology provides an added security measure for cash handling and also determines vehicle loads and capacity. In addition these systems simplify the transit system’s bookkeeping process and reduce overhead.

Table 5-15: Transit System Efficiency Costs

| Transit System Efficiency | Individual Cost* | Total Number** | Total Cost |
|--|------------------|----------------|------------|
| Automatic Vehicle Locator | | | \$80,000 |
| Electronic Fare and Passenger Counters | \$20,000 per bus | | |

**The Operating Cost is an annual cost for the proposed service, while the **Capital Cost is a one time cost to purchase vehicles.*

GOAL #12 - REGIONALIZATION

Promote inter-regional mobility by providing transit connections between regions with connections to other destinations within New Hampshire, including Manchester, Concord, Keene and Derry/Salem, as well as sites in Massachusetts.

The 1990 United States Census records provide data on journey to work patterns in the Nashua area. These records indicate that many commuters travel outside of the region to employment sites throughout New Hampshire and Massachusetts. In New Hampshire, 3,995 commuters traveled from the region to Manchester and 1,325 commuters traveled to Bedford and Goffstown on a daily basis. The following daily commuter trips occurred between the NRPC region and Massachusetts destinations: 7,649 to greater Boston; 5,083 to the Lowell area; 3,176 to Lowell; 2,323 to Lawrence/Haverhill; 1,406 to Acton/Fitchburg; and 1,405 to Boston. This is a total of 21,042 daily trips to Massachusetts destinations. These 1990 trends indicate the need for improved connections between the NRPC region and locations in both New Hampshire and Massachusetts.

- I. Improve connections with employment sites in the Boston metropolitan area by extending Massachusetts Bay Transit Authority’s commuter rail service from Lowell to the proposed Spit Brook Road commuter rail station in Nashua and ultimately through Merrimack and Bedford to the Manchester Airport and downtown Manchester.

In 1999, NRPC completed a draft Major Investment Study for commuter rail service from the NRPC region to Boston. The purpose of the study was to evaluate various alternatives associated with facilitating the movement of commuters into Boston at peak hours. This study showed that at least 400 NRPC region residents were already using commuter rail from Gallagher Terminal in Lowell for their commute to Boston. In addition, ridership estimates showed that locating a station in south Nashua could increase ridership to approximately 700 per week day in the opening year and up to 3,000 per week day within 20 years. The study also showed that extensions of the service to downtown Nashua, Merrimack, Bedford, the Manchester Airport and downtown Manchester would all be viable in the 20 year time horizon. The NH DOT is currently conducting a preliminary engineering analysis and environmental assessment for the proposed service. Currently, the cost is expected to be between \$60 and \$70 million for all required improvements. It is anticipated that the commuter rail will begin service in 2005.



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Nashua Regional Planning Commission and the Southern New Hampshire Planning Commission have also started the Alternatives Analysis process for the next extension of the service from south Nashua to downtown Manchester. This study will examine various service alternatives and provide the information required to begin the FTA's required New Starts project development process. As an interim measure, a connection could be made in northern Merrimack to connect Nashua bus service with the Manchester service. This would facilitate access between Nashua and Manchester at a reasonable price.

- II. Expansion between regions:
 - A. Make a connection to the Lowell Regional Transit Authority buses in Tyngsboro to provide service to Lowell and Lawrence.
 - B. Make a connection in Merrimack to the Manchester Transit Authority.
 - C. Make a connection to the proposed transit service in the Greater Derry-Greater Salem area.
 - D. Make a connection to Keene to access western destinations.
- III. Develop funding models to appropriately allocate the costs of inter-jurisdictional trips between communities.
- IV. Work with the NH DOT and other New Hampshire MPOs and transit systems to develop a plan for the maintenance of urban transit systems following conversion of the regions to a major metropolitan area and changes in funding from Section 5307 small urbanized area funds to large urbanized area funds.
- V. Conduct further analysis on Nashua Transit System's long term evolution into a transit authority or transit district such as the Nashua Regional Transit Authority.

D. TIMEFRAMES

The proposed projects outlined in Chapter Five are intended to occur over a 20 year period. It is difficult to identify specific dates for project implementation due to the constraints of federal funding and local support for projects. However, timeframes spanning a number of years can be identified as goals for establishing new transit services and improvements. The following tables identify proposed services and improvements with the anticipated dates of project implementation. The dark band indicates the timeframe in which a new service or improvement is estimated to begin. Dark bands spanning the entire planning period indicate on-going activities.



Table 5-16: Timeframe Goals 1 - 10

| | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | FY 2012 | FY 2013 | FY 2014 | FY 2015 | FY 2016 | FY 2017 | FY 2018 | FY 2019 | FY 2020 | FY 2021 | FY 2022 | FY 2023 | FY 2024 | FY 2025 | |
|--|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|
| Goal 1 | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Decrease Headways | | | | | | | | | | | | | | | | | | | | | | | |
| 2. Evening Service | | | | | | | | | | | | | | | | | | | | | | | |
| 3. 5:00 am -11:00 pm Service | | | | | | | | | | | | | | | | | | | | | | | |
| 4. Milford Full Day of Service | | | | | | | | | | | | | | | | | | | | | | | |
| Goal 2 | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Daniel Webster Circulator | | | | | | | | | | | | | | | | | | | | | | | |
| 2. DW College Nashua North H S | | | | | | | | | | | | | | | | | | | | | | | |
| Goal 3 | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Shared service to Amherst, Brookline, Hollis, Milford, Wilton | | | | | | | | | | | | | | | | | | | | | | | |
| 2. Establish service to Hudson | | | | | | | | | | | | | | | | | | | | | | | |
| 3. Establish service to Merrimack | | | | | | | | | | | | | | | | | | | | | | | |
| Goal 4 | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Funding for Post FY 2012 | | | | | | | | | | | | | | | | | | | | | | | |
| Goal 5 | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Bus Shelters | | | | | | | | | | | | | | | | | | | | | | | |
| 2. Bus Stop Sign Pilot Project | | | | | | | | | | | | | | | | | | | | | | | |
| 3. Voice Annunciation | | | | | | | | | | | | | | | | | | | | | | | |
| 4. Real Time Bus Stop Displays | | | | | | | | | | | | | | | | | | | | | | | |
| Goal 6 | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Security Plan | | | | | | | | | | | | | | | | | | | | | | | |
| 2. Transit Vehicle Info. System | | | | | | | | | | | | | | | | | | | | | | | |
| 3. Security Cameras | | | | | | | | | | | | | | | | | | | | | | | |
| Goal 7 | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Public Outreach | | | | | | | | | | | | | | | | | | | | | | | |
| 2. Materials in Multiple Languages | | | | | | | | | | | | | | | | | | | | | | | |
| 3. Marketing Plan | | | | | | | | | | | | | | | | | | | | | | | |
| Goal 8 | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Commuter Bus to Park and Rides | | | | | | | | | | | | | | | | | | | | | | | |
| 2. Commuter Buses to Rail Stations | | | | | | | | | | | | | | | | | | | | | | | |
| 3. Coord. Rail and Bus Connections | | | | | | | | | | | | | | | | | | | | | | | |
| 4. Connect to Bike & Ped. Facilities | | | | | | | | | | | | | | | | | | | | | | | |
| 5. Bike Racks | | | | | | | | | | | | | | | | | | | | | | | |
| 6. TDM Study | | | | | | | | | | | | | | | | | | | | | | | |
| 7. Vanpool/Carpool Program | | | | | | | | | | | | | | | | | | | | | | | |
| 8. Implement TDM Measures | | | | | | | | | | | | | | | | | | | | | | | |
| Goal 9 | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Air Quality Action Days | | | | | | | | | | | | | | | | | | | | | | | |
| 2. Reduced Emission Buses | | | | | | | | | | | | | | | | | | | | | | | |
| Goal 10 | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Mobility Training | | | | | | | | | | | | | | | | | | | | | | | |



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Table 5-17: Timeframe Goals 11 – 12

| | FY 2004 | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | FY 2012 | FY 2013 | FY 2014 | FY 2015 | FY 2016 | FY 2017 | FY 2018 | FY 2019 | FY 2020 | FY 2021 | FY 2022 | FY 2023 | FY 2024 | FY 2025 |
|---|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Goal 11 | | | | | | | | | | | | | | | | | | | | | | |
| 1. Traffic Signal Priority | | | | | | | | | | | | | | | | | | | | | | |
| 2. Automatic Vehicle Locator | | | | | | | | | | | | | | | | | | | | | | |
| 3. Electronic Fare Boxes | | | | | | | | | | | | | | | | | | | | | | |
| Goal 12 | | | | | | | | | | | | | | | | | | | | | | |
| 1. Commuter Rail to South Nashua | | | | | | | | | | | | | | | | | | | | | | |
| 2. Commuter Rail to Downtown Nashua and Merrimack | | | | | | | | | | | | | | | | | | | | | | |
| 3. Transit Connection to LRTA in Tyngsboro | | | | | | | | | | | | | | | | | | | | | | |
| 4. Transit Connection to Manchester, NH | | | | | | | | | | | | | | | | | | | | | | |
| 5. Transit Connection to Derry/Salem | | | | | | | | | | | | | | | | | | | | | | |
| 6. Funding Allocation Model | | | | | | | | | | | | | | | | | | | | | | |
| 7. Development of a Regional Transit Authority | | | | | | | | | | | | | | | | | | | | | | |