EASTERN CORRIDOR SEGMENTS II and III (PID 86462)

TRANSPORTATION NEEDS ANALYSIS

Prepared for:
Ohio Department of Transportation
District 8
505 South State Route 741
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July 31, 2017

Stantec

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EXECUTIVE SUMMARY

This report provides the results of a transportation needs analysis prepared for Segments II and III of the Eastern Corridor Program, a multi-modal transportation improvement program extending from downtown Cincinnati and communities through eastern Hamilton County and into western Clermont County, Ohio. Transportation needs within the Segments II and III study area were identified through technical studies, as well as stakeholder input. The technical studies that were undertaken and traffic data collected include: level-of-service analyses of major intersections, freeway segments, and ramp junctions using Highway Capacity Software (HCS); crash data; travel time data; and geometric data. While technical studies provide important data that can be used to identify transportation needs, community input is vital to understanding how individual communities prioritize transportation needs with respect to community goals and objectives. To identify transportation issues in Segments II and III, an online interactive survey was developed to solicit information from residents and commuters. This online survey, which was completed by nearly 1200 individuals, provides information on problem areas and locations for desired improvements within the study area. In addition to the survey, workshops were held in April 2016 to gather public input regarding the community transportation priorities and needs. These workshops were held for six focus areas identified for Segments II and III which are: the ANCOR/SR 32 Hill Focus Area, the Village of Newtown Focus Area, the SR 125/SR 32 Focus Area, the Linwood/Eastern Avenue Interchange Focus Area, the US 50/Red Bank Interchange Focus Area, and the US 50 Corridor Focus Area (see **Figure 1** in **Section 1.2**) Primary needs and secondary needs were identified for each focus area. Primary needs include those needs that **will be addressed** as part of the solutions for this project and secondary needs are needs that **may be addressed**. The primary and secondary needs were presented to the public in a Public Open House held on March 9, 2017. Based on public input received at the open house and documented in the *Public Open House Summary Report* included in **Attachment B-5,** these needs were revised and are presented on the figures at the end of this section.

ANCOR/SR 32 Hill Focus Area

The ANCOR/SR 32 Hill Focus Area extends from SR 32 in Newtown to the SR32/Bells Lane Intersection in Clermont County and includes the ANCOR/Broadwell Road Industrial area of Anderson Township. **Figure ES-1** identifies the Primary and Secondary Needs for the ANCOR/SR 32 Hill Focus Area.

Village of Newtown Focus Area

The Village of Newtown Focus Area extends from the western border of the Village of Newtown to Little Dry Run and includes the business district of Newtown. **Figure ES-2** identifies the Primary and Secondary Needs for the Village of Newtown Focus Area.

SR 125/SR 32 Area Focus Area

The SR 125/SR 32 Focus Area, which is within Anderson Township, includes segments of SR 125 just west and east of its interchange with SR 32, and the segment of SR 32 extending from its interchange with SR 125 to the west corp. limits of the Village of Newtown. This Focus Area includes

the SR 125 crossing of the Little Miami River. **Figure ES-3** identifies the Primary and Secondary Needs for the SR 125/SR 32 Area Focus Area.

Linwood/Eastern Avenue Interchange Focus Area

The Linwood/Eastern Interchange Focus Area extends from the Linwood Avenue/Herschel Avenue Intersection to the Beechmont Circle Interchange. This focus area also includes the area between the US 50/SR 125 Interchange and the Red Bank Road area. Most of this Focus Area is within the City of Cincinnati; portions near the US 50/Red Bank Interchange are within the Village of Fairfax. **Figure ES-4** identifies the Primary and Secondary Needs for the Linwood/Eastern Avenue Interchange Focus Area.

US 50/Red Bank Road Interchange Focus Area

The US 50/Red Bank Interchange Focus Area extends from the US 50/Red Bank Interchange area north to Fair Lane and to the US 50/Meadowlark Intersection to the east. This focus area is within the Village of Fairfax. **Figure ES-5** identifies the Primary and Secondary Needs for the US 50/Red Bank Road Interchange Focus Area.

US 50 Corridor Focus Area

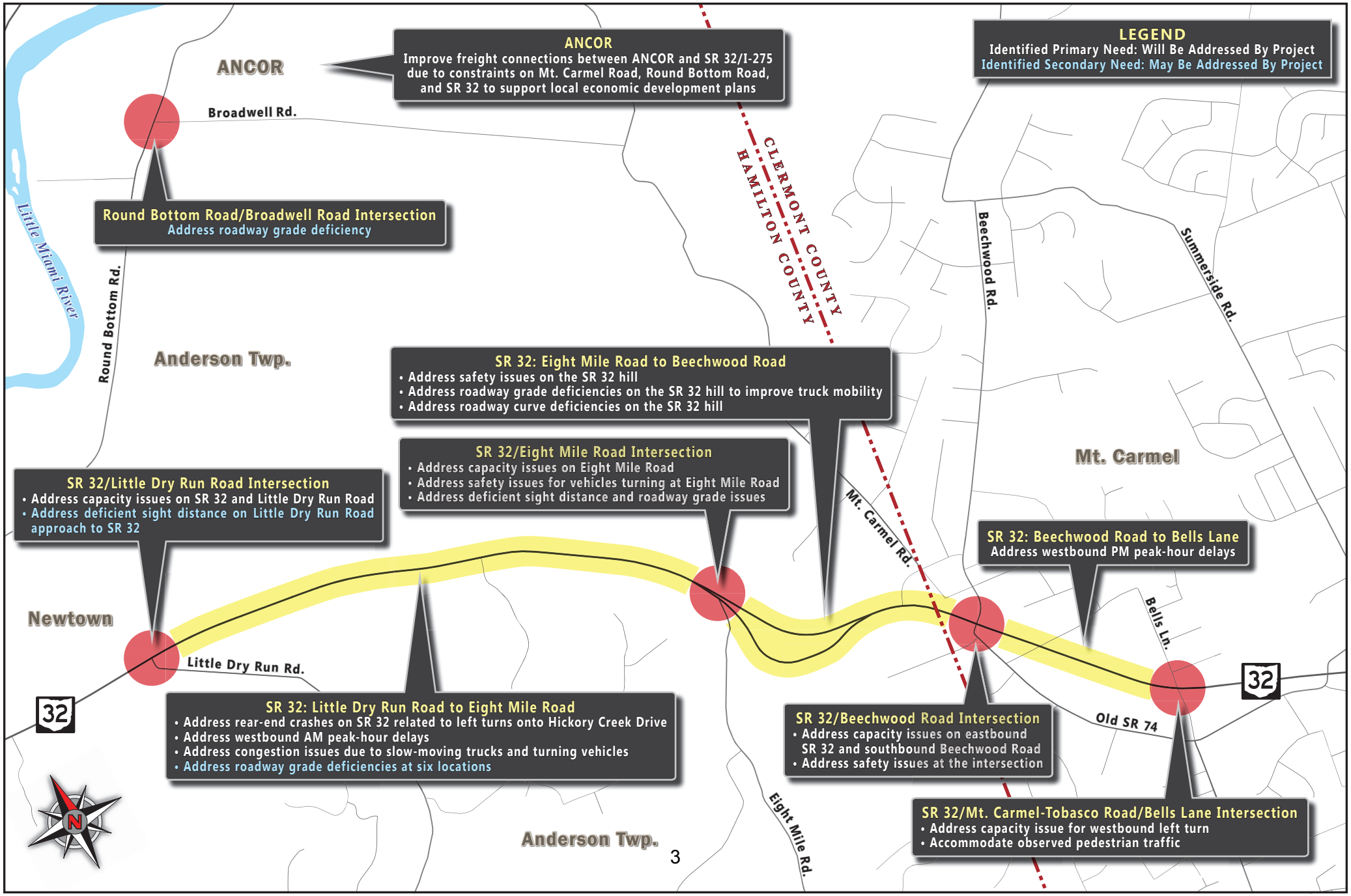
The US 50 Corridor Focus Area extends from the US 50/Meadowlark Lane intersection through Mariemont to the US 50/Newtown Road Intersection. The US 50 Corridor Focus Area includes portions of the Village of Fairfax, the Village of Mariemont, and Anderson Township. **Figure ES-6** identifies the Primary and Secondary Needs for the US 50 Corridor Focus Area.

The Eastern Corridor

Figure ES-1

Eastern Corridor Segments II and III

ANCOR/SR 32 Hill Focus Area

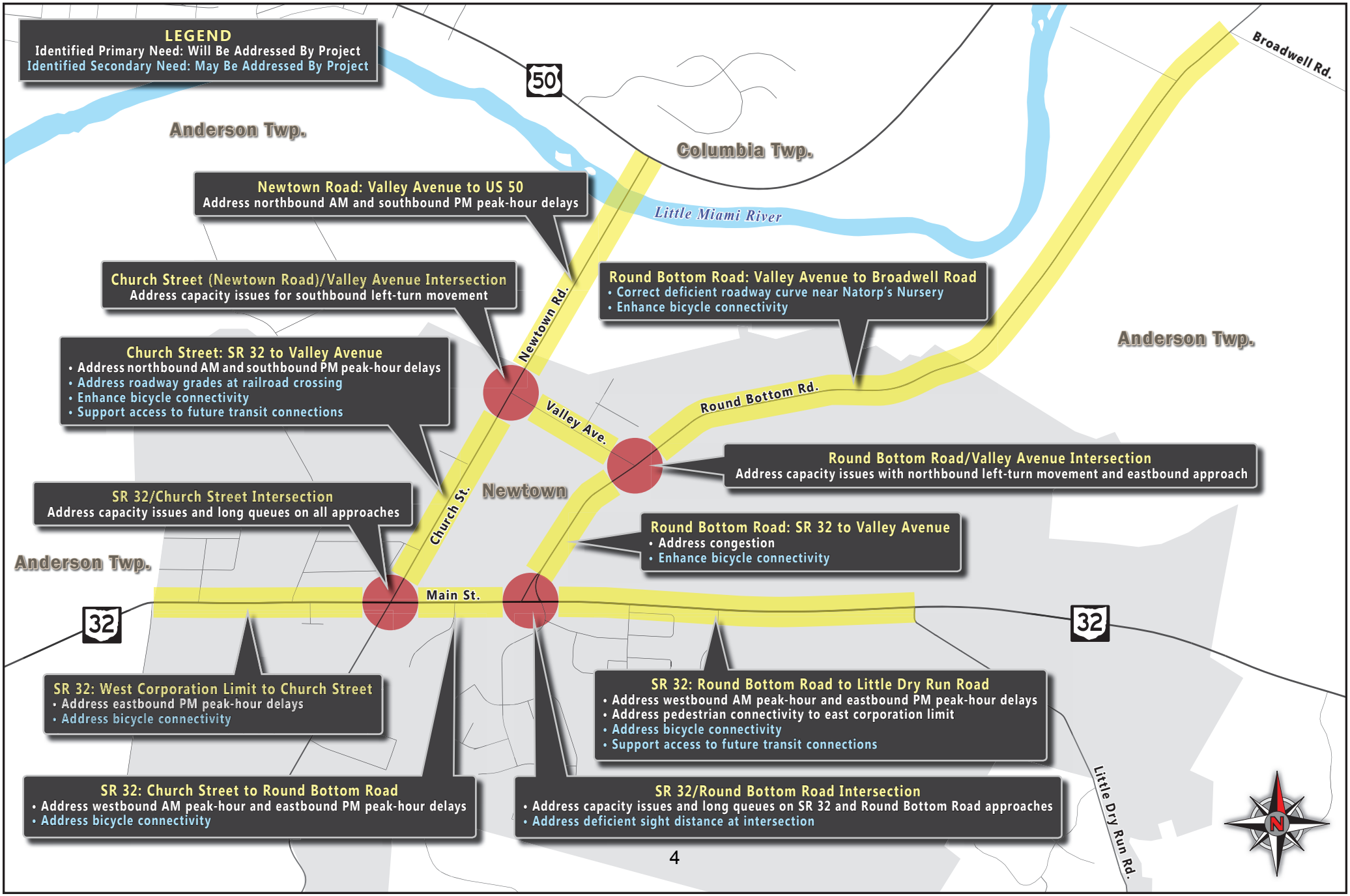


The Eastern Corridor

Figure ES-2

Eastern Corridor Segments II and III

Village of Newtown Focus Area

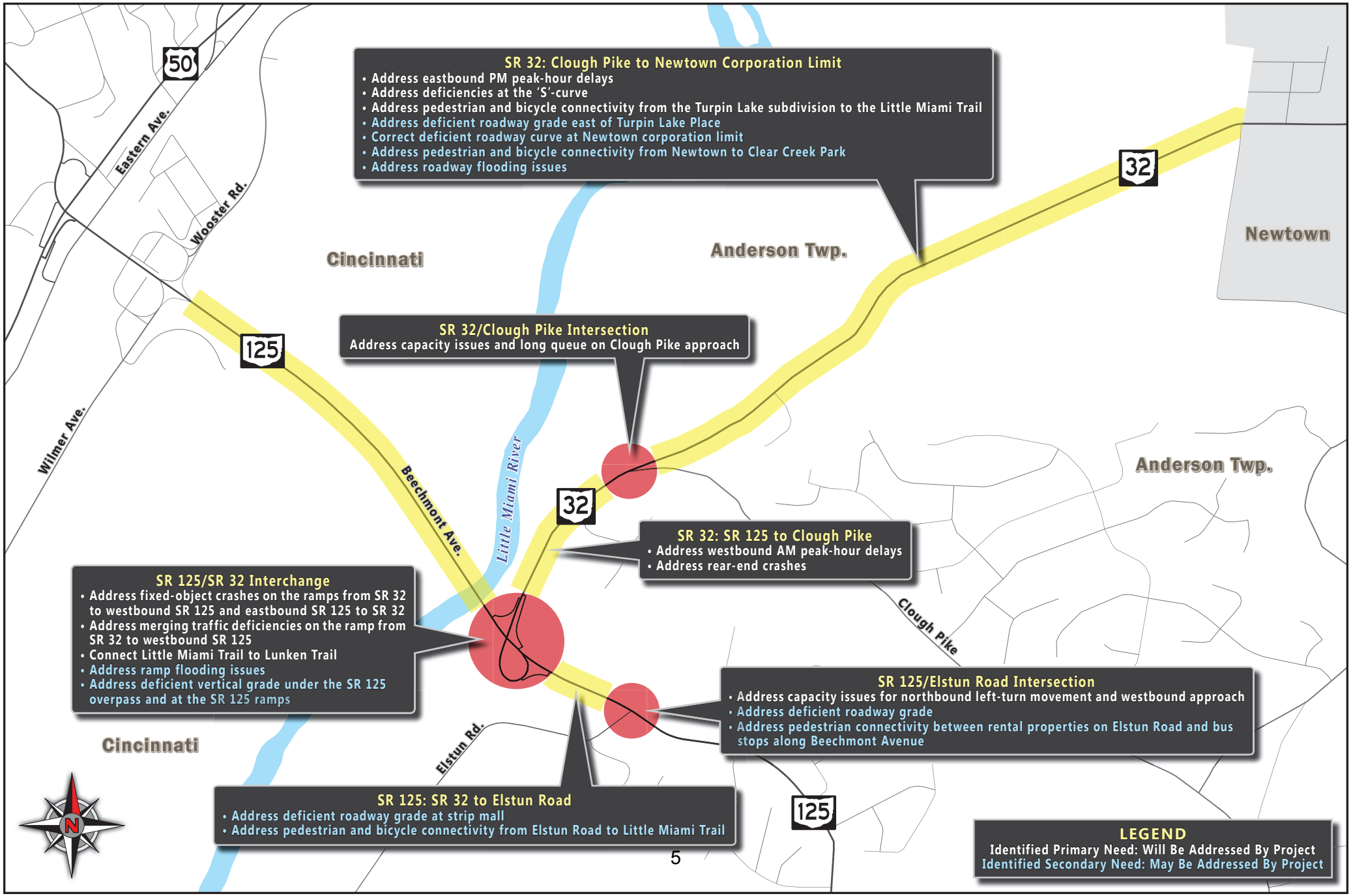


The Eastern Corridor

Figure ES-3

Eastern Corridor Segments II and III

SR 125/SR 32 Focus Area

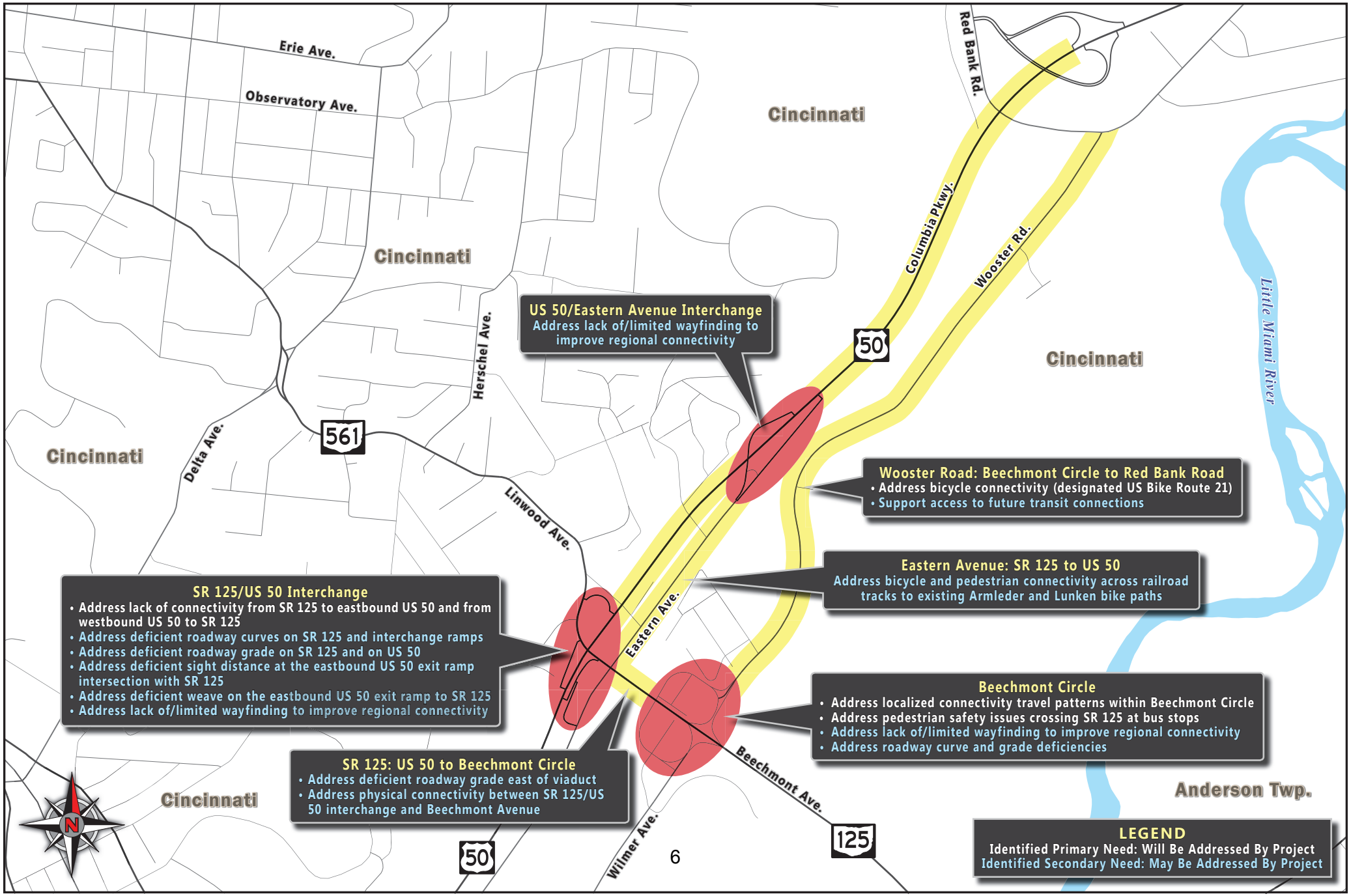


The Eastern Corridor

Figure ES-4

Eastern Corridor Segments II and III

Linwood/Eastern Interchange Focus Area

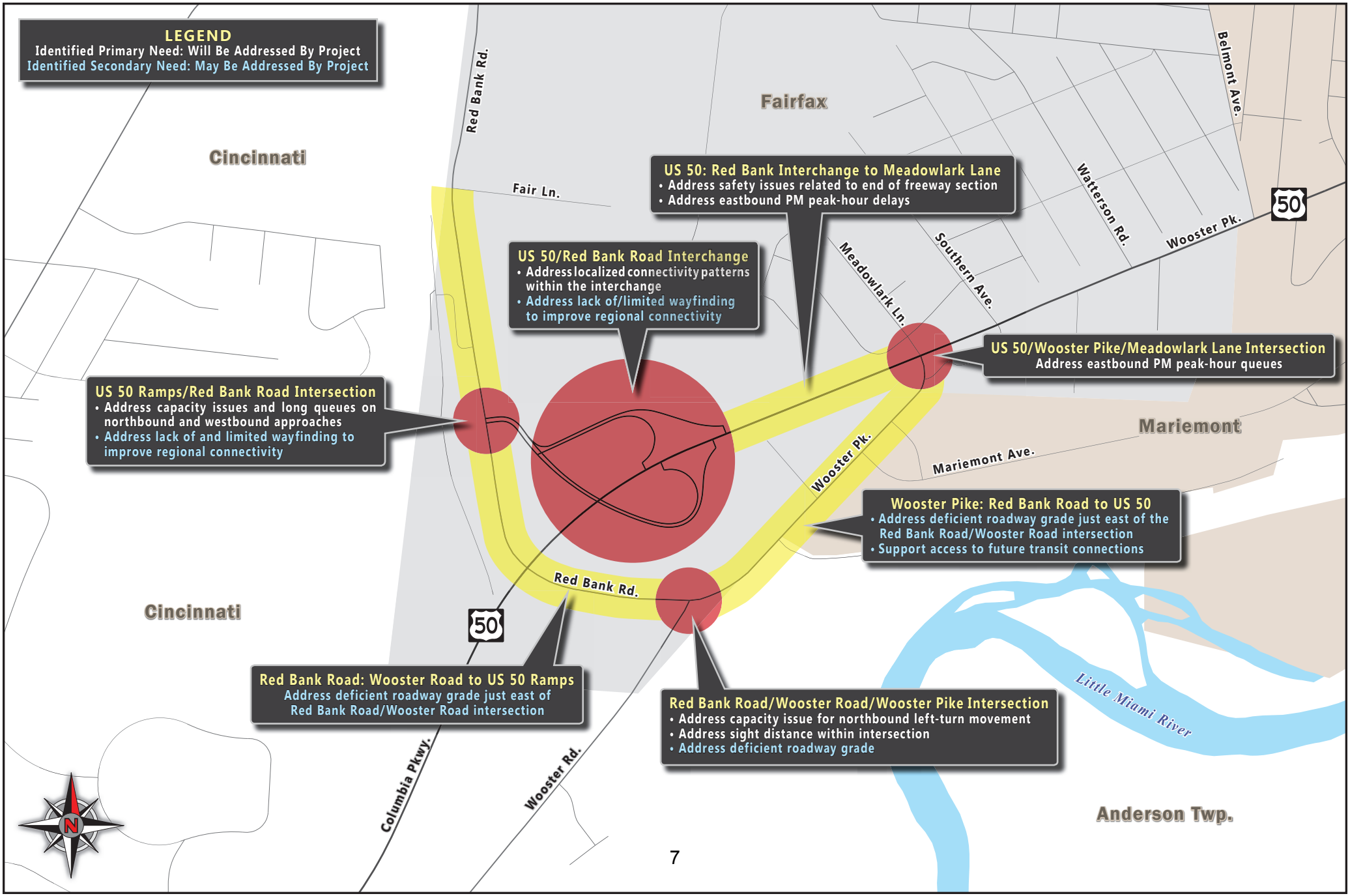


The Eastern Corridor

Figure ES-5

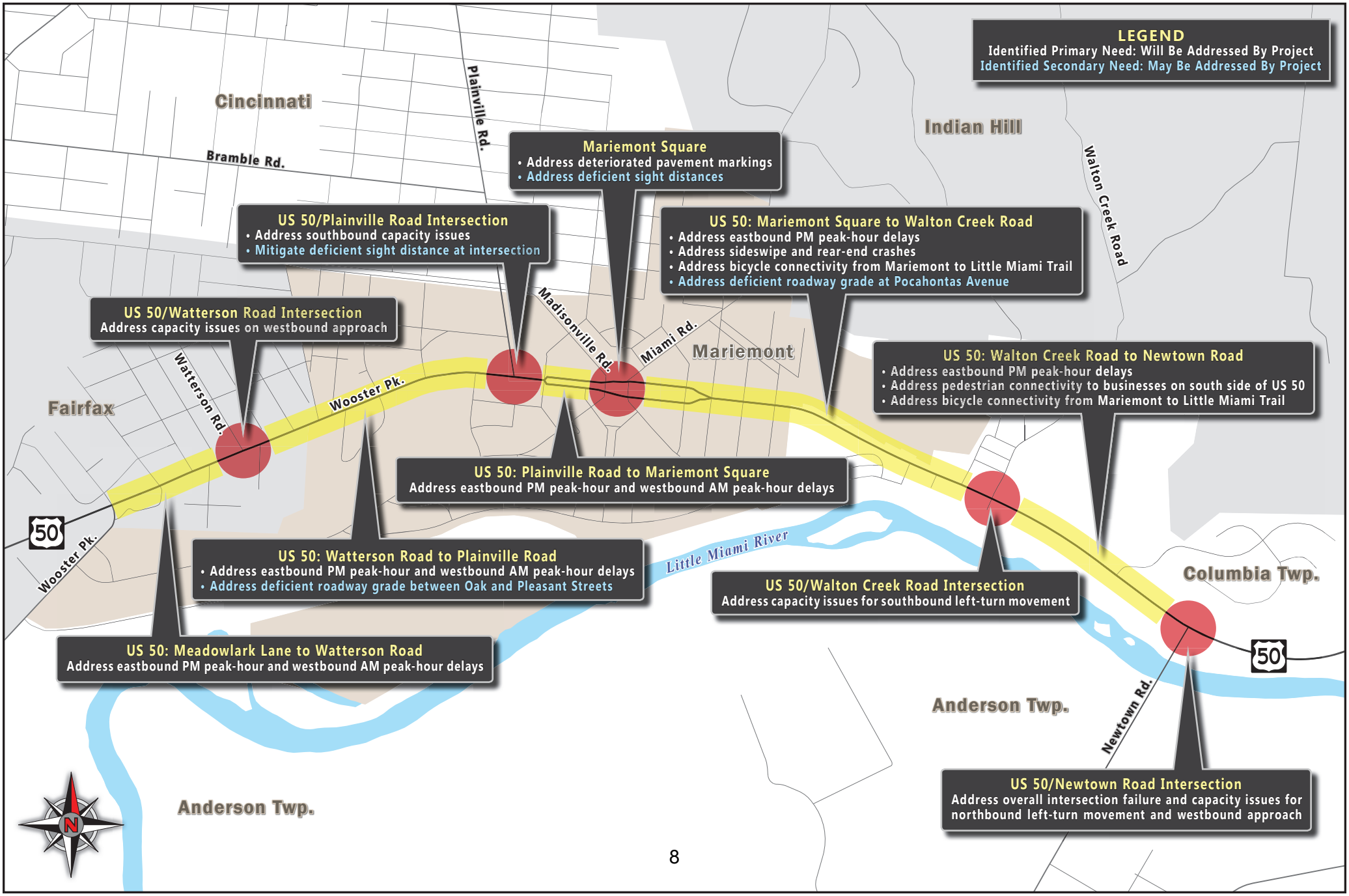
Eastern Corridor Segments II and III

US 50/Red Bank Interchange Focus Area



The Eastern Corridor
Figure ES-6

Eastern Corridor Segments II and III
US 50 Corridor Focus Area



1.0 INTRODUCTION

1.1 EASTERN CORRIDOR PROGRAM

This report provides the results of a transportation needs analysis prepared for Segments II and III of the Eastern Corridor Program, a multi-modal transportation improvement program extending from downtown Cincinnati and communities through eastern Hamilton County and into western Clermont County, Ohio. The Eastern Corridor Program is a coordinated series of regional transportation improvement studies and projects in varying stages of planning, construction, and completion. The Program is administered by the Ohio Department of Transportation (ODOT) in cooperation with the local Eastern Corridor Implementation Partners, which include the Hamilton County Transportation Improvement District (HCTID), the Clermont County Transportation Improvement District (CCTID), the City of Cincinnati, the Ohio-Kentucky-Indiana (OKI) Regional Council of Governments, and the Southwest Ohio Regional Transit Authority (SORTA). The Program is comprised of four core segment areas which are: Segment I (Red Bank Corridor), Segments II and III (Red Bank to I-275/SR 32 Interchange), Segments IV and IVa (Eastgate Area to Batavia), and the Oasis Rail Transit Project. These four core projects are being developed through separate, but closely coordinated, Tier 2 NEPA studies, which are consistent with the goals established in Tier 1 for integrating local land use, economic development, and environmental stewardship visions.

1.2 SEGMENTS II AND III

The Segments II and III study area extends between the Red Bank Corridor (Segment I) and the I-275/SR 32 interchange in the Eastgate Area of Clermont County (Segment IV) encompassing key routes through this area, including: US 50/Wooster Pike, SR 125/Beechmont Levee and SR 32. Previous transportation studies completed for Segments II and III as part of the Eastern Corridor Project were based on a "traditional approach" to transportation planning, which is focused on major capital investments rather than more near-term, potentially cost-effective strategies. This approach resulted in recommendations that centered on the relocation of SR 32, a solution that ODOT ultimately determined was not feasible at this time due to potentially significant environmental impacts, cultural impacts, and costs. However, congestion, travel delays, and safety issues still exist through this central portion of the Eastern Corridor and transportation improvements are needed. Therefore, ODOT is re-examining the existing transportation network throughout Segments II and III using a relatively new planning and design philosophy called Performance Based Practical Design (PBPD). Instead of considering a single, large-scale capital project, planners are looking at what can be accomplished by making a series of lower-impact improvements to the existing roadway network.

As part of the re-analysis of transportation needs in Segments II and III, technical data for the roadway network has been updated and reviewed, such as traffic volumes, levels of service, and crash data. In addition, the needs analysis included extensive stakeholder input. In April, May, and June of 2016, Focus Area Workshops were held in six focus areas within Segments II and IIII, which include the US 50 Corridor Focus Area, the US 50/Red Bank Interchange Focus Area, the Linwood/Eastern Interchange Focus Area, the SR 125/SR 32 Focus Area, the Newtown Village Focus Area, and the ANCOR/SR 32 Hill Focus Area (see **Figure 1**). More than 100 participants

attended these workshops. In addition, an online interactive survey was completed by nearly 1,200 individuals, which provided public input on transportation needs throughout Segments II and III. On March 9, 2017, ODOT held a Public Open House to share data and public feedback collected as part of the Transportation Needs Analysis, and confirm with the public that ODOT has captured the public's concerns regarding transportation needs throughout the study area. During the next phase of the Segment II and III Project, the needs identified in this report will be used to develop lower-impact transportation improvements to the existing roadway network (see **Section 3.0**).

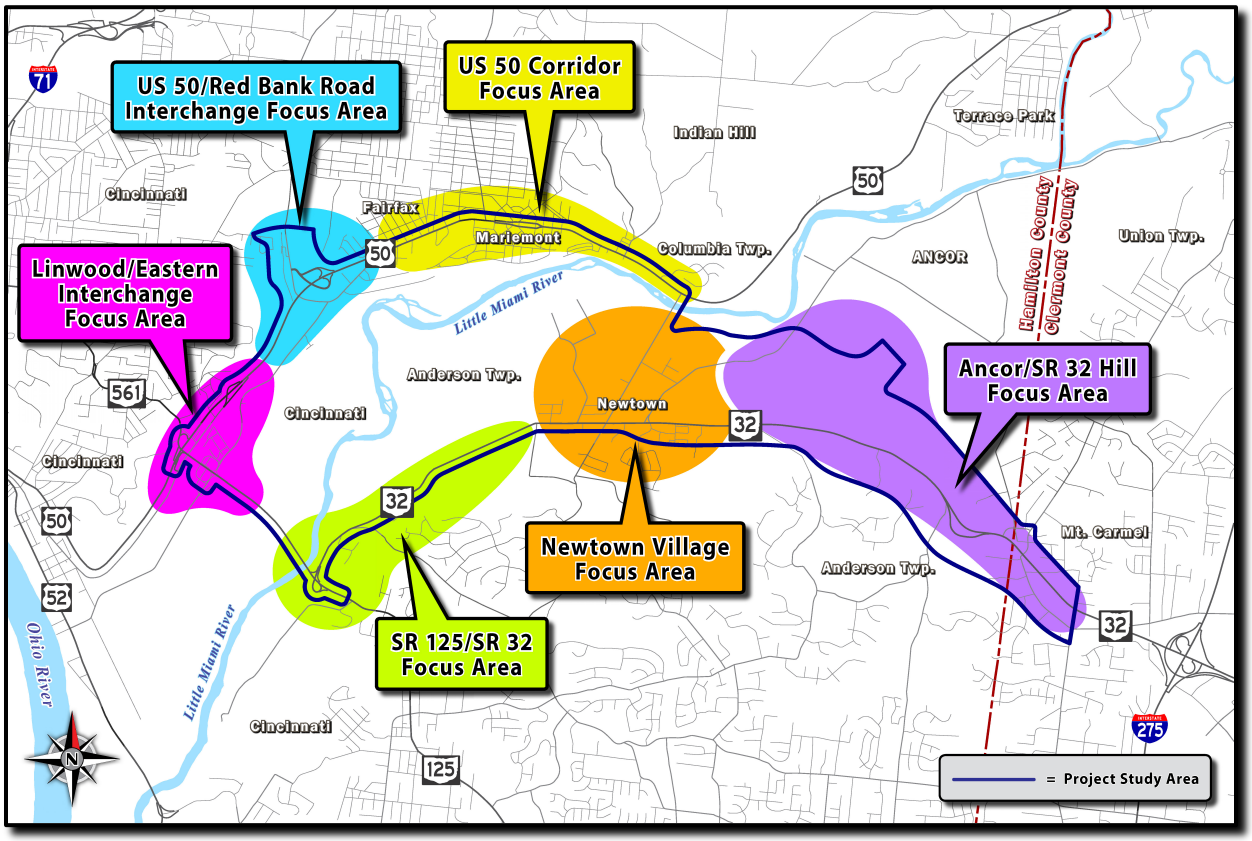


Figure 1. Focus Areas

1.3 PROJECT HISTORY

The Eastern Corridor Program is a regional transportation planning effort that incorporates multi-modal solutions to improve travel and access between employment and social centers in downtown Cincinnati and the communities in eastern Hamilton County and western Clermont County. The Eastern Corridor study area includes a 165-square mile area and extends east from downtown Cincinnati through Hamilton County just past Interstate I-275 in western Clermont County. Transportation studies for the Eastern Corridor Program began with the *Eastern Corridor Major Investment Study* (MIS), a comprehensive two-year planning study led by the Ohio-Kentucky Regional Council of Governments (OKI)and completed in 2000. This study was followed by the *Eastern Corridor Land Vision Plan* in 2002. Since 2002, the Eastern Corridor Program has used a two-tiered approach to identify improvement alternatives within the full multi-modal plan and provide a conservative assessment of impacts related to decision-making as required under the 1969 National Environmental Policy Act (NEPA).

Tier 1: The Tier 1 *Final Environmental Impact Statement* (FEIS) for the Eastern Corridor Program was completed in September 2005 and the Federal Highway Administration (FHWA) issued a Tier 1 *Record of Decision* (ROD) in June 2006. The Tier 1 ROD established a multi-modal framework for enhancing the regional transportation network and identified transportation investments to be further evaluated in Tier 2, including new roadway and rail transit projects, local network improvements, expanded bus transit, and pedestrian/bikeway improvements. The Segments II and III recommendation carried forward from the Eastern Corridor Tier 1 ROD consisted of a controlled-access, relocated SR 32 from US 50 in Fairfax, Hamilton County to the I-275/SR 32 interchange in Clermont County, including new alignment through the Little Miami River valley west of Newtown and a multi-modal river crossing. Tier 1 identified multiple preliminary alternative corridors in which a potential SR 32 relocation could be located.

Tier 2: Tier 2 investigations, which began after the ROD was issued, undertook a more detailed analysis of the engineering and environmental impacts associated with identified alignments within the approved corridors, including the "No Build" alternative. As part of Tier 2, the *SR 32 Relocation (Segment II/III) Feasibility Study* dated March 2012 was prepared, followed by a study addendum, completed in December 2012. These studies provided more detailed environmental investigations of the initial study corridors in Segments II and III.

Following the completion of the Feasibility Study, conflicting interests between various transportation, environmental, and historic interest agencies, and several local communities led ODOT, in coordination with the Federal Highway Administration (FHWA) to put future Segments II and III project development on hold and conduct a comprehensive assessment of stakeholder interests and concerns pertaining to the project.

ODOT and FHWA engaged the U.S. Institute for Environmental Conflict Resolution and a facilitation team from the Consensus Building Institute (CBI) as neutral, outside entities to review the project and complete a Situation Assessment to help in determining the next steps of the project. The Assessment, which was completed in November 2014, summarized key viewpoints from over 100 stakeholder interviews and identified key perspectives about the project. Concurrently, ODOT and FHWA continued agency coordination with Tribal groups as well as various resource agencies with interests concerning the Little Miami River and performed a risk assessment analysis on the Segments II and III project.

Based on these efforts, significant concerns with relocating SR 32 within the Little Miami River Valley were identified including: regulatory permitting challenges, potential impacts on archaeological resources and the need for tribal concurrence, design and construction challenges, hazardous materials liabilities, anticipated high construction costs, and public controversy. As a result of these concerns, ODOT concluded that relocating the SR 32 roadway through the Little Miami River Valley is not a reasonable solution at this time.

However, transportation improvements are still needed in the Segment II and III area to address increasing congestion, delay, and safety issues. Therefore, ODOT recommended that the transportation needs in Segments II and III be re-examined and reprioritized and the study area redefined, as needed, to focus on lower-impact improvements to the existing transportation network that could be implemented without significant environmental impacts. Through low-impact improvements to local roads between I-71 and I-275, mobility through the Eastern Corridor study area will in turn be improved, as will regional transportation connectivity.

1.4 NEEDS ANALYSIS METHODOLOGY

During Tier I, a Purpose and Need Statement was prepared that identified the needs for the transportation network in the Eastern Corridor. The needs elements identified in the Purpose and Need Statement focused on the regional network and were identified as: insufficient capacity, safety issues, limited transportation options, and inadequate linkage to the region's key transportation corridors for efficient movement of people and goods and services. Based on these needs, the transportation solutions which were identified during Tier I also were regionally focused and included major capital investments that focused on the entire transportation network and infrastructure in the Eastern Corridor area. Recommendations for Segments II and III included the relocation of SR 32. This transportation solution, while addressing the regional transportation needs by improving travel time, improving safety, and improving connectivity, resulted in potentially significant impacts to natural, community, and cultural resources. Because of the significant environmental impacts, construction costs, and lack of resource agency and public support for this solution, ODOT decided to revisit and update the project's purpose and need. Rather than relying on the traditional approach to identify the transportation needs for Sections II and III, which resulted in regional-focused, high investment solutions, ODOT is utilizing Performance Based Project Development (PBPD) to identify transportation needs that are more effectively balanced with community values and available resources.

Performance Based Project Development (PBPD) is a new, more flexible approach to transportation planning that provides community-based and data-driven solutions to transportation needs. PBPD is recognized by the Federal Highway Administration (FHWA) and an increasing number of state departments of transportation as a valuable tool in making incremental improvements to existing conditions in an environment that is often constrained by available funding, environmental and property impacts, and other factors. Public input is the cornerstone of the PBPD process. Local communities identify problems to be addressed and then work with transportation planners to define priority-driven solutions. PBPD modifies a traditional design approach to a "design up" approach where transportation improvements are built up from existing conditions to meet both project and system objectives. While the goal of every project should be to meet the requirements of design standards, criteria, and processes, under PBPD, solutions may be considered that deviate from design standards or may only provide incremental improvements of some of the deficiencies. As long as safety is not compromised, projects can be designed which make incremental improvements for lower costs than a "perfectly" designed project. Under PBPD, technical transportation studies and stakeholder input are used to identify the transportation needs. This process is described in the following section.

1.5 METHODOLOGY FOR IDENTIFYING NEED ELEMENTS

Primary and secondary transportation needs within the Segment II and III study area were identified through technical studies, as well as stakeholder input. Primary needs include those which will be addressed as part of this project, and secondary needs are those which may or may not be addressed with the project. Technical studies provide important data that can be used to identify transportation needs (such as traffic and crash data), and community input is vital to understanding how individual communities prioritize transportation needs in conjunction with

community goals and objectives. The process undertaken in identifying the transportation needs in Segments II and III is detailed in following sections.

1.5.1 Technical Studies

Technical studies were performed to quantify the existing traffic conditions on roadways throughout Segments II and III. The data collected for the study area included Certified Traffic for key roadways, Level of Service (LOS) for major intersections within the study area, and historical crash data for key roadway segments and intersections. These data will be utilized in the identification of transportation needs and will be used to confirm areas with safety and congestion issues that are identified by stakeholders through the Public Involvement Process described in Section 1.5.2. The transportation data and studies which were performed for the ANCOR/SR 32 Hill Area are described in the following sections.

1.5.1.1 Certified Traffic

Stantec developed Certified Traffic volumes for Existing conditions (2015), No Build Opening Year (2022), and No Build Design Year (2042) traffic for Segments II and III. Existing conditions were established by collecting 24-hour turning movement counts (and pedestrian counts) at intersections. These data were used to establish the baseline and future No-Build traffic forecasts. Future traffic volumes were estimated using the Ohio-Kentucky-Indiana Regional Council of Governments (OKI) and Miami Valley Regional Planning Commission (MVRPC) Travel Demand Model Version 8.0. OKI modeling staff ran the 2010 Base Year and 2040 Existing plus Committed (E + C) model scenarios and provided Stantec with the loaded network files. The Ohio Department of Transportation's (ODOT) certified traffic workbook was used to develop the Certified Traffic volumes. The Certified Traffic volumes were approved by ODOT on June 6, 2016. The ODOT Certified Traffic plates are provided in **Attachment A-1**.

1.5.1.2 Crash Data

Crash data for years 2013 through 2015 were obtained from ODOT for major intersections and roadway segments in Segments II and III. ODOT performed an initial screening of the study area roadway network to identify high-hazard locations in March 2016. For those locations, the crash data was mapped using ODOT's Geographic Information Systems (GIS) Crash Analysis Tool (GCAT) and analyzed using ODOT's Crash Analysis Module (CAM) Tool to determine the types of crashes, the severity of the crash, and contributing factors (hour, day, light conditions, road conditions, etc.). For other intersections and roadway segments not identified as high hazard locations, crash records were pulled and the number of crashes was documented. An in depth analysis was only performed if a safety concern was identified through the Focus Area Workshops and/or online interactive survey. The ODOT high hazard initial screening map and crash data are provided in **Attachment A-2**.

1.5.1.1 Highway Capacity Software (HCS)

Highway Capacity Software 2010 (HCS 2010), which implements the *Highway Capacity Manual* (HCM 2010) procedures, was used to evaluate major intersection, freeway segment, and ramp junction operations. For the intersection analysis, the overall intersection operations, capacities of individual movements, and the potential for queue spill back from left turn lanes that impact the operations of adjacent through lanes were evaluated. At signalized intersections, existing signal

timing was used. The timing was obtained from field observations when the turning movement count data was collected.

The level-of-service (LOS) analysis was completed for the 2015 existing, 2022 No Build opening year, and 2042 No Build design year for both the AM and PM peak hours. For the 2022 No Build opening year and 2042 No Build design year, the worst east/west approach was balanced with the worst north/south approach per the ODOT methodology. Based on the results of the HCS analysis, a determination of whether improvements are needed was made. The need for improvements were identified for existing conditions (2015), No Build opening year (2022), and No Build design year (2042), and placed into one of three categories: "no intersection improvements are required", "operational and minor intersection improvements are required", or "major capacity improvements are required".

For the purposes of this analysis, "no intersection improvements are required" means that the overall intersection level-of-service is 'E' or better, that all movements have volume to capacity (v/c) ratio of less than 1.00, and that all 95th percentile queue lengths are contained within the length of the left turn lane. "Operational or minor intersection improvements are required" means that the overall intersection level-of-service is 'E' or better, but at least one movement has a v/c ratio between 1.00 and 1.20, or at least one left turn lane has a 95th percentile queue length greater than the length of the left turn lane. "Major capacity improvements are required" means that the overall intersection level-of-service is 'F' or at least one movement has a v/c ratio greater than 1.20. The results of the HCS Analyses are provided in **Attachment A-3**.

1.5.1.2 Travel Time Data

Travel time data was pulled from ODOT's INRIX system for weekdays from September 12, 2016 through October 21, 2016 to determine locations within the study area where the AM and PM peak-hour travel time increased compared to off-peak travel times. An increase of 20% or less was considered to be normal operating speeds. For increases beyond the normal operating speeds, the reduction in operating speeds was partitioned in increments of 20% to demonstrate the severity of the reduction. The results of the Travel Time Analysis are provided in **Attachment A-4**.

1.5.1.3 Acyclica Data

Acylica Origin-Destination (O-D) sensors were placed at eight locations to determine travel patterns within the study area. These eight locations are:

1. SR 32/Bach-Buxton Road
2. SR 32/Clough Pike
3. US 50/Newtown Road
4. Red Bank Road/Wooster Road
5. Red Bank Road/Madison Road
6. Beechmont Road/Elstun Road
7. Linwood Avenue/Herchel Avenue
8. US 50/Taft Road

Average travel patterns in the middle of the work week (Tuesday – Thursday) were reviewed (October 2016). The review was focused on commuters travelling westbound from east of I-275

into the study area during the AM peak period, and commuters travelling eastbound from the study area to east of I-275 during the PM peak period. Using the SR 32/Bach-Buxton O-D sensor as the origin for the westbound commute and the destination for the eastbound commute, travel pattern trends were established. **Table 1** shows data for the westbound commute and **Table 2** shows data for the eastbound commute:

Table 1: Percent Trips Originating from SR 32/Bach-Buxton

Time Period	SR 32 / Clough Pike	US 50 / Newtown Rd	Red Bank Rd / Wooster Rd	Red Bank Rd / Madison Rd	Beechmont Rd / Elstun Rd	Linwood Ave / Herschel Ave	US 50 / Taft Rd
AM Peak Distribution - WB	18.8%	40.9%	2.8%	20.6%	2.6%	5.3%	9.1%
Off-Peak Distribution - WB	18.3%	38.6%	4.4%	12.7%	4.4%	11.1%	10.6%
Overall - WB	18.3%	38.9%	4.2%	13.8%	4.1%	10.3%	10.4%

Table 2: Percent Trips Going to SR 32/Bach-Buxton

Time Period	SR 32 / Clough Pike	US 50 / Newtown Rd	Red Bank Rd / Wooster Rd	Red Bank Rd / Madison Rd	Beechmont Rd / Elstun Rd	Linwood Ave / Herschel Ave	US 50 / Taft Rd
PM Peak Distribution - EB	18.9%	35.9%	3.2%	13.3%	2.7%	10.2%	15.8%
Off-Peak Distribution - EB	19.5%	38.0%	4.1%	13.4%	4.4%	11.9%	8.7%
Overall - EB	19.4%	37.7%	4.0%	13.4%	4.2%	11.7%	9.7%

As shown in **Table 1**, the US 50/Newtown Road (40.9%), Red Bank Road/Madison Road (20.6%), and SR 32/Clough Pike (18.8%) locations have the highest percentage of vehicles originating from SR 32/Bach-Buxton in the morning peak. As shown in **Table 2**, the US 50/Newtown Road (35.9%), SR 32/Clough Pike (18.9%), and US 50/Taft Road (15.8%) locations have the highest percentage of vehicles traveling to SR 32/Bach-Buxton in the afternoon peak. This data demonstrates that during morning hours, most westbound vehicles travel through the study area toward I-71 via Red Bank Road, and during afternoon hours, most eastbound vehicles travel through the study area from downtown via US 50.

The same exercise was performed at the SR 32/Clough Pike and US 50/Newtown Road locations, which had the highest percentage traveling to/from the SR 32/Bach-Buxton location. **Table 3** shows the westbound commute from SR 32/Clough Pike, **Table 4** shows the eastbound commute from SR 32/Clough Pike, **Table 5** shows the westbound commute from US 50/Newtown Road, **Table 6** shows the eastbound commute from US 50/Newtown Road.

Table 3: Percent Trips Originating from SR 32/Clough Pike

Time Period	SR 32 / Clough Pike	US 50 / Newtown Rd	Red Bank Rd / Wooster Rd	Red Bank Rd / Madison Rd	Beechmont Rd / Elstun Rd	Linwood Ave / Herschel Ave	US 50 / Taft Rd
AM Peak Distribution - WB	2.2%	1.8%	15.6%	11.3%	4.6%	22.2%	42.3%
Off-Peak Distribution - WB	4.5%	5.1%	15.6%	10.8%	10.6%	26.1%	27.5%
Overall - WB	4.2%	4.6%	15.6%	10.8%	9.7%	25.5%	29.6%

Table 4: Percent Trips Going to SR 32/Clough Pike

Time Period	SR 32 / Clough Pike	US 50 / Newtown Rd	Red Bank Rd / Wooster Rd	Red Bank Rd / Madison Rd	Beechmont Rd / Elstun Rd	Linwood Ave / Herschel Ave	US 50 / Taft Rd
PM Peak Distribution - EB	3.0%	4.3%	8.5%	7.7%	10.3%	26.8%	39.4%
Off-Peak Distribution - EB	9.8%	7.1%	8.5%	8.6%	17.1%	24.4%	24.5%
Overall - EB	8.8%	6.7%	8.5%	8.4%	16.2%	24.7%	26.6%

As shown in **Table 3** and **Table 4**, most traffic interacts with the US 50/Taft Road location, indicating commutes to/from downtown. The peak-hour distribution to the US 50/Taft Road site is about 55% higher compared to off-peak hours.

Table 5: Percent Trips Originating from US 50/Newtown Road

Time Period	SR 32 / Clough Pike	US 50 / Newtown Rd	Red Bank Rd / Wooster Rd	Red Bank Rd / Madison Rd	Beechmont Rd / Elstun Rd	Linwood Ave / Herschel Ave	US 50 / Taft Rd
AM Peak Distribution - WB	4.1%	1.7%	7.4%	51.2%	0.7%	1.5%	33.3%
Off-Peak Distribution - WB	13.8%	7.1%	8.4%	38.5%	5.1%	4.8%	22.3%
Overall - WB	12.4%	6.3%	8.3%	40.3%	4.4%	4.3%	23.9%

Table 6: Percent Trips Going to US 50/Newtown Road

Time Period	SR 32 / Clough Pike	US 50 / Newtown Rd	Red Bank Rd / Wooster Rd	Red Bank Rd / Madison Rd	Beechmont Rd / Elstun Rd	Linwood Ave / Herschel Ave	US 50 / Taft Rd
PM Peak Distribution - EB	6.2%	4.2%	11.3%	36.8%	2.6%	3.6%	35.3%
Off-Peak Distribution - EB	18.1%	6.8%	10.4%	32.8%	5.4%	4.4%	22.0%
Overall - EB	16.4%	6.5%	10.5%	33.4%	5.0%	4.3%	23.9%

As shown in **Table 5** and **Table 6**, most traffic interacts with the Red Bank Road/Madison Road and US 50/Taft Road locations, indicating commutes to downtown (to the south) and I-71 (to the north). The peak-hour distribution to those two sites is about 35% higher compared to off-peak hours.

1.5.1.4 Geometric Data

A variety of parameters were investigated to identify geometric deficiencies within the existing roadway network. Horizontal and vertical alignments were reviewed for major roadway segments and through major intersections. Additionally, stopping sight distance and intersection sight distance were reviewed at all major intersections under study. The methods of investigation and the parameters used to identify deficiencies are discussed below.

All state and federal routes were assigned a design speed equal to the posted speed limit plus 5 miles per hour (mph), unless a lower design speed is documented in existing plans. Design speeds assigned for all other roadways match the posted speed limit. The 2016 edition of ODOT's *Location & Design, Volume 1* (*L&D, Vol. 1*) serves as the basis for design standards.

Horizontal Geometry

Three parameters were used to define deficient horizontal geometry for all roadways analyzed: maximum centerline deflection with a horizontal curve, maximum degree of curvature, and the corresponding maximum superelevation. Maximum allowable deflections can be found in *L&D, Vol. 1, Figure 202-1*; maximum allowable degrees of curvature are tabulated for different design speeds and roadway types in *L&D, Vol. 1, Figures 202-7 through 202-10*. The corresponding maximum superelevations are also shown on these figures.

The data used to calculate these parameters were obtained from existing plans provided by ODOT or aerial mapping downloaded from the Ohio Statewide Imagery Program (OSIP) website. The maximum superelevation provided on several roadways in the study area is higher than the current standards for maximum superelevation. Roadways with too much superelevation have been noted within the individual focus area summaries in **Section 2.0**, but have not been identified as deficiencies.

Vertical Geometry

Four parameters were used to define deficient vertical geometry for all roadways analyzed: maximum grades, vertical grade breaks, and k-values for crest and sag vertical curves. The maximum allowable grades and critical length of grades were determined using *L&D, Vol. 1, Figures 203-1 and 203-1a*. The maximum allowable change in vertical alignment without a vertical curve is found in *L&D, Vol. 1, Figure 203-2*. The parameter used to document vertical curve deficiencies is a curve's k-value. Acceptable k-values are recorded in *L&D, Vol. 1, Figure 203-3* (crest vertical curves) and *L&D, Vol. 1, Figure 203-6* (sag vertical curves). Information used to calculate these parameters was obtained from existing plans provided by ODOT or calculated from aerial mapping obtained from OSIP data.

Sight Distance

Stopping sight distance and intersection sight distance were the last two parameters used to identify geometric deficiencies at intersections. Most of the intersections studied are controlled by traffic signals. Per *L&D, Vol. 1, Section 201.3.2*, "*sight distances are [generally] not needed for signalized intersections*" (ODOT, 2016). A deficiency was documented if any major road approach to an unsignalized intersection had a stopping sight distance less than the value found in *L&D, Vol. 1, Figure 201-1*. A deficiency was also documented if the intersection sight distance found in *L&D, Vol. 1, Figure 201-5* was not provided for any minor road approach. Signalized intersections were reviewed to determine whether obstructed sight distances could potentially prevent right-turn movements during red light phases. Any such locations have been noted. A field investigation was conducted on October 21, 2016 to review sight distances at all intersections in the study area.

A summary of the investigation results is provided in **Appendix A-5**; documented deficiencies (where identified) are noted in roadway segment/intersection discussions for each focus area in **Section 2.0**.

1.5.2 Stakeholder Input

The Public Involvement Plan that was developed and implemented as part of the Needs Analysis is included in **Attachment B-1.** Stakeholder input is an integral part of the PBPD process. Local communities identify problems to be addressed and then work with the transportation planners to define priority-driven results. The PBPD process considers the desires of the community and allows for flexibility in identifying solutions that better balance mobility needs with the needs of preserving and enhancing safety, community, and environmental resources. Gathering input from the public was a core element of this initiative and ODOT conducted a comprehensive community outreach effort to provide an opportunity for those who regularly travel through the area, including those who reside, work, or own businesses there, multiple opportunities to identify their transportation priorities, identify problem areas, and suggest improvements to be made. Stakeholder input was gathered through an Eastern Corridor Development Team (ECDT) meeting, a series of Focus Area Workshops, in addition to an online interactive survey. Notification for the public input opportunities utilized both traditional print and social media. The following sections describe these public outreach efforts in more detail.

1.5.2.1 Eastern Corridor Development Team (ECDT) Meeting

The Eastern Corridor Development Team (ECDT) includes the Eastern Corridor Partners[1], representatives, and leadership of the Eastern Corridor communities, business associations and organizations, environmental and historic groups, social and recreational organizations, and other stakeholder groups that have an interest in the Eastern Corridor Program. The ECDT comes together on an as-needed basis to review and discuss project details and progress updates and serves as a conduit through which the Eastern Corridor project team and stakeholders can exchange information, ideas, and feedback.

ODOT held an ECDT meeting on March 16, 2016 between 6:00 and 8:00 p.m. at the Miami Valley Christian Academy to provide an update on the status of the Eastern Corridor Program, with a focus on next steps for Segments II and III. In addition, ODOT representatives shared information with meeting attendees and gathered their feedback about the upcoming Segments II and III public engagement program to ensure maximum public engagement in the development of the transportation needs for Segments II and III. The materials that were distributed to meeting attendees and the meeting summary are included in **Attachment B-2**.

1.5.2.2 Focus Area Workshops

Segments II and III were divided into six focus areas: the US 50 Corridor Focus Area, the US 50/Red Bank Interchange Focus Area, the Linwood/Eastern Interchange Focus Area, the SR 125/SR 32 Focus Area, the Newtown Village Focus Area, and the ANCOR/SR 32 Hill Area, as shown on **Figure 1**. Workshops were held in each of the focus areas to gather public input regarding the community values and priorities and the transportation needs of the focus areas. The Focus Area Workshop locations and dates are identified in **Table 7.** Detailed summaries of the workshops are included in **Attachment B-3.**

Table 7: Focus Area Workshop Locations and Dates

Focus Area	Location	Date
US 50 Corridor Area	Mariemont High School, Mariemont	April 13, 2006
Newtown Village Area	Miami Valley Christian Academy, Newtown	April 14, 2016
ANCOR[2]/SR 32 Hill Area	Anderson Township Center, Anderson Township	April 27, 2016
Linwood/Eastern Interchange Area	Christ the King Church, Mt. Lookout	April 28, 2016
US 50/Red Bank Interchange Area	R.G. Cribbet Recreation Center, Fairfax	May 4, 2016
SR 125/SR 32 Area	Mt. Washington Recreation Center, Mt. Washington	May 5, 2016

1.5.2.3 Online Interactive Survey

An internet-based (online) survey was developed to solicit information from residents and commuters about transportation issues in Segments II and III of the Easter Corridor. This interactive

[1] The Eastern Corridor Program is administered by the Ohio Department of Transportation (ODOT), in cooperation with the Eastern Corridor Implementation Partners which include: Hamilton County Transportation Improvement District, Clermont County Transportation Improvement District, City of Cincinnati, Ohio-Kentucky-Indiana Regional Council of Governments, Southwest Ohio Regional Transit Authority, and Ohio Department of Transportation, District 8.

[2] ANCOR is named for the Air Nitrates Corporation (ANCOR), which was one of several manufacturing plants in this area originally owned by the Federal Government to provide support for World War I.

feedback tool was available for public input on the Eastern Corridor website (www.EasternCorridor.org) between March 15, 2016 and June 15, 2016. Presented as a survey with a supplemental mapping component, this tool allowed respondents to identify transportation priorities within Segments II and III, answer questions regarding the priorities they selected, and identify problem areas and locations for desired improvements on a Google-based map of the Study Area. A full discussion of the questions asked and feedback received is provided in the *Public Feedback Summary Report,* which is provided in **Attachment B-4**.

1.5.2.4 Public Notification Efforts

Notification for public input opportunities was conducted using multiple communications channels which included:

Traditional media relations: ODOT distributed news releases to Cincinnati-based print, radio, digital, and broadcast media on April 13, 2016, April 22, April 26, and May 3, 2016 which provided information on the Focus Area Workshops, as well as the online interactive survey. These releases were posted on ODOT's District 8 website, as well as the Eastern Corridor website.

Email notifications: Four announcements about the Focus Area Workshops and the online interactive survey were sent via email (eblasts) to more than 1,200 Eastern Corridor stakeholders between April 12 and May 3, 2016. Eastern Corridor stakeholders include regional and local community and business leaders, Eastern Corridor community and interest group representatives, resource agencies, representatives of environmental justice organizations, as well as individuals who have attended Eastern Corridor public meetings, past Eastern Corridor survey participants, and individuals who have signed up to receive Eastern Corridor Program updates.

Website and Social Media Postings: Announcements were posted about the Focus Area Workshops and online interactive survey on the ODOT District 8 and Eastern Corridor websites. In addition, numerous agencies and organizations throughout the Eastern Corridor area posted the announcements on their respective sites.

Social media networking: The Focus Area Workshops and online interactive survey were promoted on the Eastern Corridor Facebook site and through the Eastern Corridor's Twitter account between March and June, 2016. In addition, posts appeared on the Facebook and Twitter accounts of many community and government organizations.

Flyers: Flyers, which included information about both the Focus Area Workshops and the online feedback tool, were posted in high-traffic areas within the Study Area.

Networking: ODOT contacted by email and telephone, representatives of community councils located within or near the Study Area who were unable to attend the March 16 ECDT meeting. ODOT also met with several organizations to discuss the next steps for Segments II and III, including Sierra Club, Miami Group; Village of Mariemont; and Village of Newtown.

Additional details regarding the Notification Efforts for informing the public about the Focus Area Workshops and online interactive survey are provided in the *Public Open House Summary Report* which is included in **Attachment B-5**.

1.5.2.5 Public Open House

ODOT held a Public Open House on Thursday, March 9, 2017 to update the public on the Eastern Corridor Segments II and III Transportation Needs Analysis study and provide an opportunity for the public to provide comments on the needs identified for the six focus areas. Information shared at the meeting included updated traffic volume, travel time, congestion and crash data for Segments II and III. ODOT also shared feedback received from the public during the six Focus Area Workshops and the online interactive survey. A total of 99 people signed in at the meeting. Detailed information regarding the public meeting is included in **Attachment B-5**.

Community members were invited to share comments with the project team by completing a comment form distributed at the Open House, completing an online version of the comment form, or sending an email or letter to the project team members. A total of 42 comment forms were submitted to the project team and an additional seven individuals submitted comments by email. In addition, letters and detailed emails were received from the Sierra Club, the Mariemont Preservation Foundation, Anderson Township, and the Burger Farm and Garden Center. ODOT provided responses for each comment on a table provided in **Attachment B-5.** Separate response letters were sent to the Sierra Club, the Mariemont Preservation Foundation, Burger Farm and Garden Center, and Anderson Township which also are provided in **Attachment B-5**.

2.0 FOCUS AREA SUMMARIES

The following sections provide the Needs Analysis Summaries for each Focus Area based on a combination of technical studies and extensive public outreach efforts.

2.1 ANCOR/SR 32 HILL FOCUS AREA

The ANCOR/SR 32 Hill Focus Area extends from SR 32 in Newtown to the SR32/Bells Lane Intersection in Clermont County and includes the ANCOR/Broadwell Road Industrial area of Anderson Township. A detailed roadway map of the ANCOR/SR 32 Hill Focus Area is provided in **Appendix 1**.

2.1.1 Study Area Characteristics

This area has the largest undeveloped industrial zoned land in Hamilton County. The ANCOR Area has long been identified as the industrial center of Anderson Township, with a focus on job creation and economic growth (Meisner and Associates. 2013). In addition to the large industrial area which is situated north of SR 32 and east of Round Bottom Road, this area has environmentally sensitive areas, including the Little Miami River and environs, and wooded slopes. This focus area extends east to the SR 32/Bells Lane/Mt. Carmel-Tobasco Road intersections. The I-275 interchange and Eastgate Mall are approximately 0.8 and 1.4 miles west of the SR 32/Bells Lane/Mt. Carmel-Tobasco Road intersection. Planned and committed transportation projects included on ODOT's 2016-2019 Statewide Transportation Improvement Program (STIP) dated July 29, 2016, are shown in **Table 8**:

Table 8. ANCOR/SR 32 Hill Area Planned and Committed Projects

Project	Description	Construction Year
HAM/CLE-SR 32F- 2.50/0.00 (PID 86462)	Consolidate and manage access points to establish relocated SR 32 as a controlled access arterial roadway west of I-275, including coordination for accommodation of multi-modal	N/A
CLE-SR 32. 0.63-Bells Lane/Old-74 (PID 82553)	Upgrade SR 32 /Bells Lane and SR 32/Old SR 74 (west of I-275) intersections. South leg of SR 32/Old SR 74 intersection closed as part of Aicholtz Connector project (PID 82553)	2018
CLE-CR3-Aicholtz Road Connector (PID 82553)	This project will provide a new network connection from Mt. Carmel-Tabasco Road on Old State Route 74 approximately 7000 feet to Eastgate Boulevard.	2016

2.1.2 Community Attributes Identified in the Focus Area Workshop

Twenty-six participants from the area and surrounding communities attended the Focus Area Workshop. Workshop participants identified community attributes which are important to the ANCOR/SR 32 area and should be considered throughout the transportation planning process. These features include greenspace, country setting, parks, old forests, beautiful creeks (Little Dry Run), wildlife and flora which occur in the area. In addition, ANCOR is an area of potential economic development and job growth due to its significant industrial area. Focus group participants indicated that it is important to balance economic development and job creation with environmental protection. While the residents would like improved connectivity to the area to improve accessibility to the areas of potential development, it is important to consider environmental sustainability goals by encouraging transit, cycling, and walking.

2.1.3 Transportation Needs

Stakeholder Input: Transportation needs within the ANCOR/SR 32 Hill Focus Area were identified during the Focus Area Workshop and the online interactive survey. These comments, which focus on safety, congestion, mobility, and access issues within the area, are included in the Needs Analysis Table (see **Appendix 1**) and are summarized in following subsections for the primary roadway segments and intersections within the ANCOR/SR 32 Hill Focus Area.

Technical Studies: Technical data were collected for the roadway network within the ANCOR/SR 32 Hill Focus Area to identify areas of high crash rates, congestion, geometric deficiencies, and pedestrian usage. This information is provided for the major roadway sections and intersections within the ANCOR/SR 32 Hill Focus Area in the Needs Analysis Table provided in **Appendix 1** and summarized in the following sections.

2.1.3.1 Round Bottom Road/Broadwell Road Intersection

The Round Bottom Road/Broadwell Road Intersection is a three-leg, unsignalized intersection:

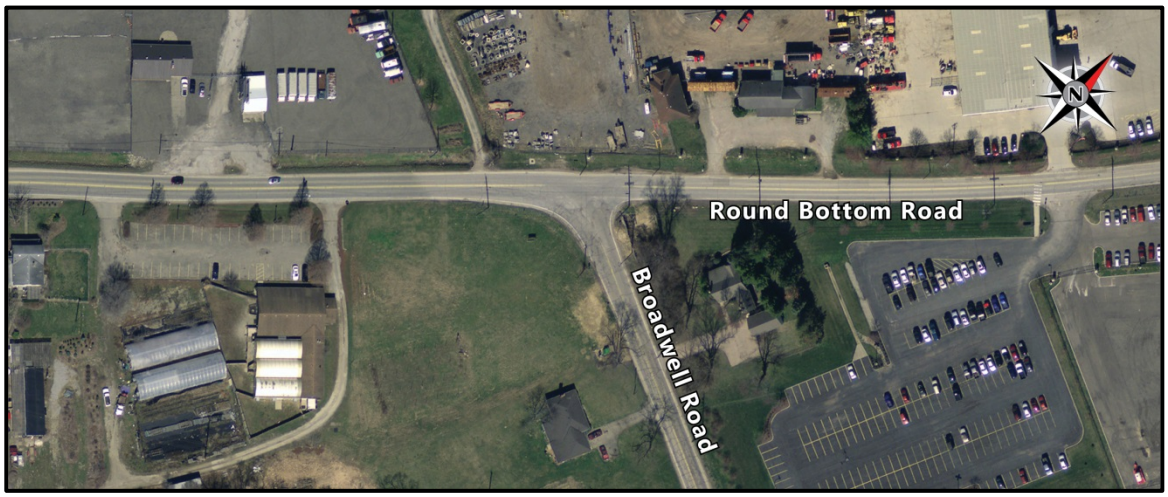


Figure 2. Round Bottom Road/Broadwell Road Intersection

Stakeholder Input: Three comments were provided for the Round Bottom Road/Broadwell Road intersection as follows:

- Broadwell Road is in poor condition and needs to be repaired
- A bike path is needed along Broadwell, which is too narrow for both bikes and cars
- An accessible transit stop is needed in this area

Crash Data: An ODOT crash screening did not identify this as a high-hazard intersection. Data indicates that one crash occurred at this intersection over a three-year period (2013-2015).

LOS Analysis: The HCS analysis indicates that the intersection currently operates at an acceptable LOS and will continue to operate at an acceptable LOS for the No Build opening year (2022) and No Build design year (2042) conditions. No intersection improvements are required.

Geometric Deficiencies: One crest vertical curve on Round Bottom Road has a substandard k-value for the design speed (45 mph) at this location. The actual k-value for Round Bottom Road through this intersection is 40; the required k-value is 61.

Pedestrian Data: No pedestrians were observed at the intersection during a 24-hour period recorded on December 2, 2015.

2.1.3.2 SR 32/Little Dry Run Road Intersection

The SR 32/Little Dry Run Road Intersection is a three-leg, signalized intersection:

Figure 3. SR 32/Little Dry Run Road Intersection

Stakeholder Input: The following comments address the SR 32/Little Dry Run Road intersection:

- Poor signal timing (5 comments)
- Need for a right-turn lane from eastbound SR 32 to Little Dry Run Road (1 comment)
- Traffic backups occur at the signal (2 comments)

One comment suggests that there are too many bicycles on SR 32 between Little Dry Run Road and Newtown, and that the pavement is too narrow for both bikes and cars. One comment cites the need for a sidewalk along Little Dry Run Road.

Crash Data: An ODOT crash screening did not identify this intersection as an area of high-hazard. Three crashes occurred at this intersection over a three-year period (2013-2015).

LOS Analysis: The HCS analysis indicates that the eastbound through/right-turn movement is currently failing during the PM peak-hour with a v/c ratio of 1.06. This problem is only exacerbated in the No Build opening year (2022) and No Build design year (2042) conditions. During the AM peak-hour in the opening and design years, the westbound through-movement is failing with v/c ratios of 1.05 and 1.06, respectively. It is anticipated that operational or minor intersection improvements are required for the existing, No Build opening year conditions and No Build design year conditions.

To supplement the HCS analysis, a queue study was conducted for the westbound approach during the AM peak period and the eastbound approach during the PM peak period. The number of cars in each queue was recorded at the end of the green cycle, beginning 15 minutes prior to the peak hour and ending 15 minutes after the peak hour. The number of cars was translated to a length by assuming a queue length of 25 feet per vehicle. During the AM peak period the maximum queue extended 475 feet and during the PM peak period the maximum queue extended 800 feet. The recorded queues during the AM peak period are shown in **Figure 4** and the recorded queues during the PM peak period are shown in **Figure 5**.

Westbound SR 32 at Little Dry Run Road (AM Peak)

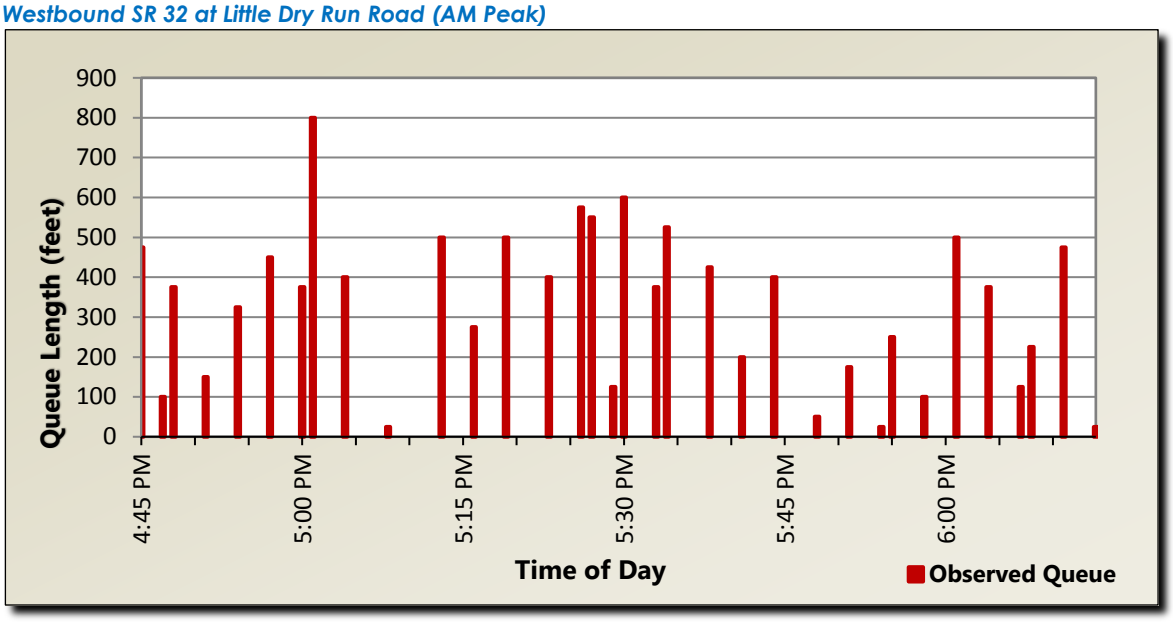


Figure 4. Westbound SR 32 AM Peak Period Queues at Little Dry Run Road

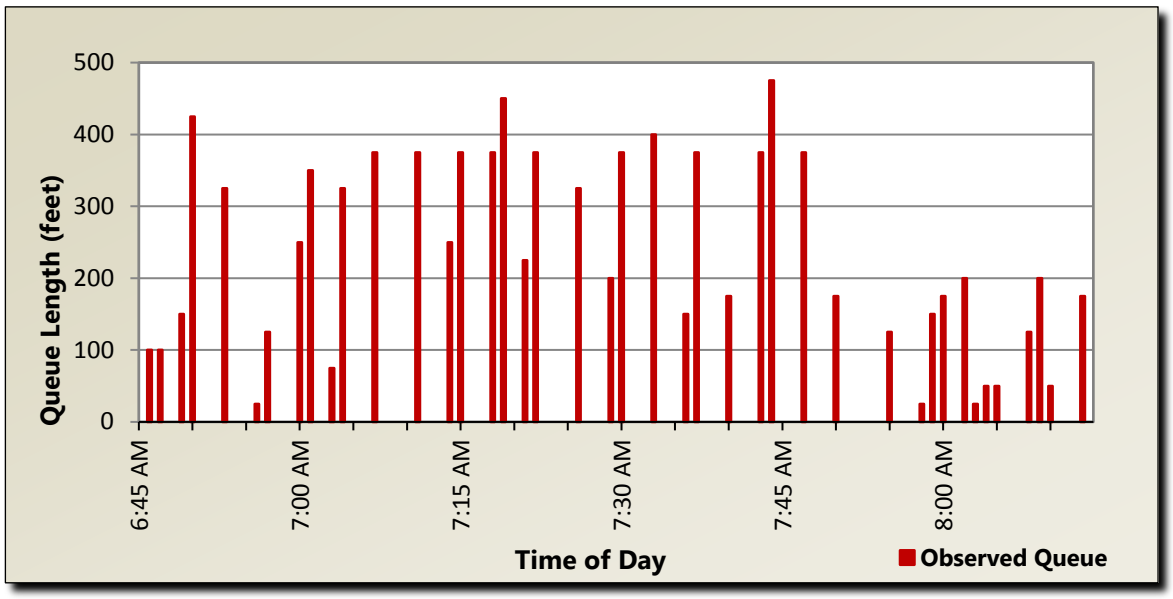


Figure 5: Eastbound SR 32 PM Peak Period Queues at Little Dry Run Road

Geometric Data: Field investigation of this intersection found poor stopping sight distance for northbound Little Dry Run Road due to the combined horizontal/vertical curve at the SR 32 approach.

Pedestrian Data: One pedestrian was observed at the intersection during a 24-hour period recorded on December 9, 2015.

2.1.3.3 SR 32: Little Dry Run Road to Eight Mile Road

The segment of SR 32 from Little Dry Run Road to Eight Mile Road is a two-lane undivided minor arterial measuring approximately 1.53 miles. There are multiple points of access to industrial land uses and commercial areas throughout this section. This segment has two-foot, paved roadway shoulders and no sidewalks. The posted speed limit through this section is 50 mph.

Stakeholder Input: Thirty-two (32) comments address congestion and safety on SR 32 from Little Dry Run Road to Eight Mile Road and 11 comments identify access concerns in this area. Representative comments include:

- Congestion is an issue (18 comments)
- Heavy truck traffic from Valley Asphalt traveling westbound (AM peak) is a major reason for the congestion issue (2 comments)
- Additional lanes needed to enable automobiles to pass slow moving truck traffic and to accommodate turning traffic (7 comments)
- Traffic congestion and narrow shoulders give motorists little room to maneuver and avoid crashes (4 comments)
- Frequent crashes (1 comment)
- Difficulty accessing businesses along SR 32 (3 comments)
- Need turn lane into Burger Farm and Garden Center (2 comments)

- Need access road to support development in this area, including access road for trucks in the Broadwell/Round Bottom area (5 comments)
- Need traffic signal at Hickory Creek Road (1 comment)

Nine (9) comments indicate that a bike path is needed to connect Eastgate with Newtown. Two (2) comments identified the need for a sidewalk along Little Dry Run Road. Ten (10) comments identified the need for public transit (bus or rail) in this area.

Crash Data: An ODOT crash screening identified an area of SR 32 between Hickory Creek Drive and Eight Mile Road as a high-hazard location. A detailed crash analysis of the entire segment of SR 32 from Little Dry Run Road to Eight Mile Road was therefore completed.

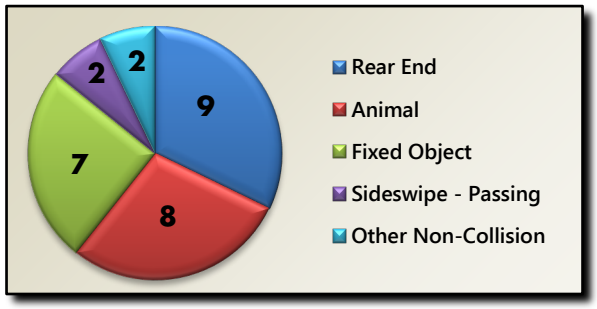


Figure 6. Frequency of Crashes by Crash Type SR 32: Little Dry Run Road to Eight Mile Road

As illustrated in **Figure 6**, there were 28 total crashes in this roadway section during the three-year analysis period (2013-2015). Rear-end, animal, and fixed object crashes represent 85% of the total crashes. Eleven of the 28 total crashes on the segment (40%) occurred in the high-hazard area.

Three rear-end crashes occurred near the Hickory Creek Drive intersection, where westbound vehicles were struck while waiting to make the left-turn to southbound Hickory Creek Drive (there is no designated left-turn lane for this movement). Another three rear-end crashes involving westbound vehicles occurred further east of this location (all of which occurred in wet conditions during the AM peak period); two of these three rear-end crashes involved vehicles slowing for a school bus making a passenger stop. A plot of all 28 crashes is included in **Attachment A-2**.

LOS Analysis: No level of service analysis was conducted for this segment; however, travel time data indicates a 75% increase in westbound travel times during the AM peak-hour compared to the off-peak travel time, indicating the AM peak-hour congestion

Geometric Data: Six vertical curves in this segment have deficient k-values. The standard k-values for crest and sag vertical curves at a design speed of 60 mph are 151 and 136, respectively. The deficient curves (k-values) along this segment are as follows:

- Crest vertical curve at Meineke Electronics (102)
- Sag vertical curves on either side of Dry Run (130, 86)
- Crest vertical curve at Hickory Creek Drive (64)
- Sag vertical curve between Hickory Creek Drive and the base of the hill (127)
- Sag vertical curve at the base of the SR 32 hill (74)

Pedestrian Data: No pedestrian data is available for this segment.

2.1.3.4 SR 32/Eight Mile Road Intersection

The SR 32/Eight Mile Road Intersection is a three-leg, unsignalized intersection:

Figure 7: SR 32/Eight Mile Road Intersection

Stakeholder Input: Forty (40) comments address roadway concerns at the SR 32/Eight Mile Road intersection. Representative comments are:

- Difficult to make left-turns from Eight Mile Road onto westbound SR 32, particularly during periods of heavy congestion (8 comments)
- Dangerous intersection (10 comments)
- Frequent accidents (6 comments)
- The continuous right-turn lane from Eight Mile Road onto eastbound SR 32 is not functioning properly due to driver hesitancy (2 comments)
- A traffic signal is needed at this intersection (4 comments)
- Re-route SR 32 (1comment)
- Poor intersection alignment (1 comment)
- Wider intersection needed (2 comments)
- The intersection is unsafe; redesign the intersection (1 comment)
- Weaving traffic on the eastbound approach is a concern (2 comments)

One comment cites a need for pedestrian access at Eight Mile Road and along SR 32, and another comment cites a need for bicycle lanes along SR 32. A third comment cites a need for rail access in this area.

Crash Data: Over the three-year period from 2013 to 2015, there were a total of 14 crashes, of which the most common collision was an angle collision. The type and frequency of crashes at the intersection are shown in **Figure 8**. Of the 14 total crashes, 11 (80%) of the crashes occurred as a result of vehicles turning to or from Eight Mile Road. Causal factors for these turn-related crashes are restricted sight distance, excessive speed, and inadequate traffic control. The five angle crashes and the three fixed-object crashes all involved vehicles making a westbound to southbound left turn onto Eight Mile Road and striking the guardrail on the west side of the road. A plot of all 14 crashes is included in **Attachment A-2.**

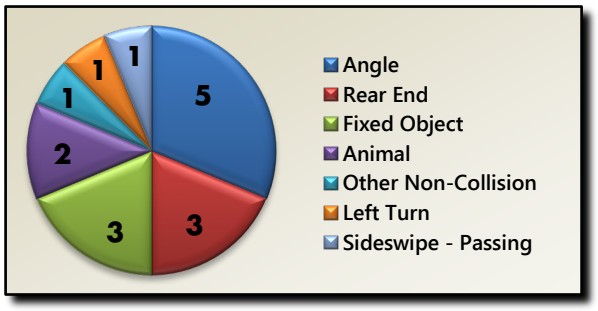


Figure 8. Frequency of Crashes by Crash Type SR 32/Eight Mile Road Intersection

LOS Analysis: The HCS analysis indicates that traffic on Eight Mile Road waiting to enter SR 32 is LOS F during both the AM and PM peak hour for the existing, No Build opening year (2022), and No Build design year (2042) conditions. During the AM peak-hour, the northbound left turn movement has a v/c ratio of 1.07 in the opening year and is expected to increase to 1.39 by the design year. During the PM peak-hour, the northbound left turn movement has a v/c ratio of 1.72 and the northbound right turn movement has a v/c ratio of 1.15 in the opening year. They are expected to increase to 3.76 and 1.41 by the design year. It is anticipated that operational or minor intersection improvements are required for the existing conditions, and that major capacity improvements will be required for the No Build opening year and No Build design year conditions.

Geometric Data: Deficient stopping sight distances and intersection sight distances were identified at this intersection. The required stopping sight distance for a design speed of 55 mph is 495 feet; however, the stopping sight distance is 350 feet for eastbound vehicles and 415 feet for westbound vehicles. The intersection sight distance for northbound vehicles on Eight Mile Road is 300 feet for vehicles making right turns onto SR 32 and 310 feet for vehicles making left turns. The required intersection sight distance is 610 feet for left-turning vehicles, and 530 feet for right-turning vehicles.

Eight Mile Road exceeds the maximum grade criterion at this intersection, which is 10% for urban arterial at 35 mph (*Location & Design Volume 1, Figure 203-1, ODOT 2016)*. This criterion is exceeded by the right-turn lane on northbound Eight Mile Road; right-turning vehicles on northbound Eight Mile Road experience grades of nearly 15%, as measured in the field.

Pedestrian Data: No pedestrians were observed at the intersection during a 24-hour period recorded on November 19, 2015.

2.1.3.5 SR 32: Eight Mile Road to Beechwood Road

The segment of SR 32 between Eight Mile Road and Beechwood Road is 0.68 miles in length. Just west of Eight Mile Road, SR 32 widens from a two-lane facility to a four-lane divided highway. Both sections of SR 32 have narrow 2-foot shoulders. At Moran Road, these sections merge into a four-lane highway. Throughout this section, the terrain becomes increasingly steep and SR 32 gradually increases in elevation from 540 feet in Newtown to 620 feet at Eight Mile Road and 870 feet at Beechwood Road.

Stakeholder Input: Sixteen (16) comments address roadway issues along SR 32 between Eight Mile and Beechwood, of which 14 comments concern safety issues. Representative comments include:

- Safety concern on SR 32 Hill due to inconsistent vehicle speeds (4 comments)
- Dangerous area with frequent accidents due to narrow shoulders (4 comments)
- Realign SR 32 in Hill area (3 comments)
- Improve signage to restrict overweight trucks on SR 32 Hill (1 comment)
- Flatten grade of SR 32 Hill to reduce jake brake and other traffic noise (1 comment)
- The drop from two lanes to one (each way) is dangerous/causes congestion (2 comments)
- Access point at SR 32 and Moran Road should be removed (1 comment)
- Road needs to be repaired (1 comment)
- Truck traffic slows on the hill causing congestion/safety issue (1 comment)

Thirteen (13) comments cite a need for a bike lane/path along SR 32 in the area; narrow lanes/shoulders and traffic speeds create unsafe conditions for cyclists. Two (2) comments recommend that a sidewalk be installed along SR 32.

Four (4) comments address public transit:

- Need accessible transit stop (2 comments)
- Need light rail service (1 comment)
- Expanded public transit will decrease vehicular traffic in this area and provide greater access for new jobs in the ANCOR area (1 comment)

Crash Data: The sub- segment of SR 32 from Eight Mile Road to the merge (the point at which SR 32 becomes undivided) was identified as a high hazard area in ODOT's crash screening of the Segments II and III roadway network. Because a sub-segment was identified, a detailed crash analysis of the entire segment from Eight Mile Road to Beechwood Road was completed.

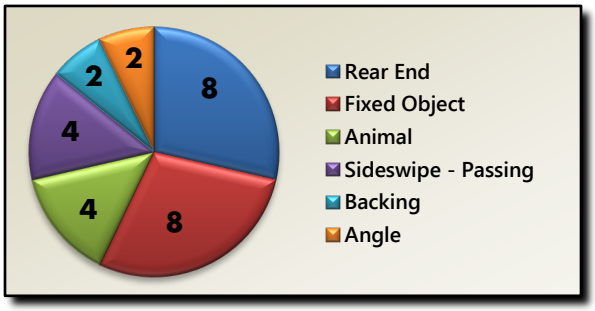


Figure 9. Frequency of Crashes by Crash Type SR 32: Eight Mile Road to Beechwood Road

As illustrated in **Figure 9**, there were 28 total crashes in this roadway section during the three-year period between 2013 and 2015. Rear-end and fixed object crashes represent 60% of the total crashes. Of the 28 total crashes on the segment, 16 (60%) occurred in the high hazard section. Within the high hazard segment, half of the crashes occurred on a curve with grade. The most common crash type was fixed object. Potential causal factors include: excessive speed, slippery pavement, inadequate geometry, or inadequate delineation. A curve analysis should be completed to ensure it meets design standards. For a plot of all 28 crashes, please refer to **Attachment A-2**.

LOS Data: No level of service analysis was conducted for this segment; however, the travel time data shows no significant increase in travel time during the peak hours compared to off-peak hours.

Geometric Data: Several deficiencies were identified for this segment of SR 32. The maximum horizontal degree of curvature for a speed of 55 mph is 5˚30'. Three horizontal curves on eastbound SR 32 exceed this maximum value. The degrees of curvature for these curves are 12˚ 08'49", 7˚50'06", and 7˚24'10". The 7˚50'06" curve has a deficient superelevation rate (0.135 ft/ft compared to 0.062 ft/ft design). The westbound portion of this divided section has one deficient horizontal curve with a curvature of 6˚00".

The maximum vertical grade for 55 mph is 8%. Though the maximum grade for this segment meets the standard design criteria, the length of this segment's 8% grade (1750 feet) exceeds the critical length of grade (600 feet), and is therefore deficient.

Furthermore, a deficient crest vertical curve with a k-value of 66 was identified at the top of the SR 32 hill. The minimum k-value for crest vertical curve at 55 mph is 114.

Pedestrian Data: No pedestrian data is available for this segment.

2.1.3.6 SR 32/Old SR 74/Beechwood Intersection

The SR 32/Old SR 74/Beechwood Road intersection is a four-leg, signalized intersection:

Figure 10: SR 32/Old SR 74/Beechwood Road Intersection

Stakeholder Input: Five (5) comments identify roadway issues at this Intersection. Representative comments include:

- Poor signal timing is an issue (2 comments)
- Signal should be replaced with combination of exit ramps and overpasses (1 comment)
- Dedicated right-turn lane on westbound SR 32 is needed (1 comment)

One public transit comment cited a need for a bus shelter in this area.

Crash Data: Over a three-year period (2013-2015), 21 crashes occurred at this intersection. Rear-end and angle crashes accounted for about 60% of these crashes. The frequency of crashes by crash type is shown on **Figure 11**. See **Attachment A-2** for a plot of all 21 crashes.

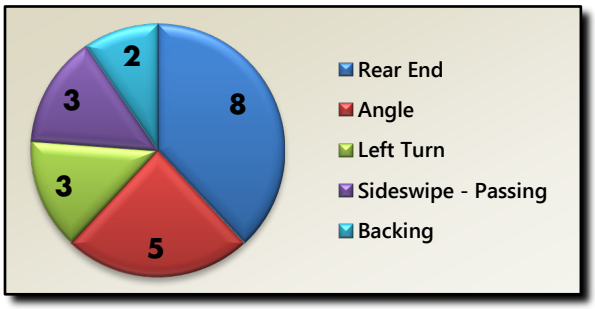


Figure 11: Frequency of Crashes by Crash Type SR 32/Old SR 74/Beechwood Road Intersection

Five of the eight rear-end crashes occurred in 2013, and four occurred at 11:00 AM. Given that they occurred in the middle of the day, sun blindness was not a contributing cause. Other than the observations described above, there were no correlation between the crash data and a specific contributing cause for rear-end crashes.

Three of the five angle crashes occurred in the rain. Of the three crashes that occurred in the rain, two were caused by motorists running red lights, indicating that there may be slick pavement or inadequate clearance intervals at the intersection. Given the infrequent amount of angle crashes, it is difficult to correlate a specific deficiency as a contributing cause for angle crashes.

LOS Data: The HCS analysis indicates that the eastbound left turn movement is currently failing during the PM peak-hour with a v/c ratio of 1.01. In the No Build opening year (2022) and No Build design year (2042) conditions, the failure is corrected and v/c ratio is less than 1.0 due to the ODOT methodology of balancing delays for future intersection analyses. This indicates that the failure of the eastbound left turn movement is likely due to a signal timing issue. It is anticipated that operational or minor intersection improvements are required for the existing, No Build opening year conditions and No Build design year conditions.

Geometric Data: No geometric deficiencies were identified at this intersection.

Pedestrian Data: One pedestrian was observed at the intersection during a 24-hour period recorded on November 24, 2015.

2.1.3.7 SR 32: Beechwood Road to Bells Lane/Old SR 74

This segment of SR 32 is a four-lane divided highway with grass median.

Stakeholder Input: Of the 16 comments submitted for this segment, 12 identify congestion as a concern (high volume of local traffic mixing with commuting traffic through the commercial area). Representative comments include:

- Eliminate traffic signals/limit access on SR 32 from Eight Mile Road to US 68 (1 comment)
- Provide limited access route for commuters (1 comment)
- Improve signal timing (1 comment)

Five (5) comments identify a need for a bike path, bike lane, or shared-use markings ("sharrows") along SR 32 to improve safety for cyclists.

One pedestrian comment recommended that a sidewalk be installed in this area to improve safety for pedestrians along SR 32.

Thirteen public transit comments were provided which identified the following needs:

- A park and ride lot (2 comments)
- A bus stop/shelter (2 comments)
- A transit stop for rail (4 comments)
- Improved bus service and bus rapid transit (BRT) (4 comments)
- Public transportation in Clermont County (1 comment)

Crash Data: ODOT's crash screening did not identify this segment as an area of high hazard. Crash data indicates that seven crashes occurred over the three-year period (2013 – 2015).

LOS Analysis: No level of service analysis was conducted for this segment; however, the travel time data indicates a 35% increase in the westbound travel time during the PM peak-hour compared to the off-peak travel time indicating congestion during the PM peak-hour.

Geometric Data: No geometric deficiencies were identified along this segment.

Pedestrian Data: No pedestrian data is available for this intersection.

2.1.3.8 SR 32/Mt. Carmel-Tobasco Road/Bells Lane Intersection

The SR 32 and Mt. Carmel-Tobasco/Bells Lane intersection is a four-leg, signalized intersection, as shown in **Figure 12**:

Figure 12: SR 32/Mt. Carmel-Tobasco Road/Bells Lane Intersection

Stakeholder Input: Two comments were submitted regarding roadway issues at this intersection:

- Widen intersection and erect barrier to allow traffic to bypass the traffic signal en route to northbound I-275 ramp (1 comment)
- Turning left from Bells Lane to eastbound SR 32 is not safe (1 comment)

One comment identifies a need for sidewalk/crosswalk at this location to accommodate high pedestrian traffic (SR 32 lies between apartment housing and Kroger).

Eleven comments address public transit:

- Provide park-and-ride facility (2 comments)
- Expand bus service and improve express service (5 comments)
- Provide accessible transit stop (4 comments)

Crash Data: ODOT's crash screening did not identify this intersection as an area of high hazard. Crash data indicates that 19 crashes occurred over the three-year period (2013 – 2015).

LOS Analysis: The HCS analysis indicates that the westbound left turn movement will fail during the PM peak-hour during the No Build opening year (2022) and No Build design year (2042) conditions. For the opening year, the v/c ratio is 1.14 and by the design year the v/c ratio increases to 1.23. No intersection improvements are required for the exiting conditions, but it is anticipated that operational or minor intersection improvements are required for the No Build opening year conditions and that major capacity improvements will be required for the No Build design year conditions.

Geometric Data: No geometric deficiencies were identified at this intersection.

Pedestrian Data: Thirty-two (32) pedestrians were observed at this intersection during a 24-hour period recorded on November 24, 2015. This is significantly more pedestrians observed than at any other intersection in the ANCOR/SR 32 Hill Focus Area; during the same period, no other intersection had more than one pedestrian.

2.1.4 ANCOR/SR 32 Hill Focus Area Needs Analysis

Based on the results of the technical studies, as well as the extensive public input received from the Focus Area Workshops, online interactive survey, and other public outreach efforts, the primary and secondary needs of the transportation network within the ANCOR/SR Hill Focus Area were identified (primary needs are needs that *will* be addressed by this project; secondary needs are needs that *may* be addressed by this project). The input used in the needs analysis is included in **Appendix 1**. The primary and secondary needs are presented in **Table 9** below:

Table 9: ANCOR/SR 32 Hill Focus Area Needs Analysis

Primary Needs	Secondary Needs
ANCOR	
Improve freight connections between ANCOR and SR 32/I-275 due to constraints on Mt. Carmel Road, Round Bottom Road, and SR 32 to support local economic development plans.	None
Round Bottom Road/Broadwell Road Intersection	
None	Address roadway grade deficiency
SR 32/Little Dry Run Road Intersection	
Address capacity issues on SR 32 and Little Dry Run Road	Address deficient sight distance on Little Dry Run Road approach to SR 32
SR 32: Little Dry Run Road to Eight Mile Road	

Primary Needs	Secondary Needs
• Address rear-end crashes on SR 32 related to left turns onto Hickory Creek Drive • Address westbound AM peak-hour delays • Address congestion issues due to slow-moving trucks and turning vehicles.	Address roadway grade deficiencies at six locations
SR 32/Eight Mile Road Intersection	
• Address capacity issues on Eight Mile Road. • Address safety issues for vehicles turning at Eight Mile Road • Address deficient sight distance and roadway grade issues	None
SR 32: Eight Mile Road to Beechwood Road	
• Address safety issues on the SR 32 hill • Address roadway grade deficiencies on SR 32 hill to improve truck mobility • Address roadway curve deficiencies on SR 32 hill	None
SR 32/Beechwood Road Intersection	
• Address capacity issues on eastbound SR 32 and southbound Beechwood Road • Address safety issues at intersection	None
SR 32: Beechwood Road to Bells Lane	
Address westbound PM peak-hour delays	None
SR 32/Mt. Carmel-Tobasco Road/Bells Lane Intersection	
Address capacity issues for westbound left turn	None
Accommodate observed pedestrian traffic	

2.2 VILLAGE OF NEWTOWN FOCUS AREA

The Village of Newtown Focus Area extends from the western border of the Village of Newtown to Little Dry Run and includes the business district of Newtown. A detailed roadway map of the Village of Newtown Focus Area is included in **Appendix 2**.

2.2.1 Study Area Characteristics

The Village of Newtown features a neighborhood business district which extends along SR 32 from the western corporation limit to just east of intersection of SR 32 (Main Street) and Church Street and approximately one-third mile both north and south of the SR 32/Church Street intersection. The business district is pedestrian-friendly, having sidewalks along both sides of SR 32 through the business district. Land use to the east of the SR 32/Church Street intersection along SR 32 includes light manufacturing, commercial, institutional, and residential land uses. In addition, a major

element in this area is an active quarry on the north side of SR 32. This area includes a link to the Little Miami Bike Trail, in addition to the Little Miami Golf Center. There are no planned transportation projects for this focus area listed on ODOT's Statewide Transportation Improvement Program (STIP) for FY 2016-2019 dated July 29, 2016.

2.2.2 Community Attributes Identified in the Focus Area Workshop

Sixteen (16) participants from the area and surrounding communities attended the Focus Area Workshop. Workshop participants identified community attributes which are important to the Village of Newtown area and should be considered throughout the transportation planning process. These features include: the small town feel; the village's rich history of the Prehistoric Native Americans who lived in the Little Miami River Valley prior to the settlement of Newtown; the natural resources in the surrounding area including the Little Miami Valley, hills, and the Little Miami River; the diversity of wildlife; the walkability of the community; the quaint business district; the diversity of housing; and recreational features, including the Little Miami Bike Trail and Little Miami Golf Course.

2.2.3 Transportation Needs

Stakeholder Input: Input on transportation needs within the Village of Newtown Focus Area were solicited from those who attended the Focus Area Workshop and through the online interactive survey. Comments received – which focus on safety, congestion, mobility, and access issues – are included in the Needs Analysis Table (see **Appendix 2**) and are summarized in following sections.

Technical Studies: Technical data was collected for the roadway network within the Village of Newtown Focus Area to identify areas of high crash rates, congestion, geometric deficiencies, and pedestrian usage. This information is provided for the roadway segments and intersections in the Needs Analysis Table (see **Appendix 2**) and summarized in following subsections.

2.2.3.1 SR 32: Village of Newtown Corporation Limit to Church Street

This section of SR 32, which extends from the Village of Newtown's western boundary at Turpin Lane to the SR 32 (Main Street) intersection with Church Street, is approximately one-half mile long. This section of SR 32 (Main Street) consists of three lanes – one through lane in each direction and a center two-way left turn lane. There are sidewalks on both sides of the roadway and numerous driveways for residences and businesses. The speed limit (55 mph west of Turpin Lane) is 35 mph between the Newtown corporation limit to Debolt Street and 25 mph between Debolt Street and to Miljoie Drive; east of Miljoie Drive, the speed limit is 35 mph.

Stakeholder Input: Of the 50 comments submitted for this segment, 43 identify congestion as a concern. Representative comments include:

- Congestion is worse during the evening rush hour (4 comments)
- Varying SR 32 speed limit through Newtown contributes to congestion (6 comments)
- Traffic signal timing contributes to traffic congestion (5 comments)
- Traffic signals should be replaced with smart lights (1 comment)
- Traffic signals should be coordinated between Newtown, Mariemont, and Fairfax (1 comment)

- Need a bypass around Newtown (1 comment)
- Widen SR 32 (5 comments)
- Poor street lighting is an issue (1 comment)

Six bike comments identify bicycle mobility and access issues in Newtown:

- Connect Newtown bike paths with Ohio to Erie Trail, Lunken bike paths, bikeway to downtown Cincinnati (3 comments)
- Cyclist safety is an issue due to 55 mph speed limit outside of the Village. (1 comment)
- Not enough bicycle and pedestrian facilities (1 comment)
- Need bike route along Newtown Road (1 comment)

One pedestrian comment identifies a need for a sidewalk/path to Clear Creek Park from Newtown.

Public transit comments identify the following needs:

- An accessible transit stop (1 comment)
- Bus service between Eastgate and Cincinnati (1 comment)
- Light rail from Eastgate to Fairfax (along SR 32), connecting to the Wasson Line, Oasis Line and to Riverfront Transit Center (1 comment)
- Additional bus service, including bus rapid transit (1 comment)

Crash Data: ODOT's crash screening did not identify this segment as an area of high hazard. Crash data indicates that five crashes occurred over the three-year period (2013 – 2015).

LOS Analysis: No level of service analysis was conducted for this segment; however, the travel time data indicates a 55% increase in the eastbound travel time during the PM peak-hour compared to the off-peak travel time indicating congestion during the PM peak-hour.

Geometric Data: No geometric deficiencies were identified along this segment.

Pedestrian Data: No pedestrian data is available for this segment.

2.2.3.2 SR 32/Church Street Intersection

The SR 32/Church Street intersection represents the center of the Newtown business district, and is a four-leg, signalized intersection. Crosswalks connect the sidewalks on each corner of this intersection, which represents the center of Newtown's business district.

Figure 13. SR 32/Church Street Intersection

Stakeholder Input: Of the 54 roadway comments provided, 53 address congestion issues. Representative comments include:

- Signal timing is an issue (21 comments)
- Additional lanes are needed at this intersection (2 comments)
- A bypass around Newtown is needed (1 comment)
- Church Street skew contributes to driver confusion (1comment)

Representative bike comments include:

- Need bikeway connections between 5-mile trail, Lunken, and downtown (3 comments)
- Need bike lanes in this area and better connectivity of the existing bike paths in Newtown with the Cincinnati Bike Trail, US 50, and SR 32 (1 comment)
- Need bikeway connection between the Anderson trail system and Little Miami Scenic Trail (1 comment)
- Need Marked bike lanes (2 comments)
- Need connection between Ivy Hills residential area and Little Miami Scenic Trail (1 comment)

Representative pedestrian comments include:

- Existing streetscape is not pedestrian-friendly (1 comment)
- Pedestrian access is unsafe (1 comment)
- A pedestrian signal is needed (1 comment)

Public transit comments identify the following needs:

- A bus stop (3 comments)
- A park-and-ride facility (1comment)
- Rail access (1 comment)
- More frequent bus service (1 comment)
- A Bus Rapid Transit (BRT) stop (2 comments)
- Public transit in Newtown (1 comment)

Crash Data: The ODOT crash screening did not identify this intersection as an area of high-hazard. Crash data indicates that 10 crashes occurred over the three-year period (2013-2015).

LOS Analysis: The HCS analysis indicates that the westbound through movement and northbound through movement are currently failing during the AM peak-hour. In the No Build opening year (2022) and No Build design year (2042) conditions, the failures are corrected due to the ODOT methodology of balancing delays for future intersection analyses. Balancing delays does create failure with the southbound left turn movement in the design year. This indicates that the failure of the eastbound left turn movement is likely due to a signal timing issue. It is anticipated that operational or minor intersection improvements are required for the existing, No Build opening year conditions and No Build design year conditions.

Eastbound SR 32 at Church Street (PM Peak)

Westbound SR 32 at Church Street (AM Peak)

Northbound Church Street at SR 32 (AM Peak)

Southbound Church Street at SR 32 (PM Peak)

To supplement the HCS analysis a queue study was conducted for the westbound and northbound approaches during the AM peak period and the eastbound, northbound, and southbound approaches during the PM peak period. The number of cars in the queue was recorded at the end of green for 15 minutes prior to the peak hour to 15 minutes after the peak-hour ended. The number of cars was translated to a length by assuming a queue length of 25 feet per vehicle. During the AM peak period the maximum westbound queue extended 1,750 feet back past the Round Bottom Road intersection and the maximum northbound queue extended 1,250 feet. During the PM peak period the maximum eastbound queue extended almost a half mile (2,400 feet) past the Newtown Corporate limits, the maximum northbound queue extended 1,100 feet, and the maximum southbound queue extended 1,200 feet. The recorded queues during the AM peak period are shown in **Figures 14 and 15** and the recorded queues during the PM peak period are shown in **Figures 16, 17, and 18**.

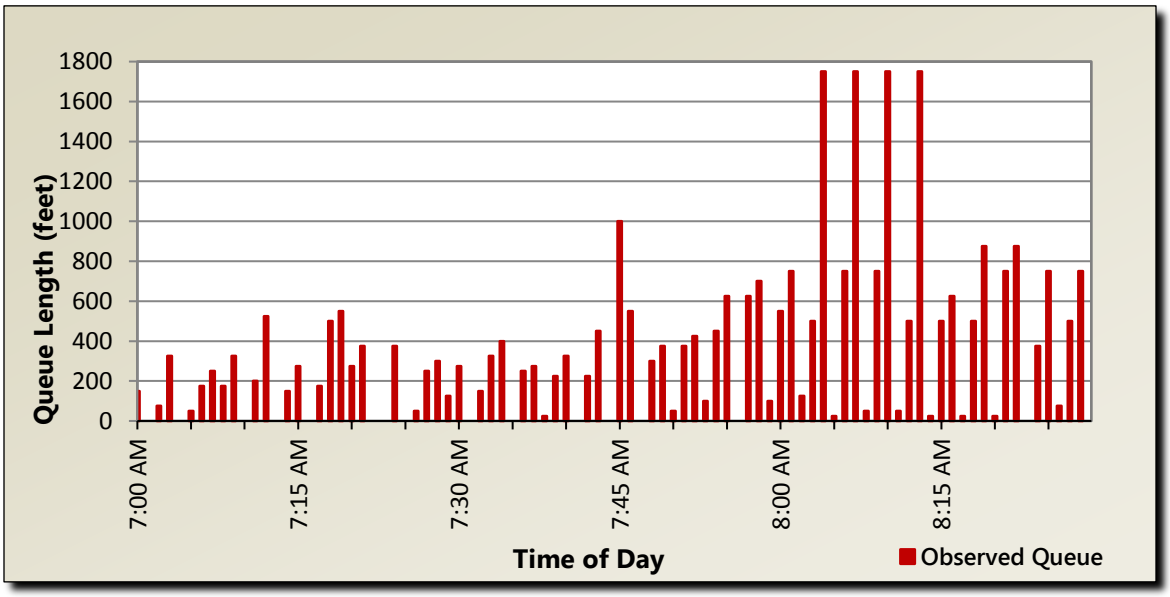


Figure 14. Westbound SR 32 AM Peak Period Queues at Church Street

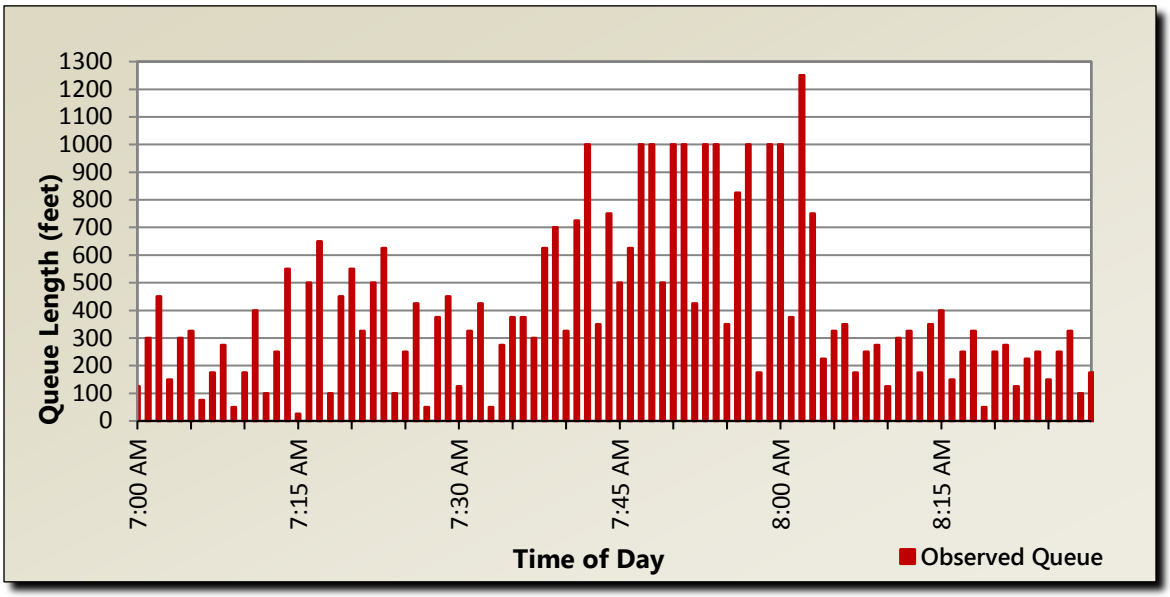


Figure 15. Northbound Church Street AM Peak Period Queues at SR 32

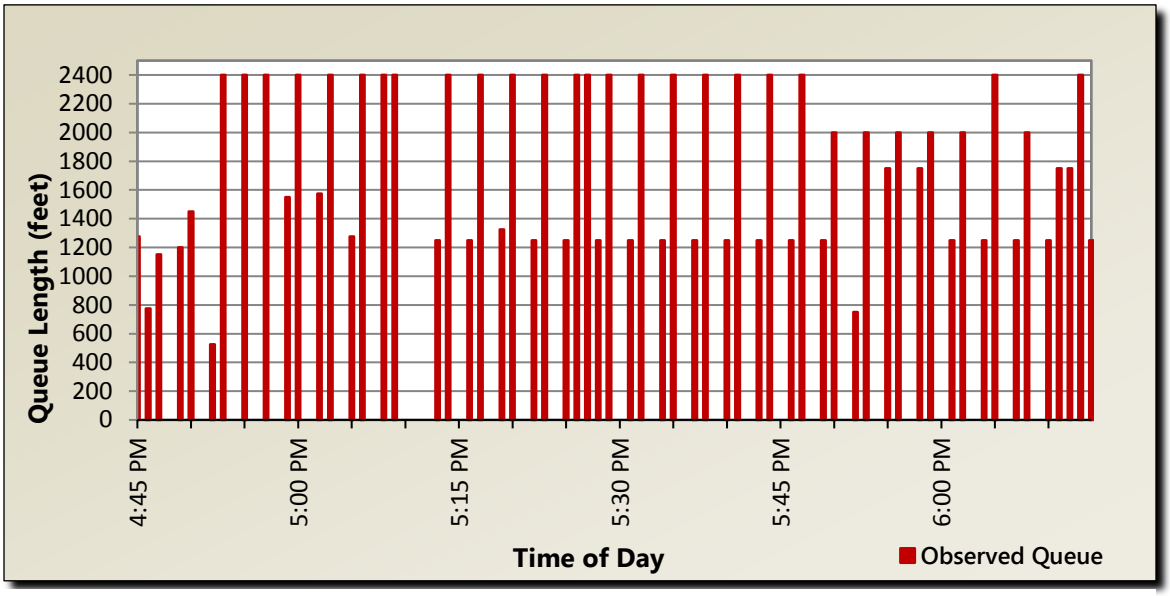


Figure 16. Eastbound SR 32 PM Peak Period Queues at Church Street

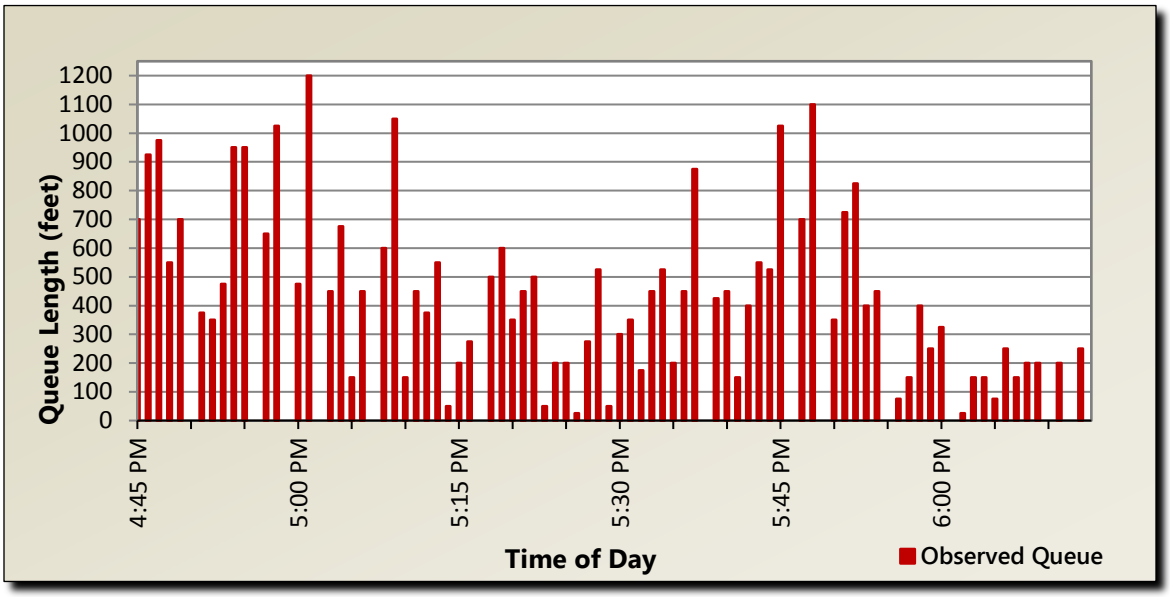


Figure 17. Southbound Church Street PM Peak Period Queues at SR 32

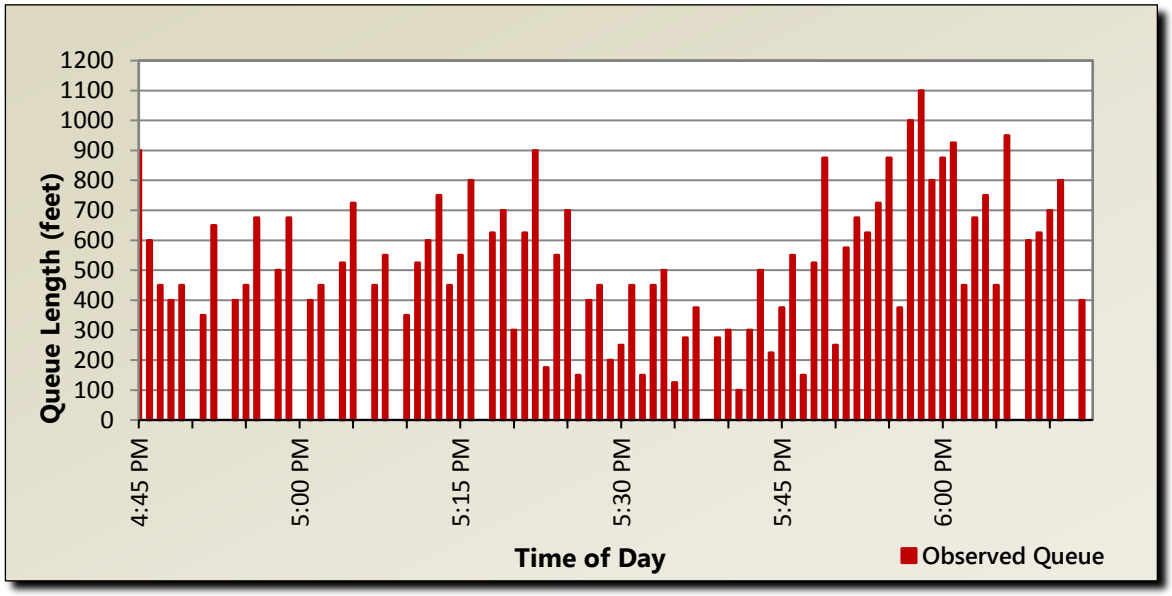


Figure 18. Northbound Church Street PM Peak Period Queues at SR 32

Geometric Data: The intersection sight distance is very poor due to obstruction by buildings on two corners of the intersection. Because this intersection is fully-controlled by a traffic signal, proper intersection sight distance is not required per *L&D Vol. 1.*; however, intersection sight distances for vehicles on SR 32 making right turns are 80 feet for eastbound traffic and 90 feet for westbound traffic. Both sight distances are less than the required 335 feet, and inhibit the ability for vehicles to execute right-turns during red signal phases.

Pedestrian Data: Forty-four (44) pedestrians were observed at the intersection during a 24-hour period recorded on December 9, 2015.

2.2.3.3 SR 32: Church Street to Round Bottom Road

The section of Main Street (SR 32) between Church Street and Round Bottom Road is approximately one-third mile. In this section, the posted speed limit is 25 mph and the roadway is two lanes with a center two-way left turn lane. There are sidewalks along both sides of the roadway, as well as numerous business and residential driveways.

Stakeholder Input: Of the 37 comments submitted for this segment, 36 address roadway congestion. Representative comments include:

- Traffic signal timing is poor (1 comment)
- Varying speed limit on SR 32 through Newtown contributes to congestion (1 comment)
- Too many traffic signals and/or stop signs in this roadway segment (2 comment)
- Need a bypass around Newtown (1 comment)
- The road should be widened (2 comments)

Five bike comments include:

- Need marked bicycle lanes (1 comment)

- Need bicycle connections to Eastgate and the Cincinnati Bike Trail (2 comments)
- Bike riding along SR 32 is not safe (2 comments)

Six comments identify public transit needs:

- Improve bus service, including expanded routes (3 comments)
- Provide light rail service (2 comments)
- Add a transit stop in the parking space near the former e-testing site (1 comment)

Crash Data: ODOT's crash screening did not identify this segment as an area of high hazard. Crash data indicates that two crashes occurred over the three-year period (2013 – 2015).

LOS Analysis: No level of service analysis was conducted for this segment; however, the travel time data indicates a 45% increase in the eastbound travel time during the PM peak-hour and a 35% increase in the in the westbound travel time during the AM peak-hour compared to the off-peak travel time indicating congestion during the AM and PM peak hours.

Geometric Data: No geometric deficiencies were identified along this segment.

Pedestrian Data: No pedestrian data is available for this segment.

2.2.3.4 SR 32/Round Bottom Road/River Hills Drive Intersection

The SR 32/Round Bottom Road/River Hills Drive intersection is a five-leg, signalized intersection:

Figure 19. SR 32/Round Bottom Road/River Hills Drive Intersection

Stakeholder Input: Of the 29 roadway comments, 14 address congestion at this intersection and 9 address traffic signal timing. Representative comments include:

- Traffic signal phases are long (2 comments)
- Need a bypass around Newtown (2 comments)
- Improve signal timing (4 comments)
- The speed limit (25 mph) is too slow (2 comments)

One comment cites a need for better pedestrian access from Ivy Hills to Newtown. Two comments cite a need for improved bus service and light rail transit.

Crash Data: ODOT's crash screening did not identify this intersection as an area of high hazard. Data indicates that five crashes occurred over a three-year period (2013-2015).

LOS Analysis: The HCS analysis indicates that currently the westbound through movement is failing with a v/c ratio of 1.01 during the AM peak-hour and the southbound left turn movement is at capacity and the 95th percentile queue length for the movement is more than twice the storage length during the PM peak-hour. In the No Build opening year (2022) and No Build design year (2042) conditions, the westbound AM peak-hour failure is corrected due to the ODOT methodology of balancing delays for future intersection analyses. Balancing delays does not correct the southbound left turn movement failure during the PM peak-hour. Additionally, the eastbound through movement fails in the opening year with a v/c ratio of 1.02 and in the design year only gets worse with a v/c ratio of 1.09. It is anticipated that operational or minor intersection improvements are required for the existing, No Build opening year conditions, and No Build design year conditions.

Westbound SR 32 at Round Bottom Road (AM Peak)

Eastbound SR 32 at Round Bottom Road (PM Peak)

To supplement the HCS analysis a queue study was conducted for the westbound approach during the AM peak period and the eastbound and southbound approaches during the PM peak period. The number of cars in the queue was recorded at the end of green for 15 minutes prior to the peak hour to 15 minutes after the peak-hour ended. The number of cars was translated to a length by assuming a queue length of 25 feet per vehicle. During the AM peak period the maximum westbound queue extended 850 feet. During the PM peak period the maximum eastbound queue extended 1,250 feet and the maximum southbound queue extended 1,050 feet. The recorded queues during the AM peak period are shown in **Figure 20** and the recorded queues during the PM peak period are shown in **Figures 21 and 22**:

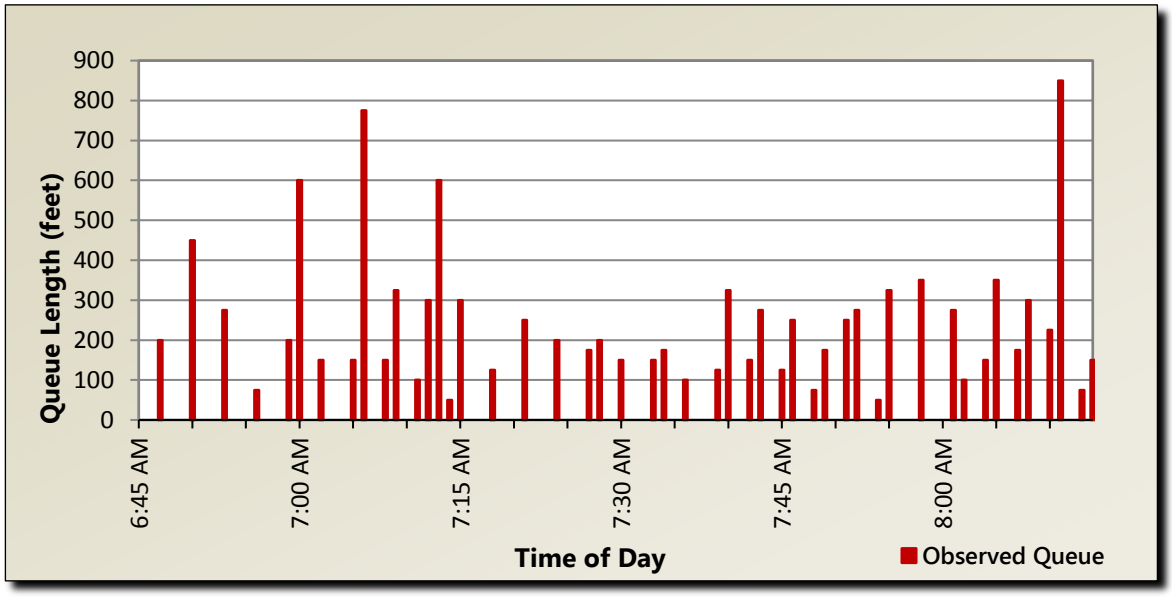


Figure 20. Westbound SR 32 AM Peak Period Queues at Round Bottom Road

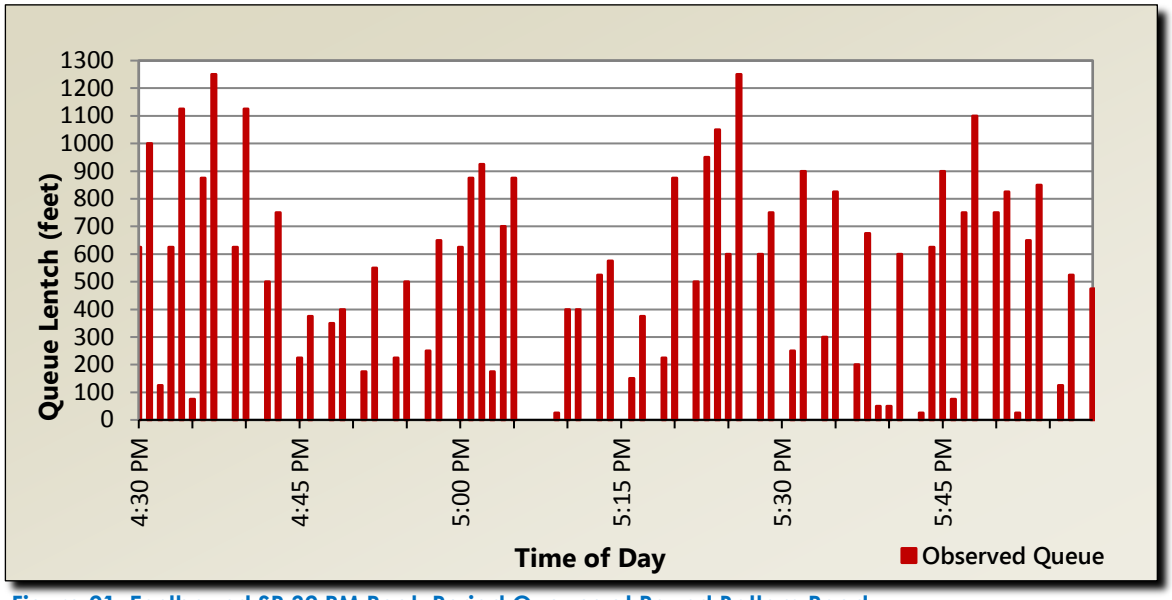


Figure 21. Eastbound SR 32 PM Peak Period Queues at Round Bottom Road

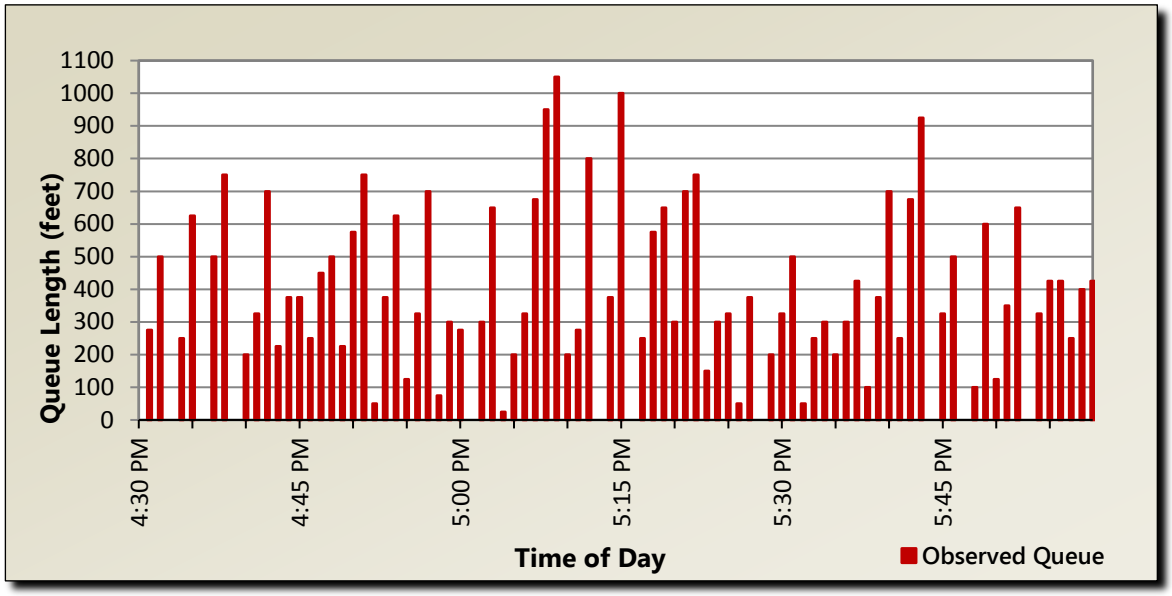


Figure 22: Southbound Round Bottom Road PM Peak Period Queues at SR 32

Geometric Data: As seen in Figure 19 (above), vehicles turning right onto SR 32 from Round Bottom Road are removed from the rest of the intersection. This right turn is stop-sign controlled, whereas all other intersection approaches are traffic signal-controlled. This right-turning movement has deficient intersection sight distance. The intersection sight distance for this movement is 290 feet looking left and the required sight distance is 335 feet. Although adequate intersection sight distance is not required at signalized intersections, the left intersection sight distance on River Hills Diver, the right intersection sight distance on Round Bottom Road, and the eastbound SR 32 stopping sight distance are all less than the 335-foot design standard for 30 mph design speed.

Pedestrian Data: One pedestrian was observed at the intersection during a 24-hour period recorded on December 9, 2015.

2.2.3.5 SR 32: Round Bottom Road to Little Dry Run Road

The section of SR 32 between Round Bottom Road and Little Dry Run Road is approximately 0.78 mile in length. This section of roadway has two through lanes and a center two-way left turn lane. Just east of Round Bottom Road, the speed limit increases from 25 mph to 35 mph. The speed limit is raised again at Ivy Hills Place where it increases to 50 mph. There are no sidewalks in this section of SR 32.

Stakeholder Input: Of the 41 comments which address roadway issues, 35 concern congestion on this segment. Representative comments include:

- Lack of dedicated left-turn lanes exacerbate congestion (1 comment)
- Need four through-lanes and a center left-turn lane (1 comment)
- Need a route that avoids Newtown, Mariemont, and Fairfax (3 comments)
- The speed limit is an issue (1 comment)

Eight comments identify the following bicycle needs:

- A shared-use path from Little Dry Run Road to the Little Miami Scenic Trail (4 comments)
- A bike/pedestrian designated lane (2 comments)
- A connection between the Little Miami Scenic Trail and the Eastgate area (2 comments)

Six comments identify the following pedestrian needs:

- Sidewalk access along SR 32 from Little Dry Run Road to Newtown (4 comments)
- Sidewalk access to Newtown parks (1 comment)
- Pedestrian access from Little Dry Run Road to Round Bottom (1 comment)

Nine comments identify the following public transit needs:

- Bus route on SR 32 connecting Fairfax to Batavia (1 comment)
- Transit hub/express service (1 comment)
- Express Bus and park-and-ride to Uptown Area along SR 32 (1 comment)
- More transit options for Clermont County residents (1 comment)
- Metro Line (2 comments)
- Light rail (2 comments)
- Oasis commuter rail from Clermont County to the Cincinnati Riverfront (1 comment)

Crash Data: ODOT's crash screening did not identify this segment as an area of high hazard. Data indicates that 12 crashes occurred over the three-year period (2013-2015).

LOS Analysis: No level of service analysis was conducted for this segment; however, the travel time data indicates a 45% increase in the eastbound travel time during the PM peak-hour and a 35% increase in the in the westbound travel time during the AM peak-hour compared to the off-peak travel time indicating congestion during the AM and PM peak hours.

Geometric Data: No geometric deficiencies were identified along this segment.

Pedestrian Data: No pedestrian data is available for this segment.

2.2.3.6 Round Bottom Road: SR 32 to Valley Avenue

Round Bottom Road is a two-lane undivided roadway which extends approximately 0.4 miles between its intersection with SR 32 at its southern terminus and its intersection with Valley Avenue at its northern terminus. Round Bottom Road has narrow shoulders and no sidewalks. There is an at-grade railroad crossing of Round Bottom Road approximately 0.1 miles north of the SR 32 (Main Street) intersection.

Stakeholder Input: There are eleven roadway comments for Round Bottom Road between SR 32 and Valley Avenue. These comments identify the following issues:

- Roadway congestion (9 comments)
- Safety is a concern
- Improve Round Bottom Road to function as an alternative route through the area

Eleven bikeway comments were provided:

- Safety of bicyclists on Round Bottom Road is a concern (6 comments)
- Marked bike lanes or a multi-modal path is needed to discourage bicycle traffic along Round Bottom Road (5 comments).

Three public transit comments identify the following needs:

- More rail and local bus access (1 comment)
- A park and ride in the area (2 comments)

Crash Data: ODOT's crash screening did not identify this segment as an area of high hazard. Crash data indicates that no crashes occurred over the three-year period (2013 – 2015).

LOS Analysis: No level of service analysis was conducted for this segment.

Geometric Data: No geometric deficiencies were identified along this segment.

Pedestrian Data: No pedestrian data is available for this segment.

2.2.3.7 Round Bottom Road/Valley Avenue Intersection

The Round Bottom Road/Valley Avenue intersection is a signalized T-intersection:

Figure 23. Round Bottom Road/Valley Avenue Intersection

Stakeholder Input: There are no public comments for the Round Bottom Road/Valley Avenue Intersection.

Crash Data: ODOT's crash screening did not identify this intersection as an area of high hazard. Crash data indicates that no crashes occurred over the three-year period (2013 – 2015).

LOS Analysis: The HCS analysis indicates that the northbound left turn movement is currently failing during the AM peak-hour with a v/c ratio of 1.02. In the No Build opening year (2022) and No Build design year (2042) conditions the northbound left turn continues to fail as well as the eastbound right turn movement. It is anticipated that operational or minor intersection improvements are required for the existing, No Build opening year conditions, and No Build design year conditions.

Geometric Data: No geometric deficiencies were identified at this intersection.

Pedestrian Data: Four pedestrians were observed at the intersection during a 24-hour period recorded on December 9, 2015.

2.2.3.8 Round Bottom Road: Valley Avenue to Broadwell Road

Round Bottom Road is a two-lane undivided roadway which extends approximately 1.6 miles between its intersection with Valley Avenue at its southern terminus and its intersection with Broadwell Road at its northern terminus. Round Bottom Road has narrow shoulders, no sidewalks, and no auxiliary turn lanes are present for the entire length of the segment.

Stakeholder Input: Two comments identify congestion as an issue on Round Bottom Road as follows:

- Poor signal timing and slow speed limit (25 mph)
- Too much traffic on this road; concerns about the impact on traffic from the limestone mine coming to the area

Bike comments include the following:

- Round Bottom Road is too narrow for bike traffic (1 comment)
- A bike lane/path is needed along Round Bottom Road (2 comments)

One pedestrian comment identifies the need for a sidewalk along Round Bottom Road because the roadway is too dangerous for pedestrians to walk along.

Crash Data: ODOT's crash screening did not identify this segment as an area of high hazard. Data indicates that seven crashes occurred over the three-year period (2013 – 2015).

LOS Analysis: No level of service analysis was conducted for this segment.

Geometric Data: There is one deficient horizontal curve in this segment. The existing curve in front of Natorp's Nursery has a degree of curvature of 8˚50' compared to the allowable 8˚00' for 45 mph.

Pedestrian Data: No pedestrian data is available for this segment.

2.2.3.9 Valley Avenue: Church Street to Round Bottom Road

Valley Avenue is a two-lane roadway which extends approximately 0.3 miles between its intersection with Church Street at its western terminus and its intersection with Round Bottom Road at its eastern terminus. Valley Avenue, which is posted as 25 mph, has sidewalks on both sides of the roadway, as well as numerous driveways for businesses and residences. About 250 feet west

of the Round Bottom intersection, there is a mid-block crosswalk. At the Church Street/Valley Avenue intersection, Valley Avenue terminates as the roadway becomes the access road into the Great Miami Golf Center. At its eastern terminus, Valley Avenue intersects with Round Bottom Road in a signalized T- intersection.

Stakeholder Input: Seven public comments address roadway issues on Valley Avenue between Church Street and Round Bottom Road. Each of these comments concern congestion issues on Valley Avenue. Representative comments include:

- There are back-ups on Valley to get to SR 32 (2 comments)
- The signal at Valley and Church and speed limit (25 mph) are issues (2 comments)

Crash Data: ODOT's crash screening did not identify this segment as an area of high hazard. Crash data indicates that three crashes occurred over the three-year period (2013-2015).

LOS Analysis: No level of service analysis was conducted for this segment.

Geometric Data: No geometric deficiencies were identified along this segment.

Pedestrian Data: No pedestrian data is available for this segment.

2.2.3.10 Church Street: SR 32 to Valley Avenue

This section of Church Street (Newtown Road), which extends approximately one-half mile from SR 32 (Main Street) to Valley Avenue, is two lanes with sidewalks along both sides of the road. In addition, there are numerous driveways for businesses and residences along this section of road. This section is posted for a speed of 25 mph. There is an at-grade railroad crossing of Church Street approximately one-quarter mile from the SR 32 (Main Street)/Church Street intersection.

Stakeholder Input: Fourteen comments concern roadway issues on Church Street between SR 32 and Valley Avenue. Of these comments, eleven identify congestion issues and several address issues with the at-grade railroad crossing. Representative comments include:

- A bypass of Newtown is needed (1 comment)
- There are problems at the following four intersections: 1) Valley/Church; 2) Valley/Round Bottom; 3) Church/Batavia; and 4) Batavia/Round Bottom (1 comment)
- Signal improvements or a roundabout should be considered at the SR 32/Church Street intersection (1 comment)
- The at-grade rail crossing is not level and should be repaired (1 comment)
- Train schedules should be posted near the railroad crossing since the train often delays traffic in this area (1 comment)

Five bike comments include:

- Safety concerns for bicyclists sharing roads in Newtown (1 comment)
- Designated bike lanes or bike paths are needed (1 comment)
- A bikeway connection is needed between Newtown and area bike paths such as the path neat Columbia Parkway and 5-mile Trail (2 comments)

- A connecting bike path should be constructed from the Little Miami Scenic Bike Trail and Newtown and Clear Creek Park (1 comment)

Eight public transit comments identify the following needs:

- Rail service is needed (4 comments)
- Expanded bus service is needed (1 comment)
- An accessible transit stop is needed (2 comments)
- The expansion of public transit will reduce vehicular traffic on the roads (1 comment)

Crash Data: ODOT's crash screening did not identify this segment as an area of high hazard. Data indicates that three crashes occurred over a three-year period (2013-2015).

LOS Analysis: No level of service analysis was conducted for this segment; however, the travel time data indicates a 40% increase in the northbound travel time during the AM peak-hour and a 50% increase in the in the southbound travel time during the PM peak-hour compared to the off-peak travel time indicating congestion during the AM and PM peak hours.

Geometric Data: The crest vertical curve at the railroad crossing on this segment of Church Street has a substandard k-value for its design speed (25 mph). The actual k-value for this segment of Church Street is 10; the required k-value is 12.

Pedestrian Data: No pedestrian data is available for this segment.

2.2.3.11 Church Street (Newtown Road)/Valley Avenue Intersection

The Church Street/Valley Avenue intersection is a signalized four-leg intersection. The northwest leg of this intersection serves as the entrance road to the Little Miami Golf Center:

Figure 24. Church Street/Valley Avenue Intersection

Stakeholder Input: Four roadway comments address congestion at this intersection. They are:

- Signal timing is an issue (3 comments)
- The posted speed through this area (25 mph) is too slow (1 comment)

Crash Data: ODOT's crash screening did not identify this intersection as an area of high hazard. Crash data indicates that no crashes occurred over the three-year period (2013 – 2015).

LOS Analysis: The HCS analysis indicates that no deficiencies currently exist at the intersection. In the No Build opening year (2022) the southbound left turn lane 95th percentile queue length for the movement is more than twice the storage length during the PM peak-hour. In No Build design year (2042) conditions the southbound left turn movement fails with a v/c ratio of 1.04. No intersection improvements are required for the exiting conditions, but it is anticipated that operational or minor intersection improvements are required for the No Build opening year and No Build design year conditions.

Geometric Data: No geometric deficiencies were identified along this segment.

Pedestrian Data: Twenty-seven (27) pedestrians were observed at the intersection during a 24-hour period recorded on December 9, 2015.

2.2.3.12 Church Street/Newtown Road: Valley Avenue to US 50

Church Street between Valley Avenue and US 50 is two lanes. There are no sidewalks along this roadway and the speed limit is posted at 35 mph.

Stakeholder Comments: Twenty-two comments were provided for the section of Church Street (Newtown Road) between Valley Avenue and US 50, of which 18 indicate that congestion is the predominant roadway concern on Church Street between Valley and US 50. Other concerns identify roadway repair and access issue. Representative comments include:

- Congestion makes access/egress to/from parking lots along Newtown Road difficult (1 comment)
- Church Street should be widened to four lanes from Valley to US 50 (1 comment)
- A bypass around Newtown is needed (1 comment)
- The current bridge over the Little Miami River is not big enough and needs to be replaced (1 comment)
- There should be no roadway expansion in this area and no additional impact on the Little Miami River (1 comment)
- Road repair is needed (1 comment)

Ten comments identify the need for improved bike access in this area through bike paths and/or lanes. Specific bikeway connections that are recommended include:

- Finish bike trail to Cincinnati (1 comment)
- Connect the Little Miami Trail to Downtown and also through Mariemont, Fairfax, and Hyde Park (1 comment)

- Connect the Little Miami Trail to the Murray Road Trail (1 comment)
- Connect bike trail from Newtown bridge to Downtown and connect to Miami Bluff Road (1 comment)
- Connect bike path to Wasson Way (1 comment)

Two comments cite a need for a sidewalk and pedestrian/bike lanes, and three comments identify the following public transit needs:

- The need for bus service (1 comment)
- The need for a park and ride (1 comment)
- Public transit is needed to serve local bars and restaurants (1 comment)

Crash Data: ODOT's crash screening did not identify this segment as an area of high hazard. Crash data indicates that six crashes occurred over the three-year period (2013 – 2015).

LOS Analysis: No level of service analysis was conducted for this segment; however, the travel time data indicates a 40% increase in the northbound travel time during the AM peak-hour and a 50% increase in the in the southbound travel time during the PM peak-hour compared to the off-peak travel time indicating congestion during the AM and PM peak hours.

Geometric Data: No geometric deficiencies were identified along this segment.

Pedestrian Data: No pedestrian data is available for this segment.

2.2.4 Newtown Village Focus Area Needs Analysis

Based on the results of the technical studies, as well as the extensive public input received from the Focus Area Workshops, online interactive survey, and other public outreach efforts, the primary and secondary needs of the transportation network with the Village of Newtown Focus Area were identified (primary needs are needs that *will* be addressed by this project; secondary needs are needs that *may* be addressed by this project). The input used in the needs analysis is included in **Appendix 2**. The primary and secondary needs are presented in **Table 10** below.

Table 10: Village of Newton Focus Area Needs Analysis

Primary Needs	Secondary Needs
SR 32: West Corporation Limits to Church Street	
Address eastbound peak-hour delays	Address bicycle connectivity
SR 32/Church Street Intersection	
Address capacity issues and long queues on all approaches	None
SR 32: Church Street to Round Bottom Road	
Address westbound AM peak-hour and eastbound PM peak-hour delays	Address bicycle connectivity
SR 32/Round Bottom Road Intersection	

Primary Needs	Secondary Needs
Address capacity issues and long queues on SR 32 and Round Bottom Road approaches	Address deficient sight distance at intersection
SR 32: Round Bottom Road to Little Dry Run Road	
• Address westbound AM peak-hour and eastbound PM peak-hour delays • Address pedestrian connectivity to east corporation limit	• Address bicycle connectivity • Support access to future transit connections
Round Bottom Road: SR 32 to Valley Avenue	
Address congestion	Enhance bicycle connectivity
Round Bottom Road/Valley Avenue Intersection	
Address capacity issues with northbound left-turn movement and eastbound approach	None
Round Bottom Road: Valley Avenue to Broadwell Road	
None	• Correct deficient roadway curve near Natorp's Nursery • Enhance bicycle connectivity
Valley Avenue	
None	None
Church Street: SR 32 to Valley Avenue	
Address northbound AM and southbound PM peak-hour delays	• Address roadway grades at railroad crossing • Enhance bicycle connectivity • Support access to future transit connections
Church Street/Valley Avenue Intersection	
Address capacity issues for southbound left-turn movement	None
Newtown Road (Church Street): Valley Avenue to US 50	
Address northbound AM and southbound PM peak-hour dealys	None

2.3 SR 125/SR 32 AREA FOCUS AREA

The SR 125/SR 32 Focus Area, which is within Anderson Township, includes segments of SR 125 just west and east of its interchange with SR 32, and the segment of SR 32 extending from its interchange with SR 125 to the west corp. limits of the Village of Newtown. This Focus Area includes the SR 125 crossing of the Little Miami River. A detailed roadway map of the SR 125/SR 32 Focus Area is provided in **Appendix 3**.

2.3.1 Study Area Characteristics

The SR 125/32 interchange and SR 32 in this area are within a floodplain for the Little Miami River, which is largely undeveloped on the north side of the roadway and is used for agriculture, greenspace, and recreation. The Clear Creek Soccer Complex and a multi-use trail are located in this area. The area south of SR 32 is largely undeveloped as well, with the exception of several suburban-style single-family housing subdivisions. There are no planned transportation improvements for this focus area listed on ODOT's Statewide Transportation Improvement Program (STIP) for FY 2016-2019, dated July 29, 2016.

2.3.2 Community Attributes Identified in the Focus Area Workshop

Fifteen participants from the area and surrounding communities attended the SR125/SR 32 Focus Area Workshop. Workshop participants identified which community attributes are important to the SR 125/SR 32 area and should be considered throughout the transportation planning process. These features include:

- presence of attractive parks and natural features (hills, greenspaces, Little Miami River)
- strong sense of community (farms, churches, schools)
- strong sense of history
- measured pace and balanced lifestyles and attitudes
- diverse housing market
- accessibility to airports, downtown Cincinnati, Kenwood, and the Red Bank corridor

2.3.3 Transportation Needs

Stakeholder Input: Transportation needs within the SR 125/SR 32 Focus Area were identified during the Focus Area Workshop and the online interactive survey. These comments, which focus on safety, congestion, mobility, and access issues are included in the Needs Analysis Table, which is included in **Appendix 3**, and summarized in the following sections.

Technical Studies: Technical data was collected for the roadway network within the SR 125/SR 32 Focus Area to identify areas of high crash rates, congestion, geometric deficiencies, and pedestrian usage. This information is provided in the Needs Analysis Table (**Appendix 3**) and summarized in the following sections.

2.3.3.1 SR 125: Beechmont Circle to SR 32

The segment of SR 125 between Beechmont Circle and SR 32 is a four-lane undivided limited-access roadway approximately one mile in length with a posted speed of 45 mph.

Stakeholder Input: Ten comments identify safety and congestion issues on SR 125 from the Beechmont Circle to SR 32. Representative comments include:

- The merge onto the levee from SR 32 is too short and dangerous (7 comments)
- Another lane should be added on the ramp from SR 32 to the levee (3 comments)
- Speeding is an issue on the levee (1 comment)

Twenty-six comments concern bicycle issues. These comments identify the following needs:

- A bikeway bridge over the Little Miami River due to safety concerns of bikes crossing the Beechmont Levee (7 comments)
- Bike lanes and traffic calming across the levee (2 comments)
- A connection between Lunken and Loveland Bike Trails (1 comment)
- A connection between Armleder and Lunken bike trails (2 comments)
- A connection between Little Miami Trail and Ohio River Trail (1 comment)
- A connection between existing bike trails and Downtown Cincinnati (1 comment)
- A bike path along Beechmont levee and Mt. Lookout Square (1 comment)

Eight comments address pedestrian issues. Representative comments include the following:

- There are a number of pedestrians who cross the levee even though there is a "Pedestrians Prohibited" sign (1 comment)
- Bike/pedestrian access is needed across the Little Miami River (4 comments)
- A connection between the sidewalk coming down Beechmont hill to the hike/bike trail is needed (1 comment)

Two comments identify the following public transit needs:

- Light transit (1 comment)
- Better transit (bus or rail) to move the region forward and attract people to the area (1 comment)

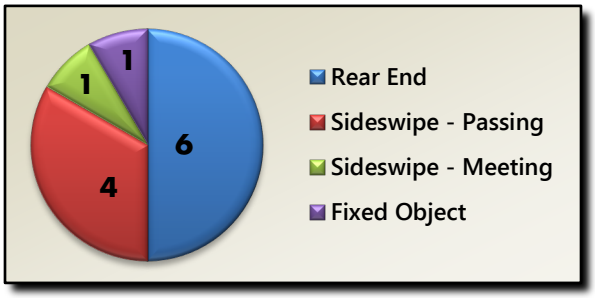


Figure 25: Frequency of Crashes by Crash Type SR 125: Beechmont Circle to SR 32

Crash Data: An ODOT crash screening identified an approximate 0.15-mile stretch of SR 125 adjacent to the Reeves Golf Course Tennis Courts as a high hazard location. As a result, the entire segment of SR 125 from Beechmont Circle to SR 32 was further analyzed. As illustrated in **Figure 25**, there were 12 total crashes on this segment during a three-year period (2013-2015). Rear-end collisions represent 50% of the total crashes. Of the 12 total crashes on the segment, five (40%) occurred in the high hazard segment. Within the high hazard segment, 60% of the crashes were rear-end crashes. See **Attachment A-2** for a plot of all 12 crashes.

LOS Analysis: A freeway analysis was performed using the HCS. During the AM peak-hour the eastbound direction operates at LOS A in 2015 and LOS B for the No Build opening year (2022) and No Build design year (2042) conditions while the westbound direction operates at LOS D in 2015 and LOS E for the No Build opening year and No Build design year conditions. During the PM peak-hour the eastbound direction operates at LOS D in 2015, the No Build opening year, and No Build design year conditions while the westbound direction operates at LOS B in 2015, the No Build opening year, and No Build design year conditions. No improvements are required for the existing, No Build opening year and No Build design year conditions. These results are supported by the

travel time data which shows no significant increase in travel time during the peak hours compared to off-peak hours.

Geometric Data: No geometric deficiencies were identified along this segment.

Pedestrian Data: No pedestrian data is available for this segment.

2.3.3.2 SR 125/SR 32 Interchange

The SR 125/SR 32 interchange is a trumpet interchange which features a loop ramp to serve traffic traveling from eastbound SR 125 to SR 32, and slip ramps for traffic traveling to and from westbound SR 125 and SR 32. A partial loop ramp carries traffic from SR 32 to eastbound SR 32:

Figure 26. SR 125/SR 32 Interchange

Stakeholder Input: Forty-five comments address roadway issues at the SR 125/SR 32 intersection. Representative comments include:

- Dangerous interchange due to the short merge on ramp to westbound SR 125 from SR 32 and the tight loop on the ramp from eastbound SR 125 to SR 32 (32 comments)
- Congestion is a problem (1 comment)
- Visibility on the ramps at SR 125 and SR 32 should be improved (2 comments)
- There are frequent accidents at this interchange (1 comment)
- The ramp from eastbound SR 125 to SR 32 occasionally floods, which cuts off access to SR 32 under SR 125 (2 comments)
- A second exit lane should be added from eastbound SR 125 to SR 32 (1 comment)

Thirty-four (34) comments were provided regarding bicycle concerns and needs in this area. Representative comments include the following:

- A connection between the Little Miami Scenic Bike Trail and the Lunken/Amleder Bike Trail is needed (9 comments)
- A connecting bike path is needed (9 comments)

- It is unsafe for bicycles to cross the Beechmont Levee (8 comments)

Nine public transit comments identify the following needs:

- Public transit (3 comments)
- Transit, in combination with park and ride (1 comment)
- Smaller shuttles to provide point-to-point service (1 comment)
- Bus Rapid Transit (BRT) routes (1comment)
- Transit to link smaller business districts together (1 comment)

Crash Data: Over a three-year period 2013-2015), a total of 27 crashes occurred at this interchange. Fixed object and rear-end crashes represented about 75% of the overall crashes, with a majority (17 crashes) occurring in wet conditions. The frequency of crashes by crash type is shown in **Figure 27**.

Data indicates that many of the crashes at this interchange occurred in two distinct clusters. One cluster of nine (9) crashes occurred at the curve/merge on the ramp from southbound SR 32 to westbound SR 125. A majority of these crashes (6) occurred in wet conditions between the hours of 11:00 a.m. and 2:00 p.m. Fixed object crash type was the most prevalent at this cluster (4 crashes), all in wet conditions.

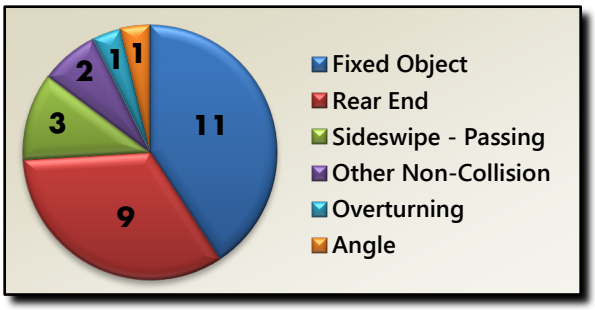


Figure 27. Frequency of Crashes by Crash Type SR 125/SR 32 Interchange

Another cluster of eleven (11) crashes occurred along the curve on the ramp from eastbound SR 125 to northbound SR 32. Ten (10) of these crashes occurred in the daylight, and eight (8) occurred in wet conditions. Fixed-object crash type was the most prevalent (6 crashes), all in wet conditions.

Potential causal factors for crashes at this interchange include excessive speed, slippery pavement, inadequate geometry, and inadequate delineation. See **Attachment A-2** for a plot of all 27 crashes.

LOS Analysis: An analysis of the merge/diverge operations of the ramps was performed using the HCS. All ramps are operating at LOS D or better during both the AM and PM peak hours in 2015 and for the No Build opening year (2022) and No Build design year (2042) conditions. No improvements are required for the existing, No Build opening year and No Build design year conditions.

Geometric Data: One sag vertical curve is deficient at this interchange and the superelevation rate on all ramps does not meet current standards. The deficient sag vertical curve has a k-value of 43 and the minimum value for a design speed of 35 mph is 49. The superelevation on all four interchange ramps is based on an 0.083 ft/ft maximum superelevation. The current standard for maximum superelevation on urban ramps is 0.06 ft/ft.

Pedestrian Data: No pedestrian data is available for this segment.

2.3.3.3 SR 125: SR 32 to Elstun Road

The section of SR 125 between SR 32 and Elstun Road is a four-lane undivided highway approximately 0.2 miles in length with a posted speed of 45 mph.

Stakeholder Input: Seventeen comments were provided for this area, which included concerns regarding congestion and safety on SR 125. Representative comments include:

- Speeding and congestion on SR 125 and through Mt. Washington has devastated Mt. Washington as the business district effectively has a highway through the middle of "town", which is unsafe for pedestrians, cyclists, and parked cars (7 comments)
- Congestion is bad on the ramp from the Beechmont levee and SR 32; second would allow a continuous turn without merging (1 comment)
- There should be a left turn lane at Beacon and Beechmont (1 comment)
- There should be consistency in the number of lanes going up or down the hill on Beechmont Avenue (1 comment)
- The bike lane going up the hill on Beechmont makes it impossible to put in a complete turn lane and compromises traffic safety (1 comment)
- Standing water is present on the eastbound lanes during rain events, causing a safety concern (1 comment)

Nine comments were provided regarding bicycle access issues. Representative comments include:

- A bike connection over the Little Miami River and a connection to the trail along Beechmont Avenue into Mt. Washington is needed (3 comments)
- Bike trail connection to Downtown Cincinnati is needed (1 comment)
- A connection of Little Miami Trail with Armleder and Lunken Trail is needed (1 comment)
- Metro buses should be used to transport bicyclists up the hill on Beechwood Avenue to Mt. Washington allowing the removal of the bike lane on Beechwood Avenue (1 comment)

The pedestrian comments include:

- Sidewalks are needed on Beechmont Avenue and Elston since many people walk from the apartment complexes to buses (1 comment)
- The lack of sidewalks in certain areas along Beechmont Avenue is unsafe (1 comment)
- There are no sidewalks on SR 125 between SR 32 and Ranchvale (1 comment)

Crash Data: ODOT's crash screening did not identify this segment as an area of high hazard. Crash data indicates that three crashes occurred over the three-year period (2013 – 2015).

LOS Analysis: No level of service analysis was conducted for this segment.

Geometric Data: At the west approach to the bridge over Clough Creek, an abrupt grade change exceeds the maximum allowable grade break for a design speed of 45 mph. The existing grade break is 1.00%; the allowable grade break is 0.55% (*L&D Vol. 1, Figure 203-2)*.

Pedestrian Data: No pedestrian data is available for this segment.

2.3.3.4 SR 125/Elstun Road Intersection

The SR 125/Elstun Road intersection is a signalized four-leg intersection:

Figure 28. SR 125/Elstun Road Intersection

Stakeholder Input: One public comment identifies congestion as an issue at this intersection.

Crash Data: ODOT's crash screening did not identify this intersection as an area of high hazard. Crash data indicates that 14 crashes occurred over the three-year period (2013 – 2015).

LOS Analysis: The HCS analysis indicates that during the AM peak-hour the 95th percentile queue length for the northbound left turn movement is more than twice the storage length for the existing, No Build opening year (2022), and No Build design year (2042) conditions. By the design year, the westbound movement is failing with a v/c ratio of 1.0. It is anticipated that operational or minor intersection improvements are required for the existing, No Build opening year and No Build design year conditions.

Geometric Data: One sag vertical curve is deficient on SR 125 through this intersection. The deficient sag vertical curve has a k-value of 38 and the minimum value for a design speed of 45 mph is 79.

Pedestrian Data: Sixty-six (66) pedestrians were observed at the intersection during a 24-hour period recorded on November 17, 2015.

2.3.3.5 SR 32: SR 125 to Clough Pike

The segment of SR 32 from the SR 125 interchange to Clough Pike is a two-lane undivided roadway which measures approximately 0.46 miles in length. The segment includes ODNR driveway access to the Great Miami River, driveway access to one commercial property, and two roadway access

points to the Estates of Signal Hill subdivision. This roadway section has no sidewalks and two-foot, paved roadway shoulders. The speed limit through this section is 45 mph.

Stakeholder Input: Two roadway comments indicate that traffic congestion is a concern on SR 32 between SR 125 and Clough Pike.

Three bike comments include:

- A connection between the Little Miami Scenic Trail, Lunken Trail, and the Ohio River Trail is needed (1 comment)
- The Anderson Township Bike Path to Newtown should be finished (2 comments)
- Hike/bike trails should be linked with existing trails (1 comment)

Two public transit comments were provided which identify the need for light rail transit.

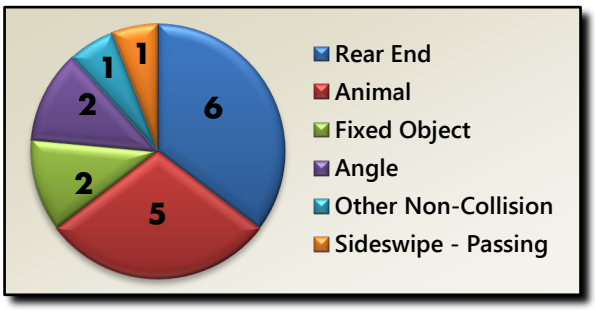


Figure 29. Frequency of Crashes by Crash Type
SR 32: SR 125 to Clough Pike

Crash Data: An ODOT crash screening identified an approximate 0.15-mile sub-segment east of the Beechmont Avenue interchange as a high-hazard location. Therefore, a detailed crash analysis of the entire segment was completed.

As illustrated in **Figure 29**, there were 17 total crashes in this roadway section during a three-year period (2013-2015). Rear-end and animal crashes represent 65% of the total crashes. Of the 17 total crashes on the segment, 12 (70%) occurred in the high-hazard section. Within the high hazard segment, half of the crashes were rear-end crashes. All six of the rear-end crashes occurred in dry conditions. Five of the rear-end crashes occurred in clear daylight conditions, five occurred from 4:00 PM to 6:00 PM, and four occurred in the northbound direction. See **Attachment A-2** for a plot of all 17 crashes.

LOS Analysis: No level of service analysis was conducted for this segment; however, the travel time data indicates a 40% increase in the westbound travel time during the AM peak-hour compared to the off-peak travel time indicating congestion during the AM peak-hour.

Geometric Data: No geometric deficiencies were identified along this segment.

Pedestrian Data: No pedestrian data is available for this segment.

2.3.3.6 SR 32/Clough Pike Intersection

The SR 32/Clough Pike intersection is a three-leg, signalized intersection:

Figure 30. SR 32/Clough Pike Intersection

Stakeholder Input: Thirteen roadway comments address roadway issues at the SR 32/Clough Pike Intersection. Representative comments include:

- The roadway should be widened to 4 lanes (1 comment)
- A new intersection should be created (3 comments)
- Due to congestion on Clough and SR 32 in the morning it is difficult to turn left from westbound SR 32 (3 comments)
- The right turn-only lane is not marked well or with enough advance notice, so drivers unfamiliar with the area try to merge left, causing a safety issue (1 comment)
- There are frequent accidents here (1 comment)

Two bike comments were provided:

- A bike/pedestrian facility is needed along Clough Pike into Anderson Township (1 comment)
- A bike path connection is needed from Saddleback to SR 32 and Clough Pike to SR 125 (1 comment)

Crash Data: An ODOT crash screening did not identify this intersection as an area of high-hazard. Crash data indicates that eight crashes occurred over a three-year period (2013-2015).

LOS Analysis: The HCS analysis indicates that the westbound movement will fail during the AM peak-hour and have a v/c ratio greater than one during the No Build opening year (2022) and No Build design year (2042) conditions. No intersection improvements are required for the exiting

Westbound Clough Pike AM Peak Period Queue at SR 32

conditions, but it is anticipated that operational or minor intersection improvements are required for the No Build opening year and No Build design year conditions.

To supplement the HCS analysis a queue study was conducted for the westbound approach during the AM peak period. The number of cars in the queue was recorded at the end of green for 15 minutes prior to the peak hour to 15 minutes after the peak-hour ended. The number of cars was translated to a length by assuming a queue length of 25 feet per vehicle. During the AM peak period the maximum westbound queue extended 1,025 feet. The recorded queues during the AM peak period are shown in **Figure 31**:

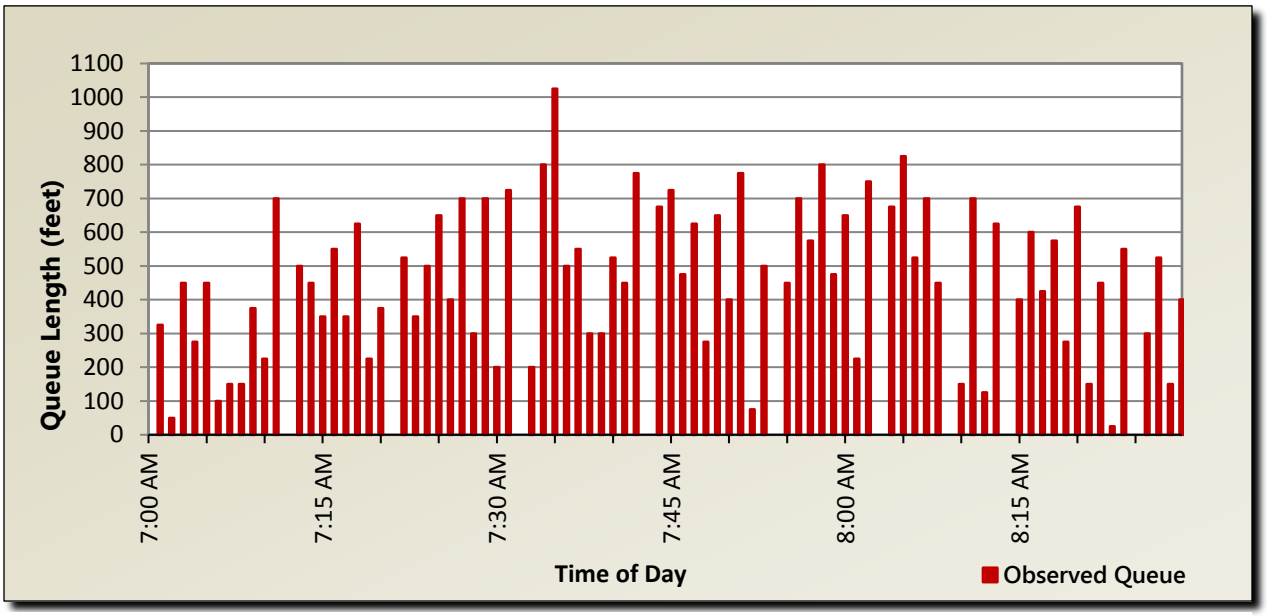


Figure 31. Westbound Clough Pike AM Peak Period Queue at SR 32

Geometric Data: No geometric deficiencies were identified at this intersection.

Pedestrian Data: No pedestrians were observed at the intersection during a 24-hour period recorded on November 17, 2015.

2.3.3.7 SR 32: Clough Pike to Village of Newtown Corporation Limit

The segment of SR 32 between Clough Pike and the west corporation limit of Newtown is a two-lane, undivided roadway with unpaved shoulders and guardrail along portions of the segment This segment of SR 32 measures 1.55 miles in length. The only access points along this stretch of SR 32 are at Turpin Lake Place, Clear Creek Park, and Anderson Driving Range, and the posted speed limit is 55 mph.

Stakeholder Input: Twenty-nine roadway comments address concerns in the section of SR 32 between Clough Pike and the West Newtown corporation limit. Of these comments, twenty-two identify congestion as a predominant concern on SR 32, especially during evening rush hour. Representative comments include:

- The road should be widened and light rail service provided in the center of a divided highway (5 comments)
- The road should be four lanes (1 comment)
- Additional lanes should be provided (3 comments)
- A bypass should be built around Newtown (1 comment)
- A new bridge is needed to connect SR 32 to the Red Bank Expressway (1 comment)
- The road needs to be repaired (1 comment)
- The roadway occasionally floods (1 comment)
- The "S" curves on SR 32 by the sod farms are an issue (1 comment)

Twelve bike comments identify the following needs:

- A new bike bridge to connect the future Five Mile Trail with the Little Miami Trail (2 comments)
- A bike path into Anderson Township (1 comment)
- The extension of the bike path to Downtown (3 comments)
- A connection between the Lunken and Loveland Trails (1 comment)
- Marked bike lanes (1 comment)

Six comments address pedestrian access needs/concerns including:

- The need for a sidewalk along SR 32 in the vicinity of the park (3 comments)
- Safe pedestrian access to Clear Creek Park (3 comments)

Public transit comments include:

- Expand bus service (1 comment)
- There is the need for public transportation in this area (1 comment)
- Expand public transportation other than bus (1 comment)
- Construct light rail along SR 32 right of way (1 comment)
- There is a need for a park and ride and public transit from Newtown to Downtown (3 comments)

Crash Data: ODOT's crash screening identified two locations (the curve west of McCullough Run and along the entrance to Clear Creek Park) as high hazard locations. Because two subsections of the segment of SR 32 from Clough Pike to the Newtown corporation limit were identified, a detailed crash analysis of the entire segment was completed.

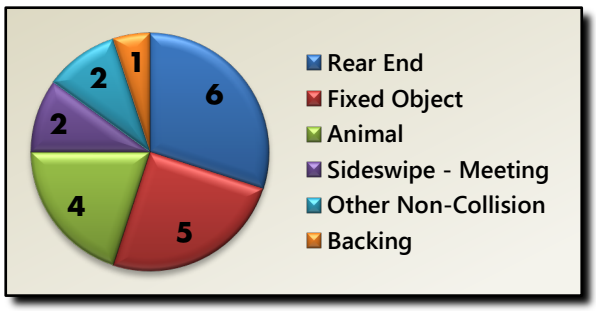


Figure 32: Frequency of Crashes by Crash Type
SR 32: Clough Pike to Newtown Corp. Limit

As illustrated in **Figure 32**, there were 20 total crashes in this roadway section during a three-year period (2013-2015). Rear-end and fixed object crashes represent 55% of the total crashes. Of the 20 total crashes on the segment, four (20%) occurred in the high hazard section west of McCullough Run and two (10%) occurred in the high hazard segment at Clear Creek Park.

There were two clusters of crashes along the segment; the four that occurred in the high hazard section west of McCullough Run and four that occurred at Turpin Lake Place. Excluding the animal crash at both clusters, there is no correlation between the crash data and a specific contributing cause for the crashes at either location. See **Attachment A-2** for a plot of all 20 crashes.

LOS Analysis: No level of service analysis was conducted for this segment; however, the travel time data indicates a 55% increase in the eastbound travel time during the PM peak-hour compared to the off-peak travel time indicating congestion during the PM peak-hour.

Geometric Data: There are three deficient horizontal curves in this segment, one of which has a deficient superelevation. There is also one deficient vertical curve in this segment. The first deficient horizontal curve, crossing McCullough Run, has a curvature of 9˚45', and a maximum superelevation of 0.08. The maximum degree of curvature for a design speed of 60 mph is 4˚15', with a maximum superelevation of 0.06. The second deficient horizontal curve (just north of the first) has a curvature of 5˚0'. A third deficient horizontal curve (at the Newtown corporation limit) has a curvature of 10˚45'. The deficient crest vertical curve is located just south of the McCullough Run crossing. This curve has a k-value of 108 (the minimum design k-value for 60 mph is 151).

Pedestrian Data: No pedestrian data is available for this segment.

2.3.4 SR 125/SR 32 Focus Area Needs Analysis

Based on the results of the technical studies, as well as the extensive public input received from the Focus Area Workshops, online interactive survey, and other public outreach efforts, the primary and secondary needs of the transportation network within the SR 125/SR 32 Focus Area were identified (primary needs are needs that *will* be addressed by this project; secondary needs are needs that *may* be addressed by this project). The input used in the needs analysis is included in the Needs Analysis Table in **Appendix 3**. The primary and secondary needs are presented in **Table 11**:

Table 11: SR 125/SR 32 Focus Area Needs Analysis

Primary Needs	Secondary Needs
SR 125: Beechmont Circle to SR 32	
None	None
SR 125/SR 32 Interchange	
• Address fixed-object crashes on the ramps from SR 32 to westbound SR 125 and eastbound SR 125 to SR 32 • Address merging traffic deficiencies on the ramp from SR 32 to westbound SR 125 • Connect Little Miami Trial to Lunken Trail	• Address ramp flooding issues • Address deficient vertical grade under the SR 125 overpass and at the SR 125 ramps
SR 125: SR 32 to Elstun Road	
None	• Address deficient roadway grade at strip mall • Address pedestrian and bicycle connectivity from Elstun Road to Little Miami Trail
SR 125/Elstun Road Intersection	
Address capacity issues for northbound left-turn movement and westbound approach	• Address deficient roadway grade • Address pedestrian connectivity between rental properties on Elstun Road and bus stops along Beechmont Avenue.
SR 32: SR 125 to Clough Pike	
• Address westbound AM peak-hour delays • Address rear-end crashes	none
SR 32/Clough Pike Intersection	
Address capacity issues and long queue on Clough Pike approach	None
SR 32: Clough Pike to Newtown Corporation Limits	
• Address eastbound PM peak-hour delays • Address deficiencies at the 'S'-curve • Address pedestrian and bicycle connectivity from the Turpin Lake subdivision to the Little Miami Trail	• Address deficient roadway grade east of Turpin Lake Place • Correct deficient roadway curve at Newtown corporation limit • Address pedestrian and bicycle connectivity from Newtown to Clear Creek Park • Address roadway flooding issues

2.4 LINWOOD/EASTERN AVENUE INTERCHANGE FOCUS AREA

The Linwood/Eastern Interchange Focus Area extends from the Linwood Avenue/Herschel Avenue Intersection to the Beechmont Circle Interchange. This focus area also includes the area

between the US 50/SR 125 Interchange and the Red Bank Road area. The majority of this focus area lies within the City of Cincinnati. Near the US 50/Red Bank Interchange, the area is within the Village of Fairfax. A detailed roadway map of the Linwood/Eastern Interchange Focus Area is provided in **Appendix 4**.

2.4.1 Study Area Characteristics

The section of Linwood Avenue between Herschel Avenue and the US 50/SR 125 Interchange is comprised of single family residences. On the east side of US 50, along Eastern and Beechmont Avenues, there is a mix of commercial and institutional land uses. East of Eastern Avenue, in the area bounded by Morse Street to the west and Wooster Road to the east, the area is residential. There is a mix of residential and commercial land uses within the Beechwood Circle ramps and manufacturing and industrial land uses are along Wooster Road to Red Bank Road. There are no planned transportation projects for this focus area listed on ODOT's Transportation Improvement Program (STIP) for FY 2016-2019, dated July 29, 2016.

2.4.2 Community Attributes Identified in the Focus Area Workshop

Fourteen participants from the focus area and surrounding communities attended the Focus Area Workshop held on April 28, 2016. Workshop participants identified community attributes which are important to the Linwood/Eastern Interchange Focus Area and should be considered throughout the transportation planning process. These features include: strong families, picturesque neighborhoods with shopping, older historic homes, and parks. Residents also commented that the area has a low crime rate and strong sense of community. The area has some biking opportunities and pedestrian access but a lack of public transportation options.

2.4.3 Transportation Needs

Stakeholder Input: Transportation needs within the Linwood/Eastern Interchange Focus Area were identified during the Focus Area Workshop and the online interactive survey. These comments, which focus on safety, congestion, mobility, and access issues within the area, are included in the Needs Analysis Table (see **Appendix 4**) and summarized in the following sections.

Technical Studies: Technical data was collected for the roadway network within the Linwood/Eastern Interchange Focus Area to identify areas of high crash rates, congestion, geometric deficiencies, and pedestrian usage. This information is provided in the Needs Analysis Table (see **Appendix 4**) and summarized in the following sections.

2.4.3.1 SR 125/US 50 Interchange

The SR 125/US 50 interchange is a trumpet interchange which features a loop ramp to serve traffic traveling from northbound SR 125 to westbound US 50. A slip ramp from southbound SR 125 provides access to eastbound US 50. Ramps also are provided from Eastern Avenue to southbound SR 125 and to westbound US 50.

Figure 33: US 50/SR 125 Interchange

Stakeholder Input: A total of forty comments were provided regarding this interchange. These comments identified congestion (7 comments), safety (11 comments), and access (22 comments) at this location as major concerns. Representative comments include:

- Congestion is an issue here due to through traffic from Anderson and other points east. (4 comments)
- The interchange needs to be improved; entrance and exit ramps have tight radii; merging is difficult for eastbound and westbound traffic on US 50. (7 comments)
- It is dangerous to turn left onto Linwood Avenue from Beechmont exit. (3 comments)
- There is a conflict point for cars merging right to turn onto Church Place with cars merging right to turn onto Columbia Parkway. (1 comment)
- There is poor signage at the Beechmont Avenue/Lunken Airport exit on Columbia Parkway and on Beechmont. (1 comment)
- A direct exit to northbound US 50 from westbound SR 125 is needed. (7 comments)
- The Beechmont Circle/US 50/Wooster/SR 125 interchanges are confusing and inefficient. (5 comments)
- There is no easy access to eastbound Columbia Parkway from Beechmont Avenue/Linwood Avenue. (2 comments)
- It is too difficult to go north or east on US 50 from SR 125. There should be a full interchange at US 50 and SR 125 and perhaps US 50 could be connected to an upgraded Red Bank interchange. (1 comment)

Six bike comments were provided including:

- A safe bike route along Linwood Avenue is needed. (2 comments)
- A bike connection from Lunken to Old Wooster is needed. (1 comment)
- A bike connection between Mt. Lookout, Lunken and Otto Armeleder is needed. (1 comment)

Four pedestrian comments were provided which identify the following issues:

- There is a safety issue at Beverly Hills Drive on Linwood Avenue where school children cross from a Metro bus stop with no pedestrian signals or crosswalks. (2 comments)
- Pedestrian paths should be connected to others in the city, creating a network rather than scattered sections that lead nowhere. Connections are needed with Downtown, Hyde Park/East Walnut Hills areas. (2 comments)

Two public transit comments identify the need for light rail to serve connect the suburbs with Downtown.

Crash Data: ODOT's crash screening did not identify this interchange as an area of high hazard. Crash data indicates that 15 crashes occurred over the three-year period (2013 – 2015).

LOS Analysis: An analysis of the merge/diverge operations of the ramps was performed using the HCS. All ramps are operating at LOS C or better during both the AM and PM peak hours in 2015 and for the No Build opening year (2022) and No Build design year (2042) conditions. No improvements are required for the existing, No Build opening year, and No Build design year conditions.

Geometric Data: There are several geometric deficiencies within this interchange area. SR 125 has 3 deficient vertical curves west of US 50 and one deficient horizontal curve. The horizontal curve immediately west of US 50 has a degree of curvature of 14˚19'23" compared to the allowable 10˚45' for 40 mph. The superelevation through this curve is also not to current standards. The maximum superelevation through this curve is 0.06 ft/ft compared to the design standard of 0.04 ft/ft. Further compounding this issue is the corresponding vertical curve deficiency. The sag vertical curve has a k-value of 35 which is compared to the 64 allowable at 40 mph. There are two other deficient vertical curves west of this interchange. The next curve is a deficient crest curve; k-value of 40, allowable K-value is 44. The last curve is a deficient sag vertical curve with a k-value of 31 (64 is the minimum allowable). US 50 also has a deficient vertical curve just south of SR 125. The sag vertical curve has a k-value of 45 compared to the allowable k-value of 96 for a design speed of 50 mph.

The remainder of the deficiencies are for the ramps. The ramp from Eastern Avenue to SR 125 has a deficient horizontal curve with a degree of curvature of 76˚0'. The loop ramp from SR 125 to US 50 has a deficient horizontal curve with a degree of curvature of 44˚0'. Neither of these curves meets the minimum degree of curvature for 25 mph, which is the minimum acceptable design speed on ramps. These curves also have maximum superelevations which exceed current standards. The length of the merging taper on the ramp from Eastern Ave to SR 125 is deficient. The actual length of the merge taper is 115' and the required taper length is 420 feet using *L&D, Vol. 1, Figure 503-4*. The total length of the exit ramp from US 50 to SR 125 does not meet the minimum 800 foot deceleration length required for high speed exit ramps. The intersection sight distance, as well as the degree of curvature of the slip lane at the end of the exit ramp, are also

deficient. The left intersection sight distance is 90 feet and the right intersection sight distance is 240 feet. The sight distance is deficient looking both ways compared to the 385 feet required for the speed (40 mph). The horizontal degree of curvature for the slip lane at the end of the US 50 exit ramp to SR 125 is 76˚0', which is below the minimum degree of curvature for 25 mph.

Pedestrian Data: No pedestrian data is available for this intersection.

2.4.3.2 SR 125 (US 50 to Beechmont Circle)

The section of SR 125 between Beechmont Circle and SR 32 is a four-lane undivided limited access roadway approximately 0.3 miles in length with a posted speed of 35 mph.

Stakeholder Input: There are no public comments for the section of SR 125 between US 50 and the Beechmont Circle.

Crash Data: ODOT's crash screening did not identify this segment as an area of high hazard. Crash data indicates that 12 crashes occurred over the three-year period (2013 – 2015).

LOS Analysis: A freeway analysis was performed using the HCS. During the AM peak-hour the eastbound direction operates at LOS A in 2015, the No Build opening year (2022), and No Build design year (2042) conditions while the westbound direction operates at LOS D in 2015, the No Build opening year, and No Build design year conditions. During the PM peak-hour, the eastbound direction operates at LOS C in 2015 and LOS D for the No Build opening year, and No Build design year conditions, while the westbound direction operates at LOS B in 2015, the No Build opening year, and No Build design year conditions. No improvements are required for the existing, No Build opening year, and No Build design year conditions. These results are supported by the travel time data which shows no significant increase in travel time during the peak hours compared to off-peak hours.

Geometric Data: One sag vertical curve is deficient along this segment. The vertical curve east of the viaduct has a k-value of 30 and the minimum allowable k-value for 40 mph is 64.

Pedestrian Data: No pedestrian data is available for this segment.

2.4.3.3 Beechmont Circle Interchange

The Beechmont Circle is a diamond interchange with eastbound and westbound slip ramps to and from SR 125.

Figure 34: Beechmont Circle Interchange

Stakeholder Input: of the 19 roadway comments provided for the Beechmont Circle Interchange, nine identify congestion issues at this interchange, seven identify access issues, and three identify safety issues. Representative comments include:

- Signal timing needs to be improved. (3 comments)
- Signage needs to be improved. (3 comments)
- The interchange is confusing. (4 comments)
- The interchange should be replaced with a roundabout. (1 comment)
- There are frequent accidents. (1 comment)
- There's a bus stop here that creates backups and a dangerous situation as motorists try to pass stopped buses. (1 comment)

Four comments address bike safety and access issues. These include:

- A bike connection is needed between Mt. Lookout and Lunken Playfield and Armleder and access over the Little Miami River is needed (2 comments)
- Going north and south along Wilmer/Wooster is not safe (1 comment)

Five comments address pedestrian issues:

- A crosswalk across Beechmont to the bus stop is needed. (2 comments)
- Improved pedestrian access between US 50 and Red Bank Road is needed. (1 comment)
- Safety is a concern for pedestrians in vicinity of Beechmont Circle. (2 comments)

Six comments identify public transit issues:

- There is a safety issue at the bus stop along Beechmont. (3 comments)
- A pull-off for the Metro bus on Beechmont Avenue is needed, which would make it easier for cars to go around the stopped bus. (1 comment)
- A park and ride station is needed at this location (bicyclists could bike to the station from the bike trails and reduce traffic on local streets) (1 comment)
- Bus Rapid Transit (BRT) should be provided to/from Lunken Airport and the eastern suburbs and Downtown (1 comment)

Crash Data: ODOT's crash screening did not identify this interchange as an area of high hazard. Crash data indicates that 20 crashes occurred over the three-year period (2013 – 2015).

LOS Analysis: An analysis of the merge/diverge operations of the ramps was performed using the HCS. All ramps are operating at LOS D or better during both the AM and PM peak hours in 2015 and for the No Build opening year (2022) and No Build design year (2042) conditions. No improvements are required for the existing, No Build opening year, and No Build design year conditions.

Geometric Data: There are several geometric deficiencies throughout the Beechmont Circle interchange. Three intersections have deficient intersection sight distance. Using a 30 mph design speed for the circle, the corresponding minimum intersection sight distances are 335 feet left and 290 feet right. Wilmer Court has an intersection sight distance of 220 feet looking left and 150 feet looking right. Beechmont Court has an intersection sight distance of 460 feet looking left and 180 feet looking right. Bloor Ave has an intersection sight distance of 100 feet looking left and 300 feet looking right.

All four curves at the corners of the circle have deficient degrees of curvature for a 30 mph design speed. The degrees of curvature for one of these curves is 30˚09'22", the degree of curvature for each of these other three curves is 28˚38'52. The minimum allowable degree of curvature for 30 mph is 22˚45'.

Three of these same four curves have a maximum superelevation that exceeds the current standard maximum superelevation. The northeast corner of the Beechmont Circle has one deficient vertical curve. The sag vertical curve at the intersection with Wooster Rd has a k-value of 29 and the minimum k-value for 30 mph is 37.

Pedestrian Data: No pedestrian data is available for this segment.

2.4.3.4 Eastern Avenue: SR 125 to US 50

The section of Eastern Avenue between SR 125 and US 50 is a two-lane undivided roadway approximately 0.5 miles in length with on-street parking. The posted speed is 35 mph.

Stakeholder Input: There are eight comments which address roadway needs for the section of Eastern Avenue between SR 125 and US 50. Representative comments include:

- Congestion is an issue here. (5 comments)
- There are frequent accidents. (1 comment)

- Street calming is needed; Eastern Avenue between Linwood Avenue and US 50 is treated mostly as an on and off ramp and motorists go too fast. A solar radar sign would be beneficial in this location. (2 comments)

Three comments address bike issues:

- A pedestrian bridge is needed to get bikes over the railroad tracks (2 comments)
- Marked bike lanes are needed (1 comment).

One public transit comment identifies the need for a transit stop in this location.

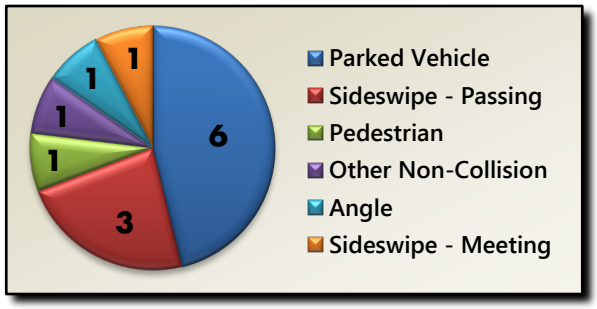


Figure 35: Frequency of Crashes by Crash Type Eastern Avenue: SR 125 to US 50

Crash Data: Eastern Avenue from south of SR 125 to US 50 was identified as a high hazard location through an ODOT crash screening of the Segments II and III roadway network.

As illustrated in **Figure 35**, there were 13 total crashes in this roadway section during the three-year period between 2013 and 2015. Parked vehicles and sideswipe crashes represent 75% of the total crashes. Although parked vehicle crashes are the most prevalent crashes, they do not occur at the same location. There is no correlation between the crash data and a specific contributing cause for the crashes. A plot of all 13 crashes is provided in **Attachment A-2**.

LOS Analysis: No level of service analysis was conducted for this segment.

Geometric Data: No geometric deficiencies were identified for this segment.

Pedestrian Data: No pedestrian data is available for this segment.

2.4.3.5 Wooster Road: Beechmont Circle to Red Bank Road

The section of Wooster Road between Beechmont Circle and Red Bank Road is a two-lane undivided roadway approximately 1.4 miles in length with a posted speed of 35 mph. There are numerous accesses to industrial businesses along this section of Wooster Road.

Stakeholder Input: Thirteen roadway comments identify concerns and needs at Wooster Road between Beechmont Circle and Red Bank Road. Of these concerns, four comments address congestion issues and indicate that extra lanes should be added to this roadway and truck traffic limited during rush hour. Other roadway concerns include the following:

- The road should be repaired (1 comment)
- The road should be repaved and restriped (1 comment)
- Wooster Road occasionally floods (1 comment)
- Air and noise pollution from traffic in this area are concerns at Ault Park (1 comment)
- Large delivery trucks and trailers to Hafner and Cincinnati Paperboard occasionally block Wooster Road as they back into loading docks (1 comment)

- Better signage is needed on Old Wooster Pike (1 comment)

Twenty-seven comments address bicycle access on Wooster Road:

- Although Wooster Road is an important route for cyclists, it is very dangerous (5 comments)
- A bike lane or bike path is needed along the Little Miami River between Lunken Park, Otto Armleder Park, Avoca Park, the Murray Avenue Trail, and the Little Miami Trail (10 comments)
- Marked bike lanes on Wooster are needed (8 comments)
- A bike/pedestrian crossing of the railroad tracks that parallel Eastern Avenue is needed (1 comment)
- A bike trail connection is needed across Wooster Pike from Armleder, along the Oasis Line ROW and connecting to the trail at Old Red Bank Road, which leads to the Murray Road Trail in Fairfax (1 comment).
- A bike path/trail is needed to connect with Downtown Cincinnati or to Hyde Park area (1 comment)
- Sharrows exist in Fairfax but disappear between Wooster Road and Otto Armleder Park (1 comment)

The following pedestrian comments were provided:

- A sidewalk is needed (1 comment)
- A crosswalk is needed at Carustar (1 comment)

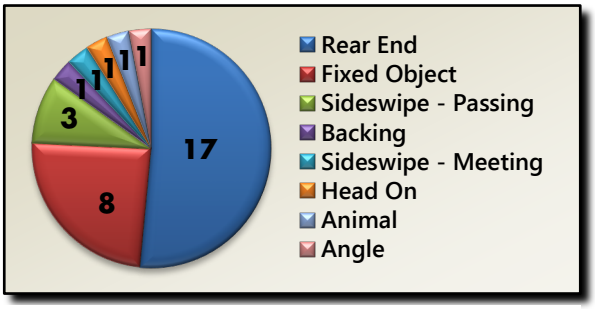


Figure 36: Frequency of Crashes by Crash Type
Wooster Road: Beechmont Circle to Red Bank

Crash Data: The ODOT crash screening of the Segments II and III roadway network identified the sub-segment of Wooster Road from the Cincinnati City Limit to approximately 0.70 miles south as a high hazard area. Therefore, a detailed crash analysis of the entire segment from Beechmont Circle to Red Bank Road was completed.

As illustrated in **Figure 36**, there were 33 total crashes in this roadway section during the three-year period between 2013 and 2015. Rear-end and fixed object crashes represent 75% of the total crashes. Of the 33 total crashes on the segment, 25 (75%) occurred in the high hazard section. Within the high hazard segment, 12 of the 25 crashes were rear-end crashes and eight of the 25 were fixed object crashes. There was not a clustering of crashes at a particular location. Half of the rear end crashes occurred between 3:00 PM and 5:00 PM with the majority of crashes occurring during the day in clear conditions. Thirty-three percent (33%) of the rear-end crashes occurred in wet conditions. Other than the observations described above, there was no correlation between the crash data and a specific contributing cause for rear-end crashes.

Seven of the eight fixed object crashes occurred in clear weather, six involved a vehicle traveling southbound, and four occurred in the dark (lighted). Other than the observations described

above, there was no correlation between the crash data and a specific contributing cause for rear-end crashes. See **Attachment A-2** for a plot of all 33 crashes.

LOS Analysis: No level of service analysis was conducted for this segment.

Geometric Data: No geometric deficiencies were identified for this segment.

Pedestrian Data: No pedestrian data is available for this segment.

2.4.3.6 US 50: SR 125 to Eastern Avenue

The section of US 50 between SR 125 and Eastern Avenue is a four-lane divided, limited-access roadway approximately 0.7 miles in length with a posted speed of 50 mph.

Stakeholder Input: There are three public comments for the section of US 50 between SR 125 and Eastern Avenue:

- US 50 should be widened
- There are dangerous merges in this section of US 50
- There is a street lighting issue in this location

One transit comment indicates that public transit in this area is very limited and there should be more frequent bus service from Downtown Cincinnati.

Crash Data: ODOT's crash screening did not identify this segment as an area of high hazard. Crash data indicates that no crashes occurred over the three-year period (2013 – 2015).

LOS Analysis: A freeway analysis was performed using the HCS. During both the AM and PM peak hours, the eastbound and westbound directions operate at LOS A in 2015, the No Build opening year (2022), and No Build design year (2042) conditions. No improvements are required for the existing, No Build opening year, and No Build design year conditions. These results are supported by the travel time data which shows no significant increase in travel time during the peak hours compared to off-peak hours.

Geometric Data: No geometric deficiencies were identified for this segment.

Pedestrian Data: No pedestrian data is available for this segment.

2.4.3.7 US 50: Eastern Avenue to Red Bank Road

The section of US 50 between Eastern Avenue and Red Bank Road is a four-lane divided, limited-access roadway approximately 0.9 miles in length with a posted speed of 50 mph.

Stakeholder Input: Four roadway comments identify congestion as a concern along US 50 between Eastern Avenue and Red Bank Road. Representative comments are:

- Congestion is a problem (2 comments)
- Columbia Parkway should be widened (1 comment)

- Access between Red Bank Road and Beechmont Avenue should be improved (1 comment)

Two bike comments identify the need for a bike path or bike lanes along Eastern Avenue.

One pedestrian comment identifies the need for a crosswalk at Otto Armleder Park.

Two transit comments identify the need for better bus service between the Columbia Tusculum area and downtown Cincinnati.

Crash Data: ODOT's crash screening did not identify this segment as an area of high hazard. Crash data indicates that one crash occurred over the three-year period (2013 – 2015). The one crash, involving a motorcycle, was a fatal crash.

LOS Analysis: A freeway analysis was performed using the HCS. During the AM peak-hour both the eastbound and westbound directions operate at LOS A in 2015, the No Build opening year (2022), and No Build design year (2042) conditions. During the PM peak-hour, the eastbound direction operates at LOS A in 2015 and LOS B for the No Build opening year, and No Build design year conditions, while the westbound direction operates at LOS A in 2015, the No Build opening year, and No Build design year conditions. No improvements are required for the existing, No Build opening year, and No Build design year conditions. These results are supported by the travel time data which shows no significant increase in travel time during the peak hours compared to off-peak hours.

Geometric Data: No geometric deficiencies were identified for this segment.

Pedestrian Data: No pedestrian data is available for this segment.

2.4.4 Linwood/Eastern Avenue Interchange Focus Area Needs Analysis

Based on the results of the technical studies, as well as the extensive public input received from the Focus Area Workshops, online interactive survey, and other public outreach efforts, the primary and secondary needs of the transportation network within the Linwood/Eastern Interchange Focus Area were identified (primary needs are needs that *will* be addressed by this project; secondary needs are needs that *may* be addressed by this project). The input used in the needs analysis is included in **Appendix 4**. The primary and secondary needs are presented in **Table 12:**

Table 12: Linwood/Eastern Avenue Interchange Focus Area Needs Analysis

Primary Needs	Secondary Needs
SR 125/US 50 Interchange	
Address lack of connectivity from SR 125 to eastbound US 50 and from westbound US 50 to SR 125	• Address deficient roadway curves on SR 125 and interchange ramps • Address deficient roadway grade on SR 125 and on US 50 • Address deficient sight distance at the eastbound US 50 exit ramp intersection with SR 125 • Address deficient weave on the eastbound US 50 exit ramp to SR 125 • Address lack of/limited wayfinding to improve regional connectivity
SR 125: US 50 to Beechmont Circle	
None	• Address deficient roadway grade east of viaduct • Address physical connectivity between SR 125/US 50 interchange and Beechmont Circle
Beechmont Circle	
• Address localized connectivity travel patterns within Beechmont Circle • Address pedestrian safety issues crossing SR 125 at bus stops	• Address lack of/limited wayfinding to improve regional connectivity • Address roadway curve and grade deficiencies
Eastern Avenue: SR 125 to US 50	
None	Address bicycle and pedestrian connectivity across railroad to existing Armleder and Lunken bike paths
Wooster Road: Beechmont Circle to Red Bank Road	
• Address bicycle connectivity (designated US Bicycle Route 21)	• Support access to future transit connections
US 50: SR 125 to Eastern Avenue	
None	None
US 50/Eastern Avenue Interchange	
None	Address lack of/limited wayfinding to improve regional connectivity
US 50: Eastern Avenue to Red Bank Road	
None	None

2.5 US 50/RED BANK ROAD INTERCHANGE FOCUS AREA

The US 50/Red Bank Interchange Focus Area extends from the US 50/Red Bank Interchange area north to Fair Lane and east to Meadowlark Lane. This focus area is within the Village of Fairfax. A detailed roadway map of the US 50/Red Bank Interchange Focus Area is provided in **Appendix 5**.

2.5.1 Study Area Characteristics

Manufacturing is the predominant land use west of the US 50/Red Bank Road Interchange along Wooster Pike to Meadowlark Lane. There are residential areas along Meadowlark Lane and Nightingale Drive at the east end of the focus area. There are no planned or committed transportation projects for this focus area listed on ODOT's 2016-2019 Statewide Transportation Improvement Program (STIP) dated July 29,2016.

The community attributes for the US 50/Red Bank Interchange area that were identified in the Focus Area Workshop include the following: diverse community with community resources that are enjoyed including the Frisch's Mainliner, the Fairfax Community pool, and the Columbia Parkway. The neighborhoods are attractive with mature trees and a range of housing choices. The community has attracted young, educated people looking for a strong community with good schools. There are many options to get around in this area, including roadways and bike paths. Another attribute of the area is its proximity to nearby cultural opportunities including Music Hall, the theater in Downtown Cincinnati, and sporting events.

2.5.2 Transportation Needs

Stakeholder Input: Transportation needs within the US 50/Red Bank Interchange Focus Area were identified during the Focus Area Workshop and the online interactive survey. These comments, which focus on safety, congestion, mobility, and access issues are included in the Needs Analysis Table (see **Appendix 5**) and summarized in the following sections.

Technical Studies: Technical data was collected for the roadway network within the US 50/Red Bank Interchange Focus Area to identify areas of high crash rates, congestion, geometric deficiencies, and pedestrian usage. This information is provided for the major roadway sections and intersections within the US 50/Red Bank Interchange in the Needs Analysis Table in **Appendix 5** and summarized in the following sections.

2.5.2.1 US 50/Red Bank Road Interchange

The SR 125/US 50 interchange is a partial cloverleaf interchange.

Figure 37. US 50/Red Bank Road Interchange

Stakeholder Input: Twenty-five comments address issues at the US 50/Red Bank Road Interchange. Representative comments include:

- The intersection is very inefficient and backs up during heavy traffic (4 comments)
- There are line of sight and merging issues (2 comments)
- The intersection has safety concerns/frequent accidents (2 comments)
- Peak-Hour congestion is an issue(6 comments)
- There is driver confusion due awkward interchange configuration (2 comments)
- Poor linkage to Beechmont Levee (SR 125) (1 comment)
- Confusing signage (2 comments)
- A safer, smoother transition from US 50 to Red Bank Road is needed (4 comments)
- Difficult to access I-71 from this area (2 comments)

Bike comments include:

- A bike path is needed (1 comment)
- Connections are needed between Madisonville and Fairfax to Wasson Way and Otto Armleder Park. (1 comment)

Three pedestrian comments are:

- Sidewalks are needed (1 comment)
- A sidewalk is needed between Fairfax and Red Bank Road (1 comment)
- A sidewalk/pedestrian path is needed to Ault Park from the Fairfax bike path (Murray Avenue Trail) (1 comment)

One public transit comment identifies the need for a train to Downtown which would connect with the Streetcar.

Crash Data: ODOT's crash screening did not identify this interchange as an area of high hazard. Crash data indicates that 15 crashes occurred over the three-year period (2013 – 2015).

LOS Analysis: An analysis of the merge/diverge operations of the ramps was performed using the HCS. All ramps are operating at LOS C or better during both the AM and PM peak hours in 2015 and for the No Build opening year (2022) and No Build design year (2042) conditions. No improvements are required for the existing, No Build opening year, and No Build design year conditions.

Geometric Data: No geometric deficiencies were identified for this segment.

Pedestrian Data: No pedestrian data is available for this segment.

2.5.2.2 US 50: Red Bank Road to Meadowlark Lane

The section of US 50 between Red Bank Road and Meadowlark Lane is a four-lane divided limited-access roadway approximately 0.3 miles in length with a posted speed of 50 mph.

Stakeholder Input: Of the 16 roadway comments provided for the section of US 50 between Red Bank Road and Meadowlark Lane, 15 concern congestion. Representative comments include:

- Traffic lights cause delays; signal timing is not correct, particularly the Watterson intersection (4 comments)
- The road is only one lane; left turns cause delay and many side streets have been blocked (3 comments)
- The roadway should be widened (1 comment)
- There should be a consistent number of lanes on Wooster Pike all the way through Fairfax and Mariemont instead of alternating between one and two lanes (1 comment)

Three bike comments indicate that better bike access is needed along US 50 from Fairfax to Red Bank and that the Red Bank bike trail should connect to the Little Miami Trail.

Three pedestrian comments were provided which identify the following concerns:

- Safety is a general pedestrian concern in the area (1 comment)
- A sidewalk is needed to Ault Park (1 comment)
- US 50 is difficult to cross (1 comment)

Three comments identify the need for public transit, of which two identify the need for commuter rail to downtown.

Crash Data: ODOT's crash screening did not identify this segment as an area of high hazard. Crash data indicates that one crash occurred over the three-year period (2013 – 2015).

LOS Analysis: No level of service analysis was conducted for this segment; however, the travel time data indicates a 165% increase in the eastbound travel time during the PM peak-hour compared to the off-peak travel time indicating congestion during the PM peak-hour.

Geometric Data: No geometric deficiencies were identified for this segment.

Pedestrian Data: No pedestrian data is available for this segment.

2.5.2.3 US 50/Meadowlark Lane Intersection

The US 50/Meadowlark Lane intersection is a signalized four-leg intersection.

Figure 38. US 50/Meadowlark Lane Intersection

Stakeholder Input: Of the 25 comments provided for the US 50/Meadow Lark Intersection, 24 identify congestion as an issue and one identifies speed. Representative comments include:

- Congestion at the stoplight is bad during the AM and PM peak hours (15 comments)
- Signal timing is an issue (3 comments)
- Drivers see back-ups at the intersection of US 50 and Old Wooster Pike and will bypass the left hand lane and use Dragon Way to jump ahead in line (1 comment)
- Commuters should be re-routed off US 50 (1 comment)
- Going from two to one lane is an issue (4 comments)

One public transit comment indicated that this would be a good place for a park and ride and rail service.

Crash Data: ODOT's crash screening did not identify this intersection as an area of high hazard. Crash data indicates that 31 crashes occurred over the three-year period (2013 – 2015). Of the 31 crashes, 17 were rear-end crashes. Eight of the 17 rear-end crashes occurred in the eastbound direction due to queued traffic.

LOS Analysis: The HCS analysis indicates that the southbound shared left/through movement 95th percentile queue length exceeds the storage length during the AM peak-hour and northbound shared left/through movement 95th percentile queue length exceeds the storage length during the PM peak-hour. This occurs for the existing, the No Build opening year (2022), and No Build design year (2042) conditions. The LOS and v/c ratios are acceptable. It is anticipated that operational or minor intersection improvements are required for the existing, No Build opening year and No Build design year conditions.

Eastbound US 50 at Meadowlark Lane (PM Peak)

To supplement the HCS analysis a queue study was conducted for the eastbound approach during the PM peak period. The number of cars in the queue was recorded at the end of green for 15 minutes prior to the peak hour to 15 minutes after the peak-hour ended. The number of cars was translated to a length by assuming a queue length of 25 feet per vehicle. During the PM peak period the maximum eastbound queue extended 1,100 feet. The recorded queues during the PM peak period are shown in **Figure 39**:

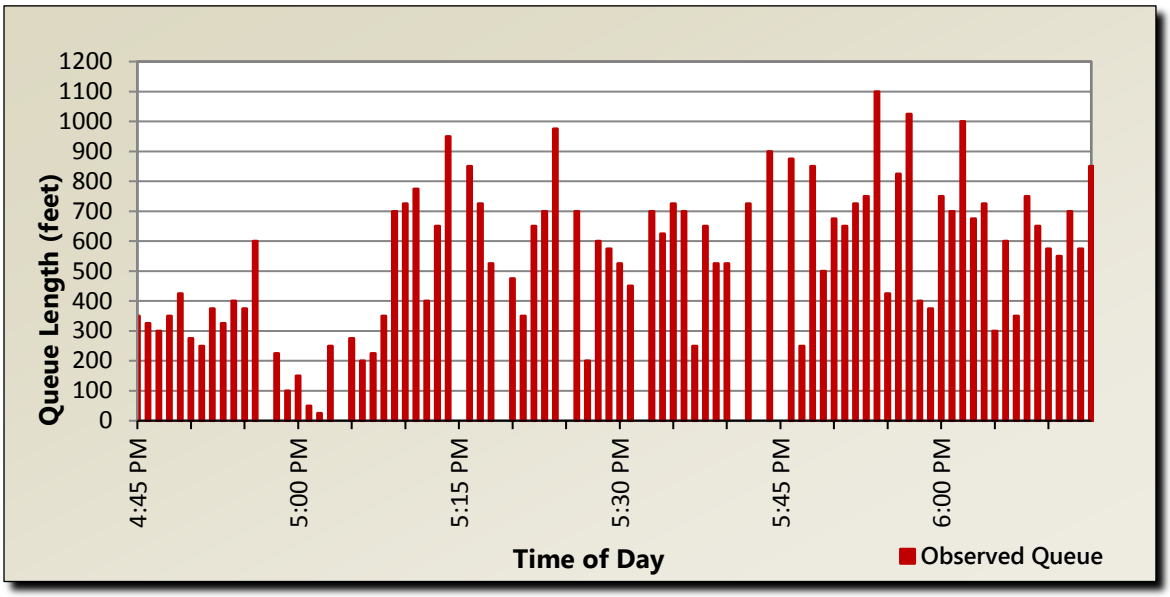


Figure 39. Eastbound US 50 PM Peak-Period Queues at Meadowlark Lane

Geometric Data: No geometric deficiencies were identified for this segment.

Pedestrian Data: Nine pedestrians were observed at the intersection during a 24-hour period recorded on November 19, 2015.

2.5.2.4 Wooster Pike: Red Bank Road to US 50

The section of Wooster Pike between Red Bank Road and US 50 is a two-lane undivided roadway, approximately 0.5 miles in length, with a posted speed of 35 mph.

Stakeholder Input: Five comments identify the following concerns regarding Wooster Pike between Red Bank Road and US 50:

- The roadway needs repair (1 comment)
- There is congestion through Fairfax (3 comments)
- The roadway striping is hard to see (1 comment)

Five bike comments include:

- A path is needed along Wooster to Old Wooster Pike to connect to Otto Armleder Park (1 comment)
- A bike path and improved walking paths are needed to connect to business areas along Red Bank Road (1 comment)
- East-west bike paths are needed that avoid US 50 (1 comment)
- Need marked bike lanes (1 comment)
- A path is needed to connect Cincinnati with the Little Miami Trail (1 comment)

Four comments identify the following public transit needs:

- A bus stop shelter (1 comment)
- Rail transit with a park and ride (2 comments)
- Bus Rapid Transit (BRT), possibly along the Oasis line (1 comment)

Crash Data: ODOT's crash screening did not identify this segment as an area of high hazard. Crash data indicates that six crashes occurred over the three-year period (2013 – 2015).

LOS Analysis: No level of service analysis was conducted for this segment.

Geometric Data: A deficient sag vertical curve just east of the Red Bank Road intersection has a k-value of 24. The minimum allowable k-value for 35 mph is 49. The superelevation through this combination horizontal/vertical curve also does not meet current standards.

Pedestrian Data: No pedestrian data is available for this segment.

2.5.2.5 Wooster Road/Wooster Pike/Red Bank Road Intersection

The Wooster Road/Wooster Pike/Red Bank Road intersection is a signalized three-leg intersection:

Figure 40: Wooster Road/Red Bank Road Intersection

Stakeholder Input: Public comments indicate that congestion and access are issues at the Wooster/Red Bank Intersection. Representative comments include:

- The intersection is very congested, especially in the AM peak (2 comments)
- There is poor signal detection (and alignment) at the Wooster Road/Red Bank Road intersection (1 comment)
- A better connection is needed from Red Bank Road to SR 32 (5 comments)
- A better connection is needed from SR 125 to Red Bank Road and a connection is needed between SR 125 via Columbia Parkway at Church Place (1 comment)

One bike comment indicates that a bike path is needed to connect Avoca and Lunken.

One public transit comment identifies a need for commuter rail into Cincinnati and beyond I-275.

Crash Data: ODOT's crash screening did not identify this intersection as an area of high hazard. Crash data indicates that five crashes occurred over the three-year period (2013 – 2015).

LOS Analysis: The HCS analysis indicates that the northbound left turn movement 95th percentile queue length exceeds the storage length during the AM peak-hour for the existing, the No Build opening year (2022), and No Build design year (2042) conditions. The LOS and v/c ratios are acceptable, but approaching capacity in the opening year and design year scenarios. If the existing signal timing was used instead of balancing the delays per the ODOT methodology, the northbound left turn movement would fail with v/c ratios greater than 1.0. This indicates that the failure of the northbound left turn movement is likely due to a signal timing issue. No intersection improvements are required for the exiting conditions, but it is anticipated that operational or minor intersection improvements are required for the No Build opening year and No Build design year conditions.

Geometric Data: One vertical curve is deficient through this intersection. The crest vertical curve has a k-value of 10 and the minimum required k-value is 29 for speed of 35 mph. In addition, the lane configuration on Red Bank Road (west of the intersection) and Wooster Pike (east of the intersection) are staggered; vehicles traveling east on Red Bank Road continuing through the intersection onto Wooster Pike must weave through the intersection to avoid collisions with westbound vehicles on Wooster Pike waiting to turn left onto Wooster Road.

Pedestrian Data: No pedestrians were observed at the intersection during a 24-hour period recorded on November 17, 2015.

2.5.2.6 Red Bank Road: Wooster Road to the US 50 Interchange Ramps

The section of Red Bank Road between Wooster Road and the US 50 Interchange Ramps is a two-lane undivided roadway, approximately 0.4 miles in length, with a posted speed of 35 mph.

Stakeholder Input: Of nine comments concerning roadway issues on Red Bank Road between Wooster Road and the US 50 Ramps, five identify congestion as an issue. Access and connectivity issues were also cited. Representative comments include:

- Red Bank Road should cross the river and connect with SR 32 (2 comments)
- The Red Bank, Wooster Pike and US 50 connections are confusing for drivers and face constant delays. The road and ramp system should be upgraded and a better connection provided between SR 32 and SR 125 (1 comment)
- An easier access is needed to the Norwood Lateral (1 comment)

Ten comments identify bikeway concerns as follows:

- A bike path is needed (1 comment)
- A connection between Ault Park and other bike paths is needed (4 comments)
- Wasson Way should be connected to Fairfax/Mariemont/Little Miami Trail (3 comments)
- A bike lane is needed at this intersection (1 comment)
- Extend Wasson Way from Ault Park to the Newtown Road bridge (1 comment)

One public transit comment identifies the need to provide transit between the Red Bank area and Eastgate.

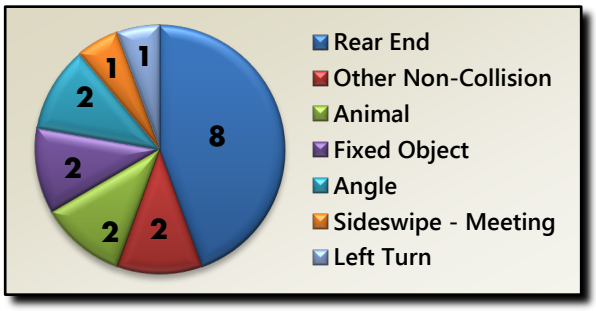


Figure 41: Frequency of Crashes by Crash Type Red Bank Road: Wooster Rd. to US 50 Ramps

Crash Data: The ODOT crash screening of the Segments II and III roadway network identified Red Bank Road from Wooster Road to the US 50 Ramps as a high hazard location through. As illustrated in **Figure 41**, there were 18 total crashes in this roadway section during the three-year period between 2013 and 2015. Rear-end crashes represent 45% of the total crashes.

Eight of the crashes occurred just south of the signalized intersection at the US 50 Ramps and were related to vehicles queued from the signal at the US 50 Ramps. Six of the seven rear-end

crashes occurred in the northbound direction. Five crashes occurred at the vertical sag curve just east of the US 50 underpass. A geometric review indicates that the vertical curve is substandard. Refer to **Attachment A-2** for a plot of all 18 crashes.

LOS Analysis: No level of service analysis was conducted for this segment.

Geometric Data: A deficient sag vertical curve on this segment has a k-value of 45. The minimum required k-value is 49 for 35 mph.

Pedestrian Data: No pedestrian data is available for this segment.

2.5.2.7 Red Bank Road/US 50 Ramps Intersection

The Red Bank Road/US 50 Ramps intersection is a signalized three-leg intersection:

Figure 42: Red Bank Road/US 50 Interchange Ramps Intersection

Stakeholder Input: One roadway comment for the Red Bank/US Ramp Intersection indicates that improved directional signage could improve the intersection.

Crash Data: An ODOT crash screening did not identify this intersection as an area of high hazard. Crash data indicates that 11 crashes occurred over the three-year period (2013 – 2015).

LOS Analysis: The HCS analysis indicates that this intersection is failing during the AM peak-hour under existing conditions. The two movements contributing to the overall intersection failure is the westbound right turn movement (v/c ratio of 1.26) and the failing northbound movement (v/c ratio of 1.10). These failures are exacerbated in the No Build opening year (2022) and No Build design year (2042) conditions. It is anticipated that major capacity improvements are required for the existing, No Build opening year, and No Build design year conditions.

Northbound Red Bank Road at Colbank (AM Peak)

To supplement the HCS analysis a queue study was conducted for the northbound and westbound approaches during the AM peak period. The number of cars in the queue was recorded at the end of green for 15 minutes prior to the peak hour to 15 minutes after the peak-hour ended. The number of cars was translated to a length by assuming a queue length of 25 feet per vehicle. During the AM peak period the maximum northbound queue extended 625 feet and the maximum westbound queue extended 600 feet. The recorded queues during the AM peak period are shown in **Figures 43 and 44**:

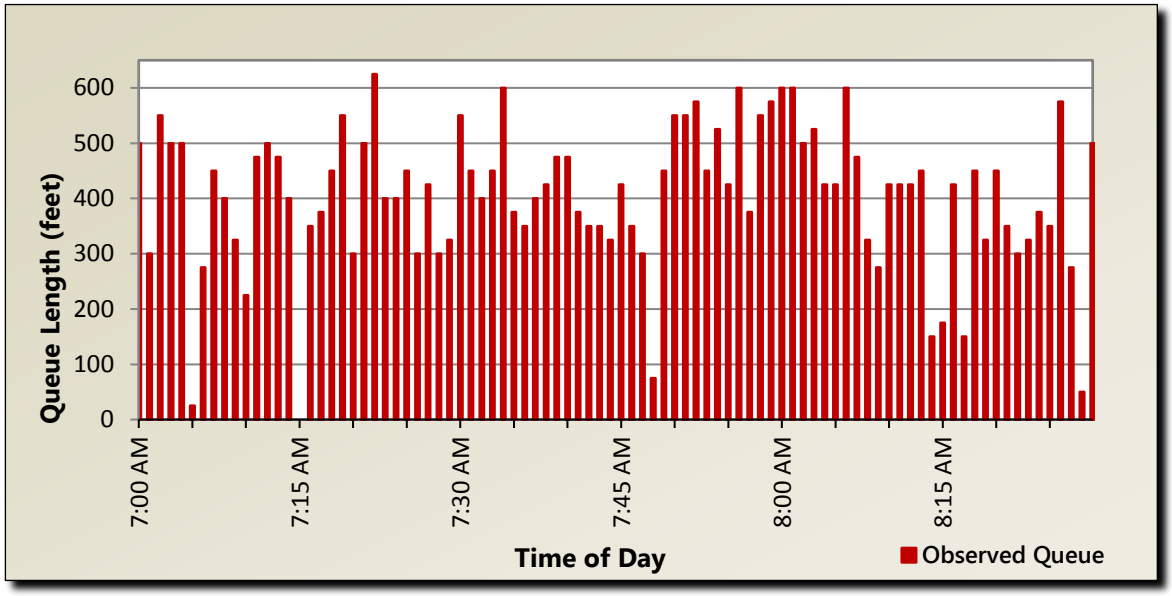


Figure 43: Northbound Red Bank Road AM Peak-Period Queues at Colbank Road

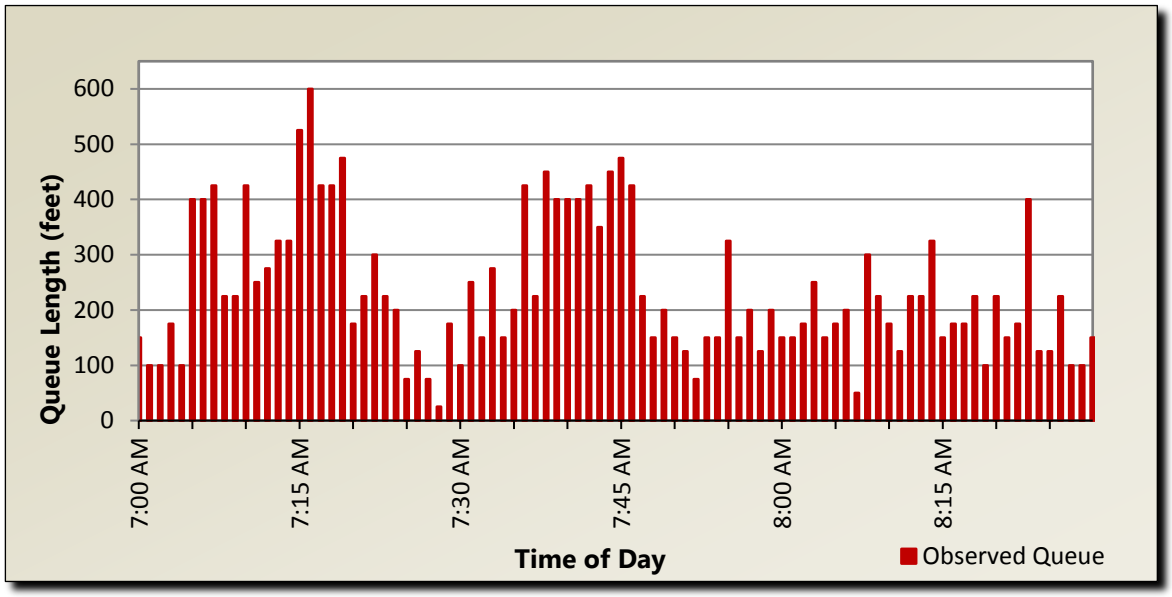


Figure 44. Westbound Colbank Road AM Peak-Period Queues at Red Bank Road

Geometric Data: No geometric deficiencies were identified at this intersection.

Pedestrian Data: No pedestrians were observed at the intersection during a 24-hour period recorded on February 17, 2016.

2.5.3 US 50/Red Bank Road Interchange Focus Area Needs Analysis

Based on the results of the technical studies, as well as the extensive public input received from the Focus Area Workshops, online interactive survey, and other public outreach efforts, the primary and secondary needs of the transportation network within the US 50/Red Bank Interchange Focus Area were identified (primary needs are needs that *will* be addressed by this project; secondary needs are needs that *may* be addressed by this project). The input used in the needs analysis is presented in **Appendix 5**. The primary and secondary needs are presented in **Table 13**:

Table 13. US 50/Red Bank Road Interchange Focus Area Needs Analysis

Primary Needs	Secondary Needs
US 50/Red Bank Road Interchange	
Address localized connectivity patterns within the interchange	Address lack of/limited wayfinding signage to improve regional connectivity
US 50: Red Bank Road Interchange to Meadowlark Lane	
• Address safety issues related to end of freeway section • Address eastbound PM peak-hour queues	None
US 50 /Meadowlark Lane Intersection	
Address eastbound PM peak-hour queues	None
Wooster Pike: Red Bank Road to US 50	
None	• Address deficient roadway grade just east of the Red Bank Road/Wooster Road intersection • Support access to future transit connections
Red Bank Road/Wooster Road/Wooster Pike Intersection	
• Address capacity issue for northbound left-turn movement • Address sight distance within intersection	Address deficient roadway grade
Red Bank Road: Wooster Road to US 50 Ramps	
Address deficient roadway grade just east of Red Bank Road/Wooster Road intersection	None
Red Bank Road/US 50 Ramps Intersection	
Address capacity issues and long queues on northbound and westbound approaches	Address lack of/limited wayfinding to improve regional connectivity
Red Bank Road: US 50 Ramps to Fair Lane	

Primary Needs	Secondary Needs
None	None

2.6 US 50 CORRIDOR FOCUS AREA

The US 50 Corridor Focus Area extends from the US 50/Meadowlark Lane intersection through Mariemont to the US 50/Newtown Road Intersection. The US 50 Corridor Focus Area includes portions of the Village of Fairfax, the Village of Mariemont, and Anderson Township. A detailed roadway map of the US 50 Corridor Focus Area is provided in **Appendix 6.**

2.6.1 Study Area Characteristics

Land use in the US 50 Corridor between Meadowlark Lane and Belmont Avenue in the Village of Fairfax is primarily commercial and retail. At Belmont Avenue (the western boundary of the Village of Mariemont), US 50 transitions to a boulevard with a treed median (single lane in each direction of travel). The area between Belmont Avenue and the Mariemont Square is characterized by large single-family residences and several parks. Between West Street and Mariemont Square, US 50 is a four-lane divided roadway with street parking and greenspaces separating each direction of travel. Mariemont Square, which serves as the community center, is a vibrant shopping area with a mix of retail and restaurants. East of Mariemont Square to the eastern Mariemont corporation line (near Walnut Creek Road) land use includes Mariemont High School, a public library, and commercial development. The section of the focus area from the eastern Mariemont corporation line to Newtown Road is within Anderson Township. In this section, US 50 is a mix of commercial and retail businesses, with development occurring primarily on the south side of the roadway. Planned and committed transportation projects included on ODOT's 2016-2019 Statewide Transportation Improvement Program (STIP), dated July 29, 2016, are shown on **Table 14** below:

Table 14. US 50 Corridor Focus Area Planned and Committed Projects

Project	Description	Construction Year
HAM-US50-30.23 RRFB (PID 999814)	Installation of two Rectangular Rapid Flashing Beacons (RFFB) at crosswalk near intersection of Wooster Pike (US 50) and Belmont Avenue in Mariemont	N/A
HAM-Murray Avenue Bikepath (PID 99816)	Installation of shared use path within grass median of Murray Avenue from Settle Street to Plainville Road	N/A

2.6.2 Community Attributes Identified in the Focus Area Workshop

Community values and priorities were identified for the US 50 Corridor as part of the Focus Area Workshop. Both the Village of Fairfax and Village of Mariemont have a "small town feel". These communities are both business-friendly and supportive of economic development. In general, this area is walkable and bike-able. The communities pride themselves on their high quality schools (both Fairfax and Mariemont are in the same school system), low crime rates, high rate of community volunteerism, and wonderful parks. Mariemont is proud of its historic heritage as one

of the nation's planned communities dating from the 1920's and 30s, which is on the National Register of Historic Places (NRHP).

2.6.3 Transportation Needs

Stakeholder Input: Transportation needs within the US 50 Corridor Focus Area were identified during the Focus Area Workshop and the online interactive survey. These comments, which focus on safety, congestion, mobility, and access issues, are included in the Needs Analysis Table (see **Appendix 6**) and summarized in the following sections.

Technical Studies: Technical data was collected for the roadway network within the US 50 Corridor Focus Area to identify areas of high crash rates, congestion, geometric deficiencies, and pedestrian usage. This information is provided in the Needs Analysis Table (see **Appendix 6**) and summarized in the following sections.

2.6.3.1 US 50: Meadowlark Lane to Watterson Road

The section of US 50 between Meadowlark Lane and Watterson Road has a single through lane in each direction and a center two-way left turn lane. The segment is approximately 0.3 miles in length with a posted speed of 35 mph from Meadowlark Lane to Southern Avenue and a posted speed of 25 mph from Southern Avenue to Watterson Road.

Stakeholder Input: Nineteen comments were provided concerning congestion along US 50 between Meadowlark Lane and Watterson. Representative comments include:

- The reduction of lanes in Fairfax from two lanes to one (in each direction) has caused bottlenecks (3 comments)
- Traffic signal timing needs to be coordinated along US 50 (3 comments)
- The road needs to be widened (1 comment)
- An alternate route around Fairfax/Mariemont is needed; do not impact these neighborhoods with street changes (1 comment)
- One lane road and left turns are a nightmare. Too many side streets have been blocked (1 comment)

Eight comments were provided as follows:

- A bike path/bike lane is needed (5 comments)
- Pedestrian and bike paths to connect beyond the corridor are needed (1 comment)
- A connection from Wasson Way to Bass Island is needed (1 comment)
- The Ohio to Lake Erie Trail could be designated a shared road (1 comment)

Two pedestrian concerns were provided. They include:

- Dividers and streetscape along US 50 are not attractive (1 comment)
- Hawthorne Road is used as an alternative to Fairfax for pedestrians. It is not safe, particularly for school children who frequently walk there (1 comment)

Three public transit comments identify the following needs:

- Direct bus service to downtown
- Light rail
- Bus Rapid Transit, possibly along the Oasis Line

Crash Data: ODOT's crash screening did not identify this segment as an area of high hazard. Crash data indicates that 17 crashes occurred over the three-year period (2013 – 2015).

LOS Analysis: No level of service analysis was conducted for this segment; however, the travel time data indicates a 75% increase in the eastbound travel time during the PM peak-hour and a 55% increase in the in the westbound travel time during the AM peak-hour compared to the off-peak travel time indicating congestion during the AM and PM peak hours.

Geometric Data: No geometric deficiencies were identified for this segment.

Pedestrian Data: No pedestrian data is available for this segment.

2.6.3.2 US 50/Watterson Road Intersection

The US 50/Watterson Road intersection is a signalized four-leg intersection.

Figure 45. US 50/Watterson Road Intersection

Stakeholder Input: Eight comments were provided for the Watterson/US 50 intersection. These comments address congestion issues at this intersection as follows:

- Congestion at the light is terrible in the PM rush hour (1 comment)
- Traffic signal timing needs to be fixed (3 comments)
- Noise and traffic are issues (1 comment)
- There is a problem where US 50 pinches down from two lanes to one by the library in Mariemont (2 comments)

One bike comment identifies the need for a bike path in this area.

Crash Data: An ODOT crash screening did not identify this intersection as an area of high hazard. Crash data indicates that 13 crashes occurred over the three-year period (2013 – 2015).

LOS Analysis: The HCS analysis indicates that the southbound left turn movement 95th percentile queue length exceeds the storage length during the AM and PM peak hours. This occurs for the existing, the No Build opening year (2022), and No Build design year (2042) conditions. The LOS and v/c ratios are acceptable. By the design year, the westbound through movement is failing with a v/c ratio of 1.0 in the AM peak-hour. It is anticipated that operational or minor intersection improvements are required for the existing, No Build opening year and No Build design year conditions.

Geometric Data: No geometric deficiencies were identified at this intersection.

Pedestrian Data: One hundred twenty- one (121) pedestrians were observed at the intersection during a 24-hour period recorded on November 19, 2015.

2.6.3.3 US 50: Watterson Road to Plainville Road

The section of US 50 from Watterson Road and Plainville Road is a two-lane roadway approximately 0.6 miles in length. From Watterson Road to Harvard Acres the two lanes are separated by a center two-way left turn lane. From Harvard Acres to Plainville Road the two lanes are separated by a raised median. The posted speed is 25 mph from Watterson Road to Belmont Avenue and 35 mph from Belmont Avenue to Plainville Road.

Stakeholder Input: Of 42 comments provided concerning the US 50 corridor between Watterson and Plainville, thirty-seven identify congestion as a significant concern. Representative comments include:

- The new Fairfax traffic pattern has created terrible congestion and air pollution (31 comments)
- Unnecessary speed changes (1 comment)
- A roundabout could be used here (1 comment)
- Extra lanes are needed on US 50 through Fairfax and Mariemont (2 comments)
- Too many lights in Mariemont/Fairfax/Plainville (1 comment)
- Frequent accidents in this location (1 comment)
- It is difficult to access Wooster from Homewood; the lanes are not well defined here (1 comment)

Nine bike comments identify the need for bike paths and bike lanes in this area, as well as specific areas where connections between bike trails are needed. These comments include:

- Bike paths/bike lanes are needed through local communities (4 comments)
- Bike connections are needed to downtown, Hyde Park/Mt. Lookout, UC and Xavier University (1 comment)
- Wasson Way trail should be built (1 comment)
- A bike connection is needed between Mariemont and the Little Miami Bike Trail (2 comments)

- A bike connection is needed between Wasson Way and Little Miami Trail (1 comment)

Three general comments concerning pedestrian issues were provided. These comments indicate that there is a need to address safety and pedestrian access in this area.

Thirteen comments relating to public transit were provided:

- More bus service is needed (2 comments)
- Public transit is needed in the populated areas of the corridor and on US 50 to downtown and Newtown (4 comments)
- Light rail is needed to Mariemont, Madisonville, and Downtown (6 comments)
- Commuter trains or light rail is needed from downtown on Oasis out to eastern Hamilton County/Clermont County (1 comment)

Crash Data: An ODOT crash screening did not identify this segment as an area of high hazard. Crash data indicates that 31 crashes occurred over the three-year period (2013 – 2015).

LOS Analysis: No level of service analysis was conducted for this segment; however, the travel time data indicates a 75% increase in the eastbound travel time during the PM peak-hour and a 55% increase in the in the westbound travel time during the AM peak-hour compared to the off-peak travel time indicating congestion during the AM and PM peak hours.

Geometric Data: One vertical curve is deficient in this segment. The sag vertical curve has a k-value of 54 and the minimum required k-value is 64 for 40 mph.

Pedestrian Data: No pedestrian data is available for this segment.

2.6.3.4 US 50/Plainville Road Intersection

The US 50/Plainville Road intersection is an unsignalized three-leg intersection in which Plainville Road is under stop control.

Figure 46: US 50/Plainville Road Intersection

Stakeholder Input: Three roadway comments address congestion and access concerns related to the Plainville/US 60 intersection as follows:

- This area is a bottleneck
- It is difficult to turn left onto Plainville Road from Wooster Pike
- There are too many roads intersecting here. It is a great intersection for a roundabout

Two bikeway comments were provided:

- Need marked lanes
- This intersection is hard for bicyclists. A bike light button for crossing, or a roundabout should be considered here.

One pedestrian comment indicates that this intersection is a safety concern for pedestrians.

One public transit comment indicates that greater frequency is needed for express routes serving this area.

Crash Data: ODOT's crash screening did not identify this intersection as an area of high hazard. Crash data indicates that four crashes occurred over the three-year period (2013 – 2015).

LOS Analysis: The HCS analysis indicates that traffic on Plainville Road waiting to enter US 50 is LOS F during both the AM and PM peak hour for the existing, No Build opening year (2022), and No Build design year (2042) conditions. During the PM peak-hour, the southbound approach has a v/c ratio of 1.50 for the existing conditions and is expected to increase to 2.51 by the design year. It is anticipated that major capacity improvements are required for the existing, No Build opening year, and No Build design year conditions.

Geometric Data: The intersection sight distance on Plainville Road and the stopping sight distance on Wooster Pike are both deficient. Vehicles turning right from Plainville Road to eastbound Wooster Pike have an intersection sight distance of 100 feet (the required intersection sight distance is 445 feet). Vehicles traveling east on Wooster Pike have a stopping sight distance of 200 feet (required stopping sight distance is 305 feet). Landscaping at the corner of the intersection is primary sight-distance obstruction.

Pedestrian Data: Eighty-three (83) pedestrians were observed at the intersection during a 24-hour period recorded on December 1, 2015.

2.6.3.5 US 50: Plainville Road to Mariemont Square

The section of US 50 from Plainville Road to Mariemont Square is approximately 0.2 miles in length. From Plainville Road to West Street, US 50 is a two-lane divided roadway with a posted speed of 35 mph. From West Street to Mariemont Square, US 50 is a four-lane divided roadway with on street parking and a posted speed of 25 mph.

Stakeholder Input: Twelve roadway comments were provided, of which ten address congestion and safety in this area. Representative comments include:

- The area is very congested. (7 comments)

- US 50 should be widened to four lanes. (1 comment)
- The traffic light is causing delays. (1 comment)
- There are frequent accidents. (1 comment)
- A highway is needed between US 50 and Eastgate. (1 comment)

Bike comments include:

- Additional bike paths are needed. (6 comments)
- A connection is needed between Lunken and the Loveland Bike Trail and the railroad should be converted to bike trail from Lunken to downtown. (1 comment)
- A connection is needed from Avoca Park to downtown. (1 comment)
- A connection is needed from Fairfax through Mariemont to connect to the Little Miami Trail. (1 comment)

Pedestrian comments include:

- Pedestrian safety is a concern here.
- LED lights are needed in the crosswalk, as well as police enforcement of the state law giving pedestrians the right-of-way in the crosswalk.

Eighteen comments concern public transit. These comments identify the need for light rail and bus options in this area. Representative comments include the following:

- Need accessible transit stop (1 comment)
- Need park and ride (1 comment)
- Rail access is needed to connect Mariemont to Clermont County. (1 comment)
- Regular direct lines from Mariemont/Milford to downtown are needed (not just during rush hours), as well as lines to Hyde Park, Mt. Lookout, the hospitals, UC and Xavier University (1 comment)
- Need public transit directly to the Playhouse/Art Museum and downtown from Fairfax/Mariemont (1 comment)
- Need light rail (1 comment)
- Need bus rapid transit and additional bus service (8 comments)
- This is an ideal place for a rail station. (1 comment)

Crash Data: ODOT's crash screening did not identify this segment as an area of high hazard. Crash data indicates that nine crashes occurred over the three-year period (2013 – 2015).

LOS Analysis: No level of service analysis was conducted for this segment; however, the travel time data indicates a 75% increase in the eastbound travel time during the PM peak-hour and a 55% increase in the in the westbound travel time during the AM peak-hour compared to the off-peak travel time indicating congestion during the AM and PM peak hours.

Geometric Data: No geometric deficiencies were identified for this segment.

Pedestrian Data: No pedestrian data is available for this segment.

2.6.3.6 Mariemont Square Intersections

The Mariemont Square consists of four closely spaced intersections. Three of the four intersections are signalized. The US 50/Crystal Springs Road intersection is unsignalized. Through the Mariemont Square, US 50 acts as a one-way pair.

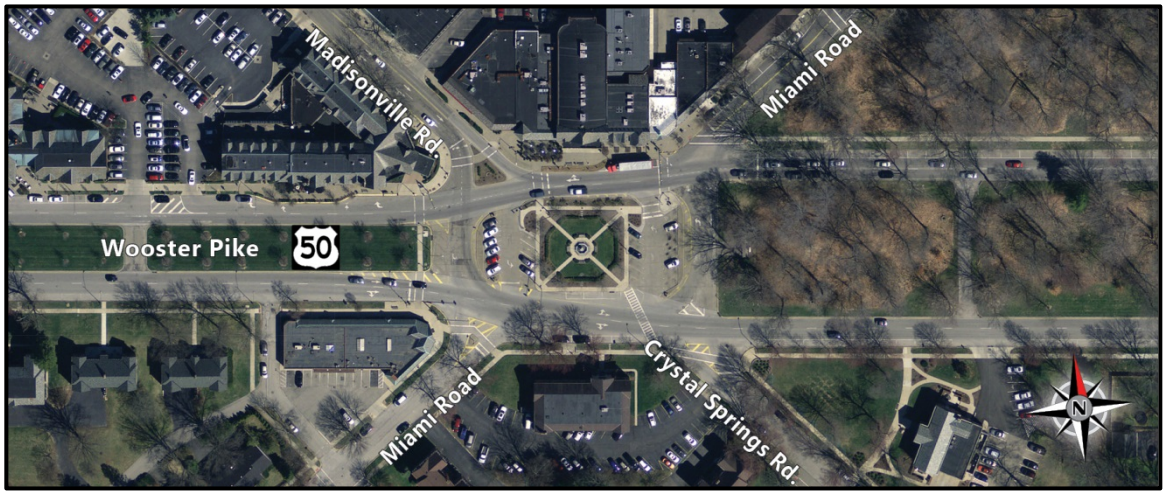


Figure 47: Mariemont Square Intersections

Stakeholder Input: Of the 28 roadway comments concerning Mariemont Square, 26 identify congestion as an issue. Representative comments include:

- Traffic lights are too slow and there are too many lights close together (15 comments)
- There are too few lanes (2 comments)

Two comments identify the need for a bypass around Mariemont.

Six comments identify bike facility needs in this area. Representative comments include:

- A bikeway connection from the Murray Avenue Bike Path to the Little Miami Bike Path is needed (2 comments)
- A connection from existing bike paths to the Wasson Way bike path is needed (1 comment)
- Bike lane is needed (2 comments)

Three comments address pedestrian access in this area. Representative comments include:

- Provide pedestrian access to businesses (1 comment)
- There is a safety issue for pedestrians trying to cross US 50 (1 comment)

Ten comments concern public transit services. Representative comments include:

- Need for a park and ride (1 comment)

- Any proposed rail transit should stop in Mariemont to help support existing businesses/residents. (1 comment)
- Need an accessible transit stop (1 comment)
- Need more bus service and a bus stop shelter (2 comments)
- The street car should be extended here, with routes to UC, Xavier, the hospitals, etc.
- Rail should be provided (2 comments)

Crash Data: The western part of the Mariemont Square intersection was identified as a high hazard location through ODOT's crash screening of the Segments II and III roadway network. Considering the complexity of the entire square, all four intersections were evaluated. As illustrated in **Figure 48**, there were 17 total crashes in the square during the three-year period between 2013 and 2015. Angle and sideswipe passing crashes represent 60% of the total crashes. There were two crashes at the US 50/Miami Road intersection (NE corner), 10 crashes at the US 50/Madisonville Road intersection (NW corner), four crashes at the US 50/Miami Road intersection (SW corner), and one crash at the US 50/Crystal Springs Road intersection (SE corner).

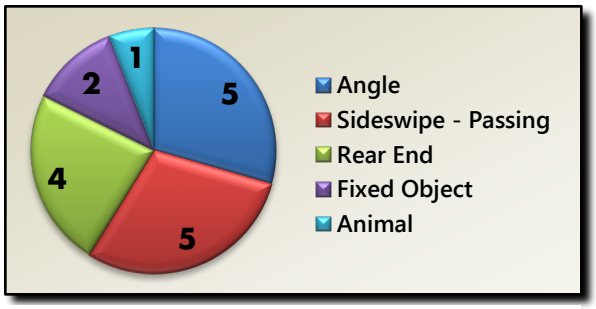


Figure 48: Frequency of Crashes by Crash Type Mariemont Square Intersections

The sideswipe passing crashes in the square appear to be, in part, due to driver confusion with the complicated nature of the four closely spaced intersections and parking around the square. At the US 50/Madisonville Road intersection, where the highest number of crashes occurred, all of them occurred in the daylight, 90% occurred in dry conditions, and 60% occurred between the hours of noon to 3:00 PM. For a plot of all 17 crashes, please refer to **Attachment A-2**.

LOS Analysis: The HCS analysis indicates that the intersection currently operates at an acceptable LOS and will continue to operate at an acceptable LOS for the No Build opening year (2022) and No Build design year (2042) conditions. No intersection improvements are required.

Geometric Data: Intersection sight distance is limited on several approaches to Mariemont Square, due primarily to building obstruction. The intersection of Wooster Pike/Crystal Springs Road has deficient intersection sight distance; vehicles on northbound Crystal Springs Road have a limited sight distance to vehicles traveling eastbound on Wooster Pike due parallel parked cars. The intersection sight distance is 120 feet and the required sight distance is 335 feet. The remainder of the intersections are either signalized or have adequate sight distances.

Pedestrian Data: A significant number of pedestrians were observed in the square. There were 298 pedestrians observed at the US 50/Miami Road intersection (NE corner), 510 pedestrians observed at the US 50/Madisonville Road intersection (NW corner), 110 pedestrians observed at the US 50/Miami Road intersection (SW corner), and 67 pedestrians observed at the US 50/Crystal Springs Road intersection (SE corner) during a 24-hour period recorded on December 1, 2015.

2.6.3.7 US 50: Mariemont Square to Walton Creek Road

The section of US 50 from Mariemont Square to Walton Creek Road is approximately 0.8 miles in length. From the Mariemont Square to East Avenue US 50 is a four-lane divided roadway with on

street parking and a posted speed of 35 mph. From East Avenue to Petoskey Avenue, US 50 is a two-lane undivided roadway. From to Petoskey Avenue to Walton Creek Road, US 50 is a four-lane undivided roadway. The posted speed from East Avenue to Walton Creek Road is 40 mph.

Stakeholder Input: Thirty-one comments address issues for the section of US 50 between Mariemont Square and Walton Creek. Of these comments the majority identify congestion as the primary transportation issue. Representative comments include:

- The reduction of lanes from two to one (in each direction) causes traffic back-ups (10 comments)
- Multiple traffic lights in this area also contribute to congestion (4 comments)
- Better striping of roads can reduce congestion (1 comment)
- Better lighting is needed along the roads (1 comment)
- There are frequent accidents in this area (3 comments)
- Speed is a concern in this area (1 comment)

Thirty comments address bikeway issues. Representative comments include:

- Safety of bikes in this area is a concern (2 comment)
- There is a need for a bike trail/path in this area (16 comments)
- A dedicated bike lane is needed all along US 50 through Fairfax and Mariemont and into Newtown. (8 comments)
- Connect Wasson Way and Little Miami Trail (1 comment)
- Extend Murray Bike Trail east to Avoca Trail (1 comment)
- Connect the Murray Avenue path thru Mariemont to Newtown (2 comments)
- Need a bike path to connect to the Little Miami Trail; the optimum route would follow the old inter-urban line, cross over at the light at Kroger, then follow the Pennsylvania tracks owned by the Park District (1 comment)

Ten comments concerning pedestrian access were provided. Representative comments include:

- A signalized crosswalk is needed at Wooster Pike at Bell Tower Park. (1 comment)
- Pedestrian access is needed between Mariemont and the businesses in Columbia Township (and between Columbia Township and the Mariemont High School and Village) to make this a more extended vibrant community. (1 comment)
- The sidewalk on both sides is too close to the road and raised curbs are lacking in several places, which are safety concerns. (1 comment)

The public transit comments include:

- Need more frequent bus service (1 comment)
- Need a park and ride and bus/light rail service to downtown (1 comment)
- Need more buses or light rail service along US 50 to Milford (1 comment)

Crash Data: An ODOT crash screening identified the approximate 0.15 stretch of US 50 at the Mariemont Promenade shopping center as a high-hazard area. Therefore, a detailed crash analysis of the entire segment from the Mariemont Square to Walton Creek Road was completed.

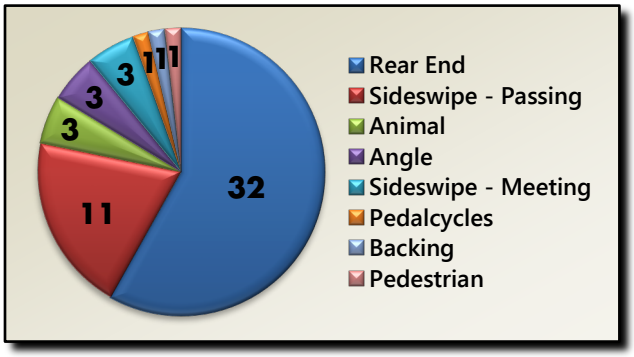


Figure 49: Frequency of Crashes by Crash Type Mariemont Square to Walton Creek Road

As illustrated in **Figure 49**, there were 55 total crashes on this segment during a three-year period (2013-2015). Rear-end crashes represent almost 60% of the total crashes. Of the 55 total crashes on the segment, 15 (30%) occurred in the high-hazard segment. All but one crash on this high-hazard segment was a rear-end crash. See **Attachment A-2 f**or a plot of all 55 crashes.

There is a cluster of five sideswipe crashes in the area where westbound US 50 merges from two lanes to one lane near the Indian View Avenue intersection. There are three other clusters of crashes at the Pocahontas Avenue signalized intersection (7 crashes), the Mariemont Promenade shopping center signalized intersection (15 crashes), and the Spring Hill Drive signalized intersection (14 crashes). Most crashes at signalized intersections on this segment are rear-end crashes.

Rear-end crashes were the most prevalent type of crash. Of the 32 rear-end crashes along the entire segment from the Mariemont Square to Walton Creek Road, 24 occurred during daylight hours, 20 occurred in the westbound direction, 10 occurred in wet conditions, and two resulted in injury.

LOS Analysis: No level of service analysis was conducted for this segment; however, the travel time data indicates a 30% increase in the eastbound travel time during the PM peak-hour compared to the off-peak travel time indicating congestion during the PM peak-hour.

Geometric Data: There is one deficient vertical curve in this segment. Additionally, the maximum superelevation on US 50 on the curve just east of Pocahontas Avenue exceeds the current standard maximum superelevation. The deficient crest vertical curve is located on US 50 at the intersection of Pocahontas Ave. The existing k-value for this curve is 54 and the minimum required k-value is 61 for a design speed of 45 mph.

Pedestrian Data: No pedestrian data is available for this segment.

2.6.3.8 US 50/Walton Creek Road Intersection

The US 50/Walton Creek Road intersection is a signalized four-leg intersection.

Figure 50: US 50/Walton Creek Road Intersection

Stakeholder Input: One comment indicates that there is a traffic signal issue at the Walton Creek/US 50 intersection.

Crash Data: ODOT's crash screening did not identify this intersection as an area of high hazard. Crash data indicates that nine crashes occurred over the three-year period (2013 – 2015).

LOS Analysis: The HCS analysis indicates that the southbound left turn movement is currently failing during both the AM and PM peak hours. During the PM peak-hour the v/c ratio is 1.52. In the No Build opening year (2022) and No Build design year (2042) conditions, the failure is corrected and v/c ratio is less than 1.0 due to the ODOT methodology of balancing delays for future intersection analyses. This indicates that the failure of the southbound left turn movement is likely due to a signal timing issue. It is anticipated that operational or minor intersection improvements are required for the existing, No Build opening year conditions and No Build design year conditions.

Geometric Data: The US 50/Walton Creek Road intersection sight distance is substandard. A retaining wall, signal cabinet, and vegetation all contribute to obstructed sight distance for vehicles turning onto US 50 from Walton Creek Road. Because this intersection is fully controlled by a traffic signal, proper intersection sight distance is not required per *L&D Vol. 1;* however, intersection sight distance for vehicles making right turns from Walton Creek Road to US 50 is 80 feet. This is significantly short of required 500-foot sight distance and inhibits the ability of vehicles to turn right on red.

Pedestrian Data: Forty (40) pedestrians were observed at the intersection during a 24-hour period recorded on November 24, 2015.

2.6.3.9 US 50: Walton Creek Road to Newtown Road

The section of US 50 from Walton Creek Road to Newtown Road has two through lanes in each direction and a center two-way left turn lane. The segment is approximately 0.5 miles in length with a posted speed of 40 mph.

Stakeholder Input: Six comments address roadway concerns for US 50 between Walton Creek and Newtown. Comments include:

- A new or second bridge is needed in Newtown due to traffic congestion (1 comment)
- Congestion is due to one lane in each direction (2 comments)
- Safety is a concern (1 comment)
- There is an off-street parking issue (1 comment)
- A road diet with pedestrian, bicycle, and transit connections is needed from the east side of Mariemont to the road diet in Terrace Park (1 comment)

Seventeen bikeway comments identify the need for bike lanes/bike paths in the area. Representative comments include:

- A connector to the Avoca bike trail is needed (2 comments)
- A shared bike/pedestrian path is needed going up the hill; existing sidewalk is in bad shape (1 comment)
- A bike path from Fairfax/Mariemont to the Little Miami Scenic Trail is needed (6 comments)
- A safer route to get to the Murray Bike Trail is needed (1 comment)
- A bike path along US 50 to Lunken is needed; it is dangerous to cycle on the US 50 (1 comment)

Nine comments identify the following pedestrian concerns:

- Safe sidewalks are needed on both sides of US 50 since this area is an emerging entertainment district (8 comments)
- Sidewalks are needed between Mariemont and the various shopping centers to the east, including the Kroger (1 comment)

One public transit comment indicates that there is limited availability of bus service in this area.

Crash Data: ODOT's crash screening did not identify this segment as an area of high hazard. Crash data indicates that 16 crashes occurred over the three-year period (2013 – 2015).

LOS Analysis: No level of service analysis was conducted for this segment; however, the travel time data indicates a 30% increase in the eastbound travel time during the PM peak-hour compared to the off-peak travel time indicating congestion during the PM peak-hour.

Geometric Data: No geometric deficiencies were identified for this segment.

Pedestrian Data: No pedestrian data is available for this segment.

2.6.3.10 US 50/Newtown Road Intersection

The US 50/Newtown Road intersection is a signalized three-leg intersection.

Figure 51: US 50/Newtown Road Intersection

Stakeholder Input: Nine comments address issues at the Newtown/US 50 intersection. Representative comments include:

- There are frequent backups along US 50 (3 comments)
- US 50 needs to be narrowed to a single lane for eastbound traffic before the intersection; too many people race around traffic in the right lane that's ending soon, then force their way into the left lane (1 comment)
- A better connection is needed between SR 32 and US 50 (2 comments)

Eleven bikeway comments were provided which address the need for additional bike paths in this area. Representative comments include:

- Need better access for bikes coming from the trail to businesses on US 50 and up into Mariemont (1 comment)
- Need a convenient and safe path to get from the Newtown Bridge to downtown (1 comment)
- Need a bike connection between the Little Miami Scenic Trail and the Murray Road Trail (1 comment)
- Need to extend the existing bike trail through Mariemont to Wasson Way (4 comments)
- A bike path to Miami Bluff Road is needed (1 comment)
- Need a bike path connection through Mariemont so that cyclists have an option to Wooster Pike, which is unsafe (1 comment)

One pedestrian comment identified the need for a sidewalk in this area and one public transit comment identified the need for an accessible transit stop.

Crash Data: ODOT's crash screening did not identify this intersection as an area of high hazard. Crash data indicates that 23 crashes occurred over the three-year period (2013 – 2015).

LOS Analysis: The HCS analysis indicates that during the AM peak-hour the overall intersection is failing for the existing conditions. The two movements contributing to the overall intersection failure is the failing northbound left turn movement with a v/c ratio of 1.25 and the failing westbound left turn movement with a v/c ratio of 1.02. These failures are only exacerbated in the No Build opening year (2022) and No Build design year (2042) conditions. It is anticipated that major capacity improvements are required for the existing, No Build opening year and No Build design year conditions.

Northbound Newtown Road at US 50 (AM Peak)

To supplement the HCS analysis a queue study was conducted for the northbound approach during the AM peak period and the northbound and westbound approaches during the PM peak period. The number of cars in the queue was recorded at the end of green for 15 minutes prior to the peak hour to 15 minutes after the peak-hour ended. The number of cars was translated to a length by assuming a queue length of 25 feet per vehicle. During the AM peak period the maximum northbound queue extended 625 feet. During the PM peak period the maximum northbound queue extended 350 feet and the maximum westbound queue extended 225 feet. The recorded queues during the AM peak period are shown in **Figure 52** and the recorded queues during the PM peak period are shown in **Figure 53** and **Figure 54**.

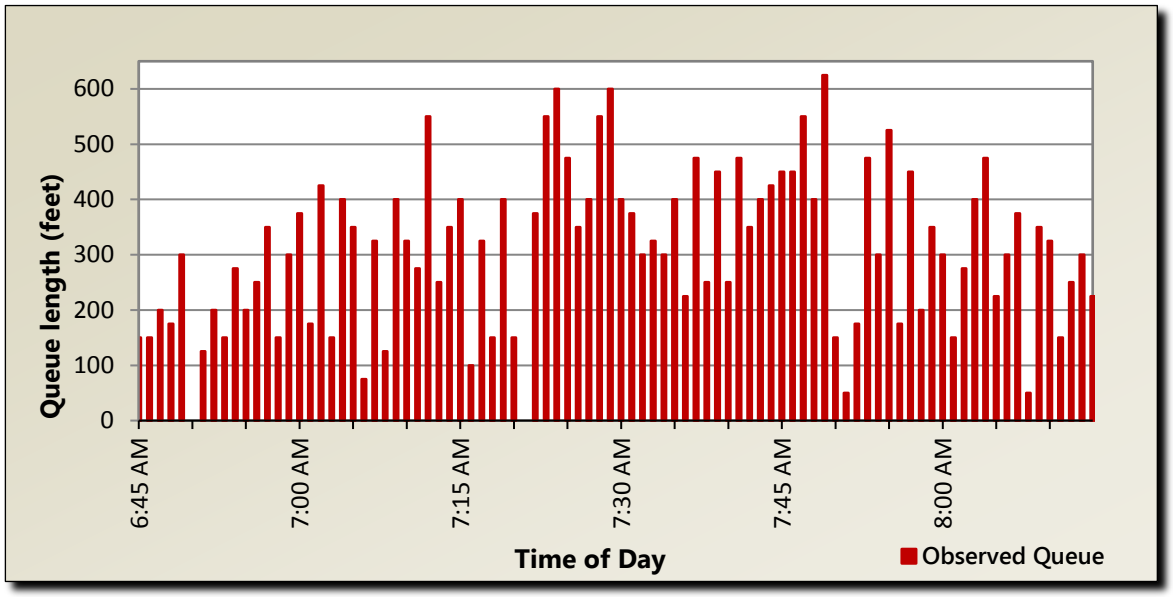


Figure 52: Northbound Newtown Road AM Peak Period Queues at US 50

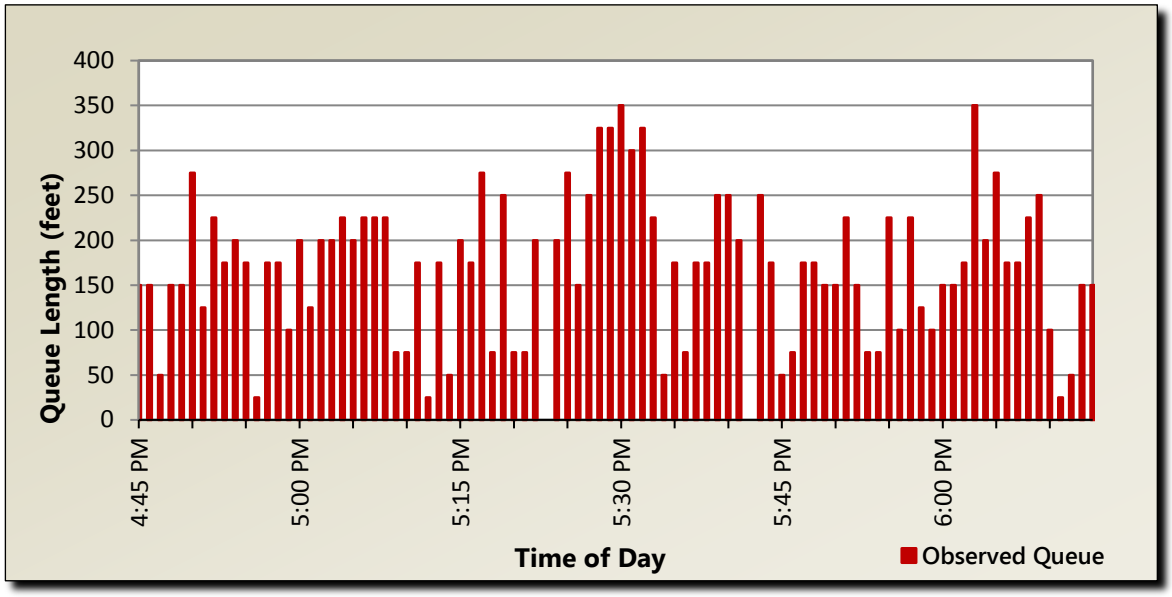


Figure 53: Northbound Newtown Road PM Peak Period Queues at US 50

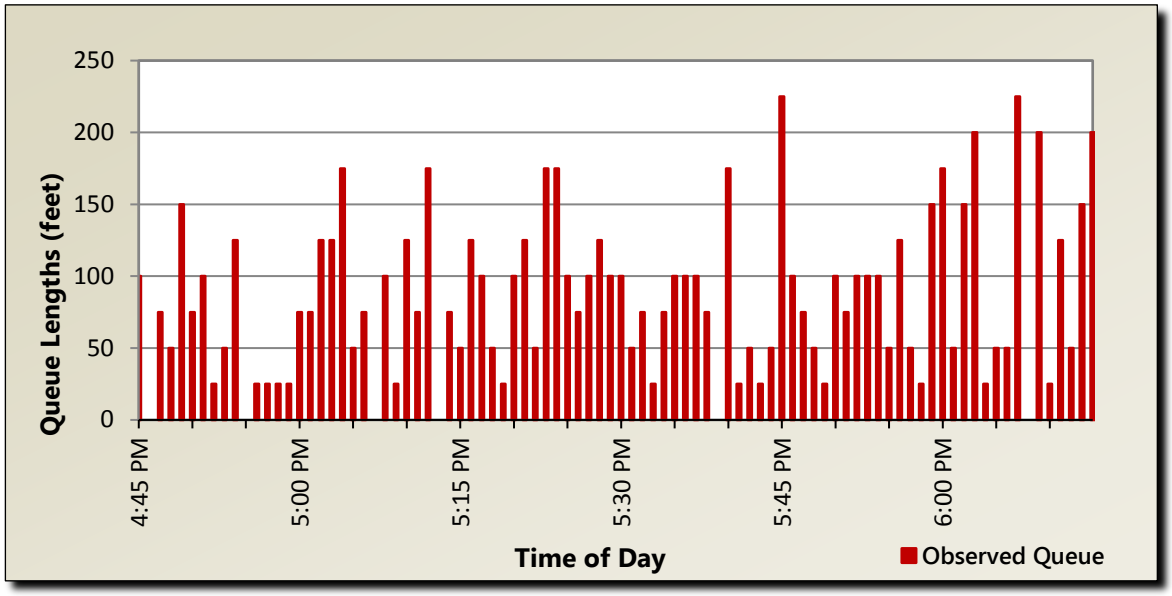


Figure 54: Westbound US 50 AM Peak Period Queues at Newtown Road

Geometric Data: No geometric deficiencies were identified at this intersection.

Pedestrian Data: Twelve (12) pedestrians were observed at the intersection during a 24-hour period recorded on November 24, 2015.

2.6.4 US 50 Corridor Focus Area Needs Analysis

Based on the results of the technical studies, as well as the extensive public input received from the Focus Area Workshops, online interactive survey, and other public outreach efforts, the primary and secondary needs of the transportation network within the US 50 Corridor Focus Area were identified (primary needs are needs that *will* be addressed by this project; secondary needs

are needs that *may* be addressed by this project). The input used in the needs analysis is presented in **Appendix 6**. The primary and secondary needs are presented in **Table 15:**

Table 15. US 50 Corridor Focus Area Needs Analysis

Primary Needs	Secondary Needs
US 50: Meadowlark Lane to Watterson Road	
Address eastbound PM peak-hour and westbound AM peak-hour delays	None
US 50/Watterson Road Intersection	
Address capacity issues on westbound approach	None
US 50: Watterson Road to Plainville Road	
Address eastbound PM peak-hour and westbound AM peak-hour delays	Address deficient roadway grade between Oak and Pleasant Streets
US 50/Plainville Road Intersection	
Address southbound capacity issues	Mitigate deficient sight distance at intersection
US 50: Plainville Road to Mariemont Square	
Address eastbound PM peak-hour and westbound AM peak-hour delays	None
Mariemont Square Intersections	
Address deteriorated pavement markings	Address deficient sight distances
US 50: Mariemont Square to Walton Creek Road	
• Address eastbound PM peak-hour delays • Address sideswipe and rear-end crashes • Address bicycle connectivity from Mariemont to Little Miami Trail	• Address deficient roadway grade at Pocahontas Avenue
US 50/Walton Creek Road Intersection	
Address capacity issues for southbound left-turn movement	None
US 50: Walton Creek Road to Newtown Road	
• Address eastbound PM peak-hour delays • Address pedestrian connectivity to businesses on south side of US 50 • Address bicycle connectivity from Mariemont to Little Miami Trail	None
US 50/Newtown Road Intersection	
Address overall intersection failure and capacity issues for northbound left-turn movement and westbound approach	None

3.0 NEXT STEPS

Upon defining the primary and secondary needs for the Segment II and III focus areas, ODOT will establish working stakeholder groups for each Focus Area who will work with the project consultants and ODOT to develop improvement alternatives that address the primary transportation needs. Secondary needs may be addressed depending on their public support and funding availability. Examples of projects that may be considered include: signal timing adjustments, new interchange designs, wayfinding signage, widening projects, bike lanes or multi-use paths, pedestrian crosswalks, and new sidewalks. Project alternatives will be evaluated, and prioritized in coordination with the Eastern Corridor Partners. The project alternatives and prioritization will be presented to the public for review and comment. Once projects are identified and prioritized, implementation plans will be developed for the individual projects and funding will be secured. While there are no funds earmarked for projects at this time, it is anticipated that these projects will be funded through a combination of federal, state, and local funding sources. The schedule of individual projects through construction will vary based on the size, complexity, and/or potential impact to the environment of the project.

Public Transit Projects: Both the Focus Area Workshops and the online interactive survey identified significant public interest in improving public transit projects in the Eastern Corridor area. Specific public transit needs were identified and documented for each of the focus areas. Some of these needs were addressed in the planning studies conducted for the Oasis Rail Transit Project, which is the rail transit component of the Eastern Corridor Program. The Oasis Rail Transit Project analyzed four segments of the OASIS line covering the 17.2-mile distance from the Riverfront Transit Center (RTC) in Downtown Cincinnati to Milford in Clermont County, with stations at: Milford, ANCOR, Newtown, Fairfax, Red Bank, Columbia Tusculum, and the RTC. An overall assessment of options for the Oasis Rail Transit line indicate that the project is worthy of advancing for more detailed analysis. Federal Transit Authority (FTA) funding will be necessary to advance this project. In order to pursue this funding, local and regional leaders need to identify a project sponsor and demonstrate that the community has the funding committed to complete Project Development.

As noted throughout this report, other public transit needs were identified. Examples of needs that were mentioned in the public outreach efforts include: new Metro bus service along SR 32 and Bus Rapid Transit routes into Downtown Cincinnati. As a next step, the public transit needs identified in this report will need to be evaluated by SORTA as part of their long-range planning process.

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