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Bicyclist on Eggerts Crossing Road
I. Introduction

The Township of Lawrence submitted an application to the New Jersey Department of Transportation – Office of Bicycle and Pedestrian Programs (NJDOT-OBPP) on December 24, 2007 to request bicycle and pedestrian planning assistance. Their stated goal was to develop and implement a comprehensive bicycle and pedestrian plan that includes improvements in the three (3) E’s (Engineering, Education and Enforcement), to enhance safety and mobility. They further expressed interest for bicycle compatible routes to major destinations, recreational opportunities, safety improvements, sidewalk network continuity and the incorporation of a bicycle and pedestrian plan into the Township’s Master Plan.

The NJDOT-OBPP requested that Michael Baker Jr., Inc. (Baker) provide bicycle and pedestrian planning assistance to the Township of Lawrence, Mercer County, NJ under the Local Planning Assistance Program. The purpose of the study was to identify and assess the condition of existing bicycle and pedestrian facilities, develop and evaluate treatments to improve bicycle and pedestrian access and mobility, and increase local knowledge of bicycle and pedestrian travel.

The outcome of this planning study is a two-part Action Plan. This document represents Part I of the Action Plan, the Planning Resource Manual. The Planning Resource Manual documents the activities, findings and determinations of the study including the data collection process, existing conditions assessment findings and concept development efforts. The manual also provides the
township with reference materials for future planning initiatives. Part II of the Action Plan is an *Implementation Workbook*. The *Implementation Workbook* identifies conceptual bicycle and pedestrian improvements and provides recommendations and cost estimates for the improvements. Each set of conceptual improvements is organized into individual ‘work package’ for implementation when funding becomes available.

A. Local Assistance Program
NJDOT initiated the Bicycle and Pedestrian Local Planning Assistance Program in 1997. Through this program, New Jersey municipalities have an opportunity to identify pedestrian and bicycle issues that they would like addressed in their community. Upon the request of a local entity, NJDOT provides consultant services to the community to conduct planning studies that evaluate needs and opportunities relating to bicycle and pedestrian circulation and safety. The result of the planning study then serves as a basis for developing recommendations for implementing specific improvements. The studies are locally driven in a partnership arrangement between NJDOT and applicant, and have a strong public outreach component.

B. Scope of Services
The Lawrence Township Local Bicycle and Pedestrian Planning Assistance Study was completed following the series of tasks described below:

1) **Data Collection:** Existing resources were obtained to support deficiency identification and concept development, including traffic volumes, bicycle and pedestrian crash reports, GIS data, Lawrence Township Bicycle and Pedestrian Task Force reports, information from the Lawrence Township Greenways Committee, and additional applicable reports and planning studies. Site visits were performed to identify the location of bicycle and pedestrian trip generators and existing bicycle and pedestrian travel patterns.

2) **Sidewalk Survey:** The presence and condition of existing sidewalks were inventoried in the township, and gaps and/or deficient sections in the sidewalk network were identified.

3) **Bicycle Facility Assessment:** The presence and condition of existing bicycle facilities were inventoried, and traffic counts and existing traffic volumes were collected to assess roadways for bicycle compatibility.

4) **Intersection Inventory and Assessment:** Inventory was performed at two (2) intersections identified as having mobility deficiencies by township officials for the presence of pedestrian facilities. Physical and operational deficiencies were identified.

5) **Regional Trail Network:** Data and available mapping was collected for existing and proposed bicycle facilities in Mercer County. Bicycle facilities, trails and proposed connections were illustrated on mapping.

6) **Traffic Calming Investigation:** Two (2) roadways were investigated for potential traffic calming measures. Roadways were selected based on bicycle and pedestrian activity, existing traffic volumes and speed study data.

7) **Conceptual Improvements:** Conceptual improvement schemes were developed to address identified bicycle and pedestrian deficiencies and opportunities. Concept-level schematics and renderings were developed to illustrate the improvement concepts.

8) **Local Officials Coordination and Public Outreach:** Baker attended Lawrence Community Day on October 5, 2008 to promote and discuss the study with the public and to provide general information about bicycle and pedestrian travel. A Public Information Center (September 17, 2008) and two (2) Study Task Force Meetings (June 16, 2008 and November 24, 2008), compromised of township, county, and state
officials as well as residents, were held to present study findings and recommendations.

C. Study Area
The Study Area included the Township of Lawrence, which encompasses approximately 22 square miles. Specific areas of investigation included major north-south and east-west travel corridors. Additional areas were also identified by township officials, and the public, as areas of concern for pedestrian and bicycle mobility. The Study Area is illustrated in Figure 1 and Figure 2 on the following pages.
FIGURE 1: STUDY AREA – REGIONAL CONTEXT
II. New Jersey Statewide Bicycle and Pedestrian Master Plan

The Local Assistance Program, and by association this study, is governed by the goals and objectives of the New Jersey Statewide Bicycle and Pedestrian Master Plan. The Master Plan maintains the following goals:

A. **Build the Infrastructure:** “Create bicycle and pedestrian infrastructure by planning, designing, constructing and managing transportation and recreational facilities that will accommodate and encourage use by bicyclists and pedestrians and be responsive to their needs.”

B. **Improve Access:** “Make community destinations, transit facilities and recreation facilities accessible and convenient for use by all types and skill levels of bicyclists and pedestrians.”

C. **Update Policies, Ordinances and Procedures:** “Reform land use planning policies, ordinances and procedures to maximize opportunities for walking and bicycling.”

D. **Educate and Enforce:** “Develop and implement education and enforcement programs that will result in reduction of crashes and a greater sense of security.”

E. **Foster a Pro-Bicycling and Walking Ethic:** “Increase bicycling and walking by fostering a pro-bicycling and pro-walking ethic in individuals, private sector organizations and all levels of government.”

Wherever possible, these goals should be factored into the bicycle and pedestrian planning and concept development process. *The Statewide Bicycle and Pedestrian Master Plan, Update* is contained in Appendix A.
III. Lawrence Township’s Existing Plans

Previous plans and proposed development plans for Lawrence Township were collected as part of this study. These plans were reviewed to identify desired improvements, current planning initiatives, and proposed private development in the township. The following plans and applications were collected:

1) **Lawrence Township Master Plan (June 1995)**, for comprehensive plan elements, including the local circulation, recreation and open space elements.
2) **Brunswick Avenue (Business Route 1) Boulevard Study (December 2005)**, for proposed streetscape improvements along Business Route 1 between Whitehead Road and the Brunswick Circle.
3) **Lawrence Road Planning Study**, for proposed planning activities in the vicinity of the Lawrence Road (Route 206) Commercial Area.
4) **Princeton Avenue and Spruce Street Traffic Safety Project**, for multi-modal transportation and land use improvements on Princeton Avenue, from the Brunswick Circle Extension to Olden Avenue, and on Spruce Street, from Princeton Avenue to Prospect Street.
5) **Lawrence Main Street Streetscape Development Plans**, for pedestrian, lighting and streetscape improvements along Main Street (Route 206) and Craven Lane.
6) **Lawrence Township Greenway Map and GIS data**, for existing and proposed on- and off-road trails in Lawrence.
7) **Lawrence Bicycle and Pedestrian Task Force Materials**, for task force recommendations on bicycle and pedestrian physical improvements and policy recommendations for the township.
8) **Lawrence-Hopewell Trail Map**, for the proposed regional bicycle route.
9) **Proposed Hopewell-Lawrence (Route 546) Bikeway**, for the proposed regional bicycle route.
10) **CVS Site Development Plan**, for proposed pedestrian improvements along Darrah Lane and Business Route 1.
11) **Senior Center Development Plan**, for proposed pedestrian improvements along Franklin Corner Road (Route 546).

Also collected were the preliminary plan maps from the *Mercer County Master Plan Update*. 
IV. Lawrence Township’s Bicycle and Pedestrian Network

Opportunities and deficiencies relating to Lawrence’s bicycle and pedestrian network were identified and evaluated through the course of this study. To identify opportunities and deficiencies, data was collected through field investigations and through input provided by the public and local officials. Comments were received from residents at a Public Information Center on September 17, 2008 and at Lawrence Community Day on October 5, 2008. Comments received addressed bicycle and pedestrian travel opportunities, and access and mobility improvements. Residents suggested sidewalk installation and repair, intersection enhancements, bicycle accommodations on roadways, and pedestrian and bicycle obstacles crossing the I-95 interchanges. A study postcard was designed and distributed at Lawrence Community Day to inform the public about the study. The postcard and a list of comments received at the Public Information Center are included in Appendix B.

A. Land Use, Bicycle and Pedestrian Trip Generators and Travel Patterns

To identify destinations and facilities accessed through bicycle and pedestrian trips, field observations were performed and land use maps were generated to delineate general land use types in the township. Local bicycle and pedestrian trip generators are detailed below, and identified on Map 1. Observed bicycle and pedestrian travel patterns are also illustrated on Map 1.

Commercial Services
Commercial services in Lawrence Township are primarily located on Route 1 (north of the Trenton Freeway merge), Business Route 1 (south of the Trenton Freeway merge), Route 206, Spruce Street and the Brunswick Circle. On both Route 1 and Business Route 1, there are restaurants, offices and shopping centers with retail and professional services, including the Lawrence Shopping Center, Mercer Mall and Quakerbridge Mall. Located along Route 206 are many local businesses, with a concentration of services in the Lawrence Road Commercial Area (Route 206 between Gainsboro Road and Lawrence Avenue) and in the Lawrenceville Main Street area (Route 206 between Green Avenue and Cold Soil Road). The Trenton Farmer’s Market and Halo Farm are located along Spruce Street, and nearby at the Brunswick Circle, is a McDonald’s, a QuickChek Convenience Store and Knapp’s Cyclery.

Civic Uses
The Lawrence Town Hall and the Police and Courts Building are located on Route 206, one block south of I-95. The Lawrence Library (which is part of the Mercer County Library System) and the Lawrence Senior Center are located on Darrah Lane near Business Route 1. The Lawrence Post Office is located nearby on Business Route 1.

Educational Uses
There are seven (7) public schools in Lawrence. The schools are listed in Table 1.
Table 1. Lawrence Public Schools

<table>
<thead>
<tr>
<th>School Name</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ben Franklin Elementary</td>
<td>Princeton Pike</td>
</tr>
<tr>
<td>Eldridge Park Elementary</td>
<td>Lawn Park Avenue</td>
</tr>
<tr>
<td>Lawrenceville Elementary</td>
<td>Craven Lane</td>
</tr>
<tr>
<td>Slackwood Elementary</td>
<td>Princeton Pike</td>
</tr>
<tr>
<td>Lawrence Intermediate</td>
<td>Eggerts Crossing Road</td>
</tr>
<tr>
<td>Lawrence Middle School</td>
<td>Princeton Pike</td>
</tr>
<tr>
<td>Lawrence High School</td>
<td>Princeton Pike</td>
</tr>
</tbody>
</table>

In addition, there are a number of other educational institutions in the township including: Notre Dame High School (Route 206), Rider University (Route 206), Lawrence Community Center (Eggerts Crossing Road), the Lawrenceville School (Route 206) and the Chapin School (Princeton Pike).

Recreation and Open Space
There are many Township parks in Lawrence, which range in size from small playgrounds to large recreational parks with playing fields. Prominent among the parks are: Central Park (Eggerts Crossing Road), Colonial Lake Park (Business Route 1), Drexel Woods (Drexel Avenue), Lawrence Veterans Park (Berwyn Place) and Village Park (Bergen Street and Yeager Drive). There are many preserved tracts of land in Lawrence, including preserved farms and environmentally sensitive areas. The Delaware and Raritan Canal State Park crosses through Lawrence, paralleling Route 1. A towpath is located in the park, and crosses Route 1 via a pedestrian bridge between Franklin Corner Road and I-95/I-295.

Mercer County Park Northwest and Rosedale Park are located in the northwest section of the township. A section of Mercer County Park is located in the southeast corner of the Township. Mercer County Park is a 2500-acre park with trails and recreational facilities, and is home to multiple festivals and sporting events.

Agricultural Uses
Many farms are in operation in Lawrence, and notable are Terhune Orchards (Cold Soil Road) and Cherry Grove Organic Farm (Route 206 and Carter Road).

B. Pedestrian Environment and Existing Facilities

Sidewalks were inventoried in the township on portions of Route 206, Business Route 1, Spruce Street (Route 613), Franklin Corner Road (Route 546), Princeton Pike (Route 583), and roadways within a third of a mile radius of Lawrence Public Schools (seven schools in total). Inventory worksheets were utilized to collect physical data for the sidewalks, and the categories in Table 2 were used in the sidewalk condition assessment.
Table 2. Sidewalk Condition Assessment Categories

<table>
<thead>
<tr>
<th>Condition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent Condition:</td>
<td>Well maintained or new sidewalk with no cracks, overgrowth (encroaching landscape) or obstacles.</td>
</tr>
<tr>
<td>Good Condition:</td>
<td>Nearly new sidewalk with very little distress.</td>
</tr>
<tr>
<td>Fair Condition:</td>
<td>Sidewalk with minor cracking, some overgrowth and/or a few obstacles.</td>
</tr>
<tr>
<td>Poor Condition:</td>
<td>Cracks in several sections with overgrowth and/or trees uprooting the sidewalk several obstacles in the walkway.</td>
</tr>
<tr>
<td>Very Poor Condition:</td>
<td>Extremely deteriorated sidewalks with severe cracks and/or sections completely covered by dirt, overgrowth or mud.</td>
</tr>
</tbody>
</table>

Map 2 and Map 3 illustrate the results of the sidewalk inventory and condition assessment.

In addition to sidewalks, work foot paths and paved walkways exist in the township and serve as connections between neighborhoods, parks and commercial services. GIS data identifying the location of the foot paths walkways were provided by the Lawrence Township Bicycle and Pedestrian Committee and the Lawrence Township Greenway Committee, and confirmed during site visits.
C. Bicycle Environment and Existing Facilities

Site visits were performed to observe bicycle travel patterns and to inventory the existing roadways for bicycle compatibility. Bicyclists were observed in many areas around the township and in specific locations such as Route 206, Princeton Pike, Bergen Street and the Delaware and Raritan Canal Towpath. Observed bicycle travel patterns are illustrated on Map 1.

Roadways in the township with available traffic volumes were inventoried to determine bicycle compatibility using NJDOT guidelines. Data collected included posted speed limit, pavement width (lane width and shoulder width), right-of-way width, pavement condition, on-street parking, bicycle compatibility of drainage grates, existing bicycle facilities (designated bicycle lanes and/or routes), location of traffic signals, lighting condition, roadway geometry, and potential horizontal and vertical sight distance issues. Traffic volume data was collected from NJDOT’s Roadway Information and Traffic Counts\(^1\) web site and the Delaware Valley Regional Planning Commission’s (DVRPC) Traffic Count web site\(^2\).

NJDOT’s *Planning and Design Guidelines for Bicycle Compatible Roadways and Bikeways* contains roadway compliance standards in the form of a table (Appendix D), which determine compatible pavement widths and recommended bicycle facilities. A matrix was then created to illustrate the compatibility results. Table 3 summarizes the data collected and bicycle compatibility results. Map 4 illustrates the results of the bicycle compatibility assessment.

---

<table>
<thead>
<tr>
<th>Street</th>
<th>From</th>
<th>To</th>
<th>AADT</th>
<th>Speed Limit</th>
<th>On Street Parking Permitted</th>
<th>Total Pavement Width</th>
<th>Direction Lane NB/SB</th>
<th>Shoulder Width 1 NB/SB</th>
<th>Shoulder Width 3 EB/ WB</th>
<th>Bicycle Compatible 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Princeton Pike</td>
<td>Spruce Street (Route 613)</td>
<td>Lanning Avenue</td>
<td>22,500</td>
<td>25 MPH</td>
<td>No</td>
<td>44'</td>
<td>11'//11'//11'//11'</td>
<td>--</td>
<td>--</td>
<td>No</td>
</tr>
<tr>
<td>Princeton Pike (Route 583)</td>
<td>Route 206</td>
<td>Carr Avenue</td>
<td>21,000</td>
<td>25 MPH</td>
<td>No</td>
<td>40'</td>
<td>20'//20'</td>
<td>--</td>
<td>--</td>
<td>Yes</td>
</tr>
<tr>
<td>Princeton Pike (Route 583)</td>
<td>Carr Avenue</td>
<td>Graf Avenue</td>
<td>21,000</td>
<td>25 MPH</td>
<td>Yes</td>
<td>40'</td>
<td>12'//12'</td>
<td>--</td>
<td>--</td>
<td>Yes (intermittent parking observed)</td>
</tr>
<tr>
<td>Princeton Pike (Route 583)</td>
<td>Graf Ave</td>
<td>Franklin Corner Road (Route 546)</td>
<td>21,000</td>
<td>25 MPH</td>
<td>No</td>
<td>44'</td>
<td>22'//22'</td>
<td>--</td>
<td>--</td>
<td>Yes</td>
</tr>
<tr>
<td>Franklin Corner Road (Route 546)</td>
<td>Route 1</td>
<td>Princeton Pike (Route 583)</td>
<td>10,000</td>
<td>40 MPH</td>
<td>No</td>
<td>50'</td>
<td>12'//13'//13'//13'</td>
<td>--</td>
<td>--</td>
<td>No 14’ shared lane needed</td>
</tr>
<tr>
<td>Franklin Corner Road (Route 546)</td>
<td>Princeton Pike (Route 583)</td>
<td>Executive Park Plaza</td>
<td>7,500</td>
<td>45 MPH</td>
<td>No</td>
<td>32'</td>
<td>13.5'//12.5'</td>
<td>2.5 – 3'</td>
<td>No</td>
<td>15’ shared lane needed</td>
</tr>
<tr>
<td>Franklin Corner Road (Route 546)</td>
<td>Executive Park Plaza</td>
<td>Route 206</td>
<td>7,500</td>
<td>45 MPH</td>
<td>No</td>
<td>32’ – 40’</td>
<td>16’//16’-24</td>
<td>--</td>
<td>--</td>
<td>Yes</td>
</tr>
<tr>
<td>Quakerbridge Road (Route 533)</td>
<td>Youngs Road</td>
<td>Village Road West</td>
<td>27,000</td>
<td>40 - 45 MPH</td>
<td>No</td>
<td>50’</td>
<td>13’//12’//12’//13’</td>
<td>--</td>
<td>--</td>
<td>No 6’ shoulder needed</td>
</tr>
<tr>
<td>Quakerbridge Road (Route 533)</td>
<td>Village Road West</td>
<td>Clarksville Road (Route 638)</td>
<td>32,000</td>
<td>45 - 50 MPH</td>
<td>No</td>
<td>62’</td>
<td>12’//12’//12’//12’ (w/14’ median)</td>
<td>--</td>
<td>--</td>
<td>No 6’ shoulder needed</td>
</tr>
<tr>
<td>Texas Avenue</td>
<td>Bus. Route 1</td>
<td>Princeton Pike (Route 583)</td>
<td>6,000</td>
<td>25 MPH</td>
<td>No</td>
<td>30’</td>
<td>15’//15’</td>
<td>--</td>
<td>--</td>
<td>Yes</td>
</tr>
<tr>
<td>Baker’s Basin Rd (Route 546)</td>
<td>Route 1</td>
<td>Lawrence Station Road</td>
<td>8,000</td>
<td>35 - 40 MPH</td>
<td>No</td>
<td>22’ - 24’</td>
<td>11’-12’//11’-12’</td>
<td>0 – 2’</td>
<td>No</td>
<td>14’ shared lane needed</td>
</tr>
<tr>
<td>Route 1</td>
<td>D &amp; R Pedestrian Bridge</td>
<td>Route 1 Split</td>
<td>69,000</td>
<td>55 MPH</td>
<td>No</td>
<td>72’</td>
<td>12’//12’//12’//12’ (w/barrier median)</td>
<td>12’//12’</td>
<td>--</td>
<td>Yes (where 12’ shoulders are maintained)</td>
</tr>
<tr>
<td>Business Route 1</td>
<td>Route 1 Split</td>
<td>East Darrah Lane</td>
<td>35,000</td>
<td>55 MPH</td>
<td>No</td>
<td>72’</td>
<td>12’//12’//12’//12’ (w/grass median)</td>
<td>10’//10’</td>
<td>--</td>
<td>Yes</td>
</tr>
</tbody>
</table>

3 On roadways with an Average Annual Daily Traffic (AADT) greater than 10,000, a shoulder width of 8’ should be provided wherever possible
4 If parking occurs intermittently then bicyclists could share the roadway as few conflicts with vehicles would potentially exist. However, if parking occurs frequently, then the likelihood for potential conflicts increase and sharing the roadways is not recommended.
<table>
<thead>
<tr>
<th>Street</th>
<th>From</th>
<th>To</th>
<th>AADT</th>
<th>Speed Limit</th>
<th>On Street Parking Permitted</th>
<th>Total Pavement Width</th>
<th>Direction Lane NB/ SB</th>
<th>Shoulder Width 1 NB/ SB</th>
<th>Direction Lane EB/WB</th>
<th>Shoulder Width 3 EB/WB</th>
<th>Bicycle Compatible 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Route 1</td>
<td>East Darrah Lane</td>
<td>Brunswick Circle</td>
<td>35,000</td>
<td>55 MPH</td>
<td>No</td>
<td>72'</td>
<td>12'/12'/12'/12'</td>
<td>10'/10' (w/shoulder drop off for right turning lanes or additional travel lanes)</td>
<td></td>
<td></td>
<td>Yes (where 10' shoulders are maintained)</td>
</tr>
<tr>
<td>Whitehead Road (Route 616)</td>
<td>Business Route 1</td>
<td>Route 1 Ramps</td>
<td>15,000</td>
<td>40 MPH</td>
<td>No</td>
<td>50'</td>
<td>13'/12'/12'/13'</td>
<td>--</td>
<td></td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Fackler Road (Route 589)</td>
<td>Route 206</td>
<td>Princeton Pike (Route 583)</td>
<td>4,000</td>
<td>40 MPH</td>
<td>No</td>
<td>22'</td>
<td>11'/11'</td>
<td>--</td>
<td></td>
<td></td>
<td>14' shared lane needed</td>
</tr>
<tr>
<td>Strawberry Street</td>
<td>Business Route 1</td>
<td>Route 1 Ramps</td>
<td>11,500</td>
<td>35 MPH</td>
<td>No</td>
<td>50'</td>
<td>13'/12'/12'/13'</td>
<td>--</td>
<td></td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Route 206</td>
<td>Princeton Pike (Route 583)</td>
<td>Gedney Road</td>
<td>12,000</td>
<td>40 MPH</td>
<td>No</td>
<td>36'</td>
<td>12'/14'</td>
<td>10'/0'</td>
<td></td>
<td></td>
<td>Yes - Northbound No – Southbound 4' shoulder needed</td>
</tr>
<tr>
<td>Route 206</td>
<td>Gedney Road</td>
<td>Lawrence Ave</td>
<td>12,000</td>
<td>40 MPH</td>
<td>No</td>
<td>36'</td>
<td>(w/ 12’ median or center turning lane)</td>
<td>12'/12'</td>
<td></td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Route 206</td>
<td>Lawrence Ave</td>
<td>Shelmet Lane</td>
<td>20,000</td>
<td>40 MPH</td>
<td>No</td>
<td>36'</td>
<td>12'/14'</td>
<td>10'/0'</td>
<td></td>
<td></td>
<td>Yes - Northbound No – Southbound 4' shoulder needed</td>
</tr>
<tr>
<td>Route 206</td>
<td>Shelmet Lane</td>
<td>I-95</td>
<td>20,000</td>
<td>40 MPH</td>
<td>No</td>
<td>39'</td>
<td>13'/13'</td>
<td>(w/13’ median or center turning lane)</td>
<td></td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Route 206</td>
<td>I-95</td>
<td>Titus Road</td>
<td>18,000</td>
<td>30 - 40 MPH</td>
<td>No</td>
<td>36'</td>
<td>18'/18'</td>
<td>--</td>
<td></td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Route 206</td>
<td>Titus Road</td>
<td>Gordon Avenue</td>
<td>18,000</td>
<td>30 MPH</td>
<td>No</td>
<td>36'</td>
<td>12'/12'</td>
<td>(w/12’ median or left turning lane)</td>
<td>12'/12'</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Route 206</td>
<td>Gordon Avenue</td>
<td>Carter Road (Route 569)</td>
<td>18,000</td>
<td>40 - 45 MPH</td>
<td>No</td>
<td>36'</td>
<td>12'/12'</td>
<td>6'/6'</td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Route 206</td>
<td>Carter Road</td>
<td>Province Line Road</td>
<td>15,000</td>
<td>45 MPH</td>
<td>No</td>
<td>28'</td>
<td>13'/13'</td>
<td>1'/1'</td>
<td></td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Eggerts Crossing Road</td>
<td>Route 206</td>
<td>Johnson Avenue</td>
<td>14,000</td>
<td>40 MPH</td>
<td>No</td>
<td>34'</td>
<td>17'/17'</td>
<td>--</td>
<td></td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Lawrenceville-Pennington Rd (Route 546)</td>
<td>Bergen Street</td>
<td>Federal City Road</td>
<td>9,000</td>
<td>50 MPH</td>
<td>No</td>
<td>50'</td>
<td></td>
<td></td>
<td>14'/14'</td>
<td>12'/10'</td>
<td>Yes</td>
</tr>
<tr>
<td>Federal City Road</td>
<td>Brandon Drive</td>
<td>Denow Road</td>
<td>8,000</td>
<td>45 MPH</td>
<td>No</td>
<td>32'</td>
<td>15'/15'</td>
<td>1'/1'</td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Street</td>
<td>From</td>
<td>To</td>
<td>AADT</td>
<td>Speed Limit</td>
<td>On Street Parking Permitted</td>
<td>Total Pavement Width</td>
<td>Direction Lane NB/SB</td>
<td>Shoulder Width ¹ NB/SB</td>
<td>Direction Lane EB/WB</td>
<td>Shoulder Width ³ EB/WB</td>
<td>Bicycle Compatible ⁴</td>
</tr>
<tr>
<td>---------------------------</td>
<td>-----------------------------------</td>
<td>----------------------------</td>
<td>------</td>
<td>-------------</td>
<td>-----------------------------</td>
<td>----------------------</td>
<td>----------------------</td>
<td>-----------------------</td>
<td>----------------------</td>
<td>----------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>Bergen Street</td>
<td>Lawrenceville-Pennington Rd (Route 546)</td>
<td>Cold Soil Road</td>
<td>2,400</td>
<td>25 MPH</td>
<td>Yes</td>
<td>36’</td>
<td>12’/12’</td>
<td>--</td>
<td></td>
<td></td>
<td>Yes (intermittent parking observed)</td>
</tr>
<tr>
<td>Carter Road (Route 569)</td>
<td>Route 206</td>
<td>Elm Ridge Road (Route 625)</td>
<td>7,000</td>
<td>45 MPH</td>
<td>No</td>
<td>28’ – 29’</td>
<td>12’/12’</td>
<td>2.5’-3’/2.5’-3’</td>
<td></td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Darrah Lane Business Route 1</td>
<td>Glenn Avenue</td>
<td>Route 206</td>
<td>5,000</td>
<td>25 MPH</td>
<td>No</td>
<td>36’</td>
<td></td>
<td>14’/14’</td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Darrah Lane Glenn Avenue</td>
<td>Birchwood Knoll Road</td>
<td>Route 206</td>
<td>5,000</td>
<td>25 MPH</td>
<td>Yes</td>
<td>44’</td>
<td></td>
<td>14’/14’</td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Darrah Lane Birchwood Knoll Road</td>
<td>Route 206</td>
<td>Darrah Lane</td>
<td>5,000</td>
<td>25 MPH</td>
<td>No</td>
<td>36’</td>
<td></td>
<td>14’/14’</td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Gainsboro Road Princeton Pike (Route 583)</td>
<td>Route 206</td>
<td>Gainsboro Road</td>
<td>4,000</td>
<td>25 MPH</td>
<td>Yes</td>
<td>36’</td>
<td></td>
<td>12’/12’</td>
<td></td>
<td></td>
<td>Yes (intermittent parking observed)</td>
</tr>
<tr>
<td>Province Line Road Route 206</td>
<td>Princeton Pike</td>
<td>Province Line Road</td>
<td>16,000</td>
<td>40 MPH</td>
<td>No</td>
<td>22’</td>
<td>11’/11’</td>
<td>--</td>
<td></td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Province Line Road (Route 569) Princeton Pike (Route 583)</td>
<td>Quakerbridge Road (Route 533)</td>
<td>Province Line Road</td>
<td>14,000</td>
<td>40 MPH</td>
<td>No</td>
<td>24’-26’</td>
<td>12’/12’</td>
<td>0’-1’/0’-1’</td>
<td></td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Brunswick Avenue Spruce Street (Route 613)</td>
<td>Mulberry Street</td>
<td>Brunswick Avenue</td>
<td>9,500</td>
<td>25 MPH</td>
<td>Yes</td>
<td>50’ – 65’</td>
<td>25’ – 31’/25’ – 31’ (w/median)</td>
<td>--</td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
</tbody>
</table>
Existing bicycle facilities were inventoried as well, including two (2) roadway sections with existing bicycle lanes. These facilities are detailed in Table 4.

Table 4. Existing Bicycle Facilities

<table>
<thead>
<tr>
<th>Street</th>
<th>Facility Type</th>
<th>From</th>
<th>To</th>
<th>Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>Princeton Pike</td>
<td>Bicycle Lane</td>
<td>Meadow Road</td>
<td>Princeton Township Border</td>
<td>4' – 5' (lane)</td>
</tr>
<tr>
<td>Federal City Road</td>
<td>Bicycle Lane</td>
<td>Lawrenceville-Pennington Road (Route 546)</td>
<td>Coach Drive (SB) Brandon Road (NB)</td>
<td>5' (lane)</td>
</tr>
<tr>
<td>Business Route 1 (Brunswick Pike)</td>
<td>Shared Roadway</td>
<td>Lake Drive</td>
<td>Pear Street</td>
<td>10' (shoulder)</td>
</tr>
<tr>
<td>Johnson Trolley Line Trail</td>
<td>Shared Use Path</td>
<td>Eggerts Crossing Road</td>
<td>Eldridge Avenue</td>
<td>10' (path)</td>
</tr>
</tbody>
</table>

Also located in the township is the Lawrence-Hopewell Trail, a planned and partially constructed 20+ mile combination of shared-use paths and on-road facilities within Lawrence and Hopewell Townships. The trail is located on private property easements, public open spaces and roadways. Up to date information at the trail’s website: [http://www.lhtrail.org/](http://www.lhtrail.org/).
D. Traffic Calming

A traffic calming investigation was performed for two (2) roadways: Eggerts Crossing Road and Franklin Corner Road (Route 546). These roadways were selected by Township Officials and the Study Task Force, and supplemented with field observations and additional traffic data, including traffic volume data.

There are various types of traffic calming measures, but the majority include physical measures to reduce the negative effects of motor vehicle speeding and traffic on non-motorized roadway users. Potential traffic calming measure were investigated and identified based on the existing roadway conditions, and on whether speed or volume control measures were applicable. The range of traffic calming measures considered is detailed in Tables 5 and Table 6.

<table>
<thead>
<tr>
<th>Volume Control Measure</th>
<th>Description</th>
<th>Illustration of Measure</th>
<th>Considerations</th>
</tr>
</thead>
</table>
| **Full Street Closures** | Barriers placed across a street to close the street completely to traffic | ![Illustration](image1)  | 1. Effects street network connectivity  
2. Can effect emergency vehicle response time  
3. Increases traffic on local parallel streets  
4. There may be legal issues associated with closing a public street |
| **Half Street Closures** | Barriers that block one travel lane                                           | ![Illustration](image2) | 1. Motor vehicles have a tendency to go around the barrier into the opposite lane of travel  
2. Not as effective for blocking through movements as a full street closure |
| **Diagonal Diverters**   | Barriers placed diagonally across an intersection blocking through movements | ![Illustration](image3) | See Full Street Closures                                                                                   |
Table 5. Volume Control Traffic Calming Measures (continued)

<table>
<thead>
<tr>
<th>Volume Control Measure</th>
<th>Description</th>
<th>Illustration of Measure</th>
<th>Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Median Barriers</strong></td>
<td>Raised islands located along the centerline of a street and continuing through an intersection to block through movement at a cross street.</td>
<td><img src="image1.png" alt="Illustration" /></td>
<td>1. Blocks access from cross streets diverting local traffic and causing circuitous movements for residents</td>
</tr>
<tr>
<td><strong>Forced Turn Islands</strong></td>
<td>Raised islands that block movements at an intersection. (e.g. right turn islands or forced channelization)</td>
<td><img src="image2.png" alt="Illustration" /></td>
<td>1. Restricts movement at an intersection, which causes turning traffic to access the blocked direction elsewhere (u-turn).</td>
</tr>
</tbody>
</table>

Table 6. Speed Control Traffic Calming Measures

<table>
<thead>
<tr>
<th>Speed Control Measure</th>
<th>Description</th>
<th>Illustration of Measure</th>
<th>Considerations</th>
</tr>
</thead>
</table>
| **Speed Humps/Bumps**      | Rounded raised areas placed across a street. | ![Illustration](image3.png) | 1. Can increase noise pollution  
2. Can cause damage to motor vehicles if they travel across the hump/bump at a higher than design speed  
3. Effective in reducing motor vehicle speeds |
| **Speed Tables/Raised Crosswalks** | Flat topped speed humps, usually textured. | ![Illustration](image4.png) | 1. Higher design speeds than humps/bumps  
2. Smoother travel for motor vehicles than humps/bumps  
3. Raised crosswalks provide a highly visible crossing location for pedestrians. |
<table>
<thead>
<tr>
<th>Speed Control Measure</th>
<th>Description</th>
<th>Illustration of Measure</th>
<th>Considerations</th>
</tr>
</thead>
</table>
| Raised Intersection   | Flat raised areas covering entire intersections, usually textured or stamped asphalt. | ![Illustration](image) | 1. Good for intersections with substantial pedestrian activity  
2. Calms motor vehicle traffic on all approaching streets |
| Neighborhood Traffic Circles | Raised islands placed in intersections around which traffic circulates. | ![Illustration](image) | 1. If small in scale can reduce approaching motor vehicle speeds and while maintaining bicycle compatibility.  
2. Positive aesthetic value |
| Roundabout            | See Traffic Circles | ![Illustration](image) | 1. Used on higher volume streets to allocate rights-of-way among competing movements  
2. Larger than neighborhood traffic circles  
3. More so intersection control than a traffic calming measure  
4. Good for locations with a history of crashes |
| Chicanes/Lateral Shifts | Curb extensions that alternate from one side of the street to the other forming S-shaped curves | ![Illustration](image) | 1. Impacts parking, driveway and cross street access  
2. No evidence it reduces motor vehicle speeds |
Table 6. Speed Control Traffic Calming Measures (continued)

<table>
<thead>
<tr>
<th>Speed Control Measure</th>
<th>Description</th>
<th>Illustration of Measure</th>
<th>Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neckdowns/Bulbouts</td>
<td>Curb extensions at an intersection that reduces roadway width curb-to-curb.</td>
<td><img src="image1.png" alt="Illustration of Measure" /></td>
<td>1. Reduces pedestrian crossing distance 2. Cause bicyclists to merge with motor vehicles</td>
</tr>
<tr>
<td>Chokers</td>
<td>Curb extensions mid-block that narrow the street by widening the sidewalk or planting strip.</td>
<td><img src="image2.png" alt="Illustration of Measure" /></td>
<td>1. Reduces traffic speed and volume 2. May require elimination of on-street parking</td>
</tr>
<tr>
<td>Center Island Narro...</td>
<td>Narrowing a roadway from the centerline.</td>
<td><img src="image3.png" alt="Illustration of Measure" /></td>
<td>1. Increases pedestrian safety by creating a stopping point mid-roadway 2. Reduces traffic speed and volume</td>
</tr>
</tbody>
</table>

Sources: [www.fhwa.dot.gov/environment/tcalm](http://www.fhwa.dot.gov/environment/tcalm); [www.ite.org/traffic](http://www.ite.org/traffic); Traffic Calming State of the Practice, ITE, 1999.

The following complimentary measures were also considered as part of the investigation:

Table 7. Complementary Measures for Traffic Calming

<table>
<thead>
<tr>
<th>Measure</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Police Enforcement</td>
<td>Speed Monitoring Trailer, Speed Watch, Safety Programs</td>
</tr>
<tr>
<td>Education</td>
<td>Give residents/students instructions on safe on-street vehicle, pedestrian and bicycle travel.</td>
</tr>
<tr>
<td>Bicycle Lanes</td>
<td>Designate a portion of the roadway for the exclusive use of bicyclists through striping, signing and/or pavement markings.</td>
</tr>
<tr>
<td>Gateway Improvements</td>
<td>Physical improvements at the entrance to a community indicating a change from a higher speed arterial to a lower speed residential district. (e.g. welcome signs, decorative lighting, landscaping, street furniture). Street furniture and landscaping enhance the environment by identifying the street as a “place” rather than a “route.”</td>
</tr>
</tbody>
</table>

Included on the following pages are the results of the traffic calming investigation and traffic calming recommendations identified for Eggerts Crossing Road and Franklin Corner Road.
Traffic Calming on Franklin Corner Road

<table>
<thead>
<tr>
<th>Road:</th>
<th>Franklin Corner Road (Route 546)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limits:</td>
<td>M.P. 9.28 – M.P. 9.98</td>
</tr>
<tr>
<td>Functional Classification:</td>
<td>Urban Minor Arterial</td>
</tr>
<tr>
<td>Speed Limit:</td>
<td>40 MPH</td>
</tr>
<tr>
<td>AADT:</td>
<td>13,000</td>
</tr>
<tr>
<td>Number of Lanes:</td>
<td>Four (4)</td>
</tr>
<tr>
<td>Pavement Width:</td>
<td>50'</td>
</tr>
<tr>
<td>Adjacent Land Uses:</td>
<td>Commercial and Residential</td>
</tr>
</tbody>
</table>

**Type of Calming Measures Investigated:**
- ☐ Volume
- ☒ Speed

**Summary of Investigation**

Franklin Corner Road (Route 546) has a four (4) lane cross-section, with 12’ and 13’ travel lanes in each direction. Although speed data is not available, during field observations it appeared that vehicles were traveling in excess of the posted speed limit (40 MPH). Additionally, there is an approximate distance of three-quarters of a mile between traffic signals on this section of Franklin Corner Road, which includes residential, commercial and office uses.

A road diet was investigated as a potential treatment for Franklin Corner Road. A road diet involves reducing vehicle travel lanes and reallocating roadway space for other modes of travel and potential uses (see Figure 3). The reallocated space can provide a benefit for many roadway users, including transit users, and increase bicycle and pedestrian mobility and access. Road diets have been successfully applied to roadways with an AADT under 20,000, and have resulted in speed reductions with minimal traffic diversions. However, this treatment requires analysis of peak hour traffic volumes and roadway capacity before it can be implemented.

On Franklin Corner Road, a road diet could include reducing the four (4) travel lanes to two (2) travel lanes, adding a center two (2) way left turn lane, and bicycle lanes or shoulders in each direction. Additionally, there may be potential for a landscaped median and/or pedestrian refuge island in locations where left turns are not expected or where mid-block pedestrian crossings may be needed.
Figure 3. Road Diet Example

Existing Cross-Section

Potential Cross-Section After Road Diet

Shoulder or Bicycle Lane
Traffic Calming on Eggerts Crossing Road

<table>
<thead>
<tr>
<th>Road:</th>
<th>Eggerts Crossing Road</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limits:</td>
<td>M.P. 0.83 – M.P. 1.46</td>
</tr>
<tr>
<td>Functional Classification:</td>
<td>Urban Collector</td>
</tr>
<tr>
<td>Speed Limit:</td>
<td>40 MPH</td>
</tr>
<tr>
<td>AADT:</td>
<td>8,700</td>
</tr>
<tr>
<td>Number of Lanes:</td>
<td>Two (2)</td>
</tr>
<tr>
<td>Pavement Width:</td>
<td>34’</td>
</tr>
<tr>
<td>Adjacent Land Uses:</td>
<td>Educational, Residential, Government and Recreational</td>
</tr>
</tbody>
</table>

Summary of Investigation

Eggerts Crossing Road was observed to have pedestrian and bicycle activity related to land uses along the corridor, including a park and recreation area, the Lawrence Middle School and a shared use path. Additionally, Eggerts Crossing Road has wide travel lanes (17’) with no striped shoulders and no parking permitted, which may contribute to observed travel speeds higher than the posted speed limit (40 MPH).

Installing raised crosswalks, bulbouts and/or a center island (pedestrian refuge island) on Eggerts Crossing Road could improve pedestrian accessibility and mobility. A raised crosswalk or bulbouts could increase pedestrian visibility and potentially reduce traffic speeds through horizontal deflection, or by visually narrowing the cartway. Installing bulbouts or a center island could reduce pedestrian crossing distances and potentially alleviate mid-block crossings at locations where a crosswalk does not exist. Complimentary improvements could include installing bicycle lanes and thermoplastic rumble strips in advance of crosswalks.

Images Source: [www.pedbikeimages.org](http://www.pedbikeimages.org)

Example of Center Island Narrowing with Pedestrian Refuge

Example of Raised Crosswalk at School Location
E. Regional Trails

Regional trails were identified within the township and in central Mercer County. Existing and proposed regional trails were identified through the NJDOT Statewide Bicycle and Pedestrian Master Plan, the Greater Mercer Transportation Management Association (TMA) Mercer County Bicycle Map and GIS Data provided by the Lawrence Greenways Committee. The trails that were identified in the township and the surrounding region are included in Table 8.

<table>
<thead>
<tr>
<th>Trail Name</th>
<th>Type</th>
<th>Description</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delaware and Raritan Canal Towpath (Main Canal)</td>
<td>Off-road, Shared Use Trail</td>
<td>Gravel path connecting between Trenton, NJ and New Brunswick, NJ</td>
<td>Existing</td>
</tr>
<tr>
<td>Delaware and Raritan Canal Towpath (Feeder Canal)</td>
<td>Off-road, Shared Use Trail</td>
<td>Gravel path connecting between Trenton, NJ and Milford, NJ</td>
<td>Existing</td>
</tr>
<tr>
<td>Lawrence-Hopewell Trail</td>
<td>On- and Off-Road Bicycle Trail</td>
<td>Loop Trail within Lawrence and Hopewell Townships</td>
<td>Partial Existing, Partial Proposed</td>
</tr>
<tr>
<td>Delaware River Heritage Trail</td>
<td>Off-road, Shared Use Trail</td>
<td>Loop Trail between Trenton, NJ – Morrisville, PA and Palmyra, NJ – Philadelphia, PA</td>
<td>Partial Existing, Partial Proposed</td>
</tr>
<tr>
<td>Johnson Trolley Line Trail</td>
<td>Off-road, Shared Use Trail</td>
<td>Off-road path between Gordon Avenue and Eldridge Avenue. Separated by I-95</td>
<td>Partial Existing, Partial Proposed</td>
</tr>
<tr>
<td>Johnson Trolley Line Trail Extension</td>
<td>Off-road, Shared Use Trail</td>
<td>Off-road path extension from Gordon Avenue, Lawrence, NJ, to West Hanover Street, Trenton, NJ</td>
<td>Proposed</td>
</tr>
<tr>
<td>Johnson Avenue Connector Trail</td>
<td>Off-road, Shared Use Trail</td>
<td>Off-road path connection to the Johnson Trolley Line Trail from Gordon Avenue Spruce Street</td>
<td>Proposed</td>
</tr>
<tr>
<td>Mercer County Park Trail</td>
<td>Off-road, Shared Use Trail</td>
<td>Internal park loop path along Lake Mercer in Mercer County Park</td>
<td>Existing</td>
</tr>
<tr>
<td>PSE&amp;G Trail</td>
<td>Off-road, Shared Use Trail</td>
<td>Trail along the PSE&amp;G utility right-of-way in West Windsor, NJ</td>
<td>Partial Existing, Partial Proposed</td>
</tr>
<tr>
<td>Trail Name</td>
<td>Type</td>
<td>Description</td>
<td>Status</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>-----------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>The College of New Jersey – Rider University Trail</td>
<td>Off-road, Shared Use Trail</td>
<td>Path connecting between the campuses of TCNJ and Rider University</td>
<td>Proposed</td>
</tr>
<tr>
<td>Route 31 Trail</td>
<td>Off-road, Shared Use Trail</td>
<td>Path connecting between the proposed Trolley Line trail extension and the TCNJ campus</td>
<td>Proposed</td>
</tr>
<tr>
<td>Hopewell – Lawrence (Route 546) Bikeway</td>
<td>On-road bicycle route</td>
<td>Bicycle route connecting between Washington Crossing State Park, Hopewell, NJ and Route 206 in Lawrence, NJ</td>
<td>Proposed</td>
</tr>
</tbody>
</table>

In addition to the trails identified in Table 8, the Lawrence Greenway Committee has proposed additional trail connections throughout the township. The results of the regional trails investigation and trail connections are illustrated on Map 5.
F. Intersection Inventory

An inventory and assessment was performed for two (2) intersections in Lawrence: 1) Route 206 and Franklin Corner Road/Lawrenceville-Pennington Road (CR 546) and 2) Business Route 1 and Darrah Lane. The intersections were identified by local officials as having existing or potential future pedestrian mobility issues. The inventory was conducted using the NJDOT Pedestrian Compatible Planning and Design Guidelines and worksheets were completed to identify the presence of sidewalks, curbs, crosswalks, curb ramps, pedestrian signals, and push buttons. Photographs were taken to record existing physical conditions and traffic signal timings were obtained. The results of the intersection inventories are detailed below and are illustrated on Plan 1 and Plan 2.

Route 206 and Franklin Corner Road/ Lawrenceville-Pennington Road (Route 546)

The signalized intersection of Route 206 and Franklin Corner Road/Lawrenceville-Pennington Road (Route 546) is a four-legged, three-phased signal with a variable cycle length of 77-129 seconds. The signal has loop detectors on the Route 206 approaches and video detection on the Franklin Corner Road/Lawrenceville-Pennington Road approaches.

There are existing sidewalks along each approach of the intersection, with the exception of the northern approach of Franklin Corner Road/Lawrenceville-Pennington Road, which has no sidewalk on either side. An existing bus stop (#606) is located on northbound Route 206, just south of the signalized intersection. ADA compatible curb ramps are provided at three (3) of the corners of the intersection (southeast, southwest and northwest). A standard striped crosswalk is provided across the northbound approach of the intersection. Installing crosswalks along the other approaches would provide pedestrians with connectivity to all four corners of the intersection. The existing crosswalk was found to meet the minimum NJDOT recommended crosswalk width of six (6) feet.

An observed unique feature of intersection is at the northeast corner where a gated driveway is located for the Lawrenceville School. Additionally, there is a gas station driveway on the southwest corner of the intersection, which creates an uncontrolled conflict point between vehicles, pedestrians and bicyclists. A high volume of truck traffic was observed at this intersection during the field visit.
The signal timing directive for the intersection indicates the pedestrian clearance time (during actuation) provides 15 seconds of green time for pedestrians to cross Route 206 during the Lawrenceville-Pennington Road right-of-way timing phase. The 15 seconds allows a pedestrian to cross at a walking speed of 4 feet per second (a typical walking speed utilized at signalized intersections) and appears to be adequate. Pedestrian push buttons and signals exist only on the Route 206 northbound approach. It is recommended that the existing signals be upgraded to include countdown signals, which assist pedestrians and bicyclists in determining the amount of time left to cross the approach of the intersection. It is further recommended that pedestrian push buttons and signals be installed on the other three (3) approaches of the intersection allowing pedestrians to more adequately cross through the signalized intersection. These added improvements would also benefit the anticipated increase in pedestrian activity generated by the future development of a senior living facility just east of the intersection along Franklin Corner Road. By providing pedestrian actuation to cross each of the roadway approaches, it allows the signal to operate more efficiently by extending the green phase of an approach when a pedestrian actuates the pedestrian phase of the signal.

A conceptual improvement plan to bring the intersection into compliance with NJDOT guidelines and improve pedestrian mobility at this intersection is provided in the Implementation Workbook, which is part 2 of the Action Plan.
Signalized Intersection of Business Route 1 (Brunswick Avenue) and Darrah Lane

The signalized intersection of Business Route 1 (Brunswick Avenue) and Darrah Lane is four-legged with a two-phased signal providing a variable cycle length of 90-105 seconds. The signal has loop detectors at each of the approaches. There are no existing sidewalks, curb ramps or crosswalks. Sidewalk is present on the western approach of Darrah Lane approximately 450 feet west of the intersection.

A CVS Pharmacy has been approved by the township for the southwest corner of the intersection. This development will provide sidewalks along the site frontage on Business Route 1 and Darrah Lane. However, the proposed pedestrian facilities for the CVS Pharmacy do not include curb ramps at the intersection or modifications to the traffic signal. ADA compliant ramps, sidewalks and crosswalks installed at this intersection could provide pedestrians with an improved connection between both sides of the Business Route 1 corridor.

The signal timing directive for the intersection indicates the pedestrian clearance time (during actuation) provides a minimum 20 seconds of green time for pedestrians to cross Business Route 1. The 20 seconds allows for a walking speed of 4 feet per second, which is a typical walking speed utilized at signalized intersections. However, during field investigation, it was determined that the crossing phase of the signal may require modifications as the actuated crossing phase did not allow enough time to cross Business Route 1. This timing requires further investigation to determine if the pedestrian actuation devices are working properly or if more time is required during the pedestrian actuation phase. There are no pedestrian signal heads at the intersection, and it is recommended that ‘countdown’ signal heads with updated push button assemblies be installed which will allow pedestrians and bicyclists to more adequately cross through the signalized intersection. The ‘countdown’ signal heads inform the pedestrian or bicyclist on the amount of time left to cross the intersection’s approach.
A conceptual improvement plan to bring the intersection into compliance with NJDOT guidelines and improve pedestrian mobility at this intersection is provided in the Implementation Workbook, which is part 2 of the Action Plan.
G. Interchange Inventory

Two (2) roadway interchanges were inventoried for existing facilities: 1) Princeton Pike and Interstate 95 (I-95), and 2) Route 206 and I-95. These interchanges were identified as having accessibility concerns for pedestrians and bicyclists by local officials and residents, who cited that I-95 acts as a ‘barrier’ to pedestrian and bicycle mobility along these roadway corridors and between areas of the township. The result of the interchange inventory is detailed on the following pages.

Figure 4. Route 206 and Princeton Pike I-95 Interchanges
Route 206 Interchange Crossing at Interstate 95

The Route 206 interchange crossing at Interstate 95 is a divided roadway providing one (1) travel lane and one (1) acceleration/deceleration lane in each direction. Shoulders and curbing are provided along this section of Route 206 with sidewalk provided only along the southbound side of Route 206.

There are no existing curb ramps or crosswalks at the ramp crossing locations for the sidewalk along Route 206 southbound. Many of the existing light fixture junction boxes have recessed below the existing sidewalk and there is overgrown vegetation at various locations along the existing sidewalks. There is no existing warning signage along Route 206 or at the exit ramps from I-95 that would alert drivers of the existing pedestrian crossing locations or the potential for bicyclists when merging to or from the ramps.
Princeton Pike (Route 583) Interchange Crossing at Interstate 95

The Princeton Pike (Route 583) interchange crossing at Interstate 95 is a divided roadway providing one (1) travel lane and one (1) acceleration/deceleration lane in each direction. Shoulders and curbing are provided along this section of the Princeton Pike overpass.

There is no existing sidewalk on either side of Princeton Pike and the I-95 interchange, with the exception of sidewalk on the overpass itself. There is existing sidewalk along northbound Princeton Pike approximately 400 feet south of the entrance ramp for I-95 North, and an existing asphalt paved path on the northbound Princeton Pike, approximately 650 feet north of the exit ramp from I-95 South. Warning signage is not present to alert drivers about the potential for bicyclists to be sharing the roadway along this section of roadway.
V. Crash Analysis

Bicycle and pedestrian crash reports were requested from the New Jersey Department of Transportation (NJDOT-BSP) Bureau of Safety Programs and the Lawrence Township Police Department for the most recent four years available (April 2004 – March 2008). The reports were requested to determine the crash history of bicyclists and pedestrians in Lawrence Township. Below is a summary of information obtained from the crash reports. Reported bicycle and pedestrian crash locations are illustrated and referenced by number in Figure 5.

**Bicycle Crashes**

There were fifteen (15) reported crashes involving bicyclists between April 2004 and March 2008. Seven (7) crashes involved bicyclists under the age of 18 and nine (9) of the crashes included improper operation by a bicyclist (either riding against traffic or on the sidewalk).

1. **May 24, 2004 (11:43am)** – A crash involving a bicycle and vehicle occurred on southbound Brunswick Pike (Business Route 1) at the Lawrence Post Office driveway. The minivan, while exiting the property onto southbound Brunswick Pike, was struck by the bicyclist who was traveling northbound along the southbound lanes. The bicyclist was not wearing a helmet and suffered no injuries.

2. **June 5, 2005 (4:24pm)** – A crash involving a bicycle and a vehicle occurred on Lawrence Road (Route 206) south of Craven Lane. The vehicle was traveling northbound when the bicyclist veered off of the sidewalk into the path of the vehicle and was struck. The bicyclist was not wearing a helmet and was under the age of 18. The bicyclist suffered minor injuries.

3. **June 21, 2005 (9:47pm)** – A crash involving a bicycle and vehicle occurred at the intersection of Lawrence Road (Route 206) north of Gordon Avenue. The bicyclist was traveling south along the northbound lane of Lawrence Road when he crossed over to the southbound travel lane and was struck by the vehicle. The bicyclist was not wearing a helmet and was under the age of 18. The bicyclist suffered moderate injuries and was issued a summons.

4. **July 1, 2005 (5:05pm)** – A crash involving a bicycle and vehicle occurred at the intersection of Princeton Pike (County Route 583) and Cresthill Road. The bicyclist was traveling south along the northbound curb and struck the vehicle as it turned right onto Princeton Pike. The bicyclist suffered no injuries.

5. **July 24, 2005 (12:25pm)** – A crash involving a bicycle and vehicle occurred at the intersection of Lanning Avenue and Princeton Avenue (Business Route 1/Route 206). The bicyclist was traveling south in the northbound lane on Princeton Avenue and was struck by the vehicle as it turned right onto Princeton Avenue. The bicyclist suffered no injuries.

6. **October 15, 2005 (2:49pm)** – A crash involving a bicycle and vehicle occurred at the intersection of Federal City Road and Surrey Drive. The bicyclist was traveling south on Federal City Road in the bicycle lane and was struck by the vehicle making a right turn as the bicyclist approached Surrey Drive. The bicyclist suffered minor injuries.
7. **March 17, 2006 (4:56pm)** – A crash involving a bicycle and vehicle occurred at the intersection of Gainsboro Road and Lawrence Road (Route 206). The bicyclist was traveling south on Lawrence Road and was struck in the crosswalk as the motorist was attempting to turn right on a red signal. The bicyclist was not wearing a helmet and was under the age of 18. The bicyclist suffered minor injuries.

8. **March 27, 2006 (3:54pm)** – A crash involving a bicycle and vehicle occurred on Brunswick Pike (Business Route 1) at the driveway for 1781 Brunswick Pike. The bicyclist was traveling north on Brunswick Pike along the southbound shoulder and was struck as the vehicle exited the driveway. The bicyclist was not wearing a helmet. The bicyclist suffered no injuries and was issued a summons.

9. **April 24, 2006 (6:06pm)** – A crash involving a bicycle and vehicle occurred at the intersection of Brunswick Pike (Business Route 1) and President Avenue. The bicyclist was traveling south on the sidewalk along the northbound lanes of Brunswick Pike and was struck by a vehicle, which was turning from President Avenue on to Brunswick Pike. The bicyclist was under the age of 18 and suffered minor injuries. Both the driver and the bicyclist were issued summons.

10. **May 31, 2006 (7:17pm)** – A crash involving a bicycle and vehicle occurred at the intersection of Greenfield Avenue and Rubert Drive. The bicyclist was traveling north on Rubert Drive and failed to obey a traffic control device at the Greenfield Avenue approach. The bicyclist was not wearing a helmet and was under the age of 18. The bicyclist suffered minor injuries.

11. **December 23, 2006 (1:42pm)** – A crash involving a bicycle and vehicle occurred at the intersection of Brunswick Pike (Business Route 1) and Pear Street. The bicyclist was traveling south along northbound lanes of Brunswick Pike and struck the vehicle as it started to cross Brunswick Pike. The bicyclist suffered no injuries, and both the driver and the bicyclist were issued summons.

12. **April 22, 2007 (1:17pm)** – A crash involving a bicycle and vehicle occurred at the intersection of Lawrence Road (Route 206) and Eggerts Crossing Road. The bicyclist was traveling north along the northbound lanes on Lawrence Road and was struck by a hit and run driver making a left turn from Eggerts Crossing Road. The bicyclist suffered moderate injuries and was taken to the hospital.

13. **May 18, 2007 (4:18pm)** – A crash involving a bicycle and vehicle occurred at the intersection of Gedney Road and Princeton Pike (County Route 583). The bicyclist was traveling north on the northbound sidewalk and struck a vehicle waiting at a traffic signal. The bicycle left the scene.

14. **October 8, 2007 (4:34pm)** – A crash involving a bicycle and vehicle occurred on Vermont Street, south of Brunswick Avenue. The bicyclist was traveling west on Vermont Street and struck a vehicle turning in front of the bicycle to enter a driveway. A passenger on the bicycle suffered minor injuries and the driver of the vehicle was issued a summons.

15. **March 25, 2008 (1:59pm)** – A crash involving a bicycle and motorcycle occurred at the intersection of Princeton Pike (County Route 583) and Lawrence Road (Route 206). The
bicyclist was crossing Princeton Pike and was struck by the motorcycle. The bicyclist was not wearing a helmet and was under the age of 18. The bicyclist suffered minor injuries.

**Pedestrian Crashes**
There were nineteen (19) pedestrian crashes reported between April 2004 and March 2008. Nine (9) crashes occurred at signalized intersections and six (6) crashes occurred at locations where a crosswalk was not present. Crash locations are illustrated on Map 1.

1. **April 6, 2004 (5:06pm)** – A crash involving a pedestrian and vehicle occurred at the intersection of Lawrence Road (Route 206) and Carter Road (County Route 569). The pedestrian, who was a firefighter directing traffic, was struck by the side view mirror of a vehicle turning from Carter Road to Lawrence Road. The pedestrian suffered minor injuries (contusion).

2. **May 6, 2004 (3:47pm)** – A crash involving a pedestrian and vehicle occurred at the intersection of Brunswick Pike (Business Route 1) and Texas Avenue. The pedestrian was crossing southbound Brunswick Pike when they were struck by a vehicle turning right from Texas Avenue to southbound Brunswick Pike. The pedestrian suffered no injuries and the vehicle fled the crash scene.

3. **July 27, 2005 (9:15am)** – A crash involving a pedestrian and vehicle occurred at the intersection of Craven Lane and Lawrence Road (Route 206). The pedestrian was crossing Craven Lane when they were struck by a vehicle turning from Craven Lane onto Lawrence Road. The pedestrian suffered no injuries and the driver was issued a summons.

4. **September 3, 2005 (8:45pm)** – A crash involving a pedestrian and vehicle occurred on Franklin Corner Road (County Route 546) west of Brunswick Pike (Route 1). The pedestrian was walking along the westbound curb and was struck by the vehicle turning left onto Franklin Corner Road. The pedestrian suffered moderate injuries.

5. **September 23, 2005 (12:01am)** – A crash involving a pedestrian and vehicle occurred on Brunswick Pike (Route 1), south of Quakerbridge Road. The pedestrian was under 18 years of age, and suffered moderate injuries and was taken to the hospital.

6. **October 7, 2005 (9:50pm)** – A crash involving a pedestrian and vehicle occurred at the intersection of Mulberry Street and Brunswick Avenue (Business Route 1). The pedestrian was crossing Mulberry Street in a marked crosswalk and was struck by the vehicle making a left turn from Brunswick Avenue. The pedestrian suffered moderate injuries and the vehicle left the crash scene.

7. **October 25, 2005 (8:32pm)** – A crash involving a pedestrian and vehicle occurred on Brunswick Pike (Business Route 1), south of Putnam Avenue. The pedestrian was crossing Brunswick Pike at a location where a crosswalk is not present and was struck by the vehicle. The pedestrian suffered minor injuries.

8. **February 8, 2006 (11:23pm)** – A crash involving a pedestrian and vehicle crash potentially occurred on the Trenton Freeway (Route 1), north of Whitehead Road. According to the motorist, they swerved out of control to avoid a pedestrian crossing the
northbound lanes of the Trenton Freeway. The pedestrian was crossing east across the
Trenton Freeway in a location where pedestrian crossings are not permitted. It could
not be determined if the pedestrian was struck by the vehicle.

9. **June 26, 2006 (11:50am)** – A crash involving a pedestrian and vehicle occurred on
Princeton Avenue, south of Lawrence Road (Route 206). The pedestrian was walking
north along Princeton Avenue and was crossing the right-turn only slip lane to Lawrence
Road when they were struck by the vehicle. The pedestrian suffered minor injuries and
the vehicle left the crash scene.

10. **July 7, 2006 (11:26pm)** – A crash involving a pedestrian and vehicle occurred at the
intersection of Brunswick Pike (Route 1) and Franklin Corner Road (County Route 546).
The pedestrian was crossing Brunswick Pike where a crosswalk is not present and was
struck on the southbound side of Brunswick Pike. The pedestrian suffered moderate
injuries and was taken to the hospital. The vehicle failed to obey a traffic control device
and left the crash scene.

11. **August 24, 2006 (2:30pm)** – A crash involving a pedestrian and vehicle occurred on
Van Kirk Road west of Carter Road (County Route 569). The pedestrian was walking
her dog west along Van Kirk Road when they were struck by a vehicle. The pedestrian
was later taken to the hospital.

12. **November 1, 2006 (8:16pm)** – A crash involving a pedestrian and vehicle occurred at
the intersection of Spruce Street (County Route 613) and Princeton Avenue (Business
Route 1/Route 206). The pedestrian was walking south on the southbound side of
Princeton Avenue. The pedestrian, in an attempt to cross Spruce Street, ran across the
intersection where there is no crosswalk present and was struck by a vehicle turning left
from Princeton Avenue. The pedestrian suffered minor injuries.

13. **December 9, 2006 (6:30pm)** – A crash involving a pedestrian and a minivan occurred at
the intersection of Brunswick Avenue (Route 1) and Bakers Basin Road (County Route
546). The pedestrian was crossing eastbound against the signal at Brunswick Pike and
stepped into the vehicle travel lane where he was struck. The pedestrian was intoxicated
and left the scene.

14. **January 1, 2007 (5:54pm)** – A crash involving a pedestrian and a pickup truck occurred
at the intersection of Brunswick Pike (Business Route 1) and Trumbull Avenue. The
pedestrian was struck crossing Brunswick Pike at a location where a crosswalk is not
present. The pedestrian was issued a summons.

15. **November 14, 2007 (6:41pm)** – A crash involving a pedestrian and a vehicle occurred
on Lawrence Road (Route 206), north of Titus Avenue. The pedestrian was struck
crossing Lawrence Road where a crosswalk is not present. The pedestrian suffered
serious injuries and was taken to the hospital.

16. **December 13, 2007 (5:21pm)** – A crash involving a pedestrian and vehicle occurred on
Inner-ring Road (Quaker Bridge Mall) west of Outer-ring Road (Quaker Bridge Mall). The
pedestrian was crossing south in a marked crosswalk across Inner-ring Road and was
struck by an inattentive driver. The pedestrian suffered minor injuries and the driver was
issued a summons.
17. **January 7, 2008 (3:34pm)** – A crash involving a pedestrian and vehicle occurred on Princeton Avenue (Business Route 1/Route 206), north of Vermont Street. The pedestrian was crossing Princeton Avenue at a location where a crosswalk is not present.

18. **February 12, 2008 (7:59am)** – A crash involving a pedestrian and SUV occurred at the intersection of Eggerts Crossing Road and Lawrence Road (Route 206). As the pedestrian was crossing Eggerts Crossing Road, they were struck by a vehicle making a right onto southbound Lawrence Road. The pedestrian suffered injuries and was taken to the hospital. The driver was issued a summons.

19. **February 13, 2008 (5:19am)** – A crash involving a pedestrian and vehicle occurred at the intersection of Princeton Avenue and Pine Street. The pedestrian was walking north on the northbound sidewalk but had stepped off the sidewalk to avoid a big puddle and was then struck by the vehicle traveling north. The pedestrian was incapacitated and taken to the hospital.
Figure 5. Bicycle and Pedestrian Crash Map

- **Bicycle Crashes**
- **Pedestrian Crashes**
- **Lawrence Public Schools**
- **Private Schools and Colleges**

A. Crash locations and descriptions based on crash data received from NJDOT Bureau of Safety Programs and the Lawrence Police Department for the most recent four years available (April 2004 – March 2008).

B. Map numbers correspond to crash descriptions.
IV. Policy Recommendations

Lawrence Township, through their application for local bicycle and pedestrian planning assistance, has documented its support for bicycle and pedestrian improvements. Similarly, through the township’s planning work, committees for trails and greenways, and Bicycle and Pedestrian Task Force, Lawrence has demonstrated its commitment to create a pedestrian and bicycle friendly local transportation network with regional connections.

Lawrence Township could use recommendations from this study, as well as from additional future planning activities, to integrate new bicycle and pedestrian policies and requirements into their local regulations. For example, as a new policy, Lawrence could require that new development in their community include sidewalk installation and bicycle parking.

A. Education

To plan for future demand of bicycle and pedestrian travel, programs could be implemented to educate bicyclists, pedestrians and motorists on safe travel practices. Education programs assist in dispelling myths, encouraging courteous and lawful behavior, and enhancing awareness. By utilizing the resources of the police department, schools and libraries, education programs have the potential of reaching a broader audience and cross section of the community.

Member of the Study Task Force, local officials and residents informed the Study Team about existing issues with bicycle and pedestrian travel behavior. The following safety concerns were identified through these discussions:

- Bicyclists riding against traffic, rather than with traffic.
- Bicyclists, other than children, and pedestrians using sidewalks or center medians.
- Bicyclists not wearing helmets.
- Bicyclists not adhering to traffic regulations, such as stopping at stop signs
- Pedestrians not using crosswalks at intersections

Education programs and materials can assist in preventing some of the above safety concerns. For example, to discourage the practice of side-by-side riding, signs can be installed instructing bicyclists to “ride single file with traffic.” However, these signs are not MUTCD approved.

The following four (4) primary groups should be educated about bicycle and pedestrian safety and awareness:

1) Children and young adults (aged 17 years or younger)
2) Parents of young bicyclists
3) Adults
4) Motorists

Each of these groups should be educated respectively on the most frequent cause of crashes and injuries.
Resources
There are many resources available to assist municipalities, organizations and individuals with educational initiatives. The Federal Highway Administration has a Bicycle and Pedestrian Program that provides guidance and resources for promoting improved bicycle and pedestrian mobility. It offers specific recommendations for planning and engineering professionals, such as guidance on implementation of specific bicycle facilities, as well as broader educational materials like a training course on bicycle and pedestrian transportation. The FHWA, along with the United States Department of Transportation (US DOT), sponsors the Pedestrian and Bicycle Information Center (PBIC), which is managed by the University of North Carolina Highway Safety Research Center. The PBIC hosts several websites including the following:

- Walkinginfo.org, which is focused on pedestrian access and mobility: http://www.walkinginfo.org/
- Bicylinginfo.org, which is focused on pedestrian access and mobility: http://www.bicyclinginfo.org/
- Pedestrian and Bicycle Image Library, which is a clearinghouse of pedestrian, bicycle, traffic calming and other images: http://www.pedbikeimages.org/

Each of these sites provided a large amount of information that can be used to engage community members to improve bicycle and pedestrian travel knowledge and behavior.

In addition to the resources above, there are Safe Routes to School (SRTS) FHWA and NJDOT initiatives. As a result of statewide and national efforts, these programs are focused on enhancing pedestrian and bicycle conditions for students walking or biking to schools. Both sources provide educational and instructional resources for teachers, organizers and parents interested in students walking or bicycling to school, including the following websites:

- National Center for Safe Routes to School: http://www.saferoutesinfo.org/
- NJDOT Safe Routes to School: http://www.nj.gov/transportation/community/srts/

NJDOT uses several messages to educate citizens about bicycle and pedestrian safety. The two (2) messages primarily used for pedestrian safety education include: “Cross the street where you can see and be seen” (intended to encourage pedestrians to be aware of motorists) and “Yield to Pedestrians” (intended to encourage motorists to stop for pedestrians in a crosswalk).
NJDOT also offers numerous other bicycle and pedestrian resources, including safety publications and guides to bicycle and pedestrian trails and routes throughout the state. Included below are examples of some of the available resources:

1. **East Coast Greenway Multi-use Trail Guide**

2. **High Point to Cape May Trail**

3. **D & R Canal Towpath Ride**

4. **Bicycle Safety Tips Poster**

NJDOT publications are available for order at the NJDOT [NJCommuter.com](http://njcommuter.com) website.

**B. Engineering**

Lawrence Township can plan for future bicycle and pedestrian travel by investing in bicycle and pedestrian accessible transportation improvements. Engineering design of new or reconstructed facilities can design to accommodate bicycle and pedestrian roadway users as well as those of motorists. Guides to accomplish the development of bicycle and pedestrian accommodations include:

- **NJDOT Planning and Design Guidelines for Bicycle Compatible Roadways and Bikeways**
- NJDOT Pedestrian Compatible Planning and Design Guidelines
- American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities
- Manual on Uniform Traffic Control Devices (MUTCD)

Of particular note is that both the AASHTO guide and the MUTCD will be receiving updates within the next two years. These will both be important resources for bicycle and pedestrian facilities planning and development, with potential changes to signage, striping, width recommendations and use of innovative techniques.

C. Enforcement

The key to encouraging a safe and well traveled transportation system is an enforcement program for traffic regulations as they apply to all roadway users: motorists, bicyclists and pedestrians. Lawrence can act to both reduce poor travel behavior and encourage beneficial travel habits through enforcement. This process should include reviewing current ordinances and regulations related to travel to identify elements that may unnecessarily affect users, especially in terms of bicyclists and pedestrian. In addition, this review may assist in identifying opportunities to partner with community, county or state organizations to inform users about safe travel behavior, such as yielding to pedestrians in crosswalks and use of bicycle helmets by bicyclists under the age of 17.