



## Limited Scope Concept Development Report

Rt. 1 Southbound, Rt. 91 Connector to Rt. 18 Resurfacing  
MP 23.04 to MP 24.18 &  
MP 26.33 to MP 27.50

*Township of North Brunswick, City of New Brunswick  
Middlesex County*

*December 2, 2013*



Prepared for:

**State of New Jersey  
Department of Transportation**

**LIMITED SCOPE CONCEPT DEVELOPMENT REPORT**  
**Route 1 Southbound, Rt. 91 Connector to Rt. 18 - Resurfacing**  
**Milepost 23.04 to 24.17 & Milepost 26.33 to 27.50**

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## I. INTRODUCTION

### A. Roadway Characteristics

Within the limits of the proposed project, Route US 1 functions as an Urban Principal Arterial. There are two sections within the limits of the project. They are:

- **Milepost 23.04 to Milepost 24.18** - Route US 1 southbound between these mileposts consists of three 12-foot travel lanes, a 3-foot minimum and variable inside shoulder, and a 15-foot auxiliary lane or full 12-foot wide outside shoulder.
- **Milepost 26.33 to Milepost 27.50** - Route US 1 southbound between these mileposts consists of three 12-foot travel lanes, a 3-foot minimum and variable inside shoulder, and a 15-foot auxiliary lane or full 12-foot wide outside shoulder.

The northbound and southbound roadways are separated by a concrete median barrier. Median barrier fencing exists between Milepost 23.20 & Milepost 24.15, and again between Milepost 27.19 & Milepost 27.50. Route US 1 is constructed as both crowned and superelevated sections throughout the project limits.

There are three (3) interchanges within the limits of the project. They are:

- Route US 1 and Route 26 – Milepost 23.30
- Route US 1 and Ryders Lane (CR 617) – Milepost 26.42
- Route US 1 and Route 18 – Milepost 27.19

Acceleration / Deceleration lanes exist at all ramps exiting and entering Route US 1 SB at the interchanges.

There are two (2) signalized intersections within the limits of the project. They are:

- Route US 1 and North Oaks Boulevard – Milepost 23.77
- Route US 1 & Fashion Plaza Driveway – Milepost 24.15

Auxiliary lanes exist at intersections. Where permitted, left turn movements are accommodated using nearside jughandles.

### B. Purpose & Need Statement

#### **Purpose:**

The purpose of this project is to rehabilitate the pavement surface to improve the service life of the roadway.

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**Need:**

This section of Route US 1 southbound has been identified by both the Pavement Management System and the Pavement & Management Drainage Office as being in need of rehabilitation.

**Goals:**

Within the limits of the project, in the southbound direction, the existing pavement exhibits various types of cracking and deterioration. Based on the most recent pavement assessment, existing mainline, shoulder and ramp pavement conditions vary from 'fair' to 'good' with medium severity transverse reflection cracking, medium severity longitudinal reflection cracking, scattered low severity fatigue cracking and low severity longitudinal cracking throughout. Therefore, based on the overall pavement condition, the goal of this project is to resurface the roadway within the project limits. Pedestrian related features such as curb ramps and crosswalks will also be brought into compliance with ADA standards. The proposed improvements will be designed to maintain the existing roadway footprint, and to minimize environmental impacts to the greatest extent possible.

**C. *Project Location and Project Limits***

The proposed project is located in North Brunswick Township and the City of New Brunswick, Middlesex County. The proposed limits of the project are from Milepost 23.04 to Milepost 24.18 and from Milepost 26.33 to Milepost 27.50; all in the southbound direction.

A location map and the applicable Straight Line Diagram pages are provided in Appendix 'B'.

**D. *List of Other Projects in the Vicinity***

A review of all applicable databases has indicated that there are three (3) projects within the vicinity of the proposed pavement project. These projects are:

- **US Route 1 Adaptive Traffic Signal Contract No.1 (2013)**– This is a project to upgrade existing traffic signals along Route US 1 with adaptive signal equipment. This project was advertised for construction in September 2013, and includes adaptive signal equipment installations at both the North Oaks Boulevard and Fashion Plaza Driveway intersections. Substantial Completion is scheduled for May 2014. Final Completion is anticipated in November 2014.
- **Route 18 Bridge over Route 1** – This project includes widening of the Route 18 NB structure to create a new acceleration /deceleration lane for the ramps to and from Route US 1. The project will also modify Ramp D from Route 18 NB to Route US 1 SB and replacement of the entire Route 18 NB/SB super structure. Construction Authorization is anticipated in the Spring 2014.
- **Maintenance Roadway Repair Contract Central, Sub Region C-2, Contract No. C205, DP 12430** – This project includes various roadway repairs to Route 18, Route 28 and Route 27, including, but not limited to, milling & paving of mainline roadways, signalized intersections, intersecting streets, U-Turns, ramps and median

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openings; full depth pavement repairs; concrete sidewalk; and, curb ramps. This project includes the milling/resurfacing of the Route US 1 SB ramps to/from Route 26. The Construction Contract was awarded in the Spring of 2013. Final Completion is anticipated in November 2013.

Coordination with both the US Route 1 Adaptive Traffic Signal Contract No. 1 (2013) and the Route 18 Bridge over Route 1 Project will be required for this pavement project.

## **II. EXISTING CONDITIONS ANALYSIS**

Field trips were conducted on August 16, 2013 and August 21, 2013 to assess the existing conditions of the pavement and to ascertain other features that could potentially have an impact on the delivery of the project. A follow-up field trip was conducted on September 24, 2013 and included Subject Matter Experts (SMEs) of the New Jersey Department of Transportation. Based on discoveries made during these field trips and subsequent follow-ups with SMEs, several issues, which will be addressed as part of the project, were identified. The following provides a summary of the key issues:

### **A. Pavement**

Within the project limits, Route US 1 southbound is comprised of both flexible and composite (asphalt over concrete pavement) sections. Flexible pavement exists from MP 23.04 – 23.35. Both flexible and composite pavements exist from MP 23.35-24.18. From MP 26.33 -27.50, lanes 1 to 3 are comprised of composite pavement, while lane 4, where it exists, consists of flexible pavement. The composite pavement areas from MP 23.35-24.18 generally consist of 5 to 9 inches of AC (Asphalt Concrete) over 9 to 10 inches PCC (Portland Cement Concrete) slabs, while composite pavement areas from MP 26.33-27.50 generally consist of 5 to 9 inches of AC over 9.5 to 10.5 inch PCC slabs. The PCC slabs are approximately 35 ft. in length. The flexible pavement areas are generally comprised of 8 to 10 inches of AC.

The condition of the existing Route US 1 southbound mainline pavement is in 'fair' to 'good' condition exhibiting medium severity transverse reflection cracking, medium severity longitudinal reflection cracking, scattered low severity fatigue cracking and low severity longitudinal cracking. Shoulder pavement, accel/decal/auxiliary lanes, and ramps are also in 'fair' to 'good' condition exhibiting similar reflection and fatigue cracking.

### **B. Structures within the Project Limits**

There are two (2) bridge structures and one (1) culvert within the proposed limits of the pavement project. These structures are characterized as follows:

- Route US 1 is crossed by two (2) local roadways via structure:
  - ✓ Ryders Lane (CR617) over Rt. US 1 (Str. 1202-155); MP 26.42 – exposed conc. deck
  - ✓ Rt. 18 over Rt. US 1 (Str. 1213-151); MP 27.19 – asphalt overlaid deck

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- One (1) culvert exists within the limits of the project:
  - ✓ Route US 1 over Stream (Str. 1202-154); MP 26.39

Based on visual inspection, and as confirmed by the most recent Structural Evaluation Report for the Ryders Lane (CR617) Bridge over Route US 1 (Str. 1202-155), the structure is rated overall in 'satisfactory' condition. Deficiencies noted include damaged guide rail sections on the west approach (northwest corner) and raveling of asphalt pavement, with small potholes.

Based on visual inspection, and as confirmed by the most recent Structural Evaluation Report for the Route NJ 18 over Route US 1 (Str. 1213-151) the structure is rated in overall 'fair' condition; however, the deck is in poor condition due to the existence of large spalls with exposed rebars and fine map cracking with efflorescence in the underside of the deck. The structure is classified as structurally deficient due to the condition of the deck. This structure will receive a major rehabilitation under the Route 18 Bridge over Route 1 Project.

Based on visual inspection, and as confirmed by the most recent Structural Evaluation Report for the culvert structure, Route US 1 over Stream (Str. 1202-154), the structure is rated in overall 'fair' condition.

In addition to the two (2) bridge structures and one (1) culvert, there are two (2) overhead sign structures located within the project limits; one at MP 23.35 (Str. 1201-203), and a second at MP 27.30. Both span over the Route US 1 southbound roadway.

Individual Structural Inventory & Appraisal (SI&A) Sheets for all bridge and culvert structures are provided in Appendix 'E'.

### **C. Drainage**

Route US 1 is constructed with both crowned and superelevated sections throughout the project limits. Curb and inlets exist along the mainline roadway, and along ramps at each of the three (3) interchanges. Records obtained from the Pavement & Drainage Management office indicate that within the past five (5) years, there were only (2) reported incidents of flooding within the limits of the pavement project. These incidences occurred due to construction in the area, and the problems have since been resolved. Maintenance records indicate that drainage inlets, pipes and manholes within the project limits were cleaned twice in the last five (5) years, and miscellaneous repairs were made three (3) times over that same five (5) year period.

### **D. Traffic Control within the Project Limits**

There are two (2) signalized intersections within the limits of the project. The intersections are:

- **Route US 1 and North Oaks Boulevard (MP 23.77)** – This intersection permits both right and left turning movements from North Oaks Drive to Route US 1. This intersection also provides a U-turn movement for Route US 1 southbound (Rt. 1 SB to Rt. 1 NB) via a nearside jughandle. Crosswalks, as well as pedestrian signal heads

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(countdown type) exist at this intersection. The existing signal and jughandle are under the Jurisdiction of the New Jersey Department of Transportation.

- **Route US 1 and Fashion Plaza Driveway (MP 24.15)** – This intersection permits both right and left turning movements from Fashion Plaza Driveway to Route US 1. This intersection also provides both left-turn access to the Walmart Shopping Center, and a U-Turn movement for Route US 1 northbound (Rt. 1 NB to Rt. 1 SB) via a nearside jughandle. Neither crosswalks nor pedestrian signal heads exist at this intersection. The existing signal is under the jurisdiction of the New Jersey Department of Transportation. Based on the current Jurisdictional Limit Map for this section of Route US 1, the nearside jughandle lies within an easement and is maintained “by others.”

As-Built Traffic Signal & Electrical Plans were reviewed for each signalized intersection, and based on a visual inspection assisted by NJDOT SMEs from both the Division of Project Management and Traffic Signal & Safety Engineering, traffic signal modifications are not necessary.

#### **E. Utility Facilities**

Aerial and underground facilities exist within the project limits and were observed during the field trip. Utility Letter No. 1 was prepared and distributed to request verification of existing and/or proposed facilities within the project limits, and to obtain the name, address and telephone number of the appropriate contact of those utility owners who have facilities within the project limits. The following utility owners have responded indicating that their facilities exist within the limits of this pavement project:

- Electric – Public Service Electric & Gas (PSE&G)
- Gas – Public Service Electric & Gas (PSE&G)
- Telephone – Verizon, NJ Inc.
- Cable – Cablevision
- Water – Township of East Brunswick; City of New Brunswick
- Sewer – Middlesex County Sewer Authority

Utility Letter No. 1 and utility correspondence can be found in Appendix ‘L’.

#### **F. Access**

Route US 1 within the project limits is an Urban Principal Arterial. Based on the New Jersey State Highway Access Management Code, Route US 1, within the project limits, is classified as an Access Level 3 roadway allowing right-turn access to and from an access point with left turn access via jughandles at signalized intersections. A total of thirteen (13) access driveways are located within the limits of the pavement project.



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**G. ITS Facilities**

A search of the NJDOT Intelligent Transportation System Engineering Inventory was performed and as confirmed during a field visit, ITS facilities exist within the project limits. These include ITS conduit manholes and underground conduit. One CCTV is located in the northwest quadrant of the Route US 1 / Ryders Lane Interchange; however, there are no DMS's located within the limits of the pavement project. Consultation with NJDOT's ITS Group has determined that existing "system loops" are located within the Route US 1 SB Roadway at MP 24.11. In addition, the US Route 1 Adaptive Traffic Signal Contract No. 1 (2013) will install new ITS facilities at the intersection of Route US 1 and North Oaks and at the intersection of Route US 1 and Fashion Plaza Driveway. New ITS facilities include Adaptive Image Detectors, Adaptive Signal Processors, a pole-mounted Radar Detector, and a TVS Automatic Traffic Recorder.

**H. Geometrics**

Route US 1 southbound from Milepost 23.04 to Milepost 24.18 consists of three 12-foot travel lanes, a 3-foot minimum and variable inside shoulder, and a 15-foot auxiliary lane or full 12-foot wide outside shoulder. Route US 1 southbound from Milepost 26.33 to Milepost 27.50 consists of three 12-foot travel lanes, a 3-foot minimum and variable inside shoulder, and a 15-foot auxiliary lane or full 12-foot wide outside shoulder.

Based upon field investigations, and a review of existing As-Built plans, no significant cross-slope, ponding or settlement issues were evident.

**I. Community Concerns**

Route US 1 is an Urban Principal Arterial with businesses, shopping centers, and residential developments located within the project limits; however, the "Mill x - Pave x" project will have no impact on these properties. The concerns of the community should therefore be limited to work hours (noise) and lane closures during construction (inconvenience).

**J. Environmental Concerns**

Based on the environmental screening, no significant impact is anticipated.

**K. Management System Input**

In addition to the Pavement Management System, the following Management Systems have been cross referenced:

- **Bridge:** Based on a review of the most recent Structural Evaluation Reports and SI&A Sheets for both the Ryders Lane (CR617) Bridge over Route US 1 (Str. 1202-155), and the culvert structure, Route US 1 over Stream (Str. 1202-154), there are no significant issues with either of these structures. The Route 18 Bridge over Route US 1, which has been classified as structurally deficient due to the condition of the deck, is being addressed under a separate project.

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- **Drainage:** Records obtained from the Pavement & Drainage Management office indicate that within the past five (5) years, there were only (2) reported incidents of flooding within the limits of the pavement project. These incidences occurred due to construction in the area, and the problems have since been resolved.
- **Safety:** The crash rates for these sections of Route US 1 SB are below the Statewide Average (1.81 crashes/mvm) over the five (5) year period of 2008-2012. Between Mileposts 23.04 and 24.18, the five (5) year crash rate is 0.74 crashes/mvm. Between Mileposts 26.33 and 27.50, the five (5) year crash rate is 1.37 crashes/mvm.
- **Congestion:** The priority ratings for the length of the project on the Congestion Management System (CMS) range from “Medium” to “High”. From Milepost 23.04 to 23.05, the Priority Ranking is rated “Medium.” From Milepost 23.25 to Milepost 24.00, the Priority Ranking is rated “Med-High.” From Milepost 24.00 to 24.18 and from Milepost 26.33 to 27.50, the Priority Ranking is rated “High”.
- **Maintenance:** Maintenance records indicate that drainage inlets, pipes and manholes within the project limits were cleaned twice in the last five (5) years, and miscellaneous repairs were made three (3) times over that same five (5) year period.

**L. Pedestrian and Bicycle Facilities**

As per the New Jersey Administrative Code, Route US 1 within the project limits is not a bicycle compatible roadway, and no bicycle facilities exist.

Pedestrian facilities exist at various locations throughout the project limits. Existing sidewalk and curb ramp slopes were field measured and were found to be in compliance with current Americans with Disabilities Act (ADA) guidelines.

At the signalized intersection of Route US 1 and North Oaks Boulevard (MP 23.77) curb ramps, pedestrian crosswalks, pedestrian push buttons, and pedestrian signal heads (countdown type) are provided for the crossing of both North Oaks Boulevard and Route US 1. Existing curb ramps were found to be missing detectable warning surfaces, and existing concrete was found to be cracked and/or broken. Existing Pedestrian Push Button positions are not ADA compliant – not parallel with the intended direction of crossing. A signed Suburban Transit Bus Stop exists along Route US 1 SB approximately 150-feet south of North Oaks Boulevard; however, a sidewalk connecting the Bus Stop to the signalized intersection does not exist.

Between the intersections of Route US 1 / North Oaks Boulevard (MP 23.77) and Route US 1 / Fashion Plaza Driveway (MP 24.15), portions of existing sidewalk were observed to be cracked/broken and settled, and warrant replacement. Curb ramps at driveway crossings were also found to be cracked/broken, and the required detectable warning surfaces were missing.

At the signalized intersection of Route US 1 and Fashion Plaza Driveway (MP 24.15), one curb ramp exists at the southwest corner and the sidewalk terminates at this intersection. There was no evidence of a worn footpath beyond the sidewalk endpoint. Pedestrian push buttons exist for

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the crossing of Route US 1, but an opposing curb ramp does not exist on the northbound side of Route US 1. Existing Pedestrian Push Button positions are not ADA compliant – not parallel with the intended direction of crossing.

At Milepost 27.40 (immediately north of the Route US 1 SB exit ramp to Route 18) an existing sidewalk terminates, and between Milepost 27.40 and Milepost 27.47, a worn footpath was observed leading to the existing AMC Loews Movie Theater driveway located on Route 1 SB.

### **III. ALTERNATIVES ANALYSIS**

#### **A. Alternatives Analysis Narrative**

This section of Route US 1 southbound has been identified by the Pavement Management System as being in need of rehabilitation. The condition of the existing pavement is in ‘fair’ to ‘good’ condition exhibiting medium severity transverse reflection cracking, medium severity longitudinal reflection cracking, scattered low severity fatigue cracking and low severity longitudinal cracking. This indicates the need for either a mill ‘x’ – pave ‘x’ treatment, or a complete reconstruction of the pavement box.

The New Jersey Department of Transportation hired XYZ Consultant to conduct a pavement evaluation and service life analysis. Ground Penetrating Radar (GPR) testing, Falling Weight Deflectometer (FWD) testing, coring and visual surveys were performed as part of the project scoping and pavement design efforts for this project.

The pavement evaluation and the service life analysis performed by XYZ Consultant indicates that a mill ‘x’ - pave ‘x’ treatment throughout the limits of the project will provide a 20-year plus pavement life.

A no-build alternative was considered, but did not address the project need of extending pavement life and meeting the Department’s Pavement Management System goals.

Based on the cost of reconstructing the entire pavement box, and the service life attained through the mill ‘x’ – pave ‘x’ treatment, the full reconstruction option was not considered.

Therefore, the preferred alternative selected for advancement is a mill ‘x’ – pave ‘x’ resurfacing project. The depth of milling and paving varies between 2” on wide shoulders, acceleration and deceleration lanes and ramps, and 3” on the Route 1 SB mainline (including narrow shoulders).

Specifics of the Pavement Design Recommendation can be found in Appendix ‘C’. Graphics illustrating the Preliminary Preferred Alternative can be found in Appendix ‘D’.

#### IV. PRELIMINARY PREFERRED ALTERNATIVE

##### A. Scope of Work

- i. **Pavement-** The scope of work, within the proposed limits of work, is to resurface Route US 1 southbound. The pavement recommendation for this work is to Mill 3” and Pave 3” using a Stone Matrix Asphalt Surface Course in the mainline lanes and narrow width shoulders (less than 6-feet). The recommendation for wide shoulders(6-feet and greater) and acceleration/deceleration lanes, is to Mill 2” and Pave 2” using a Hot Mix Asphalt Surface Course. The recommendation for ramps to and from the Route US 1 SB is to Mill 2” and Pave 2” also using a Hot Mix Asphalt Surface Course.

See the Pavement Design Recommendation for specific limits of the various treatments. The Pavement Design Recommendation is provided in Appendix ‘C’.

- ii. **Structural-** Since the Project Need, as identified by the Management Systems, is the resurfacing of Route US 1 SB and the ramps at the interchanges, and since the review of the most recent bridge inspection reports (Bridge Management System) did not identify any issues with any of the structures within the limits of the proposed project, there will be no structural scope of work included as part of this project.
- iii. **Pedestrian and Bicycle Facilities-** As per the New Jersey Administrative Code, Route US 1 within the project limits is not a bicycle compatible roadway and will remain so after construction. There are no bicycle facilities planned within the limits of this pavement project.

The scope of work for pedestrian facilities shall include the reconstruction of existing sidewalks and curb ramps found to be damaged and in need of repair. This includes existing sidewalk and curb ramps along Route US 1 SB between North Oaks Boulevard and Fashion Plaza Driveway. Curb ramp reconstruction and the installation of ADA compliant detectable warning surfaces will occur at all existing driveway crossings.

At the intersection of Route US 1 and North Oaks Boulevard, new sidewalk is needed to connect the SW corner of North Oaks Boulevard to the existing Suburban Transit Bus Stop – no sidewalk exists and a worn footpath through a parking lot was observed. This requires the reconstruction of one existing curb ramp.

At the intersection of Route US 1 and Fashion Plaza Driveway, a new curb ramp and level landing area is required on the northbound side of Route US 1 to allow pedestrians a means of leaving the Route US 1 roadway. Based on consultation with NJDOT’s Bureau of Traffic Signal & Safety Engineering, cross walks at this intersection are not required.

At Milepost 27.40 (immediately north of the Route US 1 SB exit ramp to Route 18), where the existing sidewalk terminates, and a worn footpath was observed leading to the AMC Loews Movie Theater driveway, new sidewalk will be constructed to the movie theater driveway. The pedestrian path crosses an existing egress driveway from the

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Gardens at Raritan apartment complex where two new curb ramps will be required. Sidewalk construction north of the residential driveway will require a short retaining wall (less than 3 feet) to avoid grading impacts beyond the existing right-of-way line. At the AMC Loews Movie Theater driveway, new curb ramps will be required on both the SW and NW corners. The new sidewalk will terminate at the NW corner with a level landing area located immediately behind the new curb ramp.

- iv. Traffic Signal**—Based on field observations and consultation with NJDOT’s Bureau of Traffic Signal & Safety Engineering, the scope of traffic signal work will be limited to the repositioning of existing Pedestrian Push Buttons and the replacement and/or addition of Pedestrian Push button Signs. No other traffic signal work is warranted.
- v. Incidental Roadway Work**—The scope of work shall include the repair of all damaged guiderail and the upgrading of substandard guide rail end treatments within the limits of the project.
- vi. Drainage** - No new drainage facilities will be constructed based on field inspection and review of the Drainage Management System. However, the cleaning of all drainage structures and pipes within the project limits is recommended.

**B. Anticipated Impacts to Existing Facilities**

- i. Utility** - There are no anticipated utility impacts.
- ii. Access** - There are no anticipated access impacts.
- iii. ITS**—Consultation with NJDOT’s ITS SME determined that existing “systems loops” are located in the Route US 1 SB roadway at MP 24.11 and will be impacted by proposed milling and paving operations. Existing “system loops” will need to be replaced; however, no other ITS impacts are anticipated.

**C. Maintenance of Traffic During Construction**

The milling and paving of Route 1 Southbound Mainline will be completed using standard single and multi-lane lane closures. The approved lane closure schedule, as developed by Traffic Operations North, is provided in Appendix ‘G’. Additionally, since milling and paving operations along existing ramps will necessitate temporary overnight closures, the need for short-term (nighttime) detours has been anticipated. Detour routes for each ramp closure have been identified and were field verified to assure feasibility. Schematics showing proposed ramp closure detours are also provided in Appendix ‘G’.

Preliminary construction-staging schemes were evaluated to determine the number of anticipated construction stages and their anticipated durations. Conceptual Construction Staging Sections have been developed to determine the placement of drums/cones, and to evaluate the number of lanes maintained during each stage. Construction Staging Sections can be found in Appendix ‘G’.

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The general staging of this pavement project can be divided into the following two (2) phases:

1. Phase A – Route US 1 SB from Milepost 23.04 to Milepost 24.18
2. Phase B - Route US 1 SB from Milepost 26.33 to Milepost 27.50

The general sequence of construction within each Phase is anticipated as follows:

- **Pre-Stage 1 – Incidental Construction:**
  - ✓ Construct proposed Guide Rail, Sidewalks, Curb Ramps, and install Detectable Warning Surfaces.
  - ✓ Estimated Duration (Per Phase) = 10 Working Days
- **Stages 1 – 3 – Mainline Roadway (including left shoulder):**
  - ✓ Install Traffic Control Devices as per the Standard Traffic Control Details for required nighttime lane closures (maintain one thru-lane during allowable hours)
  - ✓ Mill, Resurface, and Install Temporary Striping
  - ✓ Estimated Duration (Per Phase) = 8 Working Days
- **Stage 4 - Right Shoulder/Auxiliary Lane:**
  - ✓ Install Traffic Control Devices as per the Standard Traffic Control Details for a right-lane closure
  - ✓ Mill, Resurface, and Install Temporary Striping.
  - ✓ Estimated Duration (Per Phase) = 3 Working Days
- **Stage 5 – Ramps:**
  - ✓ Implement overnight ramp closures and closure detours (see Appendix ‘G’)
  - ✓ Mill, Resurface, and Install Temporary Striping
  - ✓ Estimated Duration (Per Phase) = 4 Working Days
- **Stage 6 - Final Striping and Raised Pavement Markers:**
  - ✓ Install Traffic Control Devices as per the Standard Traffic Control Details for required nighttime lane closures
  - ✓ Complete final striping and install raised pavement markers
  - ✓ Estimated Duration (Per Phase) = 4 Working Days

**D. Community Concerns**

The community, local officials and property owners will be consulted and apprised of the proposed work as Final Design progresses.

**E. Environmental Document Summary**

The project is classified as a Categorical Exclusion (CE) and does not have any significant environmental impacts.

**Appendix A Concept Development Checklist**

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EXAMPLE

## Appendix B Location Map& Straight Line Diagram

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***Provide an aerial map of the project location (Google Earth) with the project site/limits identified.***

***and***

***Provide the Straight Line Diagram Sheet(s) with the project site/limits identified.***

EXAMPLE



***Provide a copy of the Pavement Design Recommendation that is provided by the Office of Civil Engineering – Pavement Technology.***

EXAMPLE

EXAMPLE

***Include Structural SI&A Sheets for all structures within the limits of the project regardless of whether any work is proposed for that structure or not.***

EXAMPLE

## Appendix F Photos

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***Provide photos to clearly highlight the issues & elements discussed in the CD Report and the CD Checklist.***

EXAMPLE

Appendix G Lane Closure Schedule, Construction Staging & Ramp Closure Detour Schematics

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***Provide the Lane Closure memo as provided by the Office of Traffic Operations.***

***or***

***If traffic staging is not feasible and a detour is required, provide a schematic of a feasible detour route that has been approved by the Office of Traffic Operations.***

***Environmental Screening Report is to be provided  
by the Bureau of Landscape Architecture &  
Environmental Solutions.***

EXAMPLE

**Appendix I Project Cost Estimate**

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EXAMPLE

***Attach as-built plans if available.***

***or***

***Provide as-built plans on disc if not feasible to include in the CD Report.***

EXAMPLE



***This Crash Data should be the overall data for the corridor, not specific to any controlling substandard design element.***

EXAMPLE

***This is the Traffic Design Data and the Pavement Design Data. This should be for the design year and the design year + 20.***

EXAMPLE

**Appendix M Utility Correspondence**

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EXAMPLE

**Appendix N SME Correspondence**

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EXAMPLE

**Appendix O Final Design Scope Statement**

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EXAMPLE