Essex Junction VT 2A Circulation and Access Study

Final Report

February 15, 2010
Report Prepared for:
The Chittenden County Metropolitan Planning Organization, in cooperation with the Vermont Agency of Transportation, for the Village of Essex Junction.

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1.0 INTRODUCTION

The purpose of this study is to investigate traffic circulation, safety and access management issues in the vicinity of VT 2A south of the Five Corners (Park Street) in the Village of Essex Junction. The study is being conducted by Resource Systems Group for the Village of Essex Junction. It is being funded with assistance from the Chittenden County Metropolitan Planning Organization’s Planning Assistance and Coordination Program.

RSG prepared a related study for the CCMPO and Village at the same time that evaluates the feasibility of a connector road between VT 2A and Maple Street. The results of that study are presented in a separate report titled Essex Junction Village Connector Road Analysis.

This report presents findings and recommendations for the following focus areas (Figure 1):

- **Park Street between the New England Central Railroad northern crossing and Five Corners.** A streetscape improvement project was recently completed along this section of Park Street. It included upgraded sidewalks and curbing, street lights and some landscaping and hard-scape improvements. Although driveways to adjacent parcels were improved with new curbing, there were no significant changes to the number of access points. The study evaluates existing access management issues, suggests modifications to existing driveways and presents design concepts for a new rear-access roadway.

- **Park Terrace.** The allowable traffic pattern changes along Park Terrace from two-way traffic on the east end to one-way traffic on the west end. Street design changes are suggested to reinforce the traffic pattern change.

- **Right-turn Slip Lane from Main Street to Lincoln Street.** This slip lane is sometimes used by westbound vehicles traveling on VT 15 from Main Street to Pearl Street to bypass congestion at Five Corners. The maneuver requires a left turn movement across three lanes on Lincoln Street and should be prohibited. Design modifications are suggested to prohibit this movement.
2.0 EXISTING CONDITIONS

2.1 Land Use

Figure 2 shows the generalized land use in the focus areas. Land use along Park Street is mostly commercial except for the Park Street School, a public facility. Land use on Park Terrace is predominantly residential (multi-tenant and single-family), with commercial uses concentrated near Park Street. The Main Street to Lincoln Street slip lane is surrounded by public and commercial uses.
There are two planned projects in the study area:

- A hotel at the southwest corner of Park St/Park Terrace, and
- The addition of four condominium units at 4 Park Terrace.

These developments are identified in Figure 3. The condominium project has received conceptual approval from the Village Planning Commission\(^1\). Plans for the hotel were still in flux as of the date of this report.

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\(^1\) Per Diane Clemens as stated at the September 22, 2009 Village Trustees Meeting. Complete notes from that meeting are in Appendix B.
2.2 Roadway Characteristics

Park Street

South of the southern railroad crossing, Park Street is a two-lane urban minor arterial with angled on-street parking and five to nine foot sidewalks on both sides of the street. North of the southern crossing, the roadway widens as it approaches Five Corners to accommodate an exclusive northbound left turn lane and an additional northbound thru lane. A typical roadway cross-section for the area north of the northern railroad crossing is shown in Figure 4.
**Park Terrace**

Park Terrace is classified as a local road and extends between Park Street and School Street. There are no sidewalks and the pavement is 22 feet wide from curb-to-curb. Two-way traffic is allowed between Park Street and the western most driveway of the Chittenden Bank. Between the bank and School Street, traffic is restricted to one-way in the westbound direction. This restriction discourages traffic on Pearl Street from using School Street and Park Terrace as a bypass around Five Corners. While the "Do Not Enter" signs located at the School Street intersection make the restriction clear (see Figure 5), there are no physical barriers to prevent traffic flow in both directions.

*Figure 5: Park Terrace looking eastbound from School Street*

**Main to Lincoln Right-Turn Slip Lane**

The slip lane allows one-way traffic for vehicles moving from Main Street to Lincoln Street. This movement is not allowed at the actual intersection of Main and Lincoln at Five Corners because the two streets meet at a sharp angle. Because this is a short segment of road with large radii on each end, the curb-to-curb pavement width varies from approximately 16 to 24 feet. There are no signs restricting left turn movements from the slip lane to Lincoln Street. There is a sidewalk on the north side of the slip lane. A crosswalk over the south end of the slip lane connects the sidewalk on Main Street to the War Memorial. Traffic flow at the slip lane/Lincoln Street intersection is further complicated by two exit-only driveways from the adjacent TD Banknorth drive-up window. These driveways align with a drive-up teller window and ATM (See Figure 6).
2.3 Bicycle and Pedestrian Facilities

There is an extensive sidewalk network through the Village of Essex Junction. Sidewalks line both sides of Park Street, Pearl Street and Maple Street in the study area; crosswalks connect sidewalks at key junctures (Figure 7). There is a noticeable missing link in the sidewalk network along Park Terrace.

There are no designated bicycle facilities in the study area. Experienced cyclists should share travel lanes with motorists. Less experienced cyclists and children should use the sidewalks. The Village’s municipal code does not prohibit riding of bicycles on sidewalks.
2.4 Traffic

Table 1 presents Average Annual Daily Traffic (AADT) volumes for the major roadways in the study area.

Table 1: 2006 AADT and Functional Class

<table>
<thead>
<tr>
<th>Street Segment</th>
<th>AADT</th>
<th>Functional Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Park Street (VT2A) - from River Street to 5 Corners</td>
<td>19,500</td>
<td>Minor Arterial</td>
</tr>
<tr>
<td>Maple Street (VT 117) - from 5 Corners to Railroad Street</td>
<td>9,500</td>
<td>Principal Arterial</td>
</tr>
<tr>
<td>Pearl Street (VT 15) - from School Ave to 5 Corners</td>
<td>12,300</td>
<td>Principal Arterial</td>
</tr>
</tbody>
</table>

The directional flow of traffic on Park Street in the study area is provided in Table 2. Traffic volumes on Park Street are heavier in the northbound direction than in the southbound direction, regardless of time of day.

Table 2: Peak Hour Traffic Flow on Park Street by Direction in June 2007

<table>
<thead>
<tr>
<th></th>
<th>Southbound</th>
<th>Northbound</th>
</tr>
</thead>
<tbody>
<tr>
<td>AM Peak Hour</td>
<td>627</td>
<td>822</td>
</tr>
<tr>
<td>PM Peak Hour</td>
<td>607</td>
<td>902</td>
</tr>
</tbody>
</table>

Recent traffic data are not available for the one-way portion of Park Terrace, but inferences are possible from a nearby count. Based on a turning movement count conducted in 2005 by the CCMPO at the intersection of School Street with Pearl Street, traffic volumes on the one-way portion of Park Terrace (which must exit through School Street) appear to be less than 20 vehicles per day. Traffic volumes on Park Terrace between the bank driveways and Park Street are about 10 vehicles per hour during the AM peak hour and 50 vehicles per hour during the PM peak hour.

During the AM and PM peak hours, about 20 vehicles per hour use the slip lane to turn from Main Street to Lincoln Street (which equates to about 200 vehicles per day). This count most likely includes vehicles that are using the slip lane as a short-cut from Main Street to Pearl Street. Traffic is also added to the west end of the slip lane from the bank driveways. Based on trip generation rates from the Institute of Transportation Engineers for a drive-up bank, additional traffic from the bank includes ten vehicles exiting during the AM peak hour and 30 vehicles during the PM peak hour. Even when considering the bank, traffic volumes on the slip lane are relatively light.

2.4.1 Congestion

All three focus areas are affected by daily traffic congestion at Five Corners. Table 3 presents the results of the Five Corners congestion analysis for 2003 as estimated in the Route 15 Corridor Study.

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1 The count shows 19 vehicles exiting from School Street to Pearl Street between 7:00 am and 6:00 pm. Some portion of these vehicles pass the one-way segment of Park Terrace.

2 Per July 6, 2009 intersection turning movement count conducted by the CCMPO at the Park Street-Park Terrace intersection (count ID EJCT16)

Level-of-Service (LOS), a qualitative measure describing the operating conditions as perceived by motorists driving in a traffic stream, is based on the average control delay per vehicle. Whereas level of service is based on delay, it does not represent the amount of space occupied by vehicles that are waiting to pass through an intersection. For instance, LOS F may describe conditions for 10 vehicles or for 100 vehicles, but the impact of 100 idling vehicles in a constrained area such as Five Corners is much more substantial than the impact of 10 idling vehicles. Therefore, for the purpose of this study, queue lengths are more relevant because they are the most visible negative consequence of congestion on a surrounding area. Figure 8 shows the length of vehicle queues that back up at Five Corners during the AM and PM peak hours. The Phase I focus areas are affected by congestion at Five Corners as follows:

- **Park Street.** Vehicles exiting driveways and wishing to head north are blocked during the AM and PM peak hours;
- **Park Terrace.** Vehicles that traveling the wrong way on Park Terrace are most likely trying to avoid the long queues and delays on the Pearl Street approach to Five Corners.
- **Main-Lincoln Slip Lane.** The excessively long queues and delays on Main Street are the primary reason some drivers attempt to use the slip lane as part of a short cut between Main Street and Pearl Street. However, vehicles attempting to make this maneuver will have to force their way into the queues that form on the Lincoln Street approach to Five Corners.

### Table 3: 2003 Level of Service, Delays and Queues at Five Corners

<table>
<thead>
<tr>
<th>Signalized Intersections</th>
<th>AM Peak Hour</th>
<th>PM Peak Hour</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>LOS Delay</td>
<td>Queue v/c</td>
</tr>
<tr>
<td><strong>Overall</strong></td>
<td>F 119</td>
<td>F 265</td>
</tr>
<tr>
<td>Eastbound (VT 15), Sharp Left/Left</td>
<td>F 189 346 1.13</td>
<td>F 322 859 1.86</td>
</tr>
<tr>
<td>Eastbound (VT 15), Thru/Right</td>
<td>F 180 730 1.16</td>
<td>F 140 551 0.90</td>
</tr>
<tr>
<td>Westbound (VT 117), Left</td>
<td>F 86 375 0.63</td>
<td>F 80 284 0.58</td>
</tr>
<tr>
<td>Westbound (VT 117), Thru/Right/Sharp Right</td>
<td>F 111 705 0.95</td>
<td>F 89 549 0.92</td>
</tr>
<tr>
<td>Northbound (VT 2A), Left</td>
<td>F 113 141 0.72</td>
<td>F 104 169 0.78</td>
</tr>
<tr>
<td>Northbound (VT 2A), Thru</td>
<td>F 100 300 0.68</td>
<td>F 111 443 0.81</td>
</tr>
<tr>
<td>Northbound (VT 2A), Right/Sharp Right</td>
<td>C 28 182 0.36</td>
<td>C 32 394 0.74</td>
</tr>
<tr>
<td>Southbound (VT 2A), Left</td>
<td>F 124 185 0.83</td>
<td>F 108 110 0.63</td>
</tr>
<tr>
<td>Southbound (VT 2A), Thru/Right</td>
<td>F 151 586 1.00</td>
<td>F 117 372 0.80</td>
</tr>
<tr>
<td>Southwesternbound (VT 15), Left</td>
<td>F 124 696 0.94</td>
<td>F 88 359 0.76</td>
</tr>
<tr>
<td>Southwesternbound (VT 15), Right</td>
<td>F 85 307 0.47</td>
<td>F 84 2203 0.46</td>
</tr>
</tbody>
</table>

*Queue is 50th Percentile*
2.5 Safety

Park Street Focus Area

The Park Street study area is within a designated High Crash Location that extends along VT 2A from the northern railroad crossing on Park Street to north of the Central Street intersection with Lincoln Street (see Figure 9.) There were 68 total collisions from 2003 to 2007 in the Park Street study area between the northern railroad crossing and Five Corners. Eight of these collisions (12%) involved at least one injury. There were no bicycle or pedestrian crashes reported in the study area. Crash data are contained in Appendix A.

Crash type were reviewed to understand any underlying trends or recurring patterns. To validate this analysis, study area crash patterns were compared to the same patterns that exist within the Village and Town of Essex, and the patterns throughout urban areas of the State.¹ A chi squared statistical test was used to determine significance. (For instance, one might see that 30% of all crashes are rear-end collisions and then conclude that rear ends are a problem. However, rear end collisions are the most common type of collision, occurring at a rate of 29% throughout the state of Vermont. Therefore, a ratio

¹ “Urban areas,” for the purposes of this comparison, is identified as cities and towns which are entirely classified by the VTrans Urban Area designation. These include: Barre City, Burlington, Colchester, Essex, Milton, Montpelier, Newport City, Rutland City, Shelburne, South Burlington, St. Albans City, St. Johnsbury, Winooski and Williston.
of 30% rear ends should not be seen as significant)\(^1\). Using this method, three key factors emerged as being exceptionally high in this study area:

- **Crash Time of Day (6pm to 9pm)** – 22% in the study area (versus 11% in urban areas, and throughout the state and village)
- **Left Turn and Thru (Angle Broadside) Collisions** – 21% in the study area, versus 5%, 4%, and 7% in urban areas, the state and village, respectively)
- **No Turns, Thru moves only (Broadside) Collisions** – 19% in the study area, versus 11%, 9%, and 9% in urban areas, the state and village, respectively)

Causes of these crashes might include congestion (PM rush hour), poor access management (multiple conflict points for turning vehicles), and insufficient signage (failure to yield).

One can infer from these data that congestion and the density of driveways along this section of Park Street play a significant role in the high crash rates.

**Park Terrace Focus Area**

Based on Town Highway crash data from VTrans, there were three reported collisions on Park Terrace from 2003-2007. All of these collisions occurred at the intersection with Park Street and no patterns could be determined (one single vehicle crash, one rear end, and one left-turn and thru).

**Main-Lincoln Slip Lane**

The intersection of the slip lane with Lincoln Street falls within the state designated High Crash location.

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### 3.0 ISSUES AND RECOMMENDATIONS

This section summarizes the issues identified above related to each focus area. Recommendations to address the issues are described below. Concept plans are referenced and attached as Sheets 1 through 6.

#### 3.1 Park Street Focus Area

##### 3.1.1 Issues and Opportunities

- **Access Management.** The streetscape improvement project addressed aesthetics but did not include significant changes to driveway design or location. Vehicles entering and exiting driveways appear to be a significant contributor to crashes along this segment of Park Street. Long vehicles queues from Five Corners exacerbate the problem by blocking access to and from driveways.

- **Re-Development Changes.** The hotel proposed at the southwest corner of the Park Street/Park Terrace intersection creates an opportunity to address some of the access management challenges in this focus area. The concepts presented below should be considered as plans for the hotel continue to be developed.

- **Park Street School.** The Park Street School is fronted by a large green space that is currently underutilized. The school’s access road and parking occupy parts of the green space and are disorganized and inefficient. The school’s setback from Park Street creates an opportunity for rear access to the businesses fronting Park Street and the proposed hotel.

##### 3.1.2 Design Options

- Proposed modifications to existing driveways on Park Street as follows (See Sheet 1):
  - Drunken Noodle/Future Hotel Site: Reduce width of north driveway and make south driveway exit only;
  - Domino Pizza/Café Mediterano Plaza: North driveway entrance only, exit provided through improved school access road, additional parking provided in rear of building; and
  - Lincoln Inn: Close one driveway, establish one-way in/one-way out circulation pattern.

- **Sheet 1 Park Street School Alternative**
  - Straight access road from Park Street to formalized parking lot with sidewalks on each side and crosswalks between them;
  - Access road to rear of Park Street buildings and future Hotel;
  - Pedestrian connection to Park Terrace;
  - Parking lot has one-way circulation pattern; and
  - Opportunity for public space is created.

- **Sheet 2 Park Street School Alternative**
  - Green closer to the building to break-up the parking lot.
3.2 Park Terrace Focus Area

3.2.1 Issues and Opportunities

- While the “Do Not Enter” signs at the west end of Park Terrace are clear, there are no physical barriers to two-way traffic flow. The one-way segment of Park Terrace is excessively wide for a single lane of traffic and may invite speeding.
- There are no sidewalks along Park Terrace
- Chittenden Bank’s driveways on Park Terrace are too wide. While two driveways are necessary to accommodate access to the drive-up windows and parking spaces, it is not necessary to allow two-way traffic at each one.

3.2.2 Design Options

- Short Term (See Sheet 1)
  - Construct a bulb-out on the west end of Park Terrace at School Street to narrow the entrance. This modification will reinforce the one-way travel pattern and will help discourage drivers from entering off of School Street.

- Long-term (See Sheet 2)
  - Reduce the width of Park Terrace to one lane along the one-way segment between School Street and Chittenden Bank. Provide an eleven-foot wide lane with appropriate offset to curb. This change will make it highly unlikely that a driver will travel in the wrong direction.
  - Construct a sidewalk along the south side of Park Terrace to provide a continuous pedestrian connection between School Street and Park Street. A connection would also be provided to the pedestrian connection toward the Park Street School (Figure 10).
  - The remaining space could be used for a green strip or a bike lane. A green strip with other landscaping along the one-way segment would help calm traffic while a bike lane will provide for alternate mode of transportation (Figure 10).
3.3 Main-to-Lincoln Slip Lane Focus Area

3.3.1 Issues and Opportunities

- **Main-to-Pearl Street via Lincoln Street Movements.** The slip lane is used as a bypass around Five Corners congestion by drivers traveling westbound on VT 15 from Main Street to Pearl Street. As a result, drivers attempt to make a left turn from the slip lane to Lincoln Street where they eventually turn right onto Pearl Street. Lincoln Street is a high crash location and vehicles queues extend past the slip lane.

- **TD Banknorth Egress.** TD Banknorth has a two-lane, exit-only driveway that connects to the street system where the slip lane intersects Lincoln Street. This driveway is the only exit for the bank. One lane of the driveway serves a drive-up teller and the other a drive-up ATM. Because these driveways are so close to the end of the slip lane, any left-turn restrictions will also affect the bank’s egress.

3.3.2 Design Options

- **Short Term (Sheet 3).**
  - Install a “Left Turn Prohibited” sign at the slip lane’s exit and on the existing island for the bank.

- **Alternative 1 (Sheet 4)**
  - Extend curbing and landscaping that reinforces the right-turn only function of the slip lane.

- **Alternative 2 (Sheet 5)**
• Extend curbing and landscaping that reinforces the right-turn only function of the slip lane.
• Close the double exit driveway from the bank
• Change the Bank’s northern driveway on Lincoln Street from one-way in, to a two-way driveway. Provide a one-way traffic pattern in the Bank’s parking lot.

- Alternative 3 (Sheet 6)
  • Extend curbing and landscaping that reinforces the right-turn only function of the slip lane.
  • Close the double exit driveway from the bank and provide one exit-only driveway approximately 30 feet to the north. The northernmost driveway would remain a one-way entrance.
  • With this alternative, the on-site one-way traffic circulation pattern would not change.

4.0 PUBLIC INPUT

The recommendations listed above and the related concept plans in Section 6.0 were presented for public comment at a September 22, 2009 Village Trustees Meeting. Findings and recommendations from the Essex Junction Village Connector Road Analysis was also presented at the same meeting. Other than noting that the condominium project on Park Terrace had received conceptual approval from the Village Planning Commission, there were no specific comments on the recommendations presented in this report. Meeting minutes from the Village Trustees Meetings are in Appendix B. RSG also presented the recommendations to VTrans staff at a September 29, 2009 meeting. VTrans submitted written comments in January 2010. The comments are contained in Appendix B along with responses.

5.0 SUMMARY

This report addresses the following issues at three focus areas in the Village of Essex Junction, Vermont:

• Access management on Park Street between the northern NECR railroad crossing and Five Corners;
• Reinforcing one-way travel patterns on Park Terrace; and
• Preventing the use of a right-turn slip lane from Main Street to Lincoln Street as a short cut around congestion.

Recommendations are presented and may be used by the Village of Essex Junction to inform the development review process and assist with planning for continuing improvements to the street system.
6.0 CONCEPT PLANS ATTACHMENT
Legend:

- **Green Circle**: Existing Tree
- **Blue Arrow**: Direction of Travel
- **Red Block**: New Curb/Slab
- **Blue Block**: New Sidewalk
- **Orange Block**: New Pavement
- **Existing Sidewalk**: Existing Pavement
- **Construction Area**: Construction Zone
- **One Way**: One Way
- **Park Space**: Park Space
- **Water Flow Area**: Water Flow Area
- **Exhibit View Area**: Exhibit View Area
- **Access to Property**: Access to Property
- **Access to Commercial**: Access to Commercial
- **Access to Grocery Store**: Access to Grocery Store
- **Access to Parking Lot**: Access to Parking Lot
- **Park Sign**: Park Sign
- **Exhibit Sign**: Exhibit Sign
- **1 Way**: 1 Way
- **2 Way**: 2 Way
APPENDIX A

Crash Data
<table>
<thead>
<tr>
<th>ID</th>
<th>Route Number</th>
<th>Town</th>
<th>MM</th>
<th>Date</th>
<th>Time</th>
<th>Weather</th>
<th>Circumstance</th>
<th>Collision Type</th>
<th>In Fat</th>
<th>Direction</th>
<th>Grp</th>
<th>Day of Week</th>
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<tbody>
<tr>
<td>V002A0400</td>
<td>VT-2A</td>
<td>Essex</td>
<td>0406</td>
<td>1058</td>
<td>07</td>
<td>1/22/2007</td>
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<td>X</td>
<td>S</td>
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<td>Cloudy</td>
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<td>E</td>
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<td>8/19/2003</td>
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<td>E</td>
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APPENDIX B

Village Trustees Meeting Minutes

Response to VTrans Comments
VILLAGE OF ESSEX JUNCTION
BOARD OF TRUSTEES
MINUTES OF MEETING
September 22, 2009

BOARD OF TRUSTEES: Larry Yandow (Village President); Deb Billado, George Tyler, Peter Gustafson, John Lajza.
ADMINISTRATION: Dave Crawford, Village Manager.

I. CALL TO ORDER and PLEDGE OF ALLEGIANCE
Village President, Larry Yandow, called the meeting to order at 6:30 p.m. and led the assemblage in the Pledge of Allegiance.

II. AGENDA ADDITIONS/CHANGES
Addition(s) to agenda:
- Discussion of Pearl Street Grant Application with Village Engineer, Rick Hamlin (add under “Guests/Presentations”)
- Sanitation Capital Request to Authorize Change Order for Sewer Pipeline Repairs (add under “New Business”)
- Noise Waiver Request for High School Homecoming Fireworks (add under “New Business”)

Correction to Consent Agenda:
Minutes of 9/8/09, Page 5, Section VI, Village Manager’s Report, Item #4 – Streetlights – delete sentence reading: “Some of the lights have been turned off to reduce energy costs.”

III. GUESTS AND PRESENTATIONS
1. Comments from Public on Items Not on Agenda
There were no comments from the public at this time.

2. Park Street Traffic Study Presentation by Joe Segale, Director of Transportation Planning, Resources Systems Group, Inc. (RSG)
Joe Segale with Resources Systems Group reviewed the planning study of potential improvements to Park Street. The study area included Park Street south of Five Corners, Park Terrace, Park Street School access, the proposed connector road from Park Street to Maple Street, and a slip lane on the Main Street to Lincoln Street. The hotel on Park Street and the condo units on Park Terrace were considered in the study, confirmed Mr. Segale.

Park Terrace improvements:
Mr. Segale recommended installing a bulb-out with a curb and grass on the corner of School Street and Park Terrace to narrow the street at the corner and emphasize one-way traffic on the street. In addition, the driveways at the bank access should be tightened up to help slow down traffic. Park Terrace is currently 22’ wide. Mr. Segale suggested extending the sidewalk to Park Street and narrowing the road to an 11’ wide lane with a sidewalk and green strip.
Park Street School improvements:
The corner of Park Terrace and Park Street will possibly be developed with a hotel. The (proposed) hotel lot connects in the back to an adjacent lot. Mr. Segale recommended making a connection from the (proposed) hotel's back lot which is designated for parking to the school property and having a connector road from Park Street to the school property and the adjacent parking lots. Curb cuts should be closed on Park Street between the railroad tracks and Five Corners (considered a high accident area). Traffic circulation would be one way into the hotel from Park Street and one way out onto Park Street, ideally through the school access. Access to the Hinsdale property (Domino’s Pizza) could also be through the school access road. The idea is to share driveways where possible, stressed Mr. Segale. Lincoln Inn has multiple driveways with interconnecting parking lots. The concept is to consolidate driveways and relocate the access as far from Five Corners as possible. One-way circulation pattern in the parking lot is also recommended.

Maple Street to Park Street Connector Road:
Mr. Segale stated the proposed connector road will accommodate traffic using residential streets to bypass Five Corners. The connector road will also divert traffic from Five Corners. The amount of diversion is speculative, but the numbers are based on actual traffic patterns. It is estimated 37% of traffic will be diverted from Park Street to the connector road, 30% will be diverted from Maple Street to the connector road, and 30% will be diverted from Main Street to the connector road. An estimated 8,000 vehicles/day will use the connector road. Traffic on Railroad Street will increase from 2,000 vehicles to 5,300 vehicles per day. The on-street parking on Railroad Street will be relocated to the sidewalk side of the street. There will be 11’ wide lanes, a green strip, a five foot wide sidewalk, and a bike lane on the proposed connector road. The intersection at Park Street and the connector road will be signalized. Depending on the scenario (build, no build) and the timeframe, level of service (LOS) will be A, B, C which means very little delay. Presently, there are 21,000 vehicles per day on Park Street. With the connector road vehicle queues on Park Street are not anticipated to stretch from Five Corners to Iroquois Avenue. At the intersection at Maple Street and the connector road there will be a left turn lane on Maple Street. Level of service will be A, B, C (depending on the scenario and timeframe). Level of service at the intersection of Main Street/Railroad Street/Railroad Avenue is A, B, C, D, and E depending on the scenario/timeframe. An example of “E” level of service is the delay that occurs when a vehicle is turning left from Railroad Street onto Main Street. The shift in volume of traffic and impact on Five Corners with the proposed connector road is shorter queues. An at-grade railroad crossing is needed on the connector road. New England Central Railroad supports the crossing provided the upgrades and maintenance costs are covered by the Village. The cost of the project is $1.8 million with $1.2 million for roadway and traffic signals and $630,000 for the at-grade railroad crossing. Annual maintenance and operating costs are $5,000 for the signals and $7,400 for the railroad crossing.

3. Discussion of Potential Park Street Development
Bill Kalanges, property owner by the railroad tracks, spoke in support of the project. Mr. Kalanges asked about funding for the project. Mr. Segale said there are a litany of
funding sources including developer contribution, state and federal funds, and taxes. The availability of state and federal funds is questionable.

Diane Clemens, member of the Essex Junction Planning Commission, noted the condo project on Park Terrace and the traffic connection has been approved (conceptual approval) and should be shown in Mr. Segale’s plan. Also, there are very actively used bike lanes on both sides of Maple Street that need to be considered. Support from the railroad needs to be confirmed. Joe Segale assured New England Central Railroad supports the proposed crossing. Robin Pierce added NECR is conceptually open to discussion of the crossing. Mr. Segale agreed the bike path on Maple Street continuing through the redesigned intersection needs to be shown. Bike lanes on the connector road will connect to the planned multi-use path. Further planning of bike lanes is needed.

Alex McEwing, owner of the Lincoln Inn, suggested a subsequent study be done as it appears the traffic problem at Five Corners is being moved farther down Park Street and there will be an impact on existing businesses. The streetscape looks good, continued Mr. McEwing, but many businesses on Park Street experienced substantial decline in business (up to 40%) during and since construction. Mr. McEwing questioned how businesses will benefit by moving the traffic intersection down the street and how business activity will be maintained during construction. Also, losing parking is an issue. Mr. McEwing suggested the connector road line up with the school access across Park Street. The railroad tracks are an issue to consider.

Mark Thibeault, Chairman of the Essex Junction Planning Commission, confirmed the Planning Commission has been discussing traffic circulation and access onto Park Street for Park Street School, the Hinsdale property, and the proposed hotel. A development plan on Park Terrace has been approved with vehicle access to Park Terrace. Mr. Thibeault asked why the study was done and the anticipated benefit to the community. George Tyler replied the study was done to determine impact on traffic. The idea is to decrease commuter traffic on Park Street to Five Corners and continue to improve the environment on Park Street by having the area become more pedestrian and business friendly. Mark Thibeault observed there may be better benefit if the connector road intersection is moved half a mile down Park Street as there is clearly a benefit to having more cars going past businesses on the street. Funds would be better spent on a plan that allows fairgoers to turn left out of the fairgrounds and enter into the village to shop or go to a restaurant rather than going to Burlington, stated Mr. Thibeault. Robin Pierce commented people like to see the stores where they shop and appreciate not having large trucks and lots of traffic around them.

There was discussion of level of service at Five Corners. LOS at Five Corners is F. The proposed connector road will not change the LOS. LOS E, F means more cars are arriving than can go through the intersection. LOS D indicates a potential wait of 35-55 seconds. LOS F is a delay of greater than 80 seconds. Five Corners is a difficult intersection and will likely always have congestion. With traffic signals at each end of the connector road, the roadway has some functions and works fine. Mark Thibeault questioned building the connector road when there is no time savings benefit at Five
Comers (10 seconds will be saved). Funding could be better applied for more benefit elsewhere in the village and existing businesses will not be adversely impacted, stated Mr. Thibeault.

Rick Hamlin mentioned the delay he has experienced on Maple Street during peak hour traffic (traffic is queued from Five Corners to Mansfield Ave.) and waiting through six cycles of the traffic light before getting through Five Corners.

Deb Billado mentioned the tremendous number of cars using the east bound lane on Maple Street (going into the oncoming traffic lane) to get in the left turn lane at Five Corners.

Larry Yandow said traffic backs up to Lang Farm on Rte. 15 when school is in session. Mr. Yandow assured the Trustees do support businesses in the village. A balance with traffic must be found that benefits all.

Linda McKenna, School Street, noted rail traffic seems to have increased through the village. Trains effectively slow down the traffic. Ms. McKenna expressed concern about the road plans in light of the increase in frequency of trains. Joe Segale stated there are four trains currently on the main line and four trains going to Burlington. More freight is being shipped by rail. Larry Yandow recalled at one point there were 60 trains per day traveling through the village.

David Knox, Maple Street, spoke in support of the project if it is done correctly. Mr. Knox asked if the unsanctioned left turn lane on Maple Street and sidewalks are involved in the plan. Mr. Segale said the study focused on the connector road and does include sidewalks.

Peter Gustafson commented on the length of time he has spent at Five Corners waiting at traffic lights over the past 30 years, expressing concern about the anticipated increase in traffic by Year 2020 and stressing the importance of planning for traffic from all five directions at Five Corners.

Further comments on the Park Street Traffic Study should be forwarded to the Village Office.

4. Discussion of Pearl Street Grant Application with Village Engineer, Rick Hamlin
Dave Crawford reported the Village did not receive ARRA (stimulus) funding. Application for state grant money can be submitted for a maximum grant of $300,000 with a 20% match. The application process requires a public information meeting prior to submitting the application. The Village received a $2.6 million earmark for the comprehensive Pearl Street upgrade by CVE. It may not be prudent at this time to expend time and energy on a grant application with the state. Rick Hamlin concurred with Mr. Crawford, noting criteria that give a community priority for receiving a grant from the state includes being an economic depressed area and having complete plans and permits in hand. There is slim chance Essex Junction will receive a state grant at this
This memorandum responds to comments offered by Bernard Byrne, Ph.D., P.E., VTrans Traffic Research Engineer on the two reports referenced above. Each VTrans comment is followed by a response by RSG. The memorandum from VTrans was not dated but was sent to RSG in an email dated January 7, 2010.

VTrans Comment 1

In the Essex Junction VT 2A Circulation & Access Study, it is noted on page 8 and 9 the area analyzed is in a High Crash Location (HCL). Of the total of 68 crashes detailed reports were obtained for only 16 of the crashes with the explanation that VTrans would only send out 30 reports. In an HCL a collision diagram for ALL crashes is needed to analyze adequately the causes and countermeasures needed to mitigate the HCL. All crash reports are available at any location on the highway system from VTrans Highway Research Section. The details for obtaining such reports are appended to this letter and are available from the Traffic Impact Study Guidelines (Appendix L) available on the web at:

RSG Response to Comment 1

The report adequately identifies the causes and patterns of crashes. It is not necessary to review each individual crash report to demonstrate that poor access management and long vehicle queues are associated with the collisions occurring in the study area. The statement that VTrans provided only 30 crash reports was removed the study.

VTrans Comment 2

In the Village Connector Road Analysis in the section entitled Traffic Volumes and Adjustments on page 3, it is noted that DHV adjustments were based on continuous traffic counter P6D129 located on Vt. 2A, located approximately three miles south of the site. VTrans is skeptical of the approach to DHV adjustment especially when the continuous traffic counter in question is more than a mile from the site in question. Also, the site is largely a commuter route whereas the continuous traffic counter P6D129 is located is a heavily retail district with an entirely different traffic volume profile. VTrans Traffic Research Unit would recommend that the consultant first calculate the AADT and then calculate the DHV from that.

RSG Response to Comment 2

Table 1 shows the DHV adjustment factors that would be applied to the turning movement count conducted at the Five Corners intersection on June 7, 2007 if the AADT methodology was used. The table shows that the adjustment factors vary from a low of 1.08 to a high of 1.54 and the weighted average is 1.30.
Table 1: DHV Adjustment Factors using AADT Method at Five Corners

<table>
<thead>
<tr>
<th>Approach</th>
<th>2008 AADT</th>
<th>Design Hour Volume</th>
<th>PM Peak Hour per June 7, 2007 Turning Movement Count</th>
<th>DHV Adjustment Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearl St - Eastbound</td>
<td>12,300 E</td>
<td>1,279</td>
<td>1,123</td>
<td>1.14</td>
</tr>
<tr>
<td>Lincoln St. - Southbound</td>
<td>7,300 A</td>
<td>759</td>
<td>657</td>
<td>1.16</td>
</tr>
<tr>
<td>Main St. - Southwestbound</td>
<td>11,200 E</td>
<td>1,165</td>
<td>1,079</td>
<td>1.08</td>
</tr>
<tr>
<td>Maple St. - Westbound</td>
<td>10,200 E</td>
<td>1,061</td>
<td>766</td>
<td>1.38</td>
</tr>
<tr>
<td>Park St. - Northbound</td>
<td>20,900 A</td>
<td>2,174</td>
<td>1,415</td>
<td>1.54</td>
</tr>
</tbody>
</table>

Weight Average on AADT 1.30

AADT from VTrans Route Log, E = estimated AADT, A = Actual AADT
DHV = AADT x 10.4% (K factor for urban highways)

Table 2 compares raw traffic data collected at Five Corners on two separate dates in 2007 and 2005 for the PM peak hour. Each count was conducted by VTrans. School was in session during the June 2007 count but was not in session during the July 2005 count. With that fact in mind, the two counts are relatively close. This suggests that the DHV adjustment factors indicated in Table 1 are too large.

Table 2: PM Peak Hour Volume Comparison at Five Corners

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearl St - Eastbound</td>
<td>1,123</td>
<td>1,035</td>
<td>1.09</td>
</tr>
<tr>
<td>Lincoln St. - Southbound</td>
<td>657</td>
<td>589</td>
<td>1.12</td>
</tr>
<tr>
<td>Main St. - Southwestbound</td>
<td>1,079</td>
<td>995</td>
<td>1.08</td>
</tr>
<tr>
<td>Maple St. - Westbound</td>
<td>766</td>
<td>607</td>
<td>1.26</td>
</tr>
<tr>
<td>Park St. - Northbound</td>
<td>1,415</td>
<td>1,478</td>
<td>0.96</td>
</tr>
</tbody>
</table>

Weighted Average on PM Peak Hour Volume 1.08

Although the continuous traffic counter on VT 2A in Williston is located between Marshall Avenue and Exit 12 which is near the retail center of Taft Corners, it provides a reasonable comparison of seasonal traffic volumes at Five Corners for two reasons. First, the traffic passing through Five Corners contains trips to and from the retail uses at Taft Corner. Second, VT 2A is a regional arterial that carries through traffic from I-89 to and beyond Essex Junction. The continuous traffic counter is, in my opinion, a much more accurate measure of seasonal variation than estimates of AADT on the five approaches to Five Corners.

VTrans Comment 3

In the Village Connector Road Analysis two new traffic signals are proposed. Since they are quite close to the Five Corners intersection, it is anticipated that they would be coordinated with that signal. Nowhere is the report is that made clear. Presumably, the Level of Service (LOS) analyses were carried out with this fact in mind. This, also, is not clear.

RSG Response to Comment 3

The LOS analyses assume that the traffic signals at the connector road intersections with Park Street and Maple Street are coordinated. The LOS analysis assumes that the traffic signal at Five Corners will operate independent from the traffic signals at each end of the connector road. The traffic signal at Five Corners has an unusually long cycle length to accommodate five separate phases. It is not practical to coordinate that timing and phase plan with the proposed traffic signals at the connector road. This point has been clarified in the final report.