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# Road Safety Audit

## Intersection of NH 12 and 119, Fitzwilliam, NH

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# **Road Safety Audit**

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### **1.0 Introduction**

#### **1.1 Scope and purpose of Road Safety Audit**

A Road Safety Audit (RSA) is a formal, proactive safety performance examination of a roadway or intersection by an audit team. It is a qualitative assessment that reports on potential safety issues and identifies opportunities for safety improvements for all types of road users.

The audit team assembled for an RSA is independent of a highway design team and it is multidisciplinary in order to provide a variety of perspectives that inform any future safety design considerations by NHDOT. The RSA team assembled for this project is composed of local people that contribute valuable “context-sensitive” information and observations that are not ordinarily available to a highway design team through data sets, maps and other standard tools and resources ordinarily used to inform highway project designs.

Road Safety Audits are not meant to be a checklist of compliance with design standards and they are not meant to be a crash investigation or crash data analysis, although the crash history of an existing road is reviewed to make sure that previous crash patterns have been addressed.

The RSA process used for this particular project involved the following steps:

1. Identification of a project to be audited.
2. Selection of a RSA team and NHDOT designated liaison(s).
3. Meeting with the RSA team to review the RSA process and review project information.
4. Field observations and documentation of those efforts.
5. Analysis of findings and preparation of a RSA report.

Upon completion of the *Road Safety Audit for the Intersection of NH 12 and NH 119, Fitzwilliam, NH*, the Southwest Region Planning Commission (SWRPC) and the Road Safety Audit Team will present the audit findings to the NHDOT designated liaison(s) and request a formal response to the findings and suggestions in the Report. The Report shall be used as a tool to incorporate findings into the project when appropriate.

#### **1.2 Identification of project**

This RSA Report describes a safety evaluation of the intersection of NH 12 and NH 119 in Fitzwilliam, NH. The project was identified as a candidate for a RSA for several reasons. The intersection has been identified as a high-profile safety concern by the Town of Fitzwilliam and SWRPC’s Transportation Advisory Committee for a number of years. Although the intersection was programmed as an intersection improvement project in the 2007-2016 New Hampshire Ten Year Transportation Improvement Plan (TIP) at a cost of \$2.35 million, the project was later deferred in the 2009-2018 TIP. The project’s deferral was a result of the limited transportation funds available to the state of NH. The RSA process was identified as a positive step toward proactively seeking ways that the State, Town, intersection abutters and other interested parties can make the road safer by offering short-term as well as long-term-low cost as well as higher cost improvements that can be implemented at various stages into the future.

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### 1.3 Project limits

This RSA focuses on the safety of the intersection of NH 12 and NH 119 as well as the approaches to the intersection. The approaches were reviewed to the extent at which the RSA team surmised that they were impacting the safety of the intersection. Factors such as hill grade, driver speed, signage, sight distance and other factors were variables used to determine the project limits of the approaches to the intersection.



August 31, 2009

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## **Intersection of NH 12 and NH 119, Fitzwilliam, NH**

### **2.0 Background**

#### **2.1 Audit team, affiliation and qualifications**

The RSA Team assembled for this audit has qualifications and expertise in public safety, emergency management, road maintenance and land use planning as well as a rich local knowledge on the historic performance of the intersection. Participants on the Core RSA Team included the following people:

- Gene Cuomo, Fitzwilliam Road Agent
- Wayne Kassotis, Fitzwilliam Chief of Police
- Tom Parker, Fitzwilliam Select Board
- Paula Thompson, Fitzwilliam Town Administrator

Additional participants from the Town of Fitzwilliam at various stages of the process included Nancy Carney, Deputy Fire Chief; Paul Graseswicz, Planning Board; Macreay Landy, Planning Board; and Susan Silverman, Select Board.

NHDOT's Bureau of Traffic and District 4 office provided direct support for this RSA process. NHDOT liaisons involved in the RSA included:

- John Kallfelz, Assistant District Engineer, District 4
- William Lambert, Administrator of Bureau of Traffic

Stuart Thompson from the Bureau of Highway Design was also used as a resource to investigate crashes at the intersection.

SWRPC transportation planning staff facilitating the RSA included:

- J. B. Mack, Senior Planner
- Neel Patel, Planning Technician

#### **2.2 Data and information received from NHDOT and other sources**

The following existing data and information was collected and reviewed for this RSA:

- NHDOT available crash data from 1995 to 2006
- NHDOT available average annual daily traffic (AADT) for NH 12 and NH 119
- Aerial photos, parcel data, intersection plans, and zoning information

Additional information collected by SWRPC for this project included:

- Fitzwilliam Police Department crash reports from 2006 to present-2009
- AM and PM peak hour turning movement counts for the intersection
- Photo inventory
- NHDOT Scaled Plan of intersection

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Key data used for this audit are available at ftp.swrpc.org. The case sensitive username and password for the data is “RoadSafetyAudit” and “safety4u!!” respectively. Additional information cited above is available from SWRPC upon request.

#### **2.3 Key observations from data and information**

Crash data from January 2006 to April 2009 showed a total of 19 crashes, including 7 resulting in injuries. Nine of the 19 crashes involved rear end collisions on Route 119 during the period. Historically, most crashes have involved two or more motor vehicles during daylight hours under clear conditions.

There is a clear trend of motorists taking left turns from NH 12 southbound to NH 119 eastbound as well as right turns from NH 119 westbound to NH 12 northbound. The left turns from NH 12 southbound to NH 119 eastbound represent almost 50% of all movements of all NH 12 southbound traffic in the a.m. and p.m. peak hours.

#### **2.4 Observations regarding site visit**

The RSA team performed a site visit at the intersection which included driving through the intersection from all approaches as well as observing other road users from each corner of the intersection. The RSA team used a prompt list and followed Federal Highway Administration (FHWA) recommendations to observe the site using the GORE prompt method. GORE stands for Geometry, Operations, Road users and Environment. The following observations were made for these categories:

##### **Geometry:**

##### **General Observations**

- The intersection and intersection approaches are positioned on a downgrade toward the south.
- The intersection is skewed which causes sight distance issues as well as awkward opposing left turning movements for all approaches.
- The main line (NH 12) and side (NH 119) approaches were noted as being very wide—the combined lane and shoulder width on NH 12 may encourage drivers to speed. The width of side approaches (particularly NH 119 west of the intersection) cause vehicles to “sidestack” and block each other’s sight distance as well as causing right of way communication issues with opposing traffic.
- Motorists (especially multi-axle truck drivers) heading northbound on NH 12 and turning eastbound on NH 119 have a very tight turning radius. This tight radius is also on a difficult slope.
- The eastern side of the intersection is constrained by physical development and does not appear to have very much right of way.
- Wide shoulders are present everywhere in the intersection and at the approaches of intersection, except for the east side of the intersection.
- There is a wide curve on the northbound NH 12 approach to the intersection which limits sight distance between northbound NH 12 and westbound NH 119 motorists.

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### **Intersection of NH 12 and NH 119, Fitzwilliam, NH**

- NH 12's southbound left turning lane appears short based on the RSA team's observation of vehicles coming quickly down hill and some vehicles missing the turning lane altogether.

#### *Post Office*

- The driveway leading out of the post office is very steep, causing drivers to consistently creep forward to get a better sight distance of northbound or southbound motorists on NH 12. In addition, drivers frequently accelerate out of the post office driveway at high speeds in order to complete the climb out of the driveway. This sudden movement into the intersection's southern approach can surprise existing motor vehicle traffic on NH 12.

### **Operations:**

#### **General Observation**

- The two existing flashing beacons appear to be dirty/dim in the daytime. At night time, however, the flashing beacons appear to have enough contrast with the dark.

#### **On NH 12 north of intersection**

- Many motorists going downhill southbound on NH 12 appear to be speeding.
- Vehicles heading southbound on NH 12 and turning left on to NH 119 eastbound appear to sometimes cross paths (same pavement) as vehicles heading northbound on NH 12 and turning left on to NH 119 westbound.

#### *Jaffrey Road*

- Motorists make sudden turning movements into and out of Jaffrey Road Extension, into the northern intersection approach of NH 119 and NH 12. This causes a queue to build up for traffic heading primarily southbound on NH 12, reducing gaps between vehicles once they reach the intersection.

#### *Mr. Mike's*

- Motorists make left turning movements on to Jaffrey Road Extension into Fitzwilliam after pulling out of the Mr. Mike's driveway on NH 12. This traffic movement increases confusion at the intersection.

#### *Post Office*

- Traffic heading towards and into the post office builds up in both the breakdown lanes and the north and southbound lanes of travel during hours of high post office use. The buildup slows traffic down at the southern approach of the intersection, resulting in a queue, reducing available gaps and causing drivers to go around one another.

## **Road Safety Audit Intersection of NH 12 and NH 119, Fitzwilliam, NH**

### On Route 119 east of intersection

#### General Observations

- The Road Safety Audit team noted a number of motorists rolling through the stop sign on this approach.
- Motorists going straight westbound on NH 119 sometimes have trouble taking turns with motorists exiting the opposing side of the intersection.
- Queuing occurs on this side of intersection.
- Left turns on to NH 12 southbound from this side of this intersection have a wide, awkward turning movement.

#### *Crossroads*

- The signs for the commercial development known as “Crossroads at Fitzwilliam” (as well as other signs on NH 12 south of the intersection) block sight distance to the south when trying to exit the eastern side of the intersection from NH 119.
- The “Crossroads at Fitzwilliam” sign blocks sight distance to the east when exiting that facility’s driveway on NH 119.
- The “Crossroads” driveway is used as a detour of the NH 12/119 intersection for people turning from NH 119 westbound on to NH 12 southbound.

#### *Mr. Mike’s*

- Left turns are restricted for motorists heading east on NH 119 and wanting to enter Mr. Mike’s Convenience Store from its NH 119 driveway. Several motorists were observed ignoring this restriction.
- Right turns are restricted for motorists exiting Mr. Mike’s Convenience Store on its NH 119 driveway and wanting to drive westbound on NH 119. Several motorists were observed ignoring this restriction.
- Mr. Mike’s driveways and parking area is used as detour of the NH12/119 intersection for people turning from NH 119 eastbound to NH 12 northbound.
- Motorists at the intersection can misinterpret right turn signals of NH 12 northbound motorists with intentions to turn into the NH 12 Mr. Mike’s driveway.

### On Route 12 south of intersection

- Motorists (especially trucks) turning on to NH 119 eastbound sometimes need to travel in the unpaved shoulder or else make turning movement using the opposing lane on NH 119.
- Motorists turning left onto NH 119 westbound appear to be crossing the same pavement as vehicles heading NH 12 southbound vehicles onto NH 119 eastbound.

## **Road Safety Audit**

### **Intersection of NH 12 and NH 119, Fitzwilliam, NH**

#### On Route 119 west of intersection

- The approach on this leg of the intersection is extremely wide. The eastbound lane is currently one lane, but easily could be two lanes. Motorists appear to “sidestack” and block each other’s sight distance if making different turning movements.
- Motorists crossing the intersection to NH 119 eastbound have to cross a very wide intersection.
- Left turns on to NH 12 northbound from this side of the intersection have a wide, awkward turning movement.

#### Road Users:

- There are a fair amount of trucks using the intersection on all approaches. Limited sight distance increases issues with trucks because trucks have more difficulty accelerating or decelerating through the intersection. Park Construction (located on 138 NH 119) truck traffic was identified as a source of some trucks using the intersection.
- Trucks frequently park on NH 119 eastbound across from Mr. Mike’s which reduces limited space on an already tight approach to intersection. This also limits sight distance for motorists heading westbound as well as for motorists exiting the “Crossroads at Fitzwilliam”.
- The southeast corner of the intersection has a tight turning radius for trucks.
- The RSA Team observed a good deal of motorcycles using the intersection.
- The RSA Team noted that some drivers are physically challenged pulling out of NH 119 because they have to look back over their left shoulder.
- Commercial development in Rindge and Franklin Pierce students cause a great deal of traffic movement between the north and eastern sides of the intersection.
- No pedestrians were noted walking through the intersection.
- Motorists using the Liquor store do not appear to cause any specific issues related to the intersection.

#### *Post Office*

- Motorists entering and exiting the Post Office south of the intersection cause issues by slowing traffic at the intersection during high activity hours.

#### Environment:

- Trucks have difficulty traveling northbound on NH 12 or slide when headed southbound in the winter because of the long steep incline/decline north of the intersection.
- The RSA team noted that there are glare issues for vehicles making turn or approach into Route 119 (eastern glare in a.m. and western glare in p.m.).
- Vegetation and snow banks block sight distance from Jaffrey Road Extension looking north and south at NH 12. In addition, vegetation blocks sight distance for drivers traveling southbound on NH 12, attempting to look for Jaffrey Road Extension traffic.

## Road Safety Audit Intersection of NH 12 and NH 119, Fitzwilliam, NH

### 3.0 Priority Issues and RSA Team Suggestions

The RSA team identified four theme-related issues as well as suggestions that should improve safety at this intersection. The bullet lists of suggestions under each issue are in an order that is meant to reflect short term, low cost measures before long term improvements.

**Issue 1:** The NH 12/NH 119 intersection is skewed which causes a number of issues including awkward turning movements and aggravating already poor sight distance.

- Evaluate Federal Highway Administrations Manual on Uniform Traffic Control Devices (MUTCD) guidelines to determine if intersection signs can be placed on all approaches that show the true existing alignment of the intersection instead of a 90 degree “T” formation. Consider replacing existing signs to show skewed intersection and make them larger.
- Evaluate moving the stop bars on NH 119 closer to the intersection to improve sight distance for those motorists.
- Assess changing pavement markings on NH 119 approaches so as to discourage vehicles lining up side by side and blocking each other’s sight lines.
- On NH 12 evaluate creating opposing dashed pavement markings demonstrating the correct left turn path for each opposing left turning lane into NH 119.
- Look for opportunities to remove or adjust the location of existing embankments, trees, landscaping and signage currently limiting sight distance.
- Examine available right of way on the southern side of the intersection for adjusting the alignment of NH 119 with NH 12 so that it is as close to 90 degrees as possible. It appears that there is land available to improve the alignment especially if a remedy can be achieved using land on the southwest corner of the intersection. According to the Town, the Fitzwilliam state liquor store, located on the southwest corner of the intersection, is scheduled for closing.

**Issue 2:** Motorists appear to be speeding on NH 12 through the intersection. Measures should be considered to reduce speed and to capture the NH 12 motorists’ attention to proceed carefully through the intersection.

- Cut back vegetation around signs heading southbound on NH 12 in order to prevent drivers from missing existing traffic signs.
- As is noted in Issue 1, evaluate Federal Highway Administrations Manual on Uniform Traffic Control Devices (MUTCD) guidelines to determine if intersection signs can be placed on all approaches that show the true existing alignment of the intersection instead of a 90 degree “T” formation. Consider replacing existing signs to show skewed intersection and make them larger. Consider adding flashing beacon underneath skewed signs on NH 12 to alert and remind drivers about the skewed intersection.
- Post advisory speed signs on NH 12 before approaching the intersection.
- Evaluate the length and visibility of the left turn lane on NH 12 heading southbound into the intersection.
- Evaluate sign clutter on NH 12 on both approaches. Remove non-essential signs or duplicative signs. Assess the need to enlarge signs relating to intersection ahead.

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### Intersection of NH 12 and NH 119, Fitzwilliam, NH

- Replace existing flashing beacons with larger lenses and/or with strobes in order to alert all drivers of the intersection.
- Consider traffic calming techniques on the NH 12 approaches to the intersection such as the narrowing of pavement markings, adding rumble strips or moving highway signage closer to shoulder.
- Increase law enforcement presence and speed patrol in the vicinity of the intersection.

**Issue 3:** RSA Team observations and data suggest that Jaffrey Road and its extension create dangerous traffic at the northern approach of the intersection.

- Cut back vegetation further at Jaffrey Road looking northbound on NH 12 in order to assist motorists on NH 12 to see that there is traffic heading onto the road.
- Explore the utilization of rumble strips to alert drivers on NH 12 southbound of the Jaffrey Road Extension. In addition, explore utilizing rumble strips on the Jaffrey Road Extension, on its approach to NH 12 to alert drivers of NH 12 traffic.
- Enlarge current street and stop signs so motorists on the Jaffrey Road Extension realize that they are about to cross into the road.
- Explore redesigning the Jaffrey Road Extension/NH 12 intersection by altering or removing the triangle.

**Issue 4:** RSA Team observations and data suggest that driveways and entrances of land uses adjacent to the intersection should be evaluated to improve safety.

#### *Crossroads*

- Explore working with the Crossroad's at Fitzwilliam owner to determine if the driveway warrants the utilization of chain during the off hours, or signage such as 'Limited Access Driveway', in order to prevent motorists from cutting through the driveway.

#### *Mr. Mike's*

- Evaluate the purpose of the existing restriction on left and right hand movements into and out of Mr. Mike's. If warranted, explore other ways to discourage drivers to not make those turns.

#### *Post Office*

- Add road gripping to the pavement of the post office driveway to assist drivers in climbing out of the sloped driveway onto NH 12.
- Adjust pavement markings to create a turning lane into the post office on NH 12 southbound in order to prevent traffic queues on NH 12.
- Evaluate moving the driveway system south of the current entrance/exit to assist traffic flow into and out of the post office. Consider designing the driveway so that it has a throat that separates on-site and off-site traffic.

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**4.0 Contact Information**

Southwest Region Planning Commission has agreed to be the principal contact for any questions or comments relating to this Road Safety Audit report. Please contact SWRPC for any explanation of data or field reviews used during this report or if clarification is required for project development purposes at the intersection of NH 12 and NH 119.

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