Easton Avenue/ Main Street Corridor Plan Final Report

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Prepared for:
Somerset County, NJ

Middlesex County, NJ

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EXECUTIVE SUMMARY

The Easton Avenue/Main Street Corridor Plan is a comprehensive planning study with the primary goal of managing traffic congestion on the corridor through low-cost roadway improvements, the enhancement of alternative transportation modes, and Smart Growth zoning and design initiatives.

To address this goal, strategies have been developed for the following five plan elements:

- Transit-Friendly Design/ Smart Growth – encourage transit, pedestrian and bicycle trips through building placement and urban design.
- Travel Demand Management – reduce single occupancy vehicle trips.
- Transit Service Enhancements – evaluate schedule changes, additional or modified routes, and improvements to bus stops.
- Pedestrian and Bicycle – complete missing sidewalk links and accommodate bicyclists.
- Roadway Improvements/Intelligent Transportation Systems – provide feasible intersection upgrades, and signal modifications and coordination.

The study area encompasses Easton Avenue in the City of New Brunswick and Franklin Township, and Main Street in South Bound Brook Borough and Bound Brook Borough. New Brunswick is within Middlesex County, while Franklin Township, South Bound Brook, and Bound Brook lie within Somerset County. The study corridor is about 6.6 miles in length, extending from the New Brunswick train station at the intersection of Easton Avenue and NJ 27 to the Bound Brook train station at the intersection of Main Street and Hamilton Street. Virtually the entire length of this corridor is signed as County Route 527; the only exception is Easton Avenue between NJ 27 and Hamilton Street in New Brunswick, which is a local roadway.

The Easton Avenue/Main Street Corridor Plan focuses on improvements to the corridor outside of the Interstate 287 & Easton Avenue interchange (Exit 10) since both Somerset County and NJDOT have already focused on this interchange in various other studies and efforts. Some of the short term improvements recommended for the interchange area have recently been completed by either NJDOT or Somerset County, and longer term interchange improvements are in NJDOT's project planning process.

Traffic volumes vary widely on Easton Avenue and Main Street in the study area. Average daily traffic volumes are roughly 11,000 to 12,000 in the urban areas of New Brunswick, South Bound Brook and Bound Brook on the ends of the corridor. The roadway typically comprises two travel lanes in these municipalities. In Franklin Township, the roadway is typically four lanes in width, and volumes are much higher, typically well in excess of 40,000 per day.

Many of the proposed strategies are intended to create an environment in which it will be easier to walk, bicycle, or ride the bus along Easton Avenue and Main Street in the future. The strategies are also intended to address vehicular congestion issues where feasible. Easton Avenue/Main Street is an important arterial roadway with substantial volumes, and it is anticipated that congestion will remain an issue, but these strategies will help to manage traffic growth.

This Plan was directed by the Somerset County Planning Department and Somerset County Engineering Department, in conjunction with the Middlesex County Planning Department. The Plan was prepared by the following firms: Michael Baker Jr., Inc.; Nelson\Nygaard Consulting Associates, Inc.; Orth-Rodgers & Associates, Inc.; Amy S. Greene Environmental Consultants, Inc.; and TechniQuest Corporation.

PUBLIC INVOLVEMENT

Input was provided through a Steering Advisory Committee (SAC), consisting of a broad cross-section of municipal and county officials, municipal and county personnel, as well as representatives from the New Jersey Department of Transportation (NJDOT), North Jersey Transportation Planning Authority (NJTPA), the Delaware & Raritan Canal Commission, Rutgers University, Ridewise of Somerset County, Keep Middlesex Moving, NJ Transit, Somerset County Transportation, Middlesex County DOT, St. Peter's Hospital, Robert Wood Johnson Hospital, and other organizations. This group met four times throughout the study.

SAC members were recruited to participate in focus group and technical advisory committees, which included in-depth discussion of issues and recommended strategies.

The public provided input at two public meetings, and in a comprehensive survey placed on the Ridewise website at the beginning of the study in November and December, 2009. Responses were received from 862 residents. Following are some highlights from survey responses:

Vehicular Traffic

- The large majority of respondents depend heavily upon a personal vehicle for trips of all purposes. Of the 580 residents who use Easton Avenue/Main Street as part of their work trip, 89% drive alone.
- Residents who drive Easton Avenue on trips are often frustrated at experienced delays; 31% of residents report being stuck in traffic more than five minutes every weekday.
- Motorists have the highest degree of dissatisfaction with the intersection of Easton Avenue and Franklin Boulevard/Landing Lane, followed by the intersection of Easton Avenue and Albany Street in New Brunswick, and Easton Avenue and Cedar Grove Lane.

Transit Conditions

- Bus and rail accommodate a very small percentage of trips along Easton Avenue (2%), though over 4% for work trips. The most common reasons cited for not using transit included routes not serving preferred destinations (64%), bus stops are too far or difficult to access (45%), and service is not frequent enough (25%).
- When asked to rate factors that would encourage more transit use, 41% said more frequent trip; 39% said closer bus stops; and 31% said faster trips.

Pedestrian Conditions

- Most residents never walk along Easton Avenue; only 22% of survey respondents said that they walk along the study corridor for work or non-work trips, and the same percentage said that they consider Easton Avenue to be pedestrian-friendly.
- When asked to rate factors that would encourage more walking, 56% said safer intersections; 51% said better sidewalk conditions; and 40% said better lighting.

Bicycle Conditions

- Only 13% of respondents said that they bike along the corridor for work or non-work trips.
- When asked to rate factors that would encourage more bicycling, 47% said a bike path separated from the road; 41% said a dedicated bike lane; and 36% said safer intersections.

STRATEGIES

Following is a summary of the strategies to be considered for each of the five plan elements. To maximize the success of these recommendations, coordination is needed so that multiple strategies reinforce each other when they are implemented. An implementation matrix is provided at the back of the report with more details on each strategy, including lead agencies, time frame, possible funding sources and the funding priority level.

Transit-Friendly-Design and Smart Growth

- Designate nodal-based Transportation Management Districts (TMD's) in the corridor's five major business districts:
    - Downtown New Brunswick (Albany Street to Hamilton Street)
    - St. Peter's Hospital (Ray Street/Cortland Street to Park Boulevard)
    - Franklin Township (Cedar Grove Lane to Davidson Avenue)
    - South Bound Brook (Maple Avenue to Canal Road)
    - Bound Brook (Main Street to Columbus Place)
- Allow transit-supportive densities within the TMD's.
- Allow ground-floor commercial regardless of upper floor uses in all TMD's.
- Adopt transit-friendly design standards throughout the study area, such as:
    - Make sure that all sidewalks are comfortable for walking with effective widths of at least five feet, free of all obstructions.
    - Where sidewalks meet driveways, make sure it still looks like a sidewalk.
    - Provide clear walkways from parking areas to building entrances, and landscape parking facilities.
    - Orient building entrances to local streets and close to the street line.

Travel Demand Management

- Designate nodal-based Transportation Management Districts (TMD's) in the corridor's five major business districts.
- Adopt an ordinance to implement a TDM program focused on the TMD's.

- Expand TMA services to include all employers within a TMD with 25 or more employees. Employers should be asked to supplement TMA activities with their own services, such as a travel mitigation plan.
- Offer financial benefits to riding transit, such as by offering discounted monthly transit passes.
- Expand the "Live Where You Work" program, already present in New Brunswick, to all of the TMD's.
- Investigate re-establishing a carsharing program in New Brunswick.
- Manage parking, through the following sub-strategies:
    - Charge the right price for curb parking, by tailoring parking fees with the goal of leaving several vacant spaces on each block.
    - Return parking meter revenue to the neighborhoods that generate it, through the funding of public improvements in those areas.
    - Reduce existing minimum parking requirements for new developments in the TMDs.
    - Require the "unbundling" of parking costs from the sale or rental price of housing and commercial space.
    - Require "parking cash-out", in which employers offer the cash value of a parking subsidy to any employee who does not drive to work.

Transit

- Improve Davidson Avenue Shuttle (DASH) service, through the following sub-strategies:
    - Extend service hours to 6AM to 8PM.
    - During peak hours, operate at 30-minute headways, and provide 60-minute headway deviation service during off-peak hours.
    - To provide the best service possible on Saturday, investigate specific weekend commuting times and desire for bus service.
- Provide enhanced passenger amenities for priority bus stop locations, such as visible signage, maps and schedule, and shelters.
- Evaluate extension of DASH service to downtown Somerville and Bridgewater Commons Mall.
- Improve public information on transit, through the following sub-strategies:
    - Provide transit information on county or municipal Web sites.
    - Make bus information available via Google Maps.
    - Enhance signage, including maps and schedules at bus stops.
- Improve shelters through the use of partnerships and advertising to help offset the cost of shelter purchase and maintenance.
- Evaluate the creation of park and ride lots along Davidson Avenue, Worlds Fair Drive and Cedar Grove Lane.

Pedestrian and Bicycle

- Improve sidewalk conditions along the corridor, through the following sub-strategies:
    - Install sidewalks where missing, and replace deteriorated sidewalk.
    - Install pedestrian links between shopping centers and adjacent commercial or multi-family uses along Easton Avenue.

    - Increase width of sidewalks to minimum five feet, and move obstacles out of the sidewalk.
- Improve signal operations for pedestrians.
- Improve infrastructure for pedestrian crossings, such as high-visibility crosswalks at pedestrian crossings in the urban areas, curb ramps, and pedestrian signage.
- Improve street lighting for pedestrians and bicyclists, by evaluating pedestrian-scaled lights along Easton Avenue in New Brunswick, and better coverage of Easton Avenue in Franklin Township.
- Improve conditions on the bike path along Easton Avenue in Franklin Township, through the following sub-strategies:
    - Widen the bike path and increase "clear bicycling width".
    - Institute maintenance plan, by coordinating with adjacent landowners on regular plowing, and scheduling sweeping as needed.
    - Install warning signs at the intersection of the bike path with major driveways and roadways.
- Improve bicycling conditions in the study area, by considering appropriate signs and markings.
- Evaluate extension of bike path between JFK Boulevard and Franklin Boulevard.
- Install bike parking facilities at commercial uses and apartment complexes.
- Follow through with recommendations in the Franklin Township Bike Plan by installing bike facilities along collector roadways.
- Institute a bike-sharing program in New Brunswick.
- Increase use of Delaware & Raritan Canal Towpath, through the following sub-strategies:
    - Maintaining the surface for bicyclists.
    - Increase the number of access points.
    - Install more guide signage proximate to access points.
    - Extending the towpath past Landing Lane to opposite Buccleuch Park.

Roadway Strategies

- Stripe no parking zones, particularly along Easton Avenue in New Brunswick.
- Stripe 'chicken tracks' at intersections with double turn lanes.
- Paint shoulder lines on Main Street in South Bound Brook and Easton Avenue in New Brunswick.
- Institute far side 'No Turn on Red' signs.
- Institute signage improvements on Easton Avenue south of Foxwood Drive, to clarify operation of driveways in this area, and provide protected only left turn at Easton Avenue and Foxwood Drive.
- Provide full actuation of the traffic signal at Landing Lane & George Street.
- Provide hardwire interconnect of the traffic signal at Park Ave & Huntington Street.
- Provide minor operational improvements at the traffic signal at Easton Avenue & Franklin Boulevard, such as the addition of a westbound (Landing Lane) right turn overlap.
- Install GPS clocks on each of the traffic signals on Easton Avenue for synchronization.
- Upgrade median barriers along Easton Avenue to meet current standards.

- Monitor the intersection of Easton Avenue & Mine Street for signalization if volumes warrant in the future.
- Evaluate the dualization of Easton Avenue, i.e., installing median barriers on sections where these are currently absent.

CHAPTER 1: INTRODUCTION

The Easton Avenue/Main Street Corridor Plan is a comprehensive planning study with the primary goal of managing traffic congestion on the corridor through low-cost roadway improvements, the enhancement of alternative transportation modes, and Smart Growth zoning and design initiatives.

The study area encompasses Easton Avenue in the City of New Brunswick and Franklin Township, and Main Street in South Bound Brook Borough and Bound Brook Borough. New Brunswick is within Middlesex County, while Franklin Township, South Bound Brook, and Bound Brook lie within Somerset County. The study corridor is about 6.6 miles in length, extending from the New Brunswick train station at the intersection of Easton Avenue and NJ 27 to the Bound Brook train station at the intersection of Main Street and Hamilton Street. Virtually the entire length of this corridor is signed as County Route 527; the only exception is Easton Avenue between NJ 27 and Hamilton Street in New Brunswick, which is a local roadway (Figure 1).

This Plan focuses on improvements to the corridor outside of the Interstate 287 & Easton Avenue interchange (Exit 10) since both Somerset County and NJDOT have already focused on this interchange in various other studies and efforts. Some of the short term improvements recommended for the interchange area have recently been completed by either NJDOT or Somerset County, and longer term interchange improvements are in NJDOT's project planning process.

Following are the goals agreed upon early in the study:

- Manage traffic congestion on Easton Avenue/Main Street through low-cost roadway improvements and the enhancement of alternative transportation modes.
- Improve safety for all modes of travel.

The supporting objectives are:

- Identify travel demand management strategies.
- Enhance transit services.
- Identify pedestrian and bicycle improvements.
- Identify strategies in master plans and ordinances that encourage transit, biking and walking.
- Identify low-cost roadway improvements and ITS (Intelligent Transportation System) at signalized intersections.
- Identify strategies to improve safety, especially at crash 'hot spots'.

To address these objectives, strategies have been developed for the following five areas:

- Transit-Friendly Design/ Smart Growth – encourage transit, pedestrian and bicycle trips through building placement and urban design.
- Travel Demand Management – reduce single occupancy vehicle trips.
- Transit Service Enhancements – evaluate schedule changes, additional or modified routes, and improvements to bus stops.
- Pedestrian and Bicycle – complete missing sidewalk links and accommodate bicyclists.
- Roadway Improvements/Intelligent Transportation Systems – provide feasible intersection upgrades, and signal modifications and coordination.

Figure 1: Study Area.

In the report that follows, five chapters discuss existing conditions by mode in each of these areas, and strategies intended to address these conditions.

Many of the proposed strategies are intended to create an environment in which it will be easier to walk, bicycle, or ride the bus along Easton Avenue and Main Street in the future. The strategies are also intended to address vehicular congestion issues where feasible. Easton Avenue/Main Street is an important arterial roadway with substantial volumes, and it is anticipated that congestion will remain an issue, but these strategies will help to manage traffic growth.

This Plan was directed by the Somerset County Planning Department and Somerset County Engineering Department, in conjunction with the Middlesex County Planning Department. The Plan was prepared by the following firms: Michael Baker Jr., Inc.; Nelson\Nygaard Consulting Associates, Inc.; and Orth-Rodgers & Associates, Inc. Starting in October 2009 and concluding in December 2010, the study team carried out an intensive public involvement program, evaluated existing issues, and developed strategies to address needs in the study area.

DESCRIPTION OF ROADWAY

The roadway has very different characteristics within each of the four municipalities it traverses. Within the City of New Brunswick, Easton Avenue typically provides one through travel lane in each direction, with on-street parking permitted virtually the entire length. However, on-street parking north of Park Boulevard is not as well utilized as areas farther south. The posted speed limit on Easton Avenue throughout the City of New Brunswick is 25 mph.

In Franklin Township, Easton Avenue typically provides two through travel lanes in each direction. The roadway is divided between Castleton and Willow Avenue, and between Cedar Grove Lane and the I-287 interchange. Within Franklin Township, land uses are largely commercial, with a number of large retail developments. There are also areas which are predominantly residential, such as the west frontage of Easton Avenue between Lakeside Road and Willow Avenue. The speed limit varies from 40 to 45 mph.

Within the Borough of South Bound Brook, County Route 527 is known as Main Street, which generally provides one travel lane in each direction. From Maple Avenue north to the intersection of Canal Road and the “Queens Bridge”, the Main Street streetscape has been recently improved, including striped curbside parking spaces, “continental”-style crosswalks at intersections, brick paver sidewalks and other street furniture, and pedestrian-scale roadway lighting. Within this area of Main Street the roadside development is a mix of retail and residential uses. The speed limit decreases from 40 mph at the border with Franklin Township to 25 mph downtown.

North of the Queens Bridge in Bound Brook, CR 527 is known as South Main Street, which provides one travel lane in each direction as is passes underneath the NJ Transit rail line overpass and meets East Main Street, East Street and Bolmer Boulevard at a roundabout. From this roundabout, County Route 527 extends to the west and is known as East Main Street between the roundabout and the northern end of the corridor study area at the Bound Brook rail station. Between the roundabout and the study area limit, East Main Street provides one through travel lane in each direction with curbside parallel parking on each side of the roadway. Land uses within this downtown area of Bound Brook are predominantly commercial, aside from the rail station.

The highest-volume segment of the Easton Avenue / Main Street corridor is the segment between Cedar Grove Lane and the I-287 interchange. Average daily traffic (ADT) volumes here are estimated at 64,900 vehicles per day. To the south within Franklin Township, the ADT drops off to roughly 48,100 vehicles per day to the north of DeMott Lane, and roughly 40,800 vehicles per day just north of Franklin Boulevard. Within the City of New Brunswick, two-way traffic volumes are significantly lower than in Franklin Township. The ADT is estimated as low as 11,500 vehicles per day at Somerset Street.

To the north of the I-287 interchange in the Borough of South Bound Brook, traffic volumes are also significantly lower than in Franklin Township. The ADT on the Queens Bridge between Bound Brook and South Bound Brook is estimated at 22,400 vehicles per day, and the ADT between the roundabout and Hamilton Street in Bound Brook is estimated at 11,500 vehicles per day.

PUBLIC INVOLVEMENT

The public involvement process solicited stakeholder and public input through a variety of forums. Following is a summary of the process.

Steering Advisory Committee

Steering Advisory Committee (SAC) meetings served as the framework for the public involvement process. This group consisted of a broad cross-section of municipal and county officials, municipal and county personnel, as well as representatives from the New Jersey Department of Transportation (NJDOT), North Jersey Transportation Planning Authority (NJTPA), the Delaware & Raritan Canal Commission, Rutgers University, Ridewise of Somerset County, Keep Middlesex Moving, NJ Transit, Somerset County Transportation, Middlesex County DOT, St. Peter's Hospital, Robert Wood Johnson Hospital, and other organizations. SAC members provided important input on strategies under consideration at every step of the process. Four meetings were held throughout the course of the study.

Focus Groups and Technical Committees

Four focus group meetings were held early in the study to provide ideas to the project team members on strategies that should be considered to address study objectives. One meeting was held for each of the following four groups:

- Roadway and Intelligent Transportation Systems (ITS)
- Pedestrian and Bicycle
- Transit-Friendly Design and Smart Growth
- Transit and Travel Demand Management (TDM)

Following preparation of draft strategies to address issues and concerns, the focus groups were reconstituted as "technical committees" to provide input to the project team members. In this round, one meeting was held for each of the four groups. The majority of members of the focus groups and technical committees were recruited from the project SAC.

Public Meetings

Two public meetings were conducted. The first meeting was held at the Franklin Township Library on February 11, 2010 to review existing conditions with members of the public and solicit ideas on strategies that should be evaluated. The second meeting was held in New Brunswick at the Middlesex County Planning Board offices on September 30, 2010, to review proposed strategies with attendees and solicit input. A presentation was given at each meeting, and boards were used to display major findings and recommendations. Input was recorded during question and answer sessions following the presentations, as well as through comment forms distributed at the meetings. A newsletter was also distributed to attendees as both meetings.

Survey

Residents of the four study area communities had the opportunity to provide input to the project via a survey posted on the Ridewise website in November and December, 2009. Responses were received from 862 residents; a summary of the responses is kept under separate cover at the Somerset County Planning Board office. Following are some highlights from survey responses:

Auto Mode Share

The large majority of respondents depend heavily upon a personal vehicle for trips of all purposes. For example, of the 580 residents who use Easton Avenue/Main Street as part of their work trip, 89% drive alone. Of the 623 residents who use Easton Avenue/Main Street to travel to restaurants, 84% drive alone.

Vehicular Conditions

Residents who use Easton Avenue on trips are often frustrated at experienced delays; 31% of residents report being stuck in traffic more than five minutes every weekday. Another 20% of residents report that they are stuck in traffic at least three days per week. Motorists have the highest degree of dissatisfaction with the intersection of Easton Avenue and Franklin Boulevard/Landing Lane. Of residents familiar with the study area intersections, 53% said that this intersection was poor. Thirty-two percent (32%) said that the intersection of Easton Avenue and Albany Street in New Brunswick is poor, and 27% said that the intersection of Easton Avenue and Cedar Grove Lane is poor.

Transit Conditions

For respondents, bus and rail accommodate a very small percentage of trips along Easton Avenue (2%), though over 4% for work trips. The most common reasons cited for not using transit included routes not serving preferred destinations (64%), bus stops are too far or difficult to access (45%), and service is not frequent enough (25%). Over half of the respondents answered that transit does not meet their needs and 129 people specified they would “never use transit.” These responses were consistent between residents of the four communities. When asked to rate factors that would encourage more transit use, 41% said more frequent trip; 39% said closer bus stops; and 31% said faster trips. In the section on “Additional Comments”, several respondents requested increasing the frequency of DASH (no less than hourly during non peak periods, and requests for every 10 minutes during peak periods) and hours of service (especially providing service later in the evening). Improving access to information about

existing transit services was also frequently requested. (i.e., bus stops with schedules and making information easier to find on-line).

Pedestrian Conditions

Most residents never walk along Easton Avenue; only 22% of survey respondents said that they walk along the study corridor for work or non-work trips, and the same percentage said that they consider Easton Avenue to be pedestrian-friendly. Asked to provide additional comments, residents expressed greatest concern about walking on the corridor due to volume and speeds of traffic (offered by 89 residents), followed by lack of sidewalks (73 residents), and safety (73 residents). When asked to rate factors that would encourage more walking, 56% said safer intersections; 51% said better sidewalk conditions; and 40% said better lighting. In the section on "Additional Comments", several residents wrote in that they were particularly concerned about walking conditions in the vicinity of the I-287 interchange, and several other residents said that they were most concerned about the segment between Cedar Grove Lane and JFK Boulevard.

Bicycle Conditions

Even fewer numbers of residents bicycle along Easton Avenue than walk; 13% said that they bike along the corridor for work or non-work trips. When asked to rate factors that would encourage more bicycling, 47% said a bike path separated from the road; 41% said a dedicated bike lane; and 36% said safer intersections. Asked to provide additional comments, residents expressed the greatest concern about bicycling on the corridor due to safety (175 residents), traffic volume and speeds (103 residents) and lack of bike lane (91 residents). A number of residents specified particular segments of concern. Four residents said that they were particularly concerned about bicycling between I-287 and New Brunswick, and three said that they were concerned about bicycling between Franklin Boulevard and JFK Boulevard. A number of residents said that they were concerned about debris on the multi-use path and the street.

In other pedestrian/bicycle concerns, nine residents wrote in suggesting greater use of the Delaware & Raritan Canal Towpath. Of these, seven specifically recommended improved access to the Towpath. One resident suggested installing a footbridge across the Canal at the Somerset Diner.

CHAPTER 2: TRANSIT-FRIENDLY DESIGN AND SMART GROWTH

Smart Growth encompasses compact and mixed land uses that encourage walking, bicycling, and the use of transit. The goals of Smart Growth are to achieve a unique sense of community and place; expand the range of transportation, employment, and housing choices; equitably distribute the costs and benefits of development; preserve and enhance natural and cultural resources; and promote public health. Transit-Friendly Design concentrates residents and employees, and mixes land uses to maximize transit's effectiveness. When combined, Transit-Friendly Design and Smart Growth land use policies not only increase transit's ridership potential, but also its value as an economic development and sustainability tool.

Research from across the country determined that, on average, Smart Growth policies reduces car trips by 49 percent in the morning peak period and 48 percent in the evening peak, compared to what would be expected from standard trip generation estimates typically used by municipalities.[1] Specifically, increasing any of five factors associated with Smart Growth – destination accessibility, street connectivity, transit access, mix of uses, and neighborhood density – can reduce driving per capita compared to conventional suburban development.[2]

Because Smart Growth principles are so complementary to Transit-Friendly Design, recommendations which fall into both areas are included in this section. The same land use and design strategies that make it more feasible to walk or bicycle also support a greater use of transit. This section thus provides Smart Growth and Transit-Friendly Design strategies that the four study area municipalities can include in their land development ordinances.

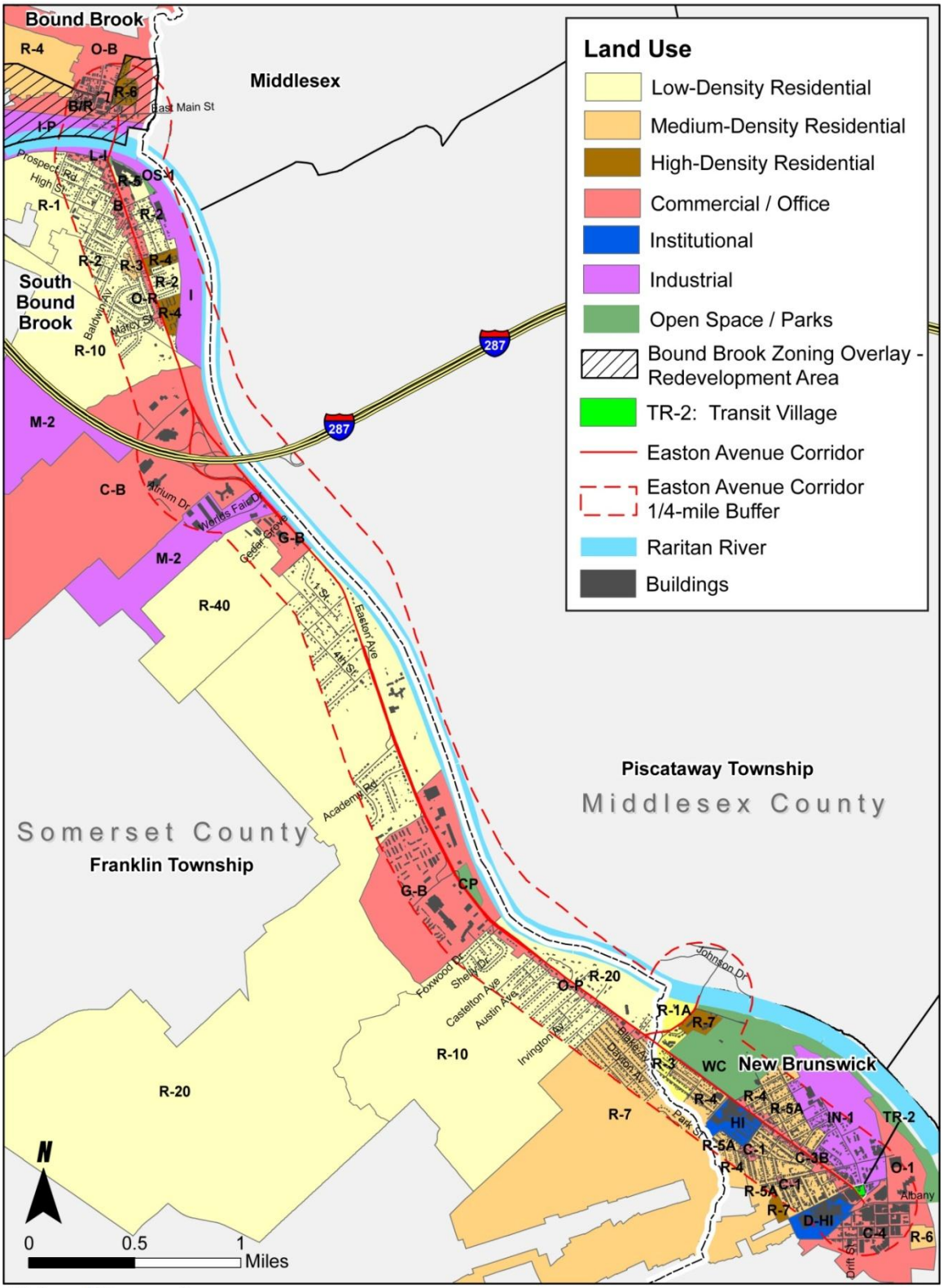
EXISTING CONDITIONS

Zoning

Land uses change considerably along the 6.6 mile length of the study area. A map of zoning categories is shown in Figure 2.

[1] *Transportation Cooperative Research Program, Report 128, Effects of TOD on Housing, Parking and Travel*, 2010.
[2] Journal of the American Planning Association, *Travel and the Built Environment: A Meta-Analysis,* Ewing and Cervero, 2010.

Figure 2: Easton Avenue Composite Zoning



Beginning in downtown New Brunswick, Easton Avenue travels through a commercial corridor surrounded by medium-density and limited areas of high-density residential. Two institutional uses, the Cancer Institute of New Jersey and St. Peter's Hospital, are directly along or close by Easton Avenue. The road passes by Buccleuch Park, which is zoned as a waterfront conservation area, then travels through a narrow office strip entering Franklin Township. Surrounding residential densities are fairly low, with minimum lot sizes of half or quarter-acre. Easton Avenue passes through a large general business and commercial area, encompassing the shopping center at JFK Boulevard. To the north is a section of both low-density single family homes and garden apartments.

Approaching I-287, there is a stretch of general business and light manufacturing uses. This section of the township, framed by Davidson Avenue, Pierce Street, and World's Fair Drive, includes a few hotels, a convention center, an industrial park, and assorted office buildings.

As Easton Avenue turns into Main Street entering South Bound Brook, the land uses become more urban, with a narrow commercial strip of office-residential and business surrounding the street. A garden apartment complex adjoins Main Street at the southern border. Crossing the river into Bound Brook, the study corridor terminates at the downtown business district.

Planning Guidance

The follow sections outline guidance from existing municipal planning documents on each community's vision for their transportation system and land use patterns, highlighting recommendations for the study area where specified in the plans.

Bound Brook Borough

The Bound Brook Master Plan Re-examinations (2003 and 2007) specify the municipality's goal "to promote the establishment of appropriate population densities and concentrations that will contribute to the well-being of persons, neighborhoods, communities and regions and preservation of the environment." The vision for implementing this goal (from the 2003 Re-examination) includes "returning to [Bound Brook's] single family profile (p. 3) and "building more parking in congested areas to help relieve traffic congestion (p. 13).

The Bound Brook Land Use Ordinance includes subdivision requirements such as minimum setbacks, sidewalks, and certain amounts of parking and access, but no TDM regulations. The parking requirements are allowed to be altered "because of the nature of the operation."

Bound Brook also published a Downtown Urban Design Plan in 2010 to present a planning framework for public investment. The plan includes open space, redevelopment, circulation, and parking components, all based on Smart Growth principles. The following are a selection of key proposals which are supported by the Easton Avenue Corridor Plan:

Circulation

- Provide wider sidewalks, bump outs, and other traffic calming features along Main Street.
- Enhance pedestrian access within the downtown.

Parking

- Create eight shared public/private parking facilities managed by the Borough's Parking Commission.
- Establish and revise parking pricing policy.
- Adjust minimum required parking ratios and clarify rules for shared parking and mechanisms for satisfying parking requirements off-site.

Land Uses

- Eliminate the requirements that residential uses be limited to the top floor of a building.
- Eliminate the requirement that residential uses be limited to studios and 1-bedrooms.
- Adjust the Business/Residential District to expand the range of permitted uses to include housing, hotels, bed and breakfasts, and potentially others.

South Bound Brook Borough

The South Bound Brook Vision Plan (*A Vision Plan for Canal Road and Main Street*, 1999) specifies the following transportation related goal: "Provide safe, efficient and convenient vehicle and pedestrian transportation and circulation throughout the borough."

The Vision Plan discusses a "balanced, productive redevelopment" of Borough Center, and states the desire to upgrade its physical appearance while maintaining its historic character. The Plan also mentions encouraging "development that reinforces transit." Specific strategies outlined in the plan include:

- Enhancing pedestrian pathways and linkages to Bound Brook;
- Creating pedestrian-oriented development along Main Street;
- Identifying potential gateway (i.e. Canal Road and Main Street);
- Physical and visual links to the Delaware and Raritan Canal State Park; and
- Promoting vehicular and pedestrian linkages to Middlesex County.

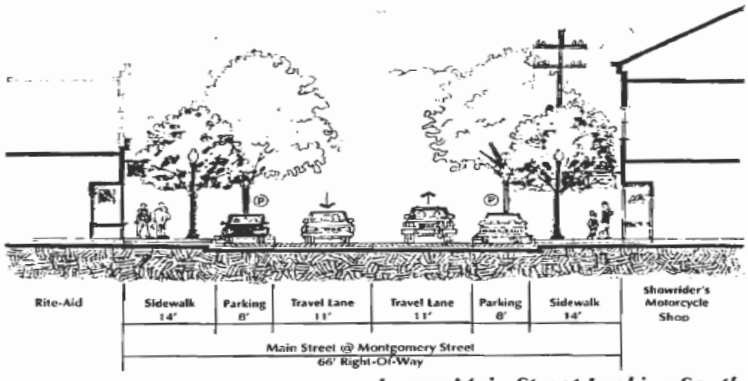
The Vision Plan specifies the need to implement mixed uses and an enhanced pedestrian environment (p. 66), as well as the need for shared parking (p. 69). The Vision Plan also includes a streetscape vision for Lower Main Street (see Figure 3), including:

- Buildings defining the edge of the street;
- Pedestrian lighting;
- Replacing inappropriately-scaled signage with smaller, perpendicular signage; and
- Parallel parking on both sides of the street with two travel lanes.

Figure 3: Lower Main Street Streetscape Vision

Lower Main Street Streetscape Vision

This cross section shows the ideal streetscape environment: buildings define the edge of the street; pedestrian lighting is used; inappropriately-scaled signage is replaced with smaller, perpendicular signage; and parallel parking is accommodated on both sides of the streets, with two travel lanes.



Lower Main Street Looking South

Franklin Township

The Franklin Township 2006 Master Plan includes the following transportation-related goals which have helped guide the vision of Easton Avenue:

- Establish a circulation system that recognizes the high level of through-Township traffic and minimizes its negative impact on Township residents.
- Support improvement of County and State roadways.
- Minimize thru-traffic in residential areas by improving traffic flow on major roads.
- Discourage "single-outlet" design to enhance local circulation.
- Encourage connectivity between developments.
- Plan connector roads in strategic locations to improve circulation throughout the Township, to preserve existing neighborhoods and to improve safety.
- Improve traffic flow by limiting points of access on arterial roadways; explore the possibility of accessing existing and proposed commercial strip development via service roads.
- Encourage use of alternate forms of transportation (transit, bikes) and continue to implement Bikeway Master Plan.
- Promote safety:
- Support traffic calming measures.
- Enhance school bus, bicycle and pedestrian safety.

New Brunswick

The New Brunswick Master Plan (2004) suggests splitting Easton Avenue into two separate zones – the upper would remain commercial, and the lower would be in a community commercial zone or neighborhood business zone. This designation suggests a desire for mixed uses, though the plan does

not assert that as a goal (MP II-31). It was recommended that zones such as the C-3B District (Easton Avenue's district) cut out all stand-alone residential uses allowed at the time of writing in order to "create more compact, efficient, cohesive, pedestrian-friendly commercial areas" (MP II-47), and p. II-48 suggests allowing a larger FAR for Easton Avenue.

Proposed Developments

Information about proposed developments and current planning studies in the corridor has been provided by Franklin Township and New Brunswick, and are presented below. In terms of Bound Brook and South Bound Brook, the Somerset County Planning Board recently reviewed planned developments, and has indicated that there are no planned developments with significant traffic impact in either of the two municipalities.

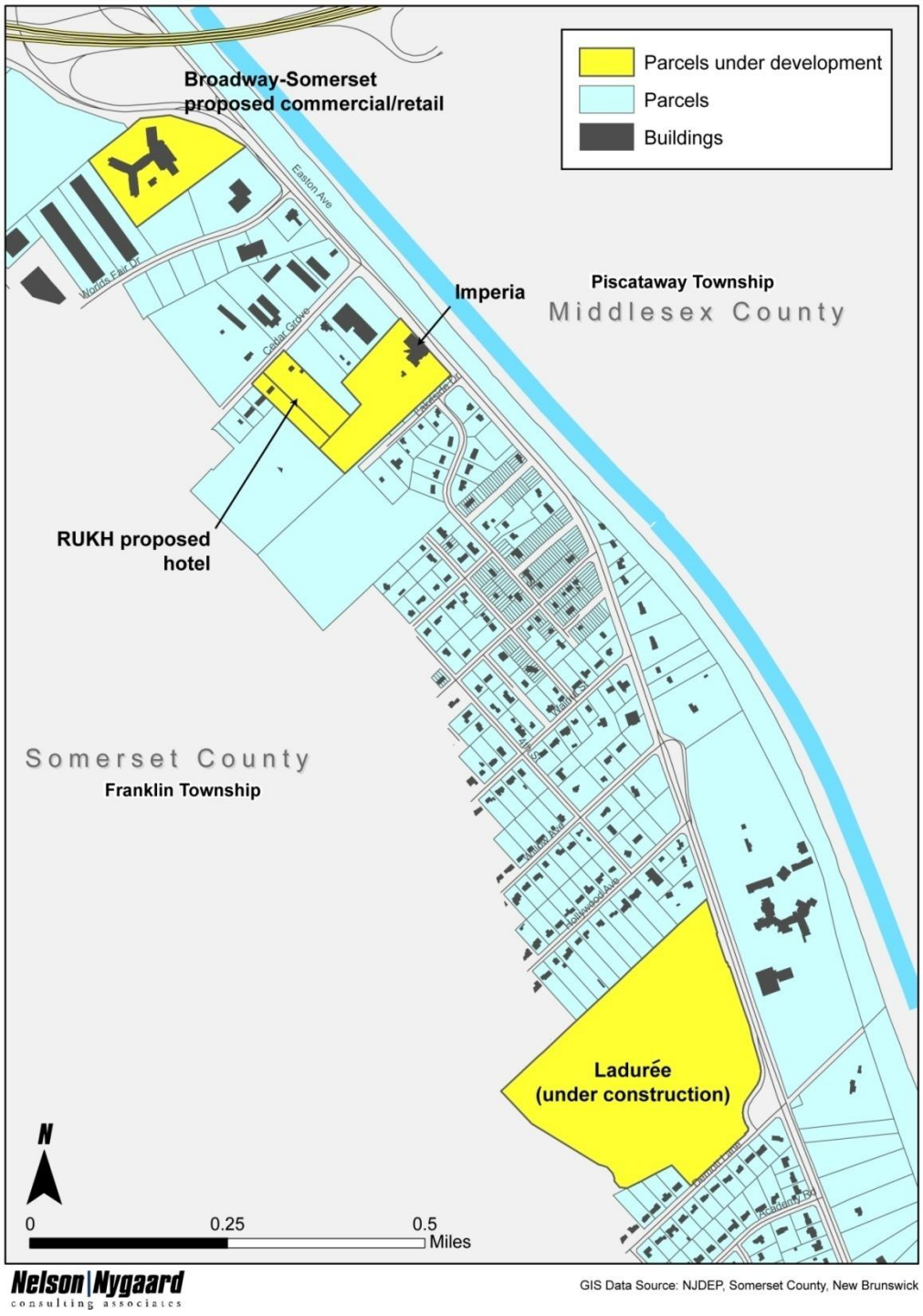
Franklin Township

Currently there are three sites under development in the quarter-mile buffer around Easton Avenue in Franklin Township. All three developments are fairly close together, as shown below. The Broadway-Somerset group has proposed demolishing the existing Quality Plaza, located on a 9.3 acre parcel, and replacing it with nearly 60,000 square feet of commercial space, including a health club, retail building, and restaurant. RUKH Properties is going through the approvals process to build a three-story hotel with 103 rooms and a free-standing restaurant at 20 Cedar Grove Lane. Approval is contingent upon RUKH also modifying the adjacent Imperia property with pedestrian connections, easements to allow shared parking, new sidewalks, and improved driver circulation. A third development, Ladurée, will be an adult community with 384 apartments and is under construction just north of DeMott Lane.

New Brunswick

Currently there are three sites under development in the quarter-mile buffer around Easton Avenue in New Brunswick. The first is "The Residences at the Park" at Easton Avenue and Park Boulevard. This project is proposed to redevelop one single-family dwelling and a technical high school into eight one-bedroom units and 31 two-bedroom units. The second project is "The Central Jersey Oncology Center" at Easton Avenue and Ray Street, which will demolish the existing on-site medical office building and three two-story dwelling units and replace it with a three-story medical office building. Finally, the Gateway project at Easton Avenue and Somerset Street is a mixed-use development under construction, providing 192 housing units, retail space, and a 650-space parking garage.

Figure 4: Franklin Township Developments



STRATEGIES

Smart Growth and Transit-Friendly Design recommendations for the Easton Avenue Corridor are focused on nodes where transit is most accessible and where Transportation Demand Management initiatives are available to facilitate non-SOV travel. The Smart Growth and Transit-Friendly Design

recommendations are therefore interdependent on the recommendations from the Pedestrian/Bicycle, Transit, and Transportation Demand Management elements. (Parking management, which is a key component of both Smart Growth planning and Transportation Demand Management, is presented in the Transportation Demand Management section.)

Smart Growth Planning

Designate Nodal-Based Districts

The first Smart Growth recommendation is to designate nodal-based Transportation Management Districts where land use and Transit-Friendly Design improvements will maximize the benefit of the TDM elements recommended in the previous chapter. These Districts should be established in the corridor's five major business districts (see Figure 5):

1. Downtown New Brunswick (Albany Street to Hamilton Street)
2. St. Peter's Hospital (Ray Street/Cortland Street to Park Boulevard)
3. Franklin Township (Cedar Grove Lane to Davidson Avenue)
4. South Bound Brook (Maple Avenue to Canal Road)
5. Bound Brook (Main Street to Columbus Place)

Allow Transit-Supportive Densities within the TMDs

Increased population and employment densities place more potential riders within walking distance of transit stations/stops. Successful transit generally requires a minimum of 15 residential units per acre in residential areas and 25 employees per acre in commercial centers.[3] These densities create adequate transit ridership to justify regularly scheduled, all-day service (as proposed in the Transit Recommendations), and help create active street life and commercial activities, such as grocery stores and coffee shops, within convenient walking distance of homes and worksites.

Commercial land uses require acknowledgement of employment density as well as Floor to Area Ratio (FAR). Recommended FAR's start at 0.35 for nonresidential activities in transit supportive neighborhoods, but are more frequently recommended at minimums of 0.5 to 1.0 for commercial developments without structured parking and at least 2.0 for developments with structured parking. Existing and proposed residential densities and FAR by zone are presented in Table 1. Greater FAR will increase total trips, including via both driving and transit. Increasing the total transit demand will improve the efficiency of the system, reducing cost per passenger, and resulting in opportunities for better headways. While additional auto trips will occur from the additional FAR, the improved transit service offers the opportunity to shift both additional and existing trips to transit.

[3] *Transportation Cooperative Research Program, Report 102: Transit-Oriented Development in the United States: Experiences, Challenges, and Prospect* (2004).

Figure 5: Proposed Easton Avenue Corridor Transportation Management Districts

Table 1: Existing and Proposed Residential Density and FAR

Municipality and Zone	Zoning Code Description	Maximum Residential Density Per Acre (Current)[4]	Maximum Residential Density Per Acre (Proposed)	Maximum FAR (Current)	Maximum FAR (Proposed)
BOUND BROOK					
B-R	Business-Residential	N/A	16	N/A	N/A
I-P	Industrial	N/A	N/A	N/A	N/A
O-B	Office-Business	4	16	N/A	N/A
SOUTH BOUND BROOK					
R-2	Residential	8	No Change	N/A	N/A
R-3	Residential	16	No Change	N/A	N/A
R-4	Residential	14	No Change	N/A	N/A
O-R	Office-Residential	16	No Change	N/A	N/A
B	Business	N/A	N/A	N/A	N/A
I	Industrial	N/A	N/A	N/A	N/A
FRANKLIN					
G-B	General Business	6	No Change	0.3	0.5
M-2	Light Manufacturing	N/A	No Change	0.5	0.5
C-B	Corporate Business	N/A	No Change	0.4	0.5
NEW BRUNSWICK					
C-3B	Community Commercial/Office	16	No Change	1.2	No Change
C-4	Downtown Commercial/Office	50	No Change	12.0	No Change
HI	Hospital/Institutional	N/A	No Change	6.0	No Change
IN-1	University	11	No Change	0.8	No Change
O-1	General Office	N/A	No Change	1.2	No Change
R1-A	Residential	1	No Change	0.35	No Change
R-4	Residential	8	No Change	0.5	No Change
R-5A	Residential	16	No Change	0.35	No Change

Bound Brook currently allows 4 units per acre in their O-B zoning district and does not specify a residential density within the B-R district. With the presence of the rail station, this district is recommended to allow up to 16 units per acre, to allow this TMD to maximize the value of the station and serve as an anchor for the bus transit throughout the corridor.

[4] Translated from Minimum Lot Area, where applicable

South Bound Brook permits residential densities of up to 8 units per acre in its R-2 district; up to 16 units per acre in its R-3 and O-R districts; and 14 units per acre in the R-4 district. These densities provide more than the minimum recommended to support the proposed transit service. No changes are recommended to density within South Bound Brook.

The proposed TMD in Franklin Township would be located in existing G-B, M-2, and C-B zones along the first 550-feet from Easton Avenue. These zones allow primarily retail, office, and hotel uses, with FARs of 0.3 and 0.4. To further encourage densities that will support transit, the FARs permitted in these zones are recommended to be increased to 0.5, which will permit additional non-residential uses in the center of the corridor. No additional residential density is recommended in the Franklin Township TMD.

New Brunswick is currently zoned for significant development, with FAR between 0.35 (residential) to 12.0 (Downtown). The amount of development accommodated in these zones is more than sufficient to encourage transit use and no changes are recommended. With residential densities as high as 50 units per acre, no change to density is also recommended for New Brunswick.

Mix Uses

Traditional, or Euclidean, zoning separates land uses, sets density thresholds and minimum lot sizes, and usually contains explicit regulations such as bulk and height controls and minimum parking requirements. To support multi-modal access, however, traditional zoning is often reversed (i.e., uses are intermixed, not excluded, and parking caps, rather than parking floors, are sometimes set).

The uses included in a transit supportive community should generate trips throughout the day. This strategy takes advantage of unused transit supply in off-peak hours and results in routes that are more productive than in areas with traditional rush-hour peaks. Ideally, the new TMDs generate approximately 1 to 1.5 jobs per household, providing significant employment opportunities for both residents and commuters.

The following list presents a sample of land uses appropriate for inclusion in a transit supportive district:

- Mid- to high- density residential
- Retail/commercial stores
- Private offices/professional businesses
- Government offices
- Schools (especially higher education)
- Child-care centers
- Community facilities
- Public space
- Entertainment complexes

The zones along Easton Avenue and Main Street where the TMD's are proposed currently allow for a range of uses, generally including the following per community:

- Bound Brook: Retail, offices, and residential

- South Bound Brook: 1-family, 2-family, garden apartments, offices, and retail
- Franklin: Retail, restaurants, offices, hotels, and garden apartments
- New Brunswick: 1-family, 2-family, high- and mid-rise apartments, offices, retail, mixed-use ground floor commercial with residential above, hospital, educational institution

These districts offer a wide mix of land uses that could support transit within a ¼-mile radius of Easton Avenue and Main Street. The only Smart Growth measure recommended to further encourage trips by alternative modes is to allow ground-floor commercial regardless of upper floor uses in all TMD's. This is a form currently accommodated in most of the study area in New Brunswick and South Bound Brook, and is recommended for the remaining areas, as well as in Bound Brook and Franklin.

Support Smart Growth Goals Emerging from the 2010 Bound Brook Downtown Urban Design Plan

Bound Brook's 2010 Downtown Urban Design Plan offers a planning framework for public investment based on Smart Growth principles. These principles are echoed by the Smart Growth recommendations in the Easton Avenue Corridor Study. The recommendation is therefore for the Easton Avenue Study stakeholders to affirm support for the Smart Growth principles in both studies.

Support Smart Growth Goals Emerging from Franklin Township's Canal Access Vision and Strategic Plan

Franklin Township has recently been engaged in a planning process to provide access to the Delaware & Raritan Canal in the area of JFK Boulevard, and to re-envision the land uses in this area. Facilities such as a bike rental are proposed to complement the new access point. Redevelopment of the existing shopping area on the east side of Easton Avenue and north of JFK Boulevard is also envisioned, with proposed compact mixed-use development. The land uses are proposed to be pedestrian-friendly, as opposed to the current auto-oriented character. This planning process is still in its early stages, but should be supported, given its compatibility with Smart Growth goals.

Transit Friendly Design

The following design standards embody two main planning ideas: form-based standards and traffic calming. Form-based standards help define the relationship between buildings and the public realm. Traditional zoning alone does not create a streetscape that encourages people to walk. In recent years many cities have adopted form-based zoning codes as a way to institutionalize urban design standards that aim to create a walkable environment. Traffic calming is a set of tools that reduce the speeds or volumes of traffic on a street. In a commercial area with pedestrian and transit access, auto speeds should be kept low to both increase pedestrian safety and also allow drivers to see in shop windows and find on-street parking. Traffic calming applies infrastructure countermeasures that slow the driver by adding complexity to a street.

The following design standards should be adopted and implemented throughout the entire corridor as infrastructure is reconstructed. They make Easton Avenue attractive to pedestrians by creating an interesting and welcoming streetscape, and make it safer for those pedestrians to walk the sidewalks and wait for the bus or train.

Driveway Design

The vast majority of crashes occur at intersections, when vehicles conflict with other vehicles and pedestrians. Driveways are also intersections, and should be designed to emphasize the pedestrian over the vehicle. The design of sidewalk-driveway interfaces should prioritize the sidewalk, meaning the sidewalk material should continue across the driveway. The sidewalk level should also be maintained, rather than sloping the driveway down to meet the roadbed in advance of the sidewalk.

This image shows a case where the driveway trumps the sidewalk.

The sidewalk materials are used for the driveway and the sidewalk remains level.

This sidewalk's brick texture makes it stand out to the driver and is reinforced with a stop sign.

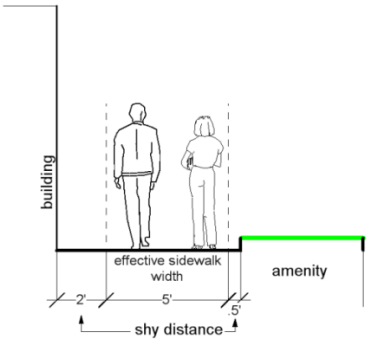
Sidewalk Width

All sidewalks should have an effective sidewalk width of at least five feet. This is the width recommended by both the Institute of Traffic Engineers and Federal Highway Administration[5]. Five feet of width is compliant with the ADA Proposed Guidelines for Accessible Rights-of-Way, and permits two wheelchairs to pass each other. Effective sidewalk width equals the total useable sidewalk space, or the total width minus amenity space or obstacles like fire hydrants or sign posts. Pedestrians do not walk right up against buildings or landscaping, thus the shy distance that people allow between themselves and sidewalk objects should also be subtracted. The Highway Capacity Manual states that people shy two feet away from buildings and half a foot from landscaping or street trees.

A sidewalk width of five feet allows two people to comfortably walk next to each other.

[5] Institute of Transportation Engineers, *Design and Safety of Pedestrian Facilities*, 1998, pg 30-34. Federal Highway Administration, *Designing Sidewalks and Trails for Access*, Part 2, 2001, Page 4-6.

This sidewalk is fairly wide, but because of amenities and building walls the effective width is five feet.



This diagram shows the concept of effective sidewalk width.

Curb Extensions

Install curb extensions (wider sidewalks) at key intersections on streets with on-street parking. Curb extensions have several functions. They increase pedestrian visibility by giving people a place to stand free of the parked cars, and shorten the total crossing distance, meaning it takes less time for someone to cross. This is especially helpful for slower pedestrians, like children and older adults. Curb extensions narrow the roadway to drivers, signaling them to slow down.

This curb extension has been landscaped, adding to the traffic calming effect by narrowing the field of vision vertically as well as horizontally.

Windows

Encourage windows at street level of buildings rather than at second-floor level. Pedestrians are much more likely to enter a building if they can clearly see inside and understand the purpose of the business.

Street level windows support local businesses by inviting pedestrians to browse.

Walls

Reduce expanses of solid walls on buildings, as they create a closed-off feeling to pedestrians. For those inside the buildings, blank walls also reduce light and air circulation.

Blank walls lack interest.

Building Articulation

Articulation refers to the concept of using street frontage design elements to make an interesting streetscape and break up building mass. Well-articulated buildings should embody transparency, defined entries, and use of patterns and various materials. Transparency means making the inside of the building visible to pedestrians, and making the street visible to those on the inside. The use of visual cues like awnings or canopies helps guide pedestrians to building entrances. Entries can also be defined through wayfinding and clearly defined ground floor uses.

This store's large windows make its purpose clear.

Using different materials and patterns creates visual interest.

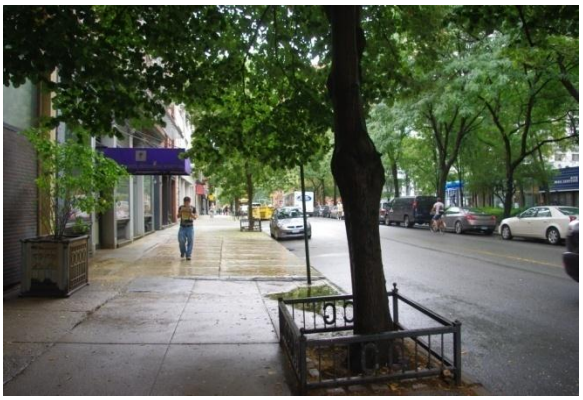
Lighting

Use on-site or building mounted lighting to provide adequate illumination between building and the street. In order to create a safe and inviting atmosphere during evening hours, lighting should be installed to dispel shadows in places where people might have security issues. Lighting should be pedestrian-scaled, with bulbs at a height of no more than 15 feet. Municipalities have typically relied on high-pressure sodium lighting, which has poor color-rendering ability and gives off a yellowish glare. Consider instead emerging lighting technologies such as induction lamps or LED that give off a warmer, brighter light.

On the left, lighting attached to buildings. On the right, lighting in this recessed area improves perceptions of security.

Street Trees

Plant street trees at a minimum of 30 feet on center. Trees have many benefits, including improved air quality, shade, and aesthetics. Trees also have a traffic calming effect by focusing the driver's line of sight.



A mature tree canopy.

Building Entrance

Orient building entrances to pedestrian-oriented streets rather than busy arterials that might be characterized by heavy vehicle traffic. In areas with regular foot traffic, building entrances should be oriented to the street, and not only to parking lots.

Building Setback

Locate buildings as close to the street lines of the lot as practicable, while complying with the setback required for that zoning district. Wide building setbacks make it difficult for pedestrians to access a site. For businesses, this also means potential customers cannot see the building's use, so they may not bother checking out the site.

Wide setbacks degrade pedestrian accessibility from the street.

The use of building setbacks for parking should also be avoided. Parking in front of stores obscures storefronts and makes businesses less accessible to pedestrians, as they must walk through a parking lot to the store. Instead, parking should be placed behind the store.

On the left, storefronts are pushed back from the street. On the right, these storefronts are much more pedestrian-oriented. The buildings also provide shade.

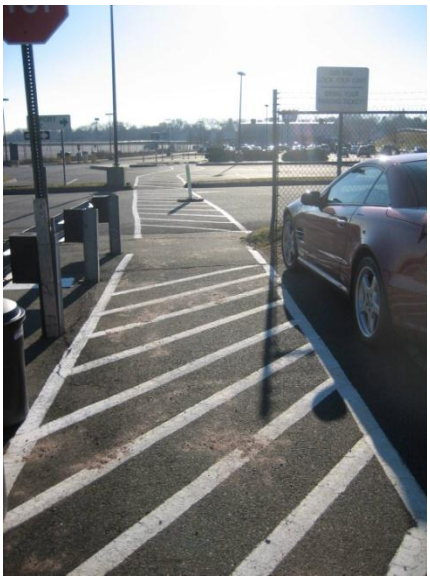
Parking Lots

Use interior landscaping and walkways to break up the size of large parking lots. Large parking lots around buildings create a sense of low density and long distances between destinations. Also, in

summer months parking lots become hot and unpleasant to walk through, which landscaping helps to minimize.

Trees and landscaping offset parking lot heat island effects.

Provide clear walkways from parking areas to building entrances. Parking lots can be difficult for pedestrians to navigate, as there are no clear pedestrian zones; people generally walk between cars or alongside the vehicle circulation routes. Creating a pedestrian walkway need not be labor or cost-intensive; as shown below, this airport parking lot simply used crosswalk paint to stripe in a high-visibility walk route that will alert drivers to pedestrian presence.



Pedestrian walk route clearly striped through parking lot.

Built as traditional downtowns, New Brunswick, South Bound Brook, and Bound Brook along Easton Avenue and Main Street generally adhere to these standards. In comparison, Franklin Township was generally developed as an auto-based suburb. Design elements along Easton Avenue have traditionally focused on auto access, prioritizing driveways, parking supply, and buildings oriented away from Easton Avenue. The result in Franklin Township therefore has been a pattern of land use development projects centered around parking lots and discouraging access by transit and walking.

This shaded sidewalk is an example of both elements above.

Recently, Franklin Township has revised their design standards for commercial development, now requiring all new developments to include sidewalks and improving the pedestrian experience within parking lots. Application of the additional Transit-Friendly Design elements described above, especially in the proposed Franklin Township TMD will result in a new direction for land use development, and offer the TMD a notable difference compared to other districts in Franklin Township.

Land uses in Franklin Township along Easton Avenue are generally oriented towards parking facilities, not transit or pedestrians.

Help the Community be Transit Friendly by Being Friendly to the Community at Transit

The New Jersey Transit rail stations at New Brunswick and Bound Brook serve as gateways to the Easton Avenue Corridor. These locations have the opportunity to welcome visitors to the area's many tourist attractions, residents returning home, and employees to their jobs. The recommendation is therefore for information kiosks to be installed at the rail stations, with maps of downtown, and information about local merchants and destinations. New Jersey Transit will soon be reconstructing the New Brunswick Station and has agreed that space for this information will be provided at the station.

CHAPTER 3: TRANSPORTATION DEMAND MANAGEMENT STRATEGIES

EXISTING CONDITIONS

Transportation Demand Management, or TDM, is a set of strategies, programs, and physical elements that influence travel behavior by mode, frequency, time, route, or trip length in order to help achieve a sustainable use of transportation facilities. TDM can reduce the number of Single Occupancy Vehicle (SOV) trips, by focusing the demand for transportation services on alternative modes and providing the public with the incentives and information to use these alternatives. Without these characteristics, travel demand will go unserved and travelers will be encouraged to use SOV's or not travel at all. This is especially true in areas like the Easton Avenue Corridor, where existing land use and travel patterns have established SOV as the dominant trip type. The goal of TDM in the study area is to nurture sustainable communities along Easton Avenue that offer feasible alternatives to the car as a way of life while providing choices of multiple modes to all travelers.

THE BENEFITS OF TDM

TDM Benefits Individuals

TDM services help residents and workers make better use of the many transportation options available, providing both lifestyle and economic benefits. For those who do not or cannot drive, non-SOV travel options can provide them with the mobility needed to hold a job, go to the doctor, shop, and otherwise lead a fulfilling lifestyle. For others, travel options can relieve the stress, time, or cost of a commute (many of the issues specified by travelers within the Easton Avenue corridor), or allow for more productive use of the time they travel. The monetary savings in fuel, vehicle wear and tear, or owning fewer vehicles in the household can amount to thousands of dollars per year.

Moreover, the health benefits can be priceless; public transportation is many times safer than the private automobile and the simple exercises of walking or bicycling, whether to one's destination or to catch public transit, greatly reduces obesity and the risk of heart disease and a myriad of other illnesses. In sum, TDM can be the introduction to an improved quality of life on many levels.

TDM Benefits Businesses

By managing or lessening the number of vehicles accessing and parking at the worksite, TDM can save companies thousands of dollars in parking costs. It can also provide even more important, though less visible, business advantages by virtue of the benefits to employees in the form of less stressed, more satisfied, and productive workers, easier recruitment, an expanded labor pool, expanded service hours, improved morale, better retention of employees, and less tardiness and absenteeism due to traffic, stress, or health issues.

TDM Benefits the Community

The combined benefits of TDM to individuals and to companies also aggregate to benefit the community as a whole. Less traffic, improved access, greater mobility, and many choices in travel modes add up to an enhanced quality of life for the residents, workers, and visitors who use Easton Avenue. Less

vehicular traffic also means less air pollution. In fact, the Easton Avenue Corridor Plan's primary goal, which is to "Manage traffic congestion through maximizing the use of alternative transportation modes and low-cost vehicular improvements, and improve safety for all modes along the Easton Avenue and Main Street corridor", is directly supported by TDM policy initiatives.

TDM is Cost Effective

One of TDM's advantages is that it is more cost-effective and environmentally sustainable than providing additional transportation infrastructure such as adding lane miles to increase roadway capacity**.** With limited opportunities to widen Easton Avenue, TDM measures help use the roadway more effectively.

TDM results in a quantifiable, cost-effective benefit to the community. In one investigation of the cost effectiveness of community-based programs that promote travel behavior change, the Victoria, Australia Department of Infrastructure found that such programs can be highly-effective in increasing use of public transit, as well as use of other alternatives to the private car.[6] The Victoria study concluded that marketing-based TDM programs have resulted in financial benefits of $3.09 to $4.70 for every dollar invested in the program.

To effect meaningful travel behavior change and encourage the widespread utilization of alternatives to SOV, residents and other travelers must first understand the options available in the multimodal transportation system – how they work, how to use them, and the benefits they offer. This requires a level of information and support that demystifies travel options and makes them rational and desirable alternatives to the car. Many jurisdictions have formed non-profit organizations called Transportation Management Associations to support their TDM efforts and lead information campaigns. These groups are member-controlled and promote TDM programs in the community, and also typically have a detailed web site cataloguing available transportation services. Following is a summary of the TMA's that serve the study area: Ridewise (Somerset County) and Keep Middlesex Moving (Middlesex County).

Ridewise

Ridewise is an affiliate of the Somerset County Business Partnership to implement TDM programs. Ridewise is the source for sustainable travel alternatives that improve mobility, reduce traffic congestion, and decrease carbon emissions in Somerset County. Their web site, www.ridewise.org, has detailed information on bus and rail providers and schedules, bicycling programs and maps, and commuting benefits available. Ridewise runs programs geared toward commuters, employers, and for the general community, as summarized below. In addition to the following programs, the Ridewise web site also has content devoted to explaining the benefits of carpooling, transit, walking, and biking, an explanation for employers of flexible work scheduling, and several available cash benefits that people can receive from programs run by NJ Transit or NJDOT.

Commuter Programs

- Carpool and vanpool classifieds – users can find a carpool or vanpool by destination city.

[6] *Travel Demand Management: Public Transport Business Case*, Ker for Department of Infrastructure, Victoria, June 2003.

- Stars for Cars – this new program is an online carpool match service. Once the user has created a detailed profile, the service will continually search for a carpool match.
- Vanpool aid – money is available from Ridewise and NJDOT for those who want to start a vanpool.
- Ticket Home – commuters who choose not to drive alone to work are guaranteed a ride home if there is an emergency, and may be reimbursed up to $110 per year for rides home on approved providers.
- Bike lockers – Ridewise administers the bike lockers available at NJT rail stations, including the Bound Brook station in the Study Area.
- Bicycle commuter map – Ridewise created a map of popular commuter cycling routes, containing turn-by-turn directions, mileage, and major intersections.

Employer Programs

- Find a Better Commute Fair – Ridewise will facilitate an employer-scheduled session with employees and explain existing programs and rewards available.
- Program implementation – in designing a TDM program, Ridewise will help the employer identify carpool or vanpool opportunities and funding, map employee homes to understand geographic scope of the employer, help people relocate, and identify incentives to offer employees, such as transit pass sales, bike racks, or corporate challenges.
- NJ Smart Workplaces – Ridewise processes employer applications and verifies information for this program, which honors companies that provide excellent commuter services.

Community Initiatives

- Ticket to Ride – non-profits working with transit-dependent populations or social services organizations may offer free tickets on SCOOT, CAT, or DASH provided by Ridewise.
- Safe Routes to School – Ridewise will help schools create a safe routes to school program.
- How to Ride – Ridewise will hold training in classrooms or on buses to explain available services and how to use them.
- Transit Connection Job Fair – held on October 15, 2009 and in conjunction with the Somerville One Stop Center, this fair sought to connect job seeks with employers accessible by transit.

Keep Middlesex Moving

Keep Middlesex Moving (KMM) is composed of 44 municipalities, government agencies, employers, and developers with the goal of improving mobility throughout Middlesex County. KMM offers the following seven categories of programs and assistance.

Carpool and Vanpool

In addition to carpool classifieds and Emergency Ride Home, KMM offers:

- Car Free Week – begun in 1999 in Europe, Car Free Week is now a global event. In 2010, 551 people registered to participate in a car-free or car-light week , up from 536 in 2009.
- KMM publishes classifieds and offers Emergency Ride Home, as well as an Empty Seat Subsidy. Geared toward new vanpools or those who have lost riders, the subsidy of $125 per month for three months is available to vanpools that are at least 20 percent empty.

Municipal TDM Awards
KMM distributed a total of $20,000 in 2010 to three towns to implement TDM programs.

Park & Ride
KMM maintains a database of information on park and ride lots throughout the county, including typical utilization and fees.

Bicycling & Walking
- Bike to Work Week 2010 – KMM is a sponsor of this program, which was held from May 10-16, 2010.
- Bike lockers – like Ridewise, KMM administers locker rentals at NJT stations, including the New Brunswick station.
- Pedestrian safety – KMM launched a multimedia campaign in the spring of 2009 to promote safe pedestrian behavior and driver awareness.

Ticket to Work
KMM will provide three free round trip passes on bus routes. If a job is secured, KMM will pay for 10 round trips on transit for the employee's first two weeks of work.

Employer Services
KMM can provide a package of services, incentives, and information to employers, including on-site transportation fairs, transit passes, and explanation of tax benefits. Like Ridewise, KMM processes applications for NJ Smart Workplace awards.

Publications
KMM publishes two quarterly newsletters: The Way to Work, geared toward commuters, and On the Move, which is about KMM events in the county. The web site, www.kmm.org, also has information on ozone levels, transit schedules, and traffic updates.

STRATEGIES
Transportation demand is a direct function of land use. TDM is most effective in concentrated areas where land use form and proximity offer people the opportunity to travel other than by driving alone. TDM initiatives for the Easton Avenue Corridor are therefore focused on nodes where pedestrian and bicycle access is most prevalent and transit service is prominent. The TDM recommendations are therefore interdependent on the recommendations from the Pedestrian/Bicycle, Transit, and Smart Growth/Transit-Friendly Design elements. The result is an integrated transportation and land use plan that parlays individual initiatives into a comprehensive strategy.

Designate Nodal-Based Districts
The first TDM recommendation is to designate nodal-based Transportation Management Districts where TDM programs have the greatest potential to reduce SOV commute trips. These Districts should be established in the Corridor's five major business districts:

1. Downtown New Brunswick (Albany Street to Hamilton Street)
2. St. Peter's Hospital in New Brunswick (Ray Street/Cortland Street to Park Boulevard)
3. Franklin Township (Cedar Grove Lane to Davidson Avenue)
4. South Bound Brook (Maple Avenue to Canal Road)
5. Bound Brook (Main Street to Columbus Place)

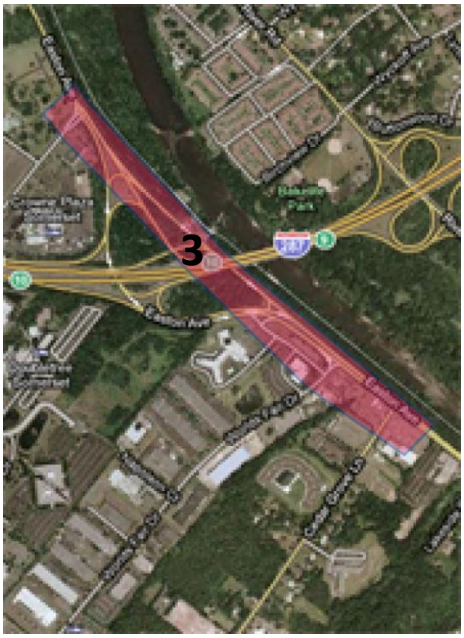
The five TMD's are not zoning districts, but would be akin to a Business Improvement District, supported jointly by the municipalities and the TMA's, as described below. It is recommended that the TMA's highlight these Districts in their literature, and that businesses within each District appoint a liaison to help coordinate TDM efforts.

Establish Corridor-wide Direction for Districts

Municipalities have the option to pass an ordinance to implement a TDM program. An ordinance gives the municipality the leverage to compel employers to do their part to control traffic. Ultimately this will benefit all stakeholders by ensuring that the study area can grow in population and employment while remaining vital and competitive. Each municipality could adopt a TDM ordinance focused on the District(s) within their boundaries. All five districts should support these Corridor-wide goals:

- Maintain and improve quality of life and economic vitality by encouraging trips with a balanced usage of different modes of travel.
- Increase transportation capacity without increasing roadway capacity.
- Provide both information and incentives for the use of alternatives to single-occupancy-vehicle and peak-hour travel.

Figure 6: Proposed Easton Avenue Corridor Transportation Management Districts



Set a Quantifiable Measure

While there are many ways to measure the corridor's transportation conditions, there is one simple measure that can be used as a baseline to determine if progress is being made in achieving the four goals above. The percentage of drive trips made during peak hour is a key indicator of sustainable transportation conditions. The current peak hour commuting modal share for each community can be used as a starting point. Reduction targets should be based on existing patterns and the potential for improvement based on implementation of the recommendations of the Easton Avenue Corridor Plan (modal share goals would not be applicable until improvements implemented). Goals are district-wide, and not specific to any one participant.

Table 2 presents the results of the travel survey conducted as part of the Easton Avenue Corridor Study, specifically the commute mode along Easton Avenue by municipality, shown as percentages of commute trips. The percentage of commuters driving to work ranges from 91% to 96% for all study area municipalities, except for New Brunswick which has a significantly different auto share of 71%. These mode shares reflect a combination of existing transit, pedestrian, and bicycle accessibility.

Auto share reduction targets are intended to provide each Transportation Management District with an initial goal. Since the rates in the table are based on Corridor-wide input, the nodal-districts where multi-modal improvements and TDM programs will be focused should have lower auto shares than other sections of the study area. However, using the corridor-wide rates as a starting point provides a benchmark from which each district can show improvement. An initial auto share reduction of 5% should be targeted for each district. If this goal is achieved within the first year, more advanced TDM measures should be considered. For districts where the target is not met, evaluation of other TDM measures may be appropriate. An alternative option for establishing the base benchmarks would be to conduct an initial TMD-specific survey. Auto share reduction targets can then be established based on this more statistically significant data and serve as the basis for annual surveys of the same user groups.

Table 2: Easton Avenue Survey Commute Mode Percentages[7]

	Drive	Carpool	Walk	Bicycle	Bus	Rail	Total
Franklin	91%	3%	1%	1%	2%	2%	100%
New Brunswick	71%	2%	12%	8%	3%	5%	100%
Bound Brook	91%	0%	0%	9%	0%	0%	100%
South Bound Brook	96%	4%	0%	0%	0%	0%	100%

Get the Most Bang Out of the TDM Buck

The TMA's that serve the study area actively promote TDM programs that reduce auto commute share. They currently provide education sessions for employees at large employment sites, to assist in decision making about carpool, vanpool, and public transit services. This service should be expanded to include all employers within a Transportation Management District with 25 or more employees (though there may be few applicable candidates in Bound Brook and South Bound Brook). Prioritizing large employers offers the opportunity to benefit from economies of scale: while the resources dedicated to programs are comparable at different sized employers, the potential modal shift is much greater at large employers.

Once TMA's start prioritizing large employers, these employers should be expected to complement that effort with resources of their own. All employers within a Transportation Management District with 25 or more employees should be required to:

a. Designate a Transportation Benefits Coordinator to serve as a liaison between the TMA and the company's employees;
b. Develop a Traffic Mitigation Plan (TMP) in consultation with TMA staff to specify trip reduction programs for the year;
c. Submit an Annual Report of Activities to the TMA at the end of the year documenting the TMP, achievements, and lessons learned; and
d. Conduct an annual employee commuter mode survey, and provide the results to the TMA. The survey would serve the purpose of providing information to create a sustainable auto trip reduction program that impacts Easton Avenue directly.
e. Engage KMM and Ridewise to reach out to major employers along the Easton Avenue Corridor and provide periodic joint transportation work fairs, updated information, and incentive programs for commuters who use bus, rail, bike to work carpool vanpool or telecommute to work along the corridor.

These elements will help the District learn from local conditions and experiences, track changes to commuting patterns, and identify ways to create a sustainable auto trip reduction program that directly improves conditions along Easton Avenue.

[7] Responses of N/A excluded from this table.

Offer Financial Benefits to Riding Transit

In recent years, growing numbers of transit agencies have teamed with universities, employers, or residential neighborhoods to provide discounted monthly transit passes. These passes typically provide unlimited rides on local or regional transit providers for low monthly fees (some costs could be absorbed by public and private sector) employers, school, or developers offering an employment benefit). The principle of employee monthly transit passes is similar to that of group insurance plans – transit agencies can offer bulk discounts when selling passes to a large group, with universal enrollment, on the basis that not all those offered the pass will actually use them regularly. Annual per-employee fees are generally between 1% and 17% of the retail price for an equivalent annual transit pass. Universal transit passes are often an extremely effective means to reduce the number of car trips in an area, as shown in Table 3. (This is a strategy recommended for the entire Easton Avenue corridor, not just the TMD's).

Table 3: Effects of Universal Transit Pass Introduction

Location	Drive to Work		Transit to Work	
Municipalities	Before	After	Before	After
Santa Clara (VTA)	76%	60%	11%	27%
Bellevue, Washington	81%	57%	13%	18%
Ann Arbor, Michigan	N/A	(4%)	20%	25%
Downtown Boulder, Colorado	56%	36%	15%	34%

Source: Nelson\Nygaard

DASH's fare is currently $2.00 per ride. A monthly commuter riding twice per day, 22 days per month pays $88. As an example, offering a $75 monthly pass (15% discount) would generate $2,431 less farebox revenue per month. As shown in Table 4, to recoup this loss, DASH would need ridership to increase by 32 rides per month (1.5 rides per day); any additional passes purchased and not utilized daily (a frequent effect of bulk purchasing by employers) would result in complete revenue increase to DASH. Any additional revenue generated by this reduced fare would be a benefit to the agency (increased revenue) and any increased ridership would be a benefit to the corridor (shifting trips to transit). The agency would also benefit from capturing farebox revenue at the beginning of the month, instead of daily, providing improved cashflow.

Table 4: Sample Monthly Transit Pass: Potential Fare and Ridership Adjustments

	Current Fare	Proposed Monthly Pass
One way fare	$ 2.00	$ 2.00
Days per month	22	22
Rides per day	2	2
Fare per month (ind)	$ 88.00	$ 75.00
Riders per month	187	187
Fares per month (total)	$ 16,456.00	$ 14,025.00
Difference		$ (2,431.00)
Additional riders needed per month		-32
Additional riders needed per day		-1.5

Expand What's Already Working

New Brunswick's "Live Where You Work" program provides low-interest mortgage loans to homebuyers to anyone working in and looking to buy a home in New Brunswick. This program is sponsored by the New Jersey Housing and Mortgage Finance Agency, and results in an increase in residents who work close enough to home to allow for commutes by transit, walking, and biking. This program should be expanded to all of the Transportation Management Districts, providing incentives for living in places that prioritize Transportation Demand Management, and offer alternatives to driving along Easton Avenue. The significant portion of DASH ridership that travels to/from Davidson Avenue employers offer a viable target market for expanded the Live Where You Work program.

Establish a Carsharing Program in New Brunswick

Car-sharing is a hassle-free way to rent cars by the hour. Rather than being concentrated at a central location like a rental car company, car-sharing cars are dispersed throughout an urban area at convenient centralized locations, such as residential or commercial developments, civic buildings, or central parking facilities. Car-share operators use telephone and Internet-based reservation systems that are completely self-service. Members are charged hourly and sometimes mileage-based fees and receive a single bill at the end of the month for all their usage. Special membership plans offer discounts for businesses and organizations to enable easy access for all employees, which can augment or replace fleet cars or use of personal vehicles for work trips. Currently, over 30 car-sharing organizations operate in North America in 36 metropolitan areas. ZipCar previously operated on the Rutgers University campus in New Brunswick, but withdrew the service due to lack of use; meantime ZipCar located at the MetroPark Train Station has been successful. Support of the program by the municipality by offering existing carsharing companies on-street spaces or spaces in public garages is anticipated to entice the different carshare providers to reconsider an operation in New Brunswick. The New Brunswick Parking authority has been in touch with carsharing companies. The consensus by these companies is that the new Transit Village in New Brunswick will be an advantageous location for carsharing, as it is convenient to the train station and travelers.

Rutgers University's experience with ZipCar should be noted if a carsharing program is to be developed for New Brunswick. Rutgers University's policies that offer incentives or disincentives allowing students

to have cars on campus should be examined when considering whether to try instituting car sharing on Rutgers campus's or in the City of New Brunswick.

Car-sharing has proven successful in reducing both household vehicle ownership and the percentage of employees who drive alone to work because of the need to have a car for errands during the workday. For residents, car-sharing reduces the need to own a vehicle, particularly a second or third car. Recent surveys have shown that 50% of car-share members are able to give up a vehicle after joining and that 70% of members are able to avoid buying a car by joining a car-share program.[8]

Car-sharing can greatly reduce both the number and length of vehicle trips because the variable cost of each trip is much higher. Unlike owning a car, where around 80% of the costs are sunk costs and therefore not perceived on a trip-by-trip basis, car-sharing makes almost all costs of driving visible for every trip. Car-sharing operators charge for miles driven and/or time used and these costs include all the costs of owning and maintaining that vehicle. Study results vary considerably in the magnitude of change that car-sharing makes in vehicle trips, but all studies have shown a decline in vehicle miles traveled by car-sharing members[9].

Manage Parking

A key set of TDM strategies are those related to managing the supply of parking. The price and availability of parking are important factors in any individual's choice of travel mode. The following strategies, therefore, can be used as a way to make optimal use of the existing parking supply, and to manage demand for additional parking generated by future growth. Because parking is such an integral element in transportation management, these strategies extend beyond the TMD boundaries. It is important to note that each of the municipalities should manage on-street parking in a comprehensive manner, so that all districts are treated appropriately. Therefore, the following parking management recommendations should be reviewed with each of the respective municipal councils.

Charge the Right Price for Curb Parking

When on-street parking rates exceed 85 percent, communities may see an increase in excess traffic due to cruising for parking (i.e., people searching and circling to find a free or below market-rate curb parking space). In these circumstances, managing parking prices to ensure that there are available curb parking spaces at all times of day is an important strategy for reducing search traffic. Charging for on-street parking with a goal of leaving one or two vacant spaces on each block (i.e., a target occupancy rate of 85%) will not drive customers away. If too many spaces are empty because rates are set too high, the policy requires adjusting rates downward until the parking spaces are again well-used by customers.

Visual observations of parking demand along Easton Avenue indicate that where meters are present, the rates are not high enough to generate turnover of spaces, so many motorists continue to circle or double park, reducing Easton Avenue's operational capacity. Anywhere that parking along Easton Avenue is metered, rates should vary based on demand. Increases to meter rates should be phased in

[8] "Car-sharing: Where and How it Succeeds." Transit Cooperative Research Program Report 108, Transportation Research Board, 2005.
[9] Ibid.

gradually until demand-based rates are established, so that drivers are not disincentivized from patronizing Easton Avenue businesses. Meters should be in effect during the day for all parkers. During evening and overnight hours, residents should be permitted to park at the meters without having to pay.

Return a Portion of Parking Meter Revenue, Bus Shelter Advertising, and Other Transportation-Generated Revenues to the Neighborhoods that Generate It

A portion of the net revenues from paid parking at the curb and from any nearby bus shelter advertising (and any other transportation-generated revenue) should fund public Transportation Management District (TMD) improvements that benefit the blocks where the money is collected. In collaboration with municipal officials, members of each TMD could prioritize their transportation needs, so that new sources of revenue can be applied towards the improvement of local transportation conditions.

Merchants and property owners should be encouraged to see that a portion of general tax and new transportation-related revenues are being applied towards projects that directly benefit transportation system projects that they have chosen.

Concurrent with implementing programs that generate new revenues towards local priorities, nearby residential districts will also need protections so that commercial parkers do not "spillover." Residential Parking Benefit Districts should be implemented in residential areas, wherever there is the potential for spillover parking from nearby commercial areas, and wherever densities are high enough that the on-street parking might fill up if left unmanaged. New Brunswick's Residential Permit Parking Program offers this strategy, which can be modeled for Bound Brook and South Bound Brook (on-street parking is not provided along Easton Avenue in Franklin Township).

As economic development begins to create a greater demand for on- and off-street parking supply, the overall parking rate structure may need to be reassessed to maintain an appropriate supply of available spaces. The application of parking fees could be flexible so that with the approval of the respective municipal entity, a portion of their revenue can be considered for investment in the advancement and implementation of the multimodal and Transportation Demand Management (TDM) elements described in this document. These TDM elements include transit, ridesharing, flex time/staggered hours, work at home, and pedestrian and bicycle facility options.

Tailor Minimum Parking Requirements for Off-Street Parking in TMDs

In the long term, requiring developers to provide off-street parking plays a powerful role in increasing the number of vehicle trips and worsening traffic congestion. Minimum parking requirements worsen traffic congestion through a simple three step process:

- Minimum parking requirements are set high enough to provide more than enough parking even when parking is free.
- Parking is then provided for free at most destinations, and its costs remain hidden.
- Bundling the cost of parking into higher prices for everything else skews travel choices toward cars and away from public transit, cycling and walking.

Along most of the corridor, off-street parking is lightly used throughout much of the day (except for in New Brunswick). Sharing this excess capacity creates the opportunity to encourage economic growth in the region without constraining new development with the burden of providing new parking.

If the first two policies in this section - setting prices for curb parking that ensure at least one or two vacancies per block, and returning the resulting parking revenue to the neighborhood where it is generated - are in place, off-street minimum parking requirements are not needed to prevent shortages of on-street parking. Instead, they only act to worsen traffic, and to discourage developers, employers, residents and other property owners from implementing strategies that reduce traffic. The recommendation is therefore to reduce existing minimum parking requirements for new developments in the Transportation Management Districts based on:

- ULI's Shared Parking Model (similar to New Brunswick's existing shared parking provisions) which provides a nationwide framework for different mixes of office, retail, hotel, restaurant, and residential space land uses that generate different parking demands, and offer the optimal parking requirements through shared parking.
- Payment of in-lieu fee set annually by each municipality as 90% of the cost of constructing a space and maintaining it for 30 years. Fees should be dedicated to fund TMD activities;
- Additional reduction of 1 space per 10 secure bicycle storage spaces provided; and
- Provide parking credit for ground-level retail for any existing managed parking spaces (metered or time limited).

Require the Unbundling of Parking Costs

Parking costs in the study area are typically subsumed into the sale or rental price of housing and commercial space. But although the cost of parking is often hidden in this way, parking is never free, and hiding its cost results in higher vehicle ownership and more traffic.

To reduce the number of unneeded vehicles housed within the study area, the full cost of providing parking can be "unbundled" from the cost of multifamily housing units (both rental and condominium), commercial space, and from the costs of other goods and services, with limited exceptions. For example, Bellevue, WA, "requires building owners to include parking costs as a separate line item in leases and to charge a minimum rate for monthly long-term parking that is equal or greater than the cost of a bus pass. This makes it easier for employers to determine the value of their current parking subsidies [when employers are establishing employee parking charges or parking cash-out programs]." Additionally, this policy means that employers who successfully reduce parking demand and traffic to their worksites are able to reap financial benefits by leasing fewer parking spaces.

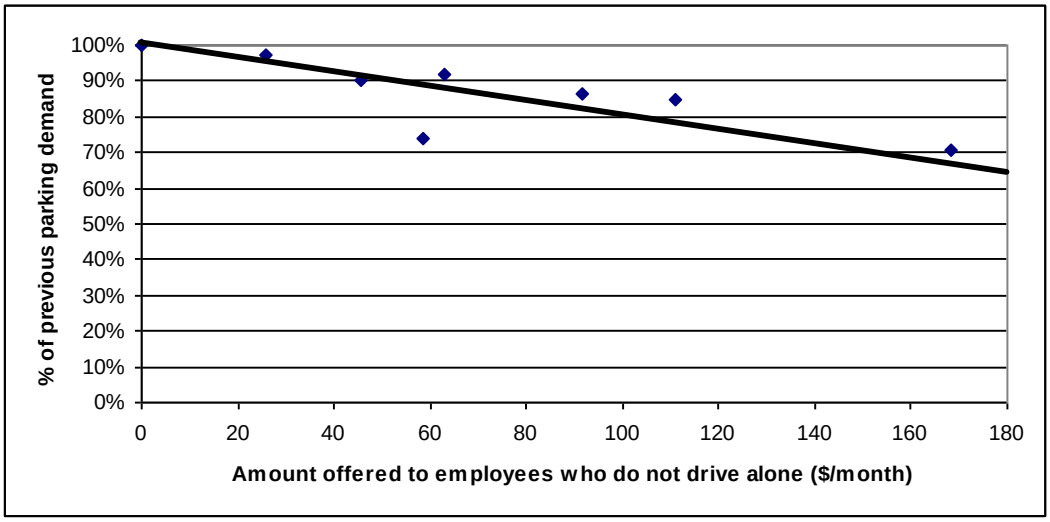
Require Parking Cash-Out

The majority of employers in the Study Area provide free or reduced price parking for some employees as a fringe benefit. Under a parking cash-out requirement, employers are allowed to continue this practice on the condition that they offer the cash value of the parking subsidy to any employee who does not drive to work. While the cost of providing parking may currently be very low in areas with a large supply of under-utilized parking, the value of this benefit may increase if future growth creates a demand for more parking. Parking rates in high parking demand areas are also relatively low, so parking

cash-out may provide a limited shift in driver behavior until market-based rates (as described above) are implemented.

The primary benefit of parking cash-out programs is their proven effect on reducing auto congestion and parking demand. Figure 7 illustrates the effect of parking cash-out at seven different employers located in and around Los Angeles. It should be noted that most of the case study employers are located in areas that do not have good access to transit service, so a large part of the reduced parking demand and driving to work that occurred with these parking cash-out programs resulted when former solo drivers began carpooling.

Figure 7: Effects of Parking Cash-Out on Parking Demand



Source: Derived from Donald Shoup, "Evaluating the Effects of Parking Cash-Out: Eight Case Studies," 1997. Based on the cost in 2005 dollars.

CHAPTER 4: TRANSIT STRATEGIES

EXISTING CONDITIONS

The Easton Avenue corridor is served by both rail and bus. Following is a summary of the area's providers by mode and available ridership information for services that run on Easton Avenue.

Rail

The Easton Avenue corridor is bookended by New Jersey Transit rail stations. At the southeast end lies the New Brunswick station on the Northeast Corridor, and at the northwest end, the Bound Brook station on the Raritan Valley Line. Located along Main Street, Bound Brook station is surrounded by three parking lots, with a total of 275 parking spaces available for $3 per day or $40 per month. The station has bicycle racks or lockers, but no ticketing agent or ticketing machines[10]. The more heavily utilized New Brunswick station has an adjacent parking garage with 512 parking spaces. A few blocks away, another lot holds an additional 185 parking spaces. Average weekday ridership at Bound Brook totals 748 passengers; at New Brunswick, 6,091.

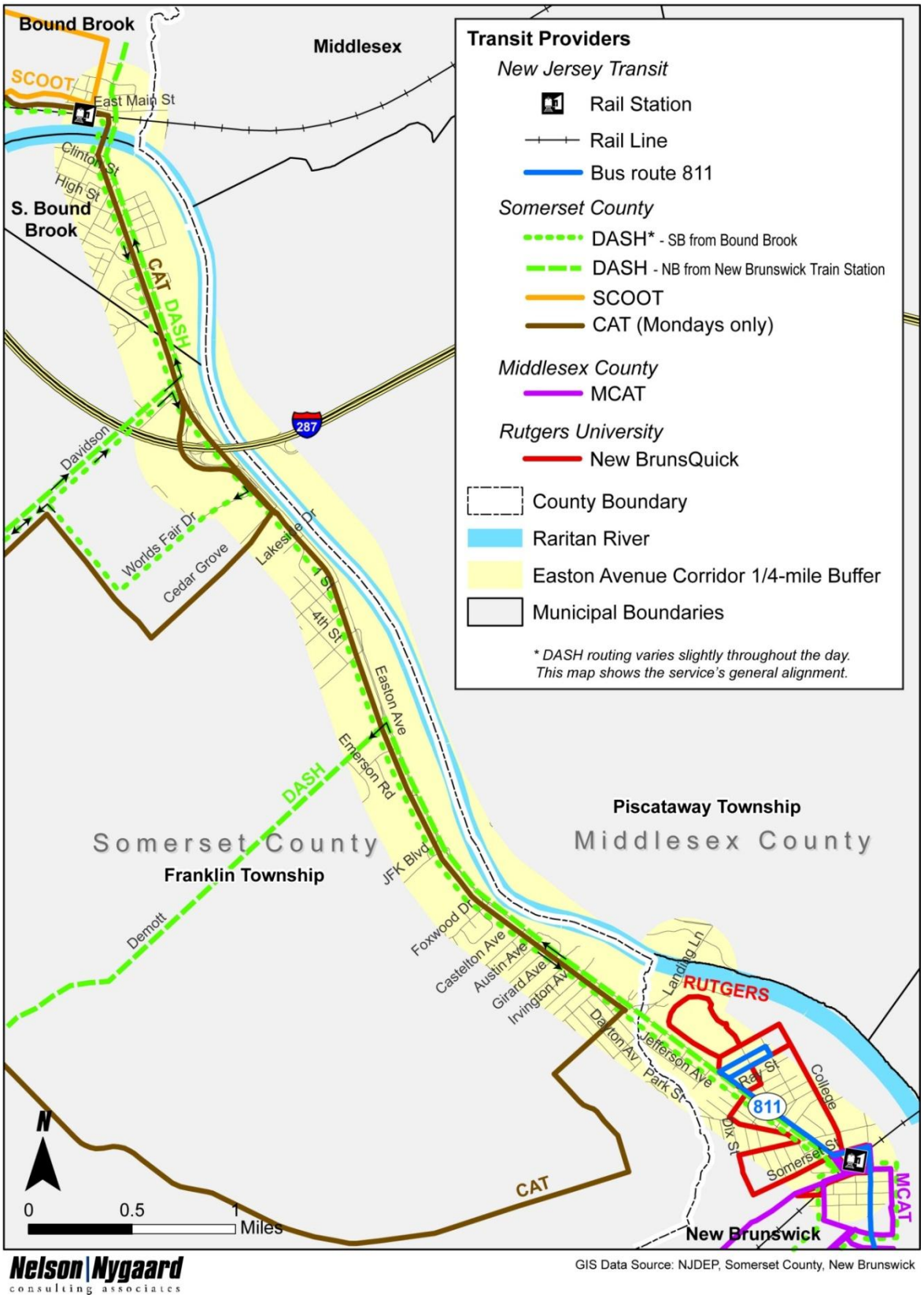
In terms of the mode of access to each station, just over half of Bound Brook riders drive alone and park, while at New Brunswick the most common access mode is walking only (37 percent). A significant portion of New Brunswick riders also take either a bus or shuttle to the station, as summarized in Table 5.

NJ Transit is currently planning intermodal improvements at the New Brunswick rail station. As of November 2009, the following improvements have been recommended:

- Signal timing changes at the intersection of Albany Street and Easton Avenue;
- Create designated curbside passenger pick-up/drop-off areas at the intersection of Albany Street and Easton Avenue (Albany Street westbound);
- Install new bike facilities, including increasing bike storage from 106 spaces to 148 spaces;
- Upgrade bus passenger facilities at Somerset Street and Wall Street including static and dynamic transit information signage and wayfinding signage; and
- Install a new elevator serving the eastbound platform at Easton Avenue.

[10] NJ Transit, 2009.

Figure 8: Transit Serving the Easton Avenue Corridor



Nelson|Nygaard consulting associates

GIS Data Source: NJDEP, Somerset County, New Brunswick

Table 5: Rail Station Mode Splits

Access Mode	Bound Brook		New Brunswick	
	Number	Percent	Number	Percent
Drove alone and parked	252	51%	961	25%
Dropped off	131	27%	782	21%
Walk Only	80	16%	1,410	37%
Bus or Shuttle	15	3%	489	13%
Carpool	10	2%	81	2.1%
Bicycle	3	1%	70	1.8%
Other	0	0%	17	0.4%
Total	**492**	**100%**	**3,809**	**100%**

Source: NJT Rail Survey, 2005

Bus

Several providers run bus service on the Easton Avenue corridor, as summarized below. Service generally is concentrated from Monday through Friday. Middlesex County provides services on Saturday as well. None of the providers run Sunday service.

Table 6: Bus Services on Easton Avenue

Provider	Route	Hours of Operation	Days per week	Peak Headways	Round Trips per Day	Average Riders per Trip
NJT	811	6:30 AM - 5:30 PM	Mon-Fri	60	12	25
Somerset County	DASH	6:15-9:45 AM, 3:15-6:45 PM	Mon-Fri	60	10.5	18
	SCOOT (R1 & R2)	9-11 AM, 1-4 PM	Mon-Fri	90	8.5	8
	CAT (Monday)	9 AM - 3:30 PM	Monday	100	8	1
Middlesex County	M1 New Brunswick Jamesburg 8A Shuttle	7 AM - 5:30 PM	Mon-Sat	60	10.5	32
	M4 BrunsQuick - Jersey Ave	5:45 AM - 6:30 PM	Mon-Sat	30	25	15
	M5 BrunsQuick - Commercial Ave	5:45 AM - 6:30 PM	Mon-Sat	30	25	5
Rutgers	New BrunsQuick	6 AM - 1:45 AM	Mon-Fri	12-13	68+	8

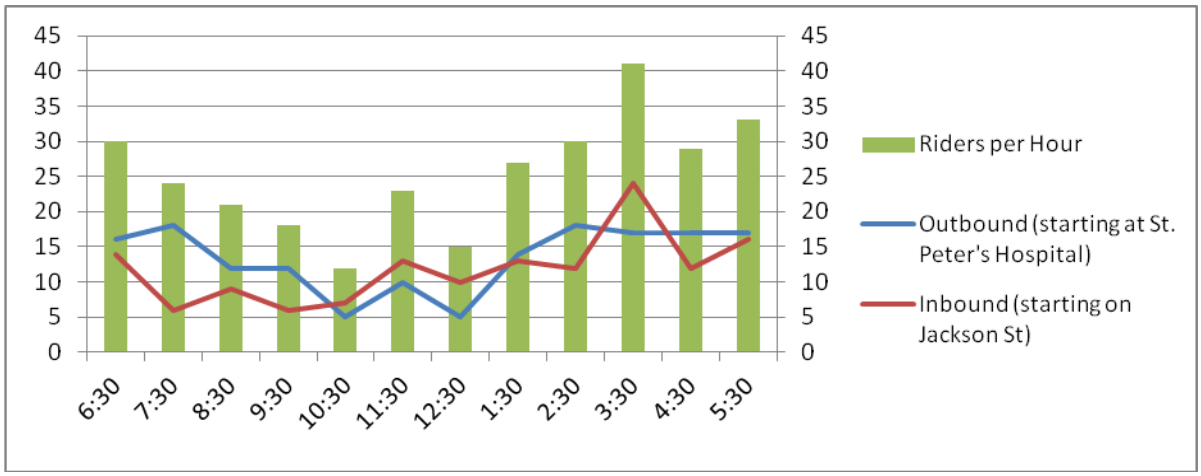
Source: NJT, Somerset County, Middlesex County, and Rutgers Web sites

New Jersey Transit

Route 811 is the only NJ Transit route that runs on a significant portion of Easton Avenue. The route travels from St. Peter's Hospital on Easton Avenue to New Brunswick rail station, and then through Milltown, East Brunswick, and South River. A few trips each day service the North Brunswick Senior Center and Pincus Apartments. The fare is $1.35 for travel within one zone, and $2.15 for trips traveling past the North Brunswick Shopping Center zone marker. This route's operation is outsourced to

Academy Express, and ridership is extremely low in comparison to the rest of the system.[11] A ridecheck was conducted in July 2009. Figure 9 shows total riders for each run of the day, with a total of 303 riders tallied for the day.

Figure 9: Daily Ridership on Route 811, July 2009

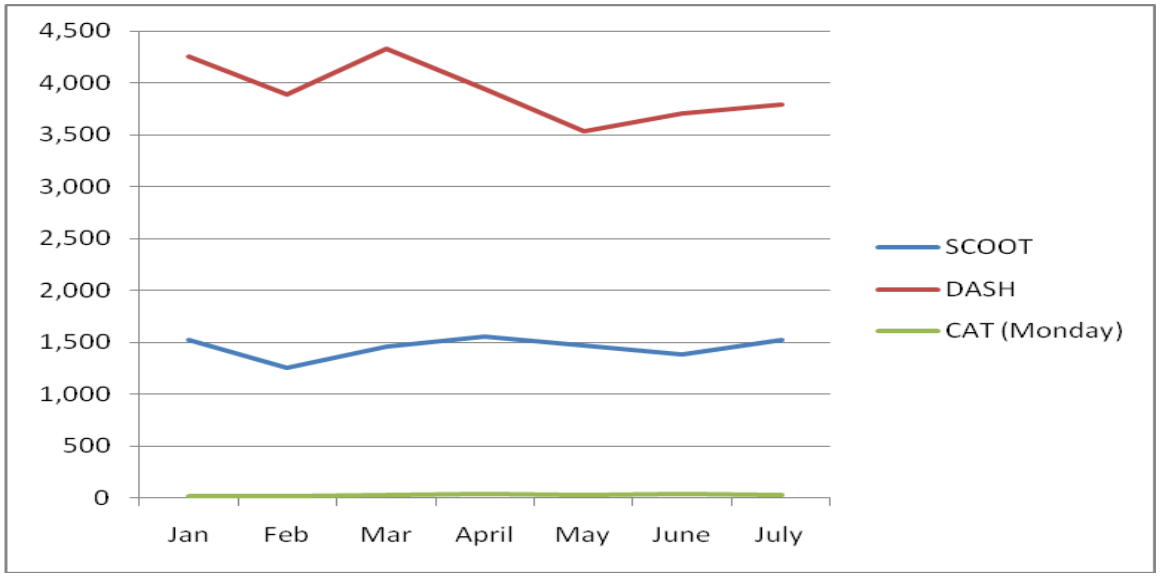


Source: NJT Ridecheck, July 2009

Somerset County

Somerset County provides three separate deviated fixed-route services, along with traditional paratransit. All Somerset County buses are operated and maintained by the County's Department of Transportation. One route, CAT, only operates on Easton Avenue on Mondays. The county's Transportation Management Association, Ridewise, distributes tickets for use on all three services. One-third of the county's public transit vehicles are equipped with bicycle racks, including the DASH vehicles that operate along Easton Avenue. Monthly ridership for 2009 is summarized below.

Figure 10: Somerset County Monthly Ridership



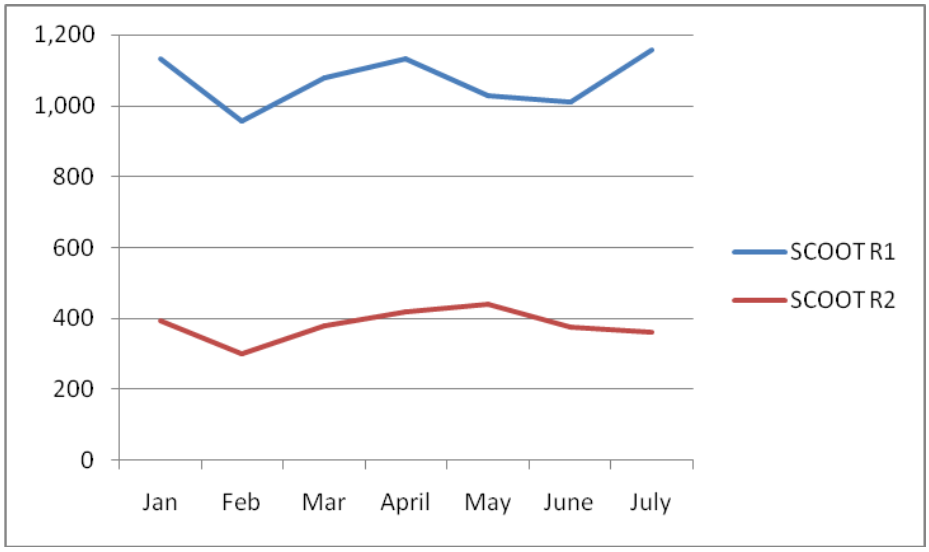
[11] Per Bob Pegg, NJT Director of Bus Service Planning, Phone Interview October 30, 2009.

Source: Somerset County Transportation

SCOOT

SCOOT consists of routes that used to be operated by New Jersey Transit. Due to low ridership, NJT decided to discontinue service, which the county then took over.[12] The county runs three SCOOT routes, two of which serve Bound Brook's train station. These two routes, Regional 1 and Regional 2, are exactly the same except Regional 1 runs counterclockwise and Regional 2 runs clockwise. Each route starts at Bridgewater Commons Mall and makes a loop along US 206, West Camplain Road, Main Street entering Bound Brook, and Union Avenue or Route 28. Passengers who are ADA eligible may call to request route deviations. The fare is $2 each way. SCOOT R1 makes 5.5 round trips per day, while SCOOT R2 runs three round trips. As shown in Figure 11, SCOOT Regional 1 has higher ridership than Regional 2. The two routes had a combined average daily ridership of 69 passengers from January to July 2009 – 51 riders on R1 (9 per trip) and 18 on R2 (6 per trip). SCOOT is heavily promoted on the Ridewise web site.

Figure 11: SCOOT Monthly Ridership



Source: Somerset County Transportation

DASH

The Davidson Avenue shuttle travels along Easton Avenue for a significant portion of its route, and serves both Bound Brook and New Brunswick rail stations. The route serves two main purposes: transporting residents to the New Brunswick train station (about 1/3 of riders) and transporting workers arriving at New Brunswick's train station to employment along Davidson Avenue (2/3 of riders). The bus circulates throughout the neighborhoods and businesses west of Easton Avenue, with different runs serving different destinations. The route accesses several hotels, Met Life, Franklin Township Municipal Complex, Harrison Towers, and a shopping center at Easton Avenue and JFK Boulevard. Like SCOOT, DASH drivers will deviate to pick up ADA-eligible passengers. Several people are registered ADA

[12] Steve Holzinger, Community Transit Manager for the Somerset County Transportation, Phone interview October 28, 2009.

customers, but only one person uses the route regularly. DASH costs $2. DASH had by far the highest ridership of the Somerset County services in 2009, with average daily ridership of 187 from January through July 2009. The service has experienced slight ridership increases as hotels along Davidson Avenue have begun rehiring workers after the recessionary layoffs. DASH handles approximately 110 boardings during the morning hours and 75 boardings in the afternoon in 2010.[13]

CAT

Community Access Transit consists of five different routes that serve different parts of the county on different days of the week. The CAT runs on Easton Avenue on Mondays. The route begins in Bound Brook and loops around Davidson Avenue, Hamilton Street, and Easton Avenues, then continues on Main Street back through Bound Brook and to the Bridgewater Commons Mall, Somerset County Complex, Somerset Medical Center, and the County Library. Route deviation is available for ADA passengers, and the fare is $2. The CAT route on Monday carried an average of seven daily passengers from January to July 2009.

Middlesex County

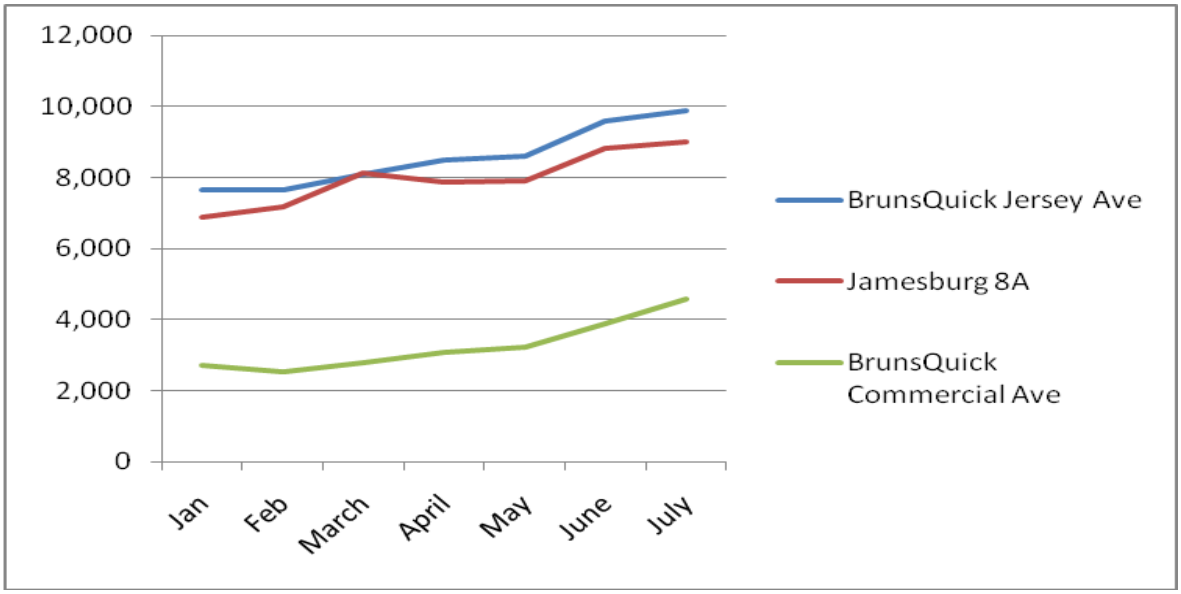
Middlesex County runs five deviated fixed-route "community shuttles" open to both ADA-eligible passengers as well as the general public. Of these five routes, three run on part of Easton Avenue. The bulk of Middlesex County's transportation services are dedicated to full paratransit – of its 80-vehicle fleet, only 10 operate on the deviated fixed routes. These vehicles, however, carry half of the county's total ridership. The routes were created five years ago and have always been open to the general public. As deviated routes, customers may call in a day in advance to have the driver deviate two blocks. The driver also has the discretion to deviate during recovery time. Unlike Somerset County transportation, passengers do not need to be ADA-eligible to request a deviation. Policy directives by the Board of Chosen Freeholders for Middlesex County dictated that these routes be available by suggested donation of $1 or 50 cents for older adults, meaning those who choose to may ride free.

During 2008, the county improved the community shuttles by implementing a travel training program geared toward older adults and persons with disabilities and restructuring routes to make timed transfers with NJ Transit bus and rail services. Ridership on the shuttles has grown considerably in the past couple years. From 2007 to 2008, ridership on daily shuttle rides rose from 443 to 968, a 118 percent increase, while on the MCAT paratransit services, daily ridership rose 21 percent in the same period, to 1,657 riders. Community shuttles carried 9.55 passengers per hour in 2008, compared to MCAT's 5.5 passengers per hour. In 2008, the shuttles carried a total of 202,125 one-way passenger trips. Following is a summary of ridership on the three routes that serve Easton Avenue.[14]

[13] Yvonne Manfra, Phone interview 7/16/2010.

[14] MCAT data provided by Steven Fittante, Executive Director of the Middlesex County Department of Transportation. Phone interview October 20, 2009.

Figure 12: Middlesex County Transit Total Monthly Ridership, 2009

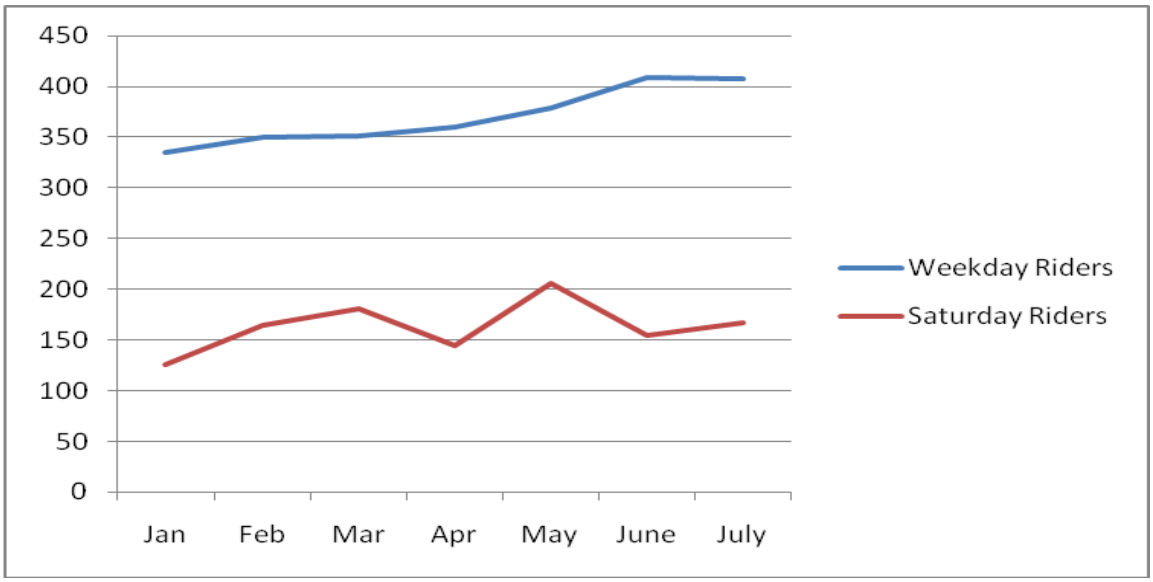


Source: Middlesex County Department of Transportation

BrunsQuick Jersey Avenue

This route has the highest ridership of the three shuttles. The route runs along Albany Street and along Jersey Avenue at half-hour intervals, accessing the New Brunswick rail station, the Robert Wood Johnson Hospital, One-Stop Center, Aldi's, the Jersey Avenue rail station, NJ Veterans Affairs, and county social services. Of the nearly 60,000 people who rode from January to July 2009, 98 percent were members of the general public. On average, 370 people rode this route each weekday, and 163 rode on Saturdays, as shown in Figure 1.

Figure 13: BrunsQuick Jersey Avenue Daily Ridership

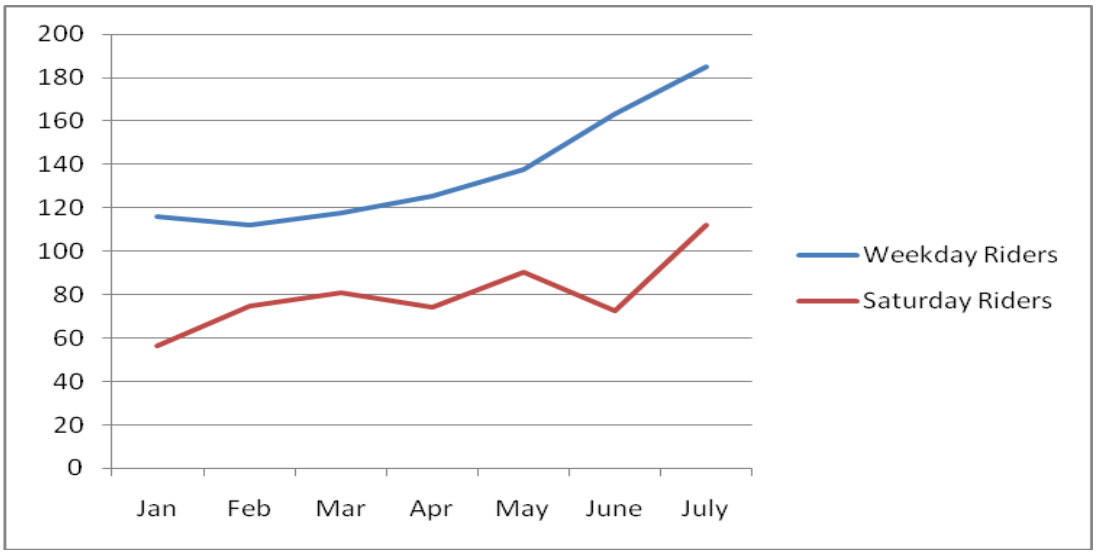


Source: Middlesex County Department of Transportation

BrunsQuick Commercial Avenue

This route carried 22,798 passengers from January to July 2009, of which 15 percent were older adults or persons with disabilities. The route runs every half hour and travels from the New Brunswick rail station along Nielson and New Streets to Elijah's Promise, then out to St. Mary's Apartments and Jack Pincus Apartments. This route carried, on an average weekday, 137 riders, and 80 riders on Saturdays (see Figure 14).

Figure 14: BrunsQuick Commercial Avenue Daily Ridership

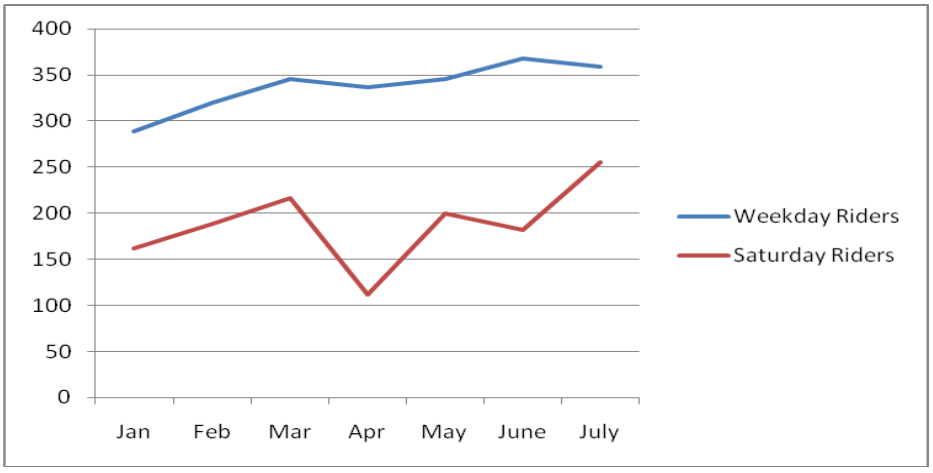


Source: Middlesex County Department of Transportation

New Brunswick Jamesburg 8A

This route runs from the New Brunswick rail station to Walmart, the North Brunswick Shopping Center, Veterans Memorial Park, Lake Street Apartments, Rossmoor, and into Cranbury. Two runs per day, one in the morning and one in the evening, run out to Perth Amboy. This route has similar ridership levels as BrunsQuick Jersey Avenue, with 338 average weekday riders and 188 average Saturday riders. Eighty-eight percent of riders are members of the general public.

Figure 15: 8A Shuttle Daily Ridership

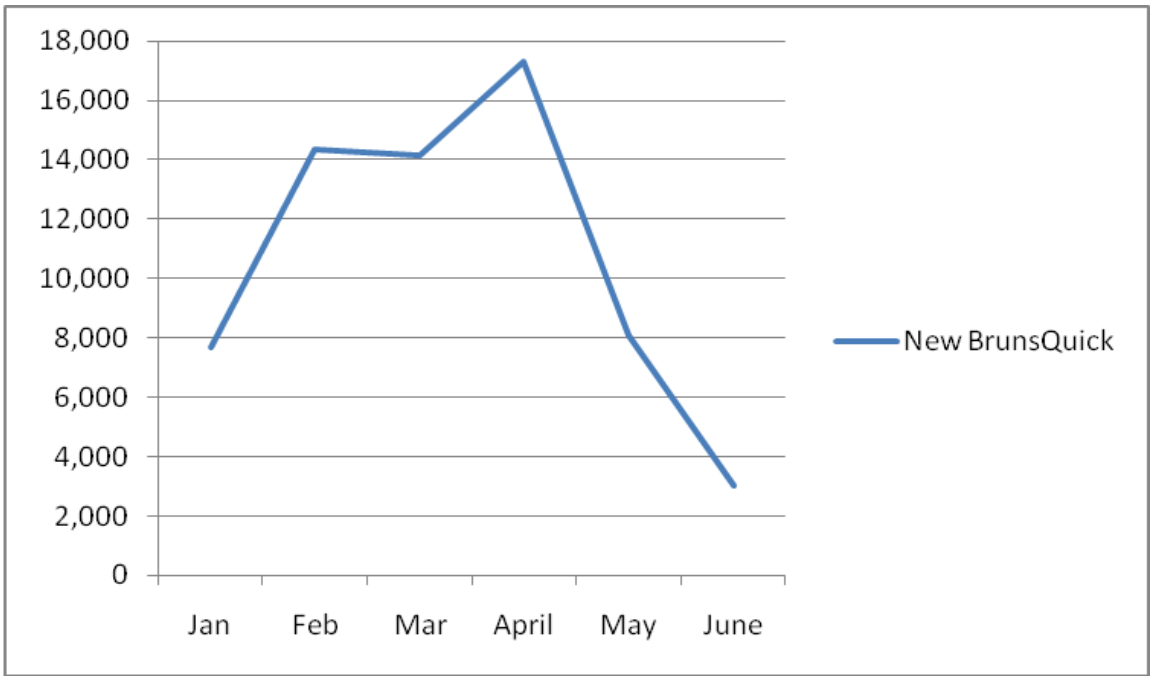


Source: Middlesex County Department of Transportation

Rutgers University

A shuttle operated by Rutgers University, the New BrunsQuick Shuttle, runs along part of Easton Avenue in the study area. Service is provided on two 16-passenger minibuses and is available to Rutgers commuters living in New Brunswick. Shuttle service begins at 6 AM and runs every 12 to15 minutes until 9:30 PM, after which shuttles run every half hour until 1:45 AM. The route provides transportation to the College Avenue campus and connects into the main campus bus system. New BrunsQuick travels from the train station up College Avenue, through Buccleuch Park, and down Central and Hamilton to Somerset. From July 2008 through June 2009, the New BrunsQuick carried 112,615 passengers; in comparison, the highest ridership route carried 1.7 million riders. The average yearly ridership across all routes was 556,000. Unlike some of the other campus shuttles, the New BrunsQuick runs year round. Figure shows monthly ridership on the shuttle for the first half of 2009. On average, the route carried an average of 513 daily riders.

Figure 16: Rutgers Shuttle Monthly Ridership

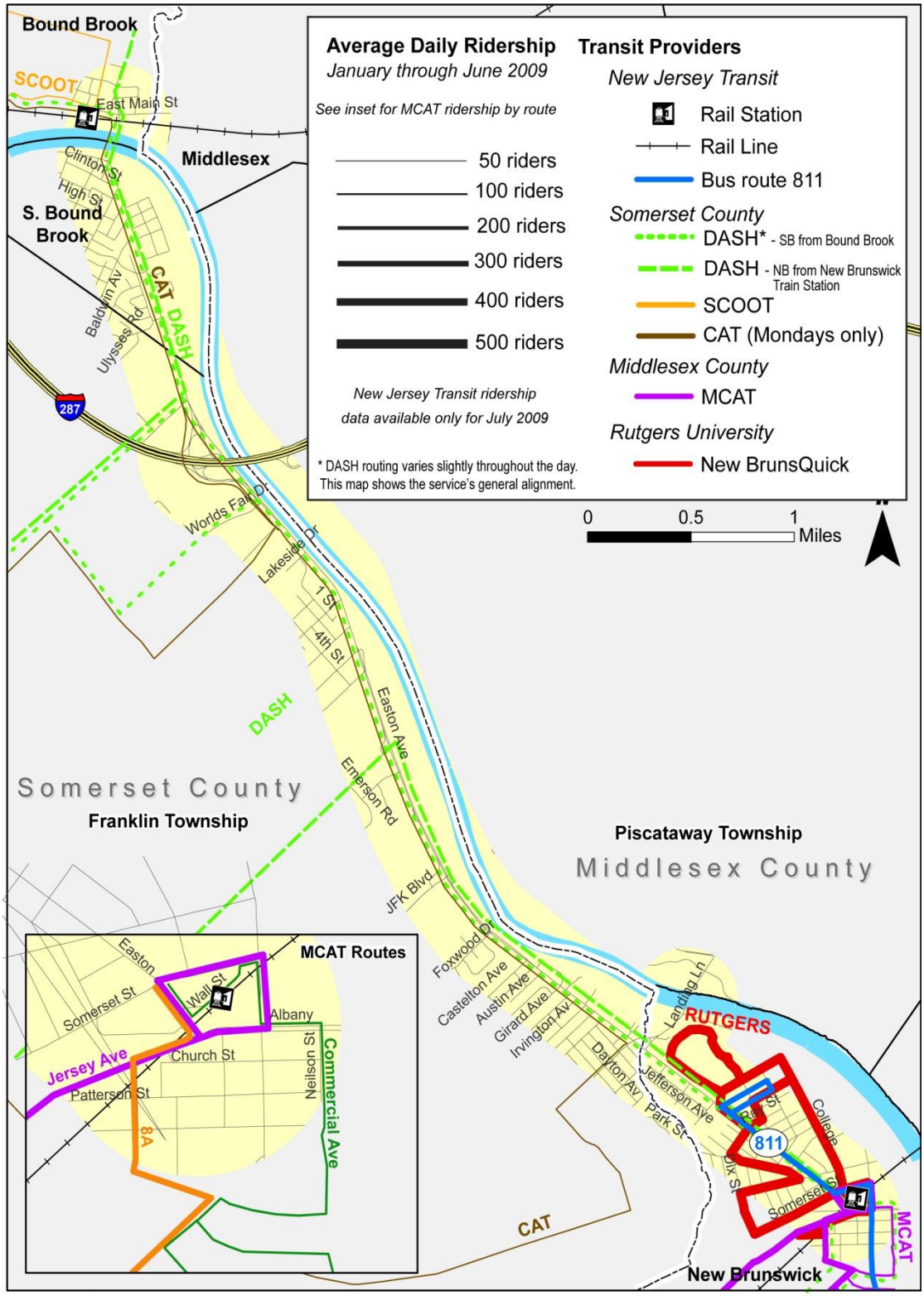


Source: Rutgers University Department of Transportation Services

Ridership Comparison

Figure 17 compares average daily ridership among all providers.

Figure 17: Easton Avenue Bus Services, Comparison of Average Daily Ridership



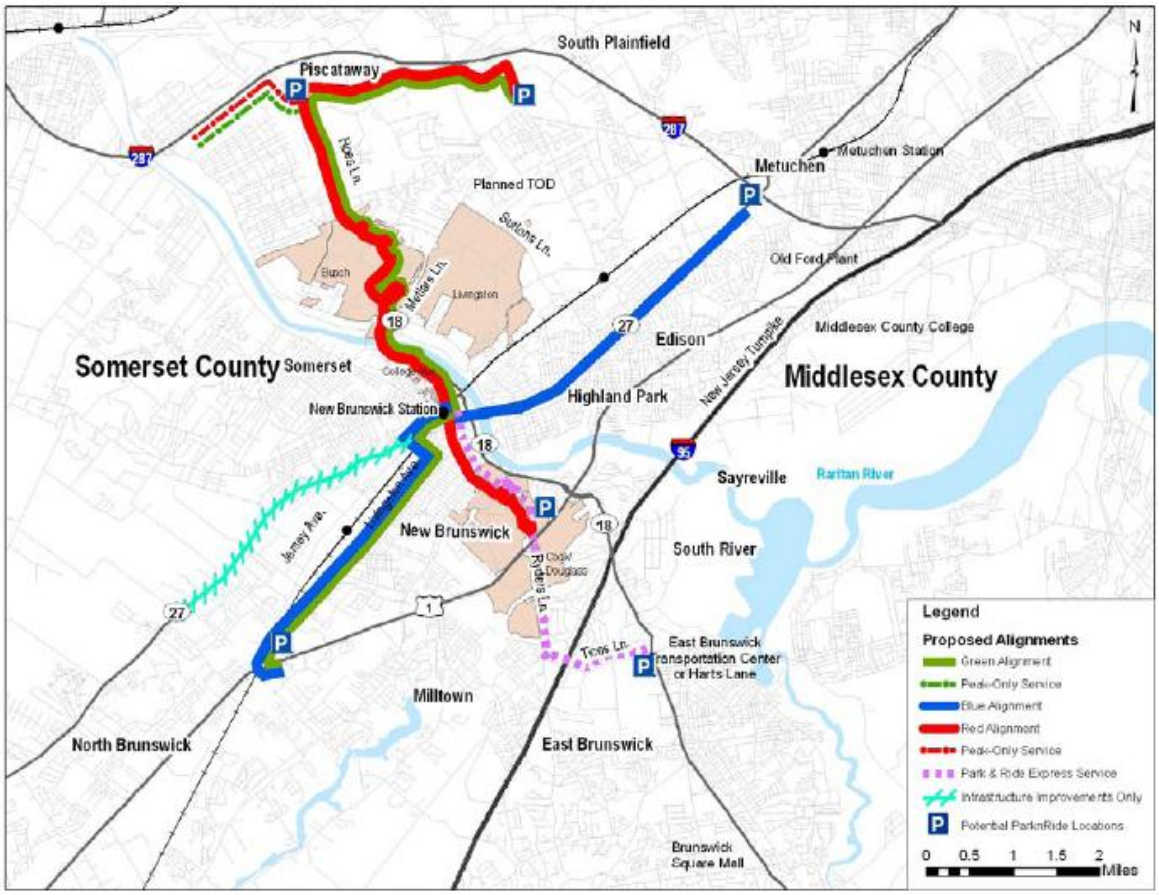
Route 1 Regional Growth Strategy

The New Jersey Department of Transportation completed the *Route 1 Regional Growth Strategy* (Final Report, September 2010) which researched growth in the Route 1 region, and recommended transportation and land use strategies to accommodate this growth. With a common objective to the Easton Avenue/Main Street Corridor Plan, the *Route 1 Regional Growth Strategy* specified recommendations consistent with those found in this document. Specifically, the report identifies about 40 locations for potential mixed-use development centers to facilitate the creation of transit-oriented infill development. In the Easton Avenue corridor, these locations include an Urban Center in New Brunswick and a Town Center at Easton Avenue and I-287, both locations identified in this study for Transportation Management Districts. (Additional Easton Avenue/Main Street TMD's include St. Peter's Hospital, South Bound Brook, and Bound Brook, which would further support the two identified in the Route 1 Regional Growth Strategy. The Strategy also recommends BRT feeder service along Easton Avenue, which is consistent with the increased DASH service recommended in the Easton Avenue/Main Street Corridor Plan.

BRT Study

New Jersey Transit and the North Jersey Transportation Planning Authority have completed initial analysis for the *Greater New Brunswick Area Bus Rapid Transit Study*, with the Phase I report published in May 2008. The study is examining potential BRT service on Routes 18 or 27, which intersect in close proximity to the New Brunswick rail station. A 2001 analysis of potential LRT (light rapid transit) or BRT on Route 18 concluded that such a service would attract significant ridership, mostly from Rutgers University, while Route 27 would link nearby residential and commercial areas with the rail station and another proposed BRT on Route 1 to the south. The study is also considering how BRT may add new strains onto the New Brunswick rail station, which already suffers from congestion issues due to the nexus of pedestrian flows, intercity buses, and NJT buses and drop-offs. Figure 18 presents the three BRT alignments under evaluation, and highlights the proximity of Easton Avenue which forms part of the proposed Red and Green Line routes and intersects with the proposed Blue Line route.

Figure 18: BRT Alignments under Evaluation



Source: Greater New Brunswick Area Bus Rapid Transit Study-Phase I

The BRT service would have stops spaced every .4 miles, and would be scheduled at 10 to15 minute headways from 6 AM to 11 PM on weekdays, with shorter hours on the weekend. The projected weekday ridership in-season (meaning during the Rutgers academic year) is projected to range from 1,400 on the Blue alignment to 3,300 on the Red alignment at the low end. At the high end, the Green line might see 4,500 daily boardings. Productivity during peak season should range from 40 to48 riders per vehicle-hour on the three alignments.

NJT and NJTPA are moving forward with forecasts and demand estimates for the study. A portion of the BRT may end up running on Easton Avenue, depending on how forecasts play out. NJT is currently completing this forecasting work .[15]

STRATEGIES

The following strategies detail ways of improving transit service on Easton Avenue.

[15] Per Tom Marchwinski of New Jersey Transit, e-mail message November 9, 2009.

Improve DASH service

DASH is the only transit service that covers most of Easton Avenue. Currently the service operates during peak hours at approximately 60-minute headways. The route continually travels back and forth between Bound Brook and New Brunswick, bringing local residents to the New Brunswick train station and bringing employees arriving at the station to Davidson Avenue. An average round trip time is approximately 80 minutes, and the driver thus runs 2.5 round trips per shift. Driver #2 starts in Bound Brook, runs south to Davidson Avenue and New Brunswick, back to Davidson Avenue, north to Bound Brook, then once again to Davidson Avenue. Between the two drivers, each vehicle runs approximately 87 total revenue miles per day over 7.5 hours of revenue service.

The County operates DASH using two vehicles: a Bluebird scheduled for replacement in two years and a Millennium scheduled for replacement in seven years. Both are full-size transit buses. The last transit bus purchased cost $325,000. Vehicles currently are in revenue service for 7.5 hours per day and have a mileage rate of 6 miles to the gallon. The Easton Avenue corridor, end to end, is approximately 6.6 miles long. An average trip from Bound Brook to New Brunswick, including service along Davidson Avenue and Livingston Street, measures 11 miles. The County pays $8,000-$10,000 annually for maintenance of the two vehicles (averaged out to $4,500 per vehicle in the subsequent cost analysis). Neither vehicle can operate a significant amount of additional service without wearing down useful life and requiring replacement sooner than currently anticipated. Drivers are paid $42,000 per year and are currently scheduled for (and paid for) 8-hour days split into two shifts. Factoring in benefits, which adds on a cost of 40 percent, drivers cost the county $58,800 per year. Administrative costs from the county end are minimal.[16]

The following describes service proposals for DASH and operating requirements needed to implement the proposals. Transit service proposals are described in priority order; costs of each successive proposal for Strategies A to D are cumulative.

DASH Strategy A: Extend service hours to 6AM to 8PM

Given the combination of inbound work trips throughout the day to Davidson Avenue's hotels and local residential demand, all-day service would improve options for employees who commute during typical business hours and would also give residents an option for local travel during the day. This additional service would also provide a direct benefit to St. Peters Hospital, offering staff and patients an all day connection to New Brunswick train station.

To maintain one-hour headways, the County would have to purchase two more vehicles and hire two drivers. A summary of operating changes is presented in Table 7 and the additional cost of running all-day service is presented in Table 8. After the capital purchase of $650,000 (which is anticipated could be 80 percent funded by federal sources), the annual operating cost would be $144,930, for a total first year cost of $274,930.

[16] Operating statistics per Yvonne Manfra and Steve Holzinger, 2010.

Table 7: Proposed Service Changes to DASH Operations (Strategy A)

Revenue Hours per day		Vehicles		Drivers		Revenue Miles per day	
Current	Proposed	Current	Proposed	Current	Proposed	Current	Proposed
15	28	2	4	2	4	174	325

Table 8: Proposed Cost Changes to DASH Operations (Strategy A)

Cost Type	Item	Cost	Quantity	Annual Total
Capital	Vehicle Purchase	$325,000	2	$650,000
Operations	Annual Vehicle Maintenance	$4,500	2	$9,000
	Drivers	$58,800	2	$117,600
	Fuel	$2.82/gallon*	25/day**	$18,330
Total Cost				**$794,930**
Total Cost After Anticipated Federal Contribution				**$274,930**

** Diesel cost source: AAA (http://www.fuelgaugereport.com/NJavg.asp)*

*** 150 additional revenue miles requires 25 gallons of diesel per day over 260 weekdays.*

DASH Strategy B: Increase service during peak hours

During peak hours, operate at 30-minute headways, and provide 60-minute headway deviation service during off-peak hours. This would require hiring another driver and buying another vehicle in addition to the purchases under Strategy A. A summary of operating changes is presented in Table 9 and the additional cost of running all-day service is presented in Table 10. After the capital purchase of $975,000 (which is anticipated could be 80 percent funded by federal sources), the annual operating cost would be $219,228, for a total first year cost of $414,228. Adding bike racks to DASH service so the service can be marketed as Rack and Roll would help promote trips that include biking as part of a trip.
The cost of operating the service would total just under $175,000 annually.

Table 9: Proposed Service Changes to DASH Operations (Strategy B)

Revenue Hours per day		Vehicles		Drivers		Revenue Miles per day	
Current	Proposed	Current	Proposed	Current	Proposed	Current	Proposed
15	35.5	2	5	2	5	174	412

Table 10: Proposed Cost Changes to DASH Operations (Strategy B)

Cost Type	Item	Cost	Quantity	Annual Total
Capital	Vehicle Purchase	$325,000	3	$975,000
Operations	Annual Vehicle Maintenance	$4,500	3	$13,500
	Drivers	$58,800	3	$176,400
	Fuel	$2.82/gallon	40/day*	$29,328
Total Cost				**$1,194,228**

** 238 additional revenue miles requires 40 gallons of diesel per day over 260 weekdays*

DASH Strategy C: Provide Saturday service

DASH provides commuter service to three hotels that operate seven days per week. DASH also provides some local circulation, and could be used by residents going on errands. To provide the best service possible on Saturday, it would be beneficial to investigate specific weekend commuting times and desire for bus service. According to the County's operations staff, Saturday service might be feasible without buying a new vehicle or significantly altering the replacement schedule. Each bus could be run two additional days per month, on alternating Saturdays. The County would use a regular driver to provide Saturday service and would pay overtime, for an hourly rate of $33 per hour. The overhead costs of opening offices on Saturday would total $37 per hour. The route would run 7.5 hours of revenue service, similar to current driver shifts. The shift could be a split shift during peak times or a 9:00 AM-4:30 PM type service, depending on feedback from the hotels. Table 11 shows the additional annual cost to the County of running Saturday service ($32,204). For the maintenance cost, the total annual cost of $4,500 per vehicle was divided by 260 weekdays to net an average cost of maintenance per day of use. (TMA can approach hotels on Davidson Avenue to contribute funding to defray the costs of operating Saturday service.

Table 11: Proposed Cost Changes to DASH Operations (Strategy C)

Item	Cost	Quantity	Annual Total
Fuel	$2.82/gallon	15/day	$2,200
Driver	$33/hour	8 hours	$13,728
Overhead	$37 /hour	8 hours	$15,392
Maintenance	$17/day	1 Vehicle	$884
Total Cost			$32,204

DASH Strategy D: Fixed headway scheduling (evaluated but not recommended, as described below)

Fixed or "clockface" scheduling means timing a route to serve the major destinations at the top, half, or quarter of the hour. This makes the schedule easier for people to remember. For instance, it is easier to remember that the bus leaves New Brunswick station at the top of every hour, and arrives at MetLife at half past. DASH's current service is timed to meet inbound and outbound trains at New Brunswick station. The County has not found the Bound Brook train station to be a place requiring timed transfers. The current transfer times at New Brunswick are shown in Table 12.

Table 12: Current DASH/New Brunswick Station Transfer Times

	New Brunswick Northbound	New Brunswick Southbound	DASH
AM service	6:58*	6:58*	7:03
	8:22*	8:17*	8:25
	9:03	8:57	9:10
PM service	**DASH**	**New Brunswick Northbound**	**New Brunswick Southbound**
	4:01	4:10*	4:03*
	4:57	5:01*	5:00*
	5:50	6:16	6:05
	6:25	6:43	6:31*

**Indicates Timed Transfer - 10 minutes or less between NEC and DASH arrival/departure*

Clockface scheduling for DASH would be difficult, as the end to end times from train station to train station vary by run. For example, the 6:17 AM bus run leaving Bound Brook gets to New Brunswick in 46 minutes, while the 7:15 AM departure takes 70 minutes, since this run travels to Davidson Avenue before heading down to New Brunswick. Table 13 shows current DASH travel times between the two train stations in the morning hours.

Since DASH is timed for New Brunswick train transfers, unless there are different train times that could serve commuters, the clockface scheduling is not feasible. Strategy 1d is not recommended at this time, though as the frequency of DASH and other area transit services increase, clockface scheduling should be revisited for further evaluation.

Table 13: Current DASH AM Travel Times Between New Brunswick and Bound Brook Train Stations

Bound Brook	New Brunswick	Trip Time
6:17	7:03	46 minutes
7:15	8:25	70 minutes
8:11	9:10	59 minutes
9:19	1/2 trip	27 minutes
New Brunswick	**Bound Brook**	**Trip Time**
7:03	8:11	68 minutes
8:25	9:19	44 minutes
9:10	1/2 trip	28 minutes

Bus Stop Construction, Renovation, and Amenities

While bus operations may be the heart of a transit system, bus stops that are easy to find and use are critical to passengers boarding and alighting. Adequate pedestrian accessibility to and enhanced passenger amenities at transit stops and stations are critical to attracting people to use transit. For the public to perceive Easton Avenue's transit services as a first-class transportation operation, there must be facilities that provide customers with protection from inclement weather and information about service.

Places with land uses that support transit or intersections where transfer activity takes place should be given first priority for installation of bus stop amenities; these locations are illustrated in Figure 19. Priority locations should have the following amenities:

- Signage – Install a highly visible sign pole with information on the routes serving the stop. Improved signage is critical at terminal points between the New Brunswick Train Station and the Bound Brook Train Station, as well as at significant mid-route stops including St. Peter's Hospital.
- Map, schedule, and website – Post the system map and schedule, highlighting the customer's current location, as well as the website where customers can find additional information.
- Shelters – These provide protection from wind and rain, and may also be used for advertising (see Strategy 5). In addition, bus stops adjoining the New Brunswick train Station need to be expanded with improved passenger amenities, which are being addressed in New Jersey Transit's station reconstruction project.
- Lighting – Install pedestrian-scaled lighting to provide a feeling of safety and security to early morning and night riders.
- Bench – This provides comfort for those waiting for the bus, and is especially helpful to older adult riders.
- Trash can – Cleanliness is an important aspect of making a bus stop feel secure and safe; providing a trash can reduces litter and improves stop appearance.
- Concrete pad with clear access and crosswalks – Patrons should be able to safely cross the intersection approaching the bus stop, and be provided with a level concrete pad free of obstructions for boarding and alighting.

A graphic of amenities for primary priority bus stops is shown in Figure 20.

Two more locations should be given second priority for installation of amenities. These two locations, Bristol Street and Washington Street, should be given the same amenities as the primary locations, minus the shelter.

NJ Transit installs bus shelters and concrete pads at no cost to the municipal or private sponsors. Once installed, the shelters become the property of the sponsor, who provides for maintenance and liability. In most cases, if a sponsor wants to remove or upgrade the shelter, NJ Transit will remove old shelters, but any additional changes are at the cost of the sponsor (in the case of Easton Avenue, most likely the two counties). Improved bus stops not only require capital investment, but also require on-going funding to maintain and ensure that all transit information displayed is accurate and up to date. Partnerships with either private sector advertising firms and/or locally based entities such as TMA's, chambers of commerce, institutional entities, businesses, residents, or other community groups may be able to provide some resources to address this need. There are also some recurring operating costs to maintaining transit information on local websites and providing information to outside entities like Google Transit (see recommendations, below).

Figure 19: Proposed Priority Bus Stop Locations

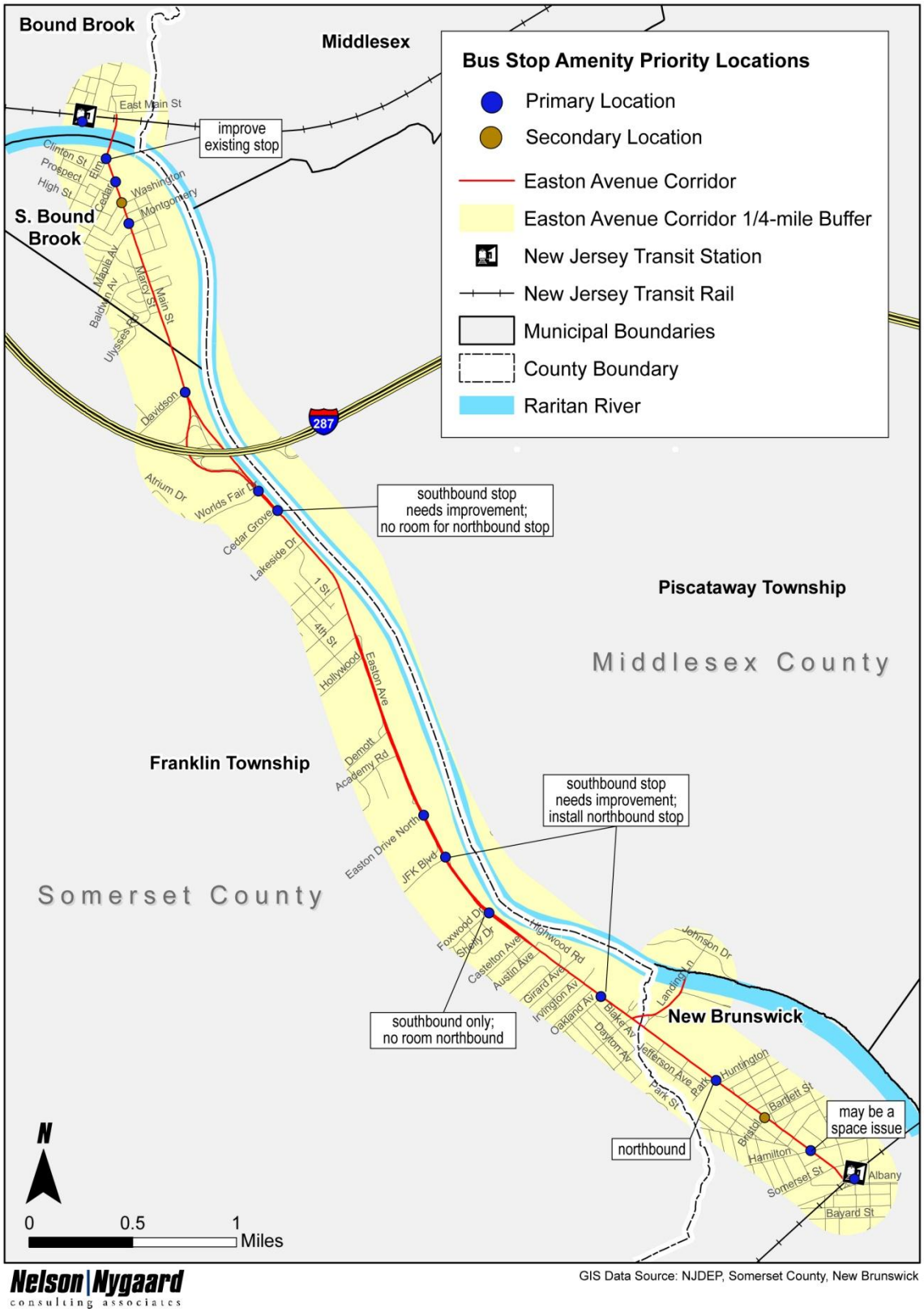
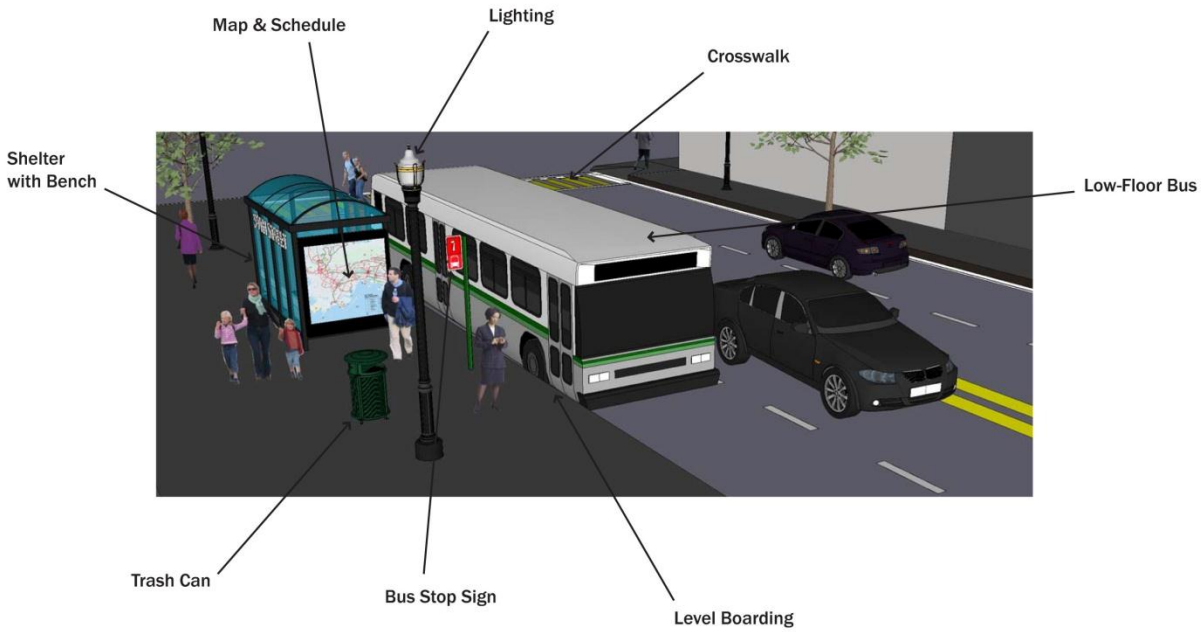


Figure 20: Sample Priority Bus Stop



Extend DASH service

Residents and stakeholders have expressed interest in extending DASH to two destinations several miles west of Bound Brook – downtown Somerville and Bridgewater Commons Mall. These destinations would be served during off-peak hours, as the mall does not open until 10 AM. A potential routing for access to these two new destinations is shown in Figure 21. The stop in Somerville is at the intersection of Main and Davenport Streets, the heart of the borough's commercial district.

An additional proposed extension of the DASH service is the connection of the Franklin and Bound Brook satellite campuses of Raritan Valley Community College with the main campus in Branchburg Township. This extension would add more than 30 minutes of travel time to an already lengthy route and is not anticipated to significantly improve travel conditions on Easton Avenue. The proposal is therefore not recommended as part of the Easton Avenue Study, but may be appropriate for evaluation by the communities and the College.

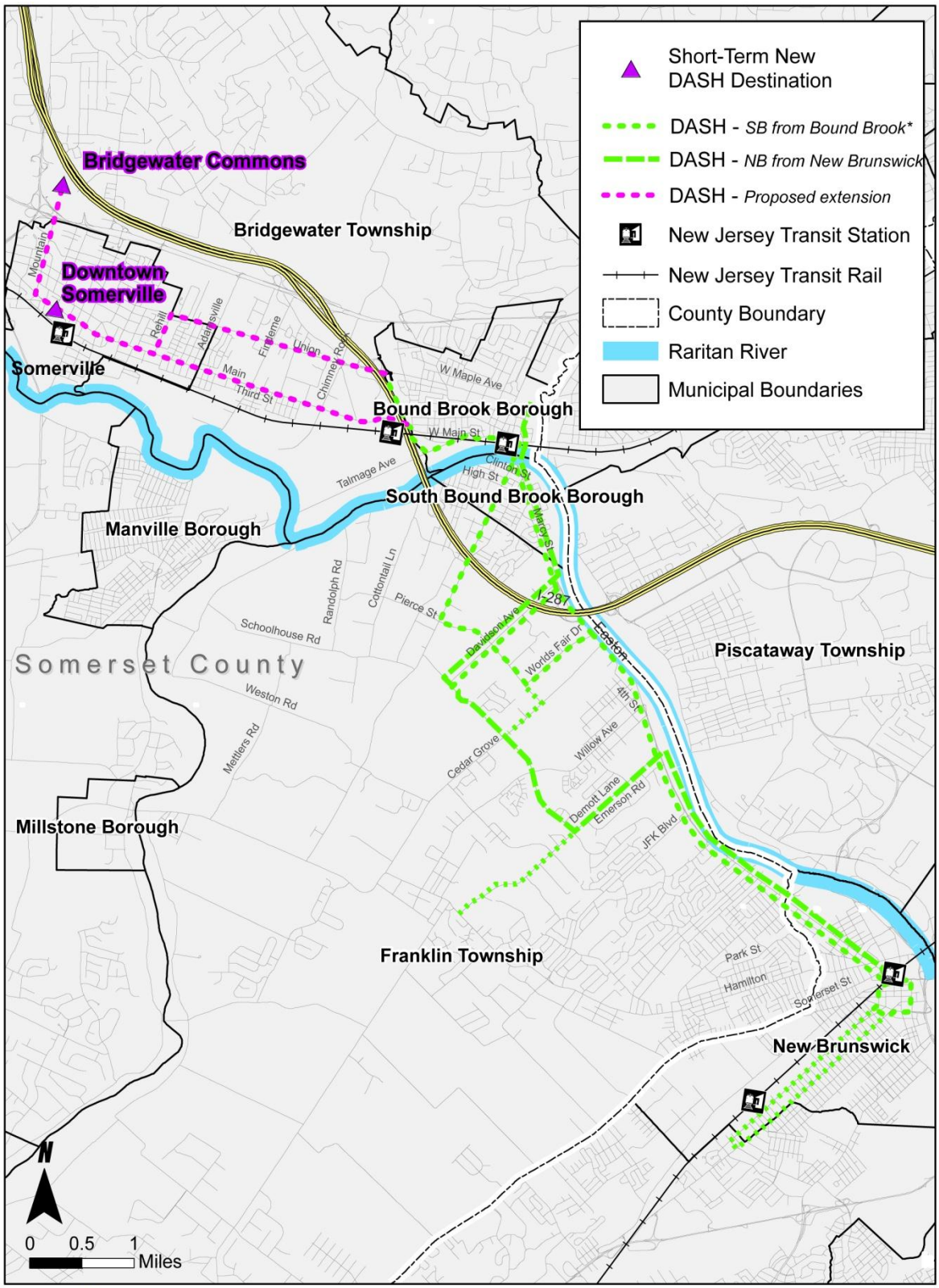
The routing to these two new destinations would begin at the Crowne Plaza Hotel, the last stop on the current morning service. The bus would then travel north to Bound Brook and west on Main Street to Somerville, then north on Mountain Avenue to Bridgewater Commons. On the way back, the route could follow Main Street again, or could travel north on Rehill Avenue past the Somerset Medical Center and east on Union Avenue. This proposed addition to the DASH route measures approximately 12-13 miles and would take 28-31 minutes by car. A time factor of 10 percent is a reasonable estimate for adding in time for slower bus speeds and stopping for passengers, thus the extension would take 31-34

minutes. Given that the average round trip time is currently 1 hour and 20 minutes, adding in these two destinations would round up the trip time to two hours. With two drivers, this equates to 60-minute headways.

One thing to note about DASH is that it serves different stops throughout the day. Some stops, like 505 Demott Lane (the Franklin Township municipal complex) are only served once per day, and only in the morning. Thus there is some room to add in more stops to round out the two-hour route. Given the approximately six hours midday for service (10 AM-4 PM), that allows for three round trips per vehicle or six opportunities for people to get to and from the mall. Though limited to six hours per day, this extension is recommended as a starter service to gauge long-term demand.

The public also requested the project team to consider three locations as the subject of a future planning study: Quakerbridge Mall in Lawrence, Woodbridge Center in Woodbridge, and downtown Bedminster. These locations might be served by a DASH extension, or more likely via a transfer to another bus service. It is recommended that these additional extensions be considered longer-term options, and that they be evaluated after the extension to downtown Somerville and Bridgewater Commons Mall is implemented.

Figure 21: Proposed Short-Term DASH Extension



Improve public information

Many times people simply do not know about available transit service – where the bus runs, how to ride, or bus schedules. Providing information online is an excellent way of increasing transit's profile and attracting riders. All information should be posted in English and Spanish. This strategy involves three sub-strategies.

Provide transit information via county or municipal Web sites

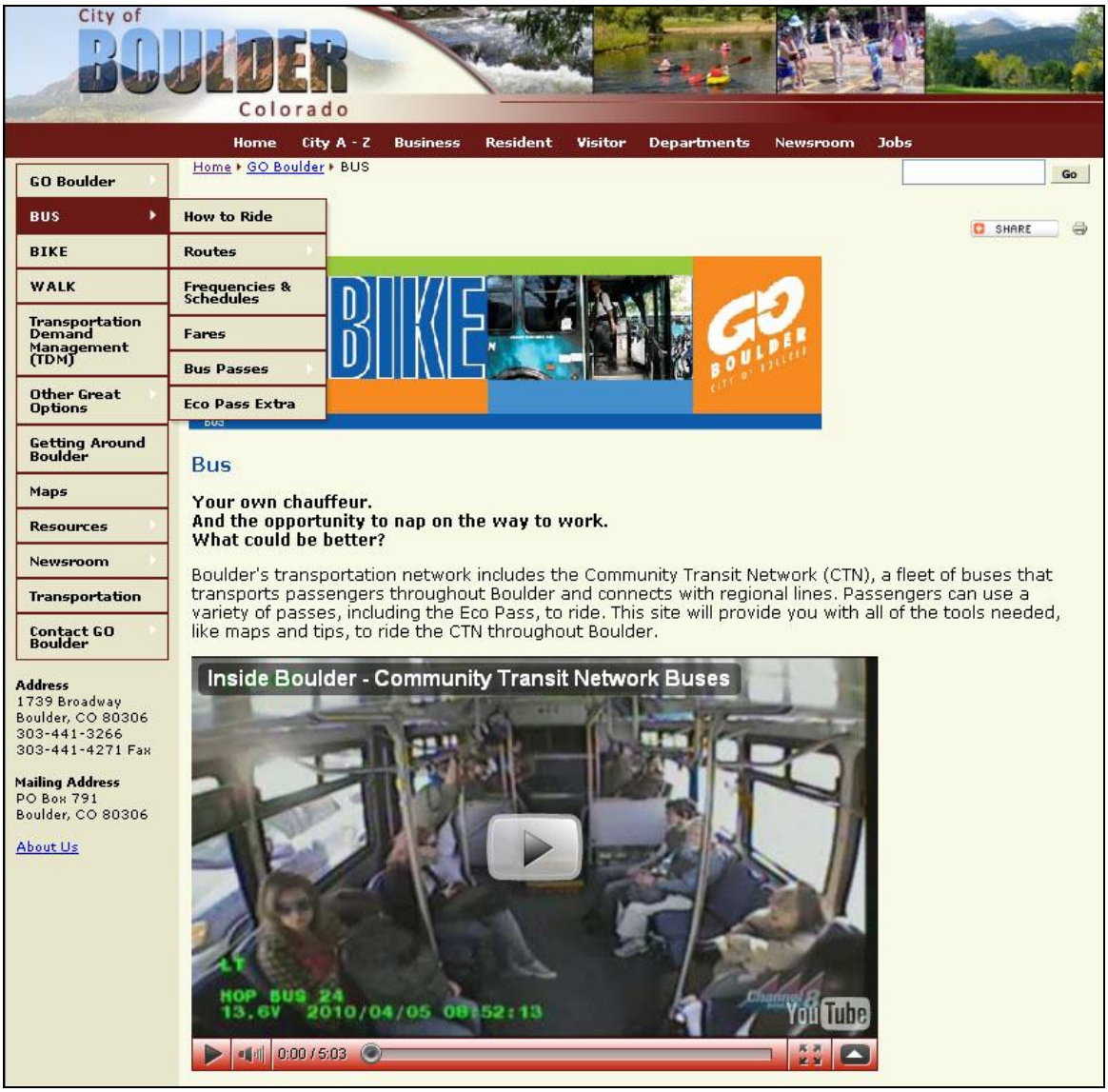
Many small cities have done an excellent job of placing transportation information on their Web sites. In the past, transit information might have been linked under the "Public Works" section or under "Departments" then "Transportation." A better way of presenting the information is to place it under the "Living Here" or "Working Here" section, as people are more likely to browse that area.

A great example of a city providing online information is the Boulder, CO Web site. From the main city Web site, by clicking on "Resident" there is a link under the sections "Living in Boulder" and "Working in Boulder" to "GO Boulder (transportation options)."[17] The site contains information on all forms of transportation in Boulder, including walking and bicycling. The city provides a section on Transportation Demand Management programs for employees and employers, as well as a trip planner. GO Boulder is a comprehensive site devoted to explaining all the options available and strongly emphasizes non-driving as environmentally-friendly.

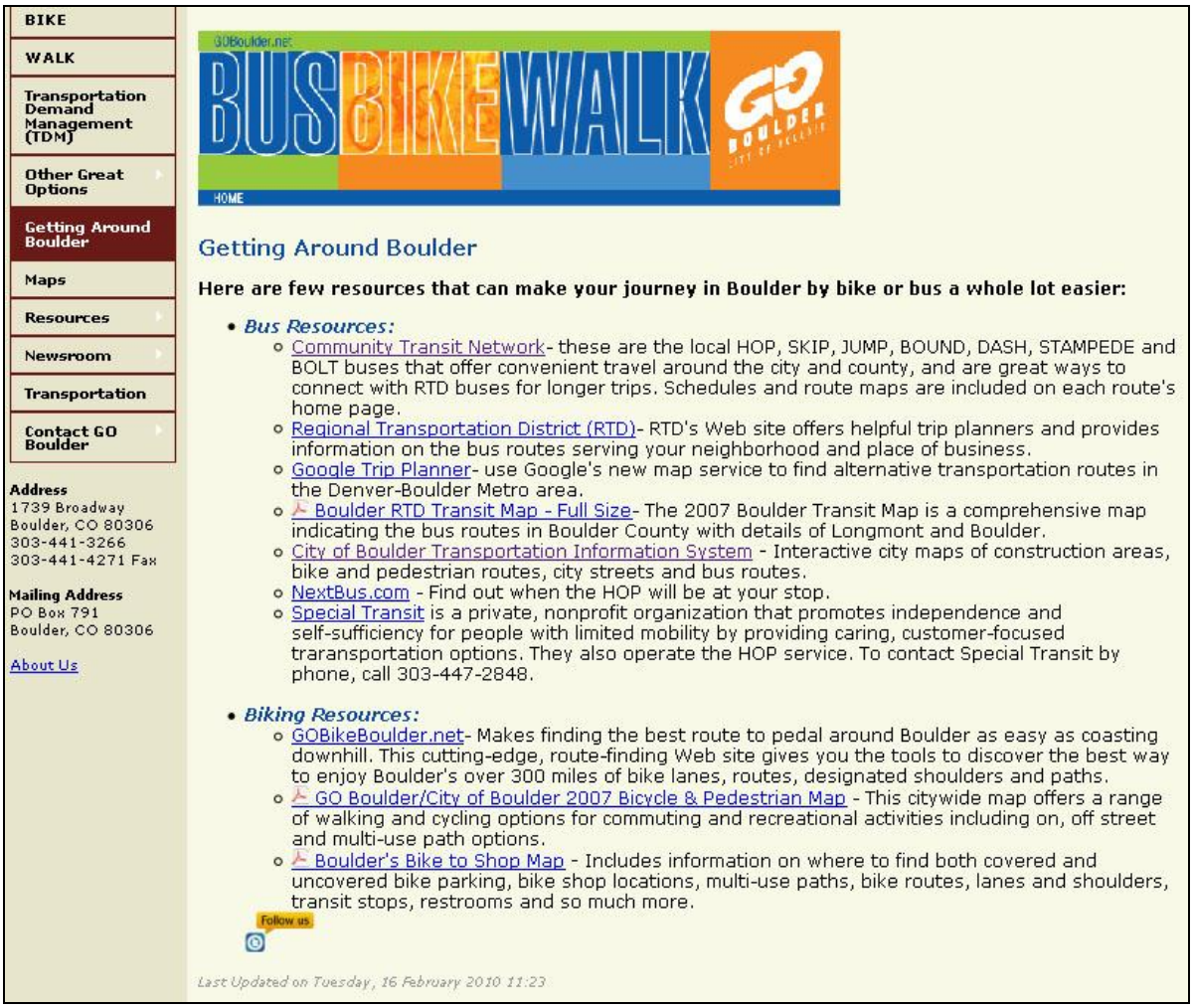
The main GO Boulder web page integrates all modes of transportation under one slogan.

[17] The GO Boulder Web site can be viewed at http://www.bouldercolorado.gov/index.php?option=com_content&view=article&id=8774&Itemid=2973

The “BUS” section of GO Boulder contains a wealth of information on routes, schedules, fares, and passes. The site also contains a short video of an interview with a Boulder transportation planner produced by the local television network. The video explains how the service was created and funded, how to ride, and destinations served. Use of technologies like YouTube lends the service a fresh, appealing feel. This page contains information on both County-run routes as well as routes run by the Regional Transportation District. A map of all available bus services, along with destinations, is provided on the Web site here: http://www.bouldercolorado.gov/files/GOBoulder/maps/transit_rack_map.pdf



The “BUS“ section is inviting and uses video to engage site visitors.



The "Getting Around Boulder" section contains links to other resources people might find useful.

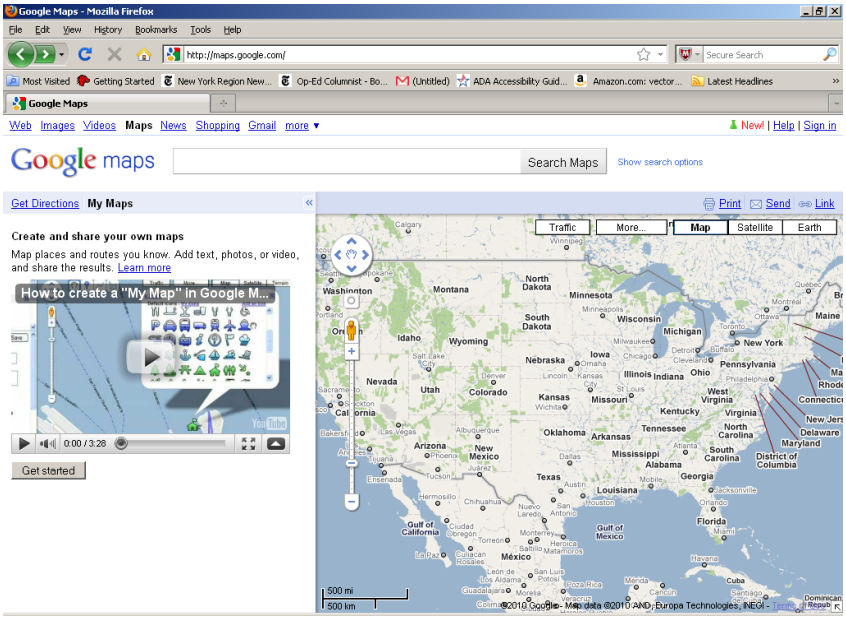
Bus information available via Google Maps

Google Maps has become an extremely popular way for people to map trips, and as of 2006 Google began providing transit information to users in addition to routes by car or foot. Since then, transit agencies worldwide have coded their routes and stops into Google Maps via Google Transit. The biggest advantage of Google Transit is it allows people to see bus stops within a geographic map that also contains road and destination information. Often times transit agency maps are either not to scale or show only the roads that the bus travels on, making it difficult for people to understand how the route exists within the overall network. Another valuable aspect of Google Transit is that when the user puts in an origin and destination, the walk routes to and from the transit stop are also provided.

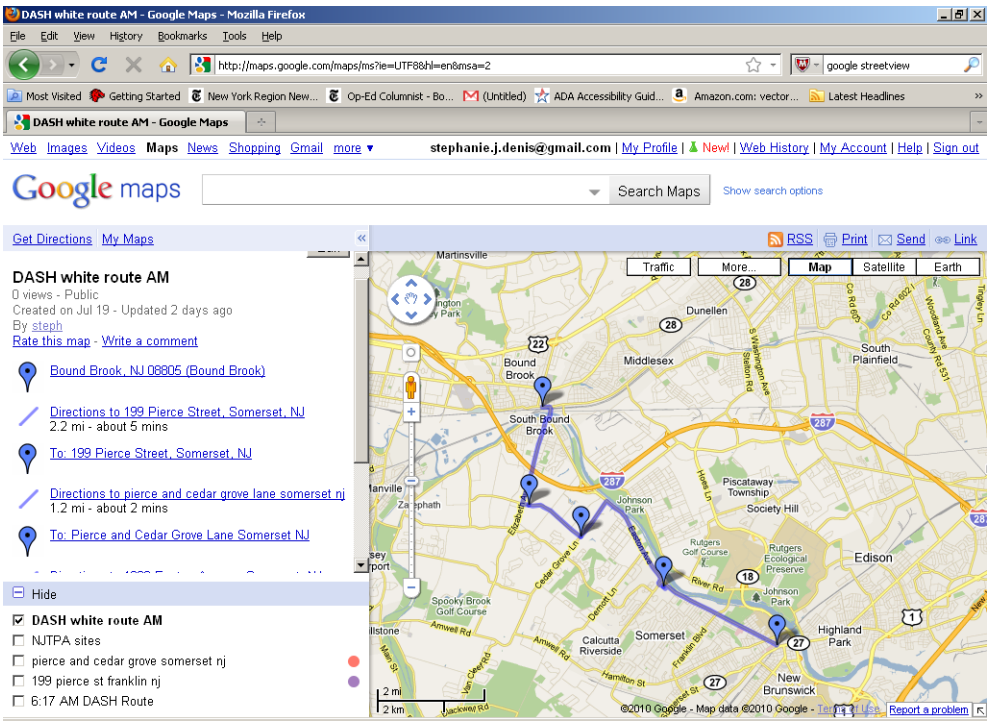
Middlesex County has submitted some of their bus routes for inclusion on Google Maps. Putting the remaining Somerset and Middlesex County routes into Google Transit is free; the only cost is staff time from the County end. (Google has detailed information about how to code transit data at its Web site: http://maps.google.com/help/maps/transit/partners/. As NJ Transit has already put its data into Google Transit, the counties may wish to work with NJT's web team for assistance. It will be important to

include transfer information between services, such as between NJT rail service and DASH and link to the Ridewise web site.

In the meantime, another way the counties can provide Google information is by creating a route map in Google's My Maps section.



All that is required is a GMail account. Once the map is created, the user can save it to "My Maps." For example, a map was created by the project team to show a DASH route for a sample passenger, as shown below.



A link to the map can be created by clicking on "Link" on the far right side of the page. This link could then be posted on a County Web site. Google Maps links tend to be very long; the link can be shortened with the Tiny URL tool, a free service located here: http://tiny.cc/.

Tiny URL will shorten the Google Map from:
http://maps.google.com/maps/ms?hl=en&ie=UTF8&msa=0&msid=115588031310663130204.00048bc0682ff98f5ccef&ll=40.540287,-74.481983&spn=0.12654,0.220757&z=12

to this: http://tiny.cc/soxwj

While creating a map in My Maps does not allow a user to plan a trip with Google, it does allow them to see the route within the street network and destinations served by the route.

Signage

Signage should be provided at all bus stops and rail stations (see the bus stop recommendations above). In cases where no shelters or benches are present, a sign is a key indicator of the presence of a bus stop. At minimum, the sign should state the bus route and provider, if multiple providers exist. If possible, bus signs with schedule and map wraps should be installed. At train stations, information on routes and schedules should also be paired with wayfinding signage to nearby destinations. At locations with multiple operators (including New Brunswick rail station and St. Peter's Hospital), the different transit services with schedules and maps should be clearly displayed.

Shelter Funding

Shelters play an enormous part in making bus service more comfortable, yet they can be an expensive investment. Depending on the size of the shelter, materials used, and roof type, costs range from $2,600 to nearly $15,000. This cost includes provision of a bench and backrest.[18] Creative partnerships and advertising can help offset the cost of shelter purchase and maintenance.

Businesses might be willing to take on part or all of the cost of shelters as a marketing strategy and a way of giving back to the community. For example, an improved bus shelter at JFK Boulevard might be something that the shopping center owner would be willing to pay for, as it would be a means of attracting customers.

Advertising on vehicles, schedules, maps, and shelters can generate significant financial or service support for a transit agency. While systems in larger cities have received direct monetary support, smaller systems have succeeded in bartering advertising space for commodities provided by the advertiser. For example, the counties might agree to place ads on bus shelters in exchange for the advertiser being responsible for shelter maintenance. This frees County employees from trash and graffiti removal, as the advertisers will want their ads to be free and clear of debris.

[18] Price quote provided by Handi Hut, shelter manufacturers based in Clifton, NJ, for 2010 rates.

Park & Ride

Park & Ride facilities offer the opportunity for drivers to park their cars in a location convenient to the regional roadway network, and transfer to a service that connects them directly to their destination. When effective, Park & Rides reduce vehicular volumes on high-volume roadways by collecting individual drivers into higher capacity transit vehicles.

Based on the high volume of single-occupancy vehicle trips during each peak hour along Easton Avenue, the study area has great potential for Park & Ride. In fact, the two-way travel patterns found within the study area provide a significant opportunity for the same Park & Ride to serve employees driving along Easton Avenue destined for downtown New Brunswick or Bound Brook, as well as residents driving out of the corridor or along I-287 destined for Newark or New York City. The enhanced DASH operating plan described above could provide direct, all day access between a Park & Ride facility near the I-287 interchange and both New Brunswick and Bound Brook. New Jersey Transit and Coach USA (or another private operator) could provide commute-based service to major regional destinations.

However, the additional transfer required by a Park & Ride service increases travel time. The only way to overcome this time-based disincentive is to either provide a quicker ride to the destination (such as with dedicated travel lanes) or a monetary incentive (making it less expensive to park at the Park & Ride than park at the destination). As discussed in the Roadway Strategies chapter, expansion of Easton Avenue to provide additional travel lanes (even for dedicated transit service) is not feasible, nor is rededication of existing lane space. Therefore, faster travel time for transit versus private vehicles is not an option.

The Transportation Demand Management Strategies chapter outlines a series of parking management strategies that would use price to encourage drivers to find alternative parking sites. By establishing a demand-based parking pricing system, drivers who are provided a less expensive option coupled with all day DASH service will be able to balance cost and access. Expanding the Ridewise Ticket Home program (commuters who choose not to drive alone to work are guaranteed a ride home if there is an emergency) to Park & Ride users will provide an additional protection, further encouraging drivers to limit their driving along Easton Avenue. A greater span of bus service operating hours, as well as bus frequency, would also serve to encourage use of a Park & Ride facility.

Ideally, Park & Ride facilities are located at existing, underutilized parking facilities. This provides the parking necessary without adding additional pavement or driveways, and limits capital costs. An important, low-cost opportunity worth exploring is space-share or space-lease arrangements with lot owners near points of access to key commute routes. Shopping centers are often an effective resource for this, as park and ride activity can fill parking spaces that otherwise remain empty during work hours and place potential new customers inside the shopping center complex in the evenings. Additional options include religious facilities (where demand peaks on weekends), as well as hotels and office complexes that have built the amount of parking required by the municipal code, but find themselves with excess space. Locations along Davidson Avenue, Worlds Fair Drive and Cedar Grove Lane offer several sites with underutilized parking facilities that are already served by DASH. Potential Park & Ride sites proximate to Easton Avenue and I-287, and where parking is underutilized, include:

Hotels
Comfort Inn and Suites
Crowne Plaza
Doubletree Hotel
Hampton Inn
Holiday Inn
Madison Suites Hotel
Quality Inn

Churches
Praise Presbyterian Church
Ukrainian Orthodox Church

Office Buildings/Exhibition Centers
224, 226, 265 Davidson Avenue
1, 2, 3-7 Worlds Fair Drive
Garden State Convention Center and Exhibit Center

In exchange for the use of spaces farthest away from the building (the spaces least used), property owners should be offered indemnification, assistance with maintenance (municipally-assisted snow removal or facility upkeep), and advertising.

CHAPTER 5: PEDESTRIAN AND BICYCLE STRATEGIES

EXISTING CONDITIONS

Pedestrian and Bicycle Activity

Traffic, pedestrian and bicycle counts were conducted along the Easton Avenue/Main Street corridor on September 29 and 30, and October 1, 6, 7 and 8, 2009. Counts took place from 7 to 9 AM and 4 to 6 PM.

Pedestrian Activity

The counts indicated a significant range in the volume of pedestrians at intersections along the corridor. Pedestrian volumes were highest in downtown New Brunswick and diminished along the Easton Avenue corridor heading north from the city, before increasing in South Bound Brook and Bound Brook. Presented below are highlights of count results along the corridor:

- **New Brunswick**: During the four-hour count period, 2,700 pedestrians crossed at the intersection of Easton Avenue and Albany Street, by far the highest volume recorded along the corridor. Pedestrian volumes were also high at Easton Avenue and Somerset Street (1,066 crossings) and Easton Avenue and Hamilton Street (545). The remaining intersections north of Hamilton had lower pedestrian volumes, although there were clusters of activity at the intersections adjacent to St. Peter's, with 50 pedestrian crossings at Easton Avenue and Park Boulevard, and at the intersection of Landing Lane and George Street, with 70 pedestrian crossings.
- **Franklin Township**: Intersections with the highest pedestrian activity include Easton Avenue and DeMott Lane, with 35 crossings, and Easton Avenue and Foxwood Drive, with 27. Pedestrian volumes were consistently lower on the east side of Easton Avenue than the west side. It is noted that sidewalk is absent on much of the east side. There was virtually no pedestrian activity recorded at the intersection of Easton Avenue and Davidson Avenue, which may reflect the lack of a pedestrian path from the south side of I-287 to the north side.
- **South Bound Brook:** The intersection of Main Street and Washington Street/Cherry Street in South Bound Brook had the highest recorded pedestrian activity, with 26 pedestrian crossings.
- **Bound Brook**: The intersection of Main Street and Hamilton Street saw highest activity with 170 pedestrian crossings.

Bicyclist Activity

Unlike pedestrian volume, the greatest amount of bicycle activity was seen on the north end of the study corridor. Bicycle volumes were consistently higher on the west side of the road than the east side. Following is a summary of activity:

- **New Brunswick**: In New Brunswick, the highest bicycle volumes were seen at Easton Avenue and Albany Street (52) followed by Easton Avenue and Somerset Street (43).

- **Franklin Township**: Bicyclist activity was lightest in Franklin Township. The highest volumes were seen at Unclaimed Freight Plaza and Easton Avenue, with 12 bicyclists recorded. Based on field views, many more bicyclists ride on the sidewalk or bike path than in the street.
- **South Bound Brook**: The intersection of Main Street and Washington Street/Cherry Street in South Bound Brook had 56 bicyclist crossings, second highest in the study area.
- **Bound Brook**: There were 101 bicyclists recorded at the intersection of Main Street and Hamilton Street, the highest total recorded in the study area.

The following table summarizes pedestrian and bicycle volumes for the four-hour periods:

Table 14: Pedestrian and Bicycle Volumes for Four-Hour Count

Intersection	Pedestrian Volume	Bicycle Volume
New Brunswick		
Easton Avenue and French Street/Albany Street	2,699	52
Easton Avenue and Somerset Street	1,066	43
Easton Avenue and Hamilton Street	545	11
Easton Avenue and Ray Street	14	28
Easton Avenue and Huntington Street	39	4
Easton Avenue and Park Boulevard	50	7
Easton Avenue and Landing Lane turn ramp	2	0
George Street and Landing Lane	70	18
Franklin Township		
Easton Avenue and Landing Lane/Franklin Blvd	26	25
Easton Avenue and Harrison Towers/Oakland Ave	9	5
Easton Avenue and Foxwood Drive	27	3
JFK Boulevard and Marconi Plaza	12	0
Easton Avenue and JFK Boulevard	13	3
Easton Avenue and Unclaimed Freight	17	12
Easton Avenue and DeMott Lane	35	5
Easton Avenue and Willow Avenue	23	4
Easton Avenue and Cedar Grove Lane	17	3
Main Street/Easton Avenue and Davidson Road	4	1
South Bound Brook		
South Main Street and Cherry Street	26	56
South Main Street and Weston Canal Road	12	13
Bound Brook		
South Main Street and East Main Street	57	25
East Main Street and Hamilton Street/Train Station	170	101

Pedestrian and Bicycle Crashes

The table below summarizes pedestrian and bicycle crashes in the study area for a recent time period, based upon crash reports provided by police departments in the study area municipalities. It should be noted that the time periods covered by crashes varies for each of the four municipalities, but extended from 2004 through 2009. Crash reports were provided for 50 crashes, of which 29 were pedestrian, and 21 bicycle.

Table 15: Pedestrian and Bicycle Crashes

Municipality	Time Period	Pedestrian Crashes	Bicycle Crashes
New Brunswick	October 2007 – November 2009	15	3
Franklin Township	December 2004 – November 2009	6	8
South Bound Brook	July 2004 – November 2008	2	6
Bound Brook	August 2005 – July 2009	6	4
Total		29	21

Pedestrian and Bicycle Crashes by Type

The greatest common denominator among pedestrian crashes in the three urban municipalities of New Brunswick, South Bound Brook and Bound Brook was vehicles turning left into pedestrians walking in a crosswalk. In these three communities, there were 23 pedestrian crashes, of which 12 involved a vehicle turning left and striking a pedestrian. More specifically, ten of these crashes involved a vehicle turning left onto Easton Avenue or Main Street from a side street.

Another pedestrian crash type of some frequency in the urban municipalities involved pedestrians walking out from between parked cars. There were three such incidents in New Brunswick, and two in Bound Brook.

The most frequent contributing circumstance for bicycle crashes was cyclists riding on the sidewalk and colliding with vehicles at driveways or intersections, which accounted for seven bicycle crashes in the study area. The majority of these occurred in Franklin Township, with four crashes.

Pedestrian and Bicycle Crashes by Municipality

Following is a review of pedestrian and bicycle crashes by municipality.

- **New Brunswick:** The highest pedestrian crash location in New Brunswick, and for the study area, was the intersection of Easton Avenue and Hamilton Street, with five crashes. Two crashes occurred at the intersection of Easton Avenue and Mine Street. Turning vehicles were involved in 10 of the 15 pedestrian crashes, with eight resulting from left turns. Of note, half of the 18 pedestrian and bicycle crashes in New Brunswick occurred when it was dark, versus less than one-quarter of crashes for the rest of the study area.
- **Franklin:** Two crashes occurred at the intersection of Easton Avenue and Franklin Boulevard; two at the intersection of Easton Avenue and JFK Boulevard; and two at the intersection of Easton Avenue and Cedar Grove Lane. Of the eight bicycle crashes, four involved a bicyclist riding on the sidewalk, a higher proportion than in the rest of the study area.

- **South Bound Brook:** There was no concentration of crashes at any one location, or of any type.
- **Bound Brook:** There was a concentration of crashes at the intersection of Main Street and Hamilton Street where three pedestrian crashes occurred, each involving a vehicle turning left onto Main Street. There were two "dooring" crashes, although one was quite unusual – a bicyclist riding on the sidewalk was struck by an opened door. In the typical "dooring" crash, the bicyclist is struck by a car door opening toward the street.

Pedestrian Facility Conditions

Sidewalks are present along the Easton Avenue/Main Street corridor in Bound Brook; virtually all of New Brunswick and South Bound Brook; and variable in Franklin Township. Areas missing sidewalks include Easton Avenue just south of Landing Lane, on the east side; most of Landing Lane; large sections of Easton Avenue in Franklin; and a small portion of Main Street at the southern side of South Bound Brook.

The width of the sidewalk is variable along the corridor:

- **New Brunswick:** Sidewalk width is 10 to 12 feet between Somerset Street and Albany Street; 5 to 10 feet between Somerset Street and Hamilton Street; 4 to 6 feet between Hamilton Street and Huntington Street; and 4 feet between Huntington Street and Franklin Boulevard.
- **Franklin Township:** Where present, sidewalks are typically 4 feet wide. The clear width of the new sidewalk north of Landing Lane is reduced to 2 feet because of the presence of signs and utility poles.
- **South Bound Brook:** Sidewalk widths range from 4 feet to 7 feet.
- **Bound Brook:** Sidewalk widths range from 8 to 10 feet.

In many places along the corridor, the sidewalk width is constrained by the presence of various obstacles, such as bus shelters, light poles, signal poles, and mailboxes. In general, a clear width of 5 feet is desirable; outside of the central business districts in New Brunswick and Bound Brook, this dimension is rarely provided.

The sidewalk is typically in good condition in Bound Brook and South Bound Brook. Deterioration is present in some sections of New Brunswick and Franklin.

Pedestrian signals are present at all signalized intersections within the study area. Curb ramps are provided at most intersections, but are absent on at least one crossing for the signalized intersections between Davidson Avenue and Foxwood Drive. Many of the crosswalk markings in the study area were noted as being in poor condition at the time of field visits. However, recent initiatives by Somerset County have begun to address this issue.

Bicycle Facility Conditions

The Easton Avenue and Main Street corridor was evaluated for compatibility with bicycle travel, using *NJDOT Bicycle Compatible Roadways and Bikeways* guidelines (April 1996). Criteria used to determine

bicycle compatibility are: lane width, shoulder width, traffic volume, speed limit, character of the area (urban or rural), presence or absence of on-street parking, and truck volumes. It should be emphasized that roadways are open to bicyclists whether or not the roadway meets compatibility criteria, nor is the compatibility evaluation intended to assess safety. "Bicycle compatible" refers to conditions that, taken together, are considered suitable for a fairly wide range of bicyclists.

The evaluation determined that a majority of the corridor would not be bicycle compatible. The segment of Easton Avenue in Franklin Township without shoulders is incompatible. As noted, many bicyclists choose to ride on the sidewalk for this segment. However, Easton Avenue and Main Street in most of New Brunswick, South Bound Brook and Bound Brook would also be considered incompatible for bicyclists. On urban roadways with parking, posted at 30 mph or less and with daily traffic volumes above 10,000, a shared lane width of 14 feet is desirable. The roadway cross-section normally offers a travel lane of 12 feet in width in these areas.

Following are the segments found to be compatible:

- New Brunswick – Easton Avenue between Park Boulevard and Landing Lane, due to the presence of shoulders.
- Franklin Township – Easton Avenue between JFK Boulevard and Willow Avenue, and between Ukrainian Orthodox Church driveway and creek bridge, due to the presence of shoulders.
- South Bound Brook – Main Street from creek bridge to Barber Boulevard, due to the presence of shoulders.

Together, these segments represent less than 2 miles of the 6.6-mile length of the study area.

The west side of Easton Avenue between JFK Boulevard and Cedar Grove Lane in Franklin Township is signed as a bike route. On this segment, an asphalt path of approximately six to seven feet in width has been installed. This shared use sidepath, or bike path, is available for use by two-way bicycle and pedestrian traffic. (Although this facility is technically regarded as a "shared use path", since it is regularly traveled by users other than bicyclists, this report will refer to it as a bike path, since that is how it is popularly known by Franklin residents.) The bike path runs for approximately half of the four-mile length of the Easton Avenue corridor in Franklin. The AASHTO *Guide for the Development of Bicycle Facilities* (1999) cites a number of problems with two-way paths installed immediately adjacent to a roadway. For example, motorists entering the roadway from a side street will often not notice bicyclists approaching from the right, since they do not expect contra-flow vehicles. Some bicyclists accessing the path are likely to ride on the wrong way of the street. The AASHTO Guide indicates that if a two-way path is adjacent to a roadway, a buffer of five feet in width should be provided, and the path itself should be at least eight feet in width. The existing path does not meet either of these guidelines. The nominal width of six to seven feet is often constrained by obstacles such as signs, poles, bus shelters, and junction boxes.

However, based on Franklin Township crash data, the path is not associated with a high number of bicycle crashes. Of the eight bicycle crashes in Franklin Township between December 2004 and November 2009, only one involved a bicyclist riding on the path.

Street Lighting

Poor street lighting on the corridor was cited as a problem by a number of residents in the study area. Based on field views, street lighting is an issue for pedestrians and bicyclists in New Brunswick and Franklin, but not South Bound Brook or Bound Brook. In the latter two boroughs, attractive pedestrian-scaled street lights have been installed at regular intervals for the length of the corridor. By contrast, in New Brunswick and Franklin, street lighting consists of "cobra-head" lights mounted on utility poles about 30 feet above the roadway. The lights are mounted at variable distances in the two municipalities: separation of 160 to 180 feet was noted in some segments of New Brunswick, and even greater intervals in Franklin. The problem is exacerbated in Franklin, since many of the street lights are mounted on the east side of Easton Avenue, while the bike path and virtually all of the sidewalk segments are found on the west side of Easton Avenue.

This has resulted in a situation with inadequate lighting for pedestrians and bicyclists along the corridor. This is of particular concern for the corridor in New Brunswick; as discussed above, half of the pedestrian and bicycle crashes along Easton Avenue occurred when it was dark, a proportion twice that of the rest of the study area. However, the frequency of crashes in the dark may also be traced to the presence of businesses open after dark (taverns, restaurants) and Rutgers University students.

Maintenance

Based on field views, maintenance of pedestrian and bicycle facilities along the corridor varies. The most significant issue with maintenance is the bike path along Easton Avenue in Franklin Township. Sections of the path are frequently littered with debris, and the presence of broken glass was noted on the path south of Cedar Grove Lane. Further, after snowfalls in the winter of 2009-2010, it was noted that many sections of the bike path were never plowed. In the Easton Avenue Corridor Survey, nine different residents commented on the presence of debris on the bike path.

Delaware & Raritan Canal Towpath

Beginning at Landing Lane in New Brunswick, the Towpath runs parallel to Easton Avenue and Main Street for the large majority of the study area. The towpath surface is stone, and the path is typically 10 feet wide. Access is provided at:

- Landing Lane, New Brunswick
- Easton Avenue and DeMott Lane, Franklin Township
- Easton Avenue in vicinity of I-287 Interchange, Franklin Township
- Main Street, South Bound Brook
- Washington Street, South Bound Brook

The towpath has long been viewed as a popular amenity for walking and cycling by the municipalities in the study area. A number of issues were identified related to the trail in the study:

- Limited number of access points – There are five access points in the study area, and a gap of over two miles between the Landing Lane and DeMott Lane access points.
- Limited or inconspicuous signage – Signs for access points are not visible for people traveling along Easton Avenue or Main Street.

- Towpath surface – Based on initial field views in February 2010, the surface was identified as a concern for bicyclists. In some sections, large and jagged stones were visible at the sub-grade. Materials spread on the surface in the spring of 2010 consisted of pea gravel, with the typical stone size being larger than desirable for bicyclists. In general, the ideal surface consists of crushed stones no larger than 3/8". In a sample taken from the freshly resurfaced Towpath in May, over 2/3 of the stones exceeded this threshold. The nature of the surface material increases resistance for bicycle tires, making it difficult to gain traction. However, it should be noted that resurfacing activities occurred in August 2010 with compacted crushed stone, making the surface more acceptable.

STRATEGIES

Recommendations were developed to improve pedestrian and bicycle travel on the corridor, and fall into the following categories:

- Improve Sidewalk Conditions along the Corridor
- Improve Signal Operations for Pedestrians
- Improve Infrastructure for Pedestrian Crossings
- Improve Street Lighting for Pedestrians and Bicyclists
- Improve Conditions on the Bike Path
- Improve Bicycle Facilities
- Increase Use of Delaware & Raritan Canal Towpath

Improve Sidewalk Conditions along the Corridor

Install Sidewalks Where Missing, and Replace Deteriorated Sidewalk

This is perhaps the most fundamental pedestrian improvement recommended for the corridor. In general, for an arterial roadway like Easton Avenue/Main Street with major commercial uses and residential developments, sidewalk should be provided along both sides for the entire length. Because of funding constraints, it will be difficult to address all of the missing sections in the short term. Therefore, certain sections of Easton Avenue should receive priority due to the potential impact on pedestrian activity. These include:

A. East side of Easton Avenue from Cedar Grove Lane to Davidson Avenue – This is the highest priority on the entire corridor, because this is segment is the least accommodating for pedestrian travel. There is no sidewalk between Cedar Grove Lane and World's Fair Drive on the east side or west side of Easton Avenue, and this is a key missing link. Although a sidewalk (albeit badly deteriorated) on the east side of Easton Avenue extends from World's Fair Drive to Davidson Avenue under I-287, there is no safe way to access it from south of I-287, because there is no signalized crossing at the intersection of World's Fair Drive and Easton Avenue. A guiderail is placed along the east side of Easton about two feet from the curb, and the canal embankment begins on the other side of the guiderail. Even putting aside the absence of a sidewalk, this physical arrangement would discourage pedestrians from walking on the east side.

A proposed improvement could consist of several parts:

- Between Cedar Grove Lane and World's Fair Drive, shift the easterly curb to the west by 2 to 3 feet. If the guiderail were left in its current location, this would create the minimal room needed for a sidewalk on the east side. This is feasible since there is a very slight recession in the easterly curbline at Cedar Grove Lane. Further, the concrete median at this location could be cut back if desired to create more room for travel lanes.
- Evaluate shifting the guiderail immediately adjacent to the easterly curb, or closer to the canal embankment, in order to create more room to install a sidewalk. This could be a stand-alone project if it is found infeasible to shift the easterly curb to the west.
- Replace the deteriorated sidewalk on the east side of Easton Avenue between World's Fair Drive and the entrance to the D&R Canal Towpath to the north of I-287.

As inhospitable as this segment of roadway is for pedestrians, it has more potential for accommodating pedestrian travel than the west side. The placement of a sidewalk on the west side of Easton Avenue would involve at least three different pedestrian crossings of ramps to and from I-287 or of Easton Avenue between World's Fair Drive and Davidson Avenue.

Easterly curbline on Easton Avenue at Cedar Grove Lane.

B. East side of Easton Avenue, south of Landing Lane - As indicated by pedestrian counts, there is regular pedestrian activity along this section.

C. North side of Landing Lane, between the Landing Lane bridge and Easton Avenue – As indicated by pedestrian counts, the intersection of Landing Lane and George Street saw more pedestrian activity than many intersections along Easton Avenue. During Saturdays with Rutgers football games, there are very high volumes of pedestrians, as they walk between the football stadium and the College Avenue campus.

D. East side of Easton Avenue from JFK Boulevard to north end of Unclaimed Freight Plaza including island at JFK Boulevard and Easton Avenue – Although pedestrian volumes here are not large, there are indications of regular pedestrian activity. Sidewalks installed here should also tie into Wendy's, which is located immediately south of the jughandle at JFK Boulevard and Easton Avenue. A sidewalk tying into Wendy's would be

especially desirable, so pedestrians would be able to cross Easton Avenue at the signalized intersection of JFK Boulevard, and not be tempted to dash across the roadway at a mid-block location.

Easton Avenue at JFK Boulevard; pedestrian activity has worn a path in the grass.

E. Between Davidson Avenue and existing sidewalk in South Bound Brook (just south of Reid Street) – The South Bound Brook Council has indicated interest in providing a sidewalk on this missing link since many residents work in the Davidson Avenue corridor. Installation of a sidewalk would be very feasible on the west side of Main Street.

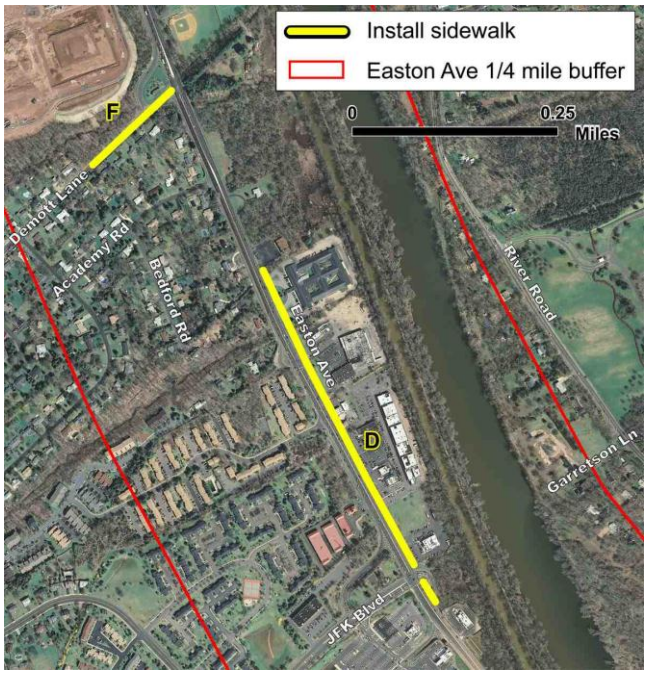
A footpath along Davidson Avenue indicates the need for sidewalk installation to better serve workers on this corridor.

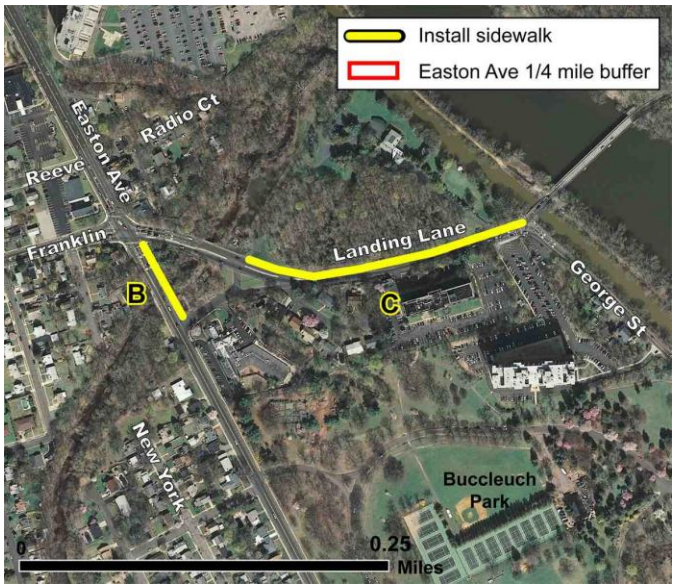
Sidewalks should also be installed along collector roadways intersecting with Easton Avenue in locations where sidewalks is not present on at least one side. These roadways include:

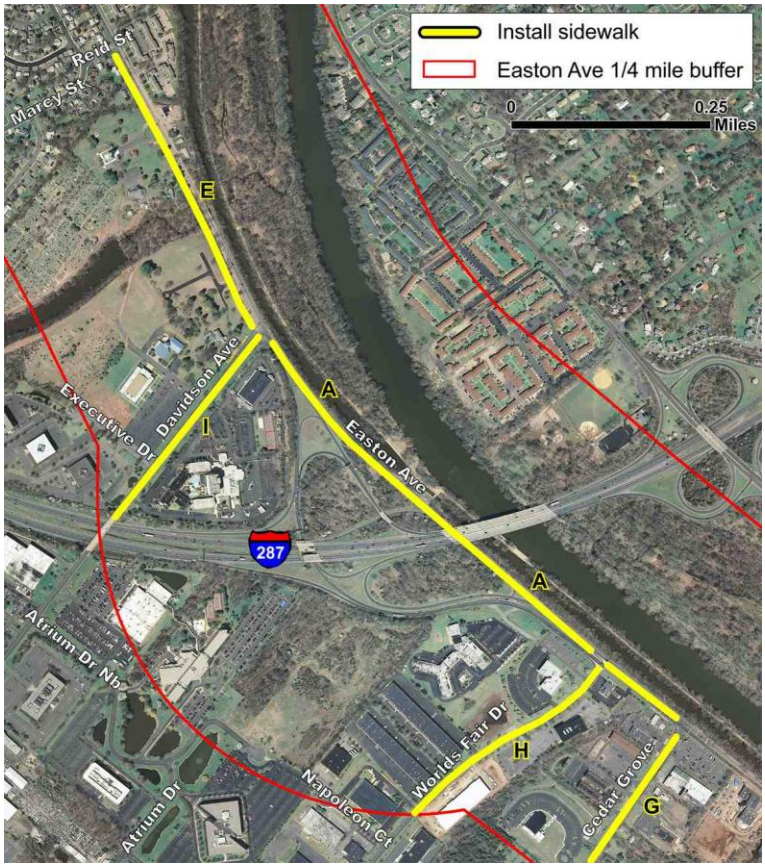
F. DeMott Lane – (closest section of sidewalk is found on the north side starting 725 feet west of Easton Avenue)
G. Cedar Grove Lane
H. World's Fair Drive
I. Davidson Avenue

Priorities for sidewalk installation are illustrated in Figure 22.

Figure 22: Sidewalk Installation Priorities







Install Pedestrian Links Between Shopping Centers and Adjacent Commercial or Multi-Family Uses Along Easton Avenue.

To encourage residents who live along Easton Avenue to walk on shopping trips, or to encourage people to walk to adjacent commercial uses, pedestrian links are recommended. This is particularly an issue for Franklin Township, given the large blocks present along the roadway. In the three urban municipalities, a small block structure accommodates relatively direct pedestrian paths. An example of a location that would benefit from a pedestrian path is the Stop 'N' Shop Plaza on the southwestern corner of Easton Avenue and JFK Boulevard. A garden apartment complex, Franklin Greens, is immediately west of the Shopping Plaza. An opening has been created in the chain-link fence between the two properties. Ideally, a formal path would be created here to accommodate residents. For developments along the corridor, evaluation of a pedestrian link should be required as part of formal subdivision and site plan review.

Increase Width of Sidewalks to Minimum Five Feet

Along much of the corridor, the sidewalk is four feet in width. This is adequate to accommodate the low numbers of pedestrians found along certain sections of the corridor. However, a five-foot width for sidewalks is generally considered desirable, in part to meet the ADA requirement for sidewalks of five-foot widths at 200-feet intervals along accessible routes. As part of future roadway/sidewalk reconstruction projects, or when land uses come in for site plan approval, 5-foot wide sidewalks should be requested if physically feasible.

Increase "Clear Sidewalk Width" by Moving Obstacles out of the Sidewalk.

As noted in the Existing Conditions section, the walkway along much of the corridor is impeded by obstacles in the sidewalk, including signal poles, signs, bus shelters, mailboxes and other objects. To the extent possible, obstacles should be moved out of sidewalks to create a 5-foot clear width. The highest priorities are locations where the walkway is less than three feet in width; these locations should be addressed in order to meet ADA standards, and to prevent pedestrians from having to walk out of the sidewalk. These locations should be inventoried and addressed.

On the left, a utility pole and signal pole block the sidewalk on the east side of Easton Avenue, north of Landing Lane. On the right is a location just to the north, where a bus shelter and garbage can force a woman to walk out of the sidewalk.

Improve Signal Operations for Pedestrians

Signal operations, in general, are not as pressing an issue as needed walkway improvements. As noted in Existing Conditions, all signals are equipped with pedestrian signal heads. However, some improvements are recommended including:

Evaluate Pedestrian Signal Facilities, and Upgrade as Needed.

An inventory should be conducted to determine locations where pedestrian pushbuttons are missing, and to evaluate operations where pushbuttons are present. The 2009 MUTCD (*Manual on Uniform Traffic Control Devices*) requires for pedestrian signals to be timed for a walking speed of 3.5 feet per second – a change from previous practice of 4 feet per second – so the adequacy of pedestrian crossing times at signalized intersections along the corridor should be evaluated. This is especially recommended for signals in New Brunswick where the timings may not have reviewed recently. Further, the 2009 MUTCD also includes new language that reduces the recommended distance between pedestrian pushbuttons and the crosswalk; the pushbutton should be located between 1.5 and 6 feet from the edge of the curb, shoulder or pavement. Many of the pushbuttons in the study area do not meet this standard, which should be addressed as part of future physical improvements. Finally, it is not always obvious which pushbuttons control which crosswalks. According to the 2009 MUTCD, pedestrian pushbutton signs must indicate which crosswalk signal is actuated by each pedestrian pushbutton. Supplemental pushbutton signs should be installed where needed.

At the intersections in New Brunswick, the pedestrian signal phase occurs when actuated (when the button is pushed). Given the high numbers of pedestrians in this area, consideration should be given to operating the signals on 'ped recall' during high pedestrian times so that the pedestrian phase comes up whether or not the button is pushed.

Other recommendations include evaluating use of concurrent pedestrian signal phases at signalized intersections with high levels of pedestrian activity and installing pedestrian countdown signals at signalized intersections along the entire corridor. Somerset County has been including these measures in all intersection reconstruction projects.

As discussed in the Existing Conditions section, a significant number of pedestrian crashes were associated with motorists making left turns into pedestrians crossing at intersections, particularly at signalized intersections. This crash pattern can be addressed through one of two strategies:

- Installation of wider and more visible crosswalk at key intersections. The crosswalk at busy intersections along Easton Avenue in New Brunswick should be 10 feet wide.
- Posting of the sign "Turning Vehicles Stop for Pedestrians," R(NJ)10-15S. Studies have demonstrated a reduction in pedestrian and vehicular conflicts following installation of similar signs.[19]

[19] H. Abdulsattar, M. Tarawneh, P. McCoy and S. Kachmann, Effect on Vehicle-Pedestrian Conflicts of "Turning Traffic Must Yield to Pedestrians" Sign, *Transportation Research Record* 1553, 1996.

Sign R(NJ)10-15S.

If these strategies are not effective in reducing the number of pedestrian crashes, use of signalization strategies should be investigated:

- *Evaluate use of protected left turns*. If left turns at an intersection can be accommodated through a dedicated signal phase, pedestrian crossings can be accommodated simultaneous with through and right-turn movements, possibly reducing the potential for conflict between pedestrians and motorists. However, it should be acknowledged that it would be difficult to stripe left turn lanes at the major intersections in question, due to the presence of on-street parking. The feasibility of a protected left turn phase, in terms of overall signal operations, would also need to be evaluated.
- *Evaluate use of Leading Pedestrian Intervals (LPI)*. In this strategy, pedestrians waiting to cross a roadway are given what is typically a three-second "head start" by the signal. By positioning themselves in the intersection before motorists begin their turning movements, pedestrians are better able to capture the attention of the motorists.

Improve Infrastructure for Pedestrian Crossings

Curb Ramps

Curb ramps are present at most signalized intersections along the corridor. The first priority for improving conditions for handicapped pedestrians should be the installation of curb ramps where missing. Intersections with curb ramps missing on at least one corner include:

- Easton Avenue and Davidson Avenue
- Easton Avenue and Cedar Grove Lane
- Easton Avenue and JFK Boulevard
- Easton Avenue and Foxwood Drive
- Easton Avenue and Willow Avenue

At Easton Avenue and the Unclaimed Freight Plaza, depressed curbing is present. While this is better able to be surmounted than regular height curbing, it is not ADA-compatible.

Crosswalks

A systematic survey of crosswalks was not conducted as part of this study, but field views indicate that crosswalks are missing at a number of signalized intersections in the study area, as well as a number of crossings of entrance and exit ramps along Easton Avenue in Franklin Township. High-visibility

crosswalks should be provided at all locations with high pedestrian activity. A width of 10 feet for crosswalks should be employed at Easton Avenue at Albany Street, Hamilton Street and Somerset Street, given the heavy pedestrian volumes in these locations, as well as regular conflicts between left-turning vehicles and pedestrians. Wherever possible, the position of crosswalks should be adjusted to shorten the crossing distance.

The use of crosswalks at select unsignalized locations in New Brunswick should also be evaluated. Currently, there are two crosswalks at uncontrolled locations: the intersection of Easton Avenue and Bartlett Street, and in front of St. Peter's Hospital at Richardson Street. A potential location for another uncontrolled crosswalk is Mine Street and Easton Avenue. There is no signalized crossing of Easton Avenue between Mine Street and Ray Street, a distance of 2,000 feet. Because of its relatively close proximity to the Rutgers campus, a crosswalk at Mine Street would enhance pedestrian mobility. It is noted that Rutgers University's Transportation Department has previously requested the Middlesex County Engineering Department to install a crosswalk here; a formal request should now be made by the City of New Brunswick. The crosswalk should be accompanied by "Stop for Pedestrians in Crosswalk" signage.

Along with a crosswalk at Mine Street, the use of curb extensions or more visible "No Parking" markings should be evaluated. Curb extensions improve the safety of pedestrian crossings by improving the sight distance of and by pedestrians, and by reducing the street crossing distance. Curb extensions also have the potential to enhance overall safety at this intersection, by preventing vehicles from parking in no parking zones. Curb extensions should be considered for installation where applicable at key intersections along Easton Avenue.

On field views, vehicles are routinely seen parked in the no parking zone in front of the deli at the northeast corner, and the tavern on the northwest corner, on Easton Avenue at Mine Street. It was determined that this intersection experiences a relatively high number of right angle crashes. Sight distance of motorists on Mine Street, impeded by parked vehicles, could factor into this crash history. It is further noted that two pedestrian crashes occurred here during the study period.

Vehicle parked in "no parking" zone on Easton Avenue at Mine Street. A curb extension here would prevent illegal parking, and aid pedestrian crossings.

A high visibility crosswalk and pedestrian warning sign should be installed at the beginning of Wyckoff Street at its intersection with Easton Avenue. Two pedestrians walking in the crosswalk here were struck by a westbound motorist turning right off Easton Avenue. Wyckoff Street intersects with Easton Avenue at an approximately 30-degree angle, which could lead to uncertainty among motorists and pedestrians about who has the right of way. A standard crosswalk is present here, but is badly faded. A

reconfiguration of this intersection and/or use of curb extensions should be considered at this intersection as well. All pedestrian crossings and curbs should be consistent with current ADA standards.

Pedestrian Warning Signs

Pedestrian warning signs at uncontrolled crosswalks should be installed throughout the study area where missing, such as the northbound direction on the Queen's Bridge in South Bound Brook. The sign should include the message of "Stop for Pedestrians," which this year superseded the old requirement of yielding to pedestrians." New Jersey sign R(NJ)9-9S is an example of a sign that fulfills the new state law.

Sign R(NJ)9-9S

Improve Street Lighting for Pedestrians and Bicyclists

Given the poor street lighting conditions in New Brunswick and Franklin Township, it is recommended to conduct a study to improve street lighting conditions along Easton Avenue in these two municipalities. A number of options exist for Easton Avenue in New Brunswick. The preferred option would be the installation of pedestrian-scaled street lights at appropriate intervals along both sides of the roadway – from Albany to Hamilton Streets at a minimum – similar to South Bound Brook and Bound Brook. This would provide better lighting coverage, and would also be an aesthetic improvement for what should be a pedestrian-friendly mixed use district. Installation of in-pavement lighting at crosswalks locations with higher pedestrian volumes should be considered. A number of solar powered pedestrian activated lighting treatments are available. These treatments are relatively low maintenance and can be effective if strategically placed at high pedestrian crossing locations along the corridor.

Pedestrian-scaled street lights are not as critical for Easton Avenue in Franklin Township, due to lower pedestrian volumes and the suburban highway character of this area. However, it would be desirable if street lights could be installed or relocated to the west side of the roadway, which has a higher number of pedestrians and bicyclists.

Improve Conditions on Bike Path

As discussed in the Existing Conditions section, the Easton Avenue bike path does not meet the guidelines for a shared use path according to the AASHTO Bicycle Guidelines. At the same time, it is widely used by bicyclists – based on field views, the large majority of bicyclists on this section of the corridor appear to prefer it to riding in the roadway – and it had a lower rate of bike crashes than the rest of the Easton Avenue corridor in Franklin. To improve the conditions of the bike path, and reduce the potential for conflict with motorists, the following actions are recommended:

Widen Bike Path and Increase "Clear Bicycling Width"

As noted in the Existing Conditions section, the bike path is less than eight feet in width for its entire length. To meet the minimum width recommended in the AASHTO *Guide for the Development of Bicycle*

Facilities, it is recommended to widen the path to eight feet where feasible. It is recognized that in a number of sections, constrained right-of-way and topography will make this difficult.

It may be more feasible to increase the "clear bicycling width" along the path, which is currently narrowed by signal poles, signs, bus shelters, mailboxes and other objects. These locations should be inventoried, and obstacles relocated where feasible. In some cases, this may mean coordinating with the adjoining landowners to see if they would host the displaced obstacle, such as a bus shelter.

Signal pole and junction box in bike path.

Institute Maintenance Plan for Bike Path

As noted (and criticized) by a number of residents in the Easton Avenue Corridor Survey, there are significant amounts of debris on the path, and it is rarely plowed after a snowfall. The problem here may, in part, be one of perception. Adjacent landowners may not feel the obligation to maintain the path as they would a sidewalk. As a signed bike path, the landowners may perceive the path as being a public facility, and one which should be maintained by the Township or County. However, although a public facility, the landowner is obliged to maintain the facility in the same manner as if it were a sidewalk. It is recommended that the Township institute a maintenance plan for the bike path and contact adjacent landowners and inform them of their responsibility for maintaining the path, including in the event of snowfall. The Township should also take steps to enforce the ordinance and impose fines in the event of regular non-compliance.

Sweeping the facility of debris is a more complex issue than clearing the facility of snow. Because of the relatively narrow width, a typical maintenance vehicle will not be able to travel along the path for sweeping. Sweepers are now manufactured that permit maintenance workers to clear walkways while riding. From a practical perspective, regular clearance of snow in the wintertime would also serve to clear debris from the path; the path is cleared so infrequently now that debris can remain undisturbed on the path for months at a time. Alternative to clearance actions by the landowners, Franklin Township should send out maintenance workers to clear sections with large amounts of debris.


On the left, the bike path in winter, covered by snow. On the right, an example of the debris found on the bike path proximate to JFK Boulevard. Gravel and broken plastic parts and glass cover the path.

Install Bicycle Warning Signs Along Bike Path

To enhance the safety of intersections of the bike path with roadways and major driveways along Easton Avenue, the use of bicycle crossing warning signs (W11-1) is recommended. Some municipalities have supplemented the image of the W11-1 sign with additional symbols or text (see bicycle warning sign posted in Brooklyn NY, below), to provide greater attention to the bike facility. Key recommended locations include:

- Easton North (garden apartment) driveway
- Jughandle to Unclaimed Freight driveway
- Jughandle to DeMott Lane
- Driveway to LaDure development
- Willow Avenue

W11-1 Sign.

Bicycle warning sign in Brooklyn, NY.

Improve Bicycle Facilities

As discussed in the Existing Conditions section, the majority of the Easton Avenue/Main Street corridor is not bicycle compatible according to NJDOT guidelines. Travel lanes are typically of insufficient width

along the corridor in locations where on-street parking is present, and shoulders are missing along much of the relatively higher-speed corridor through Franklin Township.

Options for improving the compatibility of the Easton Avenue/Main Street corridor are limited, due to constrained right-of-way, land uses, topography, environmental resources and cost. In New Brunswick, South Bound Brook and Bound Brook, on-street parking would need to be removed, which is likely infeasible. To make Easton Avenue in Franklin Township compatible for bicycle travel, two options were suggested early in the study: physically widen the roadway in order to install shoulders, or place Easton Avenue on a "road diet". Physical widening was regarded as infeasible due to constrained right-of-way, the presence of homes and/or environmental resources adjacent to the roadway, and cost.

Under a road diet, Easton Avenue would be re-striped from a four-lane cross-section to a three-lane cross-section (one through lane in each direction and a two-way left-turn lane). This treatment would allow Easton Avenue to be striped with bicycle-compatible shoulders the length of the corridor in Franklin Township, producing better conditions for bicyclists who wish to ride in the roadway. However, the road diet treatment was regarded as infeasible at the current time, due primarily to the significant traffic volumes on Easton Avenue. Successful road diet treatments have typically been done for roadways with average daily traffic volumes of less than 25,000. On Easton Avenue, average daily traffic volumes range from 50,000 near the Unclaimed Freight Plaza to 40,000 near Franklin Boulevard. A road diet treatment would thus result in a significant increase in traffic congestion and possible traffic diversion to local roadways.

A road diet treatment could be evaluated in the future depending upon compatibility with Franklin Township land use plans and ability of other strategies to significantly reduce traffic volumes on this corridor.

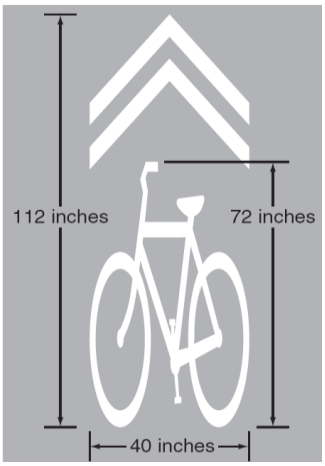
In the near future, other strategies should therefore be considered to improve conditions along the corridor for bicyclists, as presented below.

Signs and Markings

Shared Lane Markings are recommended for use on Easton Avenue in New Brunswick (section with parallel parking), Main Street in South Bound Brook, and 2nd Street in Bound Brook. A Shared Lane Marking (informally referred to as the 'Sharrow') is a new pavement marking used to guide bicyclists with lateral positioning in a shared travel lane, especially in locations with on-street parking. The Shared Lane Marking was approved for use in the 2009 MUTCD. As noted in the MUTCD, Shared Lane Markings are intended to assist bicyclists with lateral positioning on streets with parallel parking, in order to reduce the chance of a collision between bicyclists and opened car doors.

Other signs to be considered include "Shared the Road" and "Bicycle May Use Full Lane".

'Share the Road' signage



Shared lane marking

'Bicycle May Use Full Lane' sign

In conjunction with Shared Lane Markings, consideration should also be given to reducing the width of parking stalls along the corridor. Parking stalls on Easton Avenue and Main Street are 8 feet in width, a typical width for parking stalls in urban areas. A recent study indicates that motorists park closer to the curb on streets marked with 7-feet parking stalls.[20] Narrower parking stalls may thus be useful in reducing the incidence of dooring. A possible application for restriping parking spaces along Easton Avenue while installing Shared Lane Markings would be between Hamilton Street and Huntington Street in New Brunswick.

Evaluate Installation of Bike Lanes

There are only two, relatively abbreviated, sections of the corridor where bike lanes could be considered. The current cross-section of Easton Avenue consists of 13-foot travel lanes. There is a 6-foot northbound shoulder (adjacent to Buccleuch Park), where parking is not permitted; and an 8-foot southbound shoulder (adjacent to single-family homes), where parking is permitted. If it is desired to retain on-street parking in front of the homes, a potential cross-section would consist of (from west side of road to the east): 8-foot parking, 5-foot bike lane, 11-foot travel lane, 11-foot travel lane, and 5-foot bike lane. However, there would be a need to transition this section at the approach with Landing Lane and with Park Boulevard. The resulting section would be less than 2,000 feet in length. This strategy should receive serious consideration if Shared Lane Markings are installed on Easton Avenue to the south of this section, to provide greater continuity for bicyclists.

The other section where bike lanes could be installed is in South Bound Brook, between Davidson Avenue and Reid Street. The distance is only 1,500 feet. Bike lanes should receive consideration only if Shared Lane Markings are installed on Main Street to the north.

[20] P. Furth, D. Dulaski, M. Buessing, and P. Tavakolian, *Parking Lane Width and Bicycle Operating Space*, Transportation Research Board 2010 Annual Meeting.

Stripe Shoulders on Landing Lane

Shoulders can be striped on Landing Lane for a distance of approximately 800 to 1000 feet, in between the westbound approach to Easton Avenue and the eastbound approach to George Street. The width of Landing Lane is typically 35 feet, so it would be possible to stripe 12-foot travel lanes and 5.5 feet shoulders. The shoulders could accommodate bicyclists. Since there is no sidewalk and a steep embankment along much of the south side of Landing Lane, and no sidewalk along much of the north side of Landing Lane, the striping of shoulders would also better accommodate pedestrians, as well as create a greater degree of separation between pedestrians walking on the north side of the road and passing motorists.

Landing Lane.

Evaluate Extension of Bike Path Along Easton Avenue from Southern Terminus

The bike path along Easton Avenue currently runs from JFK Boulevard to Cedar Grove Lane. Interest has been expressed in extending the bike path along the west side of Easton Avenue between JFK Boulevard and Franklin Boulevard by replacing the existing sidewalk with a shared-use pedestrian/bicycle path. This strategy should be evaluated, but any extension of the bike path in this location would be subject to the same caveats as the existing facility. It will be difficult to obtain the recommended minimum width of 8 feet for bike paths, given the presence of physical objects (bus shelters, mailboxes, etc.) noted in proximity to the sidewalk. There are issues in placing a bike path immediately adjacent to a roadway, in part because motorists turning into and out of side streets and driveways do not always anticipate bicyclists riding against regular traffic flow. If a bike path is found to be feasible in this location, bike warning signs should be posted at the intersection of Easton Avenue with major driveways or roadways, similar to the recommendations noted earlier for the existing bike path.

Install New Bike Parking Facilities

To better accommodate bicyclists in the study area, new bike parking facilities are recommended at major land uses in the study area. Two major priorities for bike parking are the transit centers of New Brunswick Rail Station and Bound Brook Rail Station. Bike and pedestrian improvements near both train stations could provide better access to public transit for non-motorized transportation users. Bike parking conditions at the New Brunswick Rail Station were criticized in the *Greater New Brunswick Area BRT Study* (May 2008), which determined that there is no centralized area for bicycles, and bike parking facilities are “shoe-horned” into areas around the station. That study calls for additional bicycle lockers and bike racks in the northwest corner of the station, “including a mini-bike storage area, coordinated with and potentially incorporated into the Gateway Center parking garage.” Bike parking in this location

would provide ready access to the Easton Avenue corridor, and that recommendation is thus endorsed in this study. The Bound Brook Rail Station has an older bike rack, and this should be replaced with a newer rack or bicycle lockers of greater capacity. This strategy should be coordinated with the redesign of Van Horne Plaza in front of the Bound Brook Rail Station, recommended in the *Bound Brook Downtown Urban Design Plan* (April 2010).

Other locations for new bike parking facilities in the study area would include major land uses, such as St. Peter's Hospital; Buccleuch Park the large shopping centers and garden apartment complexes along Easton Avenue in Franklin Township; large office complexes in the World's Fair/Davidson Avenue area; garden apartment complex and central business district in South Bound Brook. Bound Brook and New Brunswick should also review the locations where bicycles are being parked; if a problem with bicycles blocking sidewalks exists, additional bicycle racks should be installed where appropriate.

Along Easton Avenue in Franklin Township. In locations where bike racks are not provided, bicyclists must improvise.

Install Bike Facilities on Collector Roadways in Franklin

Franklin Township should designate bike facilities on collector roadways that intersect with Easton Avenue. These connections would encourage bicyclists to use alternative roadways in reaching destinations along Easton Avenue, and would benefit bicycle mobility in the larger area. In determining the appropriate facility, the Township should be guided by its 2001 *Bicycle Plan*. Following is a summary of recommendations for collector roadways from the 2001 Plan, and the current status:

Table 16: Status of Recommended Bike Facilities in Franklin

Roadway	2001 Plan Recommendation	Status	Action
Franklin Boulevard	Bike lane	Bike lane	None
Foxwood Drive	Shared roadway	No signage	Install 'Share the Road' sign
JFK Boulevard	Bike lane	No bike lane, but bike-compatible shoulder	Designate bike-compatible shoulder as bike lane
DeMott Lane	Compatible shoulder	Shoulder on one side of road, not on other	Stripe bike-compatible shoulders
Willow Avenue	Shared roadway	No signage	Install 'Share the Road' sign
Cedar Grove Lane	Bike lane	Bike lane	None
Worlds Fair Drive	Bike lane	No bike lane	Stripe bike lane
Davidson Avenue	Bike lane	No bike lane	Stripe bike lane

As indicated in the table, the Township has designated bike facilities on two key roadways: Franklin Boulevard and Cedar Grove Lane. Although the 2001 Plan calls for the installation of bike lanes on JFK Boulevard, this is a lower priority than bike facilities on the other roadways, since JFK Boulevard already has a multi-use path that receives regular use from bicyclists.

Bike lane on Franklin Boulevard.

Improve Sight Distance at Intersections

To reduce the potential for conflict between motorists and bicyclists at the intersections of Easton Avenue with side streets, adequate sight distance should be provided. Sight distance may have been an issue in two of the vehicle-bicycle crashes along the corridor. A bicyclist riding north on the Easton Avenue bike path struck a vehicle on the Easton North apartment complex driveway approaching the intersection with Easton Avenue. Based on field views, the presence of a steep embankment, along with shrubbery and the Easton North complex sign, could have the potential to hinder sight distance by bicyclists or motorists at this intersection. A study should evaluate potential remedial actions at this intersection, including relocation of the sign and shrubbery. The second crash took place at the intersection of the Rutgers Plaza shopping center driveway and Easton Avenue. A motorist exiting the shopping center struck a bicyclist riding northbound on the sidewalk. The police crash report indicated that the retaining wall on the southwest corner of this intersection blocked the view of the motorist. A field view confirmed that sight distance at this intersection is limited. It is therefore recommended to re-stripe the exiting driveway and shift it slightly to the north, in order to provide greater sight distance at this location for exiting motorists. Other driveways should be evaluated and if the need to improve the sight distance of motorists for approaching pedestrians and bicyclists then the driveway may need to be reconfigured or restriped to improve safety.

Exit for Rutgers Plaza at Easton Avenue. Along with the limited sight distance, note the narrow dirt path worn by pedestrians.

Institute Bike Sharing Program in New Brunswick

A bike sharing program should be initiated by Rutgers University and the City of New Brunswick. There are an increasing number of bike sharing programs to evaluate for lessons in administration and policies. Princeton University just began a bike sharing program for its employees. Drexel University in

Philadelphia has 20 Trek bikes for students and staff to check out, and New York University has a student-run bike share program. Many other examples can be found across the country, and worldwide. Theft and vandalism continue to be concerns for groups attempting to start these programs, and the programs are attempting to address these issues, in some cases through the use of durable bikes and proprietary parts. Rutgers University has indicated that it may wish to implement a bike-sharing program in the future after a bike network is created in New Brunswick, since the lack of a network before that point may dampen the use of bikes. It should also be noted that a bike-sharing program is proposed for the Newark campus of Rutgers University; if this is implemented, results there should be evaluated for potential lessons for New Brunswick.

Finally, any initiative to improve bicycle facilities in New Brunswick should consider and build upon other projects intended to enhance bicycling in that city. The *New Brunswick Bikeway Scoping Study* (Middlesex County Department of Planning, May 2009) recommends installing a bikeway along the following roadways: Bishop Street, Neilson Street, Route 27/Albany Street, George Street, Huntington Street and College Avenue. This bikeway will be in close proximity to the Easton Avenue corridor, but is not encompassed by it. The *Greater New Brunswick Area Bus Rapid Transit Study – Phase I* (NJ Transit and North Jersey Transportation Planning Authority, May 2008) also calls for a shared use bikeway along Albany Street and George Street. By providing bike-compatible facilities in immediate proximity to Easton Avenue, these projects will make it easier for bicyclists to access the study area.

Increase Use of Delaware & Raritan Canal Towpath

The Delaware & Raritan Canal Towpath is one of the great amenities for pedestrians and bicyclists in the study area. Following are recommendations for enhancing its use.

Improve Surface of Towpath

As noted earlier, the surface of the Towpath was evaluated during field views in May 2010 and determined to be inappropriate for bicyclists. The Delaware and Raritan Canal Commission has recognized that the material is undesirable for bicyclists, and conducted resurfacing of the Towpath in August 2010. The surface now consists of compacted crushed stone, which is appropriate for bicyclists. The need for regular re-surfacing (with crushed stone no larger than 3/8") should be monitored in the future, and Somerset and Middlesex County should provide support for the Commission to receive the funding needed from the State or Federal agencies.

Approve Use of Canal for Pre-Dawn and Post-Dusk Hours

Currently, the Towpath is officially open for use from dawn to dusk. The Commission is working with the Division of Parks and Forestry to recognize the use of the Towpath by work commuters before dawn and after dusk. This would be of great benefit to the commuters who currently use the Towpath through all months of the year, and should be supported.

Improve Amenities along the Towpath

The Commission should evaluate installing additional benches at high use locations and consider installing additional comfort stations approximately every five miles along the Towpath or at key designated areas.

Increase Number of Access Points to Towpath

At least one additional access point to the Towpath is recommended to increase use of the facility by area residents. There is no access point between DeMott Lane in Franklin Township and Landing Lane in New Brunswick, a distance of over two miles. Therefore, two sites are recommended for investigation: Easton Avenue and JFK Boulevard, and Easton Avenue and Foxwood Drive. Both intersections are signalized, thereby providing safe movement across Easton Avenue for pedestrians and bicyclists. Both sites are also proximate to large residential and commercial areas.

It is noted that Franklin Township has taken action to evaluate improved access to the Towpath, through the *Canal Access Vision and Strategic Plan* (December 2009). This Plan focuses on access to the Canal at JFK Boulevard. The D&R Canal commission also undertook a preliminary analysis to add a new access point at JFK Kennedy Boulevard and Easton Avenue. Finally the Easton Avenue Corridor online survey conducted in fall 2009 identified a new access point to the Towpath at JFK Kennedy Boulevard as a priority for improving mobility along the Easton Avenue Corridor.

It should be noted that significant permitting may be required to install a pedestrian access bridge at a new access point; this issue would need to be evaluated.

Provide Guide Signage to Towpath along Corridor, and Improve Signage at Access Points

Although the Towpath is one of the great resources within the study area, many people who pass through the area are not aware of its existence. In part, this is because existing signing is lacking or inconspicuous. Signs should be posted along Easton Avenue or Main Street in advance of the access to the Towpath, alerting passing motorists as to its presence; and signs should also be posted directly at the entrances themselves. A sign with regional attractions such as the Towpath should be posted at the New Brunswick and Bound Brook Rail Stations in conjunction with planned improvements there. New signage is also recommended along the Towpath itself. The D&R Canal Commission plans on eventually installing markers every .5 mile along the path. Members of the steering committee have also expressed interest in installing signs advising visitors of the distance to major destinations.

Improve Parking Facilities at Access Points

The nearest parking facility for visitors to the Landing Lane access point is in Johnson Park, a distance of .4 miles away. For more convenient parking, the D&R Canal Commission should coordinate with the Landing Lane Apartment Complex to determine if 10 to 20 spaces in their parking lot could be set aside for visitors to the towpath. The lot has 214 spaces; a count on the evening of July 11, 2010 indicated that 163 of the spaces, or 76%, were occupied. Of the 51 vacant spaces, the large majority were clustered proximate to Landing Lane, which would be ideal for use by visitors to the Towpath. The apartment complex will likely have liability concerns to be addressed by the Commission if the lot is made available for use by visitors.

Connect New Brunswick Bikeway to Towpath

Middlesex County has begun the New Brunswick Bikeway project, which has a northern terminus near College and Lafayette Streets. It would be desirable to connect the New Brunswick Bikeway in some manner to the D&R Canal Towpath, which terminates at Landing Lane, about ¾ of a mile from the intersection of College and Lafayette Streets.

The potential for making this connection should be evaluated. One possibility would be to extend the D&R Canal State Park east of its current endpoint at Landing Lane. The original Towpath extends past Landing Lane to just west of the footing for the John Lynch Bridge. The last mile of the Canal was originally to have been restored by NJDOT, and operated as a park. It appears to be physically feasible to restore the remaining segment of the Towpath. Since the Towpath terminates at the John Lynch Bridge, this improvement should only take place if a pedestrian bridge can be placed across the Canal at the termination point, with a crosswalk across George Street. This would provide access for people wishing to access the Towpath from Buccleuch Park, with a subsequent connection to the New Brunswick Bikeway.

Alternatively, there could be an on-road connection made between the New Brunswick Bikeway and the D&R Canal Towpath, with improvements to College Avenue and George Street.

It is recommended that the potential of this linkage be evaluated, in order to create one continuous bike path, thus encouraging greater use.

CHAPTER 6: ROADWAY STRATEGIES

EXISTING CONDITIONS

The Easton Avenue / Main Street corridor extends from Main Street in Bound Brook at the Bound Brook Train Station through South Bound Brook Borough, Franklin Township, and New Brunswick City to the New Brunswick Train Station. The character of the corridor changes substantially along its length. In South Bound Brook, Bound Brook and New Brunswick, the corridor has a 'Main Street' character, where the roadway consists of a single travel lane in each direction with on street parking. Through Franklin Township, however, the corridor consists of two travel lanes in each direction, and in some areas is divided by either a grass or concrete median. Left turn treatments are unpredictable along the corridor in Franklin Township, with some left turns accomplished via direct left turn lanes, and other left turns accommodated by nearside jug handles.

While the Interstate 287 and Easton Avenue interchange experiences considerable delays and congestion, this report focuses on improvements outside of the interchange area so as not to duplicate recently completed efforts and efforts currently underway by NJDOT to address long term improvements to the interchange.

Existing Intersection Layout and Operations

As with all corridors, most of the interaction between vehicles, including delays and crashes, occur at intersections. A summary of each of the major intersections along the corridor follows:

East Main Street (CR 533) and Hamilton Street / Bound Brook Train Station Exit

The intersection of East Main Street (CR 533) and Hamilton Street / Train Station Exit is a four way intersection operating on a two phase semi-actuated traffic signal, with actuation on the Hamilton Street / Train Station Exit approaches. The eastbound and westbound (East Main Street) approaches consist of a single approach lane to accommodate all movements. The southbound (Hamilton Street) approach consists of a dedicated left turn lane and a dedicated right turn lane. The Train Station Exit (northbound approach) consists of a dedicated left turn lane and a shared through/right turn lane and is configured as egress only.

East Main Street (CR 533) and South Main Street (CR 527)/Bolmer Boulevard

The intersection of East Main Street (CR 533) and South Main Street (CR 527) / Bolmer Boulevard is configured as a roundabout with a single approach lane in each direction. A truck skirt is provided for large wheel base vehicles to maneuver through the intersection. As with all roundabouts, vehicles approaching the intersection are expected to yield to vehicles already in the roundabout.

South Main Street (CR 527) and Canal Road (CR 623) / Elm Street

The intersection of South Main Street (CR 527) and Canal Road (CR 623) / Elm Street is a four leg intersection operating on a two phase semi-actuated traffic signal. The northbound (South Main Street) approach consists of a dedicated left turn lane and a dedicated through lane. The southbound (South Main Street) approach consists of a single lane to accommodate all movements, and the eastbound (Canal Road) approach consists of a dedicated left turn lane and a dedicated right turn lane. Elm Street is signed for one-way operation away from the intersection.

South Main Street (CR 527) and Cherry Street / Washington Street

The intersection of South Main Street (CR 527) and Cherry Street / Washington Street is a four leg signalized intersection operating on a two phase semi-actuated traffic signal, with actuation on the Cherry Street / Washington Street approaches. Each approach consists of a dedicated left turn lane and a shared through/ right turn lane.

Easton Avenue (CR 527) and Davidson Avenue

The intersection of Easton Avenue (CR 527) and Davidson Avenue is a three leg signalized intersection operating on a four phase fully actuated traffic signal. The northbound (Easton Avenue) approach consists of a dedicated left turn lane and a shared left turn / through lane and the southbound (Easton Avenue) approach consists of two dedicated through lanes and a dedicated right turn lane. The eastbound (Davidson Road) approach consists of a dedicated left turn lane and two dedicated right turn lanes. Each approach to the intersection operates on its own signal phase with right turn overlap phases for the eastbound and southbound approaches. Pedestrians are accommodated by a push button actuated pedestrian only clearance phase.

Easton Avenue (CR 527) and Cedar Grove Lane (CR 619)

The intersection of Easton Avenue (CR 527) and Cedar Grove Lane (CR 619) is a three leg signalized intersection operating on a three phase semi-actuated traffic signal. The northbound (Easton Avenue) approach consists of a dedicated left turn lane and two dedicated through lanes and the southbound (Easton Avenue) approach consists of two dedicated through lanes and a dedicated right turn lane. The eastbound approach consists of two dedicated left turn lanes and a dedicated right turn lane. The signal includes a 'No Right Turn' fiber-optic blank out sign for the eastbound right turn movement which activates with pedestrian actuation to cross Easton Avenue.

Easton Avenue (CR 527) and Willow Road

The intersection of Easton Avenue (CR 527) and Willow Road is a four leg signalized intersection operating on a two phase semi-actuated signal. The northbound (Easton Avenue) approach consists of two dedicated through lanes plus an off ramp for a nearside jughandle to accommodate movements into and out of the Rutgers Preparatory School. The southbound approach consists of a dedicated through lane and a shared through/right turn lane. The eastbound (Willow Road) approach consists of a single lane to accommodate all

movements. The westbound approach consists of a dedicated left turn lane and a dedicated through lane.

Easton Avenue (CR 527) and DeMott Lane

The intersection of Easton Avenue (CR 527) and DeMott Lane is a four leg signalized intersection operating on a four phase semi-actuated traffic signal. The northbound (Easton Avenue) approach consists of a dedicated left turn lane, a dedicated through lane, and a shared through / right turn lane. The southbound approach consists of two dedicated through lanes and a nearside jughandle to accommodate southbound left turns and u-turn movements. The eastbound (DeMott Lane) approach consists of a dedicated left turn lane, a shared left turn / through lane and a dedicated right turn lane. The westbound approach consists of a single lane to accommodate all movements.

Easton Avenue (CR 527) and Unclaimed Freight Plaza

The intersection of Easton Avenue (CR 527) and Unclaimed Freight Plaza is a four leg signalized intersection operating on a two phase semi-actuated traffic signal. The northbound (Easton Avenue) approach consists of a dedicated through lane and a shared through/left turn lane. The southbound approach consists of two dedicated through lanes and a right turn lane to accommodate the nearside jughandle. The westbound approach (jughandle from Easton Avenue southbound) consists of a single lane to accommodate all movements. The westbound (Unclaimed Freight Plaza) approach consists of a dedicated left turn lane and a dedicated right turn lane.

Easton Avenue (CR 527) and JFK Boulevard

The intersection of Easton Avenue (CR 527) and JFK Boulevard is a four leg signalized intersection operating on a three phase semi-actuated traffic signal. The northbound and southbound (Easton Avenue) approaches consist of two dedicated through lanes plus a right turn ramp for a nearside jughandle. The eastbound (JFK Boulevard) approach consists of two dedicated left turn lanes and a dedicated right turn lane. The westbound (jughandle) approach consists of a shared left turn/through lane and a dedicated left turn lane.

Easton Avenue (CR 527) and Foxwood Drive

The intersection of Easton Avenue (CR 527) and Foxwood Drive is a three leg signalized intersection operating on a three phase semi-actuated traffic signal. The northbound (Easton Avenue) approach consists of a dedicated left turn lane and two dedicated through lanes. The southbound (Easton Avenue) approach consists of two dedicated through lanes plus right turn ramp for a nearside jughandle. The eastbound (Foxwoods Drive) approach consists of a dedicated left turn lane and a dedicated right turn lane.

Easton Avenue (CR 527) and Oakland Street / Harrison Towers

The intersection of Easton Avenue (CR 527) and Oakland Street / Harrison Towers is a four leg unsignalized intersection with 'stop' control on the Oakland Street / Harrison Towers approaches. The northbound and southbound (Easton Avenue) approaches consist of a shared left turn/through lane and a shared through/right turn lane. The eastbound (Oakland Street) approach consists of a single lane to accommodate all movements, and the westbound (Harrison Towers) approach is unstriped, but is wide enough to accommodate two approach lanes.

Easton Avenue (CR 527) and Franklin Boulevard (CR 617) / Landing Lane

The intersection of Easton Avenue (CR 527) and Franklin Boulevard (CR 617) / Landing Lane is a four leg signalized intersection operating on a four phase, fully actuated traffic signal. The northbound (Easton Avenue) approach consists of two dedicated through lanes plus a nearside jughandle to accommodate left and right turn movements. The southbound (Easton Avenue) approach consists of a dedicated left turn lane and a shared through/right turn lane. The eastbound (Franklin Boulevard) approach consists of a dedicated left turn lane and a shared through/right turn lane. The westbound (Landing Lane) approach consists of a dedicated left turn lane, a dedicated through lane, and a dedicated right turn lane.

Easton Avenue (CR 527) and Park Boulevard

The intersection of Easton Avenue (CR 527) and Park Boulevard is a three leg signalized intersection operating on a three phase pre-timed traffic signal. The northbound (Easton Avenue) approach consists of a dedicated left turn lane and a dedicated through lane. The southbound (Easton Avenue) approach consists of a dedicated through lane and a shared through/right turn lane. The eastbound (Park Avenue) approach consists of a dedicated left turn lane and a dedicated right turn lane.

Easton Avenue (CR 527) and Huntington Street

The intersection of Easton Avenue (CR 527) and Huntington Street is a four way 'K' shaped intersection operating on a two phase pre-timed traffic signal, with the entrance to Buccleuch Park one-way away from the intersection.. The northbound (Easton Avenue) approach consists of a dedicated through lane and a shared through/right turn lane. The southbound (Easton Avenue) approach consists of a dedicated left turn lane and a dedicated through lane. The westbound (Huntington Street) approach consists of a dedicated left turn lane and a dedicated right turn lane.

Easton Avenue (CR 527) and Ray Street / Courtland Street

The intersection of Easton Avenue (CR 527) and Ray Street / Courtland Street is a four leg signalized intersection operating on a two phase semi-actuated traffic signal. The northbound (Easton Avenue) approach consists of a single lane to accommodate all movements. The southbound approach consists of a shared left turn / through lane and a dedicated right turn lane. The eastbound (Courtland Street) approach consists of a dedicated left turn lane and a shared through /right turn lane. The westbound (Ray Street) approach consists of a single lane to accommodate all movements.

Easton Avenue (CR 527) and Hamilton Street (CR 514)

The intersection of Easton Avenue (CR 527) and Hamilton Street (CR 514) is a four way signalized intersection operating on a two phase semi-actuated traffic signal. The northbound and southbound (Easton Avenue) approaches consist of a single lane to accommodate all movements and the eastbound and westbound (Hamilton Street) approaches consist of a short dedicated left turn lane and a shared through/right turn lane.

Easton Avenue (CR 514) and Somerset Street

The intersection of Easton Avenue (CR 514) and Somerset Street is a four way signalized intersection operating on a two phase semi-actuated traffic signal. All four approaches to the intersection consist of a single lane to accommodate all traffic movements.

Easton Avenue (CR 514) and Albany Street / French Street (NJ 27)

The intersection of Easton Avenue (CR 514) and Albany Street / French Street (NJ 27) is a three leg signalized intersection operating on a three phase semi-actuated traffic signal. The southbound (Easton Avenue) approach consists of a dedicated left turn lane and a shared left turn / right turn lane. The eastbound (French Street) approach consists of a dedicated left turn lane and a dedicated through lane. The westbound (Albany Street) approach consists of a dedicated through lane and a dedicated right turn lane.

George Street (CR 672) and Landing Lane (CR 609)

The intersection of George Street (CR 672) and Landing Lane (CR 609) is a three leg intersection operating on a semi-actuated traffic signal. The northbound (Landing Lane) approach consists of a dedicated through lane and a dedicated right turn lane. The westbound (George Street) approach consists of a dedicated left turn lane and a dedicated right turn lane. The southbound (Landing Lane) approach consists of a single approach lane. Left turns from Landing Lane southbound are prohibited.

Existing Traffic Signal Coordination

Coordination among traffic signals along the study corridor is currently broken into three major sections, roughly along municipal lines. The signals in South Bound Brook operate on a time based coordination system, as do the majority of the signals in Franklin Township (Easton & Davidson and Easton & Franklin being the exceptions since they are fully actuated). The signals in Franklin Township employ five time-of-day plans including free float operations during overnight hours. Traffic signals in New Brunswick are predominately semi-actuated, but due to the volumes of vehicles and pedestrians, effectively operate as pre-timed signals during the day. Based on the timing directives, there are no set offsets between the corridor signals in New Brunswick.

2009 Existing Traffic Volumes

Peak hour traffic counts were conducted at each of the key corridor locations from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM in the fall of 2009. Data was collected based on vehicles by movement, heavy vehicles by movement, and bicycles and pedestrians by crossing. Based on the counts, the corridor wide peak was determined to be 7:30 AM to 8:30 AM and 5:00 PM to 6:00 PM. Based on the peak hour counts, the heaviest volumes are in the Franklin Township section of the corridor, particularly between Cedar Grove Lane and DeMott Lane. A comparison of existing traffic volumes for different segments

along the corridor is illustrated on the following pages. Details of the 2009 existing turning movement counts are provided as a technical appendix.

Figure 23: AM Peak Hour Traffic Volumes

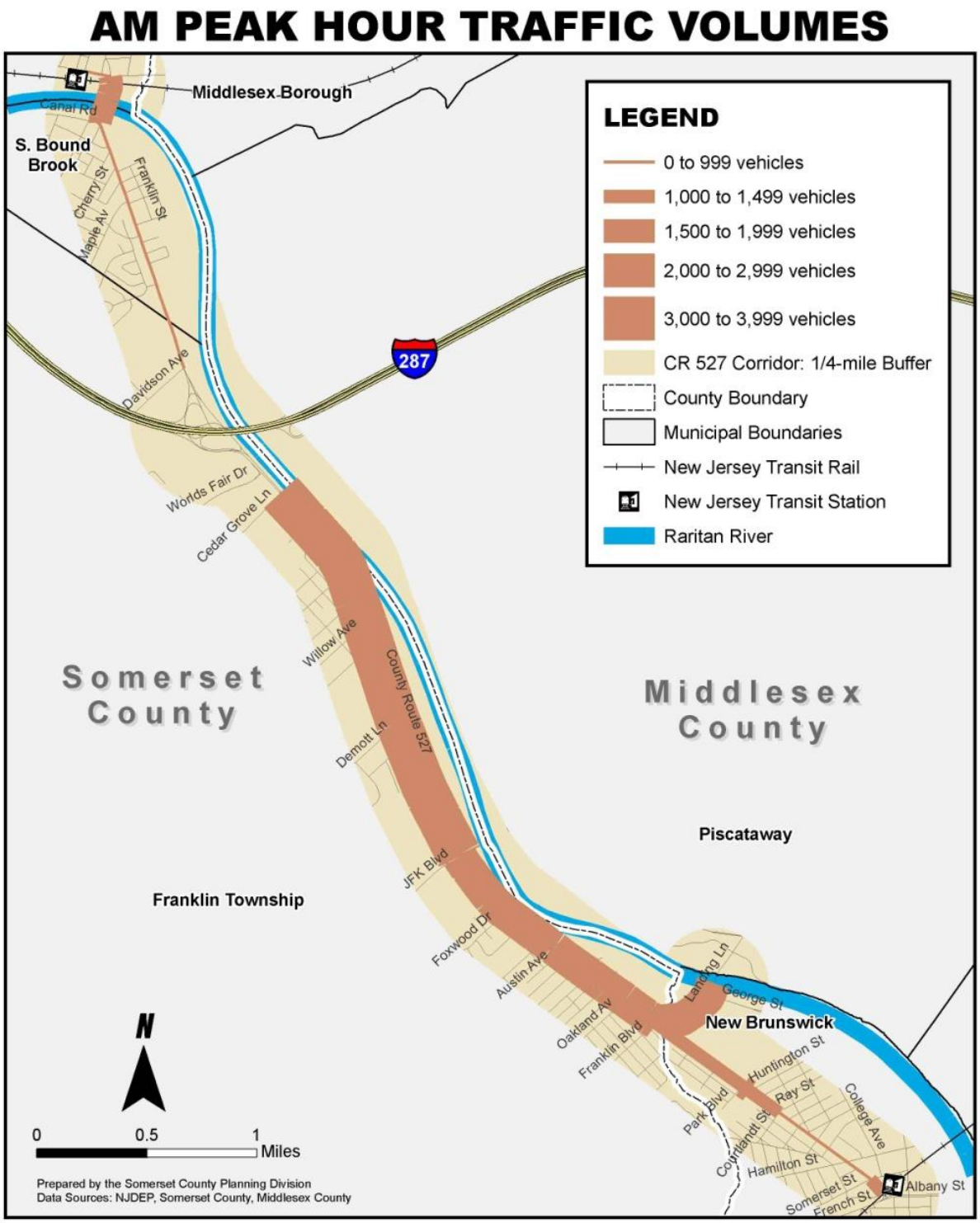
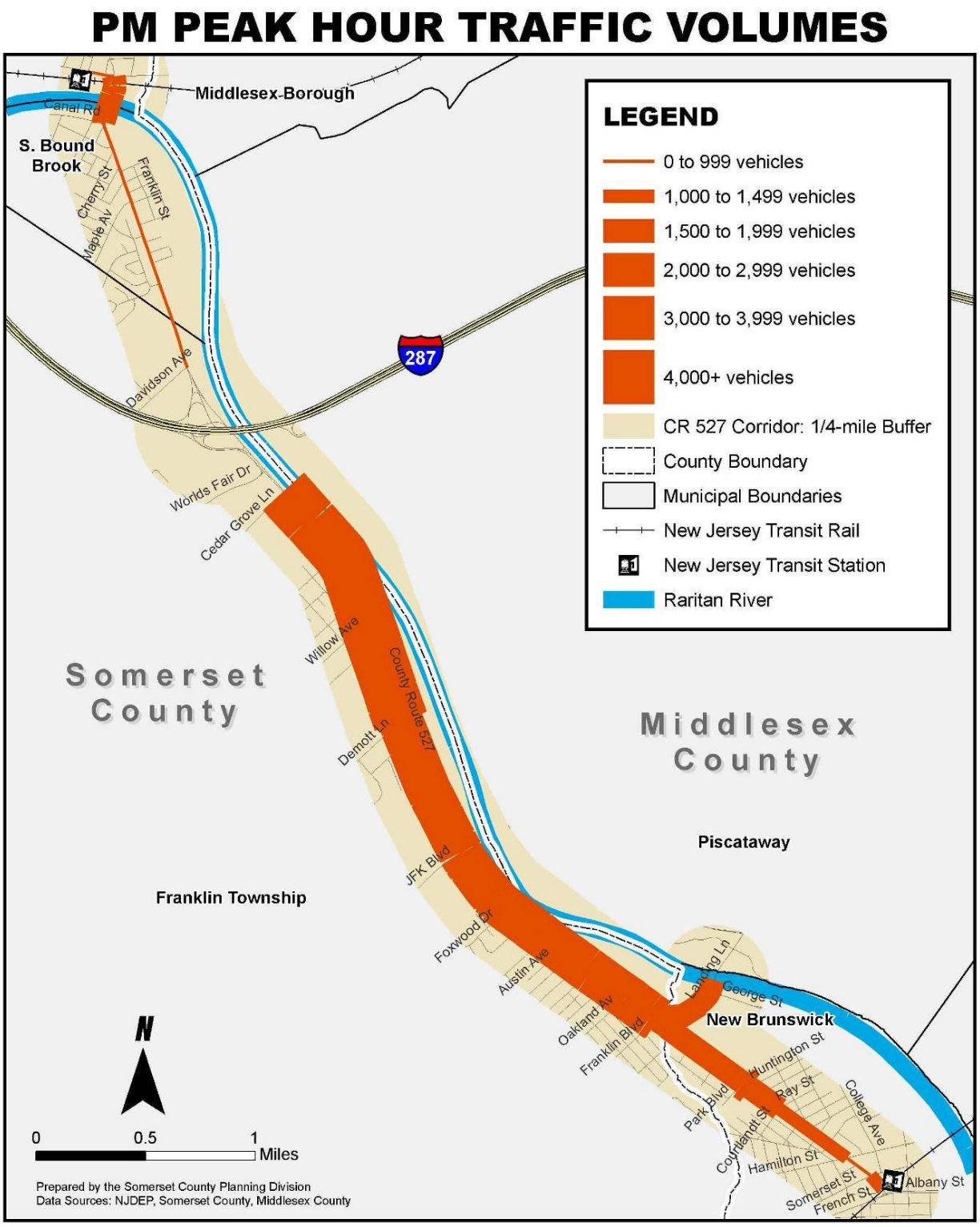


Figure 24: PM Peak Hour Traffic Volumes

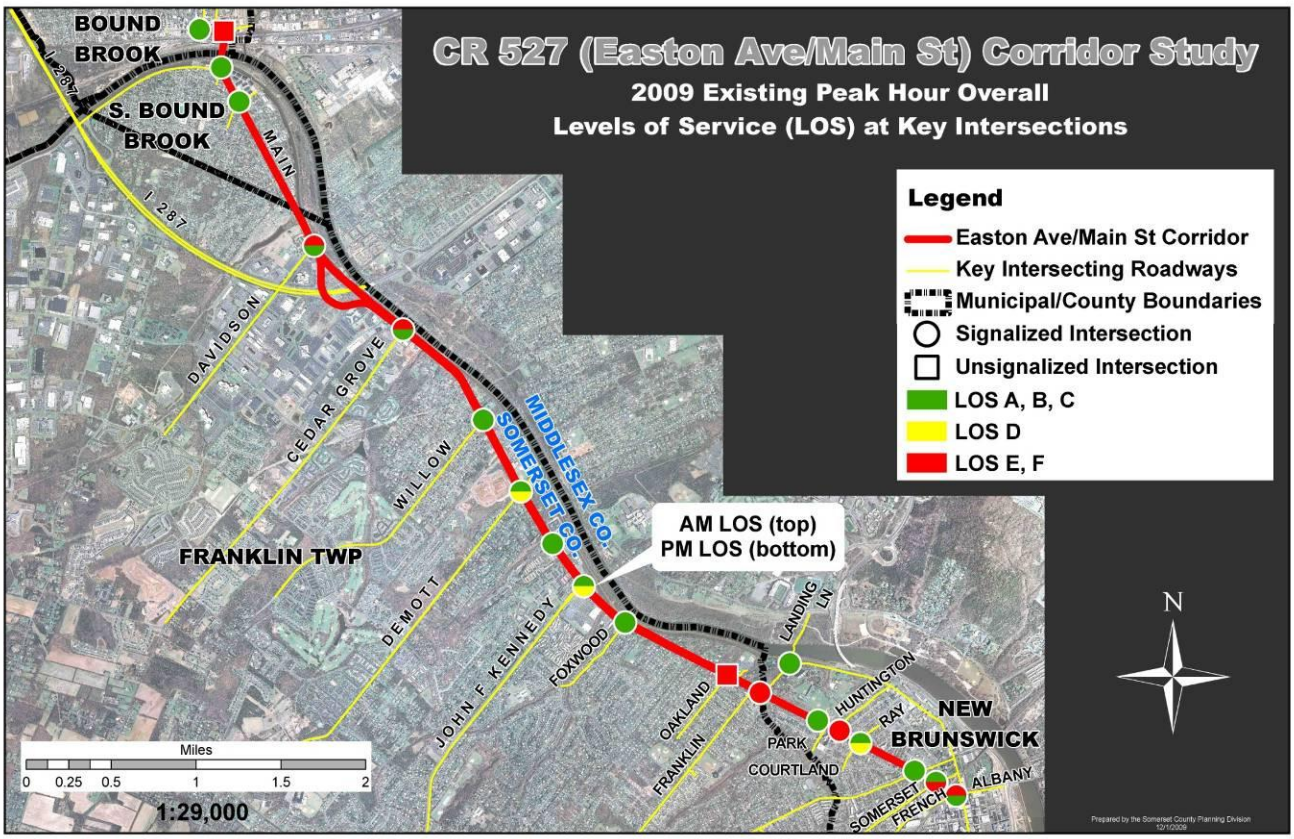


2009 Existing Peak Hour Levels of Service

Levels of service are commonly used to "grade" intersections by typical traffic delay. Using the existing roadway configuration, timing directives provided by the Somerset and Middlesex County Engineering Departments and the collected peak hour volumes, existing levels of service were calculated for each of the key study locations using Synchro, version 7 software. A comparison of the existing peak hour levels of service along the corridor are illustrated below. Detailed level of service reports are provided in the technical appendix. As the figure below shows, not every intersection along the corridor is operating at poor levels of service (LOS E or F). However, the intersections which do operate at poor levels of service tend to increase delays throughout the corridor, with long vehicle queues extending between intersections. The key intersections include:

- East Main Street & South Main Street / Bolmer Boulevard
- Easton Avenue & Davidson Road
- Easton Avenue & Cedar Grove Lane
- Easton Avenue & JFK Boulevard
- Easton Avenue & Franklin Boulevard / Landing Lane
- Easton Avenue & Huntington Street
- Easton Avenue & Somerset Street
- Easton Avenue & Albany Street

Figure 25: Existing Peak Hour Levels of Service at Key Intersections



Existing Operational Deficiencies

In addition to poor levels of service, which identify intersections where demand exceeds capacity, operational issues are present along the corridor that may not be readily apparent from the level of service analysis. Some of these operational deficiencies include:

East Main Street & South Main Street / Bolmer Boulevard

The intersection of East Main Street & South Main Street/ Bolmer Boulevard, also known as the Bound Brook Rotary, experiences additional vehicular delays due to other deficiencies in close proximity to the intersection. The narrow railroad underpass located immediately to the south of the rotary reduces vehicle speeds as they approach and depart from the rotary.

Easton Avenue & Davidson Road

While recent improvements by Somerset County have improved operations at the intersection of Easton Avenue and Davidson Road, its proximity to the Interstate 287 interchange contributes to delays as vehicles are forced to weave as they approach the intersection from the south. The recently installed northbound left / left/thru configuration has reduced congestion somewhat; however, the receiving lanes for the northbound approach are not wide enough to accommodate large wheelbase vehicles. Delays result when large trucks need to take both lanes to complete the turn.

Easton Avenue & Cedar Grove Lane

Due to the high demand for vehicles turning left from Cedar Grove Lane onto Easton Avenue to access I - 287, large numbers of vehicles routinely 'run' the red light for the eastbound left turn movement, blocking the intersection. Preliminary observations indicate that up to four cars per cycle run the red light on this movement. Enforcement is made difficult by the lack of available area to pull vehicles over and issue tickets.

Easton Avenue and Oakland Drive / Harrison Towers Driveway

The intersection of Easton Avenue and Oakland Drive / Harrison Towers Driveway is representative of many of the stop controlled intersections along Easton Avenue between Foxwood Drive and Franklin Boulevard. The rolling profile of Easton Avenue, compounded with the lack of turning lanes or shoulders make turns into and out of these streets difficult.

Easton Avenue and Franklin Boulevard / Landing Lane

In addition to the capacity constraints at the intersection of Easton Avenue and Franklin Boulevard / Landing Lane, queues for the southbound left turn movement from Easton Avenue to Landing Lane typically extend beyond the crest of the curve in Easton Avenue, making it difficult to determine the extent of the queue during peak hours.

Traffic Signal Coordination

Although the traffic signals along the study corridor are retimed on a regular basis by County personnel, the timers in the signal controllers tend to 'drift' over time, meaning the clocks eventually gain or lose a

few seconds. This reduces the effectiveness of signal coordination, and increases the amount of maintenance required to keep the system operating effectively.

Crash History / Analysis

A crash analysis was performed for the Easton Avenue corridor in order to identify any crash "hot spots" with a potential for short- or long-term correction. The initial evaluation of crash "hot spots" was performed using Rutgers "Plan4Safety" data to identify locations with an average of five or more total crashes per year from 2006 through 2008. Individual crash reports for each location were then requested from the municipal police departments. Vehicle crash reports were received from three of the four municipalities: New Brunswick, Franklin Township, and Bound Brook. The police department in South Bound Brook indicated it had no crash reports at the two locations identified through the review of the Plan4Safety database. It should be noted that the two highest-crash locations in South Bound Brook were far lower than those in the other three municipalities.

The crash data and analysis for the intersections in each municipality is presented in the following sections.

New Brunswick

The New Brunswick Police Department provided vehicle crash reports covering the period from January, 2005 to November, 2009, a period of 58 months, or just under five years. Crash reports were provided for the intersections of Easton Avenue with Mine Street, Huntington Street and Hamilton Street.

Easton Avenue and Mine Street

The crash reports indicate that during the study period, this intersection was the site of 46 crashes, an average of just under ten per year. The most significant crash pattern observed was that of right-angle crashes: 19 crashes (41% of the total) involved a vehicle approaching the intersection from stop-controlled Mine Street and colliding with a vehicle on Easton Avenue. Of these 19 right-angle crashes, at least 13[21] involved a vehicle approaching the intersection from Mine Street southbound.

A field view of the intersection indicated that there is a tavern on the northwest corner of the intersection; while the curb in front of this tavern is painted yellow to prohibit parking, short-term parking is commonplace and these parked vehicles represent a significant sight distance constraint for vehicles approaching the intersection from Mine Street southbound. Better enforcement of this parking prohibition will provide better sight lines for motorists on the southbound Mine Street approach and should help address this crash problem. It is noted that the companion memorandum regarding pedestrian and bicycle strategies recommends curb extensions at this intersection, both to shorten the pedestrian crossing length across Easton Avenue, but also because a curb extension here can unequivocally prevent parking.

There were 6 rear-end crashes, evenly split between the eastbound and westbound approaches. These crashes are indicative of either queues and congestion related to the adjacent traffic signals, or vehicles

[21] Of the 19 crashes for which reports were received, 3 indicated a right turn crash but with no reference to the direction of approach of the vehicles involved.

slowing or stopping for unanticipated maneuvers such as pedestrian crossings or vehicles parallel parking. Six other crashes involved one or more parked vehicles being struck.

Easton Avenue and Huntington Street

During the study period, this intersection was the site of 35 crashes, an average of just over seven per year. The predominant crash type was the rear-end, accounting for 14, or 40% of crashes. It is noted that there is a relatively short distance (200 feet) between the traffic signal at Huntington Street and that at Park Boulevard to the west. It is also understood that these closely-spaced traffic signals are not coordinated and do not operate on the same cycle length. In addition there are auxiliary (i.e., left-turn or right-turn) lanes at these intersections requiring some drivers to weave between lanes as they pass through this pair of intersections. The northbound Easton Avenue approach to Huntington Street is striped to provide two through lanes; however, just beyond this intersection the left lane becomes a dedicated left-turn lane onto Park Boulevard. The southbound Easton Avenue approaches to these intersections are similarly striped.

There were seven left turn crashes involving vehicles on southbound Easton Avenue turning left onto Huntington Street, colliding with a vehicle approaching from northbound Easton Avenue.

Potential strategies to address these crash issues include:

- Coordination of the signals, possibly so the two signals display the same indications to Easton Avenue at the same time;
- Redesign of the signal indications so that drivers only see one set of signal indications at a time;
- Implementation of a “protected-only” left turn phasing, including red left turn arrows to address the left turn crash problem; and,
- Clearer striping and improved advance warning signs related to the dedicated left turn lanes at these intersections.

Easton Avenue and Hamilton Street

During the analysis period, there were 32 crashes at this intersection, just under seven per year. Ten of these crashes (31%) were rear-end crashes, which were observed on three of the four approaches to this intersection. At a signalized intersection, rear-end crashes are generally indicative of congestion; while reduction of congestion at this intersection may address the problem of rear-end crashes it does not appear that the existing intersection constraints will allow for significant capacity improvement.

At this intersection there were also six crashes involving a parked vehicle being struck. In an area like this, parked vehicles near the intersection are often struck by vehicles attempting to “squeeze around” to the right of a stopped left-turning vehicle. Vehicles parked in “no parking” zones near the intersection may contribute to this problem. Although on-street parking is at a premium in this area, a minor extension of the “no parking” limits from the intersection may allow easier bypass of stopped left-turning vehicles and improve the efficiency of the intersection.

Franklin Township

The Franklin Township Police Department provided crash reports covering the period from January, 2007 through December, 2009, a period of 36 months, or three years.

Easton Avenue and Cedar Grove Avenue

This intersection was the site of 30 crashes over the three-year analysis period, an average of ten per year. The predominant crash pattern involved northbound Easton Avenue left-turning vehicles colliding with southbound Easton Avenue vehicles; there were 17 such crashes, or 57% of the total. This northbound left turn operates under "protected-permitted" phasing; that is, left turns can be made during a left turn green arrow phase, but drivers are also permitted to turn left under the circular green indication which requires them to yield to opposing through traffic. Changing the signal phasing to "protected only" left turn operation could help address this pattern. Under this plan drivers would only be able to make this left turn during the green left turn arrow phase, and would otherwise face a red left turn arrow. This safety improvement would, however, reduce capacity.

Four crashes were same-direction sideswipe collisions between vehicles in the two adjacent left turn lanes from Cedar Grove Avenue to Easton Avenue northbound. A modification to the center island on the west leg of Easton Avenue could provide more room for vehicles in these lanes, especially large trucks, to move side-by-side. Five crashes at this intersection were rear-end type crashes on the three intersection approaches. As noted previously, such crashes are often a byproduct of traffic signal congestion.

Somerset County has indicated that red-light running at this intersection is a very serious problem, with hundreds of red light violations observed in a single day. Enforcement has proven difficult since an officer who witnesses a red light violation has no place to safely stop the offending vehicle in the area of the intersection.

Easton Avenue and Franklin Boulevard / Landing Lane

This intersection was the site of 27 crashes over the three-year period, an average of nine per year. There were 14 left turn crashes (52% of the total) at this intersection. Seven of these involved a vehicle turning left from Easton Avenue southbound (i.e. heading into New Brunswick), and the other seven involved vehicles turning left from the Landing Lane / Franklin Boulevard approaches. There were also five rear-end crashes and three right-angle crashes.

Crash reports made frequent reference to drivers proceeding through the intersection on either a yellow or red signal. Although improved capacity could reduce driver aggression, increasing the capacity at this intersection will be difficult given the existing constraints, including residential development, a bridge structure and stream area.

Easton Avenue and Davidson Avenue

This intersection was the site of 19 crashes over the three-year period, an average of just over six per year. It should be noted that eight of these crashes were left-turn crashes, involving collisions between northbound Easton Avenue left-turning vehicles and southbound through vehicles. The traffic signal phasing at this intersection has since been revised to implement a "split" phasing, which means the two

Easton Avenue approaches now move separately. This phasing should address this pattern of left-turning crashes, since southbound Easton Avenue drivers face a red signal while the northbound left turn is permitted, and vice-versa.

Eleven of these crashes, or 58%, were same-direction sideswipes: three in the northbound Easton Avenue double left turn lanes onto Davidson Avenue; four in the southbound Easton Avenue lanes; and four in the Davidson Avenue double right turn lanes. All four of the crashes in the Davidson Avenue right turn lanes involved one large vehicle; two involved a bus and two involved a tractor-trailer. Better delineation of turning lanes, and/or improvement of the available turning radii, may help address this crash pattern.

Easton Avenue and Willow Avenue

There were eight crashes at this intersection over the three-year period, an average of just under three per year. Four crashes were right-angle crashes between a vehicle on Easton Avenue and a vehicle on Willow Avenue, which suggests a potential issue of signal visibility. Another three crashes involved a truck striking the signal equipment in some manner, either clipping a side-mounted signal or striking an overhead signal.

It is understood that Somerset County plans to redesign this traffic signal, at which time signal displays and horizontal and vertical clearances will be brought to County and national standards.

Borough of Bound Brook

The Bound Brook Police Department provided crash reports covering the period from January, 2007 through November, 2009, a period of 35 months, or just under three years.

Main Street Roundabout

This intersection had the highest crash rate of the intersections along the Easton Avenue corridor; with 36 crashes over the three-year period, an average of roughly 12 per year. Sixteen (comprising 44%) of these were rear end crashes on an approach to the roundabout--these include vehicles at the entrance to the roundabout as well as within queues on the approaches to it. Another four crashes were rear-end crashes within the circle of the roundabout itself.

Six crashes involved a truck striking a fixed object, either in the center of the roundabout or on one of the corners, while another six were right-angle crashes between a vehicle entering the roundabout and a vehicle already within it.

Perhaps the most notable statistic regarding this roundabout is that despite the fact that this roundabout had the highest rate of crashes per year of any intersection on the study corridor, these 36 crashes resulted in only 5 injuries and no fatalities. This is in keeping with an important attribute of roundabouts: crashes may still occur, but since roundabouts are designed to keep speeds low, the crashes that do occur are generally less severe than those that would occur at a typical intersection, where any high-speed right-angle, left-turn or rear-end crash is likely to result in injury.

It is understood that the geometry of this roundabout may not accommodate the turning radii of all large vehicles, as evidenced by the history of fixed-object crashes. Somerset County has indicated that the geometry of the roundabout was limited to what could be designed within the available right-of-way.

NJ Transit Rail Overpass

During the study period there were 27 incidents involving a large truck striking the rail overpass between the Queens Bridge and the Main Street Roundabout in Bound Brook. Of these, 26 crashes involved a northbound truck striking the bridge; the only crash involving a southbound truck (i.e. from Bound Brook to South Bound Brook) also involved an alcohol offense.

Based on the information provided in the crash reports, the following can be determined:

- Only five crashes involved a New Jersey-licensed driver; most drivers were from outside the greater NJ-NY metropolitan area;
- At least 21 of the incidents occurred during daylight hours;
- In four of the crashes the police reports indicate that a low clearance sign mounted on the overpass had been removed for a construction project; however, other static "low clearance" signs were still posted on the approach;
- 23 of the involved trucks appeared to be registered to commercial trucking lines; only three involved a truck rental (and thus potentially an inexperienced driver);
- Many drivers indicated they believed their trucks to be 13'-6" high, compared to the posted 13'-1" clearance.

Somerset County is reviewing a system of overheight detectors which will display a warning message to trucks determined to be too tall to clear the underpass. These signs should be placed no closer than the northbound Main Street approach to Canal Road in South Bound Brook, and on the eastbound Canal Road approach to Main Street since these are the last locations that will provide overheight truck drivers with an alternate route.

Other potential means to address this issue may include: the verification of the existing vertical clearance; posting of a lower vertical clearance for longer trucks (which may be more critical given the roadway profile); and ensuring that GPS navigation systems are aware of this clearance.

Planned Corridor Improvements

Improvements are planned at a number of locations along the corridor with existing concerns. These improvements include:

Queens Bridge – Bound Brook / South Bound Brook

In July, 2010 Somerset County received grant funding to install an over height truck detector system on South Main Street northbound approaching the Queens Bridge to warn and redirect vehicles away from the low clearance overpass. The detectors will likely be installed in the spring of 2012.

New Brunswick Train Station Near Term Intermodal Station Improvements

As part of planned upgrades to the New Brunswick Train Station, changes are proposed to the Easton Avenue and Albany Street intersection. The signal phasing will be modified to improve operations for pedestrians crossing Albany Street between the parking garage and the train station by eliminating the eastbound Albany Street lead through movement.

Easton Avenue & Cedar Grove Lane

To improve pedestrian access to the Middlesex County Utility Authority facilities located on the northbound side of Easton Avenue at Cedar Grove Lane, a break in the guide rail along with signal modifications was recently completed by Somerset County. The signal modifications include a 'No Right Turn' blank out sign which activates when the pedestrian button is pushed; this prevents right turning cars from Cedar Grove Lane from conflicting with pedestrians in the crosswalk.

Easton Avenue & Park Avenue

The City of New Brunswick has submitted for and obtained permission to install red light running cameras at the intersection Easton Avenue and Park Avenue to issue citations to vehicles that violate the red light on Easton Avenue.

Interstate 287 and Easton Avenue Interchange

NJDOT currently has plans in the initial stages of concept development to establish long term improvements for the Interstate 287 and Easton Avenue interchange in Franklin based on recommendations made during previous studies of the interchange and the corridor. These improvements will help alleviate congestion on both Interstate 287 and Easton Avenue, but will not replace the need for the improvements recommended herewith.

RECOMMENDED IMPROVEMENTS

In developing improvements for the corridor, consideration was given to the amount of time necessary to for design, permitting, and securing funding. The improvements were broken down into Immediate Term, Short Term, Medium Term, and Long Term improvements. Immediate term improvements are items that require minimal if any outside approvals and can usually be completed by maintenance level forces as funding is available. Short term improvements can be implemented in 1 to 2 years and medium term improvements can be implemented in 2 to 4 years subject to available funding. Long term improvements will likely require considerable permitting and design and take 5 to 10 years to complete, assuming funding is available.

Immediate Term Improvements

Supplemental Signage / Striping to Reinforce Existing Regulations

A number of signage and striping upgrades can be employed throughout the corridor to enforce the existing regulations currently in place.

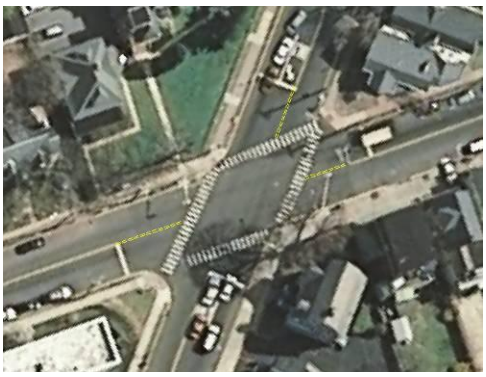
Striped No Parking Zones

No parking zones at intersections are present for vehicular and pedestrian safety to ensure that adequate sight distance is available for to see pedestrians and turning vehicles. Striped no parking zones could be helpful on Easton Avenue in New Brunswick to ensure that the required no parking zones remain clear by emphasizing the existing restrictions . One example of where is would be particularly helpful is at Mine Street. The striped no parking zones would be approximately 6 to 8 feet wide and typically 25 feet long, to match the no parking zones.

Striped no parking zones at Mine Street

'*Chicken Tracks' (Lane Line Extensions)*

'Chicken Tracks' (formally known as lane line extensions) are broken white or yellow lines which track through the intersection to help guide motorists into the appropriate receiving lanes. These markings would be particularly helpful in the areas where double turn lanes are present (such as Easton Avenue and Cedar Grove Lane, Easton Avenue and JFK Blvd) and at skewed intersections (such as Easton Avenue and Hamilton Street).



Lane line extensions at Easton Avenue & Hamilton Street.

Painted Shoulder Lines

Particularly in the area of South Main Street in South Bound Brook between Jackson Street and Barber Boulevard, the addition of a painted shoulder line will help define the travel lanes and potentially provide a traffic calming effect by giving the illusion that the roadway has narrowed. Similar treatments should also be considered on Easton Avenue in New Brunswick to help define the travel lanes and parking areas. Shoulder lines also have the visual effect of narrowing the roadway, helping to reduce speeds.

Far Side 'No Turn on Red' signs

Many of the intersections on Easton Avenue, particularly in New Brunswick have existing 'No Turn on Red' restrictions. The signs for these restrictions, however, are located in advance of the intersection, making it difficult for a driver who has stopped at the light to see if there is a restriction in place. The addition of far side 'No Turn on Red' signs mounted either on the signal poles or mast arms would help to eliminate confusion and crashes which occur from drivers making a right turn on red simply because they were unaware of the restriction.

Short Term Improvements

Signage Improvements on Easton Avenue south of Foxwood Drive

South of Foxwood Drive on Easton Avenue there are several median breaks to provide access to a series of homes via a service road. To clarify the operation of the driveways in this area, additional signage should be considered such as one-way and do-not-enter signs to better direct traffic.

Full Actuation of Landing Lane & George Street

While there are considerable constraints to widening the intersection of Landing Lane and George Street, modifications to the traffic signal operation to provide a fully actuated traffic signal would realize a modest improvement in operations without requiring any widening or roadway changes. The conversion of the signal to a fully actuated operation would allow the signal to change to the next phase waiting to be served without needing to hold in green for the northbound (George Street) approach as it does now. While this improvement would not significantly change operations during rush hour when all approaches to the intersection are congested, the more responsive, fully actuated traffic signal will help to reduce off peak congestion.

Hardwire Interconnect – Park Ave & Huntington Street

Due to the close proximity of the traffic signals at Easton Avenue & Park Avenue and Easton Avenue & Huntington Street a hardwire interconnect system is recommended to ensure that the traffic signals operate in concert. The hardwire interconnect system would eliminate the possibility of 'drift' between the two signals, ensuring that they remain coordinated at all times.

Easton Avenue & Franklin Boulevard Short Term Improvements

While major increases in capacity to the intersection of Easton Avenue and Franklin Boulevard will require significant right of way and mitigation of environmental and social impacts, minor operational improvements can be made at the intersection to improve safety and make sure the existing intersection configuration operates as efficiently as possible. The addition of a westbound (Landing Lane) right turn overlap arrow will allow additional vehicles to turn right onto Easton Avenue during the southbound lead left turn phase of the signal. Also, additional signage is needed on the northbound (Easton Avenue) approach from New Brunswick to make it clear that turning vehicles on this approach should use the provided jughandle.

Additional signage and striping should also be installed on Easton Avenue southbound approaching Franklin Boulevard / Landing Lane to encourage motorists who wish to continue south on Easton Avenue into New Brunswick to get into the right lane as soon as possible. This would include additional lane designation signs, possibly located overhead, and additional left turn only arrows on the pavement.

Protected Only Left Turn at Easton Avenue & Foxwood Drive

To mitigate left turn crashes at Foxwood Drive, the northbound left turn phase could be modified to provide a protected only left turn operation without significant reductions in delays at the intersection. The change would have little effect on mainline Easton Avenue.

GPS Clocks

To ensure that the existing signal coordination system along Easton Avenue is maintained, GPS clocks or some other coordination device should be installed on each of the traffic signals on Easton Avenue. The GPS clocks will synchronize the clocks in each signal controller to ensure that they do not drift over time, reducing the effectiveness of coordination.

Medium Term Improvements

Median Barrier Upgrades

While there is not a significant crash history involving vehicles crashing into the existing median barriers, the end treatments at a number of signalized intersections along Easton Avenue in Franklin Township should be upgraded to meet current standards. These upgrades would include the addition of 'quad guard' style end treatments to protect vehicles involved in a crash with the median barrier at intersections such as Unclaimed Freight Plaza and Willow Road.

Signalization of Easton Avenue & Mine Street

Consideration was given to installing a traffic signal at the intersection of Easton Avenue and Mine Street in New Brunswick. A traffic signal warrant analysis was performed for the intersection as part of the project, but indicates that traffic volumes are not sufficient to meet traffic signal warrants. The intersection should continue to be monitored to and a traffic signal considered when appropriate traffic volumes are present.

Grade Separation of the Port Readington Secondary

Consistent with the recommendations provided in the Somerset County Freight Study, options should be explored to relocate the Port Readington Secondary rail line where it crosses South Main Street. The Freight Study recommended potential realignment options which provided for the elimination of the at-grade crossing and the redirection of the existing rail traffic onto the railroad overpass north of the existing crossing.

Long Term Improvements / Concepts for Further Study

Dualization of Easton Avenue

To mitigate crashes along Easton Avenue involving vehicles turning left out of the stop controlled intersections along the corridor in Franklin Township, extending the median barrier could be considered. Since a project of this magnitude would require at a minimum 3-5 feet of roadway widening on each side of Easton Avenue, as well as significant access modifications along the corridor, further study including a complete alternatives analysis is recommended to determine if an improvement plan is feasible and can be implemented.

In order to provide a general description of the impacts necessary to implement this type of improvement, initial potential improvement options are discussed below.

Cut away sketch of the configuration of Easton Avenue with a median barrier installed – a minimum of 3-5 feet of widening could be required on both sides of Easton Avenue.

Cedar Grove Lane to Willow Road

Based on an initial review, a median barrier between Cedar Grove Lane and Willow Road, in addition to widening for the median, would require the construction of a jughandle in the vicinity of Willow Road to accommodate southbound vehicles wishing to make a u-turn movement. Northbound u-turns would have to be accommodated using the Interstate 287 Interchange. The additional jughandle at Willow Road would necessitate significant property acquisition, including possibly a full taking of a residential home.

Sketch of a possible location for a nearside jughandle at Franklin Boulevard.

Sketch of a possible location for a farside jughandle at Willow Road.

Foxwood Drive to Franklin Boulevard

For a median barrier to be installed between Foxwood Drive and Franklin Boulevard, a u-turn facility at Franklin Boulevard would be necessary to accommodate southbound vehicles looking to return north. Northbound u-turns would need to be accommodated via the existing jughandle at JFK Boulevard. The u-turn facility would require significant property acquisition, possibly including homes and businesses.

In addition to the u-turn facility at Franklin Boulevard discussed above, an additional signalized intersection at Bloomfield Avenue/ Highwood Road was also discussed as part of this study to provide for the residences and businesses along Easton Avenue an additional option to make u-turns. This option would also require significant property acquisition including homes and businesses. Since the addition of a median barrier would result in considerable impacts along the corridor, as stated previously, additional study is required.

Sketch of a possible location for jughandles at Bloomfield Avenue / Highwood Road

Pedestrian and Transit Impacts to Dualization

While the addition of a median barrier along sections of Easton Avenue would help to reduce crashes and move vehicular traffic along the corridor, a dualization will also have negative impacts on pedestrian and transit operations. The median will likely force pedestrians only to cross at signalized intersections, where there are breaks in the median. This will make pedestrian use of the corridor along these segments more difficult, and make it more difficult for pedestrians to access transit stops along the corridor.

Access Management

In the interest of good traffic operations and vehicular, pedestrian and bicyclist safety, opportunities for access management (controlling the design and location of driveways) should be pursued as part of future developments. Somerset County Engineering Department has identified opportunities as part of past projects, and will continue to seek to incorporate these strategies whenever possible.

Widening of the Main Street Bridge over the D&R Canal

Widening of the Main Street bridge over the D&R Canal to provide a southbound right turn lane approaching Canal Road (CR 623) was suggested late in the study as a way to help alleviate southbound congestion on Main Street, including spillback conditions into the Bound Brook Rotary. Further study for such an improvement is required to determine the feasibility of the improvement as well as the potential environmental impacts related to the modification of the structure.

CHAPTER 7: IMPLEMENTATION MATRIX

The following matrix summarizes all of the strategies recommended in the Easton Avenue/ Main Street Corridor Plan, and identifies the potential implementation lead agency; agencies or organizations that could provide funding or planning assistance; the time frame; and the priority of the strategy.

Transit-Friendly Design and Smart Growth Strategies					
#	**Strategy**	**Lead Agency**	**Potential Funding and/or Planning Assistance**	**Time Frame**	**Priority**
1	Designate nodal-based transportation management districts (TMDs).	New Brunswick; Franklin Township; South Bound Brook; Bound Brook	NJ Office of Planning Advocacy	Short	High
2	Amend zoning to allow transit-supportive densities and mixed uses within the TMDs.	Franklin Township; Bound Brook	NJ Office of Planning Advocacy	Medium	High
3	Support smart growth goals emerging from the 2010 Bound Brook Downtown Urban Design Plan.	Somerset County; Easton Avenue/Main Street Corridor Plan		Short	Low
4	Support smart growth goals emerging from Franklin Township's Canal Access Vision and Strategic Plan.	Somerset County; Franklin Township		Short	Medium
5	Adopt and implement transit-friendly design standards throughout the entire corridor as infrastructure is reconstructed.	New Brunswick; Franklin Township; South Bound Brook; Bound Brook	Land owners to provide when applying for redevelopment; NJDOT Local Aid and Safe Streets to Transit	Long	High
6	Install bilingual information kiosks at the rail stations, possibly with maps of downtown, and information about local points of interest merchants, existing transit services, and destinations.	Ridewise; KMM	NJ Transit, New Brunswick, Bound Brook, Keep Middlesex Moving, Ridewise	Short with proposed New Brunswick station improvements; Medium with Bound Brook	Medium
7	Conduct municipal workshops on how design improvements can implement policy decisions.	Middlesex and Somerset Counties, Study Municipalities	Middlesex and Somerset Counties Study Municipalities	Short	Low

Travel Demand Management Strategies					
#	**Strategy**	**Lead Agency**	**Potential Funding and/or Planning Assistance**	**Time Frame**	**Priority**
1	Designate nodal-based transportation management districts (TMDs), set corridor-wide goals, and node-specific mode share goals, and support TMA's efforts.	New Brunswick; Franklin Township; South Bound Brook; Bound Brook	TMAs; NJ Office of Planning Advocacy	Short	High
2	Offer discounted monthly DASH passes for employee bulk purchase.	Somerset County	Somerset County	Medium	Medium
3	Develop similar programs to New Brunswick's "Live Where You Work" program in other municipalities	Franklin Township; South Bound Brook; Bound Brook	New Jersey Housing and Mortgage Finance Agency	Medium	Low
4	Investigate reestablishing a car sharing program in New Brunswick.	New Brunswick; Keep Middlesex Moving	New Brunswick; Keep Middlesex Moving; private sector partnerships; private carsharing companies	Medium	Medium
5	Initiate a parking operations study for on-street demand-based pricing.	New Brunswick; South Bound Brook; Bound Brook	NJ Office of Planning Advocacy; United States Department of Transportation, Federal Highway Administration, Value Pricing Pilot Program	Medium	Medium
6	Tailor minimum parking requirements for off-street parking in TMDs.	New Brunswick; Franklin Township; South Bound Brook; Bound Brook	NJ Office of Planning Advocacy	Long	Medium
7	Adopt the 'unbundling' of parking costs, i.e., require line item payment of parking costs separate from real estate rental or purchase cost.	New Brunswick; Franklin Township; South Bound Brook; Bound Brook	NJ Office of Planning Advocacy	Short	High
8	Adopt a parking cash-out requirement so employees can choose between a subsidized parking space and equivalent funding for alternative transportation option.	New Brunswick; Franklin Township; South Bound Brook; Bound Brook	NJ Office of Planning Advocacy	Medium	Medium

Transit Strategies					
#	**Strategy**	**Lead Agency**	**Potential Funding and/or Planning Assistance[22]**	**Time Frame**	**Priority**
1	Extend Davidson Avenue Shuttle DASH service hours to 6AM to 8PM.	Somerset County	Section 5307; Section 5316 JARC; NJ Transit; NJ State Aid for Counties; Somerset County; Middlesex County	Medium	High
2	Increase Davidson Avenue Shuttle DASH service during peak hours.	Somerset County	Section 5307; NJ Transit; NJ State Aid for Counties; Somerset County; Middlesex County	Medium	Medium
3	Provide Saturday Davidson Avenue Shuttle DASH service.	Somerset County	Section 5307;NJ Transit; NJ State Aid for Counties; Somerset County; Middlesex County	Medium	High
4	Construct and renovate bus stops, update and expand bus route information, and provide amenities.	Somerset County; Middlesex County; New Brunswick; Franklin Township; South Bound Brook; Bound Brook (NJ Transit does not maintain bus shelters.)	Section 5309; NJ State Aid for Counties; Somerset County; Middlesex County	Medium	High
5	Extend Davidson Avenue Shuttle service to downtown Somerville and Bridgewater Commons Mall.	Somerset County	Section 5307; Section 5316 JARC; NJ State Aid for Counties; Somerset County	Long	Medium
6	Provide bilingual transit information via county or municipal Web sites, with links from TMA sites.	Somerset County; Ridewise; KMM	NJ State Aid for Counties; Somerset County; Middlesex County; Ridewise; KMM	Short	High
7	Ensure bus information is available via Google Maps.	Somerset County	NJ State Aid for Counties; Somerset County; Ridewise	Short	Medium
8	Provide bilingual bus stop signage, visible and user friendly, at all bus stops	Somerset County; Middlesex County; (NJ Transit does not	Section 5309; NJ State Aid for Counties; Somerset	Medium	High

[22] Traditionally, Federal transit funds have been apportioned to NJ Transit and not Somerset County; however the Federal government is currently revisiting transit funding allocations, so these sources should be considered for future DASH improvements.

	and rail stations (potential pilot program).	maintain bus shelters.)	County; Middlesex County;		
9	Investigate options for shelter capital funding and ongoing maintenance.	Somerset County; Middlesex County (NJ Transit does not maintain bus shelters.)	Section 5309; NJ State Aid for Counties; Somerset County; Middlesex County	Medium	Medium
10	Develop a park & ride lot.	Franklin Township; South Bound Brook; Bound Brook	Section 5309; Somerset County; Middlesex County	Long	Medium
Pedestrian and Bicycle Strategies					
#	**Strategy**	**Lead Agency**	**Potential Funding and/or Planning Assistance**	**Time Frame**	**Priority**
1	Install sidewalks where missing, and replace deteriorated sidewalk.	Franklin Township; New Brunswick	NJDOT Local Aid; NJDOT Transportation Enhancements Grant; land owners to provide when applying for redevelopment.	Long	High
2	Install pedestrian links between shopping centers and adjacent commercial or multi-family developments.	New Brunswick; Franklin Township; South Bound Brook; Bound Brook	Land owners to provide when applying for redevelopment.	Long	High
3	Increase width of sidewalks to minimum five feet.	New Brunswick; Franklin Township; South Bound Brook; Bound Brook	Land owners to provide when applying for redevelopment.	Long	High
4	Increase “clear width” by moving obstacles out of the walking/bicycling pathway of sidewalks and bike paths.	Middlesex County; Somerset County; New Brunswick; Franklin Township; South Bound Brook; Bound Brook	Middlesex County; Somerset County	Long	Medium
5	Evaluate pedestrian signal facilities, and upgrade as needed.	Middlesex County; Somerset County		Short	Medium
6	Install wide crosswalks and/or other crosswalk improvements at key intersections, such as Easton Ave & Hamilton St, Easton Ave & Somerset St. and Easton Ave & Mine in New Brunswick.	Middlesex County; Somerset County		Short	Medium
7	Install curb extensions or other traffic calming measures at key intersections.	Middlesex County; Somerset County	NJDOT Local Aid; NJDOT Transportation Enhancements Grant	Long	Medium
8	Conduct inventory of curb	Middlesex County;		Long	Medium

	ramps along corridor to determine compliance with ADA, and upgrade on ongoing basis.	Somerset County			
9	Install pedestrian crossing signs where missing and existing signs from "Yield to Pedestrians at Crosswalk" to "Stop for Pedestrians at Crosswalks."	Middlesex County; Somerset County		Short	Low
10	Conduct study of street lighting conditions along Easton Ave in New Brunswick and Franklin; determine viability of pedestrian-scaled street lights in New Brunswick, and better lighting coverage in Franklin.	Middlesex County; Somerset County; New Brunswick; Franklin Township;PSEG	PSE&G	Medium	Medium
11	Widen bike path in Franklin.	Somerset County; Franklin Township	NJDOT Local Aid Bikeways; NJDOT Transportation Enhancements Grant	Long	Low
12	Institute maintenance plan for bike path in Franklin.	Franklin Township	Adjacent property owners	Short	High
13	Install bicycle warning signs along bike path; work with property owners to remove shrubbery, signs, and other obstacles to sight distance at driveway intersections with Easton.	Somerset County; Franklin Township	Somerset County	Short (for bicycle warning signs); Medium (for addressing sight distance issues)	High
14	Evaluate use of shared lane markings on 2nd Street in Bound Brook and Main Street in South Bound Brook.	Somerset County; Bound Brook		Medium	Medium
15	Evaluate marking shoulders on Landing Lane.	Middlesex County		Medium	Low
16	Evaluate extension of bike path on Easton Avenue in Franklin.	Somerset County; Franklin Township	NJDOT Local Aid Bikeways; NJDOT Transportation Enhancement Grants	Long	Low
17	Install new bike parking facilities in study area.	Middlesex County; Somerset County; New Brunswick; Franklin Township; South Bound Brook; Bound Brook		Long	Medium
18	Install bike facilities on	Somerset County;		Long	Medium

	collector roadways in Franklin.	Franklin Township			
19	Institute bike sharing program in New Brunswick.	Rutgers University Transportation Department; KMM		Long	Medium
20	Evaluate surface of D&R Canal Towpath on ongoing basis; resurface as necessary.	D&R Canal Commission; Division of Parks & Forestry	NJDOT; Recreational Trails Program; NJDOT Transportation Enhancement Grants	Long	High
21	Improve amenities along Towpath.	Division of Parks & Forestry	Division of Parks & Forestry	Long	Low
22	Evaluate potential for additional access points to the Towpath.	D&R Canal Commission; Division of Parks & Forestry	Division of Parks & Forestry ; NJDOT Transportation Enhancements Grant, SAFETEA-LU transportation enhancement funding (for physical improvements)	Long	High
23	Provide guide signage to Towpath along corridor, and improve signage at access points.	Somerset County; Division of Parks & Forestry	Division of Parks & Forestry; Recreational Trails Program	Short	Medium
24	Approve use of Towpath by commuters before dawn and after dusk.	D&R Canal Commission; Division of Parks & Forestry	Division of Parks & Forestry	Short	Medium
25	Improve parking facilities at access points.	Middlesex County; Somerset County; Franklin Township; Division of Parks & Forestry	Recreational Trails Program; Division of Parks & Forestry	Long	Low
26	Extend Towpath past Landing Lane; connect with trail in Buccleuch Park.	Division of Parks & Forestry; Middlesex County; New Brunswick	Division of Parks & Forestry; SAFETEA-LU transportation enhancement funding; Recreational Trails Program	Long	Medium
Roadway Improvement Strategies					
#	**Strategy**	**Lead Agency**	**Potential Funding and/or Planning Assistance**	**Time Frame**	**Priority**
1	Provide supplemental signage & striping to reinforce existing regulations.	Somerset County; Middlesex County	County Maintenance Budgets	Short	Medium
2	Install signage Improvements at Easton Avenue south of Foxwood Drive.	Somerset County	County Maintenance Budget	Short	Medium
3	Provide full actuation of	Middlesex County	NJDOT Local Aid,	Medium	High

	the traffic signal at Landing Lane & George Street.		County Capital Budget		
4	Install hardwire interconnect at Park Avenue & Huntington Street.	Middlesex County; New Brunswick	NJDOT Local Aid, County Capital Budget	Short	High
5	Conduct study to determine improvements to implement at Easton Avenue & Franklin Boulevard.	Somerset County; Middlesex County	Local Safety Improvements Grants, NJDOT Local Aid, County Capital Budgets	Short	High
6	Provide protected left turn at Easton Avenue & Foxwood Drive.	Somerset County	Local Safety Improvements Grant, NJDOT Local Aid, County Capital Budget	Short	High
7	Provide GPS clocks for signals on Easton Avenue in Franklin.	Somerset County	NJDOT Local Aid, County Capital Budget	Medium	Low
8	Upgrade existing median barrier along Easton Avenue.	Somerset County	Local Safety Improvements Grant, NJDOT Local Aid, County Capital Budget	Medium	Low
9	Monitor for the possible future signalization of Easton Avenue & Mine Street.	Middlesex County; New Brunswick	Local Safety Improvements Grant, NJDOT Local Aid, County Capital Budget	Medium	Medium
10	Evaluate dualization of Easton Avenue in Franklin Township.	Somerset County	County Capital Budget	Long	Medium

Key to Time Frame:
Short – 1 year
Medium – 2 to 3 years
Long – 4+ years

QUICK WINS

The matrix notes that certain strategies are of a high priority and should be accomplished in the short term. It is recommended that study area agencies select these "quick wins" for implementation and begin to advance them in order to build momentum for other, inter-related strategies. These include:

Transit-Friendly Design and Smart Growth

- Designate nodal-based transportation management districts (TMD's).

Travel Demand Management

- Designate nodal-based transportation management districts (TMD's).
- Adopt the unbundling of parking costs.

Transit

- Provide bilingual transit information via county or municipal Web sites, with links from TMA sites.

Pedestrian & Bicycle

- Institute maintenance plan for bike path in Franklin Township.
- Install bicycle warning signs along bike path.

Roadway Improvements

- Install hardwire interconnect at Park Avenue & Huntington Street.
- Provide protected left turn at Easton Avenue & Foxwood Drive.

To ensure that action is taken to follow through with the recommended "quick wins," it is recommended that an Easton Avenue/ Main Street Corridor Plan Group be formed to oversee implementation. Comprised of the same key stakeholders that provided input and direction for the actual Plan, this group would meet on a periodic basis (twice a year is recommended) to discuss progress on strategies.

NOTE ON FUNDING

Some of the strategies will be relatively inexpensive and require little time, such as those requiring the simple installation of signs. Some strategies may require time to develop and approve – such as reviewing and revising ordinances to provide more transit-friendly language – but will also cost relatively little.

Another category of strategies are those which could require significant funding if implemented in the near term, but which will be relatively marginal costs if completed as part of other, regularly scheduled projects. For example, striping a roadway to install bike markings or shoulders would cost relatively little if included as part of a regularly scheduled roadway resurfacing, but costs would be higher if done in isolation. By the same token, moving signal equipment out of the Franklin Township bike path to increase bicycling clear width would be more feasible if done as part of a scheduled signal upgrade. Given the current difficult budget situation for public agencies, it may be desirable to wait to implement certain strategies until they can be packaged with other improvements.

Some strategies will require significant outlays regardless of how they are packaged. Enhancing transit services is an important part of the Plan. Funding for any transit improvements must be determined and explored during the initiation of that individual project. DASH is funded entirely by County funds and no County funds are currently designated for any of the proposed additional services. As Federal and State transit operations funds also are not currently considered available, the following best practices for funding from across the country should be investigated:

- Sales Tax Expenditure Plans: Dedicating a percentage of local sales tax to transit operations, frequently adopted by referendum.

- Self Taxing Districts: Expanding the recommended Transportation Management District concept, defining a district which will be served by DASH. The local businesses (and sometimes residents) pay an annual amount to provide the service; in exchange' they often have higher property values and recoup their costs upon sale of property.
- Parking Benefits Districts: Expanding on the recommended parking policies, first establish market-based parking fees for all on-street parking along the corridor and dedicate a portion of that revenue to the transit service. If in-lieu parking fees are authorized, then a portion of those fees should also go to the transit operations.
- Partnerships with institutional entities, businesses, residents, or other community groups would provide a direct benefit to those stakeholders.

Finally, as both project team members and stakeholders have commented throughout the process, the current poor economic climate will eventually improve. It may be necessary to postpone some strategies now, with consideration of implementing as budgets improve.

ACKNOWLEDGMENTS

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APPENDIX

Columbia Pike Parking Strategy
Example of Transportation Management District

Columbia Pike Parking Strategy

Adopted by the County Board on December 17, 2002
Updated November 2005

Introduction: The Columbia Pike Initiative (CPI) revitalization plan requires a flexible, diverse, and creative parking strategy that is accomplished using a variety of tools. The strategy must not exist in isolation, but be integrated into a comprehensive transportation plan that emphasizes walking and encourages transit and biking. Proactive public involvement is an essential element of the strategy, as it has been in other development areas including Ballston, Court House, Clarendon, and Shirlington.

Parking Goals:

1. Enable people to park once at a convenient location and access a variety of commercial enterprises in pedestrian-friendly environments by encouraging shared parking.
2. Create a coordinated, managed approach to parking that increases the visibility and accessibility of parking and uniformity of parking information, whether the parking is provided publicly or privately.
3. Reduce diffused, inefficient, single-purpose parking.
4. Avoid adverse parking impacts on neighborhoods adjacent to redevelopment areas.
5. Maximize on-street parking.
6. Provide flexibility for redevelopment of small sites and for the preservation of historic buildings.
7. Promote early prototype projects using flexible and creative incentives.

Parking Strategies:

1. Zoning (Form Based Code) and General Land Use Plan (GLUP).
    a. Concentrate redevelopment in commercial nodes.
    b. Establish minimum parking requirements for development on sites that exceed 20,000 square feet.
    c. Provide flexibility and incentives for meeting parking needs for projects on sites less than 20,000 square feet and for historic properties.
    d. Establish minimum requirements and incentives for shared parking.
    e. Establish limits and disincentives for single-purpose, private, and reserved parking.
    f. Provide flexibility to achieve parking requirements and goals on a redevelopment site or elsewhere within a redevelopment node.

2. Mitigation of impacts on residential parking.

a. Use residential permit parking to avoid adverse impacts on residential areas.
b. Extend the Douglas Park pilot permit program.
c. Within 30 days announce the parameters of a proposed residential permit program in Columbia Forest.
d. Within 90 days present proposals for public review on a comprehensive residential permit parking program.
e. Restrict inappropriate commercial vehicle parking.

3. Leadership.
   a. Proactively participate in the exploration of opportunities to achieve parking goals from the initial discussion of all redevelopment projects.
   b. Identify a parking coordinator to provide on-going analysis and leadership to achieve the following:
      i. Privately developed parking that is consistent with the County's goals;
      ii. Public-private partnerships;
      iii. Proposals for publicly provided parking (including on-street);
      iv. Mitigation of parking impacts on residential areas.
      v. Develop creative parking solutions for funding generated through contributions permitted by the Form Based Code.
   c. Provide consulting resources as necessary for the following:
      i. Evaluation of parking impacts of each redevelopment project.
      ii. Updating and monitoring of block by block parking supply, demand, and peaking trends.
      iii. Development of recommendations for implementation of a phased parking management strategy as necessary in the different nodes, including investigation and testing of specific solutions to solve parking problems (e.g. leasing of particular lots and conversion to public, short term use, etc.).

4. Parking Priorities.
   a. Establish parking zones in each redevelopment node as indicated on the attached map. Designate the parking zones as priority areas for implementation of the parking goals, including public participation in the creation of shared parking.
   b. Proactively explore opportunities for achieving goals in each redevelopment project, including either the maximization of shared parking in the project and/or the creation of parking for the project in a shared facility in its parking zone.

5. Parking Investment.
   a. Evaluate need and effectiveness of publicly leased parking to meet needs on an interim basis.
   b. Use economic incentive tools, including Tax Increment Public Infrastructure Fund (TIPIF), to achieve parking goals.
   c. Evaluate requirements for public investment in parking as part of the County's biennial Capital Improvement Program.

6. Maximize on-street parking.
   a. Subject to the recommendations of the Columbia Pike Street Space Planning Task Force, maximize on-street parking along Columbia Pike, particularly in the Town Center.
   b. Maximize on-street parking along proposed new streets throughout the redevelopment nodes (currently estimated to result in at least 160 additional spaces).
   c. Evaluate other on-street parking opportunities as part of the transportation analysis.

7. Visibility of parking.
   a. Provide short-term signage to identify public parking.
   b. Develop a comprehensive wayfinding program for Columbia Pike.

8. Public participation.
   a. As part of the quarterly updates of the implementation of the Columbia Pike Initiative and Form Based Code, explore the status of the parking strategies.

Other Related Strategies

1. Enhance Pedestrian Amenities. Making the Columbia Pike corridor a safer and more pleasant place for pedestrians will encourage people to walk instead of drive from nearby neighborhoods. It will lead to an environment where parking at a central location and walking to business, shopping and entertainment destinations is the norm. It will promote more efficient use of parking spaces by letting patrons park once and visit several destinations, rather than driving from place to place along the Pike.

   The Form Based Code requires new developments in the Columbia Pike Special Revitalization District to provide better pedestrian amenities, including adequate sidewalks, street trees, lighting and attractive streetscape. On-street parking will provide a buffer to the traffic, further encouraging walking. The placement of buildings behind the sidewalk

with retail uses on the ground floor will lead to a more urban ambiance that makes people more willing to walk.

In addition, the Columbia Pike Initiative includes a number of pedestrian improvements which County staff has recently completed or on which it is currently working[1]:

a. A streetscape project on South Garfield Street and 9th Road has been completed; another along Columbia Pike between Garfield Street and Glebe Road is currently under construction; and preliminary design work has been finished for a project between South Wakefield Street and South Four Mile Run Drive.

b. A median project between South Columbus and South Frederick Streets was completed, and another is planned for South Scott Street.

c. Five signals on Columbia Pike were upgraded with black mast arm poles, LED signals and countdown pedestrian signals during the last fiscal year: Glebe Road, Monroe Street, Quincy Street, George Mason Drive, Thomas/Taylor Streets. Highland Street has not been upgraded yet, as it is currently going through a realignment study.

d. On Frederick Street, pedestrian activated flashing beacons mounted on poles were installed on both directions in advance and also at the mid-block location to warn the motorists to stop for pedestrians in the crosswalk.

e. The south leg of Scott Street at Columbia Pike will be signalized and crosswalks and pedestrian signals will be added to Columbia Pike. Construction will start in the spring of 2006.

2. Improve Transit Options. Planned transit improvements in the Columbia Pike corridor will result in greater frequency, connectivity and reliability of transit services which will increase ridership and reduce demand for automobile parking. Proposed transit improvements for Columbia Pike include:

a. The restructuring of current Metrobus bus services.

[1] This section was updated as of November 2005.

b. New Arlington-centered routes providing connections between Columbia Pike and Pentagon City Metrorail Station with Metrorail-like services.

c. The use of small Arlington Transit (ART) buses connecting neighborhoods with activity centers along Columbia Pike.

d. Amenities to increase the comfort and convenience of transit for passengers, including transfer stations, new shelters with heating and lighting, improved access to bus stops, and better passenger information, including bus arrival time displays.

3. Enhance Bicycle Parking. Providing more bicycle parking in the Columbia Pike corridor will encourage people traveling to the corridor to consider using a bicycle. Increasing bicycle usage in the corridor will help to reduce demand for the limited vehicle parking currently available. The Form Based Code requires that new developments provide bicycle parking for residents and employees of new buildings and that new public bike parking be provided as part of the its streetscape requirements.

   Efforts to increase bicycle parking along Columbia Pike are already underway. The County and the Virginia Department of Transportation have installed bicycle racks within public rights-of-way along Columbia Pike over the past few years. Additional racks are available and suitable locations for installation of new racks will be identified and implemented. Additionally, bicycle parking will be incorporated into any new public parking lots or structures that are constructed within the corridor.

In addition, the following strategies are recommended for further consideration:

4. Development of convenient shared-use parking capacity along these new bus routes in Arlington and Fairfax Counties to serve transit riders who park and ride (less than 1% of riders) to avoid overflow parking in adjacent neighborhoods.

5. Requiring and/or encouraging building developers/owners/businesses to offer occupants transit, ridesharing, bicycling, and walking subsidies such as those offered by County and other large employers to their employees to reduce demand for automobile use and hence parking.

6. Exploring use of County contracted shared automobile programs within a defined area of Columbia Pike.