

# Alternatives Analysis Report, Volume 2: Traffic Analysis Details

SR 0030-A10 Corridor Improvements  
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## Introduction

This report is Volume 2 of the Alternatives Analysis Report series for the corridor-wide master planning effort for State Route 0030 Section A10 (SR 0030-A10, US Route 30) under the *Route 30 Projects* program. Volume 2 is essentially a continuation of the project-specific *Traffic Report for Base and No-Build Conditions* (9/28/2016) that evaluates US 30 through North Huntingdon Township from the 10<sup>th</sup> Street intersection in Irwin Borough, Westmoreland County, to State Route 48 in North Versailles Township, Allegheny County. This document details traffic analyses to assess the project's improvement alternatives and their potential traffic operational impacts or benefits relative to addressing Purpose and Need along the corridor (see [Volume 1](#)).

### Route 30 Projects Alternatives Analysis Report Series:

Volume 1: Master Planning Summary  
**Volume 2: Traffic Analysis Details**  
 Volume 3: Safety Analysis Details  
 Volume 4: Benefit-Cost Details

## Supplemental Traffic Data

Following completion of the baseline traffic analyses, various traffic data sets and insights continued to evolve in preparation for supporting traffic analysis of the alternatives. Supplemental data and insights are described below.

### Traffic Volume

Design Year traffic volumes were primarily based on the volumes that were forecasted for the 2045 No-Build scenario using VISUM modeling software. These original Design Year volumes were used as the basis of the alternatives analysis.

VISUM was used to forecast travel demand along the corridor for the Preliminary Proposed Alternative, particularly at the proposed Irwin connection and jughandle intersections. The proposed improvements will cause certain movements to become restricted or unrestricted along US 30, resulting in different traffic patterns. For example, the US 30 intersection at Bethel Road currently restricts northbound left-turns; under the Preliminary Proposed Alternative, a full access jughandle at this intersection will introduce new northbound left-turn traffic that would have previously turned left at Malts Lane.

Supplemental counts (see [Appendix A](#)) were used as necessary to refine volumes in VISSIM and Synchro software. Supplemental traffic counts were collected throughout the US 30 corridor in late June and early September 2017 at the following locations:

- |                                       |                                |
|---------------------------------------|--------------------------------|
| • US 30 at Billot Avenue              | 12-Hour Count                  |
| • US 30 at New England Motor Freight  | 12-Hour Count                  |
| • US 30 at Ardara Road                | 12-Hour Count                  |
| • US 30 at Buttermilk Hollow Road     | 2-Hour Counts (AM, PM)         |
| • Carpenter Lane at Ward Drive/Sheetz | 2-Hour Counts (AM, PM)         |
| • US 30 at Bethel Road                | 1-Hour Counts (AM, PM, SAT)    |
| • US 30 at Skellytown Road            | 1-Hour Counts (AM, PM, SAT)    |
| • SR 48 at Aldi Drive                 | 1-Hour Counts (AM, PM, SAT)    |
| • US 30 at Hams Way                   | 30-Minute Counts (AM, PM, SAT) |
| • Center Highway at Taylor Drive      | 30-Minute Counts (AM, PM, SAT) |
| • US 30 at Crown Road/Bonnie Drive    | 30-Minute Counts (AM, PM, SAT) |
| • US 30 at Aldi Drive                 | 30-Minute Counts (AM, PM, SAT) |

## Gap Studies

Two additional gap studies were conducted in June 2017 along US 30 at Billot Avenue and US 30 in front of the mobile home park at Minnesota Lane during the AM and PM peaks using Miovision video collection units ([Appendix B](#)). A gap is the time interval between two consecutive vehicles in major traffic flow. Adequate gaps in traffic are required for vehicles on minor streets to turn onto US 30. Based on the critical gap, the delay and corresponding Levels of Service (LOS) were summarized for each left-turn movement based on the observed number of vehicles and gaps ([Exhibit 1](#) and [Exhibit 2](#)). The unacceptable LOS (E or F) for the southbound and northbound left-turn movements confirm the operational concerns identified in the [Project Purpose and Need Statement](#) regarding left-turn issues. Inadequate gaps and a high number of driveways and unsignalized intersections along the corridor create overly aggressive and potentially unsafe driving behavior and increased travel delay.

**Exhibit 1: Gap Data for Billot Avenue**

Movement	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
EBL	10.1	B	12.7	B
SBL	36.0	E	69.2	F
WBL	10.2	B	15.8	C
NBL	42.9	E	75.0	F

**Exhibit 2: Gap Data for Mobile Home Park**

Movement	AM Delay (sec/veh)	AM LOS	PM Delay (sec/veh)	PM LOS
EBL	10.8	B	9.8	A
SBL	26.5	D	37.5	E
WBL	6.7	A	11.3	B
NBL	24.3	C	36.0	E

## Traffic Signal Warrants

Based on No-Build conditions analyses (see [Traffic Report for Base and No-Build Conditions](#)) and comments from public and stakeholder meetings, the intersections along US 30 at Ardara Road, New England Motor Freight, and Billot Avenue were evaluated to determine if they satisfied warrants for the installation of new traffic signals under today's volumes. These warrants were analyzed in accordance with the 2009 Manual on Uniform Traffic Control Devices (MUTCD) using PennDOT's Traffic Signal Warrant Analysis Workbook ([Appendix B](#)). Results are as follows:

- US 30 at Billot Avenue – Currently stop-controlled, this intersection satisfies criteria for Warrant 1 (Eight-Hour Vehicular Volume) and Warrant 2 (Four-Hour Vehicular Volume). A new traffic signal is warranted and is included in the Preliminary Proposed Alternative.
- US 30 at New England Motor Freight – The existing signal is a flashing signal/beacon to provide access to NEMF. This intersection does not satisfy criteria for Warrant 1 (Eight-Hour Vehicular Volume), Warrant 2 (Four-Hour Vehicular Volume), Warrant 3 (Peak Hour), or Warrant 4 (Pedestrian Volume). Therefore, a signal is not warranted at this intersection, and the Preliminary Proposed Alternative includes removal of the existing signal and rerouting of some of the movements in order to provide safe access.

- US 30 at Ardara Road - This is an existing stop-controlled intersection, and it satisfies conditions for Warrant 1 (Eight-Hour Vehicular Volume), Warrant 2 (Four-Hour Vehicular Volume), and Warrant 3 (Peak Hour). A new traffic signal is warranted and is included as part of the Preliminary Proposed Alternative.

## Bicycle and Pedestrian Checklists

In addition to the above traffic details, the US 30 corridor was also evaluated to assess general bicycle/pedestrian needs per PennDOT Publication DM-1X, as well as intersection-specific needs via PennDOT Form TE-672 ([Appendix C](#)). Insights from these checklists were used to support development of the Preliminary Proposed Alternative conditions, and details have been included in the appendices of this report for ongoing reference.

## Traffic Model Development

As stated in the [Traffic Report for Base and No-Build Conditions](#), the study area was modeled and analyzed using Synchro and VISSIM software to replicate current conditions, and Future Year 2045 volumes were generated using VISUM travel demand modeling software. Similar analysis was conducted to model various future-year build conditions as part of the alternatives analysis. Networks were developed to model the different alternatives using Synchro and VISSIM. Traffic volumes primarily matched the no-build 2045 volumes from the [Traffic Report for Base and No-Build Conditions](#), and slight adjustments to the volumes at the intersection level were incorporated from either the supplemental counts or for new movements that were allowed or restricted under existing conditions. Refer to the [Traffic Report for Base and No-Build Conditions](#) for additional detail about the project's traffic model development using Synchro, VISSIM, and VISUM software.

## Preliminary Alternatives Analysis

### Preliminary Alternatives Development

The preliminary alternatives developed as improvements across nine sub-areas based on corridor and intersection-specific needs. The sub-areas consist of:

1. **Irwin Area** – from approximately 10<sup>th</sup> Street to Main Street
2. **Norwin High School Area** – from approximately Billot Avenue to Buttermilk Hollow Road
3. **Robbins Station Area** – from approximately Hams Way to west of Robbins Station Road
4. **Lincoln Way Area** – from approximately west of Robbins Station Road to Malts Lane
5. **Skellytown Road Area** – from approximately Malts Lane to east of Colonial Manor Road
6. **Colonial Manor Rd Area** – Colonial Manor Road intersection area
7. **Carpenter Lane/Leger Rd Area** – from approximately Crown Road to Lamont Drive
8. **Ardara Road Area** – from approximately Lamont Drive to Allegheny/Westmoreland County Line
9. **North Versailles Area** – from approximately Allegheny/Westmoreland County Line to west of Route 48

[Volume 1: Master Planning Summary](#) documents the progression of the alternatives' conceptual development; this report, Volume 2, focuses on traffic operations details and analyses.

## Preliminary Alternatives Traffic Operations

The following sections provide an overview of current and future operational concerns within each sub-area at key intersections, as well as analyses of the preliminary alternatives developed to minimize and/or eliminate these concerns. LOS comparisons are summarized for these alternatives under future year 2045 conditions for the intersections considered at each sub-area ([Exhibit 3](#) through [Exhibit 9](#)). The LOS analysis was conducted using results primarily from Synchro (see [Appendix E](#)), as well as from VISSIM models (see [Appendix F](#)). For more information on base traffic conditions at the intersection level, refer to the [Traffic Report for Base and No-Build Conditions](#).

### Irwin Area (IA) Series

The Irwin Area extends from Main Street to 10<sup>th</sup> Street intersections. The signalized intersection of US 30 and 10<sup>th</sup> Street currently operates acceptably (LOS D or better) for all three peaks and will continue to operate acceptably during all peaks under future year 2045 conditions. The three preliminary alternatives are each anticipated to maintain acceptable levels of service (LOS D or better) for all signalized intersections in the area ([Exhibit 3](#)). The preliminary alternatives and their expected future year traffic operations are summarized as follows:

- **IA-1:** The first alternative includes improvements to the existing 10<sup>th</sup> Street intersection by adding a southbound left-turn lane and adding protected only left turn phasing. Under future year conditions, this intersection continues to operate acceptably (LOS D or better) during all peaks.
- **IA-2A and IA-2B:** The second and third alternatives propose a new Irwin Road connection from US 30 to Main Street to improve access to the Irwin Business District and surrounding residential communities north and south of US 30. These alternatives both propose creating a fourth leg at the signalized Main Street/Pennsylvania Avenue intersection, but they offer different alignments to connect Main Street and US 30, with IA-2A creating a “T” signalized intersection at US 30 and IA-2B tying into the existing intersection at Oakmont Street and signalizing the intersection. For both alternatives, all three signalized intersections are expected to operate acceptably with LOS C or better under future year 2045 conditions.

**Exhibit 3: Irwin Area (IA) Series Future Year 2045 LOS Summary**

Alternative Level of Service				
ID	Alternative / Intersection	AM 2045	PM 2045	SAT 2045
NB	Future No-Build			
	US 30 and 10th St / Fairwood Dr	B	C	C
IA -1	Existing 10 <sup>th</sup> St Upgrades			
	US 30 and 10th St / Fairwood Dr	C	C	C
IA-2A	New Main St Connection (Alignment A)			
	US 30 and 10th St / Fairwood Dr	B	B	A
	US 30 and Irwin Rd	A	B	B
	Irwin Rd/Main St and Pennsylvania Ave	B	C	B
IA-2B	New Main St Connection (Alignment B)			
	US 30 and 10th St / Fairwood Dr	B	B	A
	US 30 and Irwin Rd/Oakmont St	B	B	B
	Irwin Rd/Main St and Pennsylvania Ave	B	C	B

### *Norwin High School (HS) Area Series*

The Norwin High School Area extends from Buttermilk Hollow Road to Billot Avenue intersections. Existing concerns at these intersections include the following:

- The flashing signal at US 30 and Buttermilk Hollow Road is one of two main access points to/from the Norwin School District Campus; however, it has limited accessibility with right-in/right-out side streets and prohibited mainline US 30 left turns.
- The unsignalized intersection of US 30 and Billot Avenue with offset side-street geometry was a location in which deficiencies were identified from local stakeholders/public input. This intersection is one of two main access points to/from the Norwin School District Campus as well as the main access to/from the bus depot. However, it has skewed geometry with a right-in/right-out southbound approach, no existing left-turn lanes, and insufficient gaps in traffic for turning vehicles. The intersection is also warranted for signalization.

These intersections are located within a low-volume area, so traffic counts were still being conducted during the initial traffic alternatives analysis. Future year Levels of Service were not analyzed for the preliminary or detailed alternatives of this area. These measures were later incorporated into the Preliminary Proposed Alternative analysis.

### *Robbins Station (RS) Area Series*

The Robbins Station Area extends from approximately west of Robbins Station Road to Hams Way. Base Year and Future Year analyses identified the following traffic operations conditions:

- **US 30 at Robbins Station Road/Center Highway:** The signalized intersection operates acceptably with LOS D or better during the AM and Saturday peaks but unacceptably (LOS E) during the PM peak. Specifically, the eastbound and northbound approaches have unacceptable delays (LOS E or F) during the PM peak, which will only worsen under future year 2045 conditions. This intersection is expected to deteriorate to unacceptable LOS E or F for all peaks in the future with multiple movements/approaches having excessive delay and queuing.
- **Center Highway at Brownstown Road:** At the signalized intersection just north of US 30, all three peaks operate acceptably (LOS D or better) under existing conditions and are expected to continue doing so under future conditions.

Due to operational and safety concerns of the skewed geometry and oversaturated conditions, the preliminary improvements offer a complete re-design of the entire intersection at US 30 and Robbins Station Road/Center Highway. The Robbins Station Series preliminary alternatives were modeled using VISSIM due to the complexity of the continuous flow intersection (CFI) / displaced left-turn intersections: RS-3A and RS-3B. The intersection LOS results illustrate that all four preliminary alternatives improve operations for future year 2045 conditions ([Exhibit 4](#)). Each preliminary alternative's future year traffic operations are summarized below:

- **RS-1:** The first alternative consists of traditional widening of the existing intersection at Robbins Station Road to accommodate additional left-turn lanes in the eastbound, westbound, and northbound directions. Under future year 2045 conditions, the widened Robbins Station Road intersection at US 30 is expected to operate acceptably with LOS D or better during the AM and Saturday peaks. The intersection will still operate unacceptably during the PM peak at LOS E.
- **RS-2:** The second alternative converts the at-grade intersection at Robbins Station Road / Center Highway and US 30 to a grade-separated interchange with Robbins Station Road elevated over US 30. This alternative removes the Robbins Station Road intersection along US 30 and creates new signalized intersections to tie US 30 to Robbins Station Road and Center Highway. On the southern side of US 30, a new signalized intersection will be constructed at Robbins Station Road at Parkway Drive, and on the northern side, US 30 traffic will be tied into the Center Highway at Brownstown Road signalized intersection.

All intersections of interest are expected to operate acceptably (LOS D or better) under future year 2045 conditions for this alternative.

- **RS-3A and RS-3B:** The remaining two preliminary alternatives consist of continuous flow intersections (CFI) / displaced left-turn intersections at Robbins Station Road / Center Highway and US 30, with differences in turn-lane configurations between the two alternatives. Both alternatives provide positive operational benefits, with LOS D or better expected at all intersections.

**Exhibit 4: Robbins Station (RS) Series Future Year 2045 LOS Summary**

Alternative Level of Service				
ID	Alternative / Intersection	AM 2045	PM 2045	SAT 2045
NB	Future No-Build			
	US 30 and Robbins Station Rd / Center Hwy	E	F	E
	Center Hwy and Brownstown Rd	A	B	B
RS-1	At-Grade Intersection Widening			
	US 30 and Robbins Station Rd / Center Hwy	C	E	C
	Center Hwy and Brownstown Rd	A	B	A
RS-2	Robbins Station Bridge (with Taylor Dr Indirect Access)			
	US 30 and Robbins Station Rd / Center Hwy	A	A	A
	Robbins Station Rd and Parkway Dr	A	A	A
	Center Hwy and Brownstown Rd	B	B	B
RS-3A	Continuous Flow Intersection (CFI) with Displaced EB/WB Left-Turns and NB/SB Right-Turns			
	US 30 and Robbins Station Rd / Center Hwy	C	C	C
	Center Hwy and Brownstown Rd	A	B	A
RS-3B	Continuous Flow Intersection (CFI) with Displaced EB/WB Left-Turns			
	US 30 and Robbins Station Rd / Center Hwy	C	C	C
	Center Hwy and Brownstown Rd	A	B	A

### Lincoln Way (LW) Area Series

The Lincoln Way Area extends from approximately Malts Lane to west of Robbins Station Road. The US 30 and Lincoln Way intersection operates acceptably with LOS D or better for all three peaks under existing conditions; however, the northbound approach operationally fails during the PM peak with over 1,000 feet of queuing. This intersection is still expected to operate acceptably for the AM and Saturday peaks under future year 2045 conditions but deteriorate to LOS F during the PM peak. VISSIM analysis indicates that both the eastbound and northbound approaches will operationally fail with queue spillback into adjacent intersections: US 30 at Malts Lane and Lincoln Way at Bethel Road/Maus Drive.

Both preliminary alternatives for this area propose at-grade intersection widening; however, the second (LW-2) includes a Clay Pike shift away from the intersection while the first (LW-1) does not. The similarity of the two alternatives prompted the use of a single Synchro scenario to model both alternatives, with comparable LOS results for LW-1 and LW-2 under future year 2045 conditions ([Exhibit 5](#)). The two alternatives are expected to operate acceptably (LOS D or better) at all three intersections for all three peaks.

**Exhibit 5: Lincoln Way (LW) Series Future Year 2045 LOS Summary**

Alternative Level of Service				
ID	Alternative / Intersection	AM 2045	PM 2045	SAT 2045
NB	Future No-Build			
	US 30 and Lincoln Way	B	F	D
	US 30 and Malts Ln	C	C	B
LW-1	At-Grade Intersection Widening			
	US 30 and Lincoln Way	B	D	B
	US 30 and Malts Ln	B	C	B
LW-2	At-Grade Intersection Widening with Clay Pike Shift			
	US 30 and Lincoln Way	B	D	B
	US 30 and Malts Ln	B	C	B

### Skellytown Road (SK) Area Series

The Skellytown Road Area extends west of Colonial Manor Road to Malts Lane. The signalized intersection of US 30 and Malts Lane operates acceptably (LOS D or better) for all three peaks under existing conditions and will continue to operate acceptably during all three peaks under future year 2045 conditions. However, VISSIM analysis indicates that the Malts Lane intersection will experience delay and queuing back approximately one-half mile due to expected eastbound queue spillback from downstream signals, causing operations to deteriorate during the PM peak.

Under future conditions, all three preliminary alternatives will improve operations at Malts Lane and maintain acceptable operations at proposed signalized intersections adjacent to Malts Lane ([Exhibit 6](#)). For each alternative, the US 30 intersection at Malts Lane is expected to operate acceptably with LOS D or better for all three peaks under future year 2045 conditions. For each preliminary alternative, additional improvements and their anticipated traffic operations are summarized below:

- **SK-1:** The first alternative creates a new signalized intersection at Skellytown Road, which is expected to operate acceptably at LOS D or better for all peaks.
- **SK-2:** The second alternative creates a new signalized intersection at US 30 and Bethel Road/Hamilton Road, which will also operate acceptably (LOS D or better) for all peaks. For the initial traffic alternative analysis, northbound left traffic from Malts Lane was not shifted to Bethel Rd.
- **SK-3:** The third alternative creates a westbound jughandle and signalized intersection at Hamilton Road, and this new signalized intersection is expected to operate acceptably at LOS D or better for all peaks. For the initial traffic alternative analysis, northbound left traffic from Malts Lane was not shifted to Bethel Rd.

**Exhibit 6: Skellytown Road (SK) Series Future Year 2045 LOS Summary**

Alternative Level of Service				
ID	Alternative / Intersection	AM 2045	PM 2045	SAT 2045
NB	Future No-Build			
	US 30 and Malts Ln	C	C	B
SK-1	Rear Marginal Road A with Skellytown Signal			
	US 30 and Malts Ln	C	C	C
	US 30 and Skellytown Rd	B	B	A
SK-2	Rear Marginal Road B with Bethel/Finchley Realignment and Signal			
	US 30 and Malts Ln	C	C	C
	US 30 and Hamilton Rd	A	B	B
	US 30 and Bethel Rd	A	C	B
SK-3	Jughandle with Bethel/Finchley Realignment & Signal			
	US 30 and Malts Ln	C	C	C
	US 30 and Hamilton Rd / Bethel Rd	B	C	B

### Colonial Manor Road (CM) Area Series

The Colonial Manor Road Area includes just the area around the intersection. The signalized intersection of US 30 and Colonial Manor Road currently operates at an acceptable LOS D or better and will continue to do so in the future. Overall intersection Levels of Service under future year 2045 conditions are listed for the Colonial Manor Road no-build and preliminary alternative scenarios ([Exhibit 7](#)). The preliminary alternatives and their results are summarized as follows:

- **CM-1:** The first preliminary alternative proposes realigning the signalized Colonial Manor Road intersection to the west and restricting local access of the nearby properties to right-in and right-out only. These properties would have a connection to the realigned Colonial Manor Road. This alternative will maintain acceptable operations (LOS D or better) at Colonial Manor Road.
- **CM-2:** The second alternative consists of realigning Colonial Manor Road and adding eastbound and westbound jughandles at the intersection, paired with an additional eastbound jughandle at Skellytown Road. This alternative will maintain acceptable operations (LOS D or better) at Colonial Manor Road and Skellytown Road for all three peaks in the future.

**Exhibit 7: Colonial Manor Road (CM) Series Future Year 2045 LOS Summary**

Alternative Level of Service				
ID	Alternative / Intersection	AM 2045	PM 2045	SAT 2045
NB	Future No-Build			
	US 30 and Colonial Manor Rd	D	D	C
CM-1	Colonial Manor Realignment with Right-in / Right-Out at Existing			
	US 30 and Colonial Manor Rd	B	B	B
CM-2	Colonial Manor Realignment with EB / WB Jughandles & Skellytown EB Jughandle			
	US 30 and Colonial Manor Rd	B	B	A
	US 30 and Skellytown Rd	A	A	A

### Carpenter Lane/Leger Road (CL) Area Series

The Carpenter Lane/Leger Road Area extends from Lamont Drive to Crown Road. The signalized intersection of US 30 and Carpenter Lane/Leger Road operates acceptably (LOS D or better) for all three peaks under existing conditions and is expected to continue operating acceptably during the all peaks under future year 2045 conditions.

All three alternatives for the Carpenter Lane/Leger Road Area are anticipated to provide positive operational benefits. Each alternative includes realigning the intersection to eliminate the skewed geometry and split signal phasing of the Leger Road southbound approach that impedes sight distance and left-turning ability, with the following variations:

- **CL-1A:** The first alternative (CL-1A) realigns the intersection to the east of the existing location.
- **CL-1B:** The second alternative (CL-1B) similarly removes the skewed Leger Road but adds a westbound jughandle to remove left-turning traffic from lanes accommodating through traffic along US 30.
- **CL-2A:** The third alternative (CL-2A) retains the signalized intersection's existing location, while realigning Leger Road to remove the severe skew.

All three alternatives will improve operations at the Carpenter Lane/Leger Road intersection at US 30, with LOS D or better for all three peaks ([Exhibit 8](#)).

**Exhibit 8: Carpenter Lane/Leger Road (CL) Series Future Year 2045 LOS Summary**

Alternative Level of Service				
ID	Alternative / Intersection	AM 2045	PM 2045	SAT 2045
NB	Future No-Build			
	US 30 and Carpenter Lane / Leger Rd	D	D	C
CL-1A	Carpenter / Leger Realignment East			
	US 30 and Carpenter Lane / Leger Rd	C	D	C
CL-1B	Carpenter / Leger Realignment East with WB Jughandle			
	US 30 and Carpenter Lane / Leger Rd	D	C	C
CL-2A	Leger Realignment West			
	US 30 and Carpenter Lane / Leger Rd	C	D	C

### Ardara Road (AR) Area Series

The Ardara Road Area extends from the Allegheny/Westmoreland County Line to Lamont Drive. The signalized intersection of US 30 and Old Jacks Run Road currently operates at an acceptable LOS D or better, which is expected to continue under future no-build conditions. The improvement alternatives are summarized as follows:

- **AR-1:** The first alternative realigns Ardara Road to form a signalized “plus” intersection with Idaho Lane.
- **AR-2:** The second alternative similarly realigns Ardara Road to form a new intersection at Idaho Lane, but this alternative also includes a westbound jughandle at Ardara Rd that removes left-turning traffic from through lanes on US 30. This second alternative also pairs with an eastbound jughandle at Old Jacks Run Road.
- **AR-3:** The third alternative proposes a new local roadway that would connect neighborhoods located south of US 30, reducing traffic along US 30.

Low volumes were observed at the intersections located in this area, and traffic counts were still being conducted during the initial traffic alternatives analysis. As a result, future year Levels of Service were not analyzed for this area’s preliminary or detailed alternatives. These measures were later included in the Preliminary Proposed Alternative analysis.

### *North Versailles (NV) Area Series*

The North Versailles Area extends from the Allegheny/Westmoreland County Line to just west of the US 30 and SR 48 intersection. Currently, the signalized intersection of US 30 and SR 48 (Mossie Boulevard) is overcapacity and operates at an unacceptable level of service (LOS E or F) during all AM, PM and Saturday peaks. By future year 2045, all peaks will deteriorate to a failing LOS F for the overall intersection operations as well as at least two individual approaches. The PM peak is expected to have failing operations, excessive delays and queuing at all approaches.

An overall intersection LOS summary was compiled for the North Versailles Area's future year no-build and preliminary alternatives ([Exhibit 9](#)). Each preliminary alternative's LOS results are summarized below:

- **NV-1:** The first alternative includes widening the existing intersection at SR 48 to provide additional left-turn lanes at the eastbound, southbound, and northbound approaches. Although this alternative addresses existing congestion and queuing, the intersection will still operate unacceptably at LOS E for the AM and PM peaks for future conditions. The Saturday peak will operate acceptably at LOS D.
- **NV-2:** The second alternative constructs a new northeast connector road to divert certain turning movements from the US 30/SR 48 intersection. New signalized intersections will be located adjacent to the US 30/SR 48 intersection to the north and east. All intersections are expected to operate acceptably at LOS D or better under future year 2045 conditions.
- **NV-3:** The third alternative also includes the new northeast connection, but diverts additional turning movements. All intersections are expected to operate acceptably at LOS D or better for all peaks.
- **NV-4:** The fourth alternative widens the existing intersection at SR 48 to accommodate additional turn lanes. This intersection will operate unacceptably with LOS E during the AM and PM peaks under future conditions, and the Saturday peak will operate acceptably at LOS D.

**Exhibit 9: North Versailles (NV) Series Future Year 2045 LOS Summary**

Alternative Level of Service				
ID	Alternative / Intersection	AM 2045	PM 2045	SAT 2045
NB	Future No-Build			
	US 30 and PA 48	F	F	F
NV-1	At-Grade Intersection Widening			
	US 30 and PA 48	E	E	D
	Mosside Blvd (PA 48) and Aldi Dr	B	C	B
NV-2	SR-48 NE Connector with EB Dual Left-Turns			
	US 30 and PA 48	C	D	C
	Mosside Blvd (PA 48) and Aldi Dr	C	D	D
	US 30 and PA 48 Extension	A	A	B
NV-3	SR 48 NE Connector with Diverted EB/WB Left-Turns			
	US 30 and PA 48	B	C	B
	Mosside Blvd (PA 48) and Aldi Dr	C	D	D
	US 30 and PA 48 Extension	C	B	B
NV-4	At-Grade Intersection Widening			
	US 30 and PA 48	E	E	D
	Mosside Blvd (PA 48) and Aldi Dr	B	B	C

## Detailed Alternatives Analysis

After assessing potential improvements for each of the nine sub-areas, the preliminary alternatives were reorganized to create three distinct overall alternatives. The resulting detailed alternatives consist of a segment-level improvement assumed along the entire corridor, with different combinations of intersection-level improvements that address operational and safety concerns within each of the nine sub-areas. Along the corridor, Alternative 1 consists of a four-lane roadway with barrier providing general access control. Alternatives 2 and 3 consist of a five-lane option with a two-way left-turn lane (TWLTL) or left-turn pockets. These three detailed alternatives were used to compare overall operational, safety, and monetary costs and benefits. Additional information about the Detailed Alternatives such as corridor-wide assumptions and intersection-specific combinations are documented separately as part of [Volume 1: Master Planning Summary](#).

## Detailed Alternatives Traffic Operations

Based on the LOS results assembled under the Preliminary Alternatives analysis in previous sections of this report, an overall intersection LOS summary was compiled for the three Detailed Alternatives ([Exhibit 10](#)). Summary findings include the following:

- Overall intersection LOS results are comparable across all three alternatives, with 16 or 17 out of the 18 intersections operating acceptably at LOS D or better during all three peaks.
- By 2045, the North Versailles intersection at US 30 and PA 48 is projected to experience deficiencies (LOS E) during the AM and PM peaks for all three alternatives.
- For Alternative 3, the intersection of US 30 at Robbins Station Rd/Center Hwy is projected to fail at LOS E during the PM peak by year 2045. In contrast, Alternative 1 provides major operational improvements at this intersection by eliminating the at-grade intersection in favor of a grade-separated interchange.

**Exhibit 10: Overall Intersection LOS Summary for Detailed Alternatives**

Area / Intersection	Overall Intersection LOS (AM / PM / SAT)								
	Alternative 1 <sup>(1)</sup>			Alternative 2 <sup>(1)</sup>			Alternative 3 <sup>(1)</sup>		
<b>Irwin Area (IA-Series)</b>	<b>IA-2B</b>			<b>IA-2A</b>			<b>IA-1</b>		
US 30 and 10th St / Fairwood Dr	B	B	A	B	B	A	C	C	C
US 30 and Irwin Rd <sup>(2)</sup>	B	B	B	A	B	B	(2)		
Irwin Rd <sup>(2)</sup> /Main St and Pennsylvania Ave	B	C	B	B	C	B	(2)		
<b>Robbins Station Rd (RS-Series)</b>	<b>RS-2</b>			<b>RS-3B</b>			<b>RS-1</b>		
US 30 and Robbins Station Rd / Center Hwy	A	A	A	C	C	C	C	E	C
Robbins Station Rd and Clay Pike	C	C	C	C	C	C	B	C	B
Robbins Station Rd and Parkway Dr	A	A	A	(3)			(3)		
Center Hwy and Brownstown Rd	B	B	B	A	B	A	A	B	A
<b>Lincoln Way (LW-Series)</b>	<b>LW-1</b>			<b>LW-2</b>			<b>LW-1</b>		
US 30 and Lincoln Way	B	D	B	B	D	B	B	D	B
US 30 and Malts Ln	B	C	B	B	C	B	B	C	B
Lincoln Way and Bethel Rd / Maus Dr	C	C	C	C	C	C	C	C	C
<b>Skellytown Rd Area (SK-Series)</b>	<b>SK-3</b>			<b>SK-1</b>			<b>SK-2</b>		
US 30 and Skellytown Rd	(3)			B	B	A	(3)		
US 30 and Malts Ln	C	C	C	C	C	C	C	C	C
US 30 and Hamilton Rd	B	C	B	(3)			A	B	B
US 30 and Bethel Rd	(3)			(3)			A	C	B
<b>Colonial Manor Rd (CM-Series)</b>	<b>CM-2</b>			<b>CM-1</b>			<b>CM-1</b>		
US 30 and Colonial Manor Rd	B	B	A	B	B	B	B	B	B
<b>Carpenter Ln and Leger Rd (CL-Series)</b>	<b>CL-1B</b>			<b>CL-1A</b>			<b>CL-2A</b>		
US 30 and Carpenter Lane / Leger Rd	D	C	C	C	D	C	C	D	C
<b>North Versailles (NV-Series)</b>	<b>NV-4</b>			<b>NV-4</b>			<b>NV-4</b>		
US 30 and PA 48	E	E	D	E	E	D	E	E	D
Mosside Blvd (PA 48) and Aldi Dr	B	B	C	B	B	C	B	B	C

**Table Notes:**

- <sup>(1)</sup> Description IDs can be cross-referenced with descriptions in [Exhibit 3 through Exhibit 9](#) and [Vol. 1: Master Planning Summary, Exhibit 14](#).
- <sup>(2)</sup> Irwin Road refers to a new connector road from US 30 at Oakmont St to Pennsylvania Ave at Main St. This road creates new signalized intersection for Alternatives 1 and 2 that were not included under Alternative 3.
- <sup>(3)</sup> These intersections were not evaluated under the listed alternatives because they were not upgraded as signalized intersections or were only adjusted due to the median barrier or TWLTL.

## Detailed Alternatives Estimated Monetary Benefits

In addition to generating the LOS results discussed in the preliminary alternatives analysis, Synchro was used to determine other measures of effectiveness (MOE) for each future year 2045 alternative ([Appendix E](#)). These additional measures of effectiveness included total hours of delay; number of vehicle stops; fuel consumed; and emissions of carbon monoxide (CO), nitrogen oxides (NOx), and volatile organic compounds (VOC).

To create a quantifiable reduction for each measure, each alternative's MOE totals were subtracted from the 2045 no-build scenario totals ([Appendix D](#)). A 2017 unit cost in dollars was applied to the anticipated reductions to link the benefits to a monetary value. A yearly 7-percent discount rate recommended by the US Department of Transportation was applied to bring the future yearly expected benefits to a 2017 monetary value. These benefits are summarized for each alternative from opening year to design year 2045 ([Exhibit 11](#) through [Exhibit 13](#)). The description IDs can be cross-referenced to the descriptions in [Exhibit 10](#). For additional information on benefit cost analyses, refer to [Volume 4: Benefit-Cost Details](#).

### Summary Insights

Based on the benefits compiled for operations, stops, fuel, and emissions, Alternative 1 provides the greatest monetary savings for the overall US 30 corridor with a total discounted net benefit of over \$80 million. Alternative 1 also produces the highest reduction in delay hours for the overall corridor at 16.7 million hours of delay reduced, thereby providing the greatest traffic control delay improvement of the three detailed alternatives.

**Exhibit 11: Alternative 1 Benefits (Opening Year to Design Year)**

Description ID	Total Reduction of Delay Hours	Total Reduction of Vehicle Stops	Total Fuel Use Reduction, gal	Total Emissions Reduction, kg	Net Cost Benefit, 2017 \$	Discounted Net Benefit, 2017 \$
IA-2B	-59,980	-46,033,932	-2,705,316	-267,580	-\$8,917,253	-\$2,710,354
HS-1A	-	-	-	-	-	-
HS-5	-	-	-	-	-	-
RS-2	8,731,805	200,874,179	7,901,571	794,466	\$142,510,178	\$43,315,254
LW-1	2,213,687	14,413,227	2,713,604	273,406	\$37,581,852	\$11,422,815
SK-3	-1,234,676	-127,443,179	-2,271,771	-215,272	-\$24,681,296	-\$8,646,920
CM-2	1,337,504	-83,946,811	2,191,284	218,407	\$22,930,872	\$8,033,671
CL-1B	558,771	-9,168,412	-3,423,427	-342,677	-\$2,036,225	-\$713,377
CL-3A	-	-	-	-	-	-
AR-2	-	-	-	-	-	-
NV-4	5,170,409	23,271,384	5,625,075	562,450	\$85,653,482	\$30,008,100
<b>Total</b>	<b>16,717,520</b>	<b>-28,033,545</b>	<b>10,031,021</b>	<b>1,023,199</b>	<b>\$253,041,610</b>	<b>\$80,709,189</b>

Table Note: A negative value indicates a degradation of benefits

**Exhibit 12: Alternative 2 Benefits (Opening Year to Design Year)**

Description ID	Total Reduction of Delay Hours	Total Reduction of Vehicle Stops	Total Fuel Use Reduction, gal	Total Emissions Reduction, kg	Net Cost Benefit, 2017 \$	Discounted Net Benefit, 2017 \$
IA-2A	161,874	-14,818,424	-3,185,715	-318,022	-\$6,817,552	-\$2,072,161
HS-1B	-	-	-	-	-	-
HS-3	-	-	-	-	-	-
RS-3B	7,129,339	-54,740,693	4,076,427	444,643	\$106,812,158	\$32,465,019
LW-2	2,213,687	14,413,227	2,713,604	273,406	\$37,581,852	\$11,422,815
SK-1	-466,946	-99,475,931	-1,619,240	-155,121	-\$12,154,715	-\$4,258,320
CM-1	1,491,386	13,609,572	1,270,239	127,937	\$23,829,728	\$8,348,579
CL-1A	683,149	13,680,637	-4,263,012	-422,798	-\$2,348,109	-\$822,644
CL-3B	-	-	-	-	-	-
AR-1	-	-	-	-	-	-
AR-3	-	-	-	-	-	-
NV-4	5,170,409	23,271,384	5,625,075	562,450	\$85,653,482	\$30,008,100
<b>Total</b>	<b>16,382,899</b>	<b>-104,060,228</b>	<b>4,617,378</b>	<b>512,493</b>	<b>\$232,556,844</b>	<b>\$75,091,391</b>

Table Note: A negative value indicates a degradation of benefits

**Exhibit 13: Alternative 3 Benefits (Opening Year to Design Year)**

Description ID	Total Reduction of Delay Hours	Total Reduction of Vehicle Stops	Total Fuel Use Reduction, gal	Total Emissions Reduction, kg	Net Cost Benefit, 2017 \$	Discounted Net Benefit, 2017 \$
IA-1	-443,146	-20,127,785	-8,253,250	-820,382	-\$29,041,884	-\$8,827,135
HS-2	-	-	-	-	-	-
HS-4	-	-	-	-	-	-
RS-1	5,893,450	-664,197	4,588,981	456,452	\$92,214,638	\$28,028,177
LW-1	2,213,687	14,413,227	2,713,604	273,406	\$37,581,852	\$11,422,815
SK-2	-1,430,980	-145,742,121	-3,276,951	-314,131	-\$30,385,354	-\$10,645,297
CM-1	1,491,386	13,609,572	1,270,239	127,937	\$23,829,728	\$8,348,579
CL-2A	683,149	13,680,637	-4,263,012	-422,798	-\$2,348,109	-\$822,644
CL-3B	-	-	-	-	-	-
AR-1	-	-	-	-	-	-
AR-3	-	-	-	-	-	-
NV-4	5,170,409	23,271,384	5,625,075	562,450	\$85,653,482	\$30,008,100
<b>Total</b>	<b>13,577,956</b>	<b>-101,559,284</b>	<b>-1,595,313</b>	<b>-137,068</b>	<b>\$177,504,353</b>	<b>\$57,512,596</b>

Table Note: A negative value indicates a degradation of benefits

## Preliminary Proposed Alternative Analysis

### Preliminary Proposed Alternative Development

The preliminary alternatives were not only evaluated from an operations perspective but also from safety, infrastructure, right-of-way, and construction cost perspectives. After compiling these parameters, components of each alternative were combined to create the Preliminary Proposed Alternative, which is described in [Volume 1](#) of the Alternatives Analysis Report. Refinements were made so that the individual components successfully worked as an overall system for the entire US 30 corridor.

### Preliminary Proposed Alternative Traffic Operations

VISSIM software was used to evaluate traffic operations for the Preliminary Proposed Alternative to account for some of Synchro's limitations ([Appendix H](#)). VISSIM is a microscopic modeling tool that is equipped to measure corridor operations and explicitly measures the impacts of adjacent traffic control devices, such as signal coordination and queue spillback, from a systems perspective while Synchro only implicitly accounts for adjacent devices and operations. The VISSIM model for the Preliminary Proposed Alternative was assumed to be unrestrained at three intersections: US 30 at SR 48, Robbins Station Road at Clay Pike, and Lincoln Way at Bethel Road / Maus Drive.

Because US 30 at SR 48 requires additional coordination with PennDOT District 11 to develop and select a proposed alternative, the VISSIM model assumed capacity upgrades to this intersection to ensure the remainder of US 30 received the correct traffic demand. For the same reasoning, Robbins Station Road at Clay Pike and Lincoln Way at Bethel Road / Maus Drive were also improved with additional lanes in the VISSIM model. These improvements would require additional right-of-way takes not in the vicinity of US 30. As of now these improvements are not part of the Preliminary Proposed Alternative or cost estimate. Without improvement, these two intersections could create bottlenecks adjacent to the US 30 corridor and have poor LOS. It is recommended that these two intersections be further investigated to determine a need for capacity improvements.

VISSIM overall intersection LOS for the Preliminary Proposed Alternative is listed alongside Future No-Build LOS for comparison purposes ([Exhibit 14](#)). Travel times were tabulated to determine the impacts of future travel demand along US 30 when compared to Future No-Build conditions ([Exhibit 15](#)). Note that the Preliminary Proposed Alternative proposes new signals at the following intersections, which were not evaluated during the No-Build analysis:

- US 30 and Irwin Rd / Oakmont St
- US 30 and Billot Ave
- US 30 and Buttermilk Hollow Rd
- Robbins Station Rd and Parkway Dr
- US 30 and Bethel Rd / Hamilton Rd
- US 30 and Ar dara Rd

**Exhibit 14: Future Year 2045 Intersection Levels-of-Service, No-Build vs. Preliminary Proposed Alternative**

#	Intersection	No-Build LOS, Year 2045			Preliminary Proposed Alternative LOS, Year 2045		
		AM	PM	SAT	AM	PM	SAT
1	US 30 and 10 <sup>th</sup> St / Fairwood Dr	B	B	B	A	B	A
2	US 30 and Irwin Rd / Oakmont St	-	-	-	A	B	B
3	Pennsylvania Ave and Main St / Irwin Rd	-	-	-	B	B	B
4	US 30 and Billot Ave	-	-	-	A	A	A
5	US 30 and Buttermilk Hollow Rd	-	-	-	B	B	A
6	Center Hwy and Brownstown Rd	A	B	B	B	C	C
7	US 30 and Robbins Station Rd / Center Hwy	E	F	E	A	A	A
8	Robbins Station Rd and Parkway Dr	-	-	-	A	A	A
9	Robbins Station Rd and Clay Pike*	C	F	B	C	C	C
10	US 30 and Lincoln Way	B	E	C	B	C	B
11	Lincoln Way and Bethel Rd / Maus Dr*	D	F	C	C	C	B
12	US 30 and Malts Ln	B	E	B	A	A	A
13	US 30 and Bethel Rd	-	-	-	A	A	A
14	US 30 and Colonial Manor Rd	B	C	B	B	B	A
15	US 30 and Carpenter Ln / Leger Rd	C	F	C	C	C	B
16	US 30 and Old Jacks Run Rd	A	A	A	A	A	A
17	US 30 and Ardara Rd	-	-	-	B	B	B

\*Assumed capacity improvements to provide unrestrained conditions for US 30.

### Summary Insights

The Preliminary Proposed Alternative traffic operations analyses and findings are summarized as follows:

- The Preliminary Proposed Alternative improves operations so that all signalized intersections operate acceptably at LOS D or better. This includes improvements at six intersections that would otherwise operate unacceptably (LOS E or F) for at least one peak under No-Build conditions, particularly during the PM peak.
- The existing signalized intersection of US 30 at Robbins Station Road / Center Highway is expected to operate unacceptably at LOS E or F for all three peak periods under No-Build conditions, but the Preliminary Proposed Alternative eliminates this operational deficiency by converting the at-grade intersection to a grade-separated interchange. There is minimal delay along US 30 mainline due to this conversion.
- The Preliminary Proposed Alternative improves future-year travel time compared to the No-Build conditions for all peaks in both the east and westbound directions. The eastbound PM travel time improves by 48%, effectively cutting travel times by almost half, while the remaining peak travel times improve between 6% to 24%.

**Exhibit 15: Future Year 2045 Peak Travel Time, No-Build vs. Preliminary Proposed Alternative**

US 30 Travel Time - Eastbound						
US 30 Segments	No-Build TT(s)			Preliminary Proposed Alternative TT(s)		
	AM	PM	SAT	AM	PM	SAT
PA 48	44.7	104.5	55.6	47.5	60.9	56.7
Old Jacks Run Road	91.6	93.8	88.6	78.3	83.1	79.3
Magnus Lane	19.5	24.1	17.9	19.3	19.7	19.3
Carpenter Lane	72.1	267.6	71.5	59.6	68.3	57.7
Colonial Manor Road	74.9	81.1	73.1	74.3	67.8	57.3
Freight Driveway	28.7	41.7	28.9	32.4	32.5	31.8
Malts Lane	54.5	169.7	55.3	50.1	53.7	52.2
Lincoln Way	31.8	127.2	35.4	25.8	59.7	35.8
Robbins Station Road	67.5	193.2	92.6	43.1	44.3	43.2
10th Street	147.1	154.8	152.3	148.7	167.1	160.1
<b>Total (s)*</b>	<b>587.7</b>	<b>1153.2</b>	<b>615.6</b>	<b>531.6</b>	<b>596.2</b>	<b>536.7</b>
<b>Total (min)*</b>	<b>9.8</b>	<b>19.2</b>	<b>10.3</b>	<b>8.9</b>	<b>9.9</b>	<b>8.9</b>

US 30 Travel Time - Westbound						
US 30 Segments	No-Build TT(s)			Preliminary Proposed Alternative TT(s)		
	AM	PM	SAT	AM	PM	SAT
10th Street	21.4	22.2	22.8	17.2	16.5	15.1
Robbins Station Road	223.3	360.2	210.0	169.7	193.1	165.3
Lincoln Way	37.8	42.9	44.0	31.8	39.7	36.6
Malts Lane	24.9	18.2	22.8	20.1	19.2	18.5
Freight Driveway	50.7	52.5	48.1	52.4	54.3	56.7
Colonial Manor Road	40.5	40.5	35.1	47.6	45.7	43.0
Carpenter Lane	87.7	78.2	75.7	110.0	80.1	71.7
Magnus Lane	48.3	48.1	47.7	49.0	48.6	48.6
Old Jacks Run Road	22.7	22.3	21.6	24.4	27.0	21.8
PA 48	296.8	179.8	148.1	158.4	141.0	116.3
<b>Total (s)*</b>	<b>557.4</b>	<b>685.0</b>	<b>527.8</b>	<b>522.2</b>	<b>524.2</b>	<b>477.3</b>
<b>Total (min)*</b>	<b>9.3</b>	<b>11.4</b>	<b>8.8</b>	<b>8.7</b>	<b>8.7</b>	<b>8.0</b>

\*Total travel times between 10<sup>th</sup> Street and Old Jacks Run Road

## Preliminary Proposed Alternative Estimated Monetary Benefits

Synchro models were used to determine measures of effectiveness for the Preliminary Proposed Alternative under 2045 conditions ([Appendix G](#)). To estimate monetary benefits for the Preliminary Proposed Alternative, the same methodology was used as described for the Detailed Alternatives analysis earlier in this report. The benefits summarized represent reductions from the 2045 No-Build conditions ([Exhibit 16](#)). The final discounted net benefits represent a 2017 dollar value for all benefits from opening to design year after applying unit costs and a 7-percent discount rate. It is important to note that [Exhibit 16](#) only lists the intersections included as part of the initial Synchro No-Build analyses to provide a consistent comparison between the No-Build and Preliminary Proposed Alternatives.

### Summary Insights

Based on the benefits compiled for operations, stops, fuel, and emissions, the Preliminary Proposed Alternative benefits are expected to provide a total discounted net benefit of \$74 million. The Preliminary Proposed Alternative reduces hours of delay along the corridor by 14.6 million hours while providing additional benefits by reducing the number of vehicle stops; gallons of fuel use; and emissions of carbon monoxide (CO), nitrogen oxides (NOx), and volatile organic compounds (VOC).

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**Exhibit 16: Preliminary Proposed Alternative Benefits (Opening Year to Design Year)**

Intersection	Total Reduction of Delay Hours	Total Reduction of Vehicle Stops	Total Fuel Use Reduction, gal	Total Emissions Reduction, kg	Net Cost Benefit, 2017 \$	Discounted Net Benefit, 2017 \$
US 30 & 10th St / Fairwood Dr	973,115	70,755,351	2,566,418	255,577	\$20,924,330	\$6,359,845
US 30 & Main St / Oakmont St	-1,114,196	-129,503,284	-4,724,760	-468,744	-\$29,368,621	-\$8,926,445
US 30 & Bilott Ave	6,668,022	-42,832,843	3,138,194	312,985	\$98,249,403	\$29,862,413
US 30 & Buttermilk Hollow Rd	-2,882,661	-187,368,678	-3,471,969	-344,992	-\$50,366,794	-\$15,308,734
US 30 & Mt View Pl	63,767	17,039,927	-1,651,661	-166,225	-\$3,530,038	-\$1,072,937
Center Hwy & Brownstown Rd	-591,803	-38,847,598	-1,009,557	-105,115	-\$11,170,650	-\$3,395,263
US 30 & Robbins Station Rd / Center Hwy	8,907,938	258,034,638	10,422,634	1,037,397	\$151,589,756	\$46,074,946
Robbins Station Rd & Parkway Dr	-304,809	-43,277,406	-1,371,120	-135,575	-\$8,329,140	-\$2,531,600
US 30 & Lincoln Way	1,813,187	13,615,960	1,374,890	139,340	\$28,411,728	\$8,635,602
US 30 & Malts Ln	564,921	52,020,081	797,163	79,694	\$10,345,035	\$3,624,311
US 30 & Hamilton Rd	-740,972	-87,538,113	-1,441,153	-190,024	-\$14,923,298	-\$5,228,274
US 30 & Skellytown Rd	320,399	29,623,561	902,544	92,378	\$7,116,038	\$2,493,054
US 30 & Colonial Manor Rd	603,037	-24,912,671	1,936,326	194,896	\$13,236,468	\$4,637,304
US 30 and Crown Rd	0	490,411	1,348,598	132,787	\$3,722,391	\$1,304,114
US 30 & Carpenter Ln / Leger Rd	1,020,489	37,071,607	2,701,412	270,729	\$21,603,897	\$7,568,775
US 30 & Old Jacks Run Rd	-245,160	-3,364,328	1,962,993	196,060	\$2,074,623	\$726,830
US 30 & Ardara Rd	-441,464	-91,371,362	1,565,531	156,501	-\$2,552,583	-\$894,280
<b>Total</b>	<b>14,613,809</b>	<b>-170,364,746</b>	<b>15,046,485</b>	<b>1,457,667</b>	<b>237,032,546</b>	<b>73,929,661</b>

Table Note: A negative value indicates a degradation of benefits

## Travel Time and Accessibility Evaluation

The project team received feedback from North Huntingdon Township residents, businesses, municipal officials, and local fire departments through public meetings, stakeholder meetings, and public surveys. Access for emergency services, businesses, and residents was identified as a key concern because of the Preliminary Proposed Alternative's median. Based on these concerns, fire response times and commercial access times were evaluated along the corridor by comparing the estimated travel times between the 4-lane alternative and no-build conditions.

### Methodology

The accessibility evaluation was conducted using VISUM travel demand modeling software. A calibrated VISUM model was previously created to analyze baseline conditions and future no-build conditions (See [Traffic Model Calibration & Validation Report](#)). The future-year access analysis was performed for the 2045 PM Peak Hour. Using the model, a series of travel time accessibility maps were generated to illustrate the expected travel time differences between the 4-lane and no-build conditions. The analysis included signal delays derived from Synchro and VISSIM, which are more accurate models for congested intersection evaluations. Synchro and VISSIM delays were incorporated at the corridor's most congested intersections to ensure the validity of the evaluations. The area along the study corridor was characterized into 136 Traffic Analysis Zones (TAZ), and accessibility was evaluated based on the time required to travel to the center of each TAZ. These times represent the average travel time for the entire TAZ.

This methodology was used to assess travel time accessibility for the following:

- Volunteer fire department (VFD) response time
- Commercial access from North Versailles (west of US 30 corridor)
- Commercial access from Clay Pike (south of US 30 corridor)
- Commercial access from North Huntingdon (east of US 30 corridor)

For each type of accessibility listed above, three maps were generated: No-Build travel time, Four-Lane Alternative travel time, and a travel time difference map to compare the No-Build and Four-Lane Alternatives. The travel time accessibility graphics are referred to as "heat maps" because they were developed using bins of time and color-coded to represent different travel times in 1-minute increments for the No-Build and Four-Lane Alternative maps. Green shades represent shorter travel times, while yellow/red shades indicate longer travel times. The travel time thresholds are based on the average travel time to the center of each zone.

For the comparison maps, the different colors illustrate increases or decreases in travel time using 30-second increments. It is important to note that a change in color does not necessarily represent a 30 second change in accessibility but simply a shift between one travel time accessibility difference bin to the next. For example, a 59-second difference would be displayed in light yellow, but a 61-second difference would be displayed as a darker yellow since it would be included in the 1.0 minute to 1.5-minute bin. Green shades indicate travel time favoring the 4-lane option over the no-build alternative, and yellow/red shades indicate travel time favoring the no-build when compared to the 4-lane alternative. Plus or minus 30-second change was considered a marginal change. These maps are included as attachments ([Appendix I](#)).

### Fire Response Times

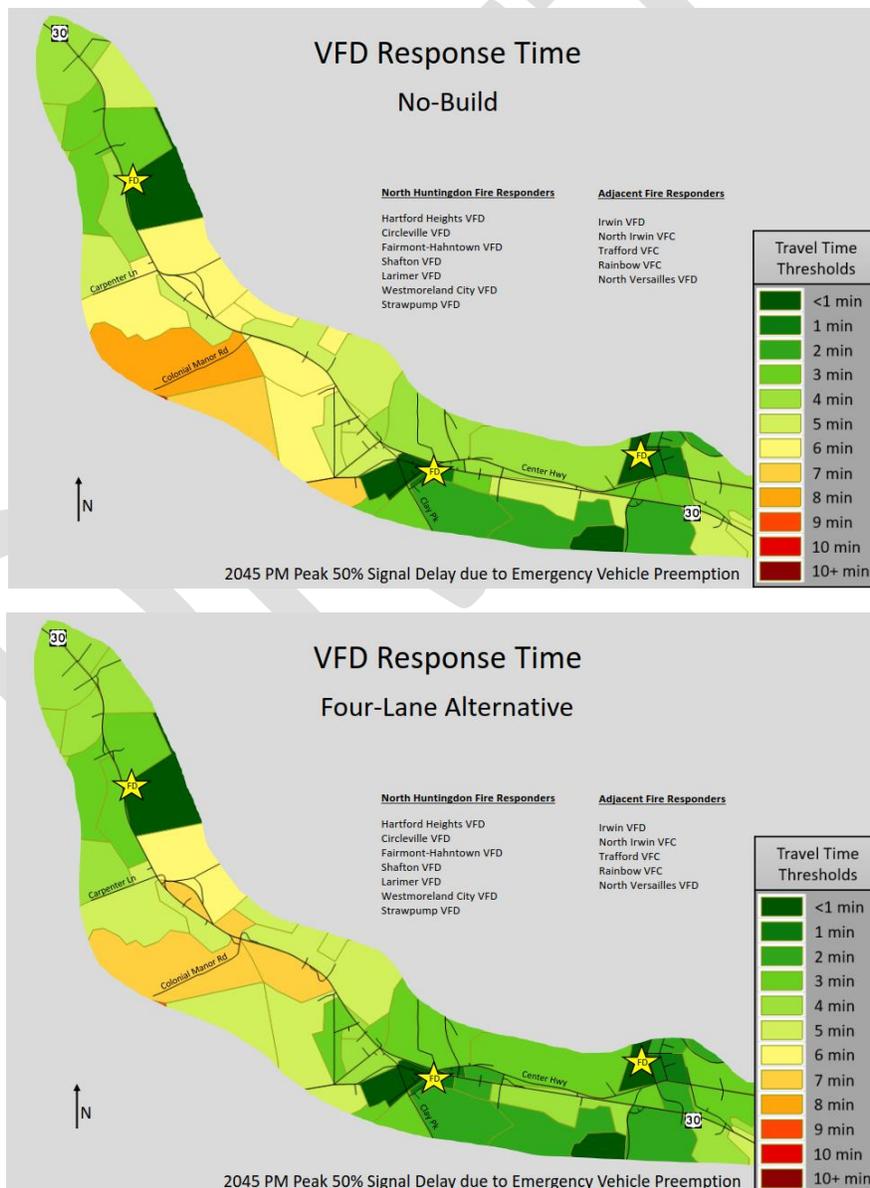
The fire response evaluations compared the travel time to each TAZ from the nearest volunteer fire department (VFD). The analysis included the seven North Huntingdon VFD's and five adjacent VFD's from neighboring communities ([Appendix I, Attachment 1-3](#)). Signal delay was reduced by 50% for the Fire Response time evaluations to account for the use of emergency vehicle preemption that would be included with the 4-lane alternative and assumed to be installed for the no-build condition.

The primary difference in response time is the region near Carpenter Lane and Colonial Manor Road. This is the area between Hartford Heights VFD and Circleville VFD. Due to the median installation, Hartford Heights would

have to make a right turn and utilize the jughandle at Old Jacks Run Road to serve properties east of their firehouse. Because the 4-lane option has restricted access, WRA evaluated the installation of a break in the median to allow full ingress and egress for Hartford Heights VFD. The access was assumed to be controlled with an emergency signal giving Hartford Heights VFD priority and full access during emergency calls.

The median break generally makes the 4-lane alternative more competitive when compared to the No-Build condition ([Exhibit 17](#)). The 4-lane alternative's new connection from Irwin Borough to the residential plans to the south improves response time for those neighborhoods since they now have a more direct connection to the downtown Irwin Fire Department. Due to the 4-lane alternative's removal of the congested at-grade intersection of US 30 and Robbins Station Rd, fire response is generally improved for the Circleville VFD. The extra travel time required to navigate the new quadrant interchange is relatively equal to an at-grade intersection. Compared to the no-build, the 4-lane alternative generally improves fire response time ([Appendix I, Attachments 1-3](#)), while a few TAZ's experience a reduction in travel time of less than 1.5 minutes.

**Exhibit 17: Volunteer Fire Department Response Time, No-Build versus Four-Lane Alternative**



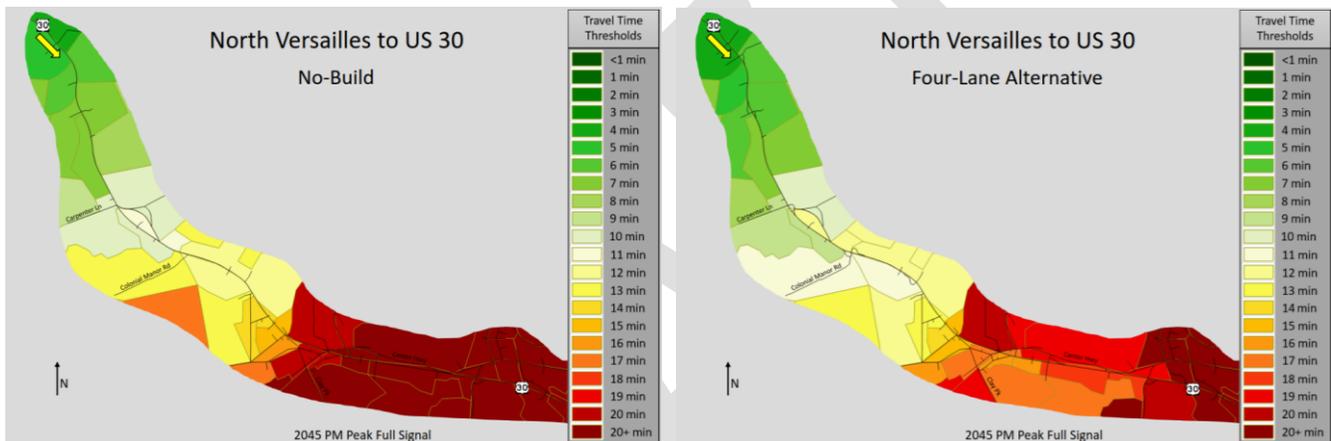
### Commercial Travel Time Accessibility

In addition to fire response access, commerce and business access impacts were also evaluated. The ingress and egress travel time accessibility differences were assessed between the no-build and 4-lane conditions from three regions entering and exiting the corridor: North Versailles (West), Clay Pike (South), and North Huntingdon (East). Overall, the 4-lane alternative provides improvements for commercial travel time accessibility for traffic entering and exiting the study area to and from the east, west, and south when compared to the No-Build alternative.

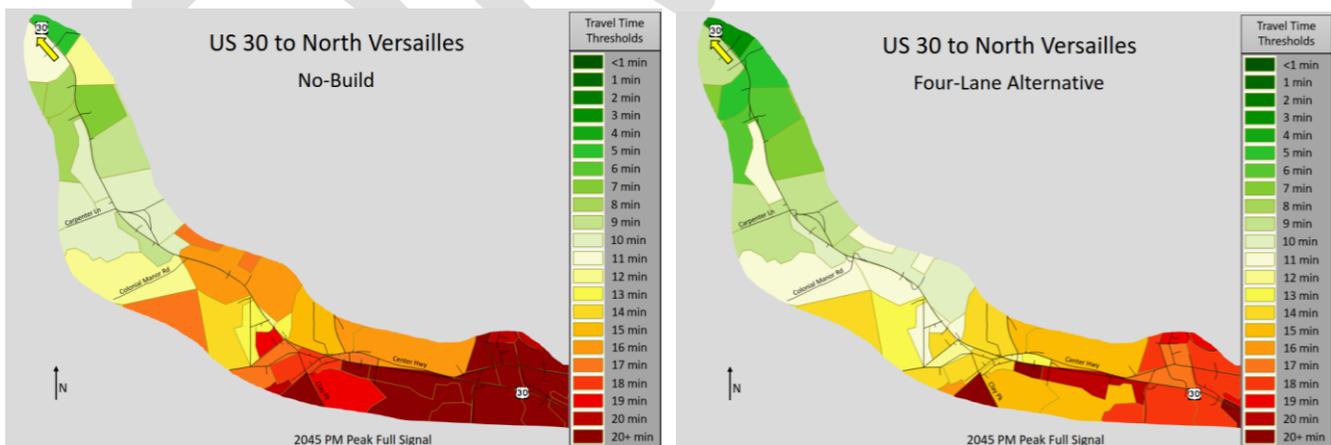
#### North Versailles - West

The North Versailles – West evaluations considered travel time accessibility of a station located west of SR 48 to the TAZ's within the study area (Exhibit 18 and Appendix I, Attachments 4-6) and from the remaining TAZ's in the study area (Exhibit 19 and Appendix I, Attachments 7-9) to US 30 west of SR 48. Travel time accessibility generally improves when compared to the No-Build condition. Overall the 4-lane alternative will significantly improve travel time accessibility when compared to the No-Build conditions for most of the corridor.

**Exhibit 18: North Versailles to US 30 Travel Time, No-Build versus Four-Lane Alternative**



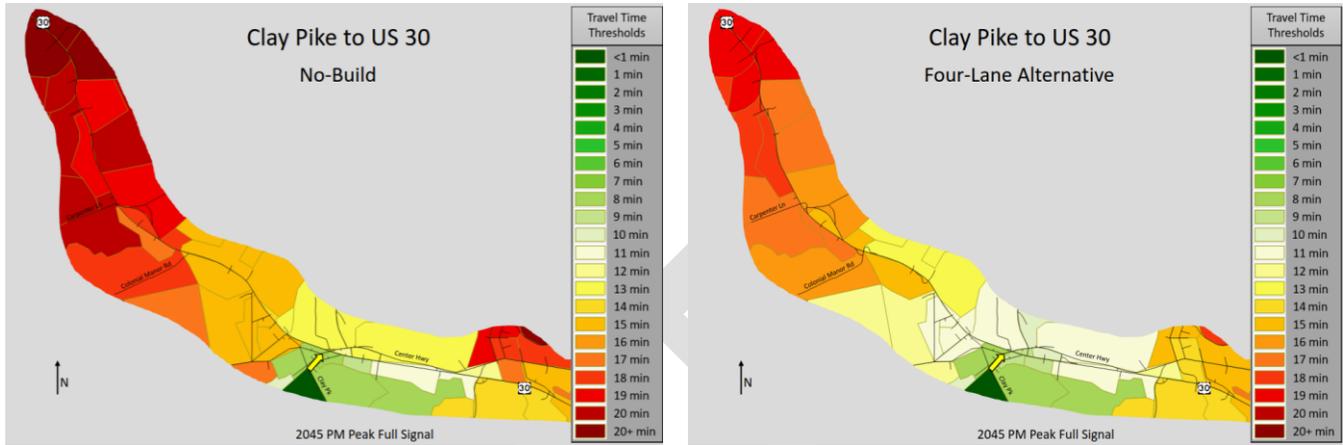
**Exhibit 19: US 30 to North Versailles Travel Time, No-Build versus Four-Lane Alternative**



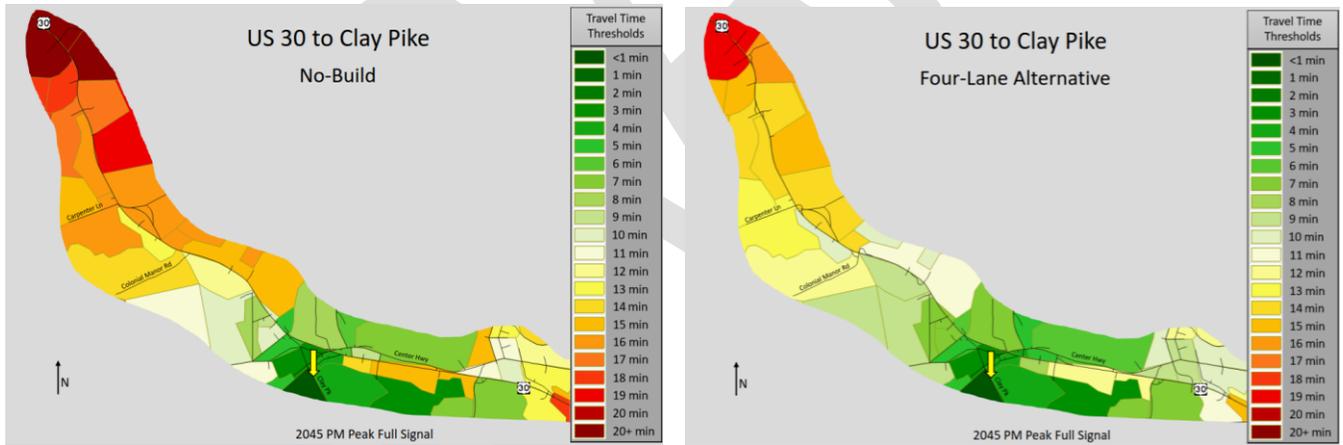
*Clay Pike - South*

The Clay Pike evaluations considered travel time accessibility of a station located south of the Robbins Station Road and Clay Pike intersection, both to the TAZ's within the study area ([Exhibit 20](#) and [Appendix I, Attachments 10-12](#)) and from the remaining TAZ's in the study area ([Exhibit 21](#) and [Appendix I, Attachments 13-15](#)). Clay Pike connects many housing developments to US 30. Generally, travel to and from Clay Pike will improve under the 4-lane alternative when compared to the No-Build alternative.

**Exhibit 20: Clay Pike to US 30 Travel Time, No-Build versus Four-Lane Alternative**



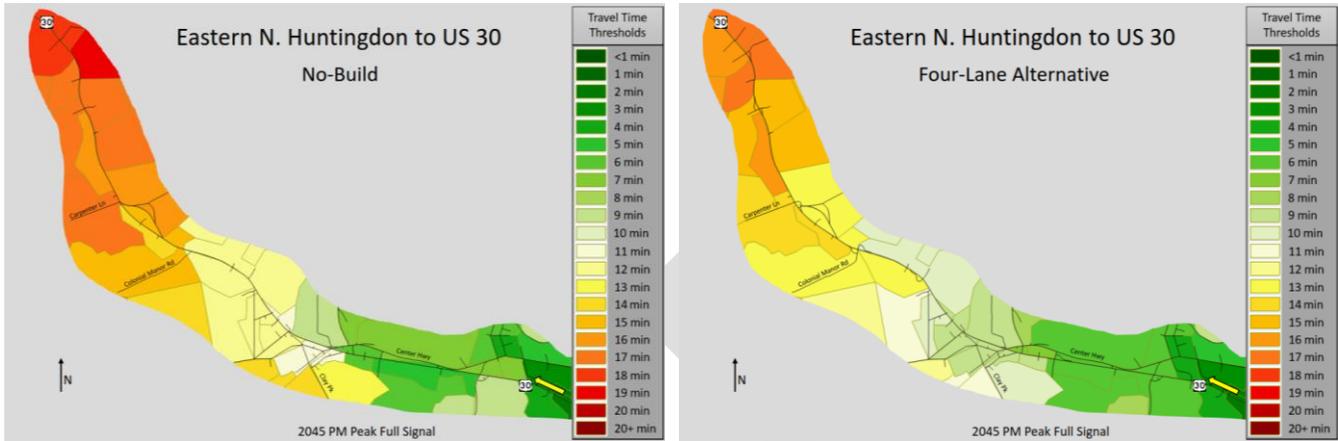
**Exhibit 21: US 30 to Clay Pike Travel Time, No-Build versus Four-Lane Alternative**



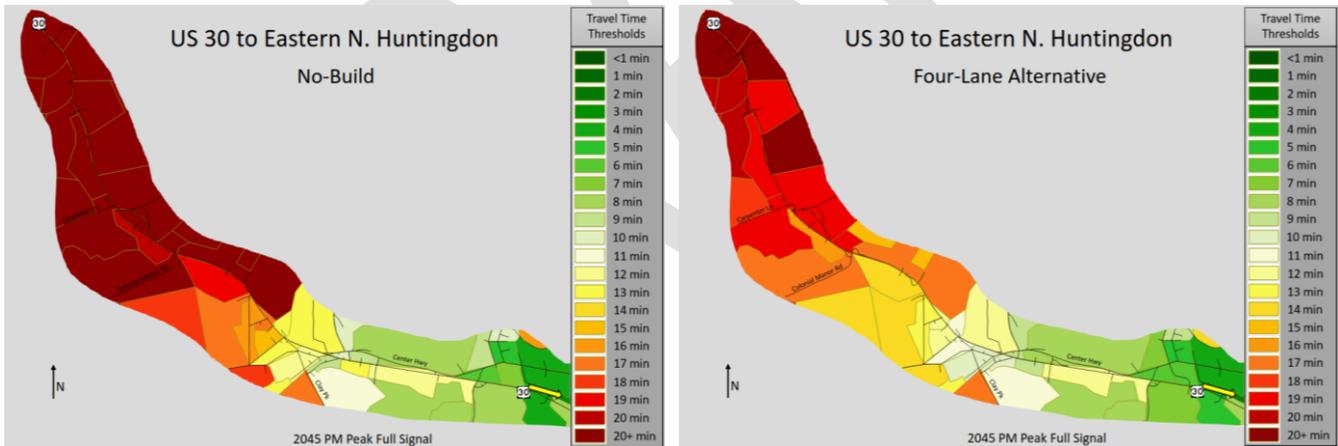
*North Huntingdon - East*

The North Huntingdon – East evaluations included travel time accessibility of a station located at Norwin Avenue to the TAZ's within the study area (Exhibit 22 and Appendix I, Attachments 16-18) and from the remaining TAZ's in the study area (Exhibit 23 and Appendix I, Attachments 19-21). The 4-lane alternative generally improves travel time accessibility for TAZ's along the corridor traveling both eastbound and westbound when compared to the No-Build alternative. Many TAZ's experience a travel time improvement greater than two minutes.

**Exhibit 22: US 30 to North Versailles Travel Time, No-Build versus Four-Lane Alternative**



**Exhibit 23: US 30 to North Versailles Travel Time, No-Build versus Four-Lane Alternative**

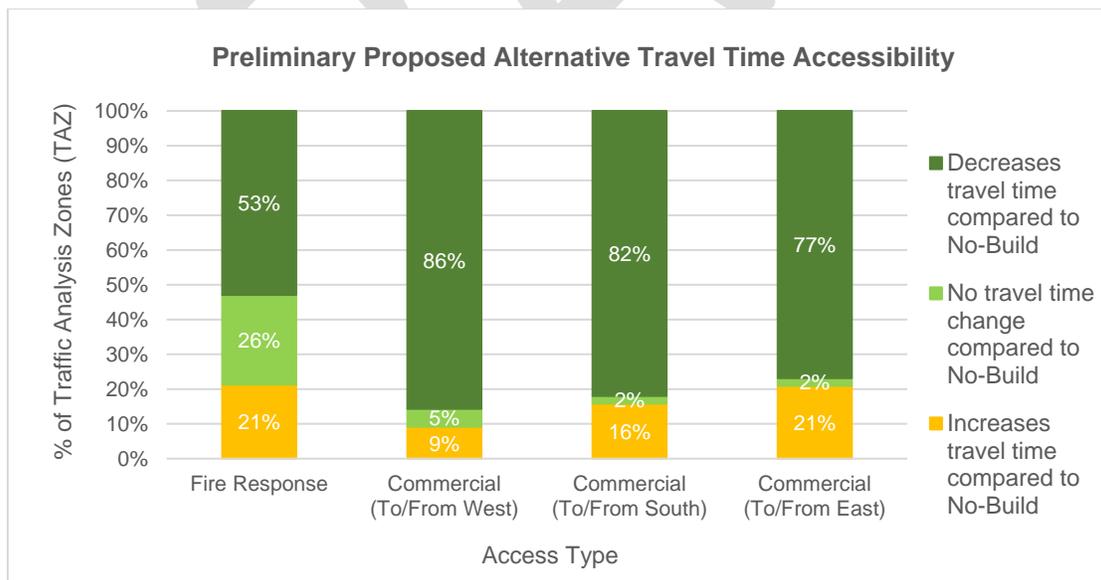


### Travel Time Accessibility Insights

For the Preliminary Proposed Alternative, fire response and commercial access times generally improve along the corridor when compared to the No-Build. The area surrounding the US 30 corridor was divided into 136 Traffic Analysis Zones (TAZ's) to evaluate travel times between the centers of these zones. The changes in travel time accessibility for these TAZ's between the Preliminary Proposed Alternative versus the No-Build is summarized below ([Exhibit 24](#)). The analysis findings for the Preliminary Proposed Alternative versus the No-Build are summarized as follows:

- Fire response times either improve or experience no change for 79% of the TAZ's analyzed along the corridor, with the average TAZ experiencing a 19-second improvement. For those TAZ's that would experience a longer fire response time compared to the No-Build, the average increase is 17 seconds. Only 6 out of 136 TAZ's experience an increase greater than 30 seconds.
- For commercial access to and from North Versailles, 91% of TAZ's experience faster travel time or no change. Travel time to and from the western end of the corridor improves on average by about 2.5 minutes. For TAZ's that increase in travel time to and from the west, the average rise is only by about 23 seconds. Only 6 TAZ's see a travel time increase greater than 30 seconds.
- For commercial access to and from Clay Pike located south of US 30, 84% of TAZ's either improve or experience no change in travel time. Travel time to and from Clay Pike improves on average by almost 2 minutes. TAZ's that increase in travel time take an average 12 seconds longer to travel to or from Clay Pike, with only 4 TAZ's experiencing an increase of more than 30 seconds.
- For commercial access to and from the eastern end of the corridor, 79% of TAZ's see improvement or no change. On average, travel time improves by about 1.5 minutes. Only 6 of 136 TAZ's see an increased travel time difference larger than 30 seconds when compared to the No-Build.

**Exhibit 24: Travel Time Accessibility Summary, Preliminary Proposed Alternative versus No-Build**



## Traffic Analysis Summary

A thorough alternative analysis was conducted to assess potential traffic operations improvements along the US 30 corridor. Based on the data and findings discussed in this report, the Preliminary Proposed Alternative will improve operations throughout the corridor compared to the No-Build alternative in the following ways:

- All signalized intersections will operate acceptably at LOS D or better, including six intersections that would otherwise operate unacceptably (LOS E or F) for at least one peak under No-Build conditions.
- The Preliminary Proposed Alternative will eliminate the corridor's second most congested intersection at Robbins Station Road / Center Highway by converting the at-grade intersection to a grade-separated interchange.
- The Preliminary Proposed Alternative improves future-year travel time conditions for all peaks in both the east and westbound directions, notably cutting the eastbound PM travel time by almost half compared to the No-Build with other peak travel times improving between 6% to 24%.
- Based on the benefits compiled for traffic operations, vehicle stops, fuel use, and emissions, the Preliminary Proposed Alternative is expected to provide a total discounted net benefit of \$74 million.
- The Preliminary Proposed Alternative reduces hours of delay along the corridor by 14.6 million hours and provides additional benefits by reducing the number of vehicle stops; gallons of fuel use; and emissions of CO, NO<sub>x</sub>, and VOC.
- Fire response times and commercial travel time accessibility to destinations along the US 30 corridor will largely improve, with at least 75% of the area surrounding the corridor seeing an improvement or no change in travel times. Of the 136 TAZ's used to evaluate accessibility along US 30, only 6 TAZ's experience travel time increases exceeding 30 seconds.