

IX. Transportation



**Intersection of Route 107 and Hannaford Supermarket/Dunkin Donuts Driveways
off Exit 5 of Route 101**

IX. Transportation

Introduction

The purpose of this Transportation study is to identify highway and other transportation issues of concern to Raymond officials and residents and to recommend proposed actions. Transportation planning is a local and state responsibility and the majority of the long range transportation planning occurs at the regional and state levels. Since land use and transportation issues are so inextricably linked, this study will devote some discussion and analysis to transportation concerns in the context of land use issues when appropriate. Local officials and planning board members have expressed concern with transportation improvements that tend to promote haphazard growth (i.e. sprawl) and desire to learn how creative land use tools can be effectively used to prevent sprawl and thereby manage and preserve transportation improvements for future users.

Since the 1960s Raymond's proximity and easy access to Interstate Routes 93 and 95 has contributed to the Town of Raymond's evolution into a predominantly bedroom residential community. According to the 2000 Census, approximately 78 percent of local residents who are employed commute to other communities for work. Approximately 20 percent of these residents are employed in Manchester (678) while other notable work locations include Exeter (236 or seven percent), Londonderry (230 or 6.8 percent) and Derry (153 or 4.6 percent). Of the 2,669 individuals employed in Raymond, 1,734 or approximately 65 percent commute from another community. The New Hampshire Department of Employment Security reported that, as of 2007, 19 percent of working residents in Raymond are employed in another state.

Accessibility for those who live and work in the Town of Raymond depends on an efficient transportation network; the existing local road and highway network will remain the primary transportation mode for the foreseeable future. Because of economic and environmental considerations, alternative forms of transportation are becoming increasingly popular, including local interest in the provision of bus services (public transportation) and improvement and expansion of town sidewalks, walking trails, bicycle paths.

The continued maintenance and expansion of the local road network, parking, sidewalks, pedestrian amenities, bicycle transportation systems, and the possible provision of public transportation services play an important role in Raymond's effort to maintain a quality of life and to plan for future growth. This study provides a focus and direction regarding these concerns and issues.

In addition to these issues, a community-wide master plan survey was conducted which included two general transportation related questions which are reviewed in the following section. A citizen-based Transportation Topic Group was not created during the development of this master plan, because the Town of Raymond already has in place a Highway Safety Committee which currently reviews and monitors a variety of

transportation concerns within the community. The results of the master plan survey as related to this report are summarized as follows.

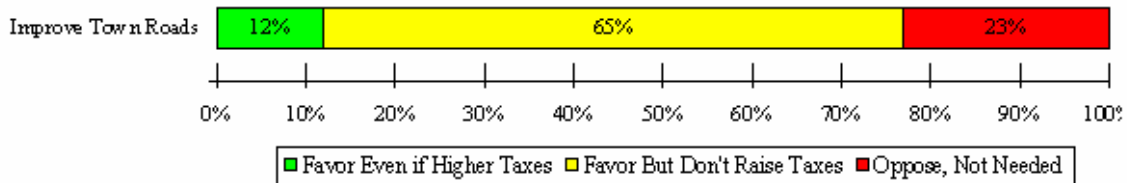
UNH Survey Results

Between September and October 2007, the University of New Hampshire Survey Center conducted a community-wide master plan survey of the perceptions, interests and attitudes of residents about the Town of Raymond and future planning initiatives for Raymond. A total of 4,580 surveys were delivered to all Raymond postal patrons in the “On the Common” newsletter on September 14, 2007. In addition, a reminder (post card) was mailed on October 4, 2007.

A total of 409 Raymond residents responded to the survey representing a response rate of nine percent. The following responses were received to Questions 6 (a) and 19 regarding transportation. An Executive Summary of the Master Plan Survey and a copy of the survey questionnaire are contained within the Appendix of this plan.

Transportation Questions

Question 6 (a): *Please indicate if you favor or oppose the following activities in Raymond and if so, are you willing to pay higher property taxes for them.*



Question 19: *What factors make Raymond less attractive to you?*

16 percent of respondents responded Traffic.

Overall Summary of Results

It is clear from the survey results that Raymond’s residents favor improving Town roads (65 percent) provided local property taxes are not raised and that 16 percent believe that traffic makes the Town of Raymond less attractive. About 23 percent of the survey respondents indicated that they were opposed to paying higher property taxes to improve Town roads while 12 percent indicated that they were in favor of doing this even with higher taxes.

A. Transportation Improvement Program

As a member community of the SNHPC, the Town of Raymond has representation on the Technical Advisory Committee (TAC) and Metropolitan Planning Organization (MPO). As a result, the Town has input into the process of development of the NH DOT Ten-Year Highway Plan and regional Transportation Improvement Program. During the Fall of even numbered years, the SNHPC begins the process of developing a new Ten-Year Plan and TIP by soliciting potential projects from member communities. The selection of projects for inclusion in the FY 2009 – FY 2012 TIP began in January 2007 when the SNHPC's TAC (in response to a request from the NHDOT) met to begin the update process for the NH DOT 2009-2018 Ten-Year Highway Plan. Because the Ten-Year Plan was financially over-programmed, the SNHPC was asked to work with its member communities to re-examine Ten-Year Plan projects in their region. Meetings to discuss Ten-Year Transportation Improvement Program projects with SNHPC member communities were held during late February and early March 2007.

At the present time, there are no projects in the Town of Raymond included in the FY 2009 – FY 2018 Ten-Year Plan or FY 2009 – FY 2012 SNHPC TIP. During late 2008 and early 2009, the Town of Raymond will be asked, along with the other SNHPC member communities, to provide input on its transportation priorities in the form of potential projects for a new FY 2011 – FY 2020 Ten-Year Plan.

B. Traffic Circulation

As noted in the SNHPC Regional Comprehensive Plan, "Raymond has strategic regional location." Long recognized as being at the crossroads of several major highways including NH Routes 101, NH Routes 101, 156, and 27 (the old Route 101), businesses and residents of Raymond can easily travel to the seacoast, Merrimack Valley and northern Massachusetts for employment, recreational or shopping purposes. Raymond's town center is equidistant from I-93 in the Manchester area and I-95 in the Seacoast -- approximately 17 miles or a 20-minute drive without construction delays. NH Route 101, the state's major east west highway and the primary connector with the Manchester area and the Seacoast provides access to Raymond from Exits 4 and 5. These two exits, along with the other state highways are Raymond's "gateways."

While in need of repair and in some cases possible reconstruction, the Town's major roads, such as Main Street, Epping Street, Harriman Hill Road, Old Manchester Road, Scribner Road, Long Hill Road, Lane Road and Batchelder Road, provide easy access into the state system.

The Town's location, complemented by an excellent highway system, has encouraged the location of commercial activities. In addition to a few national fast food establishments and a regional supermarket, the most significant commercial development is the Wal-Mart Distribution Center #30 built in 1997. The facility, located on the east side of NH Route 107 south of NH Route 101, is identified in the SNHPC Regional Transportation

Plan, as a major regional traffic generator. The 1.2 million square foot facility employs approximately 500 persons that travel on average 30 minutes to work each way. The facility added 1,450 vehicles to the annual average daily traffic count on NH Route 107/102. The facility generates about 400 heavy truck trips per day. Since all of Wal-Mart's trucks travel exclusively on Route 102 a short distance to reach Route 101, they have no direct noticeable impact on local roads. However, the truck traffic may require a reconfiguration of the entrance ramps to NH Route 101 from Exit 5.

It is anticipated that additional areas within Raymond will experience growth in the future. Development proposals for the area immediately north of the NH 101 Exit 4 interchange have been submitted to the town and in June 2007 the Planning Board approved a development consisting of residential condominium units, a hotel, a restaurant and additional retail space in this area. The proposal also included improvements to the NH 101 Exit 4 on and off ramps as a condition of approval. It is estimated that an additional 200 acres of developable land exists in this area that could potentially support over 500,000 square feet of business space. This location has been identified as a Mixed Use growth area by the town.

The area in the vicinity of the NH 27 and NH 107/NH 156 intersection in the northeastern portion of Raymond has also been identified as a potential "Mixed Use" growth area as part of the adoption of the Mixed Use Business Overlay District (MUBCOD). This portion of the town has recently experienced growth in the form of various retail, office and commercial developments. The Town of Raymond has identified the NH 27 and NH 107/NH 156 intersection as a problem location and is currently seeking to have a signal warrant analysis completed to determine potential mitigation for traffic impacts.

C. Road Classification - Functional Classification

The functional classification system identifies roadways according to the service they provide in the highway network. The system allows the user to understand how individual roads and streets relate to a highway network. The classification system provides a procedure for the long-term management and development of the state and local roadway network. To facilitate roadway planning and maintenance, the NH Department of Transportation has classified highways and roads in Raymond for state and federal aid requirements. The Town of Raymond's Public Works Department has classified roads according to *Local Roads* and *Arterial Roads*. NH DOT classifies roadways as follows: arterials, collectors, and local roads. The Town of Raymond and NH DOT have designed their classification systems based on their needs.

Arterial Roads, as designated by NHDOT, provide a high degree of mobility and handle large traffic volumes and are used for longer trips. Arterials are capable of handling between 10,000 and 30,000 vehicles per day. They connect major economic activity areas such as the Manchester area and the seacoast. NH DOT classifies arterials as principal arterials (interstate and other) and minor arterials. An example of a principal arterial is NH Route 101.

Collector Roads link the arterial roadways with local roads and roadways serving residential neighborhoods. Collector roadways are located so as to conveniently manage local road traffic and typically have two (2) travel lanes and six to eight foot shoulders with the capacity to carry 8,000 to 10,000 vehicles per day. A collector can be classified as either major or minor. Examples of major collector roads include NH Routes 102, 107, and 27 west of its intersection with NH Route 107. Examples of minor collectors include NH Route 156, Route 27 east of its intersection with NH Route 107, Mountain Road, and Lane Road.

The Town of Raymond Public Works Department adopted the following local functional classification system.

Arterial Roads: Those painted with “double yellow” traffic lines. Local arterials include Batchelder Road, Brown Road, Epping Street, Green Road, Ham Road, Harriman Road, Harriman Hill Road, Health Road, Lane Road, Langford Road, Main Street, Old Freetown Road, Old Manchester Road, Onway Lake Road, Prescott Road, Rite Aid Lane, Scribner Road and portions of Center Street, Essex Drive, Lisa Avenue and Washington Drive.

Local Roads: All those local roads not designated as an arterial.

Continued development and refinement of a functional roadway classification system for the Town of Raymond will assist in highway system planning and encourage the development of a roadway network that meets the needs of both regional and local trip-making.

D. Roadway Classification - Administrative Classification

Guidelines for administrative classification of roadways in the State of New Hampshire are based on information contained in *New Hampshire Planning and Land Use Regulation*. Highways under state maintenance and control include Class I, II, and III highways while Class IV, V and VI highways are under the jurisdiction of municipalities. The administrative roadway classification as defined in *New Hampshire Planning and Land Use Regulation* is as follows:

- Class I highways consist of all existing or proposed highways which are part of the primary state highway system excepting all portions of such highways within the compact sections of 27 towns and cities listed in RSA 229:5, V.
- Class II highways consist of all existing or proposed highways on the secondary state highway system, except those portions of such highways which are within the compact sections of 27 towns and cities listed in RSA 229:5, V.

- Class III, Recreational Roads, consist of all roads leading to, and within, state reservations designated by the legislature.
- Class III-a, highways consist of new boating access highways from any existing highway to any public water in the state.
- Class IV, Town and City Streets, consist of all highways within the compact sections of 27 towns and cities listed in RSA 229:5,V. The extensions of Class I and Class II highways through these areas are included in this classification.
- Class V, Town Roads, consist of all other traveled highways which the town has the duty to maintain regularly.
- Class VI, Unmaintained Highways, consist of all other existing public ways, including highways discontinued as open highways, highways closed subject to gates and bars, and those highways which have not been maintained by the Town in suitable condition for travel for a period of five years or more.
- Scenic Roads are special town designations (by vote of the town meeting) of any road, other than a Class I or Class II highway, where the repair, maintenance, reconstruction, or paving work shall not involve or include the cutting or removal of trees, or the destruction of stone walls, except as provided for under RSA 231:158.

Table 65
Approximate Total Highway Mileage
Town of Raymond, NH

Class I	20.3 miles
Class II	10.6 miles
Class III	1.4 miles
Class V	75.0 miles
Class VI	6.2 miles
Other	13.0 miles

Source: NH DOT (2009)

According to the NH DOT, there are approximately 126.5 miles of roadways in the Town of Raymond. As indicated in Table 65, Class V (Town Roads) comprise the largest amount of mileage in the town with approximately 75 miles followed by Class I highways (Primary State Highway System) with 20.3 miles. Other notable roadway mileage in Raymond includes Class II roads (Secondary State Highway System) with 10.6 miles, Class VI roads (Other Existing Public Ways) with 6.2 miles, and Class III roads (Recreational) with 1.4 miles. There are 13 miles of other roads in Raymond which are typically private roads.

E. Roadway Maintenance Policy

The Technology Transfer Center at the University of New Hampshire prepared a report entitled Inventory and Assessment of Road Surfaces for Raymond, NH in August of 1988. The report inventoried, rated and established priorities for all local roads. The Public Works Director reviewed the report in draft and provided guidance in developing the rating system and in establishing the priorities. To date, the report has not been adopted by the Board of Selectmen. Within available funding constraints, the Public Works Director intends to follow the report's recommendations and has encouraged the Town of Raymond to do the same. A recommendation has also been made to have the assessment updated. The assessment notes at the very beginning of the report:

“Sixty percent of Raymond’s paved local roads need rehabilitation or reconstruction. Many miles of other paved and aggregate roads require routine and preventive maintenance, which should be done before they deteriorate to poor conditions. The current capital improvements and road maintenance budgets are inadequate to meet these needs.”

The Board of Selectmen and the Public Works Director recognize the existing roadway problem in Raymond; they want to provide a long term work program and budget to improve Raymond’s current roadway situation. The total estimated cost of local roadway improvements was estimated in the 2002 Master Plan at \$4.2 million dollars. Based on information obtained from the Public Works Director in 2008, this figure has likely doubled.

In July 2008, the Raymond Highway Safety Committee submitted a list of 15 intersections identified as problem intersections in the Town Raymond for inclusion in the updated Master Plan. The following list identifies the locations as well as the reason given by the Raymond Highway Safety Committee for their inclusion in the list:

- NH 102/Blueberry Hill Road - No Deceleration Lane and Poor Sight Distance
- NH 27 and NH 107/NH 156 – Accidents, Traffic & Turning Conflicts
- Harriman Hill Road/Englewood Road – Poor Sight Distance
- Scribner Road/Gile Road – Signage
- Lane Road/Shattagee Road/Old Chester Road – Poor Geometry and Turning Conflicts
- Main Street/Epping Street – Turning Conflicts
- NH 156/Harriman Hill Road - Poor Sight Distance
- NH 156/Ham Road – Poor Horizontal Geometry
- Old Manchester Road/Industrial Drive – Turning Traffic Conflicts
- NH 107/Batchelder Road – Turning Traffic Conflicts
- Washington Drive/Batchelder Road – Poor Sight Distance
- NH 107/Rite Aid/Essex Drive – Accidents
- Prevere Road/Mountain Road – Poor Sight Distance
- NH 156/Stingy River Road – Poor Sight Distance
- NH 27/Harriman Hill Road – High Accident Volume

Based on an evaluation of this list submitted by the Highway Safety Committee, the SNHPC has completed a detailed evaluation of seven of these locations that represent specific traffic issues. The following descriptions provide an overview of each of the seven problem intersections, including a review of existing issues and safety considerations, and suggested short and long-term improvements.

NH 102/Blueberry Hill Road

The three-way NH 102/Blueberry Hill Road intersection is located in the southeastern portion of the Town of Raymond. NH 102, which acts as the major intersection leg, runs roughly in a north-south direction in this area. Blueberry Hill Road, which extends to the east from NH 102, acts as a STOP-sign controlled minor intersection approach. Advisory speed signs are posted for 35 miles per hour north and south on NH 102 in the vicinity of this intersection.

Sight distance looking south on NH 102 from Blueberry Hill Road at this location is limited by vegetation on the east side of NH 102 and by the crest of a hill on NH102 to the south. Based on field measurements, there is approximately 370 feet of sight distance looking south on NH 102 from the intersection. Short-term strategies for improving traffic safety and efficiency at this intersection include removal of vegetation from the east side of Blueberry Hill Road.



NH 102 and Blueberry Hill Road

Warning signs combined with increased enforcement would also improve safety. A minor adjustment to the positioning of the STOP bar on the Blueberry Hill Road approach would also encourage drivers to make a complete stop before attempting turns onto NH 102. Long-term strategies to improve safety and efficiency at this location include removal of the crest on NH 102 at a 90-degree angle.



Limited Sight Distance Looking South on NH 102 from Blueberry Hill Road

NH 27 and NH 107 (Epping Road)/NH 156 (Nottingham Road)

NH 27 and NH 107/NH 156 is a three-way unsignalized intersection located approximately 550 feet west of the NH 27/NH 102 signalized intersection in a commercial district in the northeastern portion of Raymond. At the NH 27 and NH 107/NH 156 intersection, NH 156 extends from the north to form a STOP-sign controlled minor intersection approach meeting NH 27 and NH 107 at a 90-degree angle. The NH 156 intersection approach provides separate left and right-turn lanes at the intersection. In the vicinity of the intersection, NH 27 and NH 107 is posted at 35 miles per hour.

At this location, turning movements from the minor NH 156 intersection leg are often difficult because of the existing NH 27 and NH 107 traffic volumes and vehicle speeds. Left turns from the NH 156 leg are particularly difficult during peak hours. Short-term strategies from addressing traffic safety and efficiency at this intersection would include better enforcement of existing speed limits or lowering the current speed limit through the NH DOT. A more long-term solution might involve installation of signals at the intersection.



Left Turn from NH 156 at NH 27 and NH 107

However, a signal warrant analysis was recently completed to determine mitigation for traffic impacts at this intersection. While the analysis did not meet justification levels for a traffic signal, a traffic signal fund has been established by the Town of Raymond.

Signalized intersection operations at this location would likely be coordinated with the NH 27/NH 107 intersection. A signal warrant analysis should also be performed at the NH 27 and NH 107/NH 156 intersection as a first step in this process.

Harriman Hill Road/Englewood Road

Harriman Hill Road forms an unsignalized 3-way intersection with Englewood Road in the northern portion of Raymond. Englewood Road intersects Harriman Hill Road from the west to form the minor eastbound approach. Northbound and southbound through traffic on Harriman Hill Road must negotiate a sharp roadway curve at this location. Because of vehicle speeds and roadway alignment, through traffic often crosses the double yellow line separating directions of travel at the intersection. Additionally, turning movements from the minor Englewood Road leg are complicated by the excessive pavement width of this approach. Sight distance looking south from Englewood Road is also limited by vegetation on the west side of Harriman Hill Road.



Through Traffic on Harriman Hill Road at Englewood Road

Short-term strategies for improving traffic efficiency and safety at this location could include clearing vegetation on the west side of Harriman Hill Road south of the intersection and reducing pavement width on the Englewood Road approach. During a field investigation of this intersection, it was noted that attempts were being made to increase safety by enforcing the 30 mile per hour speed limit on Harriman Hill Road. Long-term strategies to address issues at this location would involve eliminating the existing curve on Harriman Hill Road.

Scribner Road/Gile Road

Scribner Road/Gile Road is a three-way unsignalized intersection located in the central portion of Raymond in the vicinity of NH 101 Exit 4 interchange. Scribner Road runs in an east-west direction in this area. Gile Road intersects Scribner Road at an acute angle from the south to form a northbound minor leg approach. Traffic safety and efficiency in this area are impacted by a curve in Scribner Road at the location of the intersection.



**Eastbound Scribner Road Approach to Gile Road-
Confusing Signage and Evidence of Use of Shoulder
for Turns**

This curve and the existing travel speeds result in vehicles crossing the center of the roadway as they travel east and west through the intersection. Although eastbound and westbound Scribner Road appear to operate as the major intersection legs at this location, a Yield sign posted on the eastbound approach to the intersection likely results in driver confusion. The minor Gile Road approach to the intersection is unsigned. Additionally right turns from eastbound Scribner Road to Gile Road require vehicles to negotiate a difficult acute angle. As a result, there appears to be evidence that vehicles are using the roadway shoulders to complete this turn. Sight distance for westbound vehicles making left turns onto Gile Road is limited by vegetation on the north side of Scribner Road west of the intersection.

Short-term strategies for addressing traffic safety and efficiency at this location would include addressing existing intersection signage and clearing brush from the north side of Scribner Road west of the intersection. Modifications to the signage at the intersection have recently been implemented by the Town of Raymond. Traffic efficiency could also be improved by a minor redesign of the Gile Road approach to allow 90 degree turning movements at the intersection.

More long-term strategies to address issues at this intersection would include eliminating the curve in Scribner Road.

Lane Road/Shattagee Road/Old Chester Road

Lane Road/Shattagee Road/Old Chester Road is a four-way unsignalized intersection located in the southwestern portion of Raymond. Lane Road, which acts as the major intersection leg, runs in an east-west direction east of this location and then extends to the north towards the Chester town line. Shattagee Road, which acts as a STOP-sign controlled minor intersection leg, extends from the Chester town line to this location. Old Chester Road acts as an uncontrolled minor approach to Shattagee Road directly adjacent to this intersection. Speed limits on Lane Road are posted at 30 miles per hour near this intersection.

At this location, southbound Lane Road approaches Shattagee Road on a down grade which encourages excessive speeds. These speeds, combined with vegetation and a roadway curve at the intersection, create safety issues for westbound left turns from Lane Road and eastbound movements from the minor Shattagee Road leg. Based on measurements, there appears to be approximately 300 feet of sight distance looking north on Lane Road for westbound traffic turning onto Shattagee Road. This limited sight distance would be reduced by roadside snow in winter.



Limited Sight Distance- Lane Road at Shattagee Road

Additionally, the lack of traffic control at the Old Chester Road approach creates driver confusion for northbound traffic approaching the intersection.

Short term strategies for improving traffic safety and efficiency at this intersection include clearing vegetation on the north side of Lane Road in this area. Warning signs and additional posting of speed limits on Lane Road north and east of Shattagee Road in this area combined with increased enforcement would also improve safety. Addition of Yield sign or STOP-sign control on the Old Chester Road approach would also reduce driver confusion.

Long-term strategies to improve safety and efficiency at this location could include an intersection redesign to create a more conventional 3-way intersection eliminating acute angle turning movements and reducing driver confusion. Based on a field inspection of this location, there may be right-of-way or property limitations to this strategy.

Main Street/Epping Street

Main Street and Epping Street form a four-way unsignalized intersection in the central business district of Raymond. Epping Street serves as the minor STOP-sign controlled southbound approach to the intersection. Wight Street, which runs one-way and is off-set slightly from Epping Street, serves as a northbound STOP-sign controlled approach. Southbound through movements at the intersection utilize a one-way segment of Old Manchester Road that is also off-set from Epping Street.



Excessive Pavement Width- Epping Street Approach to Main Street

Issues of traffic safety and efficiency at this location result principally from the excessive width of the southbound Epping Street intersection approach. The approach width results in driver confusion for southbound movements and can also limit sight distance looking west on Main Street from this location. This sight distance is also limited by the crest of the elevation of Main Street at the intersection. The positioning of the off-set Wight Street northbound approach and Old Manchester southbound receiving leg with Epping Street also results in inefficient northbound and southbound through movements.

The historic nature of the central portion of Raymond with its related right-of-way restrictions limits the extent to which this area could be re-designed to improve traffic safety and circulation. A short-term strategy to address the existing conditions would involve narrowing the southbound Epping Street approach and adjusting its positioning towards the center of the intersection. Narrowing the approach would provide better definition for southbound movements and would reduce the off-set between this approach and the northbound Wight Street approach. Sight distance looking west from Epping Street would also be increased. Reducing the pavement width of the Epping Street approach would also provide new right-of-way that could be used for pedestrian facilities or landscaped areas.

More long-term strategies to address existing conditions might include redesigning the traffic circulation pattern in this portion of the town.

NH 156 (Nottingham Road)/Harriman Hill Road/Ham Road

In the northeastern portion of Raymond, NH 156 (Nottingham Road) forms a 4-way unsignalized intersection with Harriman Hill Road and Ham Road. At this location, Harriman Hill Road forms an eastbound minor leg and Ham Road intersects NH 156 from the east to form a westbound minor leg. Safety and efficiency at the intersection are compromised because of a curve and vertical crest located on NH 156 just north of the intersection. Additionally, the off-set of the minor Harriman Hill and Ham intersection approaches also compromises safety and efficiency. Turning movements are also complicated by the auxiliary two-way Ham Road “turning bay” located directly north of the principal westbound approach. The existence of the turning bay enables southbound left turns from NH 156 to eastbound Ham Road and westbound right turns from Ham Road to northbound NH 156 to be made at two different locations. Because of vegetation located on the northwest quadrant of the intersection, there is also limited sight distance looking north on NH 156 from both the eastbound Harriman Hill Road and westbound Ham Road approaches.



Ham Road Turning Bay

Short-term strategies for improving safety and efficiency at the intersection could include clearing vegetation from the west side of NH 156 immediately north of the intersection. Warning signs are currently posted on the northbound approach to the intersection and similar signage for southbound traffic would also improve safety.

Long-term strategies could involve an intersection redesign to position the Ham Road approach slightly further to the north. This re-design, combined with the elimination of the 2-way Ham Road “turning bay”, would address existing limited sight distances and simplify intersection turning movements.

F. Traffic Volumes

The SNHPC traffic counting program and regional travel demand model were used to compile and develop existing and projected traffic volumes on the town roadway network. The existing volumes were selected using data gathered from the traffic counting program. Traffic volumes for the existing condition were projected to a 2025 “horizon” year utilizing a growth rate from the regional travel demand model. The traffic growth rate was developed through a comparison of the “base” year and “horizon” year assignments from the model. These growth rates were then used to increase the base year volumes from the traffic counting program to represent the 2025 horizon year. Existing (2006) and projected (2025) average annual traffic volumes (AADT) on selected roadways in the Town are shown on Map 13 and Map 14 and in Table 66.

Table 66
Existing (2006) and Projected (2025) AADT Traffic Volumes
Town of Raymond, NH

	2006 Traffic Volumes	2025 Traffic Volumes
Langford Road West of Onway Lake Road	1,200	1,700
Onway Lake Road East of Langford Road	440	720
Harriman Hill Road South of Cilley Road	590	800
Prevere Road South of Mountain Road	250	350
Mountain Road at Nottingham T/L	1,200	1,600
NH 156 at Nottingham T/L	2,700	3,600
Cross Road North of Harriman Hill Road	270	350
NH 156 South of Harriman Hill Road	4,300	5,500
Ham Road at Epping T/L	830	1,100
NH 27 at Epping T/L	4,800	6,300
NH 27/NH 107 East of Harriman Hill Road	7,600	10,500
NH 27/NH 107 West of Harriman Hill Road	4,900	6,800
Main Street East of Old Freemont Road	3,200	3,900
Prescott Road at Fremont T/L	750	920
NH 107 at Fremont T/L	5,800	7,600
NH 102 North of Brown Road	9,700	10,100
Brown Road East of NH 102	920	1,100
NH 102 at Chester T/L	6,200	7,400
Lane Road South of Enterprise Way	1,600	2,100
Old Manchester Road South of Scribner Road	3,800	5,100
NH 101 EB-WB Exit 4-5	37,000	47,000
NH 101 EB-WB Exit 3-4	29,000	37,000

Source: SNHPC

The State of New Hampshire Ten Year Transportation Improvement Plan (2009-2018) includes an evaluation of existing (2006) traffic congestion and operational data for the State highway system. Information on the major highway links in the Town of Raymond is included in this evaluation. In the document, congestion is measured by level of service, which is an indication of how well traffic flows on the highway system. Level of Service (LOS) is expressed by a letter grade with LOS A representing little or no congestion and LOS F representing a roadway link operating at capacity. Information presented for the Town of Raymond indicates that NH 27 and NH 107 in the northwestern portion of the town are reported as operating with little or no congestion. These conditions are roughly equivalent to LOS A and B. The remaining portions of NH 27 and NH 107 as well as NH 101 and NH 102 are expressed as operating with moderate congestion, roughly equivalent to LOS C and D.

G. Traffic Accidents

Raymond crash data for the period 2003 to 2005 was obtained from the NH DOT. According to the data, a total of 716 accidents occurred in Raymond during this three-year period. The highest accident total was recorded in 2003 when 247 accidents were reported. The lowest accident total reported was in 2005 when 234 accidents occurred. Approximately 25 percent of the total accidents reported resulted in personal injuries. A summary of the accident totals for the years 2003 to 2008 is presented in Table 67.

Table 67
Total Reported Accidents
2003 – 2008
Town of Raymond, NH

Year	Total Number of Accidents Reported
2003	247
2004	235
2005	234
2006	232
2007	220
2008	222

Source: NHDOT

Crash data for the period 2003 to 2008 was also used to identify high accident intersection locations within Raymond. Table 68 presents a listing of the high accident intersection locations for this period. The table indicates that, during this period, the Fremont Road/Essex Drive/Center Street intersection experienced the greatest number of accidents with a total of 43. The Fremont Road/Rite-Aid Driveway intersection experienced 31 accidents during the reporting period and 12 accidents occurred at the NH 101/Fremont Road intersection. More recent accident data for the period from 2006 to 2008 was also received from the Raymond Police Department. This data indicated that 232, 220 and 222 accidents occurred in Raymond during the years 2006, 2007 and 2008, respectively.

Table 68
Intersection Accident Locations
2003-2008*
Town of Raymond, NH

	2003	2004	2005	Total
Fremont Road/ Rite-Aid Driveway	14	7	10	31
Fremont Road/ Essex Drive/ Center Street	18	14	11	43
Fremont Road/ NH 101	9	3	0	12
NH 107 South/ NH 102	5	0	0	5
Lane Road/Shattagee Road/Old Chester Road	0	0	1	1
NH 102 at Blueberry Hill Road	1	0	4	5
NH 27 and NH 107 (Epping Road)/ NH 156 (Nottingham Road)	2	2	1	5
NH 156 (Nottingham Road)/ Harriman Hill Road/Ham Road	1	1	1	3
Harriman Hill Road/ Englewood Road	0	0	0	0
Main Street/Epping Street	0	2	0	2
Scribner Road/Gile Road	0	0	0	0

Source: NH DOT

*Information for 2006-2008 is not available on an individual intersection basis.

In the three year period from 2003 to 2005, a total of three reported fatal accidents occurred in the Town of Raymond. Table 69 identifies the location of these accidents and when they occurred. During 2003 fatal accidents occurred on NH 27 and NH 107 and an additional fatal accident occurred on NH 101 in 2005.

Table 69
Fatal Accidents
2003-2005*
Town of Raymond, NH

Year	Fatalities	Location
2003	1	NH 27 1,000 feet west of Main St.
2003	1	NH 107 660 feet south of Prescott Rd.
2005	1	NH 101 500 west of Exit 4

Source: NH DOT

*Information for 2006-2008 is not available on an individual intersection basis.

Bridges

Based on information contained in the FY 2009 – FY 2018 Ten-Year Highway Plan and additional information obtained from the NH DOT Bureau of Bridge Design, the State is currently monitoring two bridge structures in Raymond. The structure carrying Dudley Road over the Lamprey River in the northwest portion of the town is a structurally-

deficient bridge included on the NH DOT's "Redlist" bridge summary. The inclusion of the bridge on the Redlist identifies it as a structure requiring more frequent inspections because of known deficiencies such as poor structural condition, weight restriction or type of construction. This bridge, which is owned and maintained by the State, was most recently inspected in March 2008. The other monitored bridge is the structure carrying Epping Street over the Lamprey River. This is a functionally obsolete bridge that is owned by the Town of Raymond. According to information obtained from the NH DOT Bureau of Bridge Design, this bridge does not pose a structural safety hazard but rather has a design that is not appropriate for its current use. The bridge carrying Main Street over the Lamprey River is a municipally-owned structure included in the Public Works Department Replacement Program. This bridge, which was originally built in 1900, has a 2008 replacement cost of \$1,150,000.

In addition to the state's highway block grant aid program, the NH DOT has a municipal bridge aid program, which provides 80 percent of the cost for bridge rehabilitation and improvement. The NH DOT Bureau of Municipal Highways administers this program. If a particular bridge was of significant concern, the Town of Raymond could bring it to the attention of NH DOT and request more frequent inspections.

Sidewalks

Raymond residents have expressed an interest in upgrading and extending sidewalks in the town. The Town of Raymond's Public Works Director reports that the Department receives many inquiries from residents regarding the status of local sidewalks. Sidewalks along Epping Street and Main Street have deteriorated and due to regular road paving, the roadway berm is almost non-existent in some locations.

The Americans with Disabilities Act (ADA) is a civil rights law enacted in 1990 that prohibits discrimination against people with disabilities in the areas of employment, transportation, telecommunications, state and local government services, and public accommodation. Individuals who feel they have not been granted reasonable accommodations as per the ADA may file lawsuits to enforce their rights. They may also file complaints with 8 designated Federal agencies including the Department of Justice and the Department of Transportation.

A local issue in Raymond, especially with the aging of the baby boomer population is the provision of handicapped accessibility to residents. Some of the typical issues in Raymond include the construction of wheelchair ramps within a zoning district's setback requirements and requests for handicapped accessible sidewalks and street crossings. When dealing with such zoning issues, a reasonable solution is to permit construction of wheelchair ramps under the Americans with Disabilities Act as an administrative waiver and/or variance through the Zoning Board of Adjustment. For street accessibility accommodations, the Town of Raymond has a Highway Safety Committee which can review such requests on a case by case basis.

In response to this local interest, the Public Works Department has prepared a 17 phase program of sidewalk improvements in the downtown area. The total length of the recommended improvements is 12,600 feet for a total cost of \$945,000 which is based on an average cost of \$75.00 per linear foot.

At this time, the Town of Raymond has not adopted or accepted the program. Table 70 provides a list of the first six phases of the program. A sidewalk improvement program would not only encourage walking and physical fitness, but it would attract additional residents and perhaps visitors to the downtown area who would contribute to the local economy when opportunities to do so were present.

Table 70
Suggested Sidewalk Improvements
Town of Raymond, NH

Phase	Location	Length	Cost Estimate
1	Horse Shed Road (from Church to Epping Street)	400 feet	\$34,500
2	Main St. (between Wight Street & Old Manchester Road)	200 feet	\$17,250
3	Epping Street (from Sovereign Bank to Library)	250 feet	\$21,570
4	Epping St. (from Library to Main Street)	200 feet	\$17,250
5	Main St. (from Epping Street to Floral Avenue)	250 feet	\$21,570
6	Main St. (from Floral Ave. to Pecker Bridge)	400 feet	\$34,500

Source: Original Figures from June, 2000. Cost Estimates Increased by 15 Percent based on November 2008 information from Public Works Department

A sidewalk improvement project would also be an excellent candidate for funding under the Transportation Enhancement program. Under SAFETEA-LU, ten percent of all funding under the Surface Transportation Program are to be used for transportation enhancement activities. The intent of the program is to develop and reinforce “livable communities” by funding projects that preserve the historic culture of the transportation system, and/or enhance the operation of the system for its users. When the Planning Board reviews subdivisions and site plans, the Board should consider requiring sidewalks in areas where they would be used and can be connected with an existing sidewalk or trail system.

Other Transportation Modes

The single-occupant automobile is the primary mode of transportation for the majority of travel in the SNHPC region, including the town of Raymond. Even though Raymond is almost exclusively dependent on personal vehicles for transportation purposes, the Town of Raymond can encourage the use of alternative modes of transportation by continuing its participation in planning processes sponsored by the SNHPC. These processes are designed to address various goals contained in the SNHPC Regional Transportation Plan including “[T]o assist in the development of a safe, secure, efficient, accessible, and coordinated multi-modal transportation system that provides for the cost-effective movement of people and goods within and through the region.” The following sections present information on various alternative modes of transportation in Raymond and in the SNHPC region.

Ride Sharing

The closest Park and Ride facility located on the south side of NH 101 at the NH 125 interchange is located in the Town of Epping. This facility could be used for those traveling east or north or south on I-95. There are no other similar state or locally designated facilities in Raymond. The potential for a Park and Ride facility in the NH 101 Exit 4 area was identified by the SNHPC during its Regional Transit Feasibility Study, in part because of the planned Granite Meadows development. Because a Unified Development Plan was approved by the Planning Board at Exit 4 as part of a Sewer Overlay District re-zoning, a Park and Ride facility in this location could be included on this plan.

Public Transportation

There is currently no regularly scheduled fixed-route bus service in Raymond. Through the SNHPC, the Town of Raymond is involved in an effort initiated by the New Hampshire Department of Health and Human Services and the NH DOT to coordinate community transportation. In 2006, the NH DOT, under the guidance of the Governor’s Task Force on Community Transportation, began a statewide coordination study of human services transportation. The study grew from the results of the Statewide Transit Coordination Study. The Task Force was developed to carry on the work originally begun in the Coordination Study and to develop an action plan to modify the organization of community transportation in the State including improving service efficiency and quality. Based on the recommendations of the study, the State would be broken down into eight to ten Community Transportation Regions, each composed of a Regional Transportation Council (RCC) made up of funding agencies, service providers and other stakeholders. Raymond is currently included in Region 8 and as a result, can participate in the development of the RCC for this region.

As the SNHPC region grows, it is evident that the increasing dispersion of land development in the area is leading to socio-economic and demographic changes. In turn,

these changes are resulting in increased regional trip-making, travel across municipal boundaries, and a growing need to ensure mobility and accessibility on a regional scale. In an effort to address these issues, the SNHPC and the Manchester Transit Authority (MTA) are studying the feasibility of providing regional transit services in the greater Manchester area. The study is looking not only at the feasibility of expanding the scope of the transit services presently provided by the MTA, but also examining how existing services provided by the MTA and other organizations can be coordinated more effectively and used more efficiently through a “transit brokerage” concept. It is anticipated that Raymond will ultimately benefit from this effort to more effectively utilize the existing transportation resources of the region.

Bicycling

The SNHPC recently assisted the NH DOT in an update of the State Bicycle Route Maps, last updated in 2001. The update was designed to create user friendly bicycle maps to increase the use of this alternative mode of transportation. The NH DOT asked each State regional planning commission to recommend bicycle routes in their region and evaluate them through a public process. In November 2006, the SNHPC sent out a Request of Action to member communities for input on recommended changes and/or additions to the existing routes.

The SNHPC received recommendations from member communities which were forwarded to the State Bicycle Map Update Steering Committee. The Steering Committee met on several occasions to review the work and ensure that the all recommendations and suggestions were addressed. To identify the bicycle routes, the committee reviewed several different layouts including information such as color schemes for topography, state parks and level of riding difficulty. In early 2007, public meetings were held to display the maps and receive comments. Following this process, the committee met to review public comments and address any remaining issues. The updated maps, which also include transit and passenger rail information, were released to the public in April 2008.

A number of roads in Raymond are currently designated as part of the Statewide Bicycle Route System. State highways in Raymond currently designated as Recommended Bicycle Routes (paved) include NH 27, NH 102, NH 107 and NH 156. Local roads in Raymond included as Recommended Bicycle Routes (paved) include Batchelder Road, Bill Brown Road, Epping Street, Green Road, Harriman Road, Main Street and Scribner Road. Harriman Hill Road is also included in the Recommended Bicycle Routes in Raymond and the system also includes the town’s heritage trail (former Boston and Maine Railway) as an Unimproved Rail Trail rough surface facility.

Air Transportation

Town of Raymond residents have access to passenger air services from Manchester-Boston Regional Airport (approximately 21 miles), Logan Airport (approximately 67 miles), and the Portland International Jetport (approximately 77 miles). Several major

carriers currently serve both Manchester-Boston Regional Airport and Portland International Jetport.

In 2005, the SNHPC and Rockingham Planning Commission (RPC) were awarded an FTA 5313(b) grant to conduct a feasibility study for a regularly scheduled bus service between the Portsmouth Transportation Center and Manchester-Boston Regional Airport. The proposed service, which would operate along the NH 101 corridor, would provide transportation to Raymond residents via a proposed station stop at the NH 125 Park and Ride facility in Epping. The study has been completed and the planning commissions are currently providing follow-on assistance to prospective operators of the service.

Passenger Rail Service

The Amtrak Downeaster offers five round-trip journeys every day between Boston and Portland. Town of Raymond residents have access to this service via station stops in Dover and Exeter. The Downeaster is operated through funds made available by the Northern New England Passenger Rail Authority.

The SNHPC, working to establish commuter rail service to the area, has participated, along with the Governor's Office, the City of Manchester and Manchester-Boston Regional Airport, in a Passenger Rail Task Force. The New Hampshire Rail Transit Authority, comprised of members from various municipalities and organizations within the State including the SNHPC, is also now addressing the significant hurdles remaining to the establishment of service. The Commission is active in a Manchester Commuter Rail Stakeholders group organized by the Greater Manchester Chamber of Commerce and is also participating in a Technical Advisory Committee that is overseeing work on an Investment Study for transit improvements related to the widening of the Interstate-93 corridor.

H. Transportation Issues

Regional Transportation Plan and Funding

Through involvement and participation in the regional transportation planning program managed by the SNHPC, the Town of Raymond has input into the development of funding for local and state transportation projects. Existing federal and state funding sources include:

1. State Aid Construction funds are provided for improvement of sections of the state secondary, Class II highways. The ratio of state to town matching funds is based on the assessed valuation of the municipality and varies from a 2 to 1 ratio in small towns to a 1 to 1 ratio in large municipalities.
2. Highway Block Grant Aid funds are apportioned to all cities and towns on a yearly basis for the construction, reconstruction and maintenance of Class IV and V

highways on a formula based on population and mileage.

3. Federal Aid Bridge Replacement funds are available for replacement or rehabilitation of town bridges over 20 feet in length. State Bridge Aid funds may be used to match these funds.
4. The NH DOT Bureau of Municipal Highways funds can be used for local roadway improvements in need of prompt attention.
5. In special circumstances, a community may receive congressionally mandated funds for special projects. When a member of the US Congress is interested in a particular project, the representative can insert special legislation for the project into the transportation authorization bill.

The 2007 Raymond Zoning Ordinance describes the Town of Raymond's impact fee ordinance for public capital facilities. The ordinance gives the town authority to assess impact fees on public road systems and rights of way to compensate for the impact the new development will have on the town's existing road network. Impact fees for residential roads in Raymond are calculated based on a per unit basis related to weekday PM peak hour trip generation based on a methodology established in 2004. The ordinance states that payment of impact fees does not restrict the town from requiring other payments relating to the cost of other capital improvements including roadways.

Regional and State-Aid Highway Improvements

The information contained in the Inventory and Assessment of Road Surfaces for Raymond, New Hampshire identifies the needed projects and establishes priorities. Since many of the recommended projects may be considered long term capital investments, financing through a municipal bond may be appropriate and easier for the town to handle. If the town can make a strong enough case, there may be a possibility for increased state assistance through the highway block grant program. The first step would be to ensure that local financial participation is firmly committed to the project.

Regarding investments and upgrades in the state highways maintained by the NH Department of Transportation, the Town of Raymond, in cooperation with the District 5 NH DOT Engineer, should identify the intersections, bridges and state highways that Raymond desires to see upgraded based on traffic volumes and deficiencies. The Town of Raymond and the District 5 Engineer can work together to bring projects through the approval process either for funding through the Bureau of Municipal Highways or through the Ten Year Highway Plan process.

The Town of Raymond's Safety Committee consisting of the Fire Chief, Police Chief, and Public Works Director is responsible for identifying local highway safety issues and proposing recommendations. In addition, the Town of Raymond should consider the establishment of a local Transportation Advisory Committee (TAC) whose role would be to provide local support for priority roadway improvements and other transportation and

enhancements and to advocate their implementation. This would demonstrate to the funding agencies that the Town of Raymond is interested and committed to an improved transportation system. In the early to mid 1990s, the Town of Raymond was successful in securing federal assistance for housing and community development activities. Raymond could use a similar approach in seeking transportation funding.

Other Transportation Modes

As mentioned earlier in this study, the improvement and extension of Raymond's sidewalks is of interest to many residents. Perhaps, interested residents and the Town of Raymond could mobilize town and private resources in a partnership in order to start the process. Similar to the "adopt a highway" program that the NH DOT utilizes with great success, Raymond could consider an "adopt a sidewalk" program.

Working through the TAC, the Town of Raymond could also consider a planning process for bikeway, walking trails and a complete trail system. In other parts of the state, there are many communities that have worked to develop a multi-town trail system.

Access Management/Roadway Design

Communities throughout New Hampshire are becoming increasingly concerned with the relationship between transportation and land use. Without proper planning and recognition of this relationship, a cycle can be created where transportation improvements lead to new land use, subsequent traffic increases and the need for further improvements. Haphazard and unplanned development along highway corridors also results in increased traffic congestion and travel times. Balancing mobility and access needs requires coordination of land use planning and planning of the adjacent transportation infrastructure. Communities can adopt a more proactive management of their local and state highways by adopting appropriate land use tools prior to new development.

Access management, which involves the planning and coordination of access points between a roadway and adjacent property, includes consideration of factors such as the location, spacing, design and number of access points. Access management generally includes treatments such as maximum number of driveways per lot, development of frontage or service roads, shared driveways and internal connections between lots. These tools are utilized to develop proper continuation of streets, separation of through and local traffic and provision of driveway connections to adjoining lots of similar use. A well-developed access management plan will balance the mobility and access needs of the roadway to improve through traffic and enhance safe and efficient access to properties. Businesses as well as the community at-large will also derive economic benefit from improved access and connectivity resulting from the implementation of such techniques. The SNHPC has previously assisted the City of Manchester to develop an access management plan for the NH 28 corridor and is currently providing assistance to the Town of Derry on a similar plan for the NH 102 corridor.

Planning for good access management involves cooperation between State and local authorities. NH RSA 236:13 authorizes the NH DOT to regulate and grant access to state highways and provides a permitting process that examines a number of factors including sight distance, number of permitted driveways, drainage requirements and minimum geometric standards for commercial driveways. In addition, the Town of Raymond can rely on its general planning and land use authority under NH RSA 674 and 675 to manage highway access. The following specific land use tools can be used to manage access on a transportation corridor during the development process:

Zoning

1. Adequate setbacks should be required to allow for flexibility in locating driveways, future frontage road construction and to accommodate for future widening for sidewalks and bicycle paths;
2. Increasing the frontage reduces the potential number of access points on the corridor;
3. Inappropriate signage can create visual confusion and create potential traffic hazards;
4. An Access Management Overlay District can address a number of issues such as encouragement of joint access, interconnecting driveways, spacing of driveways and limitation on new driveways; and
5. A Mixed Use Zoning approach can reduce the number of vehicle trips.

Site Plan Review

1. Minimum distances between driveways;
2. In order to minimize the number of driveways, shared driveways should be encouraged for adjacent sites;
3. In anticipation of future developments, proposed developments under site plan review should incorporate interconnecting driveways in order to promote vehicular and pedestrian access between adjacent lots;
4. On site circulation should be planned to accommodate pedestrians who prefer to park and walk from one shop or business to another; and
5. Require extensive landscaping and buffering as an access management tool.

The Town of Raymond currently enforces construction standards for driveways that specify criteria such as sight distances, driveway widths and number of allowable driveways per lot. Additional information regarding access management is available in “Innovative Land Use Planning Techniques – A Handbook for Sustainable Development” prepared by NH DES in association with the NH Association of Regional Planning Commissions, the NH OEP and the NH Local Government Center. The Town of Raymond can also provide a safe, efficient roadway network while minimizing its footprint on the open landscape through the use of cluster developments and other site design alternatives that emphasize more efficient use of land and interconnectivity of roadway networks.

Network connectivity refers to the extent of the directness of connections in the roadway network. A roadway network with a high degree of connectivity is characterized by minimal dead-ends or cul-de-sacs and one or more connections along most roads. Increased connectivity provides travelers with route options resulting in a greater distribution of all vehicle trips. Network connectivity refers not only to streets within a neighborhood but also to connections with arterials and links to other portions of the community.

A roadway network demonstrating a high level of connectivity discourages through traffic volumes and provides a sense of security for travelers. It is typically associated with cul-de-sacs if designed with short blocks, “T” intersections, narrower travel lanes and other features that provide traffic calming. The adoption of standards or goals for street connectivity during subdivision design can lead to increased safety and connectivity. Improved network connectivity can also improve pedestrian accessibility and emergency access. New connections with existing cul-de-sacs also provide improved vehicular and pedestrian access.

The benefits of improved network connectivity can work in a rural setting through the establishment of a community vision for development patterns. Planning a future street network also provides an opportunity to develop a connected transportation network for pedestrians, bicyclists and vehicles. A well-planned street network with fewer streets also creates opportunities for more open space, retains rural character and reduces maintenance costs.

In 2007, the SNHPC collaborated on development of alternative geometric roadway design standards for low volume residential streets. The standards were developed to: 1) incorporate the concept of low-impact design as a means of promoting the construction of sustainable residential neighborhoods; and, 2) promote the creation of aesthetically enhanced residential environments while recognizing the needs of motorists to safely and efficiently travel low volume residential streets. The intent of these standards is to create low-impact residential neighborhoods with enhanced “livability” for residents that realize complimentary relationships between a neighborhood and its streets. The Town of Raymond has historically considered the granting of waivers associated with the construction of transportation facilities related to alternative design standards.