**Table Of Contents**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Table of Contents | | | |  | | | | | | | | | i |
|  | | | |  | | | | | | | | |  |
| List of Exhibits | | |  | | | | | | | | | | i |
|  | | |  | | | | | | | | | |  |
| Appendices |  | | | | | | | | | | | | i |
|  |  | | | | | | | | | | | |  |
| Project Background | | | | | |  | | | | | | | 1 |
|  | | | | | |  | | | | | | |  |
| Preferred Alternative | | | | | | |  | | | | | | 4 |
|  | | | | | | |  | | | | | |  |
| Traffic Analysis (IMS) | | | | | | | |  | | | | | 6 |
|  | | | | | | | |  | | | | |  |
| Geometric Design | | | | |  | | | | | | | | 10 |
|  | | | | |  | | | | | | | |  |
| Design Exceptions | | | | |  | | | | | | | | 13 |
|  | | | | |  | | | | | | | |  |
| Retaining Wall Justification | | | | | | | | | |  | | | 15 |
|  | | | | | | | | | |  | | |  |
| Major Utility Relocations | | | | | | | | |  | | | | 17 |
|  | | | | | | | | |  | | | |  |
| Highway Lighting | | | | |  | | | | | | | | 21 |
|  | | | | |  | | | | | | | |  |
| Design Aesthetics | | | |  | | | | | | | | | 22 |
|  | | | |  | | | | | | | | |  |
| Railroad Coordination | | | | | | | |  | | | | | 25 |
|  | | | | | | | |  | | | | |  |
| Value Engineering/Constructability Review | | | | | | | | | | | |  | 27 |
|  | | | | | | | | | | | |  |  |
| Maintenance of Traffic | | | | | | | |  | | | | | 28 |
|  | | | | | | | |  | | | | |  |
| Right-of-Way | |  | | | | | | | | | | | 33 |
|  | |  | | | | | | | | | | |  |
| Estimated Project Cost Summary | | | | | | | | | | |  | | 34 |

List of Exhibits

|  |  |  |
| --- | --- | --- |
|  | |  |
| Exhibit 1 | Project Location and Study Area | | |
| Exhibit 2 | I-75 Mainline Geometric Sections | | |
| Exhibit 3 | Design Completion Risk Guidelines for Cost Estimating of Major Projects | | |
| Exhibit 4 | FY08-09 Business Plan Inflation Calculator – Project #1 | | |
| Exhibit 5 | FY08-09 Business Plan Inflation Calculator – Projects #2-#8 | | |
| Exhibit 6 | Cost Estimate | | |
| Exhibit 7 | Project Cost Estimate Breakdown | | |
| Exhibit 8 | Project Phasing Schematic – Sheet 1 of 2 | | |
| Exhibit 9 | Project Phasing Schematic – Sheet 2 of 2 | | |

Appendices

|  |  |  |
| --- | --- | --- |
|  | |  |
| Appendix A | Pavement Design | | |
| Appendix B | LD-33 & LD-35 Forms | | |
| Appendix C | Signal Warrant Analysis | | |
| Appendix D | Railroad Correspondence | | |
| Appendix E | Cost Estimate Documentation | | |
| Appendix F | Detailed Design Development Schedule | | |
| Appendix G | Right-of-Way Spreadsheets | | |
| Appendix H | Drainage Calculations | | |

**Project Background**

Introduction

The purpose of the Preferred Alternative Verification (PAV) is to further investigate assumptions made during the Assessment of Feasible Alternatives and refine the construction limits on the Recommended Alternative. These activities are completed during Step 7 of the Ohio Department of Transportation’s (ODOT’s) 14-Step Project Development Process (PDP) for Major Projects. The PAV provides the basis for recommending a Preferred Alternative that can be presented to stakeholders, agencies, and the public by the end of Step 7.

**Project History**

This *I-75 Thru the Valley* *Project* falls within an area of I-75, which is part of a broader transportation study of an 85-mile stretch of I-75 from northern Kentucky to Piqua, Ohio. This study was titled the “North South Transportation Initiative” (NSTI) and was completed in 2003. In 2000, members of the Ohio-Kentucky-Indiana Regional Council of Governments (OKI) and the Miami Valley Regional Planning Commission sponsored the NSTI study in order to analyze the I-75 multimodal transportation system. This initiative formed an agreement between the two regions to improve the safety, efficiency and reliability of the transportation system.

The underlying task of the NSTI study was to determine the issues in the corridor, provide goals for the study, and create a list of project solutions. Several public involvement techniques were employed to provide a forum to gather input and comments regarding the issues and concerns of the multimodal transportation system. The public involvement activities solicited input from stakeholders including state representatives; county, city, village and township officials; other agencies and groups who have an interest in the multimodal transportation system; and the general public. Issues collected from the public involvement activities included infrastructure conditions, congestion, land use and the environment, existing resources, need for alternatives, and safety. Five goals for the NSTI study were then created to address these concerns.

* *Goal #1* – Promote a balance between sustaining the operational condition of the existing system and maximizing its safety, efficiency and cost-effectiveness.
* *Goal #2* – Cooperatively address transportation system design, safety, congestion and mobility problems that affect both local residents and through travelers, including trucks.
* *Goal #3* – Support opportunities for economic development through transportation system improvement projects that incorporate sustainable design and funding options and that promote a balanced approach to keeping people and the economy moving.
* *Goal #4* – Maintain and improve community-wide/regional quality of life with respect to the natural and built environments by fostering supportable investments that are sensitive to community preservation and equity.
* *Goal #5* – Reach consensus on a preferred program of projects that support a shared future vision for both the Cincinnati and Dayton regions respectively over the intermediate and longer term(s).

Originating from a preferred program of improvement projects, as a result of the NSTI, the *I-75 Thru the Valley* *Project* involves the widening and reconstruction of I-75 from I-275 to Paddock Road. Work on the project began in 2004 and is sponsored by ODOT, through their District 8 office. The project team consists of ODOT Central Office, ODOT District 8 (ODOT-D8) and the consultant team, M•E Companies, Inc. Improvements to the existing I-75 facility are included as a project in the Governor of Ohio’s “Job and Progress Plan,” listed as a Tier I project by the Transportation Review Advisory Council and listed in *ACCESS OHIO,* the State’s 30-year statewide transportation plan. The project is currently in Step 7 of ODOT’s 14-Step PDP for Major Projects.

**Study Area**

The project study area is located in central Hamilton County, Ohio and includes a 7.3-mile section of I-75 from Paddock Road to I-275 (see Exhibit 1). Logical termini for project development are generally defined as rational end points for a transportation improvement and rational end points for a review of the environmental impacts. For this project, the southern terminus is the I-75/Paddock Road interchange; however Paddock Road and its associated ramps will not be studied because they are part of a different study (*HAM-75-2.30, PID: 76257*). The northern terminus for this project is near I-275; however, I-275 and its associated ramps will not be studied as part of this project because they are part of a different study (*HAM-75-15.39, PID: 77278*). These interchanges were selected as the logical termini for the project because they are existing interchanges that serve as points of access to the regional and interstate highway system in the area. The western limit of the project is Anthony Wayne Avenue/Chester Road and the eastern limit is Reading Road. These roadways were selected as project limits because they are adjacent, parallel roadways to I-75 that accommodate through movements for local traffic and achieve a seamless connection with the existing transportation system without creating additional new access points to the I-75 mainline.

**Summary of Previous Reports**

Leading up to the PAV, six other reports have been completed previously for this project. The first report completed was the Existing and Future Conditions Report. This report was prepared in Step 2 of the PDP and was approved by ODOT on July 30, 2004. The second report completed was the Draft Purpose and Need Statement. This report was prepared in Step 2 and was approved by ODOT and the Federal Highway Administration (FHWA) on August 27, 2004. The Red Flag Summary was also completed in Step 2, and it was approved by ODOT on August 27, 2004. The Planning Study Report was prepared in Step 4, and it was approved by ODOT on November 8, 2004. The fifth report was the Conceptual Alternatives Study, completed in Step 5 and approved by ODOT on October 5, 2005. Finally the sixth report was the Assessment of Feasible Alternatives, which was completed in Step 6 and approved by FHWA on September 7, 2007.

**Preferred Alternative**

**Preferred Alternative Description**

The Preferred Alternative would add one lane to Interstate I-75 in each direction with auxiliary lanes where needed to achieve interchange spacing requirements. The preferred alternative will not only correct the severe safety problems along the corridor but will also include a number of access improvements as described below.

* The Galbraith Road interchange will maintain its full access to I-75. The I-75 southbound and Galbraith Road ramps, along with the Galbraith Road to I-75 northbound ramp would remain as they are today, with the exception of the southbound ramp to Galbraith Road exiting farther north and running parallel to I-75 via a collector-distributor road. The I-75 northbound to Galbraith Road left exit would be replaced with a right exit connecting with Galbraith Road in its current location.
* The SR 126 interchange will be improved by adding two of the three missing movements. A new ramp connecting SR 126 westbound to I-75 northbound will be added, as well as a new ramp connecting I-75 southbound to SR 126 westbound.
* The Davis Street ramp from I-75 northbound will be closed due to the proximity to the Galbraith Road to I-75 northbound ramp and the Shepherd Lane interchange.
* The Cooper Avenue ramps to and from I-75 southbound will be closed without replacement.
* A new connection to Anthony Wayne Avenue will be added to and from I-75 southbound to provide additional access. The ramps would be placed south of the former Cooper Avenue ramps.
* The collector-distributor (C-D) system between Glendale-Milford Road and Shepherd Lane will be eliminated in both directions due to high accident rates. Elimination of this C-D roadway also results in the following access point closures/removals.
  + The Mangham Drive Ramps
  + The General Electric (GE) loop ramps
* Construct GE Parkway, a 2-lane local road east of I-75 between Shepherd Lane and Glendale-Milford Road to provide access to the GE employee parking lots whose access was lost through removal of the C-D road.
* The Shepherd Lane/I-75 northbound exit ramp will remain in its existing configuration, but a new northbound entrance ramp will replace the existing loop ramp and a new tight diamond at Shepherd Lane will provide access to and from I-75 southbound.
* A new local road will be constructed to reconnect Shepherd Lane and Mangham Drive in Lincoln Heights.
* A new ramp connecting I-75 southbound ramp to the GE local road will also be constructed.
* The Glendale-Milford Road interchange will receive much needed capacity improvements to handle future traffic flows in the future.
* The Sharon Road interchange will receive capacity improvements to handle future traffic flows.

Auxiliary Lanes will be placed in the following locations:

* Along I-75 northbound and southbound between Paddock Road to SR 126.
* Along I-75 northbound and southbound between Shepherd Lane and Glendale-Milford Road.
* Along I-75 northbound and southbound between Glendale-Milford Road and Sharon Road.
* Along I-75 northbound and southbound between Sharon Road and I-275.
* Shepherd Lane to the Galbraith/Anthony Wayne C-D exit, southbound.

**Traffic Analysis (IMS)**

**Traffic Analysis (IMS) Summary**

The purpose of the *I-75 Thru the Valley* *Project* is to efficiently serve existing and future traffic volumes, reduce the crash rate and severity and correct several sub-standard design elements that contribute to these problems. To do this, the *I-75 Thru the Valley* *Project* will extend the one additional through lane in each direction from the southern terminus just north of Paddock Road to the northern terminus which is just south of I-275. Auxiliary lanes will also be added as described on Page 8. These improvements are consistent with the intent of the Major Investment Study and are components of the larger improvement to the portion of I-75 from the Ohio River north to I-275. The recommended alternative also includes the following access point adjustments:

***Access Point Adjustments***

| **Intersecting Roadway** | **Interchange Type** | **No Build Condition** | **Build Condition** |
| --- | --- | --- | --- |
|  |  |  |  |
| SR 126 | System | Partial Interchange with 3 missing movements | Add SR 126 Westbound to I-75 Northbound ramp; Add I-75 Southbound to SR 126 Westbound ramp |
| Galbraith Road | Service | Complete Interchange | Rebuild northbound left exit to right exit; Add Southbound C-D road to also serve Anthony Wayne ramps |
| Davis Street | Service | Partial Interchange Northbound Exit only | Eliminate Exit ramp |
| Cooper Avenue | Service | Partial Interchange Southbound Exit and Entrance only | Eliminate both ramps and replace with ramps to Anthony Wayne Ave. |
| Shepherd Lane | Service | Partial Interchange Northbound Exit and Entrance Only | Add Southbound Exit and Entrance Ramps |
| Collector-Distributor Road with At-Grade intersections | Service | Both Northbound and Southbound between Shepherd Land and Glendale-Milford | Eliminate Collector- Distributor Roadways both Northbound and Southbound |
| Mangham Dr | Service | Partial Interchange Southbound Exit from C-D Southbound Entrance to I-75 | Eliminate both ramps and replace with ramps at Shepherd Lane |
| Glendale-Milford Rd | Service | Complete Interchange | Improve Ramp Terminal Intersections; eliminate southbound C-D road |
| Sharon Road | Service | Complete Interchange | Improve Ramp Terminal Intersections |

The additional through lane with auxiliary lanes at key locations and ramp terminal improvements improves the Level of Service (LOS) in the Build condition over the No-Build condition. However, the additional lane is not sufficient to bring all segments up to LOS E or higher. Working with a stakeholder committee, ODOT is committed to ensure that the project meets the needs of both Interstate traffic and local motorists. Part of the solution package adopted by ODOT is system-wide ramp metering for the *I-75 Thru the Valley* and *I-75* *Mill Creek Expressway* projects. Ramp metering along with the capacity improvements will be sufficient to result in LOS E or better through the project area, as shown in the analyses.

Design year traffic for 2030 was modeled for I-75 from the Ohio River to I-275 then certified by ODOT. Capacity analyses were done for the No-Build, Build and Metered-Build conditions. In those situations where the volume-to-capacity (V/C) ratios exceeded 1.0 for any roadway element (i.e. freeway segment, ramp junction or intersection), the constrained portion of demand traffic (that amount which exceeds a V/C ratio of 1.0) was not used in subsequent downstream calculations.

The results for the 2030 No-Build condition show that much of the project area will be at LOS F. Analysis of the 2030 Build condition (without ramp metering) reveals that all of the I-75 LOS F segments and ramp junctions are improved to LOS E except for one segment. When ramp metering assumptions are applied to the calculations, all I-75 freeway segments are improved to LOS E or better. All of the ramp terminal intersections will operate at LOS D or better.

The operational goals for the project are satisfied with the recommended alternative plus ramp metering. There are; however, several boundary locations, outside of the project area, at which the Build condition LOS is lower than the No-Build condition or at which a LOS F situation gets worse. These locations are:

* SR 126 westbound between the I-75 northbound ramp and Galbraith Road
* SR 126 eastbound between the I-75 northbound ramp and Reading Road
* I-75 northbound in the segment between I-275 and Union Centre Boulevard

Among the reasons for this are:

* The one additional through lane in each direction on I-75 mainline allows a greater portion of the demand traffic to reach the segment in question;
* The addition of two of the three missing ramps at the I-75/SR 126 system interchange shifts traffic from an adjacent interchange on SR 126 to a segment on SR 126 closer to I-75;
* The additional capacity on I-75 makes this route more attractive than other parallel north-south routes, thereby drawing traffic to I-75 that would otherwise use roads such as Anthony Wayne Avenue or Reading Road in the No-Build condition.

The section north of I-275 is outside of the project area and will need to be addressed as a separate project by ODOT at an appropriate time. It should also be noted that I-75 is the most heavily travelled highway in the State of Ohio. Connecting Michigan with Florida, this interstate route is also a NAFTA free trade corridor. SR 126, which is also impacted by the improvements on I-75, is a non-Interstate, intra-county freeway which carries less traffic, is less significant, both regionally and nationally, and serves primarily as a commuter route.

The May 2008 cost estimate for this project in 2013, 2016 or 2020 dollars (depending on the phase) is $528 million. It is anticipated that the project will be constructed in eight phases to facilitate both maintenance of traffic and funding availability.

It is recommended that ODOT and FHWA approve the improvements to I-75 as set forth below:

* Add one additional through lane in each direction on I-75 from south of SR 126 to just south of I-275, which is the entire 7.3 mile length of the project
* Add auxiliary lanes in these segments:
  + Paddock Road to SR 126, northbound and southbound
  + Shepherd Lane to Glendale-Milford Road, northbound and southbound
  + Glendale-Milford Road to Sharon Road, northbound and southbound
  + Sharon Road to I-275, northbound and southbound
  + Shepherd Lane to the Galbraith/Anthony Wayne C-D exit, southbound
* Remove the C-D Roads in both directions, slip ramps to/from I-75 and twin sets of loop ramps at GE
* Construct GE Parkway, a 2-lane local road east of I-75 between Shepherd Lane and Glendale-Milford Road to provide access to the GE employee parking lots whose access was lost through removal of the C-D road
* Eliminate the following access points:
  + Northbound exit ramp to Davis Street
  + Southbound exit ramp to Cooper Road
  + Southbound entrance ramp from Cooper Road
  + Southbound exit ramp from C-D road to Mangham Drive
  + Southbound entrance ramp from Mangham Drive
  + Northbound slip ramps to/from C-D road
  + Southbound slip ramps to/from C-D road
* Add the following new access points:
  + Eastbound SR 126 to northbound I-75
  + Southbound I-75 to westbound SR 126
  + Northbound entrance ramp from Shepherd Lane
  + Southbound exit ramp to Shepherd Lane
  + Southbound entrance ramp from Shepherd Lane
  + Southbound exit ramp to GE Parkway
  + Southbound exit ramp to Anthony Wayne Avenue (from new C-D road)
  + Southbound entrance ramp from Anthony Wayne Avenue (to new C-D road)

**Geometric Design**

**I-75 Mainline Geometric Summary**

The I-75 mainline geometry has been broken down into four distinct sections for analysis and discussion purposes (see Exhibit 2).

* Section 1 - south of the “Lockland Split”, where the existing centerline runs down the center of the entire mainline footprint.
* Section 2 - the northbound lanes through the “Lockland Split”.
* Section 3 - the southbound lanes through the “Lockland Split”.
* Section 4 - north of the “Lockland Split”, where the lanes converge into one mainline footprint.

The existing alignment was determined from a myriad of available existing plans that had conflicting or missing information. Since I-75 will be reconstructed on new alignments, exact existing alignments were of less importance. Alignment revisions were frequently required to address spiral lengths based on new super-elevation designs for the additional width pavement sections throughout the project. Once the proposed mainline alignments were established, proposed lanes could be created.

A number of other design issues arose throughout the design process. Among them were:

* Existing ramp design designations, i.e. Rural vs. Urban
* Interchange and ramp spacing
* I-75 northbound to SR 126 westbound ramp radius
* SR 126 eastbound to I-75 southbound ramp profile

The specific design issues and the design process are presented in *Geometric Sections*, shown below.

## Geometric Sections

***Section 1***

In Section 1, the existing alignment can be utilized since there are no spirals that need to be modified for super-elevation runoff. For northbound traffic, an auxiliary lane is provided from the Paddock Road entrance ramp to the SR 126 exit ramps. Both the SR 126 eastbound and westbound ramps exit simultaneously, with the auxiliary lane being for eastbound and the fourth mainline thru lane splitting into a thru lane and SR 126 westbound exit lane. The eastbound lane simply pulls off and ties into the existing SR 126 eastbound exit ramp. The SR 126 westbound ramp runs along the I-75 mainline and straddles a line of piers at the existing ramp structure over I-75 before tying into the existing SR 126 loop ramp. Also there is an I-75 northbound exit ramp to Galbraith Road that extends into Section 2. While the existing left-side ramp will be closed, a standard right side exit has been established. The SR 126 and Galbraith Road exit ramp layouts were originated by ODOT, Central Office, but have been modified both horizontally and vertically as design progressed. This configuration eliminates the interchange spacing problem that was present when attempting to pull each of the SR 126 ramps off separately as well as include the right-side Galbraith Road exit ramp. Section 1 has four or five lanes in the northbound direction. For the southbound traffic, an auxiliary lane is provided between SR 126 and Paddock Road. This lane runs south from SR 126 eastbound to the I-75 southbound entrance ramp down to the Paddock Road exit ramp.

The I-75 northbound to SR 126 westbound ramp radius is of some concern. According to the current ODOT, *L&D Manual, Vol. 1*, *Figure 202-10* (dated January 2006), the radius can be as small as 39 degrees and 30 feet, but the design speed must be reduced to 25 mph. The SR 126 eastbound to I-75 southbound entrance ramp will also require close attention in regard to the existing ramp structure over Anthony Wayne Avenue and the adjacent railroad. Using the existing structure and then tying into the new lanes will require a retaining wall. This ramp will also require running the length further south along the mainline interstate than the tie-in to the existing ramp.

***Sections 2 and 3***

Sections 2 and 3 have geometry concerns due to the existing SR 126 westbound mainline structures over I-75. Due to the difficulty and cost associated with reconstructing these structures, the decision was made to avoid them. Therefore, the proposed alignment must fit within the existing allowable footprint. A new alignment throughout both of these sections will be needed to address the new super-elevation runoffs, spiral lengths, a straightening of the existing southbound corridor, and utilizing the existing retaining wall on the west side of Section 3.

In Section 2, the left-side exit to Galbraith Road is closed and replaced with a traditional right-side exit. The exit to Davis Street is also closed.

In Section 3, the Cooper Road ramps are replaced with a C-D road and exit and entrance ramps that tie into Anthony Wayne Avenue, which introduce a four-legged intersection with Millsdale Street. The C-D road and Anthony Wayne Avenue ramps were designed to minimize the impact to adjacent properties for future development.

Another design consideration in Section 3 concerns the HAM-75-1166 structure over the West Fork of Mill Creek. Due to the condition of the existing structure, ODOT will be constructing a new bridge under HAM-75-11.59, PID 13539 in Fiscal Year 2009. In an email message, dated January 17, 2008, M•E was directed to assume this new structure to be the existing condition for the purposes of preparing the Step 7 PAV submittal and to cease work on the Structure Type Study at this location.. Therefore, a Structure Type Study will not be submitted for this bridge at this time. The replacement structure will accommodate the addition of the fourth lane and wider shoulders along the mainline. However, it will need to be widened as when this section of I-75 is reconstructed in order to accommodate the new exit ramp.  To facilitate the future widening of this structure, as noted, the proposed profile in Section 3 has been adjusted accordingly to match, as closely as possible, that proposed for the bridge to be constructed in FY09.

***Section 4***

Section Four has a proposed centerline east of the existing centerline at the southern tie-in to Sections 2 and 3. This change reduces impacts to West Forrer Street. North of the tie-in point, the proposed alignment mostly follows the existing alignment, except where required for variations in spiral lengths. The Shepherd Lane/Mangham Drive ramps and the GE loop ramps are also closed due to safety and capacity issues. There are also auxiliary lanes for both I-75 northbound and southbound from Shepherd Lane to Glendale-Milford Road, Glendale-Milford Road to Sharon Road and from Sharon Road north to the I-275 ramps.

The Shepherd Lane interchange was completed, with southbound exit and entrance ramps added in a tight diamond configuration. The incorporation of these ramps eliminates some of West Forrer Street. The northbound exit ramp will remain as it is today. The GE entrance from Shepherd Lane lines up directly across from the northbound exit ramp terminal intersection. In order to address intersection capacity concerns at this location, the northbound entrance ramp has been relocated to the northeast quadrant of the interchange, resembling a traditional diamond configuration. This will better handle the Shepherd Lane to I-75 northbound movements.

Throughout the entire design process in Step 7, there was direct and frequent contact with ODOT-D8 Project Manager, Jay Hamilton, and various other ODOT staff members from both District 8 and Central Office. This frequent coordination has helped to eliminate geometric deficiencies in design and potential conflicts.

**Design Exceptions**

**Design Exceptions Summary**

Design Exceptions have been identified along mainline I-75 in four locations. The criteria violation is for shoulder width. This occurs in the I-75/SR 126 Interchange area. Current design standards require 12-foot wide shoulders on both the median and outside shoulders. The proposed alignment of I-75 follows the existing alignment and passes under four very large existing bridge structures carrying SR 126 directional ramps. These structures are not scheduled to be re-constructed with the *I-75* *Thru the Valley* P*roject*. The existing pier locations are spaced such that sufficient width is not available to accommodate the widening of I-75, including the required shoulder widths. Therefore, the proposed shoulder widths must be reduced and a Design Exception request will be required.

The locations identified are I-75 northbound and southbound under structure HAM-126-1328 L and R, I-75 southbound under structure HAM-126-1376 and I-75 northbound under structure HAM-126-1389. Note that not all proposed shoulders under these structures violate current shoulder width criteria. The minimum proposed shoulder width is currently designed to be approximately 3.75-feet wide instead of the required 12-feet wide. Although this is very narrow compared with current criteria, the formal Design Exception request will address factual data, reasoning, mitigation measures, and other pertinent information necessary to make a decision regarding the acceptance of the Design Exception request.

At this stage of the project development, crash data has been reviewed to determine whether or not the potential Design Exceptions are likely to contribute to future crash patterns. Traffic crash data was requested from ODOT in the vicinity of these structure locations to determine if the current crash patterns exhibit any indication pattern involving hitting objects. The data collected at HAM-75-10.30 revealed the following:

* 45 crashes from 2005 -2007
* 24 rear end, 11 sideswipe passing, 5 fixed object, 3 other non-collision, 1 overturning, 1 angle
* 34 daylight, 11 dark
* 36 no adverse weather condition, 6 rain, 3 snow
* 34 dry, 10 wet, 1 snow
* 37 nothing struck, 6 other object struck, 2 guardrail struck
* 23 following too close, 9 improper lane change, 7 failure to control, 3 no driver error, 2 load shift, 1 other driver error
* 33 southbound, 10 northbound, 1 eastbound, 1 southeastbound

The primary crash pattern at this site on I-75 is southbound rear end and sideswipe crashes related to merging traffic and congestion. The reported five fixed object crashes represent 11 percent of the total crashes. Copies of the OH-1 reports for the five fixed object crashes were reviewed. One of the five actually occurred on a ramp and was miscoded to the I-75 mainline. Of the remaining four, two occurred in the southbound direction on wet pavement, one southbound on dry pavement and one northbound on wet pavement. In these four crashes, the object struck was either median barrier or guardrail or both. Wet pavement seems to be the primary contributing factor to the fixed object. No traffic crashes were reported in either direction in the vicinity of the HAM-75-10.89 SB under SR 126 ramp structure

While a comprehensive study has not been performed to determine whether narrowing the shoulders at the existing piers could be a contributing factor in future crashes, some mitigation measures will need to be considered in an effort to reduce that unknown potential.

In summary, a high priority was placed on reducing or eliminating potential Design Exceptions during the design of the Preferred Alternative. However, working within the project constraints, some Design Exceptions, as noted above, may be appropriate. The very costly replacement of the SR 126 bridges may very well justify shoulder width Design Exceptions.

**Retaining Wall Justification**

**Retaining Wall Justification Summary**

The following is a summary of the Retaining Wall Justification Study (RWJS) submitted to ODOT, under separate cover. For more detailed information, please refer to the RWJS.

As a result of the interstate widening and the interchange and ramp alterations, retaining walls will need to be considered. Most of the retaining walls were introduced to either provide a new desired movement or maintain an existing one. Other walls were suggested with the idea of maintaining desired movements without the disruption of side roads, to minimize environmental impacts, or simply to limit Right-of-Way (ROW) takes. A total of twenty-three walls (please note Wall 6 has 4 walls associated with it, 6A-6D) have been proposed. Please refer to the updated Retaining Wall Justification Study, November 2009 for more detailed information. The table below compares the impacts and costs, including ROW and construction, of the project with and without retaining walls.

***Retaining Wall Justification Cost Comparison***



After comparing impacts and costs, including R/W and construction, of the project with and without retaining walls, walls 1, 3, 4, 8, 14, 16, 19, and 20 indicate that there would be significant R/W costs associated with the no wall option. As stated above in the individual wall discussions, Wall 1 and Wall 4 would have significantly larger “without wall costs” associated with the relocation, design, and additional R/W costs needed to relocate Summit Road and West Forrer Street. The relocation costs of Summit Road and West Forrer Street would be very high, therefore, constructing walls 1, 4, 8, 14, 16, 19, and 20 would be the most economical.

All of the remaining proposed retaining walls are assumed to undergo construction due to maintaining the existing and new desired traffic movements or due to the without wall ramifications being too high either for environmental and/or R/W impacts.

**Major Utility Relocations**

**Major Utility Relocations Summary**

The following utilities companies are impacted by the Preferred Alternative.

***ARTIMIS***

* The ARTIMIS system is affected throughout the length of the proposed improvements and will need to be rebuilt in its entirety.

***Cincinnati Bell Telephone***

* The Cincinnati Bell Telephone underground duct bank immediately north of the Galbraith Road/I-75 southbound lanes (approximate Sta. 130+00) may require lowering.
* The shared overhead Duke Energy Electric and Cincinnati Bell Telephone line on the east side of I-75 southbound between approximate Sta. 132+50 to 192+00 (approximately 300 feet north of Galbraith Road to 600 feet north of Wyoming Street) will need relocation.
* The underground Cincinnati Bell Telephone lines crossing I-75 southbound lanes at the Wyoming Street bridge will be impacted.
* The overhead Cincinnati Bell Telephone lines on the east side of I-75 between approximate Sta. 236+00 to 245+00 (Shepherd Lane to approximately 900 feet north of Shepherd Lane) falls within the construction limits and will need to be relocated.

***Cincinnati Water Works***

* The Cincinnati Water Works line crossing near Section Road will be impacted by the construction of the proposed retaining wall along the east side of I-75 and will require relocation.
* The Cincinnati Water Works line on the west side of I-75 between approximate Sta. 279+00 to 292+00 (Neumann Way to approximately 1500 feet south of Glendale-Milford Road) needs to be relocated outside the construction limits.
* Cincinnati Water Works lines are along the new local road extending from Shepherd Lane northward to Mangham Drive and will need to be adjusted to grade.
* Cincinnati Water Works lines along the SR 126 westbound to I-75 northbound ramp (Ramp M).
* There are Cincinnati Water Works manholes along the southbound C-D Road/ Millsdale Street ramps at approximately Sta. 159+80 and 162+60.

***Duke Energy Electric***

* The overhead Duke Energy Electric line on the west side of I-75 between Section Road to approximately 1,000 feet north of Section Road (approximate Sta. 78+00 to 88+00) falls within the construction limits and will have to be relocated.
* The Duke Energy Electric tower located north of Clark Street and east of the I-75 northbound lanes (approximate Sta. 169+50) falls within the proposed construction limits. In fact, this tower is currently located within the existing right of way and in the embankment slope. The proposed toe of slope is approximately 12 feet further east than the existing toe of slope.
* The shared overhead Duke Energy Electric and Cincinnati Bell Telephone line on the east side of I-75 southbound between approximate Sta. 132+50 to 192+00 (approximately 300 feet north of Galbraith Road to 600 feet north of Wyoming Street) will need relocation.
* The overhead Duke Energy Electric line on the west side of I-75 southbound between approximately 400 feet south of Lock Street to 300 feet north of Lock Street (approximate Sta. 176+00 to 183+00) needs to be relocated outside the construction limits.
* The poles for the Duke Energy Electric crossing the I-75 northbound lanes at approximate Sta. 198+50 (approximately 200 feet south of railroad crossing) will have to be relocated.
* Duke Energy Electric overhead line on the east side of I-75 between approximate Sta. 212+50 to 227+00 (approximately 400 feet south of the north end of the *I-75 Mill Creek Expressway* project to the Shepherd Lane ramp) falls within the construction limits and will need to be relocated.
* The overhead Duke Energy Electric line on the east side of I-75 between approximate Sta. 270+00 to 297+50 (approximately 800 feet south of Neumann Way to 800 feet south of Glendale-Milford Road) falls within the construction limits and will have to be relocated.
* Underground Duke Energy Electric lines along the new Shepherd Lane ramps will need to be relocated or adjusted to grade.

***Duke Energy Gas***

* Duke Energy Gas lines along the new local road extending from Shepherd Lane northward to Mangham Drive will need to be adjusted to grade.

***MCI***

* The MCI fiber optic lines crossing the I-75 southbound lanes at the railroad crossing will be impacted.

***Metropolitan Sewer District (MSD)***

* The MSD sewer crossing at approximately 350 feet north of Section Road (approximate Sta. 80+75) will be impacted and will require relocation.
* The MSD sewer extending along the east side of I-75 near the southern end of the “Lockland Split”(approximate Sta. 119+00 to 122+00) falls within the construction limits and will require relocation.
* The MSD sewer located on the west side of I-75 between approximate Sta. 161+00 to 186+00 falls within the proposed construction limits and will need to be relocated.
* The MSD sewer on the west side of I-75 between approximate Sta. 270+00 to 293+00 (approximately 900 feet south of Neumann Way to 1400 feet south of Glendale-Milford Road) falls within the construction limits and will need to be relocated.
* MSD sewer lines along the new local road extending from Shepherd Lane northward to Mangham Drive will need to be adjusted to grade.
* MSD Sewer lines along the new Shepherd Lane ramps will need to be relocated or adjusted to grade.
* MSD sewer lines at approximately Sta. 136+67 at the SR 126 westbound to I-75 northbound ramp (Ramp M).
* There are MSD manholes along the SR 126 eastbound to I-75 northbound ramp (Ramp I) at Sta. 113+20, 121+05, 121+80, 124+40, 127+50, 130+45, and finally 134+13.
* There are MSD manholes along the I-75 southbound C-D road/ramp to Millsdale Street at approximately Sta. 157+50.  There are also water manholes around Sta. 159+80 and 162+60.
* MSD sanitary lines on the west side of the mainline near Glendale-Milford Road from Sta. 270+50 to 293+00.

***Quest***

* The Quest fiber optic lines crossing the I-75 southbound lanes at the railroad crossing will be impacted.

***Southwestern Ohio Water***

* The Southwestern Ohio Water 36-inch line between approximately 650 feet south of the West Fork of the Mill Creek crossing to 400 feet south of Lock Street (approximate Sta. 159+50 to 176+50) will need to be lowered or relocated.
* The Southwestern Ohio Water line crossing the I-75 southbound lanes at the Wyoming Street bridge will be impacted.
* The Southwestern Ohio Water 36-inch line between approximately 1,300 feet north of the I-75 southbound crossing of the railroad to 650 feet south of the West Fork of Mill Creek crossing (approximate Sta. 150+00 to 159+50) will need to be lowered or relocated.

***Sprint***

* The Sprint fiber optic lines crossing the I-75 southbound lanes at the railroad crossing will be impacted.

***Village of Lockland Water***

* The Village of Lockland water lines crossing the I-75 southbound lanes at the Wyoming Street bridge will be impacted.
* The Village of Lockland water line along the I-75 southbound lanes falls within the construction limits between approximate Sta. 198+00 to 200+00 (approximately 700 feet south of the north end of the “Lockland Split”) and will require relocation.
* The Village of Lockland water line on the east side of I-75 between Sta. 214+00 and 217+00 (near the north end of the “Lockland Split” falls within the construction limits and will need to be lowered or relocated.
* The Village of Lockland water lines on the eastside of I-75 between approximate St. 239+00 to 245+00 (approximately 250 feet north of Shepherd Lane to 850 feet north of Shepherd Lane) falls within the construction limits and will need to be lowered or relocated.
* Village of Lockland water lines along the new Shepherd Lane ramps will need to be relocated or adjusted to grade.

**Highway Lighting**

**Highway Lighting Summary**

The *I-75 Thru the Valley* *Project* will utilize a mix of lighting as designated in the I-75 Aesthetics Final Report. The I-75 Aesthetics Final Report was submitted to ODOT in October of 2007. Low mast lighting will be utilized in-between interchanges and at non-system interchanges with an average spacing between 180 feet and 200 feet. High mast lighting will be utilized at the SR 126/I-75 interchange with an average spacing of 500 feet. Further information can be found on the lighting plan sheets.

**Design Aesthetics**

**Aesthetics Committee & I-75 Aesthetics Final Report**

ODOT’s goal of creating a uniform approach to design aestheticsalong the I-75 corridor has been accomplished through uniting the communities and organizations along the I-75 corridor through discussion and consensus. An aesthetics committee was formed to assist the transportation agencies and the project consultant team in implementing guidelines for the design aesthetics along I-75. The aesthetics options chosen satisfy the State’s vision of a safe, efficient and attractive vision for the corridor, through a collaborative and interdisciplinary approach. The I-75 Aesthetics Final Report was submitted to ODOT in October of 2007. Below is a summary of the design aesthetic decisions.

**Design Aesthetics Decisions**

The following design aesthetics were agreed upon, by the *I-75* *Aesthetics Committee,* during the second meeting on October 2, 2007.

***Bridges***

*Bridge Color.*

Consensus: To be determined. Once the bridge type (steel or concrete) is determined, a bridge color can be chosen. As bridge designs are completed, ODOT will work with communities in choosing colors for their communities. Sharp contrasts in color will be avoided, while a smooth transition in color along the corridor will be the ultimate goal.

*Bridge Texture.*

Consensus: Rustic Ashlar.Rustic Ashlar will be used as the bridge texture throughout the corridor and in those areas of the City of Cincinnati which Rustic Ashlar fits into the design of their interstate master plan.

*Bridge Design. Bridge Elements.**Bridge Fencing.*

Consensus: Geometric Consensus: Texas Rail Consensus: Straight Fencing

  **

***Community Identification***

*Community Identification.*

Consensus:Community Names Consensus: Community Seals

** **

Since Texas Rail was chosen, ODOT will work to place community names where possible (i.e. bridge abutments), though some bridges may not be able to host a community name. One community seal will be chosen for each community and spaced appropriately along available surfaces (i.e. noise walls, appropriate sized retaining walls, etc.).

***Noise Walls***

Decisions made by the *Aesthetics Committee* regarding noise walls, includes only the “appearance” of the interstate side of the noise walls. It should be noted that final noise wall locations will be determined at a later date. Separate meetings will be held with affected stakeholders regarding noise walls in their communities.



*Noise Wall Type.*

Consensus:Rustic Ashlar

*Noise Wall Color.*

Consensus:To be determined

Once the bridge type (steel or concrete) and bridge color are determined, a noise wall color can be chosen. ODOT will work with communities in choosing a smooth-transition of noise wall color, along the corridor, in order to avoid sharp contrasts.

*Landscaping along Noise Walls.*

Consensus: Yes

Landscaping along noise walls can be planted and maintained by local entities if an agreement is made with ODOT.

***Lighting***

*Lighting Type (At Systems Interchanges, i.e. I-74, Norwood Lateral and SR 126).*

Consensus: High Mast Lighting

*Lighting Type (In-between Interchanges and at non-systems interchanges).*

Consensus:

South of I-74/ North of I-74/

I-75: Cobra I-75: Low Mast

Lighting Lighting

*Decorative Lighting on Bridges.*

Consensus: Yes

Decorative lighting on bridges can be purchased and maintained by local entities if an agreement is made with ODOT.

***Landscaping***

*Landscaping near Interchanges.*

Consensus:Yes

Landscaping of interchanges can be purchased and maintained by local entities if an agreement is made with ODOT. ODOT will work with communities to provide grading and areas for landscaping.

*Planting trees near the Interstate.*

Consensus: Yes

Trees near the interstate can be planted and maintained by local entities if an agreement is made with ODOT and all safety requirements are met.

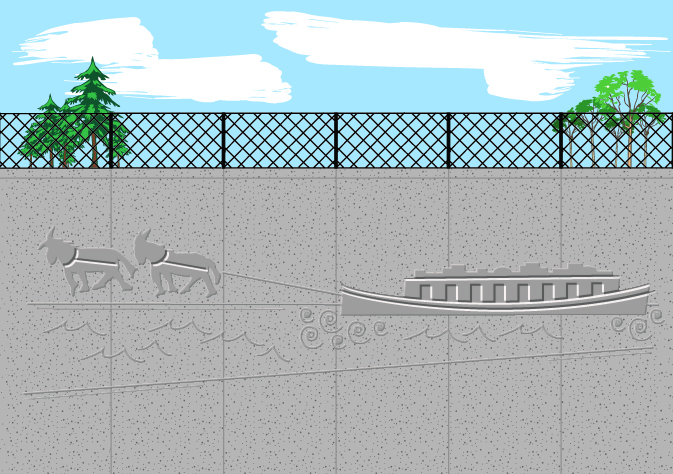
***Retaining Walls***

*Retaining Walls.*

Consensus:

Lockland Split Retaining Walls: Other Retaining Walls: Rustic Ashlar

Canal Scene with community seals



**Railroad Coordination**

**Railroad Coordination Summary**

There are two rail lines within the project area: CSX and Norfolk Southern. Starting in Step 5 of ODOT’s PDP, both rail companies were contacted by telephone to discuss the project. They were also sent a project description and mapping for their review and comment. Further coordination has occurred as project development has progressed through Step 7. Appendix D contains copies of all correspondence with the rail companies.

As more detailed information was developed during Step 6, a better understanding of the railroad involvement associated with this project was gained. Based on the preliminary design performed during Step 6, it was determined that the project would not involve the CSX railroad, as their facilities are located outside of the limits of any of the proposed feasible alternatives. Therefore, coordination with CSX ceased during Step 6.

As design development continued into Step 7, coordination with Norfolk Southern has continued, as their line crosses over the southbound lanes just north of Galbraith Road and then crosses under the northbound lanes just north of Wyoming Avenue. This set of mainline tracks, known as the Cincinnati Line, is part of the Dearborn Division and operated by the Norfolk Southern Corporation. A coordination meeting with Norfolk Southern was held on September 25, 2007, during which track realignment and structure types were discussed. The Structure Type Study and track realignment plans were subsequently prepared in accordance with the minutes of this meeting. A discussion of the level of Norfolk Southern involvement follows.

***Norfolk Southern Railroad over I-75 Southbound***

The existing railroad structure is a three span bridge carrying two tracks across the southbound lanes of I-75 at mile marker 11.00 and the West Branch of the Mill Creek. It was originally constructed in 1906 and rehabilitated in 1950. Spans 1 and 2 are open deck girder spans, with Span 1 crossing the West branch of the Mill Creek. Span 3 is an open deck through girder crossing I-75 southbound.

As described in Structure Type Study, the proposed structure will include 4 spans of varying length. Spans 1 and 2 will include twelve non-composite plate girders with steel deck plates, concrete underlayment and ballast. Spans 3 and 4 will include two through girders with transverse floor beams, steel deck plates, concrete underlayment and ballast. The new structure will be located on permanent track realignment. This arrangement will allow railway traffic to be maintained at all times during construction, with the exception of a temporary tie-in outage.

For more details about the existing and proposed structures and track realignment details, please refer to the Structure Type Study for HAM-75-1105L, submitted under separate cover.

***I-75 Northbound over Norfolk Southern Railroad***

A 2,418 foot-long structure carries existing I-75 northbound over the Mill Creek, Wyoming Avenue, the Norfolk Southern Railroad and Shepherd Avenue. This structure will be widened to accommodate the addition of a fourth lane on I-75. Work will also include a complete superstructure replacement, while salvaging the existing piers. The new structure will be designed in accordance with Norfolk Southern’s Overpass Grade Separation Criteria.

For more details about the existing and proposed structures, please refer to the Structure Type Study for HAM-75-1192R, submitted under separate cover.

**Value Engineering/Constructability Review**

**Value Engineering/Constructability Review Summary**

A disposition of comments regarding the potential cost savings from the Preliminary Engineering Value Engineering Study can be viewed in the table below.

***Summary of Potential Cost Savings***

|  |  |
| --- | --- |
| **Comment** | **Disposition of Comment** |
|  |  |
| **Roadway** |  |
| 1. Improvement of Shepherd Lane and McIntyre Street. | Incorporated into the Recommended Preferred Alternative. |
| 1. Add ramp from Davis Street to I-75 NB. | Previously rejected by ODOT. |
| 1. Construct west section of Davis/Cooper extension instead of ramp to Anthony Wayne Avenue. | Previously rejected by ODOT |
| 1. Eliminate Davis Extension between I-75 SB and NB. | This design was part of Step 6 Alternative B. Alternative B was eliminated. |
| **Roadway** |  |
| 1. New WB Ramp to SR 126 from Galbraith Road. | Previously rejected by ODOT. |
| 1. Eliminate/Reduce Lockland Road Retaining Wall. | Incorporated in the design where possible, please refer to the Retaining Wall Justification Reports for more information. |
| 1. Eliminate/Reduce Summit Road Retaining Wall. | Incorporated in the design where possible, please refer to the Retaining Wall Justification Reports for more information. |
| **Bridge** |  |
| 1. Eliminate steel pier caps for NB I-75 at Galbraith Road. | Incorporated into the design, please refer to the Structure Type Study for HAM-1102R Bridge. |
| 1. Replace only first span of railroad bridge over I75 SB at Galbraith Road. | The entire structure must be replaced per discussions with Northfolk Southern. A new bridge will be constructed on permanent realignment. |
| 1. Build proposed Davis Street railroad crossing at grade. | This design was part of Step 6 Alternative B. Alternative B was eliminated. |
| 1. Salvage/reuse substructure for Glendale-Milford Road bridge. | Previously rejected by ODOT. |
| 1. Maximize use of MSE walls in lieu of spas at Benson Street Bridge (long structure 2400’). | Please refer to the Structure Type Study which recommended the salvage and reuse of piers. |
| **Design Suggestions** |  |
| 1. Realign Millcreek to reduce overall bridge length. | Previously rejected by ODOT. |
| 1. Broaden project scope to allow precast pier replacement. | Not Applicable at this time; will be reviewed during the final design phases. |
| 1. Use longer spans to optimize design. | Incorporated into the design, please refer to the Structure Type Studies. |

**Maintenance of Traffic**

**Maintenance of Traffic/Construction Sequencing Summary**

This section summarizes the planned Maintenance of Traffic scheme for the *I-75 Thru the Valley* *Project*. The Maintenance of Traffic Alternative Analysis (MOTAA) Report was previously submitted to ODOT under separate cover as part of Step 6 of ODOT’s PDP. This report formed the basis for the Maintenance of Traffic (MOT) and construction sequencing scheme for this project. For more detailed information regarding the MOTAA, please refer to the complete report.

### *Maintenance of Traffic Goals*

The MOT goals established for this project were to maintain three 11-foot lanes in each direction with a 2-foot lateral clearance between the edge line and the edge of pavement or a 2-foot lateral clearance between the edge line and any object (drum, portable concrete barrier, etc.). In some areas it will be difficult to maintain the desired lane width and shoulder offset due to limitations from existing bridge widths and/or overpass pier spacing. The lane widths and shoulder widths in these areas will be reduced to 10-foot lanes and 1.5-foot offsets as needed. These areas are discussed in more detail in the appropriate sections below.

### *Maintenance of Traffic Alternatives*

Two basic MOT Alternatives were considered in order to meet the above goals:

### *Part-Width Construction* – construct the proposed pavement and shoulders in both directions simultaneously while maintaining three lanes of traffic in each direction using the existing and/or proposed pavement.

### Part-width construction provides room for maintaining three lanes of traffic in each direction on the existing pavement by shifting toward either the outside shoulder or inside median and constructing the proposed lanes and or proposed bridges or overpass structures. Temporary pavement and bridge width is needed in some areas in order to provide the desired lane widths.

### *Crossover Construction* – construct new pavement and shoulders sequentially in one direction at a time by shifting opposing traffic over to the other direction of travel while maintaining three lanes in each direction (six total).

### Temporary pavement is needed in some areas in order to provide the desired lane widths. Crossover construction requires a large footprint on each side of the freeway to provide adequate space for six lanes of traffic plus the required shoulder and clearances from the portable concrete barrier. In areas where the existing mainline bridge decks are already too narrow, part-width construction is needed prior to considering the crossover construction option.

For MOT purposes, I-75 was divided into six sections.

* Section 1 – Paddock Road to Station 103+50
* Section 2 – Station 103+50 to Station 215+00 (northbound only)
* Section 3 – Station 103+50 to Station 178+00 (southbound only)
* Section 4 – Station 178+00 (southbound only) to Station 205+00 (southbound only)
* Section 5 – Station 215+00 (northbound only) to Station 329+00

Station 205+00 (southbound only) to Station 329+00

* Section 6 – Station 329+00 to Station 420+00 @ Kemper Road

The following Work Zone Constraints table summarizes the ability of each MOT option to meet the MOT requirements and constraints.

***Work Zone Constraints***

| **Constraint** | **Work Zone Alternatives** | |
| --- | --- | --- |
| **Part-Width Construction** | **Crossover Construction** |
|  |  |  |
| **Ability to meet Work Zone Policy** | Able to meet work zone policy except at Overpass HAM-75-13.89 & Section 5 where lane widths reduced to 10’ w/ 1’-6” offsets (Refer to Part-Width Table 1) | Able to meet work zone policy except at Overpass HAM-75-13.89 and all bridges except HAM-75-11.84 where lane widths reduced to 10’ w/ 1’-6” offsets (Refer to Crossover Table 2) |
| **Ability to maintain all accesses** | Maintained access to all except Ramp C at EB SR 126 to SB I-75 (refer to MOTAA) | Maintained access to all except Ramp C at EB SR 126 to SB I-75 & Ramps M, N, F located in the Lockland Split (refer to MOTAA) |
| **Access impacts to important traffic generators** | Ramp C, EB SR 126 to SB I-75 which will be closed during the first phase of const. | Ramp C, EB SR 126 to SB I-75 which will be closed during the first phase of const. Ramps to and from RRCC would be closed during different phases in section 1. |
| **Ability to provide required on-ramp merge decision sight distance.** | Meets TEM requirements when marked as open. Also the existing number of lanes are maintained at all times on each ramp if shown as open | Meets TEM requirements when marked as open. Also the existing number of lanes are maintained at all times on each ramp if shown as open |
| **Location of longitudinal joints** | Part-width construction as shown does not result in a joint in a wheel track location. The majority of the joints will fall into a lane line or center of lane. | N/A |
| **Right-of-way & Environmental impacts** | MOT scheme would not increase R/W or environmental impacts along I-75 that are not already affected by the proposed roadway improvements. | MOT scheme would not increase R/W or environmental impacts along I-75 that are not already affected by the proposed roadway improvements. |
| **Final bridge widths** | No structures will have to be increased beyond the proposed width | A total of three bridges would have to be increased by 4 ft. (Refer to MOTAA) |
| **Significant impacts for construction duration and/or construction costs** | Part-width construction of the bridges within the Lockland split would be more costly and result in a longer construction period. Also Part-Width construction would cost $250,000 more than Crossover. Part-width construction is more economical than crossover in Section 1, 5 and 6. | Crossover construction in the area of the Lockland split will be less costly than the part-width and the construction time should be reduced with Crossover const. |
| **Significant impacts to earthwork, retaining walls, pier clearances, profile differences, etc.** | No impacts to these permanent design features are anticipated. | No impacts to these permanent design features are anticipated. |
| **Ability to maintain existing drainage and lighting systems** | Drainage is a concern within section 4, & Section 5 but can be handled with temporary drainage structures. Also Overhead lights and truss signs in Section 5 will need to be addressed when the median is removed. | Drainage is a concern within section 4, & Section 5 but can be handled with temporary drainage structures. Also Overhead lights and truss signs in Section 5 will need to be addressed when the median is removed. |
| **Construct ability; and construction equipment access** | No special provisions required. | No special provisions required. |
| **Location of crossovers** | N/A | Crossovers can be located Just north of Paddock Road and Just north of Glendale Milford Road. |
| **Estimated maintenance of traffic cost** | Refer to the tables to see the additional estimated MOT cost for additional temporary pavement and bridge work | Refer to the tables to see the additional estimated MOT cost for additional temporary pavement and bridge work |

***MOT Recommendations***

After careful evaluation of the issues and constraints summarized above, the following MOT recommendations were made for each section of I-75:

##### Section 1- (Paddock Road) to Station 103+50. There is a cost advantage to using part-width construction versus crossover in this section due to the additional cost for temporary pavement under the crossover option. Therefore part-width construction is the preferred option in this section.

* *Section 2- Station 103+50 to Station 215+00 (northbound only).* Because the number of bridges located along this length of highway, crossover construction is recommended.
* *Section 3 – Station 103+50 to Station 178+00 (southbound only) and Section 4 – Station 178+00 (southbound only) to Station 205+00 (southbound only).* Section 3 and 4 are located on the southbound leg of I-75 and are the compliment to section 2. Therefore crossover construction is recommended for these sections also.
* *Section 5 – Station 215+00 (northbound only) to Station 329+00 and Station 205+00 (southbound only) to Station 329+00.* Under both the part-width and crossover schemes, Section 5 will require extensive pre-phase work in order to remove the existing median barrier and place temporary pavement. Crossover construction is recommended for Section 5.
* *Section 6 – Station 329+00 to Station 420+00 @ (Kemper Road).* The improvements in Section 6 of the I-75 project include widening and resurfacing with one bridge widening. In general, part-width construction works best in areas where only widening and resurfacing occur. Therefore part-width construction is recommended for this section.

Proposed Project Phasing

Subsequent to the development of the MOTAA and the resulting MOT recommendations for the *I-75 Thru the Valley* *Project*, a construction phasing strategy was developed. This strategy is based primarily on funding availability, logical construction sequencing and MOT considerations. The overall *I-75 Thru the Valley* *Project* has been broken into eight separate construction projects as follows.

1. Project #1 – I-75 from Shepherd Lane to Glendale-Milford Road (crossover construction)
   1. Addition of the 4th lane
   2. Auxiliary lanes
   3. Reconfigured interchange @ Shepherd Lane
   4. Ramp improvements @ Glendale-Milford Road and Glendale-Milford Road improvements

Note: The project limits would begin just north of the split.

1. Project #2 - Local Roads
   1. New southbound exit ramp and flyover bridge to GE Parkway
   2. GE Parkway
   3. McIntyre Road improvements with tie-in to Mangham Drive

Note: These have been shown separately to identify the true cost of building these local network improvements. However, it is intended that GE Parkway and the McIntyre Road improvements will be included with Project #1 to handle traffic flow in the area after access to the collector road is removed.

1. Project #3 – I-75 northbound/southbound from Paddock Road to Galbraith Road (combination part-width and crossover construction)
   1. Addition of the 4th lane
   2. Auxiliary lanes
   3. New right side exit ramp from I-75 northbound to Galbraith Road
   4. Existing ramp reconfigurations & tie-ins @ SR 126 eastbound to I-75 southbound; Galbraith Road entrance to I-75 southbound; I-75 northbound to SR 126 eastbound; I-75 northbound to SR 126 westbound
2. Project #4 – Norfolk Southern railroad bridge over I-75 southbound

Note: Could be combined with Project #5.

1. Project #5 – Galbraith Road to Shepherd Lane – southbound I-75 in Split (crossover construction)
   1. Addition of the 4th lane
   2. Auxiliary lanes
   3. Anthony Wayne Avenue connector ramps and C-D road to Galbraith Road
2. Project #6 - Galbraith Road to Shepherd Lane – northbound I-75 in Split (crossover construction)
   1. Addition of the 4th lane
   2. Auxiliary lanes
   3. Galbraith Road to I-75 northbound ramp tie-in
3. Project #7 – New SR 126 Ramps
   1. New ramp from SR 126 westbound to I-75 northbound
   2. New ramp from I-75 southbound to SR 126 westbound (via Galbraith Road at-grade intersection)
   3. Complete ramp tie-in from SR 126 eastbound to I-75 northbound
4. Project #8 - Glendale-Milford Road to Kemper Road (part-width construction)
   1. Addition of the 4th lane
   2. Auxiliary lanes
   3. Ramp improvements @ Sharon Road, including ramp terminal intersections and associated Sharon Road improvements

**Right-of-Way**

**Right-of-Way Summary**

The following table represents the right of way required for the *I-75 Thru the Valley* *Project*. More information can be found in the accompanying spreadsheets in Appendix G.

***ROW Summary***

|  |  |
| --- | --- |
| **ROW Needed** | **Amount** |
|  |  |
| Temporary ROW Needed | 1.45 (Acres) |
| Drainage ROW Needed | 1.728 (Acres) |
| Permanent L/A Needed | 41.465 (Acres) |
| Permanent ROW Needed | 15.371 (Acres) |
| **TOTALS** | |
| Total Area Required | 60.014 (Acres) |
| Total Full Takes | 83 (Properties) |
| Total Buildings Required | 71 (Buildings) |

Estimated Project Cost Summary

**Methodology, Final Estimates & Conclusions**

The construction cost estimate for each Project Phase was developed using ODOT’s *Procedure for Construction Budget Estimating* and the *Estimator 2.5a* software. The *Procedure for Construction Budget Estimating* defines the procedure for assuring a consistent, reasonable, and reliable estimate, although these procedures are not intended to replace engineering and estimating judgment.

The PAV requires that a C-1 Estimate be used. Three important guidelines of inflationary costs, constructible risk contingencies, PDP design contingency costs have been carefully described, which will be explained in more detail later. In ODOT’s *Procedure for Construction Budget Estimating*, they have suggested some conceptual estimating techniques for various items. Because the project is in Step 7 and the design work is approximately 50 percent complete, most major cost items have been defined, such as roadway costs, pavement costs, drainage costs, etc. and corresponding quantities have been identified. The estimate at this step has been prepared using estimating data based upon historic data.

Additional cost contingencies for work items such as utilities, MOT, lighting, etc. have also been used. The appropriate design contingency factors, based on the analysis of the project have also been included. As stated above, many Major Cost Items have been determined, both by engineering experience and the “80/20” rule. In having the major cost items defined, the estimating software, *Estimator 2.5a*, was used to categorize and sub-categorize the major cost items, hence resulting in a cost estimate with rough quantities and a 15 percent PDP design contingency, which is the highest of confidences and lowest of percentages at this particular stage. Due to rising costs in the industry, it is very important to appropriately account for all contingencies, primarily inflationary costs, constructible risk percentages, and of course design contingencies, all of which are add-ons to the today’s dollar amount.

Estimating constructible risks when preparing initial budget estimates can be very difficult due to insufficient information at the current step, therefore a “worst-case” analysis was used to estimate costs in certain “unknown” areas, such as retaining walls, noise barriers, and unknown soil conditions. This is known as constructible risk contingency and is an actual item used in the *Estimator* program. This is an item used to quantify the risk that would affect the project cost. This contingency was added based upon possible scenarios that are unknown or may change causing costs to rise.

PDP design contingency is a percentage add-on to the whole project. This contingency is based on different levels of design completion, and meets a contingency for items not accounted for in the design. For Steps 4-7 of the PDP, a range of 15-25 percent is recommended as an add-on cost to the whole project. Because of this, a design contingency of 15 percent was chosen. These contingencies have been developed based on previous historical data for similar type and size of projects. A design contingency graph that assisted in determining the 15 percent is shown in Exhibit 3.

Much attention must be paid to the inflationary cost contingency. This is a cost added after the design contingency has been incorporated. The inflationary cost contingency is the final portion of the construction estimate. ODOT recommends using their *FY 08-09 Business Plan Inflation Calculator* in determining the inflation percentage*.* Of the eight total project phases, Project #1 will have a different inflation percentage than Projects #2 through #8. Project #1 was calculated to be 44.2 percent, while the remaining Projects #2 through #8 were calculated to be 102.9 percent. Project #1 has an estimated mid-point of construction date of 2013, while the remaining projects have an estimated mid-point of construction date of 2020. The Inflation Calculator for Project #1 can be found in Exhibit 4 and for Projects #2 to #8 in Exhibit 5. The estimator software, *Estimator 2.5a*, was used to calculate all Step 7 cost estimates. The C-1 estimate template from ODOT was used to categorize the major cost items. The pricing per group, listed as a major cost driver or as other costs, was priced based on both engineering judgment and experience as well as recommended prices given by the conceptual estimating techniques. Quantities were determined and entered into the program along with the appropriate unit price. The program than determines the total cost per category, which in turn was used to determine the risk contingency add-on. These categories that now have risk, if deemed necessary, were than totaled to determine the construction cost. The 15 percent PDP design contingency was then added to the construction cost, increasing the construction cost of the project as a whole. Finally, this construction cost, which has all risk contingencies and the 15 percent design contingency, is used to calculate the inflationary contingency giving the total estimated cost of the project. The following table shows the estimated costs for the eight Project Phases of the Preferred Alternative Verification.

*Pricing for the different Project Phases of the PAV*

| **Project** | **State Fiscal Year** | **Construction Cost** |
| --- | --- | --- |
|  |  |  |
| #1 | 2013 | $77,256,988 |
| #2 | 2020 | $28,020,774 |
| #3 | 2020 | $96,650,733 |
| #4 | 2016 | $20,430,000 |
| #5 | 2020 | $67,594,757 |
| #6 | 2020 | $111,724,000 |
| #7 | 2020 | $71,576,397 |
| **#8** | 2020 | $55,060,658 |

(Refer to Project Phasing Schematics for project locations)

As a supplement to this information, Exhibits 6 and 7 are provided to indicate a percentage breakdown of the major cost categories. Each Project Phase Estimator file showing all calculated quantities and unit prices can be found in Appendix E. The Project Phase Schematics showing the location of the eight Project Phases can be found in Exhibits 8 and 9.