

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Traffic Management Plan

FOR
Georgia IM 089-3(72)
Interstate 89 Northbound, MM 107.5 – MM 107.95

September 28, 2017



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1.0 Project Description

- Project Location
 - The Ledge Cut is located on the east side of Interstate 89 northbound between MM 107.50 and MM 107.95.
- Work zone limits.
 - Within the State ROW



- Project background information.
 - Since construction, the rock slope has suffered several slope failures and rockfall events, some of which have impacted highway travel. The first major rock slide occurred on July 28, 1972, blocking both northbound lanes of the highway. A second rock slide occurred in the same area on October 9, 1978, that brought down additional overhanging rock and again blocked both lanes of the northbound barrel. An additional rockfall occurred in February 1999, and a small rockfall in 2014 resulted in rock debris reaching the paved shoulder. Currently, loose material that periodically falls is contained within the ditch at the slope toe, requiring maintenance to clear accumulated debris. The rock slope (No. 0142) has received an “A” rockfall hazard rating in the VTrans rock slope inventory in accordance with the FHWA/Oregon DOT Rockfall Hazard Rating System, indicating it is a high hazard slope with ongoing rockfalls expected to occur and reach the roadway. The high rating was developed based on the presence of large overhangs, the potential for planar failure, groundwater discharging on the slope face, and a history of rockfalls.
- Specific traffic restrictions expected on major roadways during the work.
 - The right (east) shoulder will be closed and both lanes of traffic will be shifted towards the median to accommodate the work and maintain both lanes during construction.
- Specific roadways that will be directly affected by the project work zones.
 - US Route 7 may see increased traffic as local traffic uses it to bypass construction.
- Regional projects that may impact each other.
 - Yes, Georgia IM CULV(25) bridge nos. 83-1 N&S
 - Construction - October 2016 to June 2018

- Project schedule.
 - Target Construction schedule: Construction activities will likely take place beginning in (June 2018).
 - Traffic will be maintained on a two-lane shift for the shoulder closure during the project. Rolling road blocks will be used during trim blasting operations.

2.0 TMP Team—Contact Information

Defining roles and responsibilities from the initial stages of a project helps to coordinate all the activities related to TMP development, implementation, and monitoring. This section includes contact information and roles and responsibilities for major personnel involved in the project.

- **TMP Development Managers**—Agency/Contractor personnel with the primary responsibility for developing the TMP.
- **TMP Implementation Managers**—Agency/Contractor personnel primarily responsible for implementing the TMP.
- **Construction Engineering**—Agency personnel who have primary responsibility for overseeing the construction of the project, including the traffic control plan.
- **Emergency Contacts**—Public or semi-public agencies (e.g., hospitals, schools, fire, police, select board/town administrator, road foremen) that need to be kept informed about work zone activities, especially in case of a road closures.
- **Contractor**—Primary Contractor responsible for construction of the project. (to be completed after contract award)

Contact information and roles and responsibilities of major personnel involved in the project.

TMP Development Managers

Agency of Transportation (AOT)	Town/Consultant
Name/Title: Ken Upmal, P.E. Unit: Roadway Phone: (802) 828 - 3594 Email: Ken.upmal@vermont.gov	Name/Title: N/A Unit: N/A Phone: N/A Email: N/A

Roles and Responsibilities: Development of the Traffic Management Plan. AOT will be responsible for developing the TMP related to the area within the project construction limits as well as related to the detour route.

TMP Implementation/Monitoring Managers

AOT Resident Engineer	Town (If Applicable)
Name/Title: Unit: Phone: Email:	Name/Title: Unit: Phone: Email:

Roles and Responsibilities: AOT will be responsible for implementing the TMP.

Other Important Agency Contacts

AOT Regional Engineer	
Name/Title: Chris Williams/ Northwest Regional Construction Engineer Unit: Construction Phone: (802) 828-1333 Email: Chris.Williams@vermont.gov	Name/Title: Unit: Phone: Email:

Roles and Responsibilities: Ensure timely and accurate communication of all necessary construction updates.

Emergency Service Contacts

Georgia Volunteer Fire Department	VT State Police (St. Albans Barracks)
Name/Title: Keith Baker/Chief Address: 4134 Ethan Allen Highway, St. Albans VT, 05478 Phone: (802) 752-5813 Email: gfdvt@comcast.net	Name/Title: Maurice Lamothe/Lieutenant Address: 140 Fisher Pond Road, St. Albans VT, 05478 Phone: (802) 524-5993 Email: Maurice.Lamothe@vermont.gov

Roles and Responsibilities: Prepare any response plans necessary to ensure the least impact to Emergency services for the duration of Construction.

Contractor

Contractor	Superintendent
Name/Title: Address: Phone: Email:	Name/Title: Unit: Phone: Email:
<p>Roles and Responsibilities: Planning, installation, and maintenance of any necessary permanent or temporary infrastructure needed to implement the TMP for the duration of the project. Work closely with the Resident Engineer, Project Manager, and TSMO to ensure the TMP is functioning as desired and implement any changes deemed necessary due to un-anticipated traffic requirements.</p>	
Contractors Competent Person	Contractors Safety Officer
Name/Title: Unit: Phone: Email:	Name/Title: Unit: Phone: Email:
<p>Roles and Responsibilities: Responsible for making real time decisions in the event of an emergency or unplanned interruption. Must identify risk and make judgments that ensure public safety while taking measures to mitigate the emergency/unplanned traffic interruption.</p>	

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3.0 Preliminary Work Zone Impact Assessment

Preliminary assessment of work zone impacts Questionnaire:

- Does the project include a long-term closure and/or extended weekend closure - No
- Can traffic be detoured - Yes
 - Traffic can be detour but since Interstate 89 Northbound will not be closed to accomplish the work necessary to remediate the ledge cut detouring traffic onto another route is not needed for this project.
- Is additional width required on culverts or bridges to maintain traffic - No
- Is there a pedestrian/bicycle facility that must be maintained - No
 - Pedestrians and bicycles are not allowed on the interstate system.
- Would a temporary structure(s) be required - No
- Would a median crossover be needed - No
- Would there be a need to maintain railroad traffic - No
 - Operations on the railroad near the project area should not be affected by construction, although during construction the railroad track shall be checked for any ledge material on the tracks
- Could maintenance of traffic have an impact on existing or proposed utilities - No
- Does it appear that maintenance of traffic will require additional right-of-way - No
- Can the contractor restrict the roadway during the time periods listed:
 - a.m. peak hours, one direction - No
 - p.m. peak hours, one direction - No
 - a.m. peak hours, both directions - No
 - p.m. peak hours, both directions - No
 - Overnight - No
 - During Local celebrations - No
 - Holidays or weekends - No
 - Sporting events/other special events - No
- Will project timing (for example, start or end date) be affected by special events:

- School closings or openings - No
- Holidays - Yes
 - Memorial Day, 4th of July, Bennington Battle Day, Labor Day, and Columbus Day
- Sporting events - No
- Are there any projects to be considered along the corridor or in the region?
 - Yes, Georgia IM CULV(25) bridge nos. 83-1 N&S
 - Construction - October 2016 to June 2018
- Roadwork in the immediate area that may affect traffic or the contractor's operations - No
- Roadwork on other roads that may affect the use of alternate routes - No
- Are there other maintenance of traffic issues - No

4.0 Existing Conditions

- Roadway characteristics (history, roadway classification, number of lanes, geometrics, urban/suburban/rural).
 - Roadway Classification: Interstate - NHS
 - Roadway Lane/Shoulder Widths and Bridge Lane/Shoulder Widths 12/4 LT/10 RT
- Historical traffic data (volumes, speed, capacity, volume/capacity, percent trucks, queue length, peak traffic hours).
 - A traffic Study of this site was performed by the Vermont Agency of Transportation. The traffic volumes are projected as seen in the table below.

Table 1 – Interstate 89 Northbound Traffic Data

TRAFFIC DATA	2015	2035
AADT	8600	10000
DHV	1180	1370
ADTT	1400	2500
%T	12.3	18.8
%D	100	100

- Design Speed: 65 mph
- Traffic operations (signal timing, traffic controls).
 - None
- Crash data.
 - 01/01/2013 – 12/31/2016
 - Northbound between MM 107.5 and MM 107.95
 - 3 total crashes between the dates listed above
 - 1 - Same Direction Sideswipe, 1 - Single Vehicle Crash, 1 - Unknown
 - 0 - Fatalities, 1- Injuries, 1 - Property Damage, 1 - Unknown

- Pedestrian/bicycle facilities.
 - None
- Transit facilities.
 - The project is near the New England Central Railroad's right-of-way.
- Truck routes.
 - The project is on Interstate 89 which is part of the National Highway System and has 12.3 percent truck traffic
- School Bus Routes.
 - No
- Local community and business concerns/issues.
 - No

5.0 Operational Analysis

Interstate 89 is a Principal Arterial-Interstate (NHS) with a posted speed limit of 65 miles per hour (mph). There are no existing ITS devices within the project corridor. The completion of this project is not expected to make permanent changes to the Interstate 89 traffic operations.

The right shoulder will be closed to accommodate the ledge remediation and the current right traffic lane on Interstate 89 Northbound will be narrowed to 11-foot wide with a 1-foot shoulder, the left lane will remain 12-foot wide with 4-foot shoulder except near the existing median ledge cut where a 1-foot shoulder will be established. Traffic barrier separating traffic from the construction area and the ledge cut within the median.

5.1. Safety Analysis

The crash data was extracted from the VTrans Public Crash Data Query Tool, a web-based program to search and download crash data, beginning with January 1, 2010. The search parameters used for analyzing the Interstate 89 NB Ledge Remediation project included data along Interstate 89 NB between MM 107.50 and MM 107.95 within the Town of Georgia from January 1, 2013 through to December 31, 2016. The crash data from this search was downloaded as a Microsoft Excel file, organized, and finally summarized. The crash data summary is represented in Table 2.

Table 2 – Crash Summary – MM 107.50 to MM 107.95

Summary of Crashes									
Intersection Name/ Control Section	Total	Injuries	Fatalities	Work Zone	Type of Crashes				
					Pedestrian	Bicycle	Rear-End	Right Angle	Left-Turn
Interstate 89 NB, MM 107.50 to MM 107.95	3	1	0	0	0	0	0	0	0

6.0 Work Zone Impact Management Strategies

This section provides an overview of various strategies deployed to improve the safety and mobility of work zones and reduce the work zone impacts on the road users, community, and businesses.

The strategies are grouped according to the following three categories.

1. Temporary Traffic Control (TTC)
2. Transportation Operations (TO)
3. Public Information and Outreach (PI&O).

6.1. Temporary Traffic Control (TTC)

A TTC plan describes temporary traffic control measures to be used for facilitating road users through a work zone or an incident area. The TTC plan plays a vital role in providing continuity of reasonably safe and efficient road user flow and highway worker safety when a work zone, incident, or other event temporarily disrupts normal road user flow. The TTC plan shall be consistent with the provisions of the MUTCD and AASHTO Roadside Design Guide.

Temporary Traffic Control	Check if recommended for use
Control Strategies	
1. Construction phasing/staging	
2. Full roadway closures	
3. Lane shifts or closures	✓
4. One-lane, two-way controlled operation	
5. Two-way, one-lane traffic/reversible lanes	
6. Ramp closures/relocation	

7. Freeway-to-freeway interchange closures	
8. Night work	
9. Weekend work	
10. Work hour restrictions for peak travel	✓
11. Pedestrian/bicycle access improvements	
12. Business access improvements	
13. Off-site detours/use of alternate routes	
Traffic Control Devices	
14. Temporary signs	✓
15. Arrow boards	
16. Portable Changeable message signs	✓
17. Channelizing devices	✓
18. Temporary pavement markings	✓
19. Flaggers and uniformed traffic control officers	✓
20. Temporary traffic signals	
21. Automated Flagger Assistant Devices	
22. Truck attenuators	
23. Lighting devices	
Project Coordination Strategies	
24. Other area projects	
25. Utilities	
26. Right-of-Way	
27. Other transportation infrastructure	
Innovative Contracting Strategies	
28. Design-Build	
29. A+B Bidding	
30. Incentive/Disincentive clauses	
31. Lane rental	
32. Performance specifications	
Innovative or Accelerated Construction Techniques	
33. Prefabricated/precast elements	
34. Rapid cure materials	

6.2. Transportation Operations (To)

The TO component shall include the identification of strategies to mitigate impacts of the work zone on the operation of the transportation system within the work zone impact area. The work zone impact area consists of the immediate work zone as well as affects to the surrounding roadways and communities. Additional information can be acquired from the *“Workzone Safety and Mobility Guidelines”* (WSMG) and *“Appendix A”* in the WSMG document:

Transportation Operations	Check if recommended for use
Demand Management Strategies	
1. Transit service improvements	
2. Transit incentives	
3. Shuttle services	
4. Parking supply management	
5. Variable work hours	
6. Telecommuting	
7. Ridesharing/carpooling incentives	
8. Park-and-Ride promotion	
Corridor/Network Management Strategies	
9. Signal timing/coordination improvements	
10. Temporary traffic signals	
11. Street/intersection improvements	
12. Bus turnouts	
13. Turn restrictions	
14. Parking restrictions	
15. Truck/heavy vehicle restrictions	
16. Reversible lanes	
17. Dynamic lane closure system	
18. Ramp closures	
19. Railroad crossing controls	
20. Coordination with adjacent construction site(s)	
Work Zone ITS Strategies	
21. Late lane merge	
22. PCMS with speed display	
23. Travel time estimation system	
24. Advanced speed information system	

25. Advanced congestion warning system	
26. Conflict warning system (e.g., construction vehicles entering roadway)	
27. Travel time monitor system	
28. Freeway queue monitor system	
29. CCTV monitoring	
30. Real-time detour	
Work Zone Safety Management Strategies	
31. Speed limit reduction/variable speed limits	✓
32. Temporary traffic signals	
33. Temporary traffic barrier	✓
34. Movable traffic barrier systems	

Transportation Operations	Check if recommended for use
35. Crash cushions	
36. Temporary rumble strips	
37. Intrusion alarms	
38. Warning lights	
39. Automated flagger assistance devices (AFADs)	
40. Project task force/committee	
41. Construction safety supervisors/inspectors	
42. Road safety audits	
43. TMP monitor/inspection team	
Incident Management and Enforcement Strategies	
44. ITS for traffic monitoring/management	
45. TMC	
46. Surveillance (e.g., CCTV)	
47. Helicopter for aerial surveillance	
48. Traffic Screens	
49. Call boxes	
50. Mile-post markers	
51. Tow/freeway service patrol	
52. Total station units	
53. Photogrammetry	

54. Media coordination	✓
55. Local detour routes	
56. Contract support for incident management	
57. Incident/Emergency management coordination	✓
58. Incident/Emergency response plan	✓
59. Dedicated (paid) police enforcement	✓
60. Cooperative police enforcement	✓
61. Automated enforcement	
62. Increased penalties for work zone violations	✓
63. Emergency pull-offs	

Contingency/Incident Management Plans—

It is best to develop the Contingency/Incident Management plan as a collaborative effort with the emergency response and the public safety community. Development of such a plan is crucial in the early phases to properly integrate the concerns of the first responder personnel.

6.3. Public Information and Outreach (PI&O)

The PI component can include communication strategies that seek to inform the general public of work zone impacts and the changing condition of the project. The general public may include road users, area residences and businesses, and other public entities.

Public Information and Outreach can be important for the success of bridge closure projects. This project will create a short term impact to travelers, businesses, residents, and truckers. Properly informing these stakeholders of what to expect during construction will ensure proper public support and reduce problems during construction. The following measures can be used:

- Factsheets
 - A project factsheet can be used to show the detour routes, describe the project and why and when it is taking place.
- Business concerns/issues
- Public Input and Surveys
- Social Media to inform the public

Public Information and Outreach	Check if Recommended for use
Public Awareness Strategies	
1. Branding	
2. Press kits	
3. Brochures and mailers	

Public Information and Outreach	Check if Recommended for use
4. Press releases/media alerts	
5. Mass media (earned and/or paid)	
6. Paid advertisements	
7. Project Information Center	
8. Telephone hotline	
9. Planned lane closure website	
10. Project website	
11. Public meetings/hearings, workshops	✓
12. Community task forces	
13. Coordination with media/schools/business/emergency services	
14. Work zone education and safety campaigns	
15. Work zone safety highway signs	
16. Rideshare promotions	
17. Visual information	
Motorist Information Strategies	
18. Radio traffic news	
19. Changeable message signs	✓
20. Temporary motorist information signs	
21. Dynamic speed message sign	
22. Highway Advisory Radio (HAR)	
23. Extinguishable Signs	
24. Highway information network (web-based)	✓
25. Traveler information systems(wireless, handheld)	✓
26. Transportation Management Center (TMC)	✓
27. Live traffic camera(s) on a website	
28. Project information hotline	
29. Email alerts	

Additional information can be acquired from the [“Workzone Safety and Mobility Guidelines”](#) and [“Appendix A”](#) to said document:

7.0 Notes

Any additional notes on selected strategies, the TMP in general, or any item requiring special attention for the project can be provided in this section.

This section should include meeting notes or conversation notes where decisions pertaining to the TMP are made.

8.0 TMP Summary

This summary should include a brief description of the traffic management strategies selected for use on the project as well as important contact information. This summary should be included in the contract documents.

TMP Summary

- The following temporary traffic control (TTC) measures have been identified for use though the construction area.
 - Control Strategies:
 - Traffic Control Devices:
 - Innovative or Accelerated Construction Techniques:
- The following transportation operations (TO) measures have been identified for use for mitigation of impacts to the work zone and the surrounding roadway network
 - Incident Management and Enforcement Strategies: The media should be coordinated with to inform the public of any delays that occur due to unexpected incidents, Emergency response personnel should be aware of the local routes available in case of emergency, and an Incident/Emergency response plan should be drafted and coordinated with emergency personnel.

Public Information and Outreach Summary

The following measures are recommended to warn the public of the possible impacts to them:

- Public meetings prior to the closure should be held in order to notify the public what to expect during construction, and to hear concerns.
- Factsheets
- Public Input and Surveys
- Social Media to inform the public of upcoming impacts

Contacts

Design Project Manager: Ken Upmal, P.E. (802) 828-3594

Resident Engineer: TBD

Regional Engineer: Chris Williams, (802) 828-1333

Public Information Officer: TBD

Fire and Emergency Medical Services: Keith Baker(Chief), (802) 752-5813

VT State Police (St. Albans Barracks): Maurice Lamothe(Lieutenant), (802) 524-5993

Contractor: TBD

Superintendent: TBD

Contractors Competent Person: TBD

Contractor Safety Officer: TBD

9.0 TMP Review/Approvals

TMPs, and changes to TMPs, can be submitted for review by the Transportation Systems Management & Operations (TSMO) section at AOT before they are implemented. Review of the TMP by AOT prior to implementation is not mandatory, but is highly encouraged.

TSMO Contacts		
AOT - Transportation Systems Management & Operations (TSMO)		
Name/Title: Amy Gamble, PE\Traffic Operations Engineer		
Address: 1 National Life Drive, Montpelier, VT 05633-5001		
Phone: 802-828-1055		
Email: amy.gamble@state.vt.us		
Roles and Responsibilities: Review of Traffic Management Plans		

The approval of the TMP should be based on conformance of the TMP with the Work Zone Safety and Mobility Guideline.

Regional Construction Engineer			Traffic Operations Engineer			Project Manager		
All approvals must be obtained prior to the start of work								
Signature:			Signature:			Signature:		
Name:			Name:			Name:		
Date:			Date:			Date:		
Revision#	Initials	Date	Revision#	Initials	Date	Revision #	Initials	Date
1			1			1		
2			2			2		

10.0 Appendices

Future appendices may include:

- Traffic Analysis (Existing compared with future)
- Temporary Traffic Control Plans
- Public Information and Outreach Plan
- TMP Review Notes
- Project Monitoring Form or Post-Project Evaluation Form.