

# Warren County

## Light Industrial Site Assessment

Final Report

September 9, 2020

Prepared by:



Prepared for:



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Warren County  
Light Industrial Site Assessment

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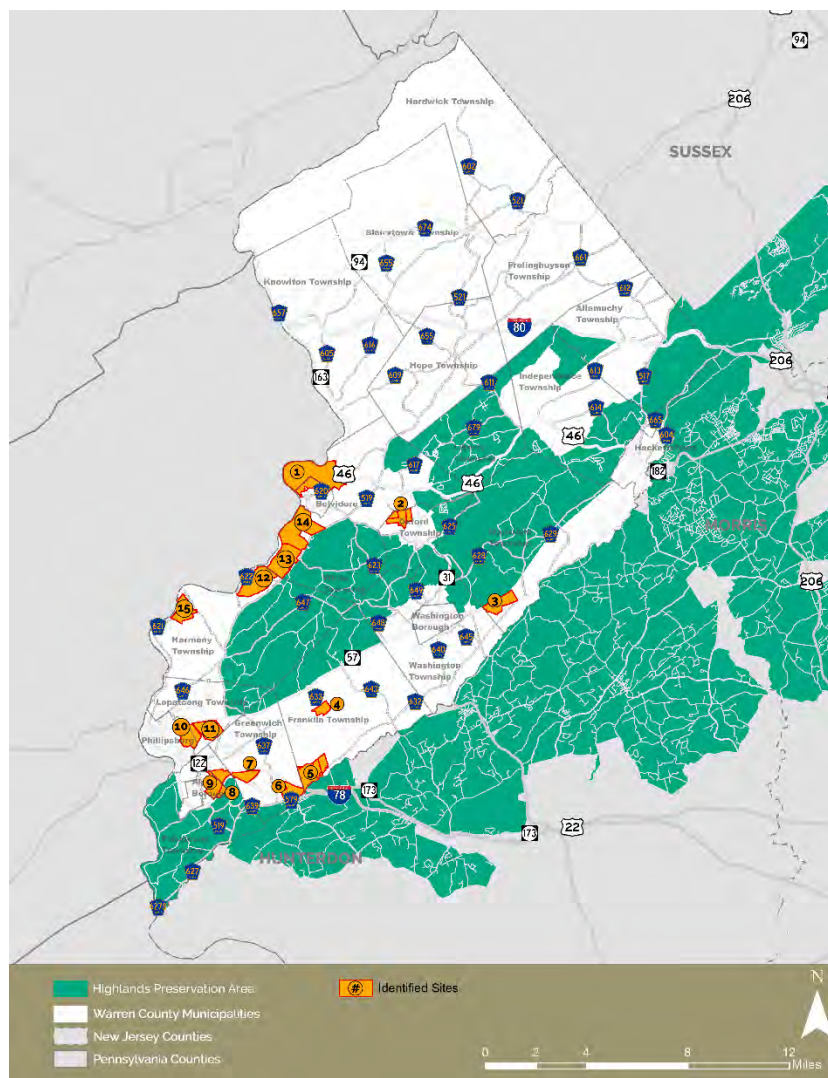
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## EXECUTIVE SUMMARY

Warren County's location in the Region and proximity to Interstates 78 and 80 position the County as a desirable center for warehouse development and freight/goods movement. The County is currently experiencing increased interest in warehousing and distribution development. This study was undertaken to understand the potential long-term impact of such development in the County.

Locations with large clusters of industrial zoning were identified for analysis. Locations within the Highlands Preservation area were not considered as developable. Fifteen sites with the potential for industrial development were identified for analysis in the study (Figure 1.) These 15 sites include over 4,000 acres and over 45 million square feet of gross floor area which could potentially be developed for industrial uses such as warehousing. If developed, these sites would generate a significant amount of traffic, both from trucks and automobiles, as increased employment and goods movement would be generated to and from these sites.

*Figure 1 - Sites and Highlands Preservation Area*



Warren County is comprised of a variety of community types, and County and local officials wish to be prepared for the challenges this potential development may bring throughout its communities. The purpose of the study was to identify areas of the greatest potential impact and the types of measures that would be necessary to mitigate the negative effects associated with traffic.

## CONDITIONS ASSESSMENT

To understand the County's needs and concerns, and to establish a relevant set of existing and possible future conditions in the study area, various data sources were consulted with a focus on freight and heavy vehicles. The data analysis included information about current land use and zoning; demographics; traffic patterns; traffic counts; and crash data. An extensive trip generation, distribution and assignment process was undertaken for each of the 15 sites. All traffic volumes were projected to a "Build Year" of 2045 to understand traffic conditions if all sites under study were developed in the future.

These additional site generated trips were overlaid on typical expected traffic growth from existing year 2020 to build year 2045. A capacity analysis was performed at key intersections and mainline roadway sections near the potential development site. This comparison was done for Existing 2020 conditions, 2045 No Build conditions (background growth only), and 2045 Build conditions (background growth plus potential development site trips). This comparison between future No Build and Build shows the direct impact of the additional development. The resulting analysis found that conditions deteriorate at nearly every location analyzed. The results of this future analysis are depicted in Figure 2 through Figure 5 and discussed in more detail in the body of the report.

Roadway suitability was considered during trip assignment which included existing height and weight restrictions along County roadways. A detailed truck turning radii analysis was completed to identify possible pinch points in the network for the expected increase in truck traffic. These locations are depicted in Figure 6 and 7 and methodology is discussed in more detail in the body of the report.

Figure 2 - Intersection Level of Service - No Build 2045

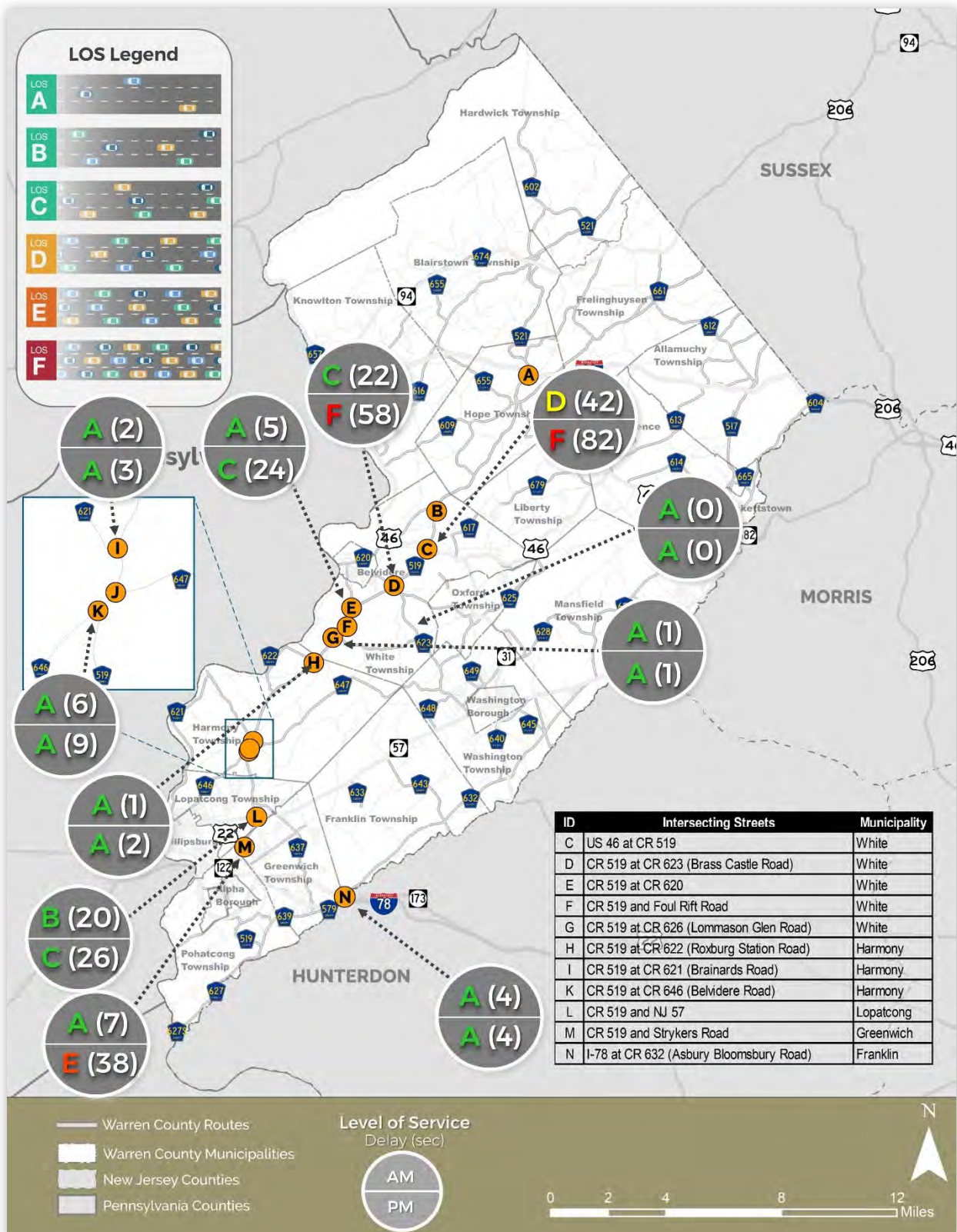




Figure 3 -Intersection Level of Service - Build 2045

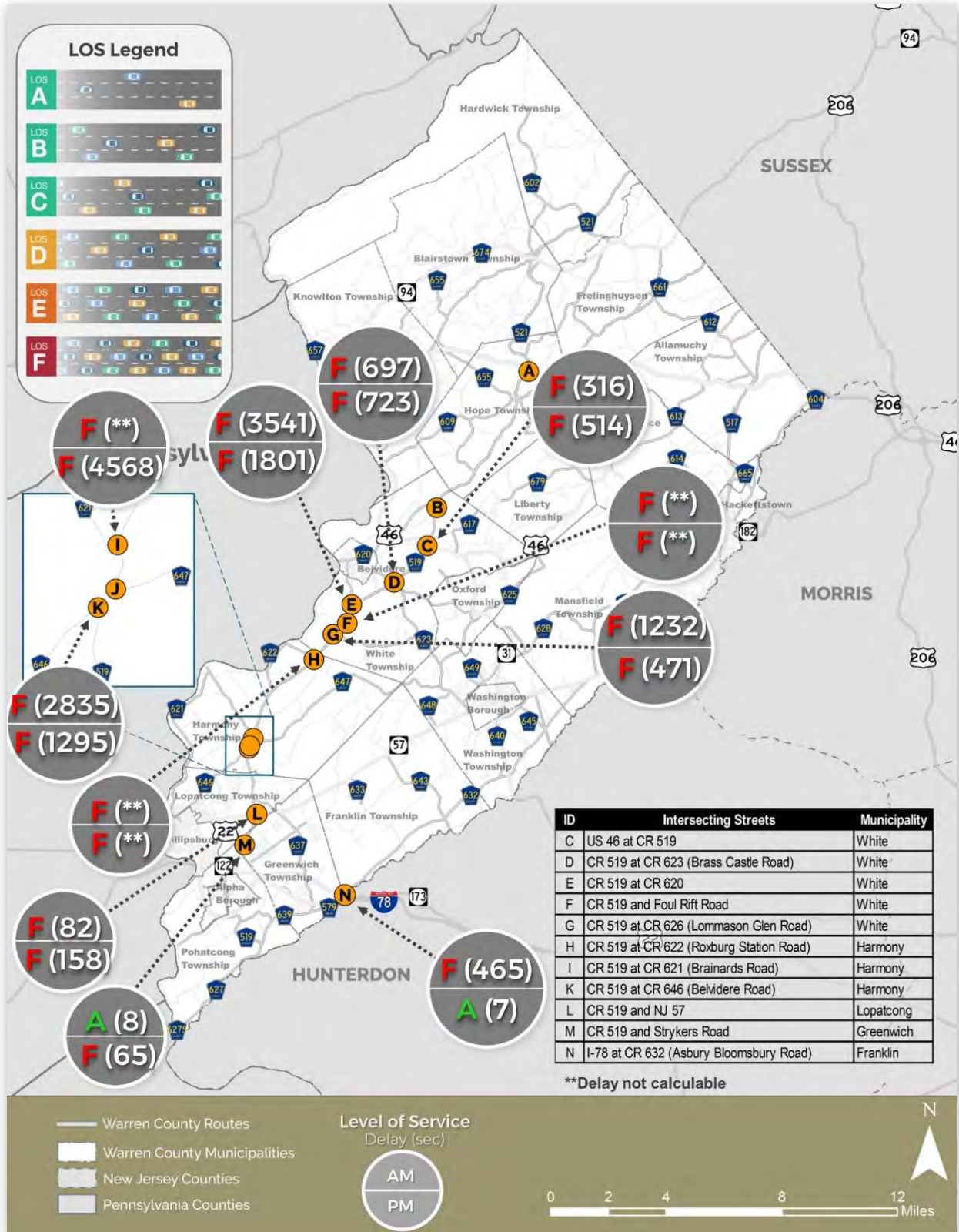


Figure 4 -Mid Block Level of Service and Demand to Capacity Ratio - No Build 2045

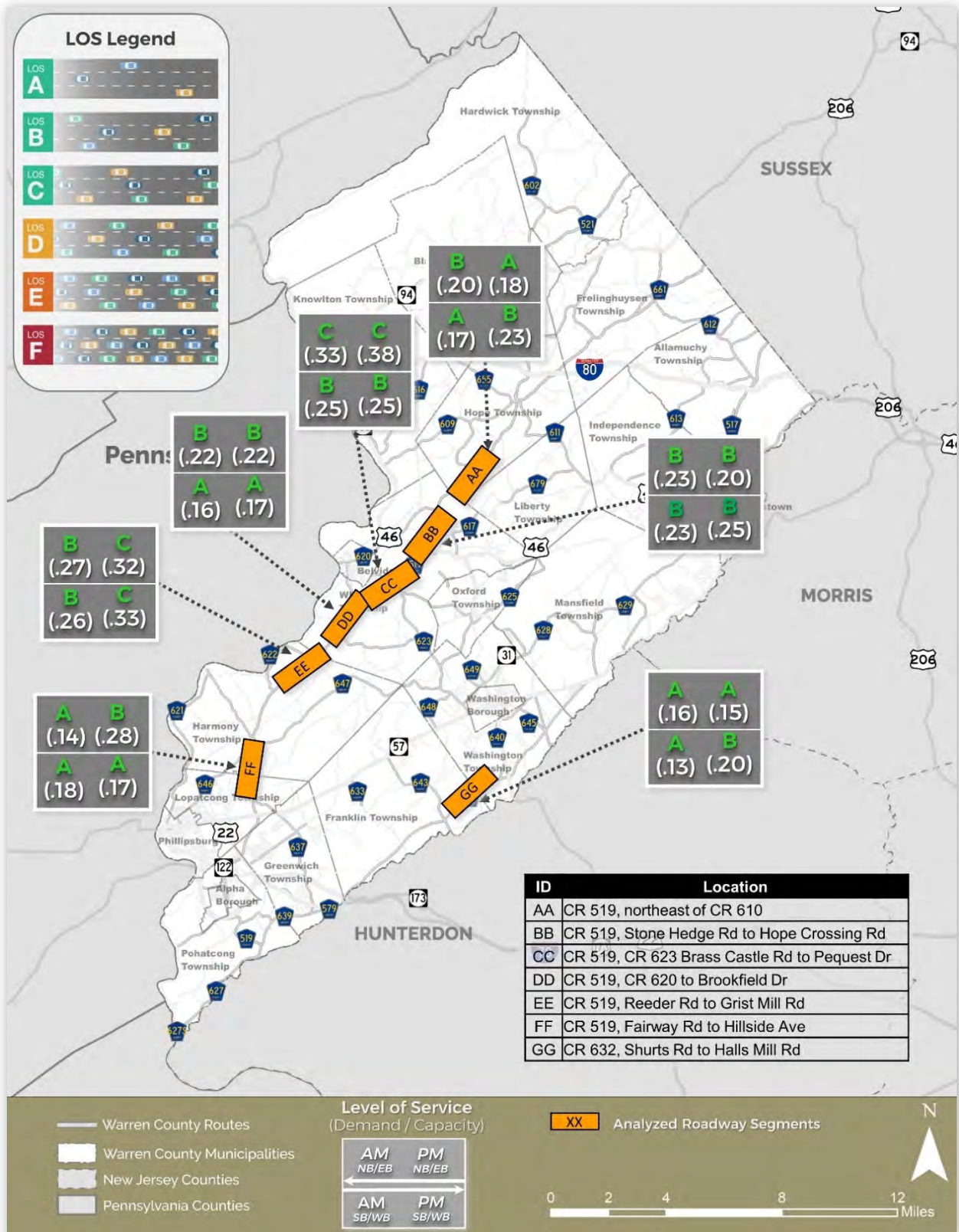




Figure 5 -Mid Block Level of Service and Demand to Capacity Ratio - Build 2045

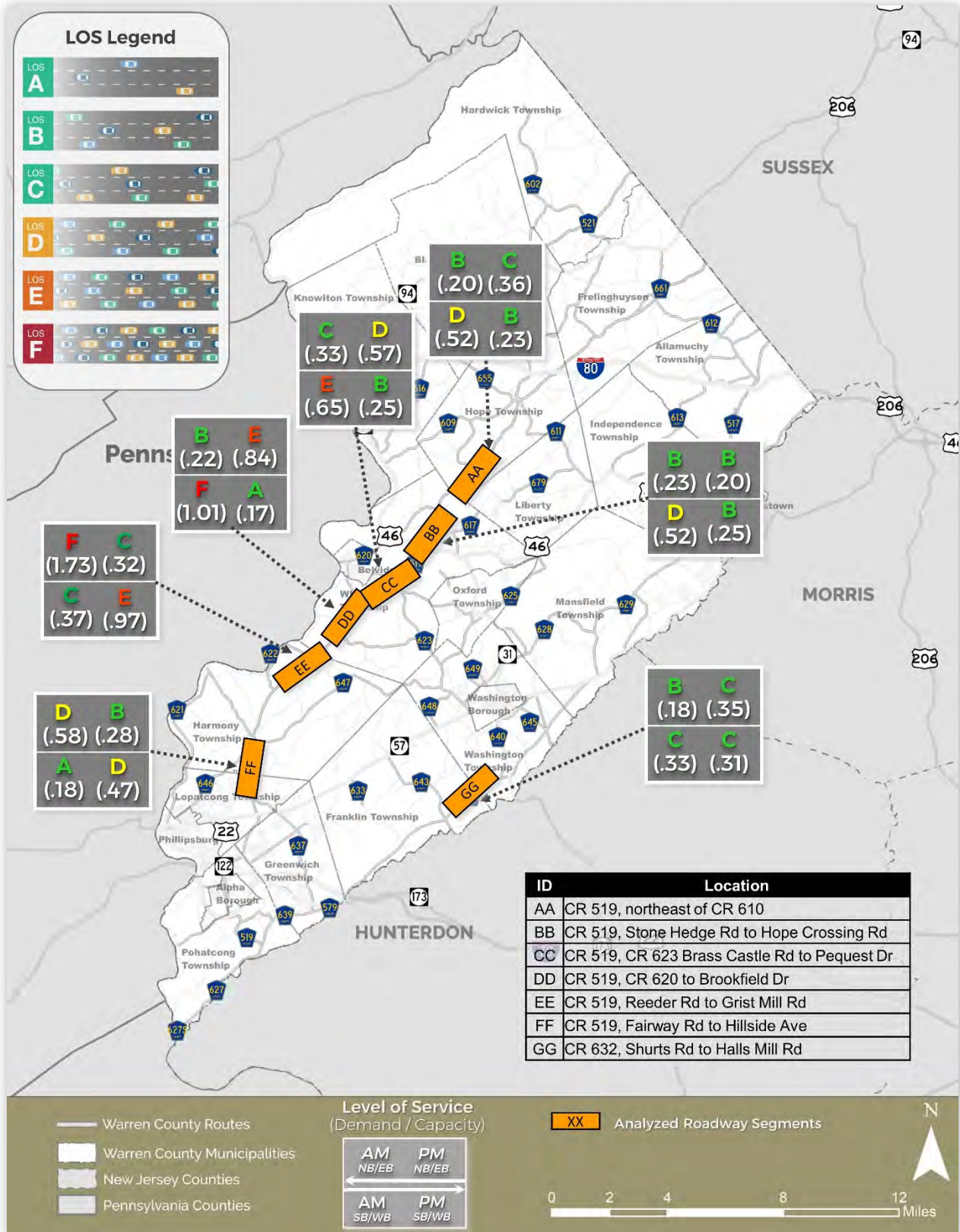




Figure 6 -Turning Radii Assessment Intersections (Locations A to H)

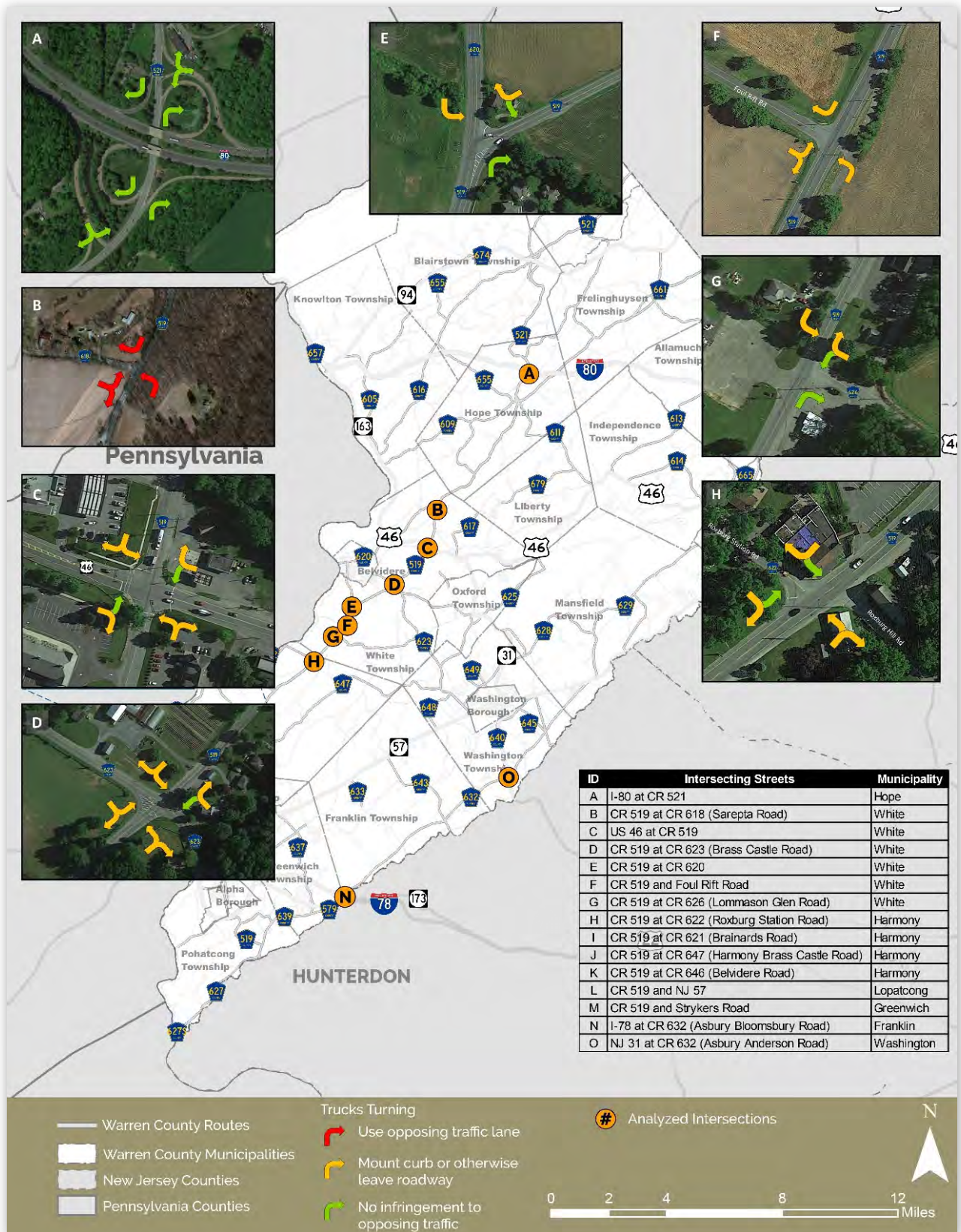
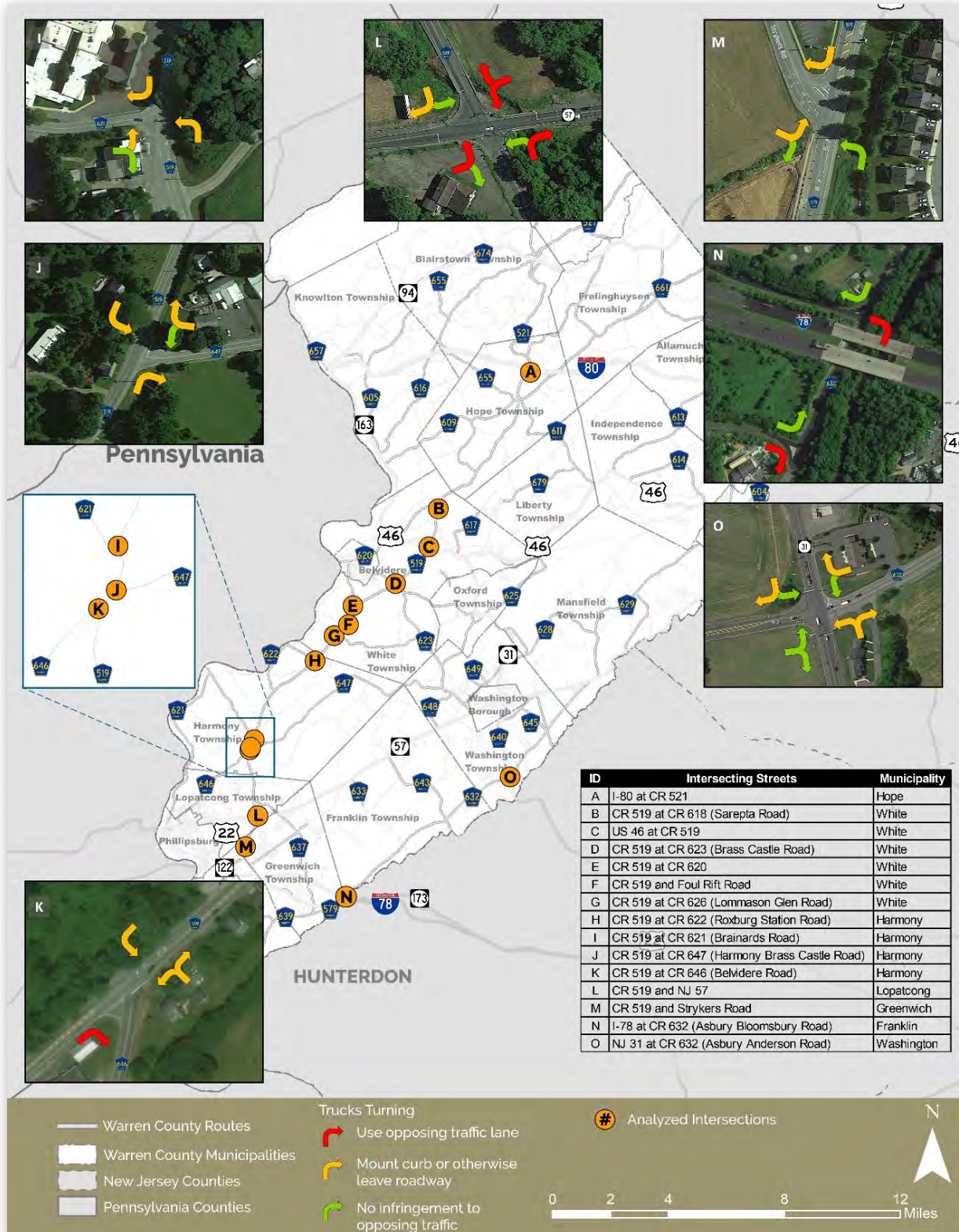




Figure 7 -Turning Radii Assessment Intersections (Locations I to O)



## MITIGATION MEASURES

Based on the detailed data analysis and County input key mitigations measures for the identified issues will be needed to maintain acceptable traffic operations if the sites are developed. The mitigation measures relate to issues including:

- Intersection and Mainline Congestion
- Safety
- Truck Movements at Intersections
- Transportation Demand Management

This analysis identified the roadway capacity that would be required to accommodate an acceptable level of service to meet potential traffic demand for the full-buildout of the industrial sites evaluated. An evaluation of existing road widths, available right of way, and required additional right of way necessary to construct the potential improvements would require further study. Extensive right-of-way acquisition may be required in many locations to accommodate needed roadway capacity. It is noted that road widening may be prohibited on roadways and intersections that are adjacent to the Highlands Preservation Area boundary and may affect how widening concepts are advanced.

Mitigation measures that would be needed to accommodate expected increases in traffic as a result of site development at key intersections were developed. The potential increase in cars and trucks could be better accommodated at intersections through a variety of potential improvements ranging from low cost solutions such as moving stop bars to higher cost investments such as roadway widening. These necessary improvements are explained in more detail in the body of the report.

At the locations nearest the highest areas of projected development along CR 519, the mainline traffic volume is expected to be in excess of 3,000 vehicles per direction in the peak hour. One lane in each direction will not be sufficient to handle the additional demand. CR 519 would need to be widened to two lanes in each direction from approximately CR 646/Uniontown Road in Harmony to Route 46 in White Township to accommodate the anticipated demand to bring CR 519 to at least a Level of Service (LOS) D. If a LOS C is desired along CR 519, the widening should be further extended south to NJ 57 and north to I-80. The widening from CR 646 to Route 46 is assumed in many of the intersection mitigations measures described in the next section. Additionally, the segment of CR 620 between Belvidere and CR 519 would need to be widened to two lanes in each direction to accommodate the anticipated car traffic expected to be generated due to site developments.

The following intersections and midblock segments were included in this report. Capacity analysis was completed where volume data and signal timings were available.

### Intersections

- I-80 and CR 521 – 2-way stop controlled ramps
- CR 519 and CR 618 – 2-way stop controlled (T intersection)
- US 46 and CR 519 – 4-way signalized
- CR 519 and CR 623 – 4-way stop controlled by a blinker signal
- CR 519 and CR 620 - 2-way stop controlled (T intersection)
- CR 519 and Foul Rift Road – 2-way stop controlled (T intersection)
- CR 519 and CR 626 – 2-way stop controlled (T intersection)
- CR 519 and CR 622 (Roxburg Station Road) – 2-way stop controlled
- CR 519 and Brainards Road – 2-way stop controlled (T intersection)

- CR 519 and CR 647– 2-way stop controlled (T intersection)
- CR 519 and CR 646 – 2-way stop controlled (T intersection)
- CR 519 and NJ 57 – 4-way signalized
- CR 519 and Strykers Road – 2-way stop controlled (T intersection)
- I-78 EB off-ramp and CR 632 – ramp stop controlled left turn to NB CR 632

#### Midblock Segments

- CR 519, northeast of CR 610
- CR 519, Stone Hedge to Hope Crossing Road N
- CR 519, CR 623 (Brass Castle Road) to Pequest Drive
- CR 519, CR 620 to Brookfield Drive
- CR 519, Reeder Road to Grist Mill Road
- CR 519, Fairway Road to Hillside Avenue
- CR 632, Shurts Road to Halls Mill Road

Typical improvements that are needed to accommodate the expected increase in traffic include signal installation or optimization, addition of turning lanes at intersections, or other geometric changes to improve safety or truck accessibility. More detail regarding capacity analysis and the necessary improvements are provided in the body of the report.

Transportation Demand Management (TDM) strategies specific to freight and warehousing developments have been utilized within New Jersey and throughout the region, particularly in locations with substantial growth in warehousing and distribution centers. A series of potential TDM strategies specific to freight are included below.

- *Identify potential rail connections to reduce the reliance entirely on truck trips.*
- *Promote non-peak trips where possible.*
- *Stagger worker shifts to reduce congestion during peak times.*
- *Promote development adjacent to key regional highways.*
- *Promote requirements that developers fund their “fair share” of necessary infrastructure improvements*
- *Create a county-wide freight transportation advisory group*
- *Encourage facility operators to promote specific trip paths/routing*
- *Promote use of alternative transportation modes, including worker shuttles or microtransit*

#### IMPLEMENTATION

Each mitigation measure would require additional study, engineering, funding and acceptance from various stakeholders and agencies. To explore these measures, coordination will be required between Warren County, NJ Highlands Council, the involved municipalities, developers, NJDOT, and the North Jersey Transportation Planning Authority. It is noted that road widening may be prohibited on roadways and intersections that are adjacent to the Highlands Preservation Area boundary and may affect how widening concepts are advanced.

#### CONCLUSION

Warren County's proximity to Interstates 78 and 80 position the County as a desirable center for warehouse development and freight/goods movement. As a result of its location in the region and availability of large parcels of land zoned for industrial use, there is an increased interest in warehousing and distribution development.

This study evaluated a build-out scenario of property zoned for industrial use at 15 sites in Warren County. The potential long-term impacts of such development in the County would be substantial. The

increase in automobile and truck traffic volumes that would be anticipated if all 15 light industrial sites studied were developed would have a major impact on the County roadway network. The traffic increase is largely driven by the increase in automobiles that are expected to result from increased employment at these sites. Roadway levels of service would deteriorate to unacceptable conditions at most analyzed intersection locations and mainline segments of CR 519, as well as other key intersections throughout the County. In addition, the existing physical configuration at some intersections is challenging for trucks to complete turns without lane or shoulder encroachments which would be further impacted with an increase in truck traffic in the future.

TDM strategies can be used to reduce the demand on the roadway network; however, TDM strategies alone would not be enough to maintain traffic operations at an acceptable level should all sites studied be developed for industrial use. Necessary improvements to County roadways and intersections to maintain traffic operations at an acceptable level of service would require further detailed study as development projects are proposed. Future studies will need to identify locations where there are roadway right-of-way constraints that will require property acquisition for roadway widening for capacity improvements and/or to alleviate lane encroachments by turning trucks. Acquisition costs and Highland Preservation Area restrictions may be a consideration for the implementation of any required widening improvements in Warren County, particularly along CR 519.

## INTRODUCTION

Warren County's location in the Region and proximity to Interstates 78 and 80 position the County as a desirable center for warehouse development and freight/goods movement. The County is currently experiencing increased interest in warehousing and distribution development. This study was undertaken to understand the potential long-term impact of such development in the County.

Locations with large clusters of industrial zoning were identified for analysis. Locations within the Highlands Preservation area were not considered as developable. Fifteen sites with the potential for industrial development were identified for analysis in the study for evaluation in the study, as shown in Figure . These 15 sites include over 4,000 acres and over 45 million square feet of gross floor area which could potentially be developed for industrial uses such as warehousing. These sites are located in Alpha Borough, Belvidere, Franklin Township, Greenwich Township, Harmony Township, Lopatcong Township, Mansfield Township, Oxford Township, Phillipsburg, Pohatcong Township, and White Township. Table 1 lists the sites, municipality, zoning, and total acreage for each site.

*Table 1 - Identified Sites*

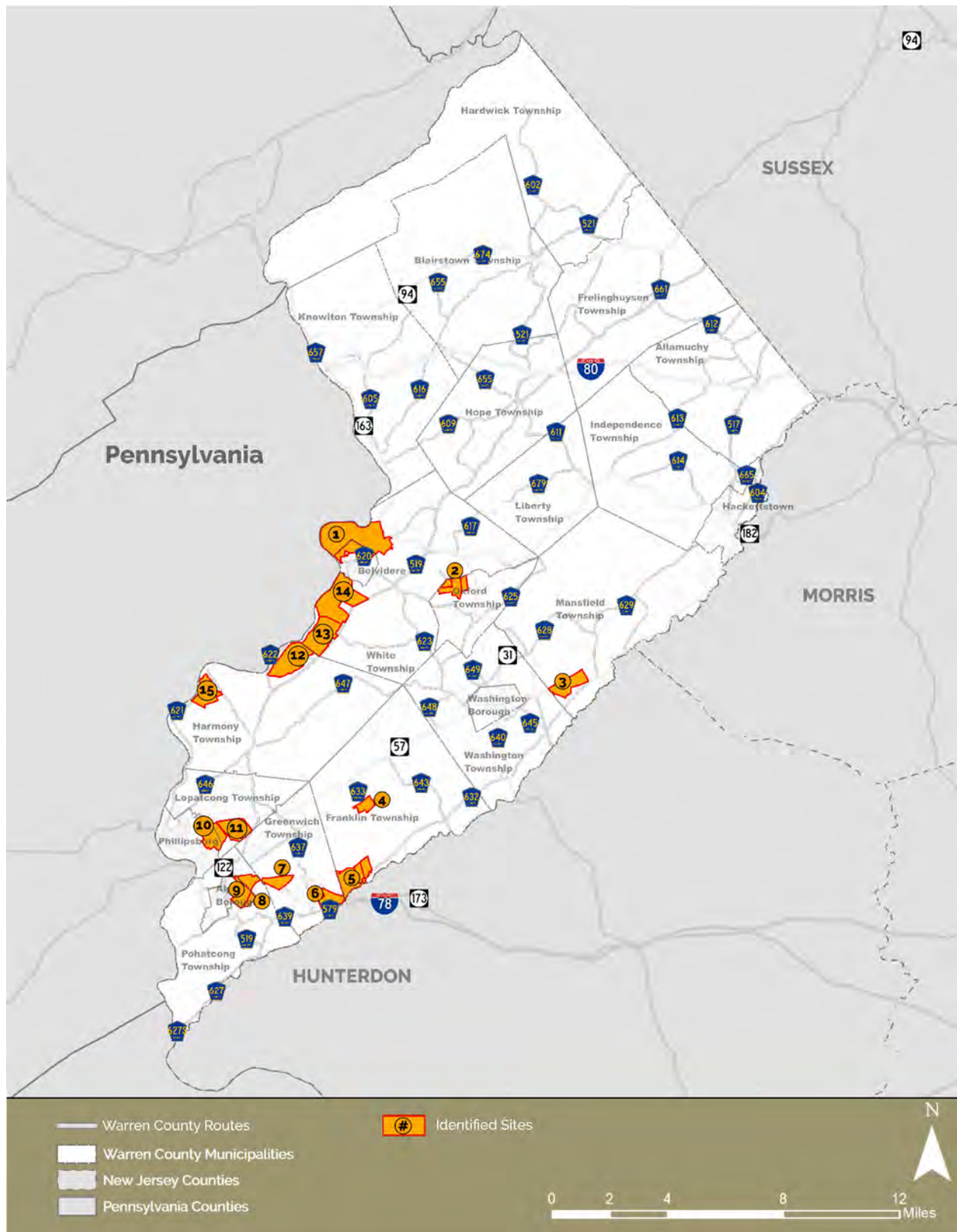
Site ID	Municipality	Zoning	Total Area (Acres)
1	Belvidere	LM - Light Manufacturing	283.2
	White	I - Industrial	1260.7
2	Oxford	I - Industrial	49.0
	Oxford	I - Industrial, O & LI - Office and Light Industrial	66.6
	Oxford	I - Industrial, LI - Light Industrial	186.2
3	Mansfield	I - Industrial	356.0
4	Franklin	I - Industrial	141.3
5	Franklin	I - Industrial, IP-A - Industrial Park	89.8
5	Franklin	I - Industrial, IP-A - Industrial Park	444.7
6	Greenwich	ROM - Research, Office & Manufacturing	246.9
7	Greenwich	RO - Research, Office	199.7
8	Alpha	I - Industrial	71.6
9	Pohatcong	I - Industrial	146.0
	Alpha	I - Industrial	239.0
10	Phillipsburg	I - Industrial, Phillipsburg Commerce Park Redevelopment Area	384.6
11	Lopatcong	ROM -Research, Office & Manufacturing	376.2
12	Harmony	I - Industrial	623.9
13	White	LDI -Low Density Industrial	622.8
14	White	I - Industrial	943.3
15	Harmony	I - Industrial	369.0

The sites for analysis include warehouses under construction, known proposed/planned warehouse sites, and potential future sites. The list of potential future sites is based on building potential permitted by use as-of-right per current zoning in each municipality. The amount of potential development on sites was constrained based on site conditions limiting development such as wetlands, floodplains, steep slopes,

drainage/detention basins, internal roadways, and other identified factors. The 15 sites include one warehouse site already approved and under construction, and two warehouse sites currently in the site plan review process.



Figure 1- Light Industrial Sites



## SITE IDENTIFICATION AND ZONING ANALYSIS

To determine the impact of possible development of these 15 sites, corresponding parcels for each site were aggregated, determining total acreage using a geospatial geometrical computation. Sites within multiple municipalities or with different zoning regulation were separated for analysis. Areas of environmental constraint or impervious surfaces were considered not eligible for development.

Environmental constraints for each site that could limit developable area were identified and removed from the calculated developable areas. These included wetlands, waterways, Federal Emergency Management Agency (FEMA) flood zones, preserved open space, and preserved farmland. These are constraints that cannot be or would be difficult to overcome; therefore, they have been excluded from the total developable area. Impervious surfaces such as roads, buildings, and others were also removed from the developable area. The Highlands Preservation Area is depicted in Figure 2. GIS layers/data obtained from New Jersey Department of Environmental Protection (NJDEP), FEMA, and Warren County for the environmental screening include:

- i. Impervious Surfaces
- ii. Wetlands
- iii. Waterways
- iv. FEMA Flood Zones
- v. County Property
- vi. Federal Property
- vii. Municipal Property
- viii. Non-Profit Property
- ix. Preserved Farmland
- x. Semi Public Property
- xi. State Property

Impervious surfaces for each site include roads, buildings, and other structures. On-site buildings were confirmed by using available Impervious Surfaces of New Jersey Edition September 30<sup>th</sup>, 2018 to conduct a visual analysis comparing footprints of buildings within the 15 sites with Bing satellite imagery from November 2019. From this exercise, 64 buildings were identified as no longer existing within the sites. The area of these sites was subtracted from the combined environmental and impervious surface area, and therefore considered to be clear for new development.

The end result was the available developable area that omitted environmental constraints, impervious surface, and proposed planned development areas. Those individual constraints and combined constraints are shown for each site in Figure 3 through Figure 17.

To estimate the total number of trips being generated by a site, the total allowable buildable area (Gross Floor Area) needed to be identified. The total allowable buildable area was calculated based on the zoning code of each municipality. The zoning code defines the limits for minimum and maximum lot size as well as setbacks, Floor Area Ratio (FAR), and maximum building coverage. Gross Floor Area (GFA) for each site was calculated by multiplying FAR, where available, by the available developable area. In cases where FAR is not provided, maximum building coverage was used.



Figure 2 - Highlands Preservation Area

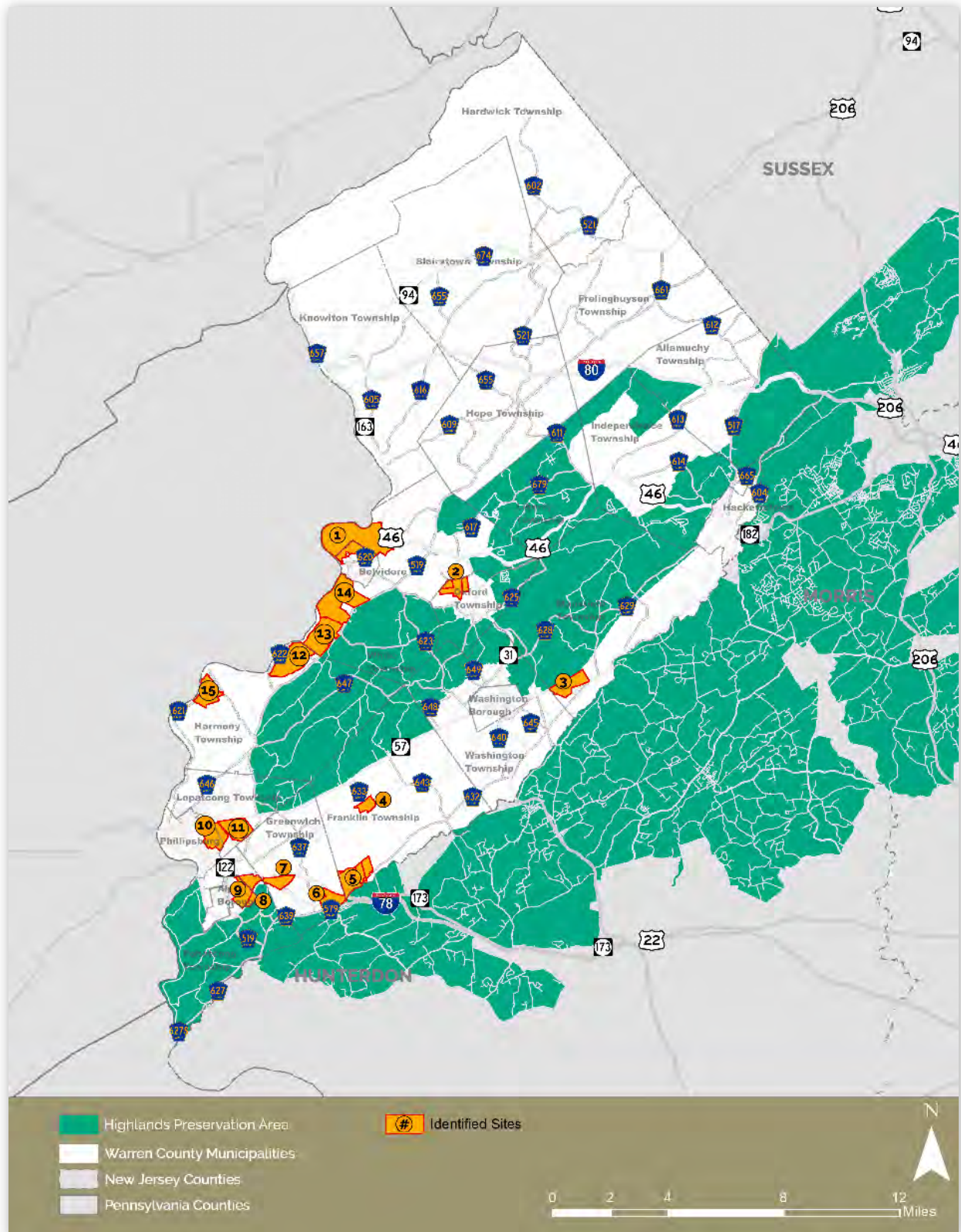




Figure 3 - Site 1 Constraints

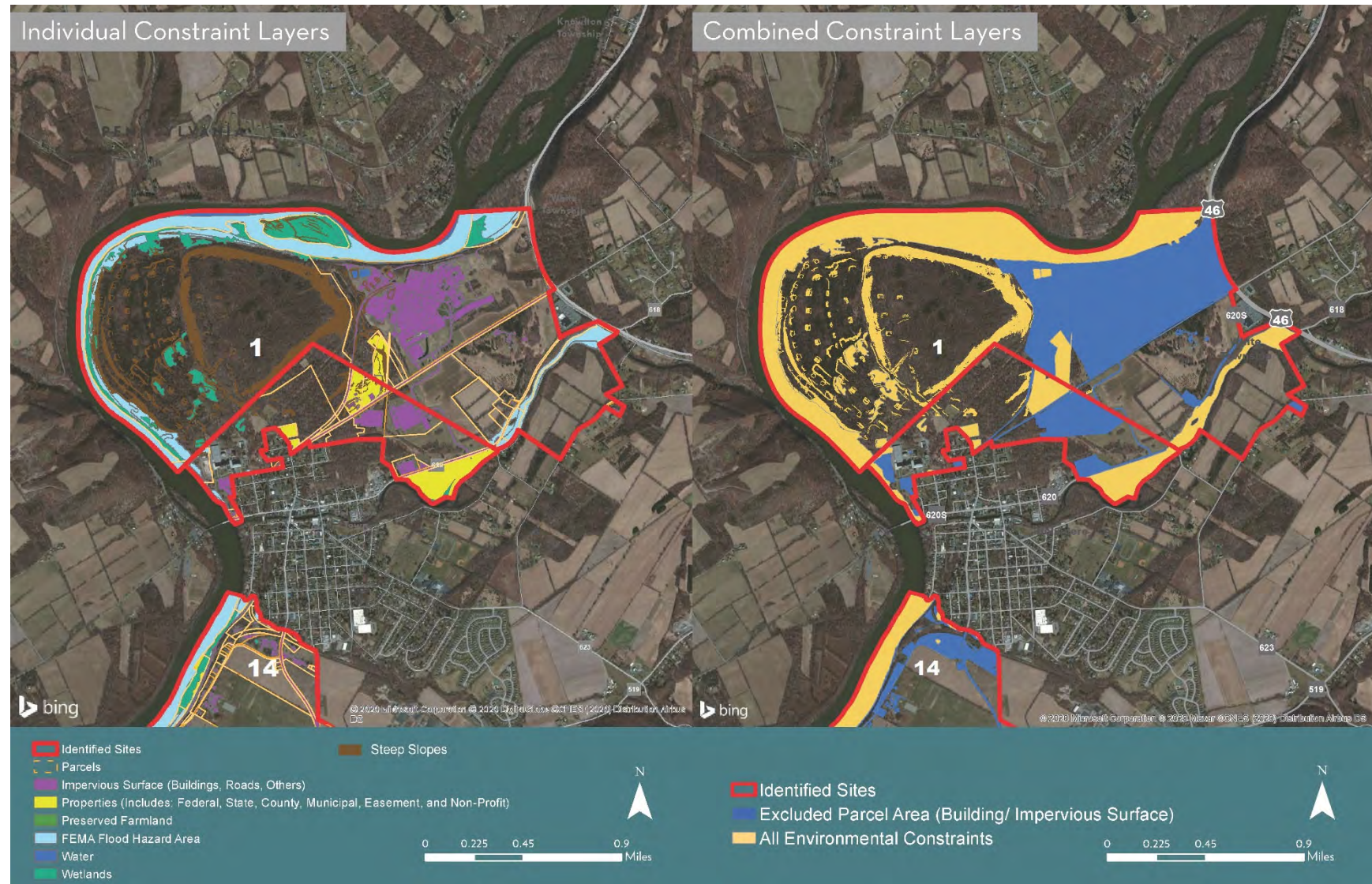




Figure 4 - Site 2 Constraints

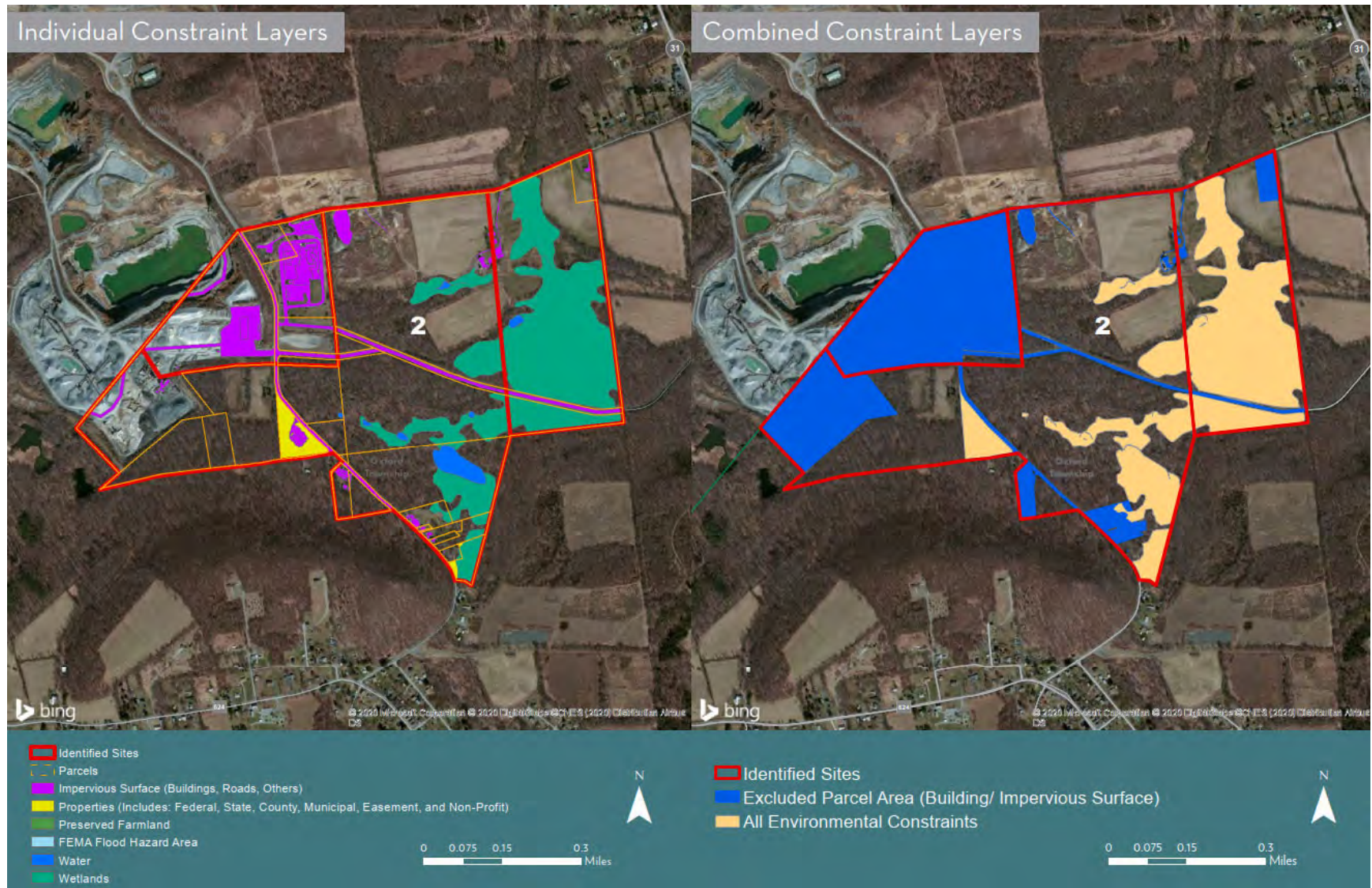




Figure 5 - Site 3 Constraints





Figure 6 - Site 4 Constraints

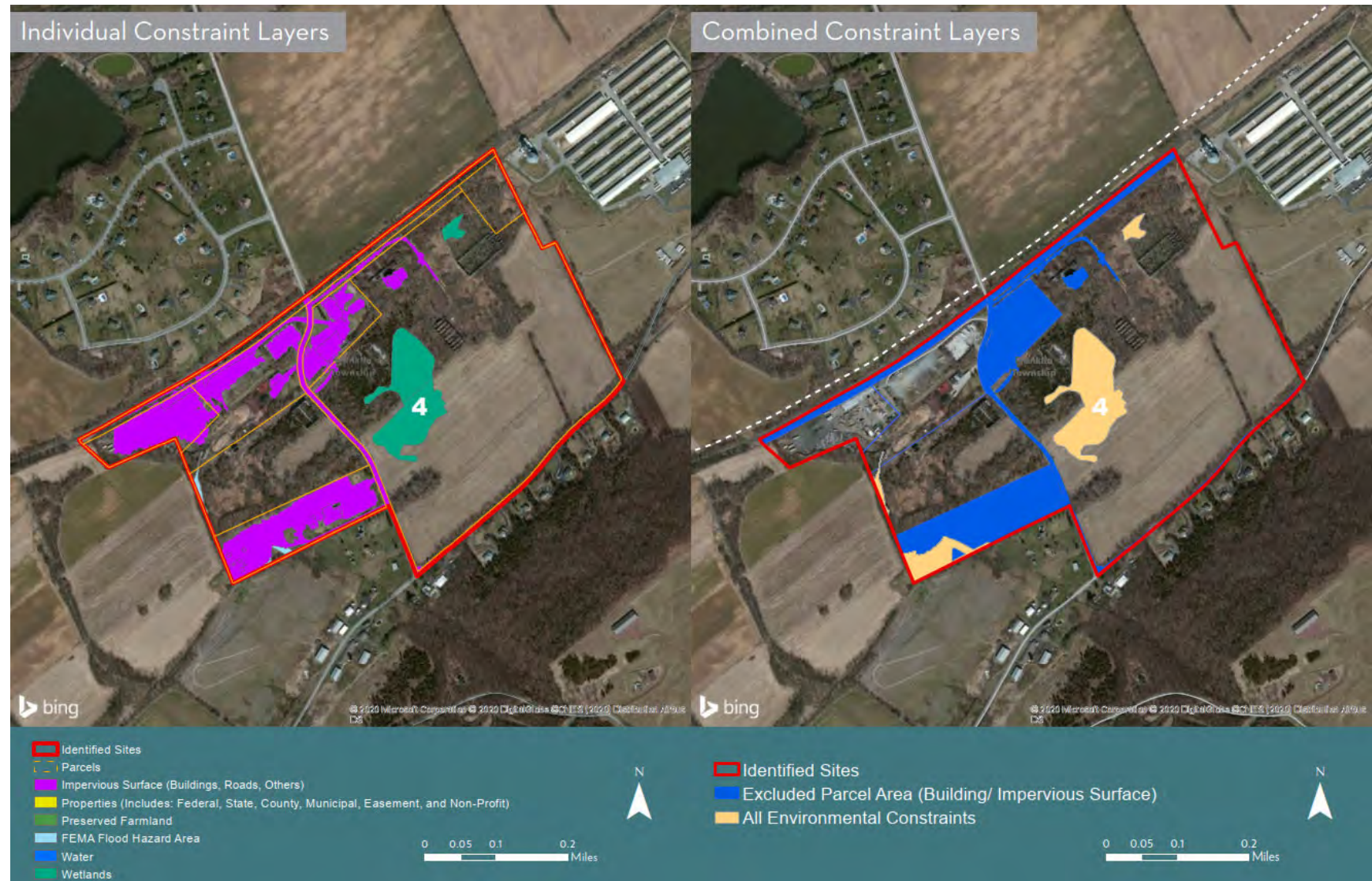




Figure 7 - Site 5 Constraints

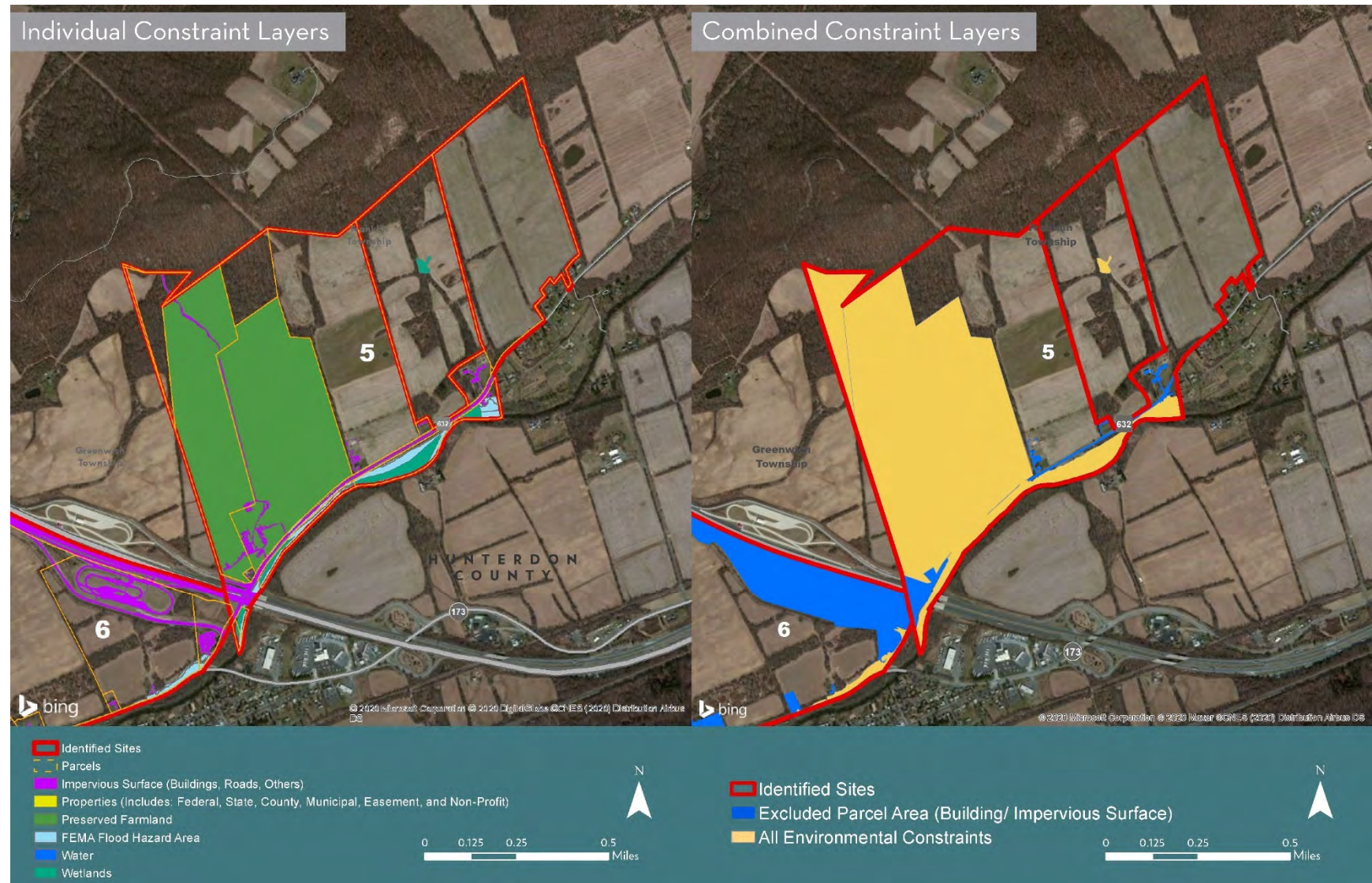




Figure 8 - Site 6 Constraints

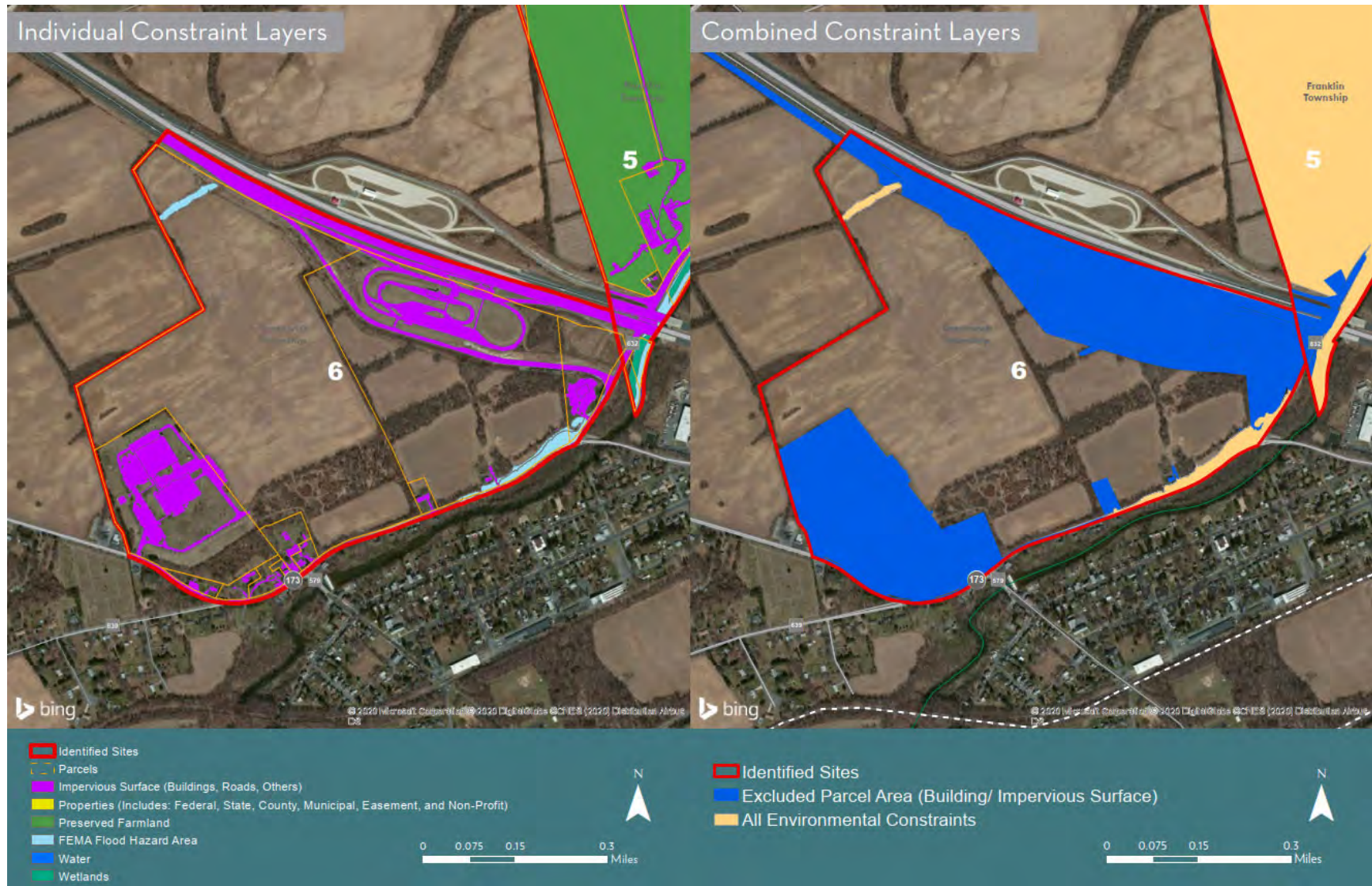




Figure 9 - Site 7 Constraints

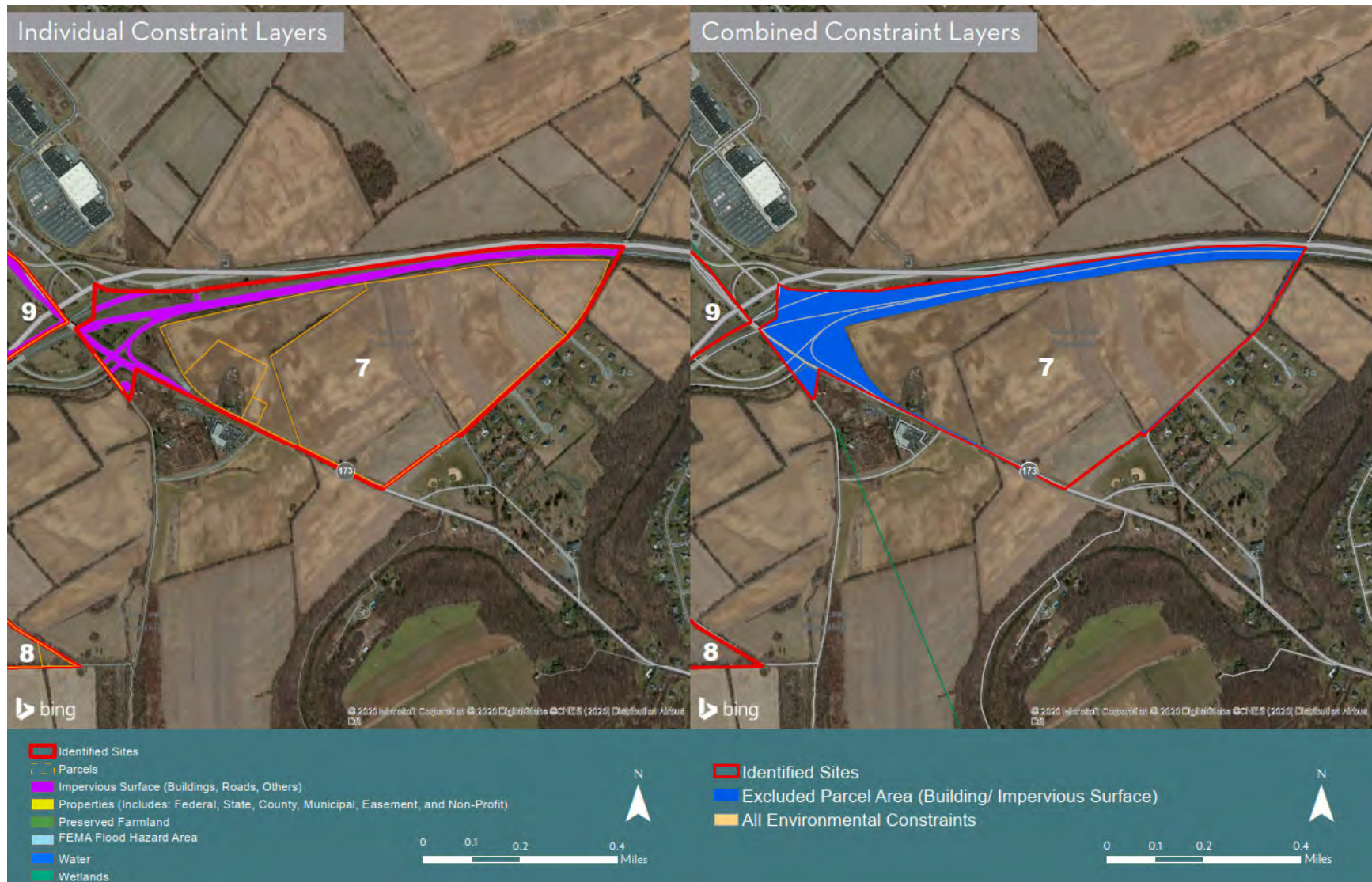




Figure 10 - Site 8 Constraints





Figure 11 - Site 9 Constraints

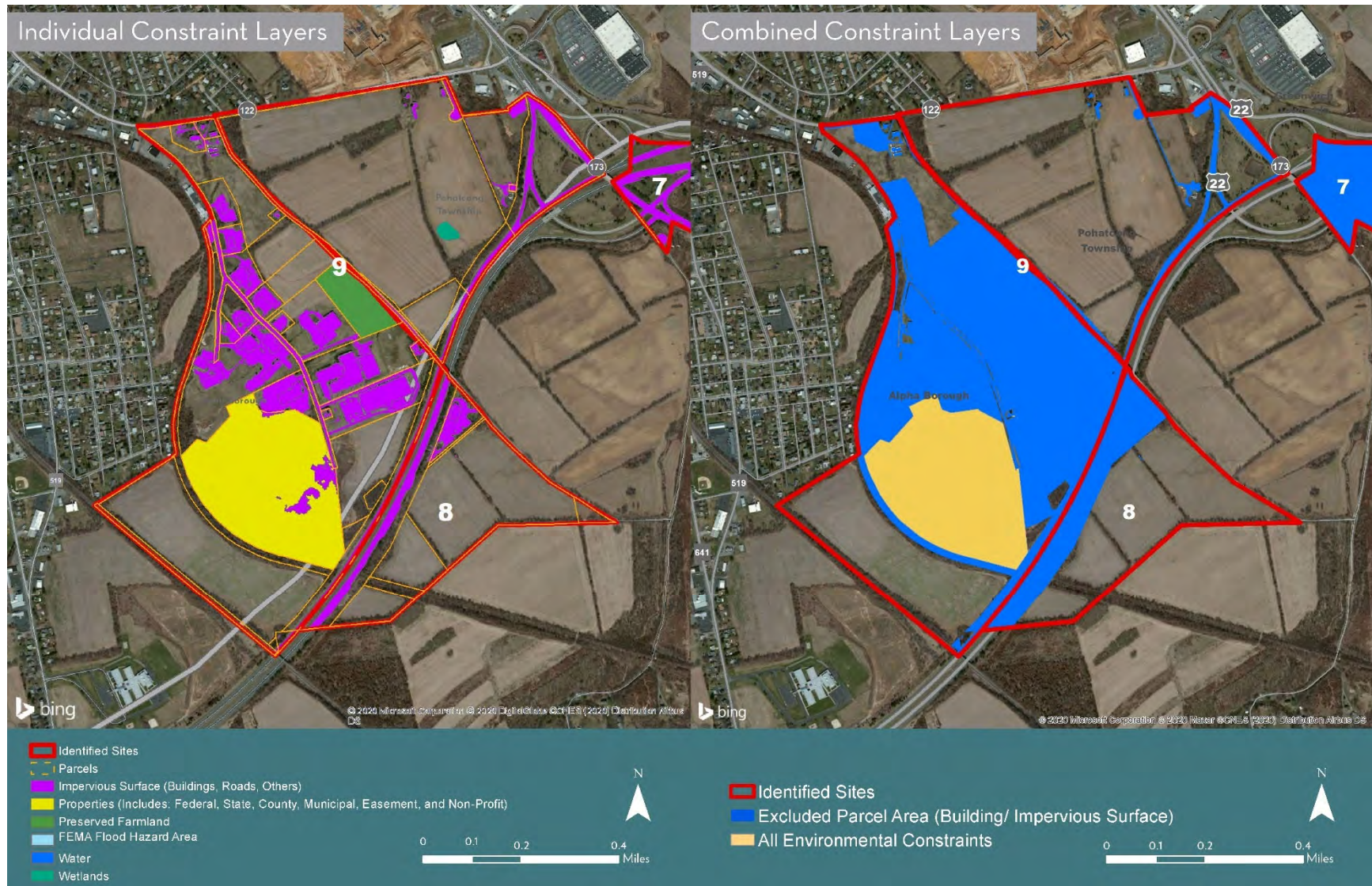




Figure 12 - Site 10 Constraints

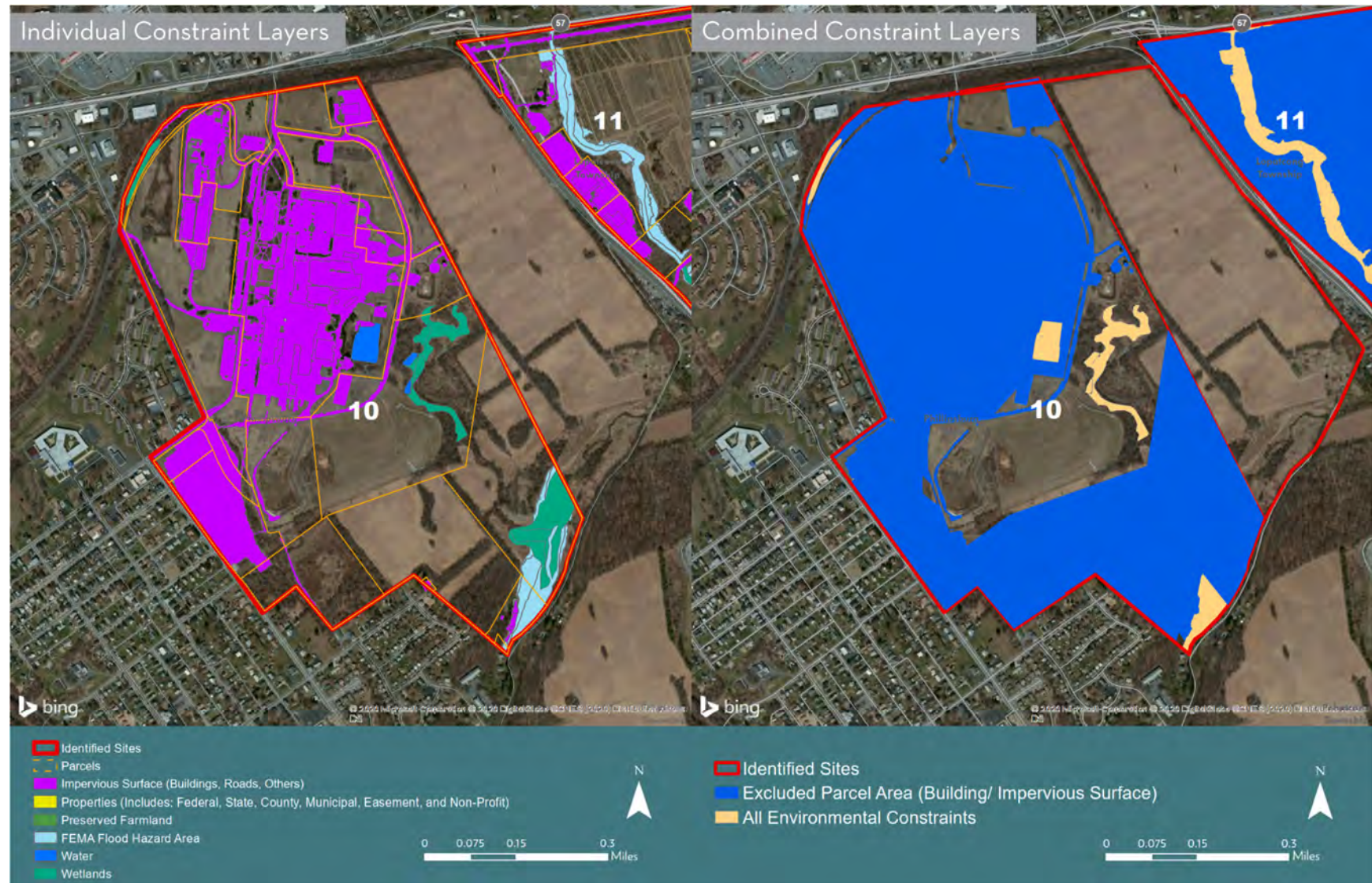




Figure 13 - Site 11 Constraints

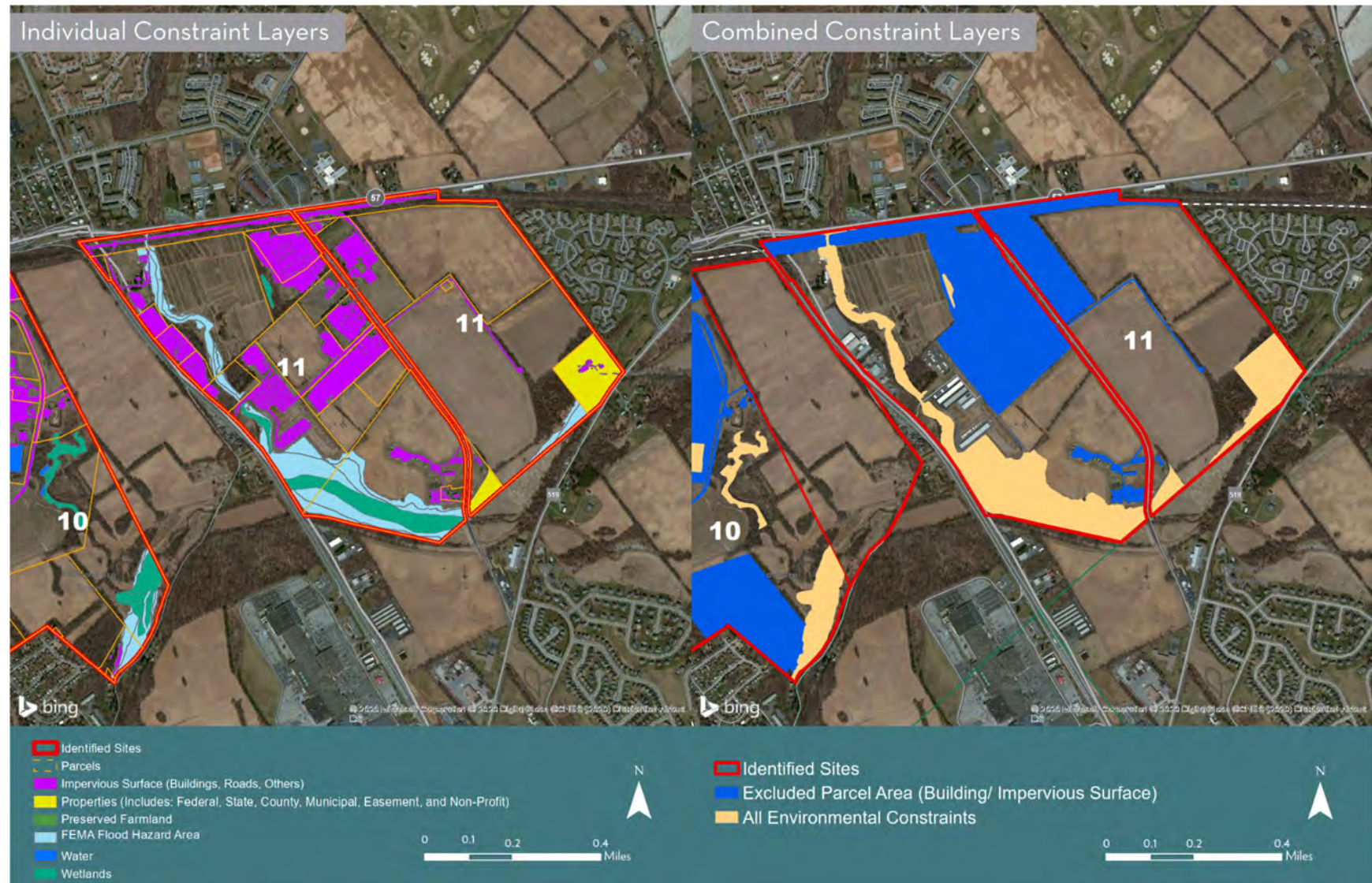




Figure 14 - Site 12 Constraints

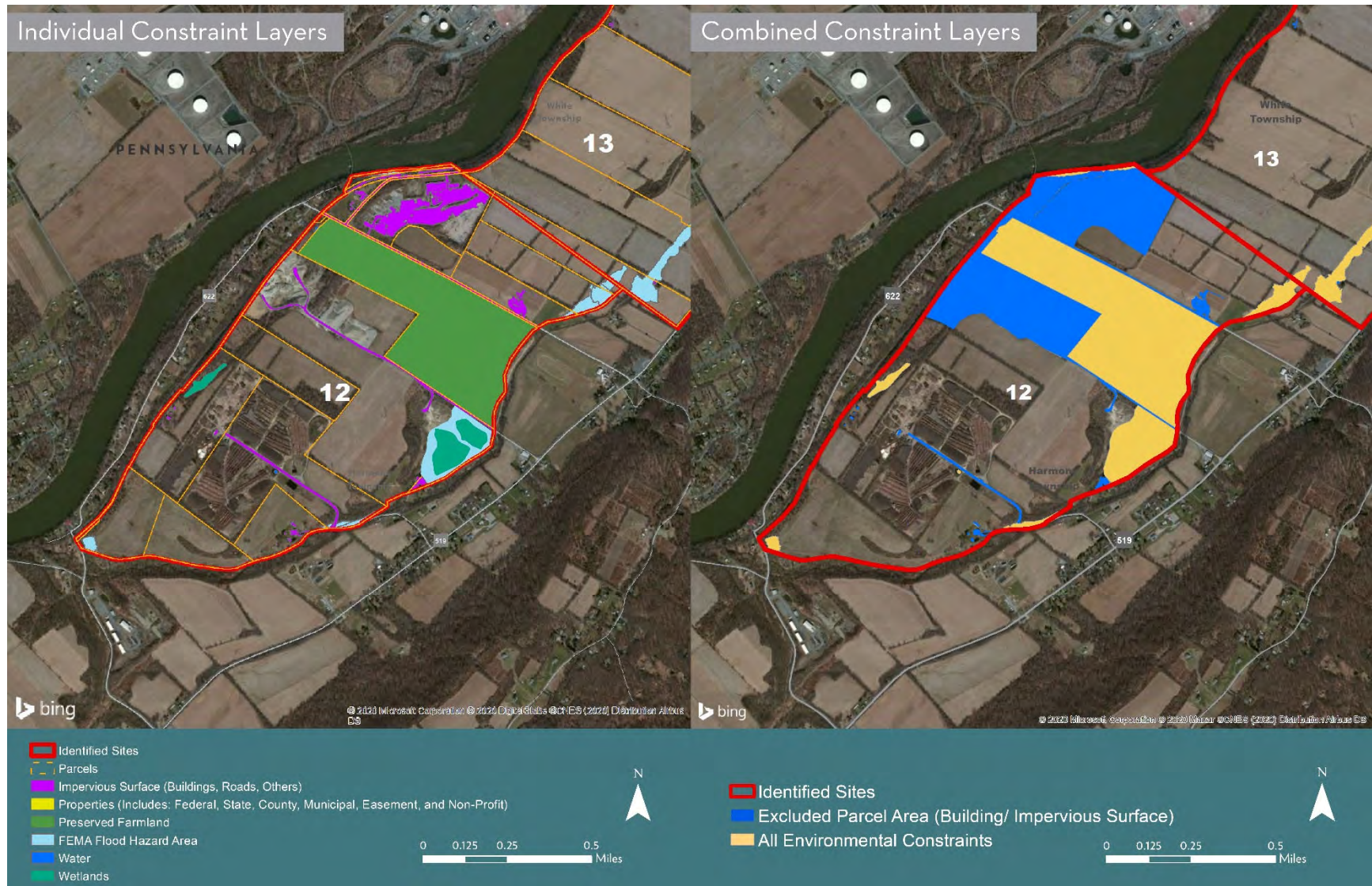




Figure 15 - Site 13 Constraints

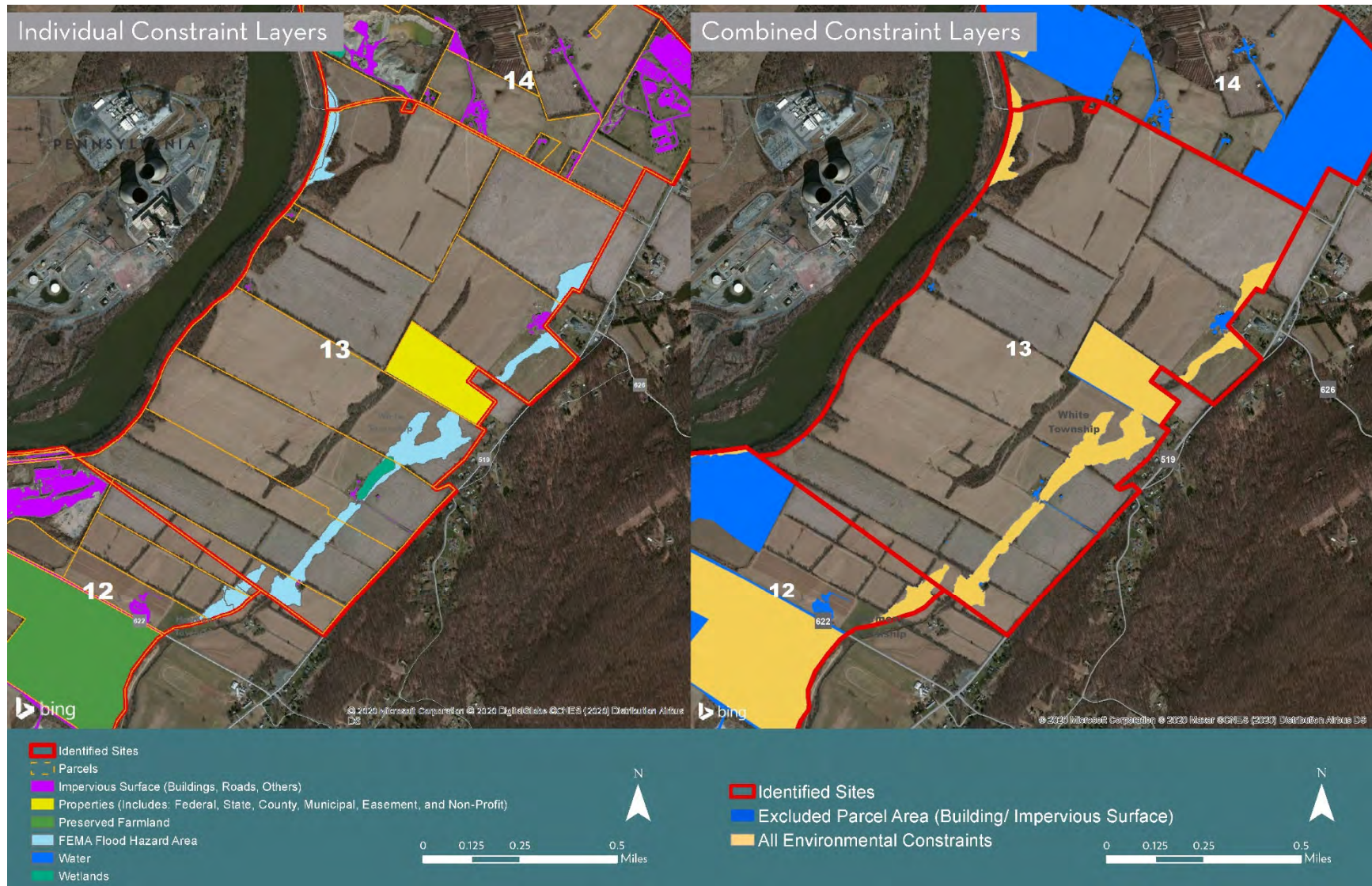




Figure 16 - Site 14 Constraints

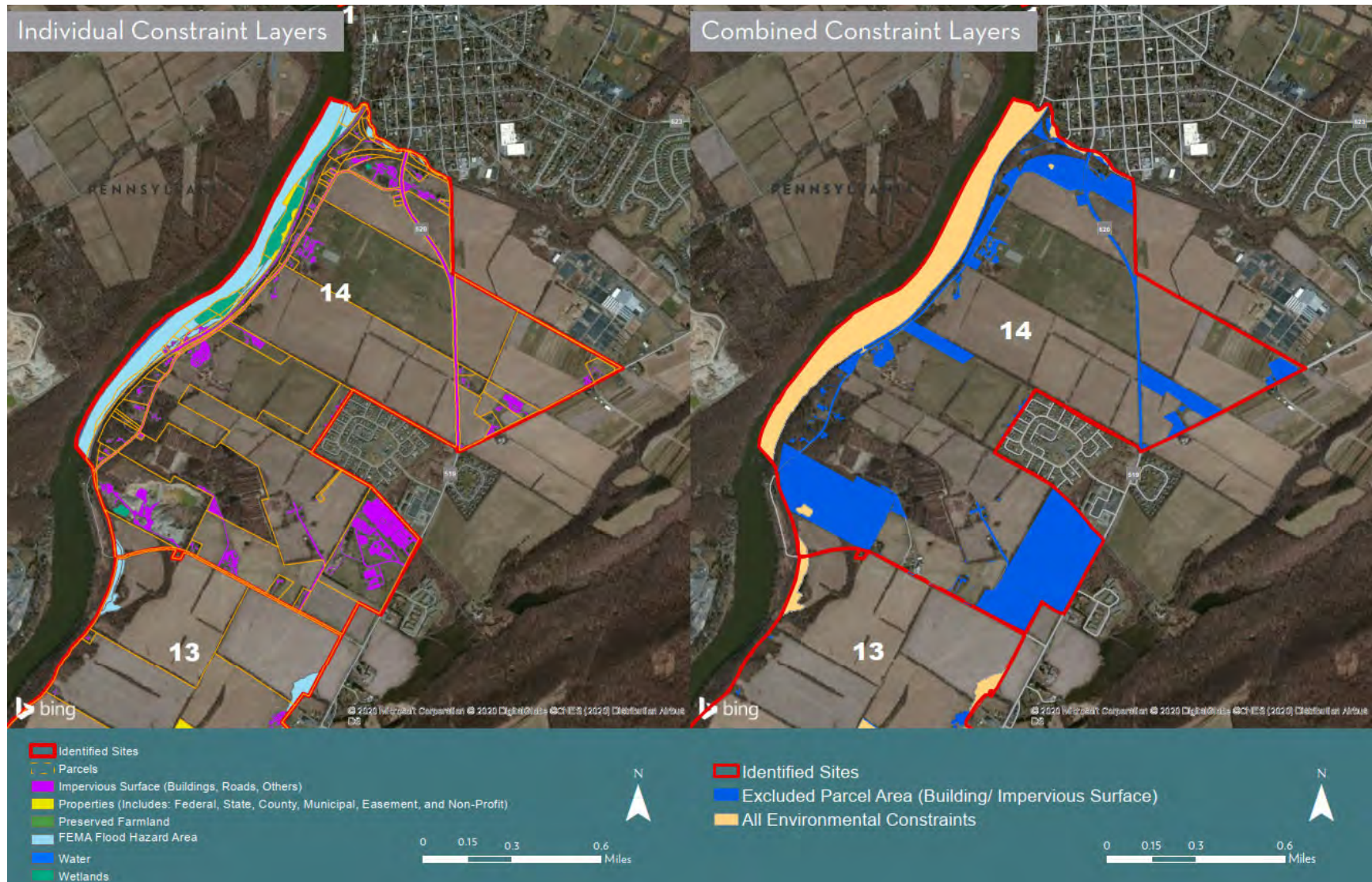
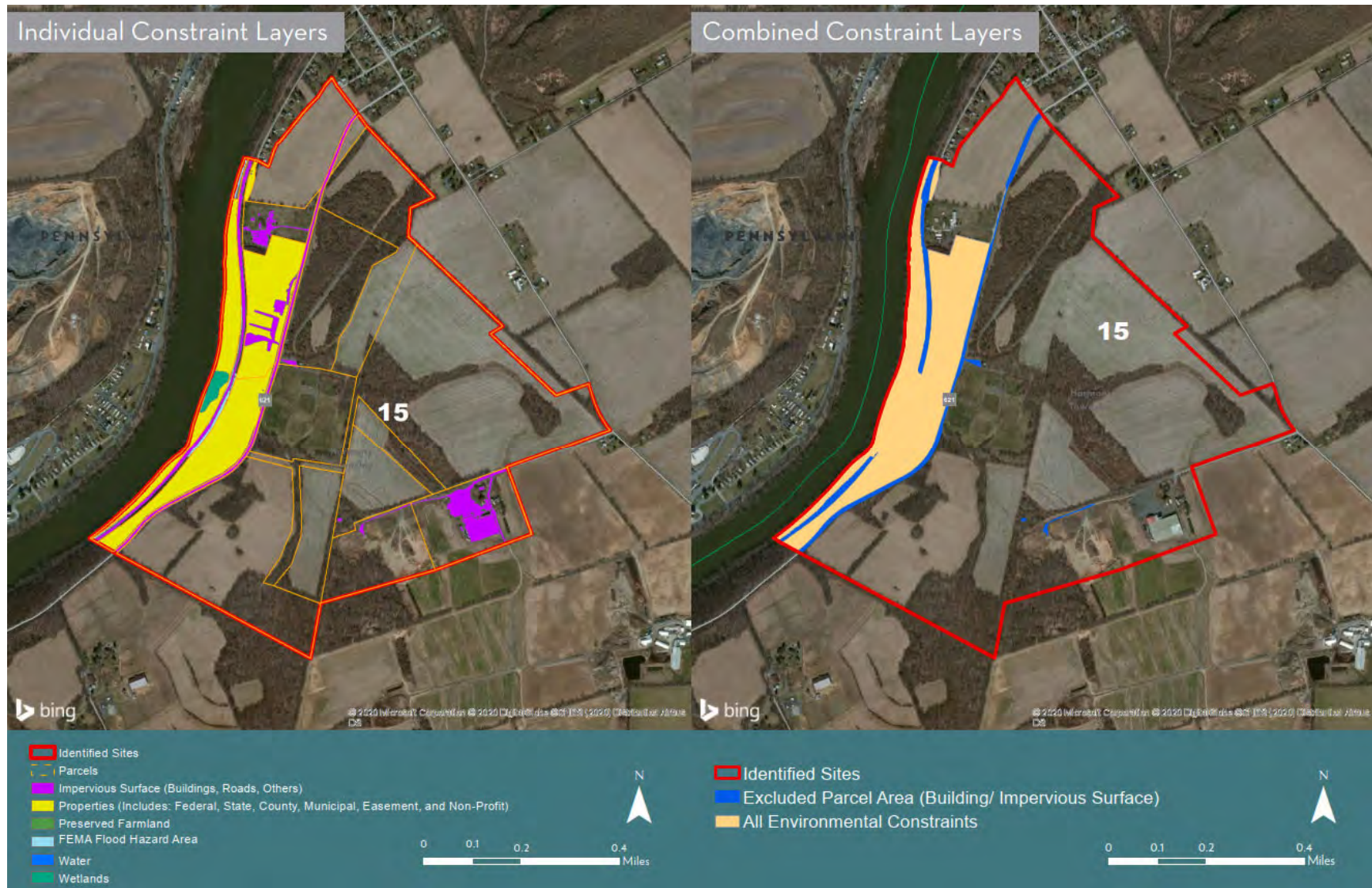




Figure 17 - Site 15 Constraints





## TRIP GENERATION

Using the 15 sites identified and their respective developable area assessment from the zoning analysis, trip generation was completed using the 10<sup>th</sup> Edition of the Institute of Transportation Engineers (ITE) Trip Generation Handbook. Corresponding land use codes from ITE 10<sup>th</sup> Edition handbook for each site was identified based on the zoning and permitted land use. It should be noted that for a majority of sites the allowed zoning and permitted land use varies; therefore, the Industrial Land Use codes 110 through 157 from the ITE Handbook were considered for screening. Also, since sites could potentially include multiple developments, each with different trip production rates, three land use codes were identified per site for low ( $R_L$ ), medium ( $R_M$ ) and high ( $R_H$ ) trip production rates. For the high trip production rate, land use code 110 (General Light Industrial) was used for all sites because the uses specified in the industrial zone districts generally fall within the light industrial definition. Table 2 illustrates the potential land use codes and the trip production rate for peak hours for each code.

*Table 2 – Trip Production Rate by Land Use Code*

ITE Land Use Code	Description	Combined AM and PM Peak Hour Trip Rate
110	General Light Industrial	1.33
130	Industrial Park	0.80
140	Manufacturing	1.29
150	Warehousing	0.36
151	Mini-Warehouse	0.27
154	High-Cube Transload and Short-term Storage Warehouse	0.18
155	High-Cube Fulfillment Center Warehouse	0.96
156	High-Cube Parcel Hub Warehouse	1.34
157	High-Cube Cold Storage Warehouse	0.23

Source: ITE 10<sup>th</sup> Edition Handbook

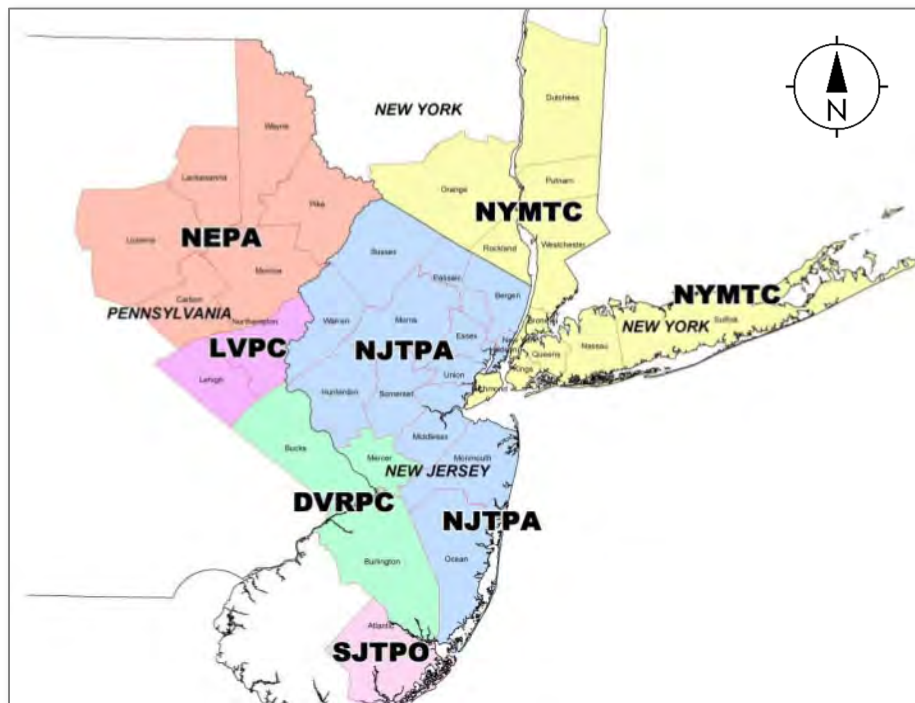
Based on the previously calculated GFA in square feet for each of the 15 identified sites, trips (auto and truck) were generated for the AM / PM peak hours, and Daily. Trip production was estimated as a Mixed-Use scenario. Mixed Use assumes a weighted trip production approach, where each development will include a mix of multiple developments with different trip production rates. Under this approach each identified trip production rate (low, medium and high) per site are weighted by weighting constant. GFA is multiplied by a user defined percentage for the low ( $R_L$ ), medium ( $R_M$ ) and high ( $R_H$ ) AM and PM trip production rates identified per Land Use per site. To best represent the most likely development scenario, in consultation with the County the weights were set as: low production trip rate ( $R_L$ ) at 50%, medium ( $R_M$ ) at 30%, and high ( $R_H$ ) at 20%. Detailed site data, zoning assignments, and trip generation information is presented in the table in Appendix A.

## TRIP ASSIGNMENT AND DISTRIBUTION

To conduct trip assignment and to identify the roadway segments that will see an increase in traffic flows originated from the proposed sites, the North Jersey Regional Transportation Model Enhanced (NJRTME) was used. This travel demand model was developed by the North Jersey Transportation Planning

Authority (NJTPA). It is a conventional four step transportation model that consists of trip generation, trip distribution, mode choice, and trip assignment. This model includes both highway and transit networks. It covers the NJTPA region, and the five surrounding Metropolitan Planning Organizations (MPO's) areas, as shown in Figure 18.

*Figure 18 - NJRTME Model Coverage*



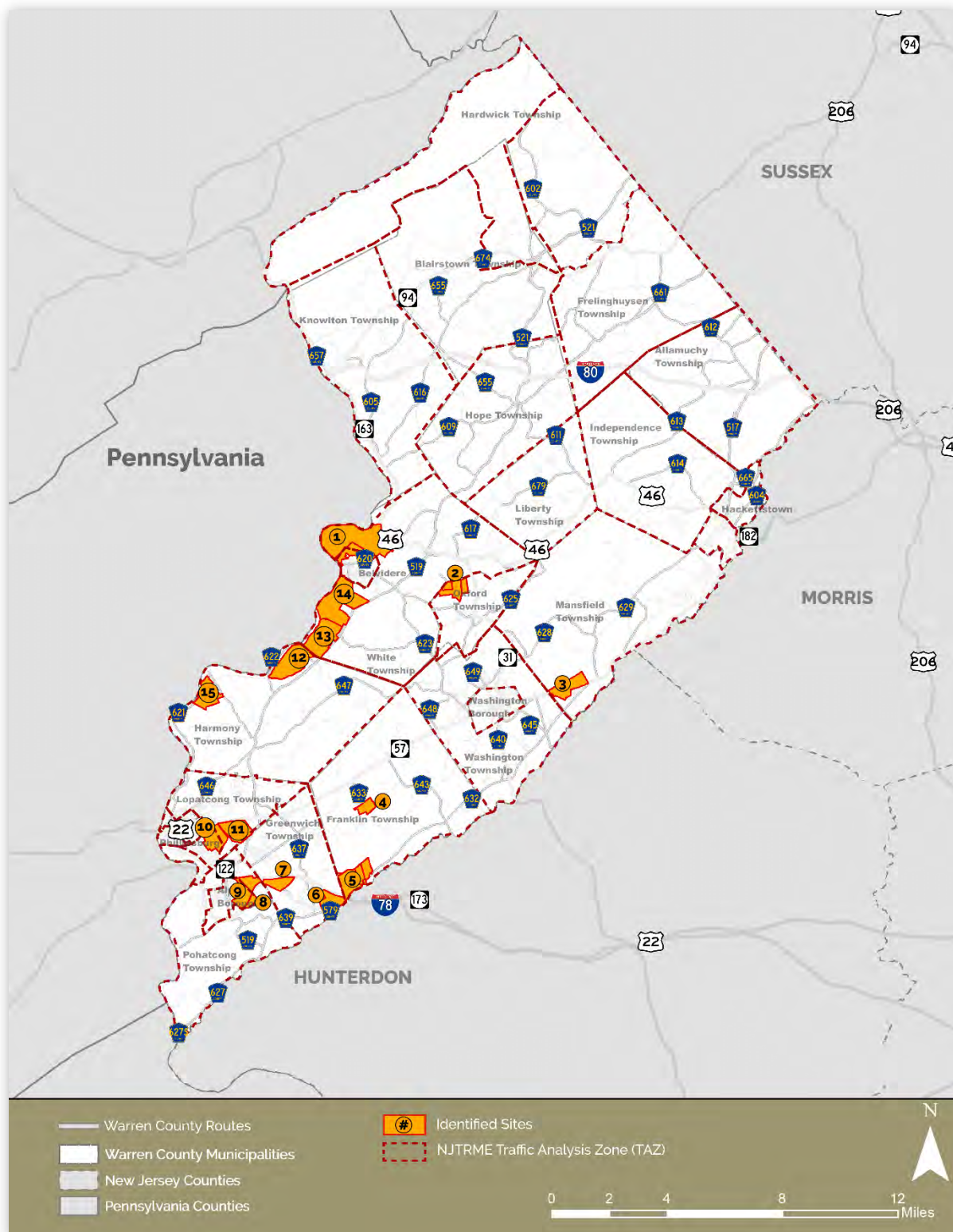
Source: NJTPA

## TRAFFIC ANALYSIS ZONES

The NJRTME is designed to support the forecasting of regional traffic flows, using socioeconomic information such as population and employment forecasts at five-year intervals. The underlying socioeconomic data is gathered, developed, and processed from the latest MPO-approved socioeconomic projections, as well as the U.S. Census, and other sources. This data is compiled into several categories by Traffic Analysis Zones (TAZs), which are established based on geographic definitions consistent with U.S. Census Tracts, but in some areas are disaggregated into Block Groups where finer levels of detail are required. For Warren County the TAZ zone system is comprised of twenty-seven zones, closely aligned to the municipal boundaries, although slightly different. The TAZ zone system within the County was enhanced to include fifteen additional zones replicating the size and location of each proposed site. Figure 19 below displays the added zones (outlined in red) overlaid on top of the twenty-seven TAZs within the County.



Figure 19 – Warren County TAZ's and Identified Sites



Source: WSP, NJTPA

## Socioeconomic Variables

TAZs contain the relevant socioeconomic information needed to develop traffic flow forecasts for the four-step process. This information is divided into population, number of households, employment, and average household income as shown in Table 3. Employment is further subdivided into ten different sectors corresponding to the North American Industry Classification System (NAICS).

Table 3 – Socioeconomic Variables

CODE	DESCRIPTION
POP	Number of Persons Living within TAZ
HH	Number of Households contained in TAZ
<b>EMPLOYMENT</b>	
AGMINE	Agriculture, Forestry, Fishing, and Mining
CONST	Construction
MFG	Manufacturing
TRANS	Transportation, Communications, Electric, Gas, and Sanitary
WHLSE	Wholesale Trade
RET	Retail Trade
FIRE	Finances, Insurance, and Real Estate
SER	Services
GOV	Government-Public Administration
MIL	Military
<b>INCOME</b>	
INCOME	Average Household Income

For this project, the 2045 NJTPA socioeconomic forecasts were used and adjusted to include the information pertaining to each of the 15 sites. It was assumed the 2045 NJTPA socioeconomic projections do not include the proposed growth that would result from the inclusion of these sites. Therefore, employment estimates for each of these sites were added to the corresponding employment sector within each TAZ within the study area.

## Employment Estimates

To estimate the employment generated by each site, an average ratio of 2,000 square feet by employee was used. This metric was obtained from the National Association for Industrial and Office Parks (NAIOP), using the Commercial Buildings and Energy Consumption Survey (CBECS). This survey identifies the inventory, employment and square feet by employee for logistics buildings and their characteristics across a set of variables including region, building size, year built, and building type. This ratio was applied to the estimated GFA for each site. Logistics buildings included in this survey include refrigerated and non-refrigerated warehouses, distribution or shipping center, self-storage, and flex buildings<sup>1</sup>. This ratio varies according to the region, type of industry, and building type. Thus, applying this ratio to the 15 identified sites within the study area, socioeconomic estimates shown in Table 4 were used for the 2045 forecast year.

<sup>1</sup> Logistics Trends and Specific Industries that Will Drive Warehouse and Distribution Growth and Demand for Space. National Association for Industrial and Office Parks, NAIOP, 2010.



Table 4 – 2045 Employment Estimates Based on 2,000 Square Feet by Employee

Site ID	Total Area (Acres)	Developable Area (Acres)	Gross Floor Area (1,000 SQFT)	Employment (# of jobs)
1	1,543.9	809.2	8,175	4,088
2	301.7	152.9	1,332	666
3	356.0	88.3	962	481
4	141.3	88.9	968	484
5	534.5	313.4	3,413	1,707
6	246.9	149.9	980	490
7	199.7	151.2	658	329
8	71.6	53.1	694	347
9	385.0	143.8	1,123	562
10	384.6	325.5	5,672	2,836
11	376.2	189.2	1,648	824
12	623.9	387.7	5,066	2,533
13	622.8	559.8	4,877	2,439
14	943.3	660.0	5,750	2,875
15	369.0	311.7	4,073	2,037

## TRIP GENERATION

The NJRTM-E contains a Truck Specific procedure/module estimating trip distribution between destinations and/or origins, subdivided into External to External (pass-by-trips from zones outside the NJTPA Region to zones outside the NJTPA region), External to Internal (trips from zones outside the NJTPA Region to zones inside the NJTPA region), and Internal (trips within the NJTPA region) zones. Truck flows can be obtained for medium (2 axle, 6-tire vehicles) and heavy (3+ axle vehicles) size trucks. To perform truck trip generation, the employment data is grouped into five categories: retail, industrial (manufacturing), public (government and military), office (finance, insurance, real state) and other (Agriculture, Forestry, Fishing, Mining, Construction, Transportation, Communications, Electric, Gas, Sanitary, and Wholesale Trade). The trip rates in Table 5 are used for this purpose.

Table 5 - Truck Trip Generation Rates

Type	Medium Truck	Heavy Truck	Commercial Trips Manhattan	Commercial Trips NY Other Counties	Commercial Trips Other Regions
<b>by Population</b>					
Households	0.0240	0.0202	0.0407	0.0234	0.0116
<b>by Employment</b>					
Retail Employment	0.1264	0.0590	0.1241	0.0709	0.0355
Industrial Employment	0.0522	0.0800	0.1470	0.0840	0.0420
Public Employment	0.0032	0.0384	0.1470	0.0840	0.0420
Office Employment	0.0202	0.0051	0.0630	0.0360	0.0180
Other Employment	0.0553	0.1207	0.1470	0.0840	0.0420

Intermodal facilities are also accounted for in the NJRTM-E. For Warren County, the model shows the municipalities of Phillipsburg, Harmony, Lopatcong, White, and Liberty Townships as having Truck Terminals. To account for the assumption that by 2045 each of the 15 sites will have a warehouse built, this database was augmented to include a warehouse at each of these zones. The model considers the truck size split for each facility type as shown in Table 6.

Table 6 - Percentage Truck Split by Facility Type

Intermodal Facility	Medium Truck Percentage	Heavy Truck Percentage
Truck Terminal	45%	55%
Warehouse	36%	64%
Pipeline Terminals	20%	80%
Other Special Generators (such as Ports and Airports)	100%	100%

## TRIP DISTRIBUTION

This procedure is designed to match (distribute) trips between population areas and employment centers. It considers the cost of travel between different destinations. Trips are classified on whether they are oriented toward home or work. The model includes multiple trip purposes: Home-Based Work Direct (from home to work), Home-Based Work Strategic (e.g. drop off kids, pick up coffee on the way to work), Home-Based Shopping, Home-Based Other (e.g. leisure), Home-Based University, Work-Based Other (e.g. to lunch, shopping), Non-Home Non-Work (all the rest, e.g. from a store to school), and Trucks.

## MODE CHOICE

No specific adjustments were made to mode choice components of the model. This procedure was performed using the base parameters and methodology included in the model.

## TRIP ASSIGNMENT

The model performs the assignment of trips to both highway and transit networks. For the highway assignment the roadway network includes multiple parameters that determine the capacity of each roadway segment, such as number of lanes, facility type, tolls, and speed. Other, physical and



operational roadway characteristics such as terrain type, presence of shoulders, right or left turn lanes, and traffic control devices are also included but these do not play a significant role on the determination of the capacity. Roadway characteristics such as truck weight or height restrictions are roadway attributes not included on the model highway network. Therefore, truck trips could be assigned to roadway segments with any of these restrictions in place. Such trips cannot be reassigned with the model; rather, those volumes were manually rerouted to other roadways from one link to another before the intersection or mainline capacity assessment was performed.

## MODELING SCENARIOS

Two scenarios were modeled for this project: 2045 No Build and 2045 Build (2045 No Build + Proposed Development). For the 2045 No Build scenario, no modifications were made to the socioeconomic variables within the TAZs in Warren County. Relevant Transportation Improvement Projects (TIP) projects were included on the roadway network. However, for the 2045 Build scenario, the employment data described previously was added. Other changes to this scenario include the addition of warehouse facilities and centroid connectors to the roadway network.

Daily traffic flows from each scenario were compared to estimate changes in traffic patterns due to the proposed developments. Changes in traffic volumes can be used as proxy to trace routes (roadway segments) where an increase in future traffic will occur. Figure 20 and Figure 21 show the changes in daily traffic flows (total vehicles and trucks only, respectively) between scenarios.

Figure 20 - Changes in Daily Traffic Flows (Auto & Truck) between 2045 No Build and 2045 Build Scenarios

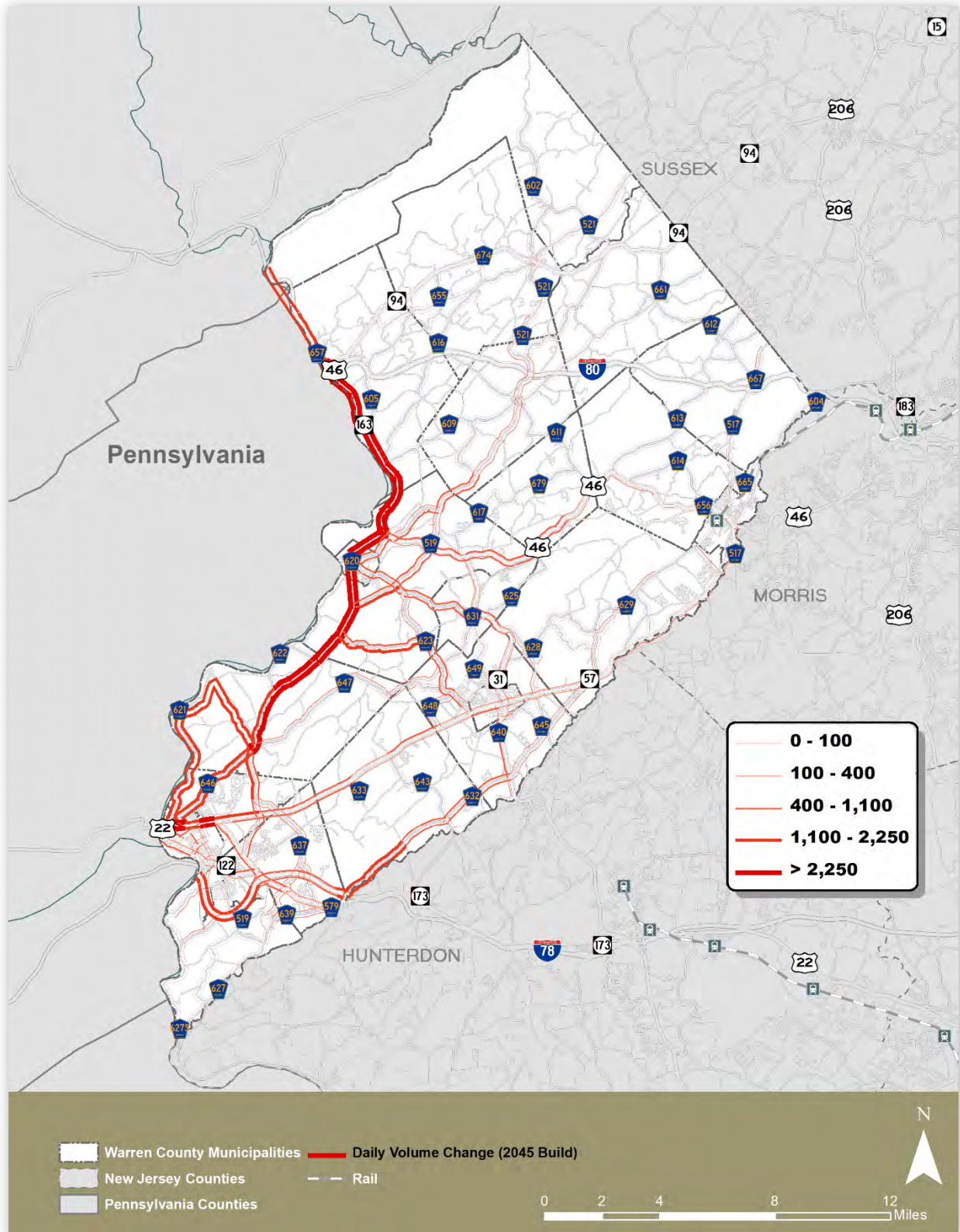
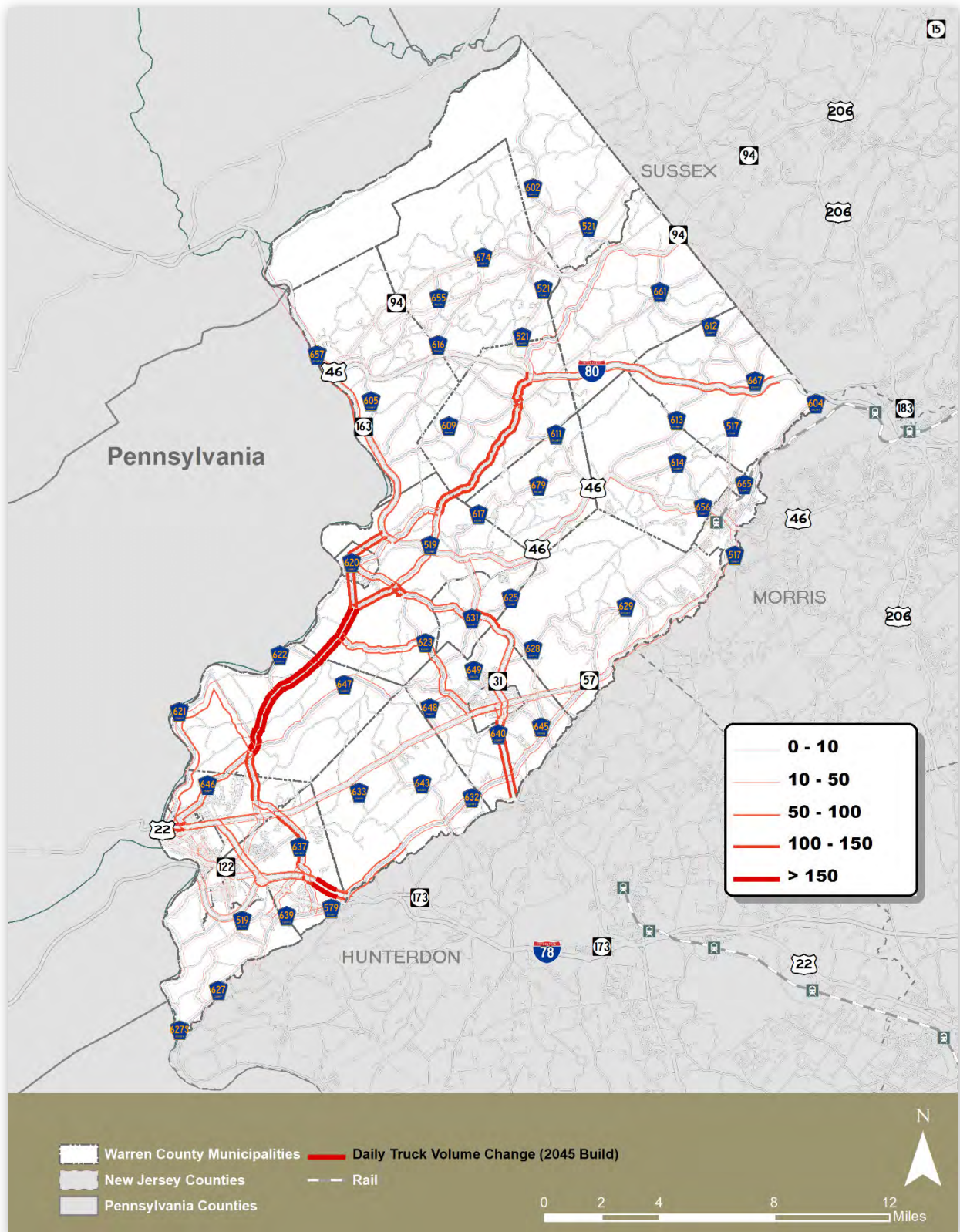




Figure 21 - Changes in Daily Truck Traffic Flows between 2045 No Build and 2045 Build Scenarios



The magnitude of the line width highlights those roadway segments where an increase of traffic would occur. The highest impact would occur along roadways connecting proposed sites in the western portion of the county, County Road (CR) 621 (River Road) and CR 519 (Belvidere Road). These roads provide connections to major roadways such as U.S. Routes 22 and 46, on the south and north respectively. U.S. Route 22 would carry north-south traffic flows destined to Interstate 78. U.S. Route 46 would carry traffic flows to Interstate 80. For those sites analyzed in the southern portion of the county, CR 632 (Asbury Bloomsbury Road) would provide the main connection to Interstate 78. Other routes being impacted include CR 626, CR 624, and CR 632.

More specifically in AM and PM peak periods we see increased volumes that indicate commuter patterns. For example, in the AM we see an increase in southbound trips from Route 46 or I-80 towards CR 519 in Belvidere. In the PM the reverse is true, and there is an increase in trips heading north from CR 519 towards Route 46 and I-80. Projected model changes are displayed in more detail in Appendix B.

As explained previously, the NJRTME model is a demand-based model. These types of models are designed to assign trips to roadway segments despite its available capacity or physical constraints. Because of this, the model can result in roadway segments with excessive demand, or in other words, segments with Demand to Capacity Ratios (D/C) above one. For planning purposes, this characteristic is very important since it provides an indication of where the demand would want to go despite physical constraints. For example, the model assigns some of the site generated truck demand to CR 626 to connect CR 519 with CR 623 and NJ 57. However, CR 626 is a narrow, steep and windy roads that goes over a mountain making it a difficult path for trucks use. To account for such roadway characteristics (i.e. steepness, narrowness, weight and height restrictions), the highway assignment final volumes from this study were reviewed by county staff. Using the feedback from the County, truck trips that had been assigned to incompatible roadways by the model, i.e. weight or height restricted, were manually shifted to truck-compatible alternate paths that most closely replicated the trip assigned by the model. Those additional truck volumes were added to mid block and intersection Build volumes along the new path and subtracted from the original path. The adjusted volumes were used in the capacity analysis for both mid block and intersection locations.

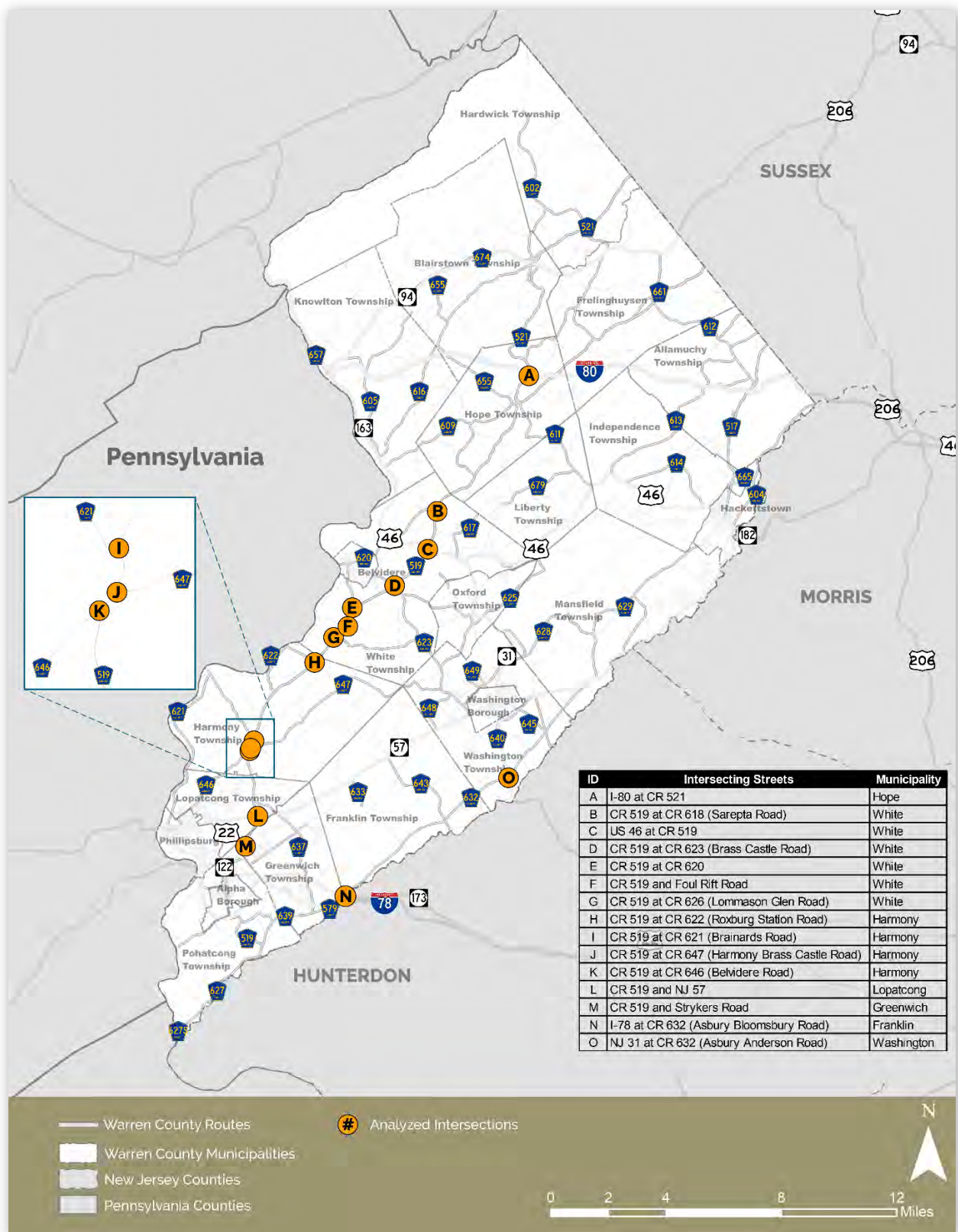
Key intersections that would receive additional auto and truck traffic generated by future development of the industrial sites were identified. Those intersections were analyzed for truck turning radii compatibility, and where recent traffic counts were available, operation for the existing, 2045 No Build, and 2045 Build conditions. Mid-block locations between these intersections were also analyzed for traffic operations. The analyzed intersections are listed in Table 7 and shown in Figure 22.



*Table 7 – Analyzed Intersections*

Intersection	Intersecting Streets	Municipality
A	I-80 at CR 521	Hope Township
B	CR 519 at CR 618 (Sarepta Road)	White Township
C	US 46 at CR 519	White Township
D	CR 519 at CR 623 (Brass Castle Road)	White Township
E	CR 519 at CR 620	White Township
F	CR 519 at Foul Rift Road	White Township
G	CR 519 at CR 626 (Lommason Glen Road)	White Township
H	CR 519 at CR 621 (Brainards Road)	White Township
I	CR 519 at CR 622 (Roxburg Station Road)	Harmony Township
J	CR 519 at CR 647 (Harmony Brass Castle Road)	Harmony Township
K	CR 519 at CR 646 (Belvidere Road)	Harmony Township
L	CR 519 at NJ 57	Lopatcong Township
M	CR 519 at Strykers Road	Greenwich Township
N	I-78 at CR 632 (Asbury Bloomsbury Road)	Franklin Township
O	NJ 31 at CR 632 (Asbury Anderson Road)	Washington Township

Figure 22 - Analyzed Intersections





## ROADWAY SUITABILITY

### HEIGHT AND WEIGHT RESTRICTIONS

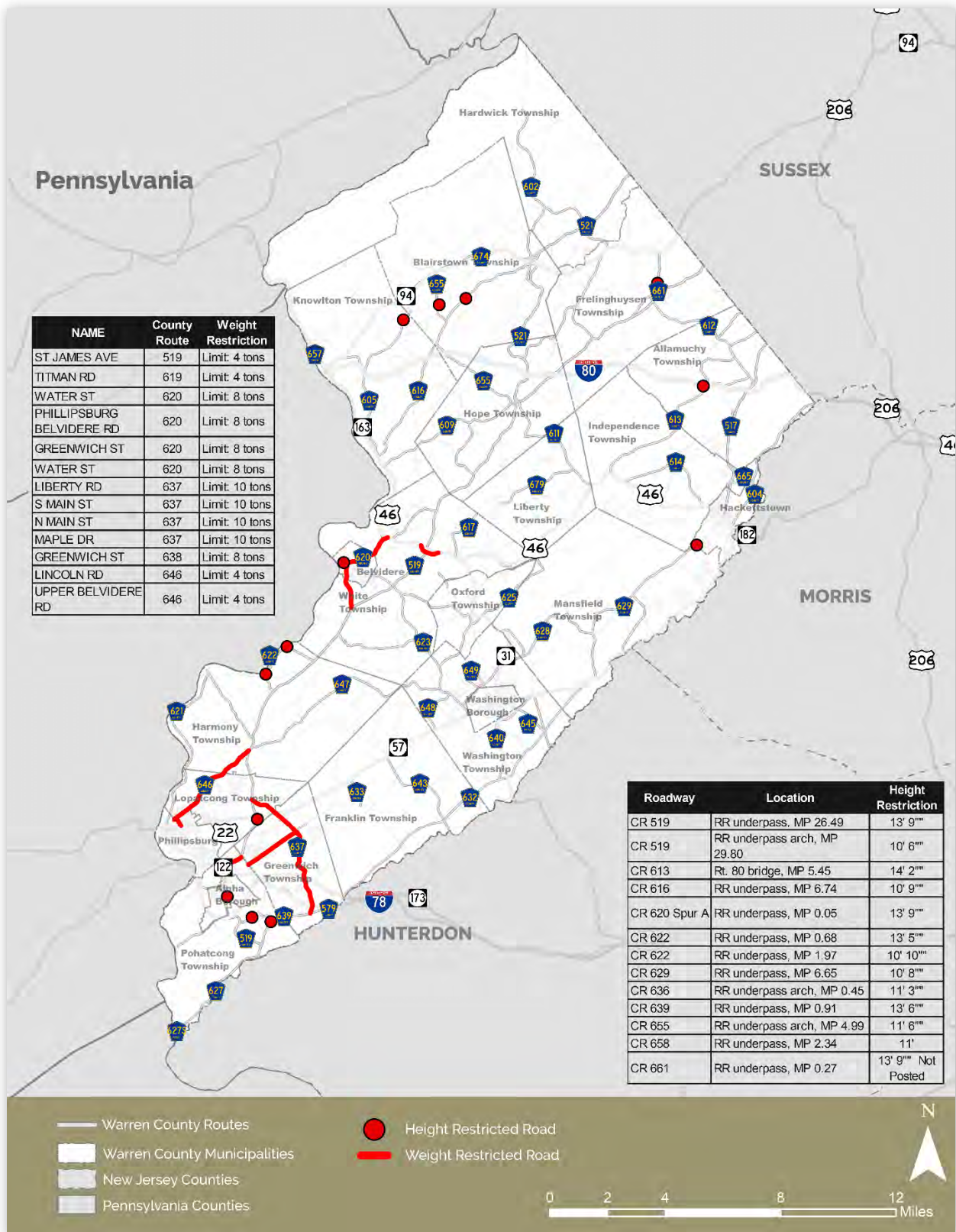
Numerous bridges and roadways in Warren County have weight or height restrictions that preclude the use of a roadway by trucks exceeding those limits. The design or condition of these bridges and roadways do not permit usage by certain vehicles. Height is measured from the roadbed to the highest point on the vehicle or load it is carrying. Weight includes the weight of the vehicle plus the weight of the load that is being carried.

While necessary for physical and safety reasons, height and weight restrictions can create secondary impacts. Restrictions can limit transportation accessibility for local businesses, impact local economic viability, increase vehicle miles traveled, and divert traffic through residential neighborhoods. Eleven County routes have height restrictions and five county routes have weight restrictions.

County roads with height and weight restrictions tend to be around the border of Warren County, with few restrictions in the County's interior. In Pohatcong, both CR 636 and CR 639 have height restrictions of 11'3", and 13'6", respectively. Additionally, CR 519 in Alpha has a 13'9" height restriction and a 10'6" height restriction in Lopatcong. These restrictions pose a mobility concern for trucks in the County as they restrict entrance into the County from the southeast. In the north, height restrictions are present along CR 658 in Knowlton, and CR 616 and CR 655 in Blairstown. Near the Delaware River, two height restrictions are present on CR 622 in Harmony, west of CR 519. To the north of this, CR 620 Spur A in Belvidere has a 13'9" height restriction.

Five county roads have weight restrictions, mostly in the southern portion of the County. CR 519 in Pohatcong has a four-ton limit and in Greenwich it has an eight-ton limit. CR 637 in Lopatcong and Greenwich has a 10-ton limit. CR 646 in Philipsburg, Lopatcong, and Harmony has a four-ton limit. CR 620 has an eight-ton limit White and Belvidere, and the short extent of CR 519 in Pohatcong has a four-ton limit. The location of height and weight restricted County routes are presented in Figure 23.

Figure 23 – County Facilities with Height and Weight Restrictions



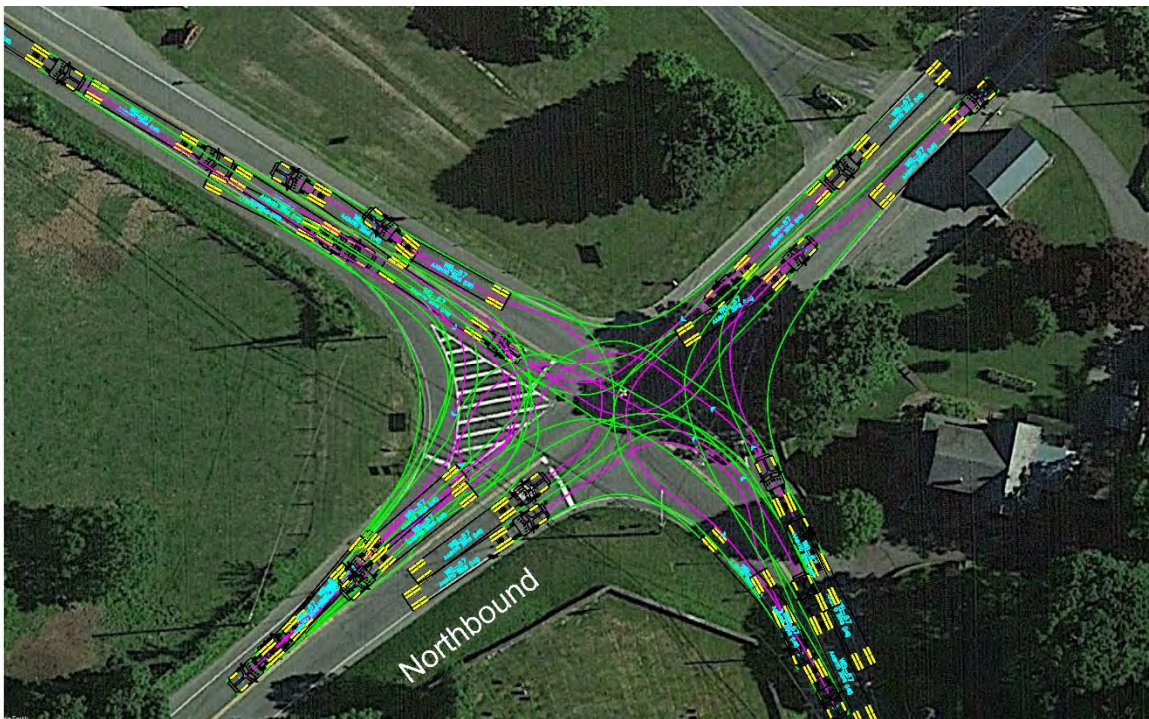


## TURNING RADII ANALYSIS

A turning radii analysis was conducted at the selected intersections. This analysis utilized AutoCAD's AutoTURN feature to simulate the ability of a WB-67 truck (defined as 73.5-foot-long total, including 53-foot trailer) make each of the turns at the key intersections. Roadway extents were gathered from recent Google Earth satellite images. Turning movements were tested in five mph increments, so if a vehicle was able to turn at five mph, they were also tested at ten mph, etc. until the vehicle was not able to make the turn.

An example of the AutoTURN analysis for a sample intersection (CR 519 & CR 623) from AutoCAD is presented in Figure 24. The process of testing turning movements at each intersection identified specific issues involving each turn. In the sample AutoTURN analysis below, green lines represent the outline of the vehicle body movement as it makes a turn. The magenta lines represent the path of the truck, defined as the center of the truck axes.

*Figure 24 - Sample AutoTURN Analysis*



An existing condition turning radii assessment was performed that classified each turning movement into one of three categories, as defined below and presented in Figure 25 and Figure 26:

- Trucks can turn without infringing on opposing traffic (Green)
- Trucks must encroach upon the opposing travel lane (Orange)
- Trucks must mount the curb or otherwise leave the roadway (Red)

Most turns can be presently made but require encroaching into the opposing lane. The ease of safely maneuvering depends on the location, as trucks may be able to easily turn at a low-volume intersection but require more encroachment into opposing traffic at busier locations.

Locations where trucks are currently unable to turn tend to have narrow rights-of-way or slip lanes that make maneuvering difficult while locations where trucks can easily turn tend to have wider right of ways or are off-ramps to interstate highways with higher speeds and truck volumes (such as I-80 or I-78).

More detailed information by movement is available in Appendix C.



Figure 25 - Turning Radii Assessment Intersections (Locations A to H)

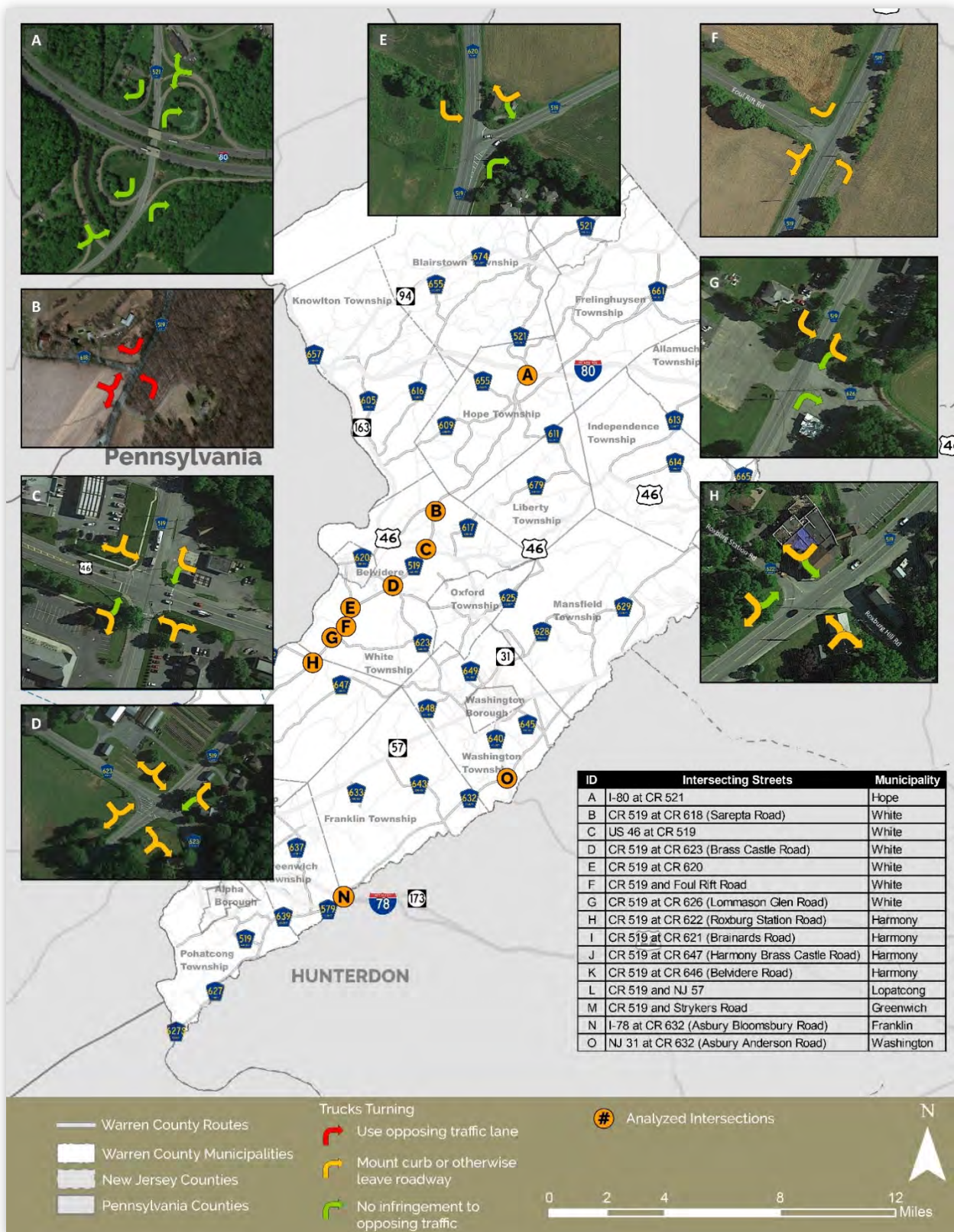
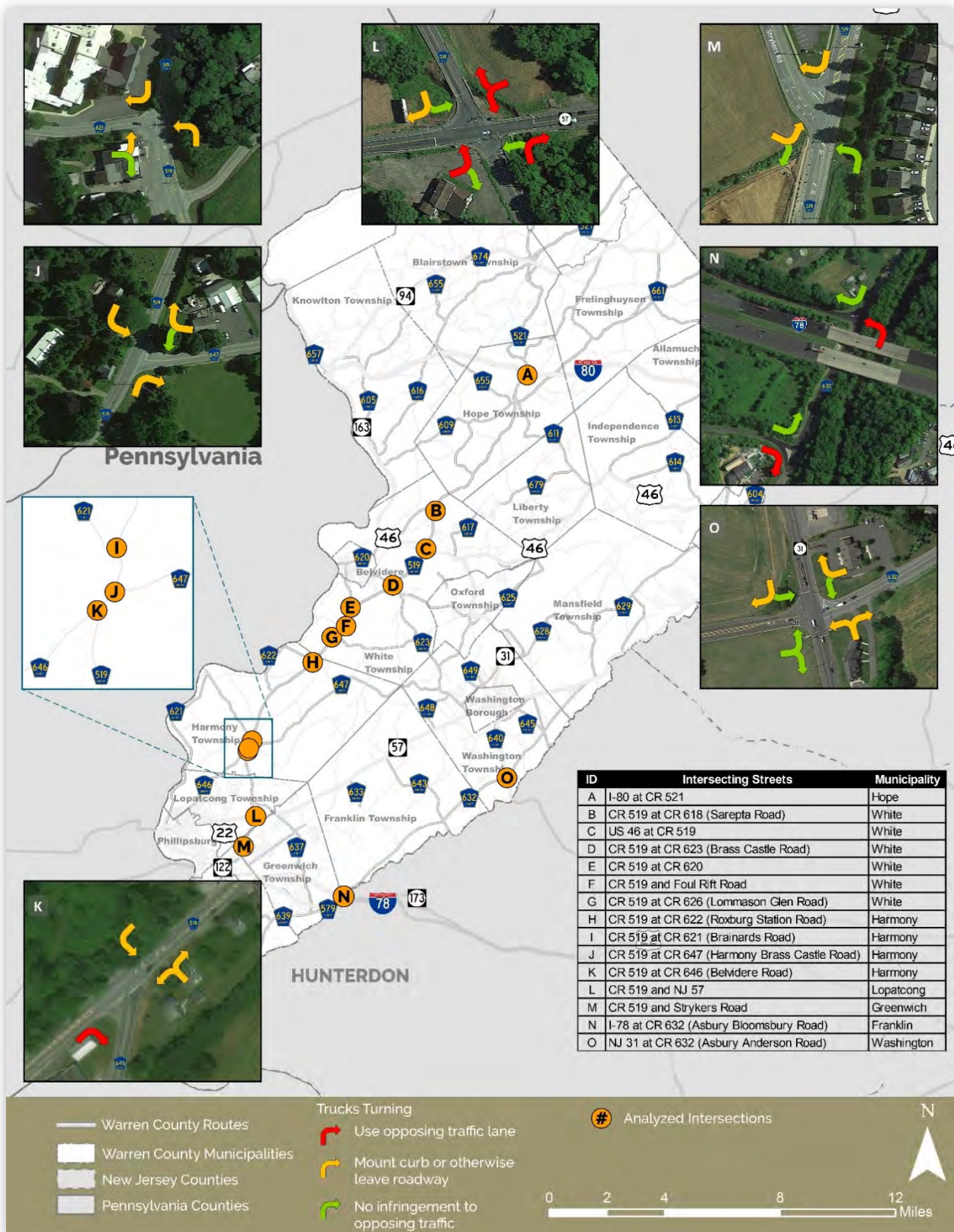




Figure 26 - Turning Radii Assessment Intersections (Locations I to O)





## CAPACITY ANALYSIS

The level of service (LOS) measure is an indication of the amount of delay, measured in seconds, experienced by motorists before they can proceed through an intersection during peak travel hours. LOS results for intersections are given a letter grade, 'A' through 'F', with 'A' indicating no delay and 'F' denoting highly congested conditions. Generally, LOS A through C are considered acceptable. For roadway mainline sections, LOS is based on the ratio of demand versus roadway capacity, or D/C ratio.

Count traffic data was collected from available resources and summarized to derive traffic volumes, peak hour adjustment factors, and the percentage of heavy vehicles for the morning and evening peak hours. Subsequently, intersections and roadway segments were analyzed with traffic simulation software. For this study LOS was calculated for the morning and evening peak hours to evaluate the differences in traffic patterns, and to better quantify the delay along the more congested roadway segments in the study area.

The following intersections and midblock segments were analyzed, where volume data and signal timings were available. The letter assignments provide a location key to the results figures provided later in this section.

### Intersections

- C - US 46 and CR 519 – signalized
- D – CR 519 and CR 623 – 4-way stop controlled by a blinked signal
- E – CR 519 and CR 620 - 2-way stop controlled (T intersection)
- F CR 519 and Foul Rift Road – 2-way stop controlled (T intersection)
- G – CR 519 and CR 626 - 2-way stop controlled (T intersection)
- H - CR 519 and CR 622 (Roxburg Station Road) – 2-way stop controlled
- I - CR 519 and Brainards Road – 2-way stop controlled (T intersection)
- K - CR 519 and CR 646 – 2-way stop controlled (T intersection)
- L - CR 519 and NJ 57 - Signalized
- M - CR 519 and Strykers Road – 2-way stop controlled (T intersection)
- N – I-78 EB off-ramp and CR 632 – ramp stop controlled left turn to NB CR 632

### Midblock Segments

- AA - CR 519, northeast of CR 610
- BB - CR 519, Stone Hedge to Hope Crossing Road N
- CC - CR 519, CR 623 (Brass Castle Road) to Pequest Drive
- DD - CR 519, CR 620 to Brookfield Drive
- EE - CR 519, Reeder Road to Grist Mill Road
- FF – CR 519, Fairway Road to Hillside Avenue
- GG - CR 632, Shurts Road to Halls Mill Road

Volume data was obtained from the NJDOT Traffic Monitoring website <https://www.njtms.org/map/> and from sources provided by Warren County. Trafficware LLC's Signal Timing and Analysis software, Synchro version 10.3.122.0 was used for all stop controlled and signalized intersection analysis. McTrans' Highway Capacity Software, version 7.8.5, Highways - Two Lane module was used for all mid-block analysis segments. Output files are presented in Appendix D.

**PEAK HOUR VOLUMES – 2020 EXISTING CONDITION**

Available traffic data was obtained from various years, ranging from 2003 to 2019 and included intersection peak hour turning movement counts and AADT mainline counts. Morning and evening peak hour volumes were pulled directly from counts provided with hourly distribution. For locations where only mainline AADT was available a peak hour factor was applied to produce peak hour volumes. Peak hour volume growth was projected to the year 2020 using a Compound Annual Growth Rate (CAGR) derived by looking at historical data at five locations where multiple years were available. The growth factor obtained fluctuates widely between locations. In order to account for this variability an overall weighted CAGR was obtained using the latest traffic volumes to normalize the data. This resulted in a 1.15% overall CAGR and shown in Table 8. This factor was applied to each count grown to the Year 2020.

*Table 8 – CAGR Computation*

Roadway Segment	Year1	Year2	CAGR		
			AADT	AM	PM
CR 519, Reeder Road to Grist Mill Road	2015	2018	4.85%	-1.64%	2.26%
CR 519, CR 623 (Brass Castle Road) to Pequest Road	2015	2018	5.95%	16.63%	12.04%
NJ 57, Lincoln Avenue to N Wandling Avenue	2015	2018	0.74%	2.16%	0.12%
NJ 31, Springtown Road to Clubhouse Drive	2014	2017	-2.24%	0.14%	-2.96%
CR 519, northeast of CR 610	2011	2017	0.10%	3.97%	2.88%
			0.93%	3.49%	1.50%
<b>Weighted Compound Annual Growth Rate</b>			<b>1.15%</b>		

**PEAK HOUR VOLUMES – 2045 NO BUILD CONDITION (BACKGROUND GROWTH)**

To develop traffic volumes for the 2045 No Build condition a background growth rate was derived. This factor was developed using the latest sociodemographic projections from the NJTPA for the 2045 Year and the NJRTME Model. Traffic volumes for the AM, PM Peak, Daily time periods for all roadways within Warren County were used. The CAGR values obtained show little variability between facility type and time periods. However, in order to normalize this small difference a weight was derived using estimated model volumes (Table 9).



Table 9 - CAGR Weighting

Facility Type	CAGR		
	AM	PM	DAILY
Freeways	0.47%	0.60%	0.51%
Principal Arterials Divided	0.63%	0.66%	0.67%
Principal Arterials Undivided	0.58%	0.61%	0.59%
Major Arterials Undivided	0.57%	0.64%	0.57%
Minor Arterials	0.90%	0.98%	0.84%
Collector /Locals	0.44%	0.51%	0.40%
<b>Overall Weighted Average</b>	<b>0.59%</b>		

## PEAK HOUR VOLUMES - 2045 BUILD (2045 NO BUILD PLUS PROPOSED DEVELOPMENT)

The 2045 Build scenario estimates traffic operations in the future if the potentially developable parcels are built-out. The changes in volumes that were predicted by the NJTRM-E model scenario were overlaid on top of the 2045 No Build volumes. This process consisted of determining the demand along the roadway segments that will carry the site generated traffic using the estimated trip distribution from the 2045 Build condition model run. 2045 Build site generated traffic volumes were derived for the morning and evening peak hours, by applying the percentage trip distribution from the model run to the ITE trip generation estimates described in previous sections.

## INTERSECTION CAPACITY ASSESSMENT

The traffic counts developed above were analyzed as part of the process to determine congestion and how traffic flows through select county roads. The overall result of the traffic volume analysis is that congestion is currently (2020) minimal throughout the study area, though there are some locations that may experience congestion in the future during peak hours.

In 2020 (Figure 27), all intersections operate well, with slight congestion at US 46 and CR 519 during the PM peak hour. By 2045 No Build (Figure 28), that intersection experiences much greater congestion, with a predicted LOS of D and F for AM and PM, respectively. The intersection of CR 519/CR 623 also experiences congestion in 2045 No Build, with LOS of C and F for AM and PM peak hour, respectively. The remaining three intersections are much lower in volume, and therefore operate well both presently and in the 2045 No Build peak periods.

However, if all 15 sites are developed to their full capacity as projected by the trip generation and assignment, the increase in traffic at these locations cause all analyzed intersections to fail in the 2045 Build scenario (Figure 29).

Table 10 summarizes the LOS and delay in seconds of the 2020 Existing, 2045 No Build and 2045 Build Scenarios of each location by peak hour.

Table 10 - Intersection LOS and Delay (seconds)

Location	EXISTING AM		EXISTING PM		2045 No Build AM		2045 No Build PM		2045 Build AM		2045 Build PM	
	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
C-US 46 at CR 519	C	21.7	D	38.2	D	42.4	F	82.3	F	315.9	F	514.4
D-CR 519 at CR 623 (Brass Castle Road)	B	14.8	C	24.1	C	21.3	F	56.8	F	697.4	F	722.6
E-CR 519 at CR 620	A	4.3	A	9.6	A	5.4	C	24.3	F	3541	F	1801
F-CR 519 and Foul Rift Road	A	0.1	A	0.1	A	0.1	A	0.1	F	**	F	4661
G-CR 519 at CR 626 (Lommason Glen Road)	A	0.4	A	0.7	A	0.5	A	0.9	F	1232	F	471.2
H-CR 519 at CR 622 (Roxburg Station Road)	A	1.1	A	1.4	A	1.3	A	1.8	F	**	F	**
I-CR 519 at CR 621 (Brainards Road)	A	1.5	A	2.3	A	1.6	A	2.7	F	**	F	4568
K-CR 519 at CR 646 (Belvidere Road)	A	5.0	A	6.9	A	5.5	A	8.9	F	2836	F	1295
L-CR 519 and NJ 57	B	17.8	C	22.9	B	19.4	C	25.5	F	81.5	F	157.5
M-CR 519 and Strykers Road	A	6.4	B	14.8	A	7.3	E	38.0	A	7.9	F	64.6
N-I-78 at CR 632 (Asbury Bloomsbury Road)	A	4	A	4.1	A	4.1	A	4.1	F	465.4	A	7.2

\*\*Delay not calculable – delay is outside the high boundary and cannot be computed.



Figure 27 - Intersection Level of Service and Delay (seconds) - Existing

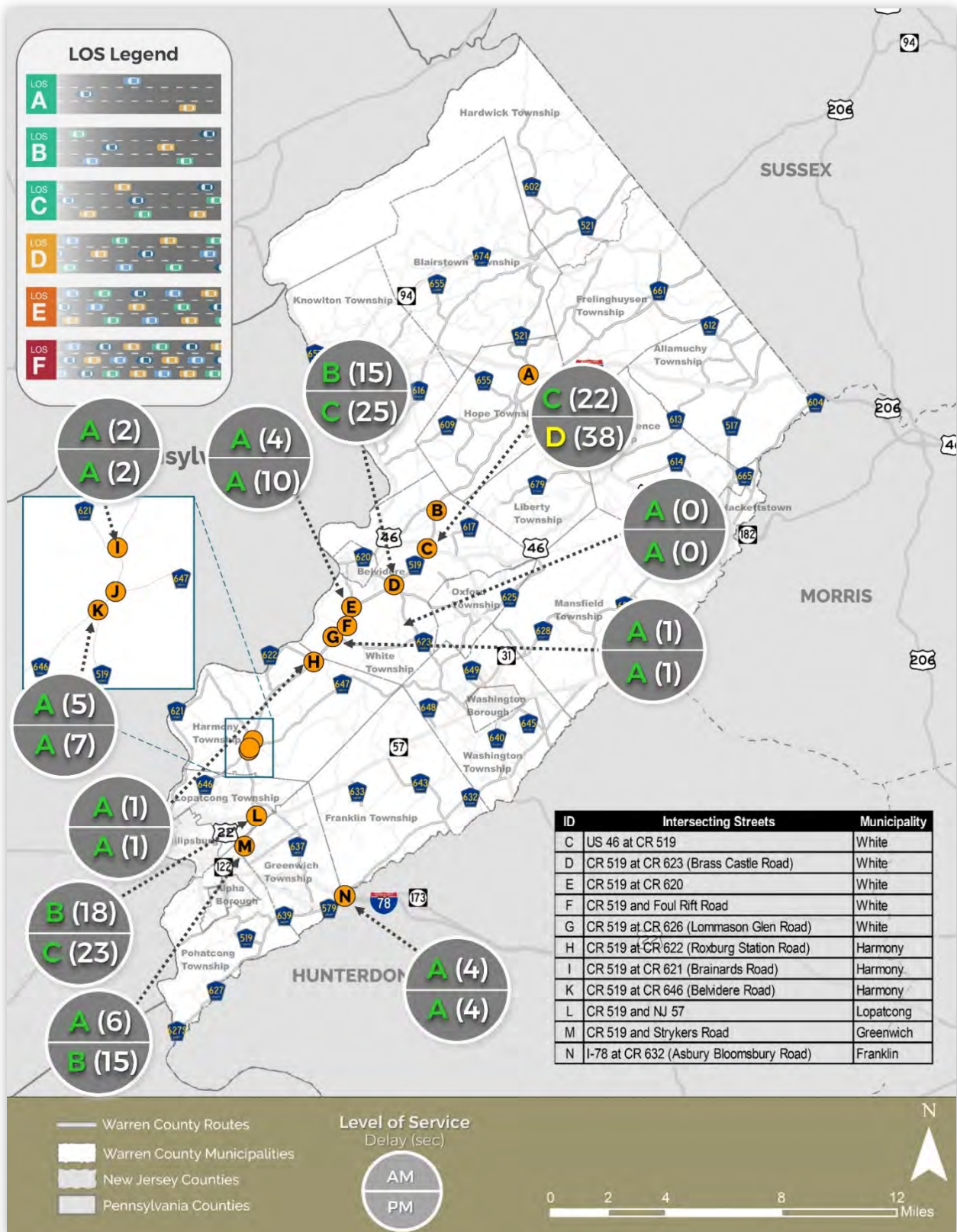


Figure 28 - Intersection Level of Service - No Build 2045

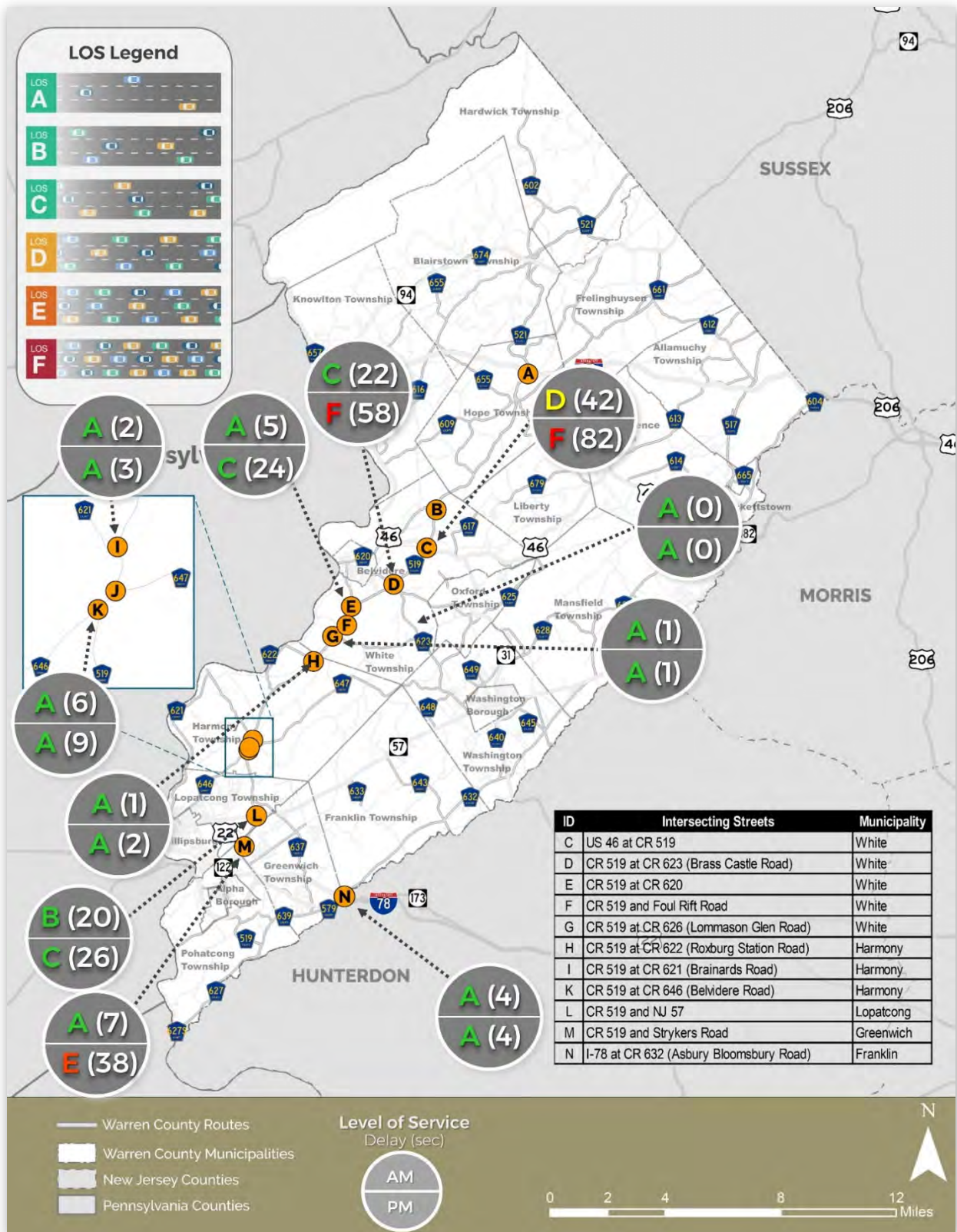
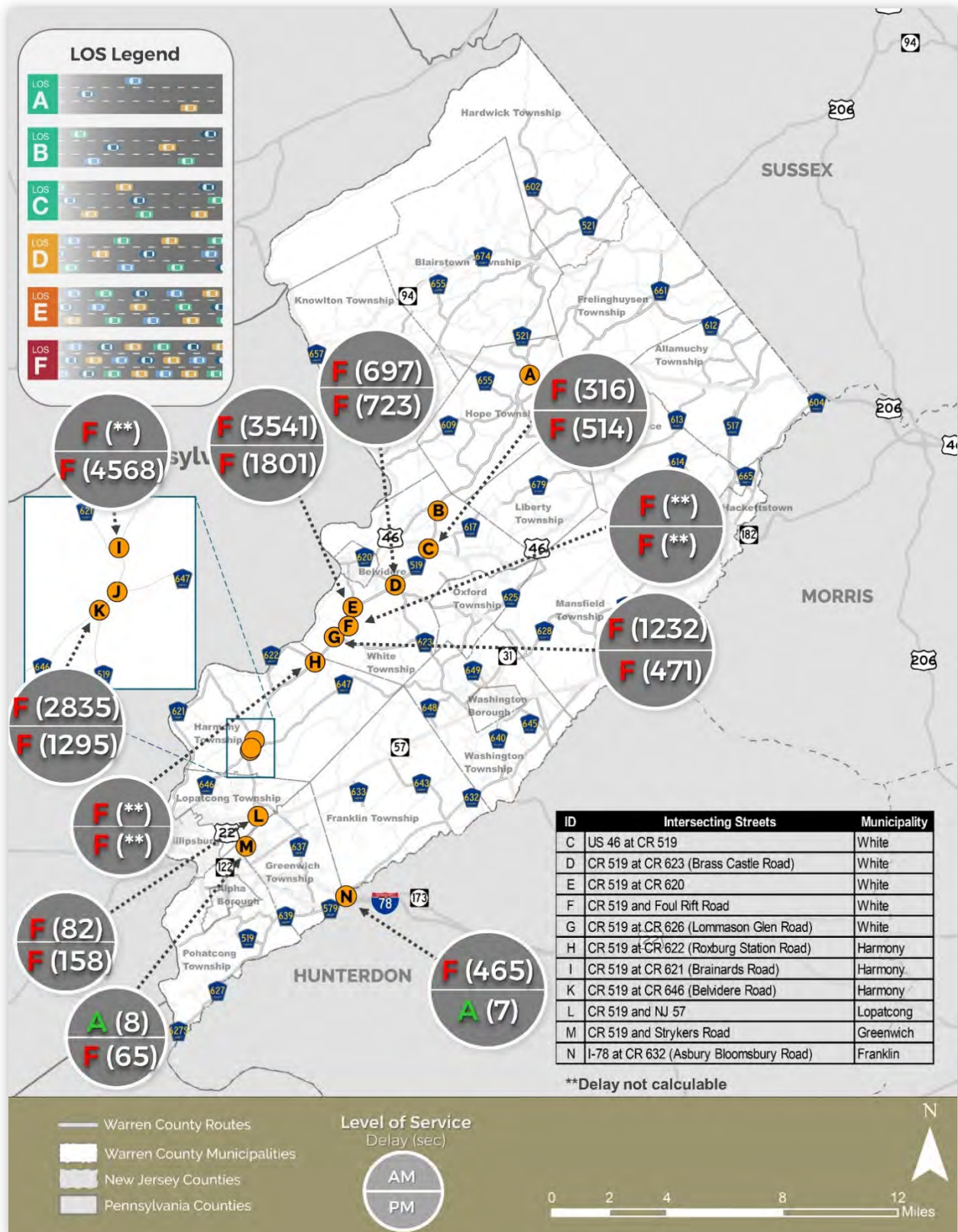




Figure 29 - Intersection Level of Service - Build 2045





**MID-BLOCK CAPACITY ASSESSMENT**

In 2020, all midblock sections on County Roads operate well (Figure 30), and continue to operate well in the 2045 No Build (Figure 31) condition. Once the additional trips generated by the 15 industrial sites are added to the roadway network, several segments of CR 519 deteriorating to LOS E or worse, specifically CR 519 between Grist Mill Road and CR 623 (Brass Castle Road) (Figure 32). The remaining segments of CR 519 deteriorate to LOS D in at least one peak hour. Below in Table 11 are the Demand/Capacity Ratios of the 2020 Existing, 2045 No Build and 2045 Build Scenarios of each location by peak hour and direction.

*Table 11 - Mid-Block D/C Ratios and LOS*

Location	EXISTING - AM		EXISTING - PM		2045 No Build - AM		2045 No Build - PM		2045 Build -AM		2045 Build - PM	
	D/C Ratio	LOS	D/C Ratio	LOS	D/C Ratio	LOS	D/C Ratio	LOS	D/C Ratio	LOS	D/C Ratio	LOS
AA-CR 519, northeast of CR 610 - NB	0.18	A	0.15	A	0.20	B	0.18	A	0.20	0B	0.36	C
AA-CR 519, northeast of CR 610 - SB	0.15	A	0.20	B	0.17	A	0.23	B	0.52	D	0.23	B
BB-CR 519, Stone Hedge to Hope Crossing Road - EB	0.20	B	0.17	A	0.23	B	0.20	B	0.23	B	0.20	B
BB-CR 519, Stone Hedge to Hope Crossing Road - WB	0.20	B	0.22	B	0.23	B	0.25	B	0.52	D	0.25	B
CC-CR 519, CR 623 Brass Castle Road to Pequest Drive - NB	0.29	B	0.33	C	0.33	C	0.38	C	0.33	C	0.57	D
CC-CR 519, CR 623 Brass Castle Road to Pequest Drive - SB	0.22	B	0.22	B	0.25	B	0.25	B	0.65	E	0.25	B
DD-CR 519, CR 620 to Brookfield Drive - NB	0.19	A	0.19	A	0.22	B	0.22	B	0.22	B	0.84	E
DD-CR 519, CR 620 to Brookfield Drive - SB	0.14	A	0.15	A	0.16	A	0.17	A	1.01	F	0.17	A
EE-CR 519, Reeder Rd to Grist Mill Road - NB	0.24	B	0.28	B	0.27	B	0.32	C	1.73	F	0.32	C
EE-CR 519, Reeder Rd to Grist Mill Road - SB	0.22	B	0.28	B	0.26	B	0.33	C	0.37	C	0.97	E
FF-CR 519, Fairway Rd to Hillside Ave	0.12	A	0.25	B	0.14	A	0.28	B	0.58	D	0.28	B
FF-CR 519, Fairway Rd to Hillside Ave	0.16	A	0.15	A	0.18	A	0.17	A	0.18	A	0.47	D
GG-CR 632, Shurts Road to Halls Mill Road - EB	0.14	A	0.13	A	0.16	A	0.15	A	0.18	B	0.35	C
GG-CR 632, Shurts Road to Halls Mill Road - EB	0.11	A	0.17	A	0.13	A	0.20	B	0.33	C	0.31	C

Figure 30 - Mid Block Level of Service and Demand to Capacity Ratio - Existing

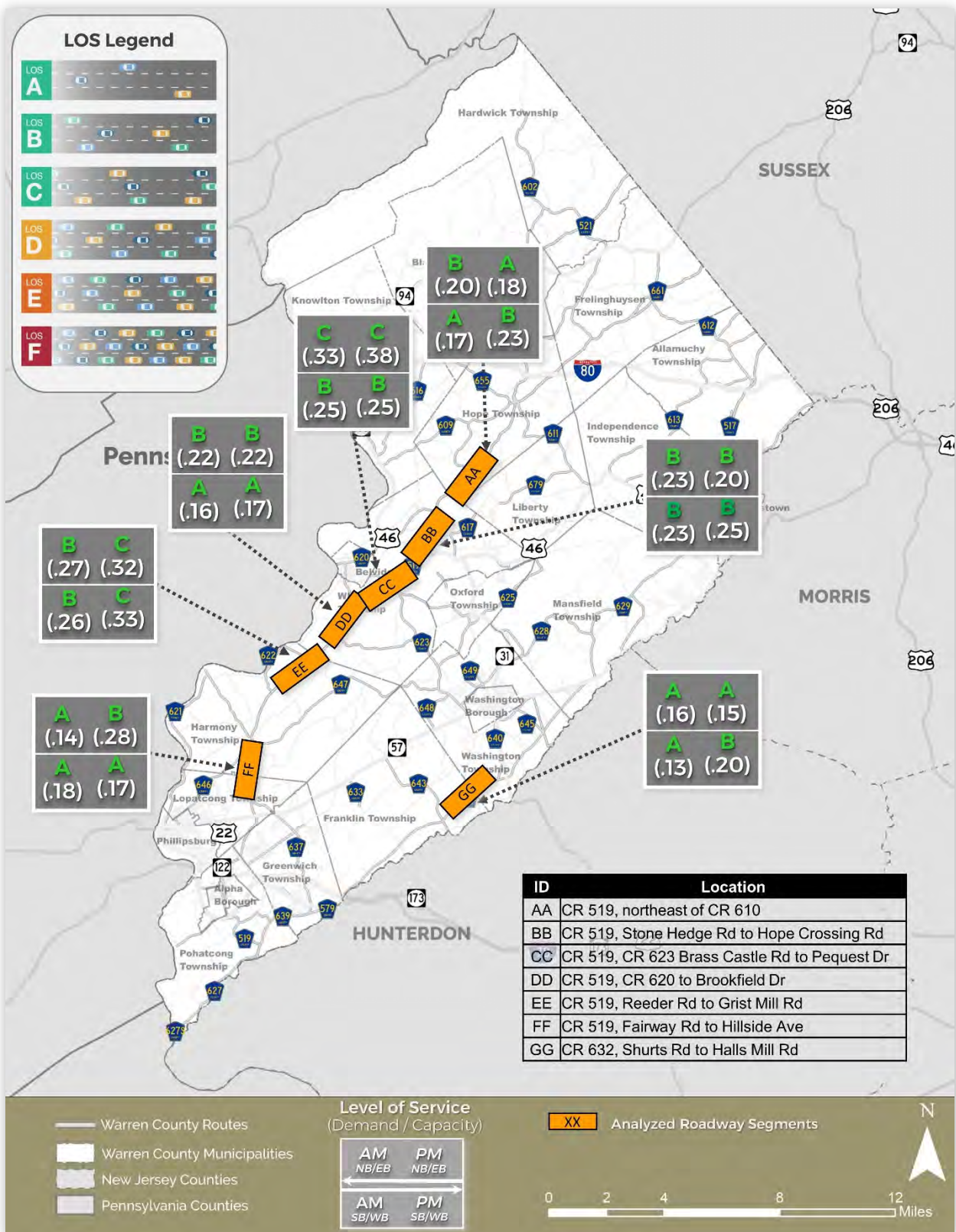




Figure 31 - Mid Block Level of Service and Demand to Capacity Ratio - No Build 2045

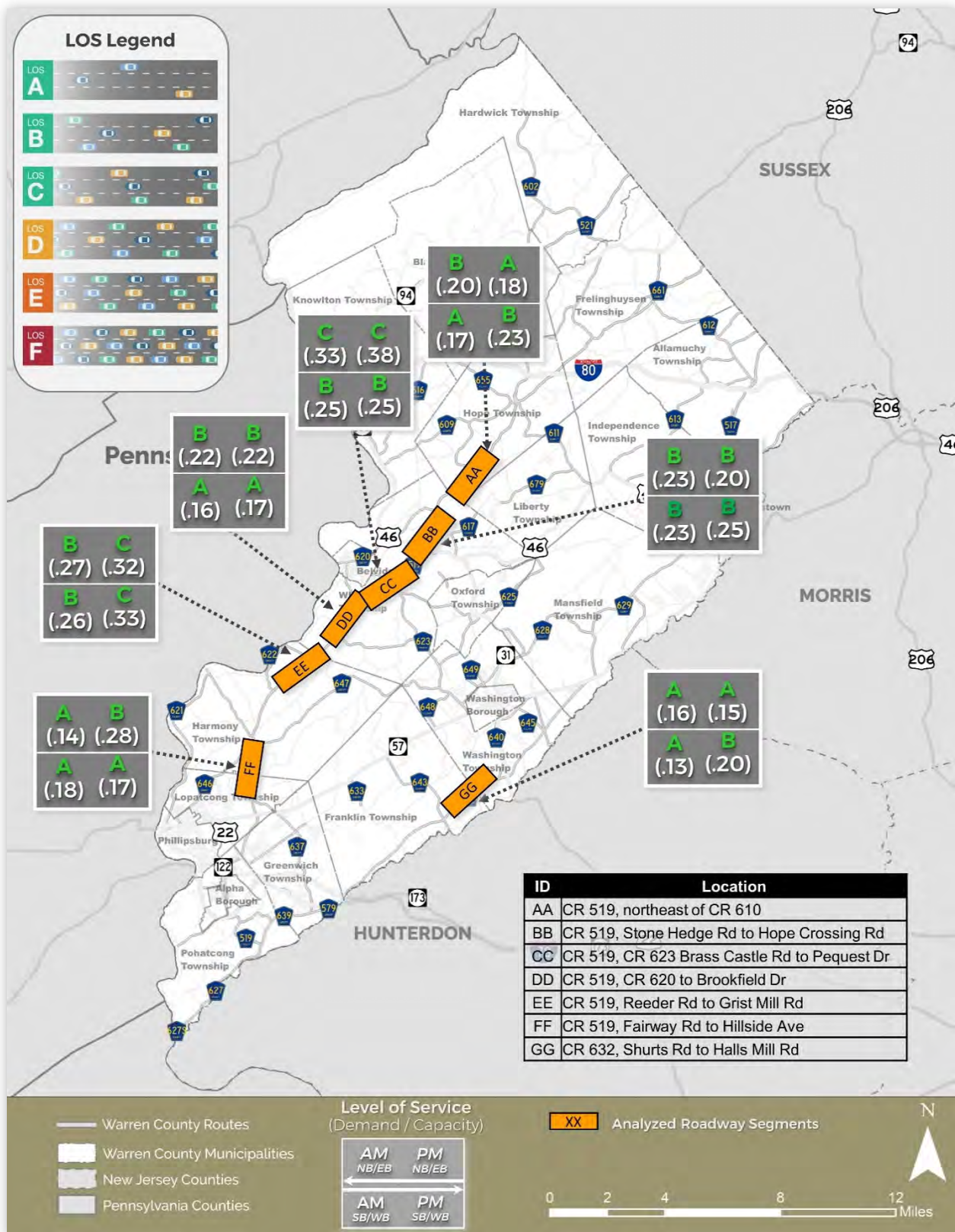
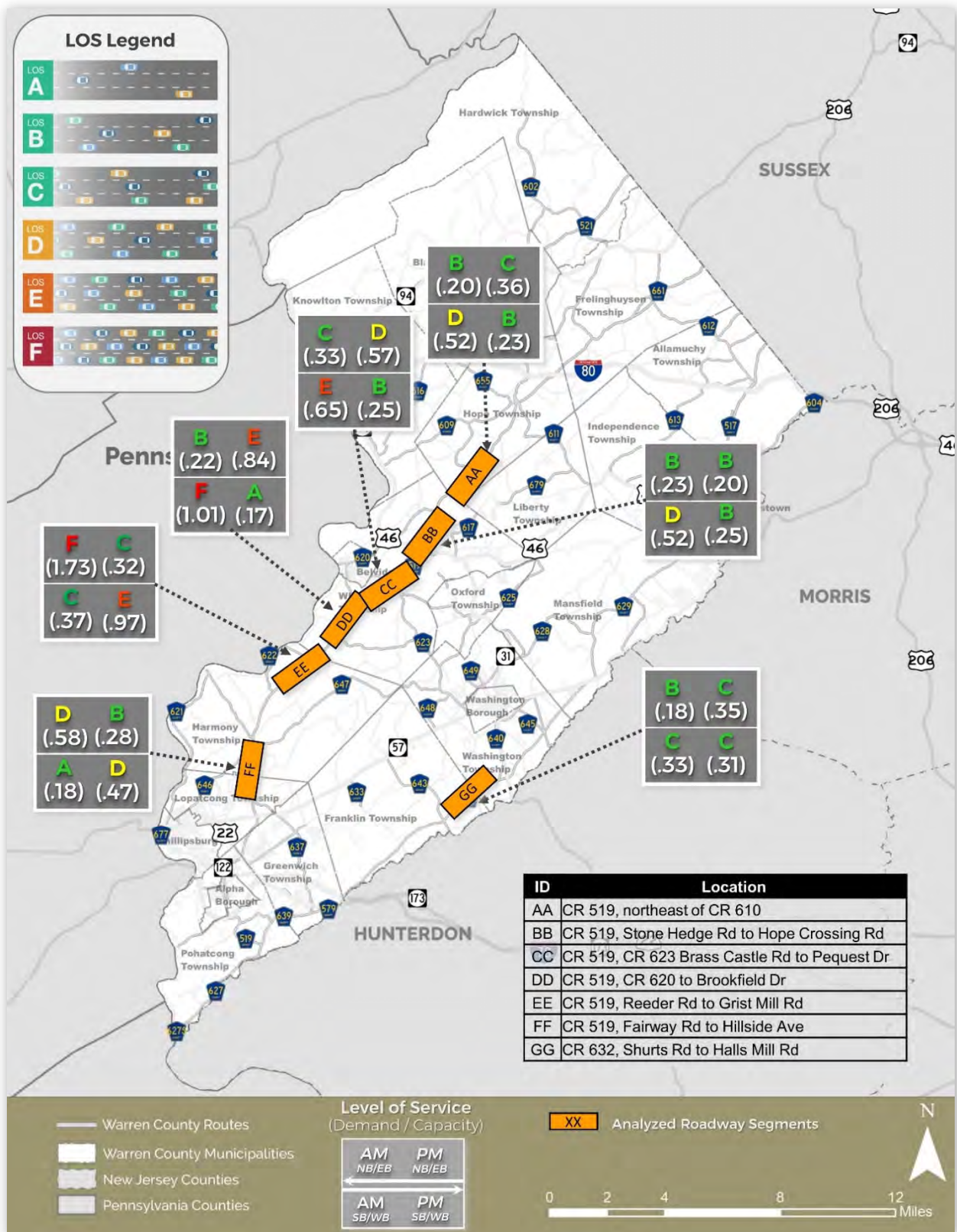


Figure 32 - Mid Block Level of Service and Demand to Capacity Ratio - Build 2045

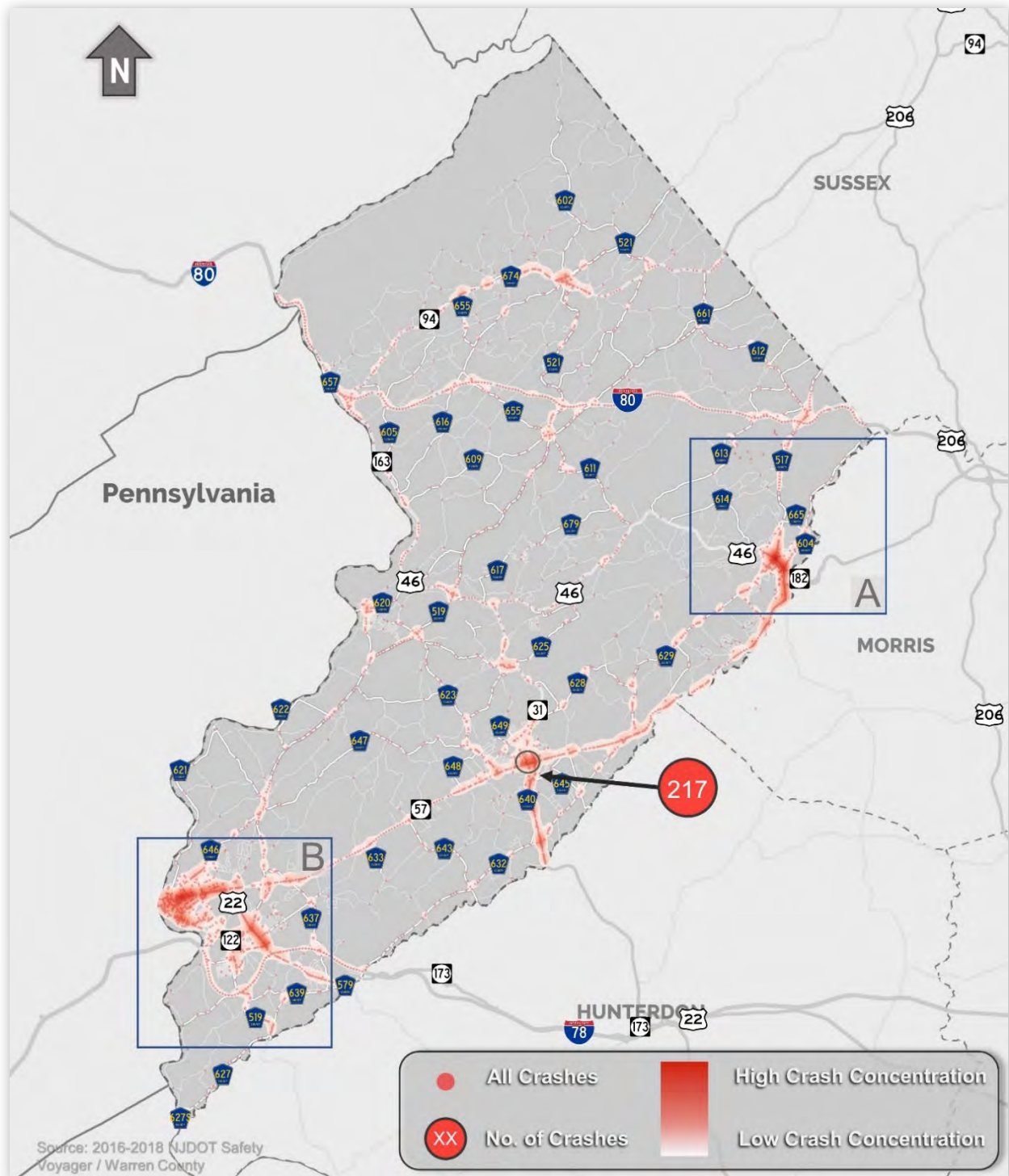




## CRASH ANALYSIS

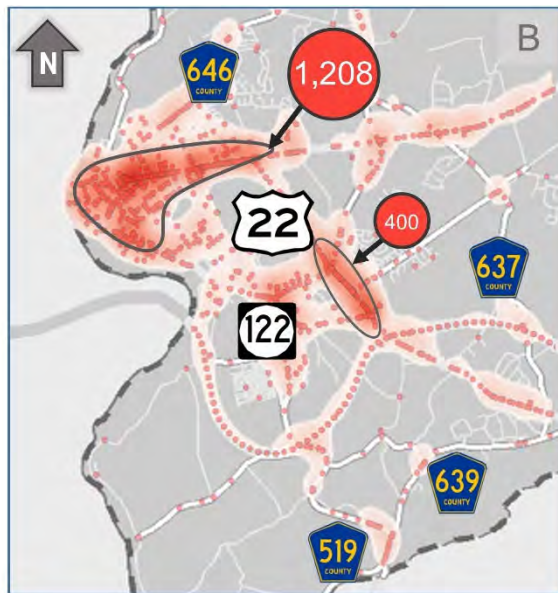
Crash records for the years 2016, 2017, & 2018 were collected and mapped for all roads in Warren County from the New Jersey Department of State's (NJDOT) Safety Voyager system (Figure 33). This






Figure 33 - Hotspots for All Crashes, Warren County (2016-2018)



analysis was performed for two different crash subsets. The first subset included all crashes within the database (10,041 records). This analysis was aimed to identify the overarching crash clusters in the County (Figure 33). The second subset analyzed only crash incidents along County Roadways and within a 50-foot radius. The purpose of this second analysis was to identify crash clusters at the intersection/corridor level along County Roadways.

Figure 34 - US 22/ Phillipsburg Crashes (2016-2018)



US 22, Phillipsburg		Statewide	
	Right Angle	17%	10%
	Struck Parked Vehicle	16%	1%
	Wet Surface	20%	18%
	Daylight	74%	70%
	Heavy Vehicles	9%	N/A
Crashes		1,208	

XX

All CrashesNo. of Crashes

Crash Concentration

HighLow

Source: 2016-2018 NJDOT Safety Voyager / Warren County

## OVERALL CRASH CLUSTERS (ALL ROADWAYS)

Two major hotspots identified are shown in detail in the insets (Figure 34 and Figure 35) near Routes 46/182 (599 total crashes, 8% involving trucks) and US 22/ Phillipsburg (1,208 total crashes, 9% involving trucks total), while another minor hotspot at the intersection of NJ 31 and NJ 57 (217 total crashes) was also identified. The hotspot containing 400 total crashes includes the top two Warren County crash intersections as reported in the 2017 and 2018 Warren County crash summary reports, US 22/CR 638 and US 22/CR 519.

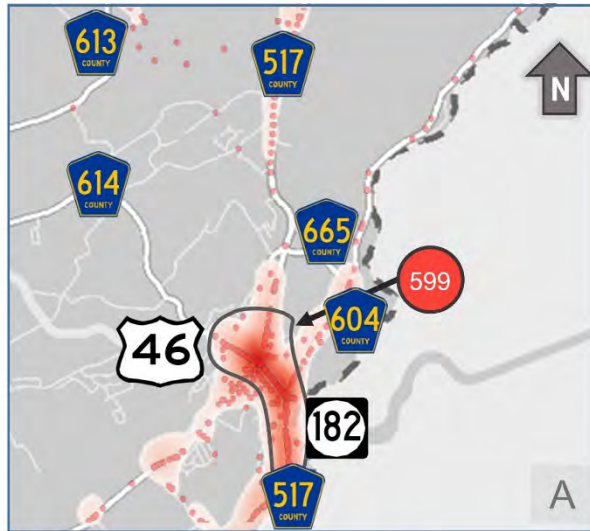
A detailed summary of the crash analyses is presented in crash tables in Appendix E that provide the number of crashes at each identified hotspot location by Type of Crash, Road Surface Condition, Lighting Conditions, Severity, and Vehicle Type. Statewide averages (2016-2018) for each category are also presented in the table and the percentage of crash for any category that is higher than the Statewide average for similar road type is represented in bold font. Morning peak period for the crash analysis was 7 AM to 9 AM, while evening peak period was 4 PM to 6 PM.

For all roads in Warren County, the identified hotspots and their overrepresented crash types are:

- US 22/ Phillipsburg – Crashes occurring at rates significantly higher than the statewide average include right angle (17% hotspot vs 10% statewide), fixed object (12% vs 9%), stuck parked vehicle (16% vs 1%), and backing (4% vs 1%). Nine percent involved heavy vehicles.



Figure 35 – US 46, NJ 182, CR 517 & CR 604 Crashes (2016-2018)



US 46, NJ 182, CR 517, & CR 604			Statewide
	Right Angle	24%	10%
	Struck Parked Vehicle	11%	1%
	Dry Surface	80%	80%
	Daylight	78%	72%
	Heavy Vehicles	8%	N/A
<b>Crashes</b>		<b>599</b>	



Source: 2016-2018 NJDOT Safety Voyager / Warren County

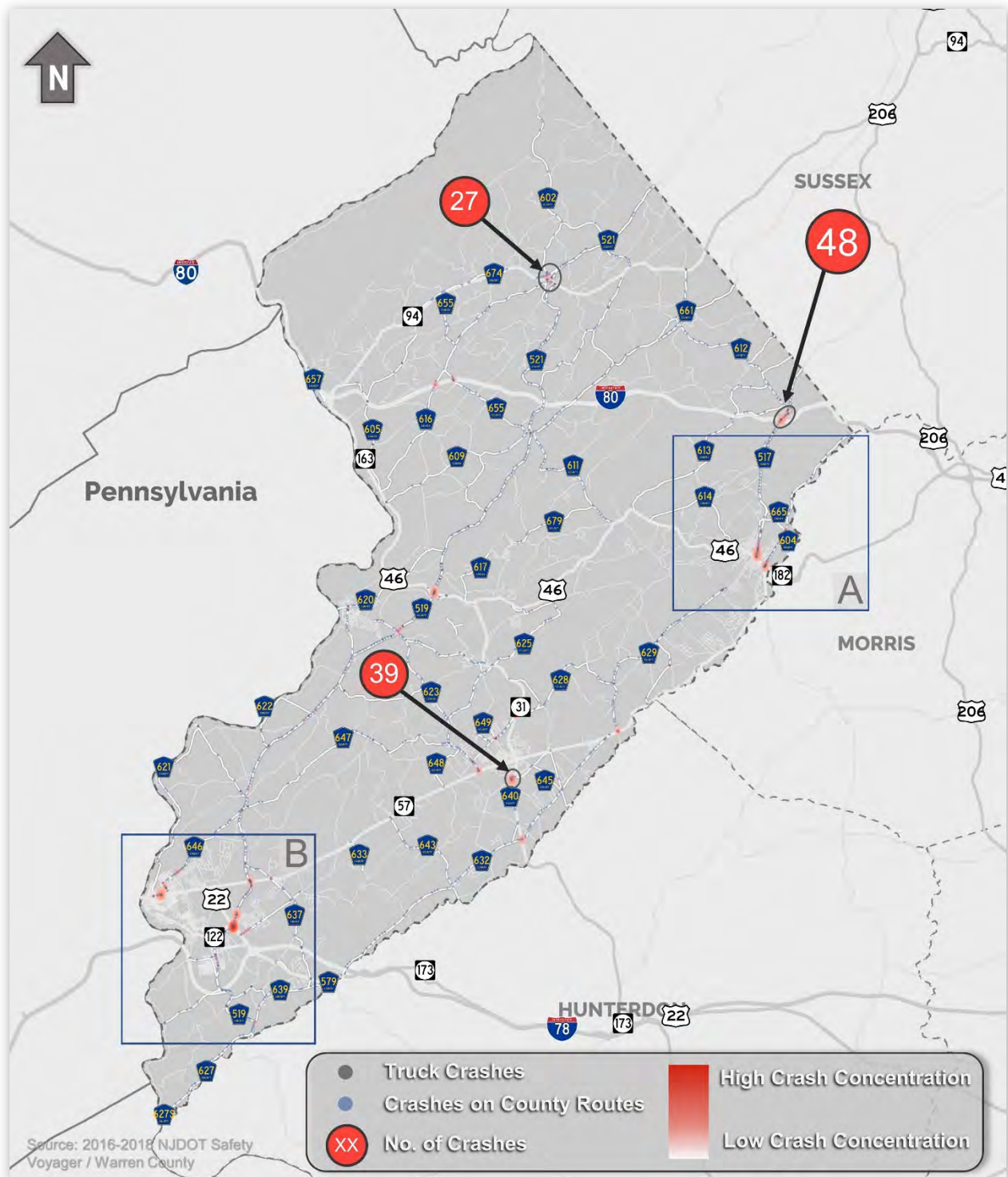
- US 46/NJ 182/CR 517/CR 604 - Crashes occurring at rates significantly higher than the statewide average include right angle (24% hotspot vs 10% statewide), struck parked vehicle (11% vs 1%), and backing (3% vs 1%). Eight percent involved heavy vehicles.

## COUNTY ROAD CRASH CLUSTERS

The second hotspot analysis was completed to determine hotspots from crashes that occurred only on County Routes (Figure 36). Figure 37 and Figure 38 provide more detailed inset maps of the two major hotspot locations for crashes occurring on County Routes, accompanied by a brief summary table. The most prominent hotspots included 61 total crashes (7% involving trucks) near US 46/Route 182/CR 517, and 92 total crashes (3% involving trucks) at US 22/CR 519. Crashes involving trucks are indicated by grey dots. Three minor hotspot locations are shown in Figure 36 and tabulated in Appendix E.

The analysis determined that existing crash hot spots are in areas that are NOT expecting a significant increase in traffic as a result of the industrial site development; therefore, it is not expected that crashes in these hotspots will be made worse. It is possible that new hot spots emerge as light industrial development occurs

Figure 36 - Hotspots for County Route Crashes, Warren County (2016-2018)

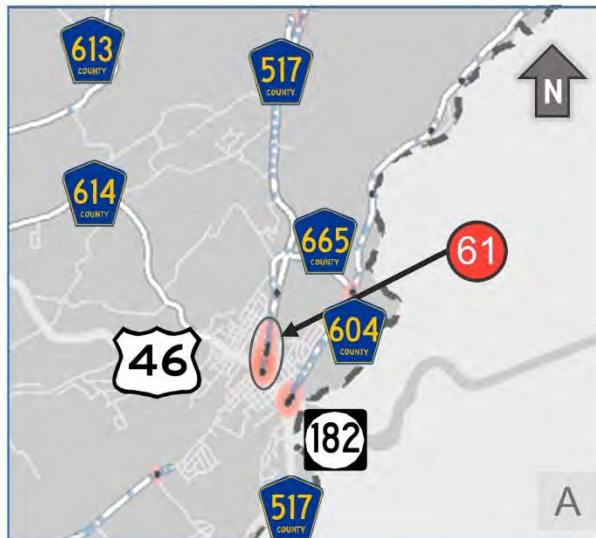




For all County Roads in Warren County, the identified hotspots and their overrepresented crash types are:

- US 22/CR 638/CR 519 - Crashes occurring at rates significantly higher than the statewide average include rear end (55% hotspot vs 48% statewide), backing (2% vs 1%), and other (6% vs 2%). Ten percent involved heavy vehicles. This intersection appears as a top crash location on Warren County's annual crash summary.

Figure 37 - US 46 at NJ 182 & CR 517 Crashes (2016-2018)



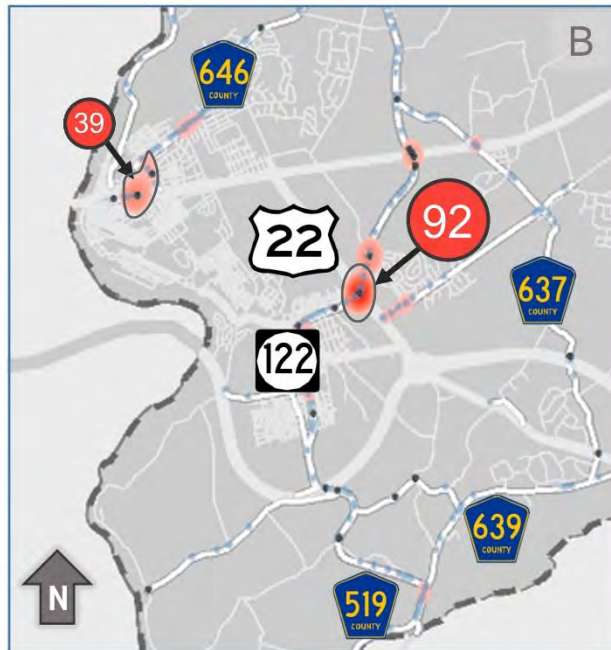
US 46 @ NJ 182 & CR 517			Statewide
	Right Angle	16%	10%
	Pedestrian	3%	0.9%
	Wet Surface	22%	18%
	Dusk	5%	3%
	Heavy Vehicles	7%	N/A
<b>Crashes</b>		<b>61</b>	








Source: 2016-2018 NJDOT Safety Voyager / Warren County

- US 22/CR 519 - Crashes occurring at rates significantly higher than the statewide average include right angle (14% hotspot vs 10% statewide), sideswipe (15% vs 9%), backing (3% vs 1%), and other (15% vs 2%). Three percent involved heavy vehicles. Ten percent involved heavy vehicles. This intersection appears as a top crash location on Warren County's annual crash summary.
- US 46/CR 517 - Crashes occurring at rates significantly higher than the statewide average include right angle (16% hotspot vs 10% statewide), fixed object (23% vs 19%), backing (4% vs 1%), pedestrian (3% vs 1%) and other (8% vs 2%). Seven percent involved heavy vehicles.
- I-80/CR 517 - Crashes occurring at rates significantly higher than the statewide average include left turn/U-turn (8% hotspot vs 2% statewide), head on (4% vs 2%), overturned (2% vs 1%), backing (6% vs 1%), animal (6% vs 4%), pedestrian (4% vs 1%) and other (4% vs 2%). Ten percent involved heavy vehicles.
- US 22/Morris Street/CR 646 - Crashes occurring at rates significantly higher than the statewide average include rear end (59% hotspot vs 48% statewide), fixed object (13% vs 9%), parked vehicle (10% vs 1%), and backing (3% vs 1%). Five percent involved heavy vehicles.
- CR 630/CR 640 - Crashes occurring at rates significantly higher

Figure 38 - Selected Hotspots for County Route Crashes, Warren County (2016-2018)



US 22 @ CR 519		Statewide	
	Right Angle	14%	10%
	Same Direction Sideswipe	23%	19%
	Backing	4%	0.8%
	Daylight	78%	70%
	Heavy Vehicles	3%	N/A
Crashes		92	



Source: 2016-2018 NJDOT Safety Voyager / Warren County

than the statewide average include rear end (59% hotspot vs 48% statewide), fixed object (13% vs 9%), head on (5% vs 2%), and overturned (3% vs 1%). Three percent involved heavy vehicles.

- NJ 94/CR 521/CR 602/CR 616/CR 607 - Crashes occurring at rates significantly higher than the statewide average include fixed object (11% hotspot vs 9% statewide), struck parked vehicle (26% vs 1%), left turn/U-turn (4% vs 2%), head on (4% vs 2%), and backing (19% vs 1%). Seven percent involved heavy vehicles.



## MITIGATION MEASURES

To accommodate the expected increase in traffic that would result from the development of the 15 industrial sites and provide an acceptable level of service, a combination of improvements including additional turning lanes or intersection alignments, traffic signal timing adjustments, and Travel Demand Management strategies were explored. The potential increase in cars and trucks could be better accommodated at intersections through a variety of potential improvements ranging from low cost solutions such as optimizing stop bars to higher cost investments such as roadway widening. Other physical improvement to mitigate roadway impacts, such as round-abouts, should be explored in the future as sites are developed.

An evaluation of existing road widths, available right of way, and required additional right of way necessary to construct these potential improvements would require further study. Extensive right-of-way acquisition may be required in many locations to accommodate needed roadway capacity. It is noted that road widening may be prohibited on roadways and intersections that are adjacent to the Preservation Area boundary and may affect how widening concepts are advanced.

## MIDBLOCK OPERATIONAL IMPROVEMENTS

At the locations nearest the highest areas of projected development along CR 519, the mainline traffic volume is expected to be in excess of 3,000 vehicles per direction in the peak hour. One lane in each direction will not be sufficient to handle the additional demand. CR 519 would need to be widened to two lanes in each direction from approximately CR 646/Uniontown Road in Harmony to Route 46 in White Township to accommodate the anticipated demand. This widening is assumed in many of the intersection mitigations measures described in the next section. Additionally, the segment of CR 620 between Belvidere and CR 519 would need to be widened to two lanes in each direction to accommodate the anticipated car traffic expected to be generated due to site developments. This widening should be carried through each intersection along the corridor and may require extensive right-of-way acquisition depending on the County's current right-of-way.

## INTERSECTION MITIGATIONS

### US 46/CR 519

In the 2045 Build condition, this intersection is expected to deteriorate to LOS F in the AM and PM peak hours. With a low level of investment, the northbound and southbound approaches can be restriped to create a left turn lane and a through/right lane and the signal can be optimized to improve operations (Table 12). Currently, each approach is two lanes consisting of a through/left turn lane and a right turn lane. These changes would require coordination with NJDOT as this signal is NJDOT's jurisdiction.

Table 12 - US 46/CR 519 LOS and Delay (seconds)

US 46 and CR 519	2045 Build - AM		2045 Build - PM			2045 Build Improved AM		2045 Build Improved PM	
	LOS	Delay	LOS	Delay		LOS	Delay	LOS	Delay
Current configuration	F	315.9	F	514.4	Restripe NB and SB as left, through/right	E	63.0	D	46.6

At this intersection, the largest trucks need to cross the double yellow center line to make every turning move other than northbound and southbound left turns. Pulling back the stop bars on each approach allows more pavement area to begin the turn and would enable those moves. Mitigations are shown in Figure 39.

Figure 39 - US 46/CR 519 Mitigation





*CR 519/CR 623*

In the 2045 Build condition, this intersection is expected to deteriorate to LOS F in the AM and PM peak hours (Table 13). This intersection is currently stop controlled with a flashing traffic signal. Adding a signal and widening provides significant operational improvement though the addition of lanes in each direction resulting in eastbound left and through/right lanes, westbound left and through/right lane, northbound left/through and through/right lanes, and southbound left/through and through/right lane. The intersection would still operate at LOS F in the PM with geometric and signal optimization improvements, but with much lower delay as shown below. The County has a design prepared that widens the intersection to left and through/right lanes eastbound and southbound, left, through, and right turn lanes northbound, and left, through, and channelized right turn lane westbound. However, this design was prepared prior to this report and may need to be revisited to account for anticipated traffic increases.

*Table 13 - CR 519/CR 623 LOS and Delay (seconds)*

CR 519 and CR 623	2045 Build - AM		2045 Build - PM			2045 Build Improved AM		2045 Build Improved PM	
	LOS	Delay	LOS	Delay		LOS	Delay	LOS	Delay
Current configuration	F	697.4	F	722.6	Signalize and add EB and WB left turn lanes, and add one NB and SB lane	D	46.8	C	30.0

Mitigations are shown in Figure 40.

*Figure 40 - CR 519/CR 623 Mitigation*

*CR 519/CR 620*

This intersection would require significant widening to improve operations in the Build condition (Table 14). Signalizing and enlarging the intersection to include two through lanes and a left turn lane southbound (CR 620), two through lanes and a right turn lane northbound (CR 519), and two left lanes and a right turn lane westbound (CR 519) would improve operations to LOS E.

*Table 14 - CR 519/CR 620 LOS and Delay (seconds)*

CR 519 and CR 620	2045 Build - AM		2045 Build - PM			2045 Build Improved AM		2045 Build Improved PM	
	LOS	Delay	LOS	Delay		LOS	Delay	LOS	Delay
Current configuration	F	3541.4	F	1801.4	Signalize and add two lanes at each approach	E	75.5	E	75.4

Mitigations are shown in Figure 41.

*Figure 41 - CR 519/CR 620 Mitigation*





*CR 519 at Foul Rift Road*

At this intersection, it was assumed that approximately half of the vehicular traffic generated by site 12 would be routed through Foul Rift Road, causing the intersection to fail in Build condition. If full buildout were realized, this intersection would require signalization and significant investment, and still operate at LOS F with lower delays. The full mitigated configuration of this intersection would be an eastbound left turn lane and left/right turn lane, northbound double left and double through lanes, and southbound double through and double right lanes.

Mitigations are shown in Figure 42.

*Table 15 - CR 519/Foul Rift Road LOS and Delay (seconds)*

CR 519 at Foul Rift Road	2045 Build - AM		2045 Build - PM			2045 Build Improved AM		2045 Build Improved PM	
	LOS	Delay	LOS	Delay		LOS	Delay	LOS	Delay
Current configuration	F	**	F	4661.1	Signalize and add a lane NB and SB	F	408	F	481
					Signalize and add lane EB and three lanes NB and SB to allow double turn lanes	F	305.3	F	127.2

\*\*Delay not calculable - delay is outside the high boundary and cannot be computed.

*Figure 42 - CR 519/Foul Rift Road Mitigation*



*CR 519/CR 626*

Signalization alone offers a modest improvement in operations at this location in the PM (Table 16). This intersection would require significant widening to meaningfully improve operations in the Build condition. Widening the westbound approach to a left and right lane, northbound to through and through/right lanes, and southbound to a through/left and two additional through lanes would offer significant operational improvement.

*Table 16 - CR 519/CR 626 LOS and Delay (seconds)*

CR 519 and CR 626	2045 Build - AM		2045 Build - PM			2045 Build Improved AM		2045 Build Improved PM	
	LOS	Delay	LOS	Delay		LOS	Delay	LOS	Delay
Current configuration	F	1232.1	F	471.2	Signalize	F	1279.8	F	334.5
					Signalize and add a lane WB and NB, add two lanes SB	D	38.9	A	5.9

Mitigations are shown in Figure 43.

*Figure 43 - CR 519/CR 626 Mitigation*





*CR 519/CR 622 (Roxburg Station Road)*

At this intersection, it was assumed that approximately half of the vehicular traffic generated by site 12 would be routed through Roxburg Station Road, causing the intersection to fail in Build condition. If full buildout were realized, this intersection would require signalization and significant investment, and still operate at LOS F with lower delays. The full mitigated configuration of this intersection would be eastbound left/through and right lane, westbound one lane for all movements, northbound left, through, and through/right lanes, and southbound left, double through, and right lanes. A slight realignment may be needed to remove the offset of Roxburg Station Road.

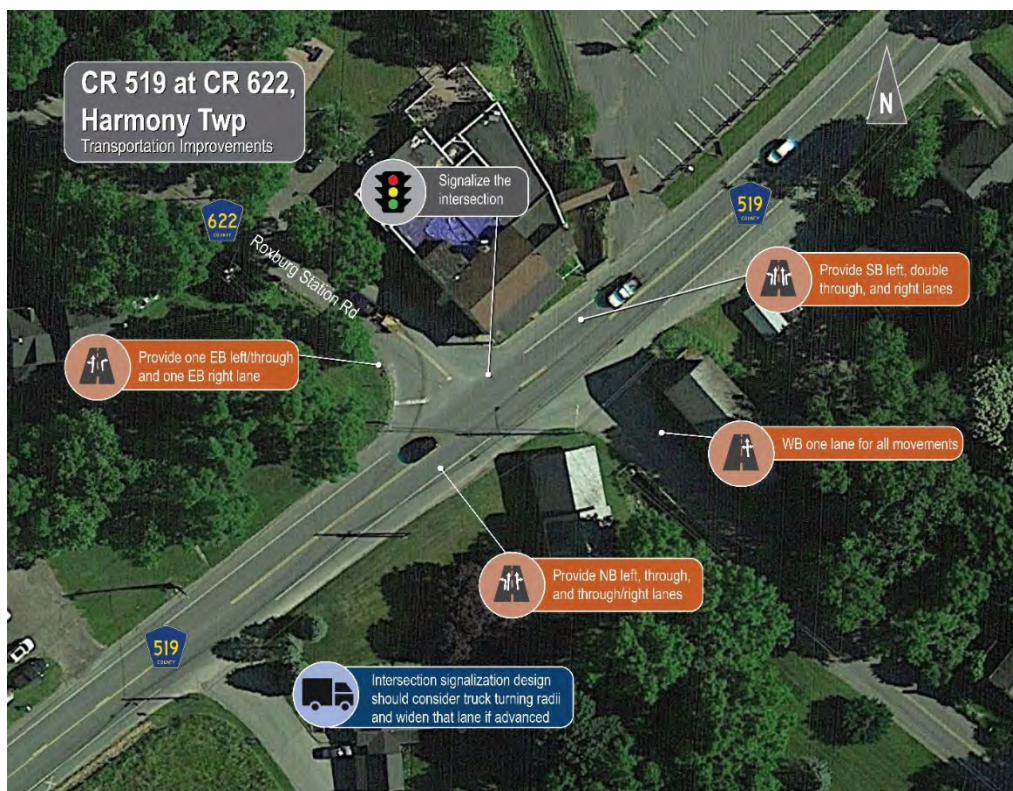
Mitigations are shown in Figure 44.

*Table 17 - CR 519/CR 622 LOS and Delay(seconds)*

CR 519 at CR 622	2045 Build - AM		2045 Build - PM			2045 Build Improved AM		2045 Build Improved PM	
	LOS	Delay	LOS	Delay		LOS	Delay	LOS	Delay
Current configuration	F	**	F	**	Signalize and add a lane NB and SB, add lane EB	F	422	F	608
					Signalize and add lane EB, two lanes NB three lanes SB	F	294.7	F	565.3

\*\*Delay not calculable - delay is outside the high boundary and cannot be computed.

*Figure 44 - CR 519/CR 622 Mitigation*



*CR 519/CR 621 (Brainards Road)*

At this intersection the Build condition is LOS F in both peak hours with incalculable delay in the AM peak hour. Signalization and mainline widening offer some improvement in delay although the intersection will still operate at LOS F. Further widening at the intersection improves delay significantly, but still results in LOS F. The full mitigated configuration would be eastbound left and right turn lanes, northbound double left and double through lanes, and southbound through and through/right lanes.

Table 18 - CR 519/CR 621 LOS and Delay (seconds)

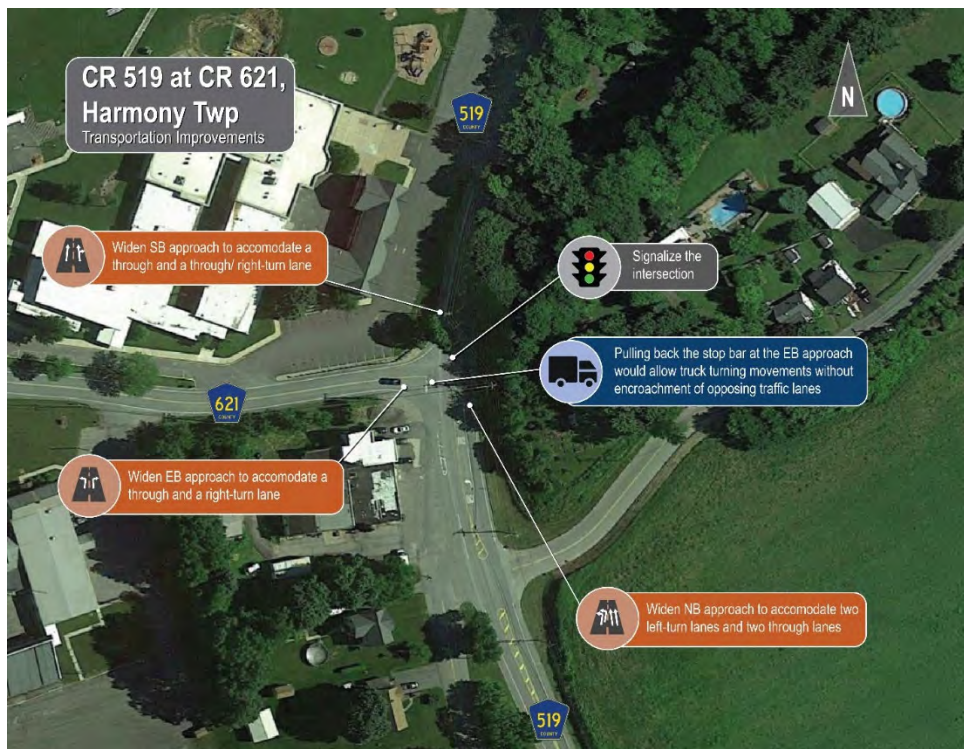
CR 519 at CR 621	2045 Build - AM		2045 Build - PM			2045 Build Improved AM		2045 Build Improved PM	
	LOS	Delay	LOS	Delay		LOS	Delay	LOS	Delay
Current configuration	F	**	F	4558	Signalize and add two lanes NB and one lane SB	F	1057	F	400
					Signalize and add lane EB, three lanes NB, one lane SB	F	507	F	340

\*\*Delay not calculable - delay is outside the high boundary and cannot be computed.

At this intersection, the largest trucks currently cannot complete northbound left turns, southbound right turns, or eastbound left turns without crossing the double yellow centerline. Pulling back the stop bar at the eastbound approach would alleviate those encroachments.

Mitigations are shown in Figure 45.

Figure 45 - CR 519/CR 621 Mitigation





*CR 519/CR 647*

The proposed CR 519 mainline widening would add an additional northbound and southbound lane to this intersection.

Mitigations are shown in Figure 46.

*Figure 46 - CR 519/CR 647 Mitigation*



*CR 519/CR 646*

This intersection represents the southern limit of where mainline widening would be required to accommodate additional volume. Signalizing the intersection and adding one lane southbound to include a left turn lane would significantly improve delay, though still operate at LOS F. The resulting intersection would be one lane eastbound and northbound to accommodate all movements, and southbound left and through lanes.

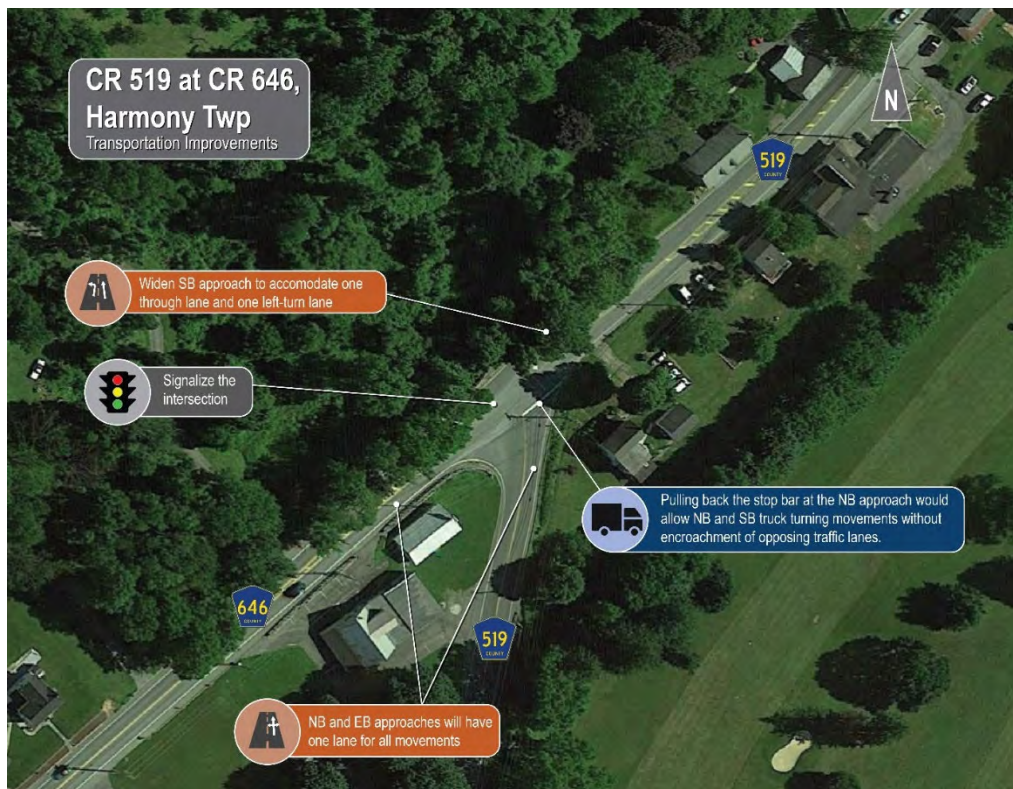
*Table 19 - CR 519/CR 646 LOS and Delay (seconds)*

CR 519 at CR 646	2045 Build - AM		2045 Build - PM			2045 Build Improved AM		2045 Build Improved PM	
	LOS	Delay	LOS	Delay		LOS	Delay	LOS	Delay
Current configuration	F	2835	F	1295	Signalize and add SB left turn lane	F	315	F	91

Currently, large trucks cannot complete northbound right turns or southbound left turns without encroachment into opposing lanes or shoulders. Pulling the northbound and southbound stop bars back when designing the intersection widening would alleviate the current turning encroachments into opposing lanes.

Mitigations are shown in Figure 47.

*Figure 47 - CR 519/CR 646 Mitigation*





*CR 519/NJ 57*

This intersection is currently signalized and would deteriorate significantly in the Build condition. NJDOT is currently redesigning the intersection to include dedicated left turn lanes and shared through/right lanes in each direction. This mitigation, when complete, would improve LOS significantly in the AM and cut delays in the PM.

Mitigations are shown in Figure 48.

Table 20 - CR 519/NJ 57 LOS and Delay (seconds)

CR 519 at NJ 57	2045 Build - AM		2045 Build - PM			2045 Build Improved AM		2045 Build Improved PM	
	LOS	Delay	LOS	Delay		LOS	Delay	LOS	Delay
Current configuration	F	81.5	F	157.5	NJDOT design: left turn lane and through/right all approaches	C	28.7	F	99.3

Figure 48 - CR 519/NJ 57 Mitigation



*CR 519/Strykers Road*

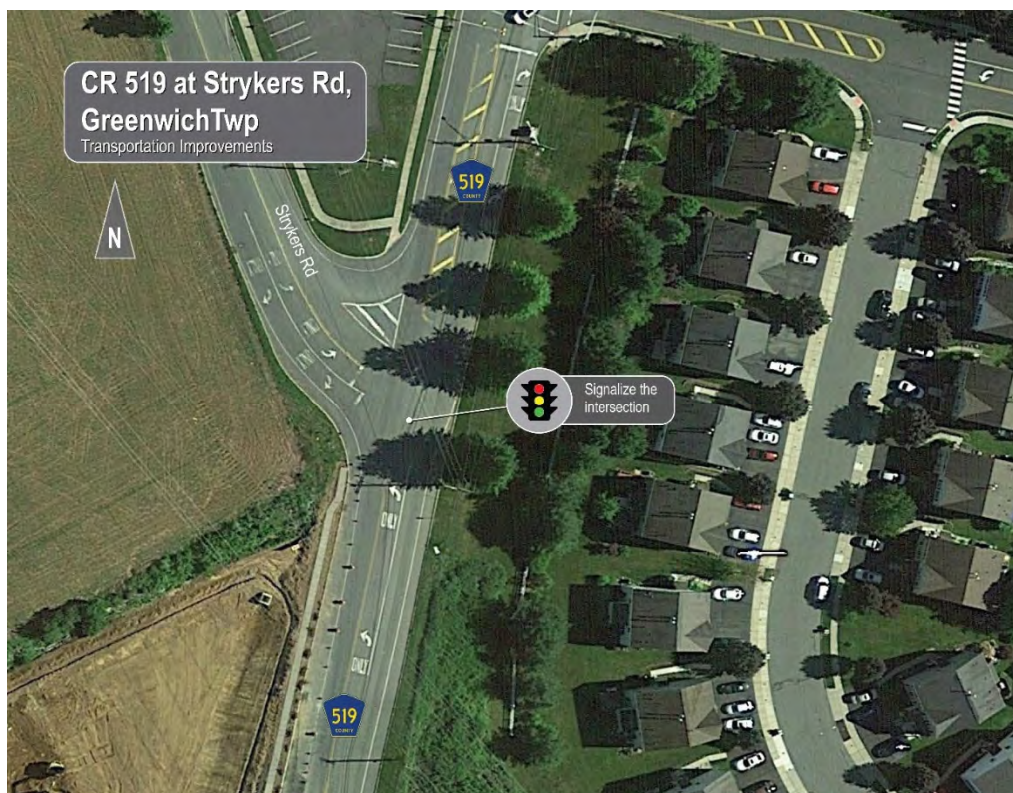
This intersection deteriorates slightly in the Build Condition. Signalizing the intersection improves operations.

*Table 21 - CR 519/Strykers Road LOS and Delay (seconds)*

CR 519 at Strykers Road	2045 Build - AM		2045 Build - PM			2045 Build Improved AM		2045 Build Improved PM	
	LOS	Delay	LOS	Delay		LOS	Delay	LOS	Delay
Current configuration	A	7.9	F	64.6	Signalize	A	9.7	D	38.6

Mitigations are shown in Figure 49.

*Figure 49 - CR 519/Strykers Road Mitigation*





*I-78/CR 632*

The addition of a signal at the end of the ramp from I-78 eastbound to CR 632 improves operations significantly (Table 22). This would require coordination with NJDOT as this intersection is NJDOT jurisdiction.

Table 22 - I-78/CR 632 LOS and Delay (seconds)

I-78 ramp at CR 632	2045 Build - AM		2045 Build - PM			2045 Build Improved AM		2045 Build Improved PM	
	LOS	Delay	LOS	Delay		LOS	Delay	LOS	Delay
Current configuration	F	465.4	A	7.2	<b>Signalize</b>	D	41.9	B	10.5

This ramp geometry currently prevents eastbound right turns and northbound left turns for the largest trucks. The signalization design should consider truck turning radii and widen that lane if advanced.

Mitigations are shown in Figure 50.

Figure 50 - I-78/CR 632 Mitigation



*NJ 31/CR 632*

Northbound left and right turns, southbound right turns, and westbound right turns cannot be completed by large trucks without encroachment into opposing lanes or shoulders. Pushing back stop bars would improve conditions and would require coordination with NJDOT, as this signal is under their jurisdiction.

Mitigations are shown in Figure 51.

*Figure 51 - NJ 31/CR 632 Mitigation*



## INTERSECTION SAFETY IMPROVEMENTS

In addition to capacity concerns, several intersections were identified as high crash locations that should be further explored to determine if improvements related to safety as outlined below are warranted.

*US 22 Phillipsburg*

US 22 near this area has three lanes in each direction with frequent driveways which may be causing the overrepresentation of right-angle crashes. Opportunities to consolidate driveways should be explored to improve safety.

*US 46/NJ 182/CR 517/CR 604*

This wide, skewed intersection has several movements that behave like through movements even though it is a turn. Overrepresentation of right-angle crashes may be mitigated by realigning the US 46 westbound approach closer to perpendicular and curbing the reclaimed area. This intersection is under NJDOT jurisdiction and would require further study and coordination between County and State officials.



*US 22/CR 638/CR 519*

This intersection has been the subject of many studies over the years. It experiences an overrepresentation of same direction sideswipes, and same direction rear-ends. Southbound to westbound slip lane enters the roadway very quickly and may be causing sideswipe crashes. Additional acceleration distance may reduce crashes. Rear ends may be caused by the short roadway distance available for vehicles to queue between the two directions of US 22. Any geometric or signal timings changes aimed at reducing crashes at this intersection would require further study.

*US 22/CR 646*

This unsignalized intersection is overrepresented in same direction rear ends, striking fixed object, and striking parked vehicle and is an area of transition from high speeds on US 22 into a residential neighborhood. This change to residential area is likely the reason for striking parked vehicles; and the change in speeds may be responsible for rear end crashes. Improving signage from US 22 to signify the change into a residential neighborhood may mitigate crashes. Tightening the curve from US 22 westbound on CR 646 northbound would slow speeds and improve safety.

## TRANSPORTATION DEMAND MANAGEMENT (TDM) STRATEGIES

Transportation Demand Management (TDM) provides solutions that focus on creating a more efficient transportation network through targeted policies and strategies focused on demand. These strategies are optimal in locations where existing constraints limit physical improvements or where funding for capital improvements is not available or feasible.

TDM strategies specific to freight and warehousing developments have been utilized within New Jersey and throughout the region, particularly in locations with substantial growth in warehousing and distribution centers. A series of potential TDM strategies specific to freight are included below.

- *Identify potential rail connections to reduce the reliance entirely on truck trips.*

For facilities where rail access exists, goods that are less time-sensitive may be able to be moved via rail. This solution can be utilized on longer distance trips where the cost of moving goods by rail may result in a cost savings.

- *Promote non-peak trips where possible.*

Shifting deliveries to off-peak periods will reduce the impact of trucks during peak congested period. This can also benefit the trucking industry by allowing drivers to achieve more consistent trip times. Moving operations to non-peak periods can also reduce the impact of traffic generated by facility employees as well.

- *Stagger worker shifts to reduce congestion during peak times.*

Staggering employee shifts for individual facilities can reduce congestion associated with a specific location and adjacent roadways/intersections.

- *Promote development adjacent to key regional highways.*

Encouraging large scale developments that generate truck trips to locate near or adjacent to major regional highways will substantially reduce impacts on local and county roadways.

- *Promote requirements that developers fund their “fair share” of necessary infrastructure improvements*

Where traffic impacts can be identified and quantified, developers can be held to a “fair share” standard that requires they fund necessary transportation improvements required due to traffic impacts from a

proposed facility. These requirements should be explicitly detailed within all applicable municipal, county, and state regulations and ordinances.

- *Create a county-wide freight transportation advisory group*

Freight uses often exist in clusters and given the amount of regionally significant traffic they generate, a county-wide freight advisory group would help support the common needs and concerns of the goods movement industry. This advisory group should, at a minimum, include key industry partners, county or municipal representatives, as well as citizen advocates. Collectively, such a group would report on these issues to county planning staff.

- *Encourage facility operators to promote specific trip paths/routing*

Facility operators should work with their drivers to identify and promote optimal routes between a facility and major highways. Providing consistent information to drivers will result in more consistent travel times, while also limiting impacts on local communities from trucks on routes whose design may limit circulation for larger vehicles.

- *Promote use of alternative transportation modes, including worker shuttles or microtransit*

To reduce impacts from employee traffic related to a facility, user shuttles or microtransit options, often working with county transportation authorities, may be a viable alternative. Further, such transportation options may provide improved mobility for employees that may not have access to a personal motor vehicle.

## IMPLEMENTATION

The results of this study provide information with which to mitigate the effects of freight and freight-related traffic. The mitigation measures represent the most appropriate remedies for the area. They consider the safety of all travelers and the needs of people and businesses to ship and receive goods. The application of the mitigation measures is projected to improve congestion and mitigate the negative effects of site-related traffic. However, it is not the end of the process.

Each mitigation measure would require additional study, engineering, funding and acceptance from various stakeholders and agencies. An evaluation of existing road widths, available right of way, and required additional right of way necessary to construct the potential improvements would require further study. Extensive right-of-way acquisition may be required in many locations to accommodate needed roadway capacity.

It is noted that road widening may be prohibited on roadways and intersections that are adjacent to the Highlands Preservation Area boundary and may affect how widening concepts are advanced. Approval or waivers from the Highlands Council may be necessary to advance many of the improvements needed to maintain acceptable levels of service. To explore these measures, coordination will be required between Warren County, Highlands Council, the involved municipalities, developers, NJDOT, and the North Jersey Transportation Planning Authority.

## CONCLUSION

Warren County's proximity to Interstates 78 and 80 position the County as a desirable center for warehouse development and freight/goods movement. As a result of its location in the region and availability of large parcels of land zoned for industrial use, there is an increased interest in warehousing and distribution development.



This study evaluated a build-out scenario of property zoned for industrial use at 15 sites in Warren County. The potential long-term impacts of such development in the County would be substantial, particularly along the CR 519 corridor. The increase in automobile and truck traffic volumes that would be anticipated if all 15 light industrial sites studied were developed would have a major impact on the County roadway network. The traffic increase is largely driven by the increase in automobiles that are expected to result from increased employment at these sites. Roadway levels of service would deteriorate to unacceptable conditions at most analyzed intersection locations and mainline segments of CR 519, as well as other key intersections throughout the County. In addition, the existing physical configuration at some intersections is challenging for trucks to complete turns without lane or shoulder encroachments which would be further impacted with an increase in truck traffic in the future.

TDM strategies can be used to reduce the demand on the roadway network; however, TDM strategies alone would not be enough to maintain traffic operations at an acceptable level should all sites studied be developed for industrial use. Necessary improvements to County roadways and intersections to maintain traffic operations at an acceptable level of service would require further detailed study as development projects are proposed. Future studies will need to identify locations where there are roadway right-of-way constraints that will require property acquisition for roadway widening for capacity improvements and/or to alleviate lane encroachments by turning trucks. Acquisition costs and Highland Preservation Area restrictions may be a consideration for the implementation of any required widening improvements in Warren County, particularly along CR 519.

## APPENDIX A - ZONING AND TRIP GENERATION



Unique ID	Site Information								Local Zoning and Land Use Regulations					
	Site ID	Municipality	Zoning	Permitted Uses	Total Area (Acres)	Parcels and Impervious Surface (Acres)	Environmental Constraints (Acres)	Proposed Development Block-Lot Area (Acres)	Zone Description	Minimum Lot Size (Acres)	Max Lot Building Coverage (Acres)	Height (ft)	Floor Area Ratio (FAR)	Comments
					T <sub>A</sub>	P <sub>S</sub>	E <sub>C</sub>	P <sub>D</sub>					FAR	
151	1	Belvidere	LM - Light Manufacturing	Office, light manufacturing, research/laboratory, storage building, and utilities	283.2	59.1	52.0	0.0	Min. lot size 40,000 S.F.	0.92	35%	35'	0	
152	1	White	I - Industrial	Office, manufacturing, research/laboratory, wholesale business, warehouses, and utilities	1260.7	263.9	359.7	0.0	Industry, 4 Acre Lot, * FAR 0.20	4	60%	40' ^	0.20	
153	2	Oxford	I - Industrial	Farms, manufacturing, research/laboratory, truck terminals, warehouse and distribution centers	49.0	47.6	0.0	0.0	Manufacturing 100,000 S.F. Lot	2.3			0.20	FAR or Max Buildable Area value not available
154	2	Oxford	I - Industrial, O & LI - Office and Light Industrial	Farms, manufacturing, research/laboratory, truck terminals, warehouse and distribution centers	66.6	3.9	43.2	0.0	Office Buildings and Light Manufacturing 100,000 S.F. Lot	2.3			0.20	FAR or Max Buildable Area value not available
155	2	Oxford	I - Industrial, LI - Light Industrial	Farms, manufacturing, research/laboratory, truck terminals, warehouse and distribution centers	186.2	29.6	26.5	0.0	Light Industrial 3 Acre Lot	3			0.20	FAR or Max Buildable Area value not available
156	3	Mansfield	I - Industrial	Office, research/laboratory, warehousing, telecommunications, solar and photovoltaic energy facilities, small wind energy systems	356.0	254.8	12.9	0.0	Min. lot size 5 Acres, Bld Cov 20% Industrial	5 acres (industrial park 15 acres min. 2.5 acre lots)	20%	35'	0.25	
157	4	Franklin	I - Industrial	Storage & warehousing, wholesaling, processing, light manufacturing & assembling, office, research and lab uses, computer & data process centers, agricultural uses, wireless telecom & antennas placed	141.3	43.3	9.1	0.0	Industrial 3 Acre Lot	3		40% 35'	0.25	
158	5	Franklin	I - Industrial, IP-A - Industrial Park	Storage & warehousing, wholesaling, processing, light manufacturing & assembling, office, research and lab uses, computer & data process centers, agricultural uses, wireless telecom & antennas placed	89.8	0.0	0.7	0.0	Industrial Park Option	3		40% 35'	0.25	
159	5	Franklin	I - Industrial, IP-A - Industrial Park	Storage & warehousing, wholesaling, processing, light manufacturing & assembling, office, research and lab uses, computer & data process centers, agricultural uses, wireless telecom & antennas placed	444.7	15.5	204.8	0.0	Industrial Park 3 Acre Lot	3		40% 35'	0.25	
160	6	Greenwich	RDM - Research, Office & Manufacturing	Office, research/laboratory, light industrial/manufacturing, warehousing associated with research/manufacturing, utilities, agriculture, day care, renewable energy facs	246.9	91.9	5.1	0.0	Research Office & Manufacturing, 10 Acre Lot, FAR 0.35	10		50% 45'	0.15	
161	7	Greenwich	RD - Research, Office	Office, research/laboratory, warehouse as part of permitted use, utilities, farm/agriculture, banks, health clubs, schools/day care, renewable energy facs	199.7	48.5	0.0	0.0	Research Office 5 Acre, FAR 0.30	5		45% 45'	0.10	
162	8	Alpha	I - Industrial	Office, research/laboratory, manufacturing, farms, public buildings, warehouses and wholesale distribution centers, commercial	71.6	18.5	0.0	0.0	Industrial	5		30% 35'	0.00	FAR value was not available, so, Max. building coverage was used to calculate Gross Floor Area
163	9	Pohatcong	I - Industrial	Office, research/laboratory, manufacturing, farms, public buildings, warehouses and wholesale distribution centers, commercial sales/service, utilities, adult uses, light manufacturing	146.0	29.3	1.0	0.0	Industrial		15 acres (industrial park external); 2.5 acres (internal components)	50% 50'	0.15	
164	9	Alpha	I - Industrial	Office, research/laboratory, manufacturing, farms, public buildings, warehouses and wholesale distribution centers, commercial sales/service, utilities, adult uses, light manufacturing	239.0	139.7	56.9	14.3	Industrial	5		30% 35'	0.00	FAR value was not available, so, Max. building coverage was used to calculate Gross Floor Area
165	10	Phillipsburg	I - Industrial, PCPRA - Phillipsburg Commerce Park Redevelopment Area	Office, manufac, warehouses, research/lab, computer proces centers, printing/publishing, food proces, wholesale business, lumber yards, health clubs, livery services, & small-scale retail	384.6	0.0	15.8	43.3	Industrial-Heavy Research Office	2		70% 50'	0.40	
166	11	Lopatcong	RDM - Research, Office & Manufacturing	Farms,warehouse & dist centers,industry,office,computer	376.2	118.6	53.5	14.9	Manufacturing Zone	5		65% 45'	0.20	
167	12	Harmony	I - Industrial	Industrial/light industrial/business, office, warehouse and distribution centers, retail business, industrial parks, public buildings, services stations, farms/farmhouses	623.9	115.8	120.4	0.0	Light Industry, & Business Office, 3 Acre Lot	5		30% 45'	0.00	FAR value was not available, so, Max. building coverage was used to calculate Gross Floor Area
168	13	White	LDI - Low Density Industrial	Office, manufacturing, research/laboratory, wholesale business, warehouses, golf courses, and utilities	623.8	7.4	55.6	0.0	Low Density Industrial, 15 Acre Lot, * FAR 0.20	15		60% 40' ^	0.30	
169	14	White	I - Industrial	Office, manufacturing, research/laboratory, wholesale business, warehouses, and utilities	943.3	195.7	87.6	0.0	Industry, 4 Acre Lot, * FAR 0.20	4		60% 40' ^	0.20	
170	15	Harmony	I - Industrial	Industrial/light industrial/business, office, warehouse and distribution centers, retail business, industrial parks, public buildings, services stations, farms/farmhouses	369.0	9.9	47.4	0.0		5		30% 45'	0.00	FAR value was not available, so, Max. building coverage was used to calculate Gross Floor Area

NOTES  
\* Indicates sites where only Minimum Building Height value is available

Unique ID	Site ID	Trip Generation										
		Unique ID			Developable Area (Acres)	Gross Floor Area (GFA) (K Square Feet)	Mixed Use Approach Total (Auto/Truck) Trips AM Peak	Mixed Use Approach Total (Auto/Truck) Trips PM Peak	Mixed Use Approach Total (Auto/Truck) Trips Daily	Number of Employees	Total Area (SqMi)	Developable Area (SqMi)
		R <sub>L</sub>	R <sub>W</sub>	R <sub>U</sub>	D <sub>L</sub> =T <sub>L</sub> •P <sub>L</sub> •E <sub>L</sub> •P <sub>D</sub>	GFA=D <sub>L</sub> *43,560	GFA*(A%R <sub>L</sub> +B%R <sub>W</sub> +C%R <sub>U</sub> )	GFA*(A%R <sub>L</sub> +B%R <sub>W</sub> +C%R <sub>U</sub> )	GFA*(A%R <sub>L</sub> +B%R <sub>W</sub> +C%R <sub>U</sub> )	Sq Ft Required 2,000 per Employee	Acres*0.0015625	Acres*0.0015625
151	1	151	140	110	172.1	2,624	987	1,082	7,678	1,312	0.4425	0.2689
152	1	150	130	110	637.1	5,551	1,916	1,893	15,949	2,776	1.9699	0.9955
153	2	150	130	110	1.4	12	5	5	35	6	0.0765	0.0021
154	2	150	130	110	21.5	187	65	64	538	94	0.1040	0.0336
155	2	150	130	110	130.1	1,133	391	387	3,256	567	0.2909	0.2032
156	3	150	130	110	88.3	962	332	329	2,764	481	0.5563	0.1380
157	4	150	130	110	88.9	968	334	331	2,782	484	0.2207	0.1388
158	5	150	130	110	89.1	970	335	331	2,787	485	0.1403	0.1392
159	5	150	130	110	224.3	2,443	843	834	7,019	1,222	0.6948	0.3505
160	6	150	130	110	149.9	980	339	335	2,816	490	0.3858	0.2343
161	7	150	130	110	151.2	658	228	225	1,891	329	0.3120	0.2362
162	8	150	130	110	53.1	694	240	237	1,994	347	0.1119	0.0830
163	9	150	130	110	115.7	756	261	258	2,172	378	0.2281	0.1808
164	9	150	130	110	28.1	367	127	126	1,055	184	0.3734	0.0438
165	10	150	130	110	325.5	5,672	1,957	1,935	16,296	2,836	0.6009	0.5086
166	11	150	130	110	189.2	1,648	569	562	4,735	824	0.5878	0.2956
167	12	150	130	110	387.7	5,066	1,748	1,728	14,555	2,533	0.9748	0.6058
168	13	150	130	110	559.8	4,877	1,683	1,664	14,012	2,439	0.9732	0.8747
169	14	150	130	110	660.0	5,750	1,984	1,961	16,520	2,875	1.4739	1.0313
170	15	150	130	110	311.7	4,073	1,406	1,389	11,702	2,037	0.5766	0.4870

NOTES  
\* Indicates sites where only M

4,385

45,391

15,750  
0.346985085

15,676  
0.345354806

130,558  
2.876233002

## APPENDIX B - MODEL VOLUME CHANGES



The map displays Warren County, New Jersey, with its municipalities outlined in black. Major roads are shown in red, and rail lines are indicated by dashed lines. The map includes labels for surrounding areas: Pennsylvania to the west, Sussex to the north, Morris to the east, and Hunterdon to the south. Major roads like I-80, I-78, and US-46 are shown. A legend at the bottom identifies Warren County Municipalities, New Jersey Counties, Pennsylvania Counties, and Rail lines. A scale bar indicates distances up to 12 miles.

The map displays Warren County, New Jersey, with its municipalities outlined in white. The background is shaded to represent New Jersey counties (light gray) and Pennsylvania counties (darker gray). Major roads are shown in black, with route numbers in white or blue shields. A red line indicates the PM Peak Volume Change (2045 Build) for various road segments. The map includes labels for surrounding areas: Pennsylvania, Sussex, Morris, and Hunterdon. Major roads like I-80, I-78, and US-46 are shown. A legend at the bottom identifies Warren County Municipalities, New Jersey Counties, Pennsylvania Counties, and Rail lines. A scale bar indicates distances up to 12 miles.



CR 519 Belvidere Rd & CR 620 Belvidere Rd-Peak Hour Volumes						
<i>Morning Peak</i>						
	<i>CR 519 Belvidere Rd</i>		<i>CR 620 Belvidere Rd</i>		<i>CR 519</i>	
Scenario	NBT	NBR	SBL	SBT	WBL	WBR
2020 Existing	213	288	14	224	240	14
2045 No Build	247	334	16	260	278	16
2045 Build	937	333	16	1927	1668	94
CR 519 Belvidere Rd & CR 620 Belvidere Rd-Peak Hour Volumes						
<i>Evening Peak</i>						
	<i>CR 519 Belvidere Rd</i>		<i>CR 620 Belvidere Rd</i>		<i>CR 519</i>	
Scenario	NBT	NBR	SBL	SBT	WBL	WBR
2020 Existing	322	364	10	269	349	14
2045 No Build	374	423	12	312	405	16
2045 Build	2484	1422	11	840	404	641
CR 519 Belvidere Rd & CR 621 Brainards Rd-Peak Hour Volumes						
<i>Morning Peak</i>						
	<i>CR 519 Belvidere Rd</i>				<i>CR 621 Brainards Rd</i>	
Scenario	NBL	NBT	SBT	SBR	EBL	EBR
Existing	56	401	432	9	9	68
No Build	65	465	501	10	10	78
Build	1868	1577	501	269	1448	141
CR 519 Belvidere Rd & CR 621 Brainards Rd-Peak Hour Volumes						
<i>Evening Peak</i>						
	<i>CR 519 Belvidere Rd</i>				<i>CR 621 Brainards Rd</i>	
Scenario	NBL	NBT	SBT	SBR	EBL	EBR
Existing	121	473	503	10	18	83
No Build	141	549	584	12	20	96
Build	236	549	1028	511	108	1846



**CR 519 Belvidere Rd & CR 622 Roxburg Station Rd/CR 622 Roxburg Hill Rd-Peak Hour Volumes**

***Morning Peak***

	<i>CR 519 Belvidere Rd</i>						<i>Roxburg Station Rd</i>			<i>Roxburg Hill Rd</i>		
Scenario	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
Existing	10	498	4	1	466	14	20	1	8	9	1	13
No Build	12	577	4	1	540	16	23	1	9	10	1	15
Build	1319	1928	5	1	729	1856	236	1	21	10	64	15

**CR 519 Belvidere Rd & CR 622 Roxburg Station Rd/CR 622 Roxburg Hill Rd-Peak Hour Volumes**

***Evening Peak***

	<i>CR 519 Belvidere Rd</i>						<i>Roxburg Station Rd</i>			<i>Roxburg Hill Rd</i>		
Scenario	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
Existing	15	562	4	5	432	23	25	1	29	5	1	1
No Build	18	651	4	6	501	26	29	1	34	6	1	1
Build	18	651	5	1430	500	589	713	538	1284	6	1	1

CR 646 Belvidere Rd/CR 519 Belvidere Rd & CR 519 Uniontown Rd-Peak Hour Volumes						
Morning Peak						
	CR 519 Uniontown Rd		CR 646 Belvidere Rd		CR 519 Belvidere Rd	
Scenario	NBL	NBR	NET	NER	SWL	SWT
Existing	3	168	307	9	289	286
No Build	3	195	356	10	335	331
Build	3	838	1307	10	336	478
CR 646 Belvidere Rd/CR 519 Belvidere Rd & CR 519 Uniontown Rd-Peak Hour Volumes						
Evening Peak						
	CR 519 Uniontown Rd		CR 646 Belvidere Rd		CR 519 Belvidere Rd	
PM	NBL	NBR	NET	NER	SWL	SWT
Existing	13	326	317	5	241	320
No Build	15	378	367	6	280	371
Build	15	378	398	6	780	1482
CR 620 Belvidere Rd & Foul Lift Rd-Peak Hour Volumes						
Morning Peak						
	CR 620 Belvidere Rd				Foul Rift Rd	
Scenario	NBL	NBT	SBT	SBR	EBL	EBR
Existing	0	481	540	8	5	0
No Build	0	558	626	9	6	0
Build	938	1253	2042	2009	813	63
CR 620 Belvidere Rd & Foul Lift Rd-Peak Hour Volumes						
Evening Peak						
	CR 620 Belvidere Rd				Foul Rift Rd	
Scenario	NBL	NBT	SBT	SBR	EBL	EBR
Existing	3	554	588	9	4	1
No Build	3	643	682	10	4	1
Build	3	1254	1182	573	1379	1251

CR 519 Uniontown Rd & NJ 57-Peak Hour Volumes								
Morning Peak								
	NJ 57				CR 519 Uniontown Rd			
Scenario	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Existing	29	307	24	250	31	79	3	101
No Build	29	307	24	250	31	79	3	101
Build	284	356	28	290	36	330	3	125
CR 519 Uniontown Rd & NJ 57-Peak Hour Volumes								
Evening Peak								
	NJ 57				CR 519 Uniontown Rd			
Scenario	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Existing	27	228	82	277	29	213	3	124
No Build	27	228	82	277	29	213	3	124
Build	31	264	145	571	34	295	3	294
CR 519 Uniontown Rd & Strykers Rd-Peak Hour Volumes								
Morning Peak								
	CR 519 Uniontown Rd				Strykers Rd			
Scenario	NBL	NBT	SBT	SBR	EBL	EBR		
Existing	96	142	247	73	110	266		
No Build	112	165	286	84	128	309		
Build	111	483	362	84	128	282		
CR 519 Uniontown Rd & Strykers Rd-Peak Hour Volumes								
Evening Peak								
	CR 519 Uniontown Rd				Strykers Rd			
Scenario	NBL	NBT	SBT	SBR	EBL	EBR		
Existing	231	356	337	130	144	179		
No Build	268	412	391	151	167	207		
Build	239	527	618	151	166	223		



## APPENDIX C - TURNING RADII ANALYSIS



## APPENDIX D - CAPACITY ANALYSIS



**2020 EXISTING CONDITIONS ANALYSIS**

INTERSECTION ANALYSIS

MID-BLOCK ANALYSIS

**2045 NO-BUILD ANALYSIS**

INTERSECTION ANALYSIS

MID-BLOCK ANALYSIS

**2045 BUILD ANALYSIS**

INTERSECTION ANALYSIS

MID-BLOCK ANALYSIS

**2045 BUILD MITIGATION ANALYSIS**



















INTERSECTION ANALYSIS

## **2020 EXISTING INTERSECTION ANALYSIS**

# Lanes, Volumes, Timings

## 3: RT 519 & US 46

06/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	241	22	48	161	39	31	206	58	84	158	19
Future Volume (vph)	20	241	22	48	161	39	31	206	58	84	158	19
Satd. Flow (prot)	0	1835	0	0	1800	0	0	1848	1583	0	1833	1583
Flt Permitted		0.958			0.870			0.883			0.654	
Satd. Flow (perm)	0	1765	0	0	1580	0	0	1645	1583	0	1218	1583
Satd. Flow (RTOR)		10			25				70			61
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.71	0.76	0.69	0.80	0.77	0.65	0.78	0.94	0.85	0.91	0.84	0.53
Growth Factor	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	389	0	0	339	0	0	267	70	0	289	37
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Total Split (s)	47.0	47.0		47.0	47.0		25.0	25.0	25.0	25.0	25.0	25.0
Total Lost Time (s)		7.0			7.0			5.0	5.0		5.0	5.0
Act Effect Green (s)		40.0			40.0			20.0	20.0		20.0	20.0
Actuated g/C Ratio		0.56			0.56			0.28	0.28		0.28	0.28
v/c Ratio		0.39			0.38			0.59	0.14		0.86	0.08
Control Delay		10.3			9.8			28.6	6.5		50.8	3.2
Queue Delay		0.0			0.0			0.0	0.0		0.0	0.0
Total Delay		10.3			9.8			28.6	6.5		50.8	3.2
LOS		B			A			C	A		D	A
Approach Delay		10.3			9.8			24.0			45.4	
Approach LOS		B			A			C			D	

### Intersection Summary

Cycle Length: 72

Actuated Cycle Length: 72

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.86

Intersection Signal Delay: 21.7

Intersection LOS: C

Intersection Capacity Utilization 73.8%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 3: RT 519 & US 46























# Lanes, Volumes, Timings

## 3: RT 519 & US 46

06/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	168	17	32	270	63	35	169	44	99	179	36
Future Volume (vph)	23	168	17	32	270	63	35	169	44	99	179	36
Satd. Flow (prot)	0	1829	0	0	1801	0	0	1846	1583	0	1827	1583
Flt Permitted		0.933			0.955			0.701			0.622	
Satd. Flow (perm)	0	1715	0	0	1727	0	0	1306	1583	0	1159	1583
Satd. Flow (RTOR)		12			31				61			61
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.84	0.80	0.65	0.88	0.91	0.69	0.73	0.83	0.75	0.76	0.85	0.68
Growth Factor	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	271	0	0	437	0	0	259	60	0	351	55
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Total Split (s)	47.0	47.0		47.0	47.0		25.0	25.0	25.0	25.0	25.0	25.0
Total Lost Time (s)		7.0			7.0			5.0	5.0		5.0	5.0
Act Effct Green (s)		40.0			40.0			20.0	20.0		20.0	20.0
Actuated g/C Ratio		0.56			0.56			0.28	0.28		0.28	0.28
v/c Ratio		0.28			0.45			0.72	0.12		1.09	0.11
Control Delay		9.0			10.5			36.7	6.6		106.7	6.1
Queue Delay		0.0			0.0			0.0	0.0		0.0	0.0
Total Delay		9.0			10.5			36.7	6.6		106.7	6.1
LOS		A			B			D	A		F	A
Approach Delay		9.0			10.5			31.1			93.1	
Approach LOS		A			B			C			F	

### Intersection Summary

Cycle Length: 72

Actuated Cycle Length: 72

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 1.09

Intersection Signal Delay: 38.2

Intersection LOS: D

Intersection Capacity Utilization 74.0%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 3: RT 519 & US 46



Intersection	
Intersection Delay, s/veh	14.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	48	149	8	36	90	32	5	169	44	30	109	30
Future Vol, veh/h	48	149	8	36	90	32	5	169	44	30	109	30
Peak Hour Factor	0.92	0.80	0.92	0.92	0.80	0.92	0.92	0.80	0.92	0.92	0.80	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	63	225	11	47	136	42	7	256	58	39	165	39
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	15.7	13.4	15.8	13.7
HCM LOS	C	B	C	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	2%	23%	23%	18%
Vol Thru, %	78%	73%	57%	64%
Vol Right, %	20%	4%	20%	18%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	218	205	158	169
LT Vol	5	48	36	30
Through Vol	169	149	90	109
RT Vol	44	8	32	30
Lane Flow Rate	320	299	226	244
Geometry Grp	1	1	1	1
Degree of Util (X)	0.534	0.515	0.393	0.421
Departure Headway (Hd)	6.008	6.202	6.275	6.212
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	599	580	573	578
Service Time	4.055	4.251	4.328	4.262
HCM Lane V/C Ratio	0.534	0.516	0.394	0.422
HCM Control Delay	15.8	15.7	13.4	13.7
HCM Lane LOS	C	C	B	B
HCM 95th-tile Q	3.2	2.9	1.9	2.1

Intersection	
Intersection Delay, s/veh	24.1
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	31	114	13	41	206	31	22	111	31	43	181	52
Future Vol, veh/h	31	114	13	41	206	31	22	111	31	43	181	52
Peak Hour Factor	0.92	0.80	0.92	0.92	0.80	0.92	0.92	0.80	0.92	0.92	0.80	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	41	172	17	54	312	41	29	168	41	57	274	68
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	16.8	29.1	16.8	27.7
HCM LOS	C	D	C	D












Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	13%	20%	15%	16%
Vol Thru, %	68%	72%	74%	66%
Vol Right, %	19%	8%	11%	19%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	164	158	278	276
LT Vol	22	31	41	43
Through Vol	111	114	206	181
RT Vol	31	13	31	52
Lane Flow Rate	238	230	406	399
Geometry Grp	1	1	1	1
Degree of Util (X)	0.478	0.469	0.768	0.752
Departure Headway (Hd)	7.247	7.334	6.807	6.792
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	497	491	532	530
Service Time	5.313	5.403	4.863	4.848
HCM Lane V/C Ratio	0.479	0.468	0.763	0.753
HCM Control Delay	16.8	16.8	29.1	27.7
HCM Lane LOS	C	C	D	D
HCM 95th-tile Q	2.5	2.5	6.8	6.5



# HCM Unsignalized Intersection Capacity Analysis

## 3: CO 620 & RT 519












07/27/2020

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	216	11	192	259	11	202
Future Volume (Veh/h)	216	11	192	259	11	202
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.80	0.90	0.90	0.80	0.90
Hourly flow rate (vph)	240	14	213	288	14	224
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	465	213			213	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	465	213			213	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	56	98			99	
cM capacity (veh/h)	550	827			1357	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1		
Volume Total	254	213	288	238		
Volume Left	240	0	0	14		
Volume Right	14	0	288	0		
cSH	582	1700	1700	1357		
Volume to Capacity	0.44	0.13	0.17	0.01		
Queue Length 95th (ft)	55	0	0	1		
Control Delay (s)	16.1	0.0	0.0	0.5		
Lane LOS	C			A		
Approach Delay (s)	16.1	0.0		0.5		
Approach LOS	C					
Intersection Summary						
Average Delay			4.3			
Intersection Capacity Utilization			38.2%		ICU Level of Service	A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 3: CO 620 & RT 519

07/27/2020

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	314	11	290	328	8	242
Future Volume (Veh/h)	314	11	290	328	8	242
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.80	0.90	0.90	0.80	0.90
Hourly flow rate (vph)	349	14	322	364	10	269
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	611	322			322	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	611	322			322	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	23	98			99	
cM capacity (veh/h)	453	719			1238	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1		
Volume Total	363	322	364	279		
Volume Left	349	0	0	10		
Volume Right	14	0	364	0		
cSH	466	1700	1700	1238		
Volume to Capacity	0.78	0.19	0.21	0.01		
Queue Length 95th (ft)	172	0	0	1		
Control Delay (s)	35.0	0.0	0.0	0.4		
Lane LOS	E			A		
Approach Delay (s)	35.0	0.0		0.4		
Approach LOS	E					
Intersection Summary						
Average Delay			9.6			
Intersection Capacity Utilization			43.3%		ICU Level of Service	A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 3: CR 519 Belvidere Rd & Foul Lift Rd

07/24/2020












Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			T	T	R
Traffic Volume (veh/h)	4	0	0	433	486	6
Future Volume (Veh/h)	4	0	0	433	486	6
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.90	0.90	0.80
Hourly flow rate (vph)	5	0	0	481	540	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1025	544	548			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1025	544	548			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	100	100			
cM capacity (veh/h)	260	539	1032			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	5	481	548			
Volume Left	5	0	0			
Volume Right	0	0	8			
cSH	260	1032	1700			
Volume to Capacity	0.02	0.00	0.32			
Queue Length 95th (ft)	1	0	0			
Control Delay (s)	19.1	0.0	0.0			
Lane LOS	C					
Approach Delay (s)	19.1	0.0	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			35.9%	ICU Level of Service		A
Analysis Period (min)			15			









# HCM Unsignalized Intersection Capacity Analysis

## 3: CR 519 Belvidere Rd & Foul Lift Rd

07/24/2020

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	3	1	2	499	529	7
Future Volume (Veh/h)	3	1	2	499	529	7
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.90	0.90	0.80
Hourly flow rate (vph)	4	1	3	554	588	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1152	592	597			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1152	592	597			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	100	100			
cM capacity (veh/h)	220	510	989			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	5	557	597			
Volume Left	4	3	0			
Volume Right	1	0	9			
cSH	248	989	1700			
Volume to Capacity	0.02	0.00	0.35			
Queue Length 95th (ft)	2	0	0			
Control Delay (s)	19.8	0.1	0.0			
Lane LOS	C	A				
Approach Delay (s)	19.8	0.1	0.0			
Approach LOS	C					
<b>Intersection Summary</b>						
Average Delay		0.1				
Intersection Capacity Utilization		38.3%		ICU Level of Service		A
Analysis Period (min)		15				

Intersection						
Int Delay, s/veh	0.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	10	427	1	11	366
Future Vol, veh/h	8	10	427	1	11	366
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	80	80	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	13	469	1	12	402
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	896	470	0	0	470	0
Stage 1	470	-	-	-	-	-
Stage 2	426	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	311	594	-	-	1092	-
Stage 1	629	-	-	-	-	-
Stage 2	659	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	307	594	-	-	1092	-
Mov Cap-2 Maneuver	307	-	-	-	-	-
Stage 1	629	-	-	-	-	-
Stage 2	650	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	14.1	0		0.2		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	-		420	1092	
HCM Lane V/C Ratio	-	-		0.054	0.011	
HCM Control Delay (s)	-	-		14.1	8.3	
HCM Lane LOS	-	-		B	A	
HCM 95th %tile Q(veh)	-	-		0.2	0	

















Intersection						
Int Delay, s/veh	0.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	16	12	474	0	18	511
Future Vol, veh/h	16	12	474	0	18	511
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	80	80	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	15	520	0	20	561
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1121	520	0	0	520	0
Stage 1	520	-	-	-	-	-
Stage 2	601	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	228	556	-	-	1046	-
Stage 1	597	-	-	-	-	-
Stage 2	547	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	222	556	-	-	1046	-
Mov Cap-2 Maneuver	222	-	-	-	-	-
Stage 1	597	-	-	-	-	-
Stage 2	532	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	18.6	0	0.3			
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	299	1046	-	
HCM Lane V/C Ratio	-	-	0.118	0.019	-	
HCM Control Delay (s)	-	-	18.6	8.5	0	
HCM Lane LOS	-	-	C	A	A	
HCM 95th %tile Q(veh)	-	-	0.4	0.1	-	



# HCM Unsignalized Intersection Capacity Analysis

## 3: CR 519 Belvidere Rd & CR 622 Roxbury Station Rd/CR 622 Roxbury Hill Rd

















07/24/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	1	6	7	1	10	8	444	3	1	415	11
Future Volume (Veh/h)	16	1	6	7	1	10	8	444	3	1	415	11
Sign Control	Stop				Stop				Free			
Grade	0%				0%				0%			
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.90	0.80	0.80	0.90	0.80
Hourly flow rate (vph)	20	1	8	9	1	13	10	498	4	1	466	14
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1008	997	473	1004	1002	500	480				502	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1008	997	473	1004	1002	500	480				502	
tC, single (s)	7.2	6.5	6.5	7.2	6.5	6.3	4.2				4.1	
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.6	3.6	4.0	3.4	2.3				2.2	
p0 queue free %	90	100	99	96	100	98	99				100	
cM capacity (veh/h)	208	243	538	204	242	555	1042				1073	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	29	23	512	481								
Volume Left	20	9	10	1								
Volume Right	8	13	4	14								
cSH	252	321	1042	1073								
Volume to Capacity	0.12	0.07	0.01	0.00								
Queue Length 95th (ft)	10	6	1	0								
Control Delay (s)	21.2	17.1	0.3	0.0								
Lane LOS	C	C	A	A								
Approach Delay (s)	21.2	17.1	0.3	0.0								
Approach LOS	C	C										
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization			39.8%	ICU Level of Service				A				
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 3: CR 519 Belvidere Rd & CR 622 Roxbury Station Rd/CR 622 Roxbury Hill Rd

07/24/2020





												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	1	23	4	1	1	12	501	3	4	385	18
Future Volume (Veh/h)	20	1	23	4	1	1	12	501	3	4	385	18
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.90	0.80	0.80	0.90	0.80
Hourly flow rate (vph)	25	1	29	5	1	1	15	562	4	5	432	23
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1049	1050	444	1077	1059	564	455			566		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1049	1050	444	1077	1059	564	455			566		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.6			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.7			2.2		
p0 queue free %	87	100	95	97	100	100	98			100		
cM capacity (veh/h)	198	224	610	185	221	529	894			1016		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	55	7	581	460								
Volume Left	25	5	15	5								
Volume Right	29	1	4	23								
cSH	309	210	894	1016								
Volume to Capacity	0.18	0.03	0.02	0.00								
Queue Length 95th (ft)	16	3	1	0								
Control Delay (s)	19.2	22.8	0.5	0.1								
Lane LOS	C	C	A	A								
Approach Delay (s)	19.2	22.8	0.5	0.1								
Approach LOS	C	C										
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			44.4%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 3: CR 519 Belvidere Rd & CR 621 Brainards Rd

07/24/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	7	54	45	361	389	7
Future Volume (Veh/h)	7	54	45	361	389	7
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.90	0.90	0.80
Hourly flow rate (vph)	9	68	56	401	432	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	950	436	441			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	950	436	441			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	89	95			
cM capacity (veh/h)	275	620	1130			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	77	56	401	441		
Volume Left	9	56	0	0		
Volume Right	68	0	0	9		
cSH	540	1130	1700	1700		
Volume to Capacity	0.14	0.05	0.24	0.26		
Queue Length 95th (ft)	12	4	0	0		
Control Delay (s)	12.8	8.4	0.0	0.0		
Lane LOS	B	A				
Approach Delay (s)	12.8	1.0		0.0		
Approach LOS	B					
Intersection Summary						
Average Delay			1.5			
Intersection Capacity Utilization			38.0%	ICU Level of Service		A
Analysis Period (min)			15			







# HCM Unsignalized Intersection Capacity Analysis

## 3: CR 519 Belvidere Rd & CR 621 Brainards Rd

07/24/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	14	66	97	426	453	8
Future Volume (Veh/h)	14	66	97	426	453	8
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.90	0.90	0.80
Hourly flow rate (vph)	18	83	121	473	503	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1223	508	513			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1223	508	513			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	85	89			
cM capacity (veh/h)	176	565	1063			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	101	121	473	513		
Volume Left	18	121	0	0		
Volume Right	83	0	0	10		
cSH	405	1063	1700	1700		
Volume to Capacity	0.25	0.11	0.28	0.30		
Queue Length 95th (ft)	24	10	0	0		
Control Delay (s)	16.8	8.8	0.0	0.0		
Lane LOS	C	A				
Approach Delay (s)	16.8	1.8	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			2.3			
Intersection Capacity Utilization			44.5%		ICU Level of Service	
Analysis Period (min)			15		A	

# HCM Unsignalized Intersection Capacity Analysis

## 2: CR 646 Belvidere Rd/CR 519 Belvidere Rd & CR 519 Uniontown Rd

07/24/2020



Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (veh/h)	2	151	276	7	260	257
Future Volume (Veh/h)	2	151	276	7	260	257
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.80	0.90	0.90	0.80	0.90	0.90
Hourly flow rate (vph)	3	168	307	9	289	286
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1176	312			316	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1176	312			316	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	77			76	
cM capacity (veh/h)	163	722			1227	
Direction, Lane #	NB 1	NE 1	SW 1			
Volume Total	171	316	575			
Volume Left	3	0	289			
Volume Right	168	9	0			
cSH	681	1700	1227			
Volume to Capacity	0.25	0.19	0.24			
Queue Length 95th (ft)	25	0	23			
Control Delay (s)	12.1	0.0	5.7			
Lane LOS	B		A			
Approach Delay (s)	12.1	0.0	5.7			
Approach LOS	B					
Intersection Summary						
Average Delay			5.0			
Intersection Capacity Utilization			62.3%		ICU Level of Service	B
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 2: CR 646 Belvidere Rd/CR 519 Belvidere Rd & CR 519 Uniontown Rd

07/24/2020



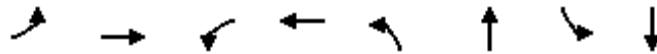
Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (veh/h)	10	293	285	4	217	288
Future Volume (Veh/h)	10	293	285	4	217	288
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.80	0.90	0.90	0.80	0.90	0.90
Hourly flow rate (vph)	13	326	317	5	241	320
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1122	320			322	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1122	320			322	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	54			80	
cM capacity (veh/h)	185	714			1221	
Direction, Lane #	NB 1	NE 1	SW 1			
Volume Total	339	322	561			
Volume Left	13	0	241			
Volume Right	326	5	0			
cSH	644	1700	1221			
Volume to Capacity	0.53	0.19	0.20			
Queue Length 95th (ft)	77	0	18			
Control Delay (s)	16.7	0.0	4.9			
Lane LOS	C		A			
Approach Delay (s)	16.7	0.0	4.9			
Approach LOS	C					
Intersection Summary						
Average Delay			6.9			
Intersection Capacity Utilization			71.1%		ICU Level of Service	C
Analysis Period (min)			15			



# Timings

## 3: CR 519 Uniontown Rd & NJ 57

07/24/2020



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕		↕		↕		↕
Traffic Volume (vph)	29	307	24	250	31	79	3	101
Future Volume (vph)	29	307	24	250	31	79	3	101
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	50.0	50.0	50.0	50.0	15.0	15.0	15.0	15.0
Minimum Split (s)	57.0	57.0	57.0	57.0	23.0	23.0	23.0	23.0
Total Split (s)	57.0	57.0	57.0	57.0	33.0	33.0	33.0	33.0
Total Split (%)	63.3%	63.3%	63.3%	63.3%	36.7%	36.7%	36.7%	36.7%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		0.0		0.0		0.0		0.0
Total Lost Time (s)		7.0		7.0		8.0		8.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	Min	Min	Min
Act Effect Green (s)		57.6		57.6		17.4		17.4
Actuated g/C Ratio		0.64		0.64		0.19		0.19
v/c Ratio		0.37		0.29		0.61		0.49
Control Delay		9.2		8.5		37.5		33.3
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		9.2		8.5		37.5		33.3
LOS		A		A		D		C
Approach Delay		9.2		8.5		37.5		33.3
Approach LOS		A		A		D		C

### Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 10.9 (12%), Referenced to phase 4:EBTL and 8:WBTL, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.61

Intersection Signal Delay: 17.8

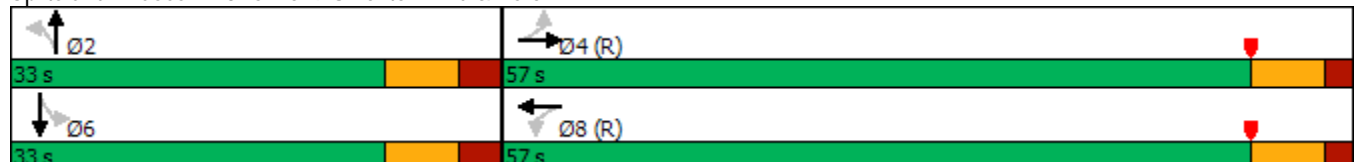
Intersection LOS: B

Intersection Capacity Utilization 79.1%

ICU Level of Service D

Analysis Period (min) 15

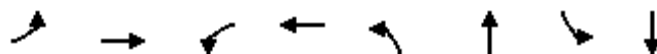
### Splits and Phases: 3: CR 519 Uniontown Rd & NJ 57



# Timings

## 3: CR 519 Uniontown Rd & NJ 57

07/24/2020



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕		↕		↕		↕
Traffic Volume (vph)	27	228	82	277	29	213	3	124
Future Volume (vph)	27	228	82	277	29	213	3	124
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	50.0	50.0	50.0	50.0	15.0	15.0	15.0	15.0
Minimum Split (s)	57.0	57.0	57.0	57.0	23.0	23.0	23.0	23.0
Total Split (s)	57.0	57.0	57.0	57.0	33.0	33.0	33.0	33.0
Total Split (%)	63.3%	63.3%	63.3%	63.3%	36.7%	36.7%	36.7%	36.7%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		0.0		0.0		0.0		0.0
Total Lost Time (s)		7.0		7.0		8.0		8.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	Min	Min	Min
Act Effect Green (s)		53.4		53.4		21.6		21.6
Actuated g/C Ratio		0.59		0.59		0.24		0.24
v/c Ratio		0.34		0.46		0.79		0.38
Control Delay		10.7		13.1		44.9		28.9
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		10.7		13.1		44.9		28.9
LOS		B		B		D		C
Approach Delay		10.7		13.1		44.9		28.9
Approach LOS		B		B		D		C

### Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 10.9 (12%), Referenced to phase 4:EBTL and 8:WBTL, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 22.9

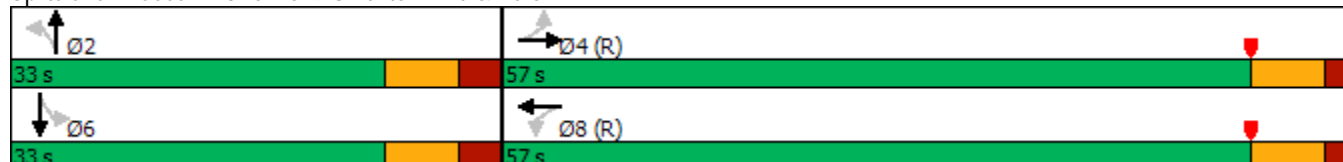
Intersection LOS: C

Intersection Capacity Utilization 83.8%

ICU Level of Service E

Analysis Period (min) 15

### Splits and Phases: 3: CR 519 Uniontown Rd & NJ 57







# HCM Unsignalized Intersection Capacity Analysis

## 4: CR 519 Uniontown Rd & Strykers Rd

07/29/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	88	213	77	128	222	58
Future Volume (Veh/h)	88	213	77	128	222	58
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.90	0.90	0.80
Hourly flow rate (vph)	110	266	96	142	247	73
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	618	284	320			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	618	284	320			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	74	65	92			
cM capacity (veh/h)	421	760	1251			
Direction, Lane #	EB 1	EB 2	NB 1	SB 1		
Volume Total	110	266	238	320		
Volume Left	110	0	96	0		
Volume Right	0	266	0	73		
cSH	421	760	1251	1700		
Volume to Capacity	0.26	0.35	0.08	0.19		
Queue Length 95th (ft)	26	39	6	0		
Control Delay (s)	16.5	12.3	3.7	0.0		
Lane LOS	C	B	A			
Approach Delay (s)	13.5		3.7	0.0		
Approach LOS	B					
Intersection Summary						
Average Delay			6.4			
Intersection Capacity Utilization			41.1%		ICU Level of Service	A
Analysis Period (min)			15			







# HCM Unsignalized Intersection Capacity Analysis

## 4: CR 519 Uniontown Rd & Strykers Rd

07/29/2020













Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	115	143	185	320	303	104
Future Volume (Veh/h)	115	143	185	320	303	104
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.90	0.90	0.80
Hourly flow rate (vph)	144	179	231	356	337	130
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1220	402	467			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1220	402	467			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	9	73	79			
cM capacity (veh/h)	159	653	1105			
Direction, Lane #	EB 1	EB 2	NB 1	SB 1		
Volume Total	144	179	587	467		
Volume Left	144	0	231	0		
Volume Right	0	179	0	130		
cSH	159	653	1105	1700		
Volume to Capacity	0.91	0.27	0.21	0.27		
Queue Length 95th (ft)	162	28	20	0		
Control Delay (s)	105.1	12.6	5.0	0.0		
Lane LOS	F	B	A			
Approach Delay (s)	53.8		5.0	0.0		
Approach LOS	F					
Intersection Summary						
Average Delay			14.8			
Intersection Capacity Utilization			65.7%	ICU Level of Service		C
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 4: CO 632 & I-78 WB ramp











06/25/2020

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	50	55	0	72	63	0
Future Volume (Veh/h)	50	55	0	72	63	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	55	61	0	80	70	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	150	70	70			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	150	70	70			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	94	100			
cM capacity (veh/h)	842	993	1531			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	116	80	70			
Volume Left	55	0	0			
Volume Right	61	0	0			
cSH	1776	1700	1700			
Volume to Capacity	0.07	0.05	0.04			
Queue Length 95th (ft)	5	0	0			
Control Delay (s)	9.2	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	9.2	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay		4.0				
Intersection Capacity Utilization		13.9%		ICU Level of Service		A
Analysis Period (min)		15				

# HCM Unsignalized Intersection Capacity Analysis

## 4: CO 632 & I-78 WB ramp

06/25/2020

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	52	40	0	88	24	0
Future Volume (Veh/h)	52	40	0	88	24	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	58	44	0	98	27	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	125	27	27			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	125	27	27			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	96	100			
cM capacity (veh/h)	870	1048	1587			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	102	98	27			
Volume Left	58	0	0			
Volume Right	44	0	0			
cSH	1530	1700	1700			
Volume to Capacity	0.07	0.06	0.02			
Queue Length 95th (ft)	5	0	0			
Control Delay (s)	9.1	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	9.1	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		4.1				
Intersection Capacity Utilization		14.7%		ICU Level of Service		A
Analysis Period (min)		15				



## **2020 EXISTING MID-BLOCK ANALYSIS**

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	CR 519, northeast of CO 610	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	3
Speed Limit, mi/h	50	Access Point Density, pts/mi	9.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	298	Opposing Demand Flow Rate, veh/h	253
Peak Hour Factor	0.92	Total Trucks, %	2.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.18

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	52.6
Speed Slope Coefficient	3.17369	Speed Power Coefficient	0.52554
PF Slope Coefficient	-1.25142	PF Power Coefficient	0.78453
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.2
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	51.2

## Vehicle Results

Average Speed, mi/h	51.2	Percent Followers, %	38.4
Segment Travel Time, minutes	1.17	Followers Density, followers/mi/ln	2.2
Vehicle LOS	A		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	CR 519, northeast of CO 610	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	3
Speed Limit, mi/h	50	Access Point Density, pts/mi	9.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	253	Opposing Demand Flow Rate, veh/h	298
Peak Hour Factor	0.92	Total Trucks, %	2.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.15

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	52.6
Speed Slope Coefficient	3.18761	Speed Power Coefficient	0.51566
PF Slope Coefficient	-1.26085	PF Power Coefficient	0.78175
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.7
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	51.4

## Vehicle Results

Average Speed, mi/h	51.4	Percent Followers, %	35.0
Segment Travel Time, minutes	1.17	Followers Density, followers/mi/ln	1.7
Vehicle LOS	A		



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## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	3
Speed Limit, mi/h	50	Access Point Density, pts/mi	9.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	263	Opposing Demand Flow Rate, veh/h	347
Peak Hour Factor	0.92	Total Trucks, %	2.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.15

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	52.6
Speed Slope Coefficient	3.20174	Speed Power Coefficient	0.50607
PF Slope Coefficient	-1.27002	PF Power Coefficient	0.77898
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.9
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	51.3

## Vehicle Results

Average Speed, mi/h	51.3	Percent Followers, %	36.2
Segment Travel Time, minutes	1.17	Followers Density, followers/mi/ln	1.9
Vehicle LOS	A		

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## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	3
Speed Limit, mi/h	50	Access Point Density, pts/mi	9.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	347	Opposing Demand Flow Rate, veh/h	263
Peak Hour Factor	0.92	Total Trucks, %	2.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.20

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	52.6
Speed Slope Coefficient	3.17684	Speed Power Coefficient	0.52326
PF Slope Coefficient	-1.25359	PF Power Coefficient	0.78389
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.9
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	51.1

## Vehicle Results

Average Speed, mi/h	51.1	Percent Followers, %	42.1
Segment Travel Time, minutes	1.18	Followers Density, followers/mi/ln	2.9
Vehicle LOS	B		

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Analyst	MAA	Date	6/17/2020
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Project Description	CR 519, Stone Hedge Rd to Hope Crossing Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	0.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	335	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.80	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.20

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	56.9
Speed Slope Coefficient	3.64416	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.32222	PF Power Coefficient	0.75266
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.7
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	54.9

## Vehicle Results

Average Speed, mi/h	54.9	Percent Followers, %	44.0
Segment Travel Time, minutes	1.09	Followers Density, followers/mi/ln	2.7
Vehicle LOS	B		



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## Segment 1

## Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	0.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	336	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.84	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.20

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	56.9
Speed Slope Coefficient	3.64416	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.32222	PF Power Coefficient	0.75266
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.7
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	54.9

## Vehicle Results

Average Speed, mi/h	54.9	Percent Followers, %	44.1
Segment Travel Time, minutes	1.09	Followers Density, followers/mi/ln	2.7
Vehicle LOS	B		

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## Segment 1

## Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	0.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	290	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.90	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.17

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	56.9
Speed Slope Coefficient	3.64416	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.32222	PF Power Coefficient	0.75266
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.1
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	55.1

## Vehicle Results

Average Speed, mi/h	55.1	Percent Followers, %	40.6
Segment Travel Time, minutes	1.09	Followers Density, followers/mi/ln	2.1
Vehicle LOS	A		

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## Segment 1

## Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	0.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	371	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.82	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.22

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	56.9
Speed Slope Coefficient	3.64416	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.32222	PF Power Coefficient	0.75266
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.2
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	54.8

## Vehicle Results

Average Speed, mi/h	54.8	Percent Followers, %	46.6
Segment Travel Time, minutes	1.10	Followers Density, followers/mi/ln	3.2
Vehicle LOS	B		



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Project Description	CR 519, CO 623 Brass Castle Rd to Pequest Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	4.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	493	Opposing Demand Flow Rate, veh/h	388
Peak Hour Factor	0.88	Total Trucks, %	0.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.29

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.7
Speed Slope Coefficient	3.38169	Speed Power Coefficient	0.49890
PF Slope Coefficient	-1.26598	PF Power Coefficient	0.78592
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	4.8
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.6

## Vehicle Results

Average Speed, mi/h	53.6	Percent Followers, %	51.6
Segment Travel Time, minutes	1.12	Followers Density, followers/mi/ln	4.8
Vehicle LOS	B		

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## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	4.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	371	Opposing Demand Flow Rate, veh/h	472
Peak Hour Factor	0.92	Total Trucks, %	0.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.22

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.7
Speed Slope Coefficient	3.40278	Speed Power Coefficient	0.48595
PF Slope Coefficient	-1.27764	PF Power Coefficient	0.78186
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.1
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.9

## Vehicle Results

Average Speed, mi/h	53.9	Percent Followers, %	44.5
Segment Travel Time, minutes	1.11	Followers Density, followers/mi/ln	3.1
Vehicle LOS	B		

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## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	4.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	562	Opposing Demand Flow Rate, veh/h	418
Peak Hour Factor	0.85	Total Trucks, %	7.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.33

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.5
Speed Slope Coefficient	3.37685	Speed Power Coefficient	0.49400
PF Slope Coefficient	-1.27056	PF Power Coefficient	0.78476
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	5.9
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.2

## Vehicle Results

Average Speed, mi/h	53.2	Percent Followers, %	55.5
Segment Travel Time, minutes	1.13	Followers Density, followers/mi/ln	5.9
Vehicle LOS	C		

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## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	4.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	374	Opposing Demand Flow Rate, veh/h	503
Peak Hour Factor	0.95	Total Trucks, %	7.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.22

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.5
Speed Slope Coefficient	3.39753	Speed Power Coefficient	0.48165
PF Slope Coefficient	-1.28168	PF Power Coefficient	0.78080
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.1
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.6

## Vehicle Results

Average Speed, mi/h	53.6	Percent Followers, %	44.8
Segment Travel Time, minutes	1.12	Followers Density, followers/mi/ln	3.1
Vehicle LOS	B		



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## Project Information

Analyst	MAA	Date	6/16/2020
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Project Description	CR 519, CO 620 to Brookfield Dr	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	11	Shoulder Width, ft	5
Speed Limit, mi/h	50	Access Point Density, pts/mi	2.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	321	Opposing Demand Flow Rate, veh/h	245
Peak Hour Factor	0.85	Total Trucks, %	2.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.19

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.1
Speed Slope Coefficient	3.30909	Speed Power Coefficient	0.52759
PF Slope Coefficient	-1.24167	PF Power Coefficient	0.79289
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.4
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.6

## Vehicle Results

Average Speed, mi/h	53.6	Percent Followers, %	39.6
Segment Travel Time, minutes	1.12	Followers Density, followers/mi/ln	2.4
Vehicle LOS	A		

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## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	11	Shoulder Width, ft	5
Speed Limit, mi/h	50	Access Point Density, pts/mi	2.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	239	Opposing Demand Flow Rate, veh/h	314
Peak Hour Factor	0.87	Total Trucks, %	2.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.14

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.1
Speed Slope Coefficient	3.33055	Speed Power Coefficient	0.51240
PF Slope Coefficient	-1.25564	PF Power Coefficient	0.78856
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.5
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.9

## Vehicle Results

Average Speed, mi/h	53.9	Percent Followers, %	33.4
Segment Travel Time, minutes	1.11	Followers Density, followers/mi/ln	1.5
Vehicle LOS	A		

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## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	11	Shoulder Width, ft	5
Speed Limit, mi/h	50	Access Point Density, pts/mi	2.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	325	Opposing Demand Flow Rate, veh/h	254
Peak Hour Factor	0.91	Total Trucks, %	2.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.19

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.1
Speed Slope Coefficient	3.31209	Speed Power Coefficient	0.52540
PF Slope Coefficient	-1.24368	PF Power Coefficient	0.79228
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.4
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.6

## Vehicle Results

Average Speed, mi/h	53.6	Percent Followers, %	40.0
Segment Travel Time, minutes	1.12	Followers Density, followers/mi/ln	2.4
Vehicle LOS	A		

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## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	11	Shoulder Width, ft	5
Speed Limit, mi/h	50	Access Point Density, pts/mi	2.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	257	Opposing Demand Flow Rate, veh/h	329
Peak Hour Factor	0.90	Total Trucks, %	2.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.15

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.1
Speed Slope Coefficient	3.33492	Speed Power Coefficient	0.50943
PF Slope Coefficient	-1.25836	PF Power Coefficient	0.78770
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.7
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.8

## Vehicle Results

Average Speed, mi/h	53.8	Percent Followers, %	35.0
Segment Travel Time, minutes	1.11	Followers Density, followers/mi/ln	1.7
Vehicle LOS	A		



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## Project Information

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## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	5.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	405	Opposing Demand Flow Rate, veh/h	380
Peak Hour Factor	0.92	Total Trucks, %	7.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.24

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.2
Speed Slope Coefficient	3.35364	Speed Power Coefficient	0.50009
PF Slope Coefficient	-1.26602	PF Power Coefficient	0.78590
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.5
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.4

## Vehicle Results

Average Speed, mi/h	53.4	Percent Followers, %	46.4
Segment Travel Time, minutes	1.12	Followers Density, followers/mi/ln	3.5
Vehicle LOS	B		

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## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	5.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	380	Opposing Demand Flow Rate, veh/h	405
Peak Hour Factor	0.92	Total Trucks, %	7.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.22

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.2
Speed Slope Coefficient	3.36018	Speed Power Coefficient	0.49595
PF Slope Coefficient	-1.26981	PF Power Coefficient	0.78463
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.2
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.4

## Vehicle Results

Average Speed, mi/h	53.4	Percent Followers, %	44.8
Segment Travel Time, minutes	1.12	Followers Density, followers/mi/ln	3.2
Vehicle LOS	B		

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## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	5.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	475	Opposing Demand Flow Rate, veh/h	484
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.28

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.4
Speed Slope Coefficient	3.38665	Speed Power Coefficient	0.48428
PF Slope Coefficient	-1.28029	PF Power Coefficient	0.78074
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	4.6
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.2

## Vehicle Results

Average Speed, mi/h	53.2	Percent Followers, %	51.1
Segment Travel Time, minutes	1.13	Followers Density, followers/mi/ln	4.6
Vehicle LOS	B		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	CR 519, Reeder Rd to Grist Mill Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	5.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	484	Opposing Demand Flow Rate, veh/h	475
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.28

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.4
Speed Slope Coefficient	3.38460	Speed Power Coefficient	0.48549
PF Slope Coefficient	-1.27920	PF Power Coefficient	0.78113
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	4.7
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.2

## Vehicle Results

Average Speed, mi/h	53.2	Percent Followers, %	51.6
Segment Travel Time, minutes	1.13	Followers Density, followers/mi/ln	4.7
Vehicle LOS	B		



# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/17/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	CR 519, Fairway Rd to Hillside Ave	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	5
Speed Limit, mi/h	50	Access Point Density, pts/mi	4.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	210	Opposing Demand Flow Rate, veh/h	323
Peak Hour Factor	0.78	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.12

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	54.9
Speed Slope Coefficient	3.32061	Speed Power Coefficient	0.51056
PF Slope Coefficient	-1.25807	PF Power Coefficient	0.78748
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.2
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.8

## Vehicle Results

Average Speed, mi/h	53.8	Percent Followers, %	30.8
Segment Travel Time, minutes	1.11	Followers Density, followers/mi/ln	1.2
Vehicle LOS	A		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/17/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	CR 519, Fairway Rd to Hillside Ave	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	5
Speed Limit, mi/h	50	Access Point Density, pts/mi	4.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	271	Opposing Demand Flow Rate, veh/h	176
Peak Hour Factor	0.93	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.16

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	54.9
Speed Slope Coefficient	3.27194	Speed Power Coefficient	0.54619
PF Slope Coefficient	-1.22523	PF Power Coefficient	0.79744
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.8
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.7

## Vehicle Results

Average Speed, mi/h	53.7	Percent Followers, %	35.1
Segment Travel Time, minutes	1.12	Followers Density, followers/mi/ln	1.8
Vehicle LOS	A		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/17/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	CR 519, Fairway Rd to Hillside Ave	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	5
Speed Limit, mi/h	50	Access Point Density, pts/mi	4.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	418	Opposing Demand Flow Rate, veh/h	277
Peak Hour Factor	0.78	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.25

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	54.9
Speed Slope Coefficient	3.30679	Speed Power Coefficient	0.52014
PF Slope Coefficient	-1.24924	PF Power Coefficient	0.79024
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.7
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.1

## Vehicle Results

Average Speed, mi/h	53.1	Percent Followers, %	46.6
Segment Travel Time, minutes	1.13	Followers Density, followers/mi/ln	3.7
Vehicle LOS	B		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/17/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	CR 519, Fairway Rd to Hillside Ave	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	5
Speed Limit, mi/h	50	Access Point Density, pts/mi	4.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	248	Opposing Demand Flow Rate, veh/h	375
Peak Hour Factor	0.87	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.15

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	54.9
Speed Slope Coefficient	3.33494	Speed Power Coefficient	0.50108
PF Slope Coefficient	-1.26680	PF Power Coefficient	0.78467
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.6
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.6

## Vehicle Results

Average Speed, mi/h	53.6	Percent Followers, %	34.6
Segment Travel Time, minutes	1.12	Followers Density, followers/mi/ln	1.6
Vehicle LOS	A		



# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	CR 632, Shurts Rd to Halls Mill Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	3
Speed Limit, mi/h	45	Access Point Density, pts/mi	8.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	238	Opposing Demand Flow Rate, veh/h	188
Peak Hour Factor	0.92	Total Trucks, %	6.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.14

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	46.7
Speed Slope Coefficient	2.83200	Speed Power Coefficient	0.54268
PF Slope Coefficient	-1.24283	PF Power Coefficient	0.77043
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.8
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	45.7

## Vehicle Results

Average Speed, mi/h	45.7	Percent Followers, %	33.7
Segment Travel Time, minutes	1.31	Followers Density, followers/mi/ln	1.8
Vehicle LOS	A		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	CR 632, Shurts Rd to Halls Mill Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	3
Speed Limit, mi/h	45	Access Point Density, pts/mi	8.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	188	Opposing Demand Flow Rate, veh/h	238
Peak Hour Factor	0.92	Total Trucks, %	6.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.11

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	46.7
Speed Slope Coefficient	2.84978	Speed Power Coefficient	0.52922
PF Slope Coefficient	-1.25634	PF Power Coefficient	0.76680
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.2
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	45.9

## Vehicle Results

Average Speed, mi/h	45.9	Percent Followers, %	29.4
Segment Travel Time, minutes	1.31	Followers Density, followers/mi/ln	1.2
Vehicle LOS	A		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	CR 632, Shurts Rd to Halls Mill Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	3
Speed Limit, mi/h	45	Access Point Density, pts/mi	8.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	228	Opposing Demand Flow Rate, veh/h	290
Peak Hour Factor	0.92	Total Trucks, %	4.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.13

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	46.8
Speed Slope Coefficient	2.87005	Speed Power Coefficient	0.51726
PF Slope Coefficient	-1.26875	PF Power Coefficient	0.76342
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.7
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	45.8

## Vehicle Results

Average Speed, mi/h	45.8	Percent Followers, %	33.7
Segment Travel Time, minutes	1.31	Followers Density, followers/mi/ln	1.7
Vehicle LOS	A		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	CR 632, Shurts Rd to Halls Mill Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	3
Speed Limit, mi/h	45	Access Point Density, pts/mi	8.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	290	Opposing Demand Flow Rate, veh/h	228
Peak Hour Factor	0.92	Total Trucks, %	4.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.17

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	46.8
Speed Slope Coefficient	2.85007	Speed Power Coefficient	0.53168
PF Slope Coefficient	-1.25407	PF Power Coefficient	0.76740
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.4
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	45.6

## Vehicle Results

Average Speed, mi/h	45.6	Percent Followers, %	38.4
Segment Travel Time, minutes	1.32	Followers Density, followers/mi/ln	2.4
Vehicle LOS	A		





















## **2045 NO-BUILD INTERSECTION ANALYSIS**

# Lanes, Volumes, Timings

## 3: RT 519 & US 46

06/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	241	22	48	161	39	31	206	58	84	158	19
Future Volume (vph)	20	241	22	48	161	39	31	206	58	84	158	19
Satd. Flow (prot)	0	1835	0	0	1800	0	0	1848	1583	0	1833	1583
Flt Permitted		0.950			0.852			0.762			0.551	
Satd. Flow (perm)	0	1750	0	0	1547	0	0	1419	1583	0	1026	1583
Satd. Flow (RTOR)		10			25				81			61
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.71	0.76	0.69	0.80	0.77	0.65	0.78	0.94	0.85	0.91	0.84	0.53
Growth Factor	119%	119%	119%	119%	119%	119%	119%	119%	119%	119%	119%	119%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	449	0	0	391	0	0	308	81	0	334	43
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Total Split (s)	47.0	47.0		47.0	47.0		25.0	25.0	25.0	25.0	25.0	25.0
Total Lost Time (s)		7.0			7.0			5.0	5.0		5.0	5.0
Act Effect Green (s)		40.0			40.0			20.0	20.0		20.0	20.0
Actuated g/C Ratio		0.56			0.56			0.28	0.28		0.28	0.28
v/c Ratio		0.46			0.45			0.78	0.16		1.17	0.09
Control Delay		11.2			10.8			40.3	6.3		136.6	4.3
Queue Delay		0.0			0.0			0.0	0.0		0.0	0.0
Total Delay		11.2			10.8			40.3	6.3		136.6	4.3
LOS		B			B			D	A		F	A
Approach Delay		11.2			10.8			33.2			121.5	
Approach LOS		B			B			C			F	

### Intersection Summary

Cycle Length: 72

Actuated Cycle Length: 72

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 1.17

Intersection Signal Delay: 42.4

Intersection LOS: D

Intersection Capacity Utilization 77.9%

ICU Level of Service D

Analysis Period (min) 15



















Splits and Phases: 3: RT 519 & US 46



# Lanes, Volumes, Timings

## 3: RT 519 & US 46

06/23/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	168	17	32	270	63	35	169	44	99	179	36
Future Volume (vph)	23	168	17	32	270	63	35	169	44	99	179	36
Satd. Flow (prot)	0	1829	0	0	1801	0	0	1846	1583	0	1827	1583
Flt Permitted		0.920			0.948			0.551			0.548	
Satd. Flow (perm)	0	1691	0	0	1715	0	0	1026	1583	0	1021	1583
Satd. Flow (RTOR)		12			31				70			63
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.84	0.80	0.65	0.88	0.91	0.69	0.73	0.83	0.75	0.76	0.85	0.68
Growth Factor	119%	119%	119%	119%	119%	119%	119%	119%	119%	119%	119%	119%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	314	0	0	505	0	0	299	70	0	406	63
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Total Split (s)	47.0	47.0		47.0	47.0		25.0	25.0	25.0	25.0	25.0	25.0
Total Lost Time (s)		7.0			7.0			5.0	5.0		5.0	5.0
Act Effect Green (s)		40.0			40.0			20.0	20.0		20.0	20.0
Actuated g/C Ratio		0.56			0.56			0.28	0.28		0.28	0.28
v/c Ratio		0.33			0.52			1.05	0.14		1.43	0.13
Control Delay		9.6			11.8			96.6	6.5		240.5	6.7
Queue Delay		0.0			0.0			0.0	0.0		0.0	0.0
Total Delay		9.6			11.8			96.6	6.5		240.5	6.7
LOS		A			B			F	A		F	A
Approach Delay		9.6			11.8			79.5			209.1	
Approach LOS		A			B			E			F	

### Intersection Summary

Cycle Length: 72

Actuated Cycle Length: 72

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 1.43

Intersection Signal Delay: 82.3

Intersection LOS: F

Intersection Capacity Utilization 78.1%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 3: RT 519 & US 46



Intersection	
Intersection Delay, s/veh	21.3
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	48	149	8	36	90	32	5	169	44	30	109	30
Future Vol, veh/h	48	149	8	36	90	32	5	169	44	30	109	30
Peak Hour Factor	0.92	0.80	0.92	0.92	0.80	0.92	0.92	0.80	0.92	0.92	0.80	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	73	261	12	55	158	49	8	296	67	46	191	46
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	23.3	17.7	24.1	18.6
HCM LOS	C	C	C	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	2%	23%	23%	18%
Vol Thru, %	78%	73%	57%	64%
Vol Right, %	20%	4%	20%	18%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	218	205	158	169
LT Vol	5	48	36	30
Through Vol	169	149	90	109
RT Vol	44	8	32	30
Lane Flow Rate	370	346	261	282
Geometry Grp	1	1	1	1
Degree of Util (X)	0.698	0.672	0.518	0.554
Departure Headway (Hd)	6.782	6.991	7.151	7.065
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	533	515	504	511
Service Time	4.841	5.052	5.219	5.13
HCM Lane V/C Ratio	0.694	0.672	0.518	0.552
HCM Control Delay	24.1	23.3	17.7	18.6
HCM Lane LOS	C	C	C	C
HCM 95th-tile Q	5.4	5	2.9	3.3



Intersection	
Intersection Delay, s/veh	58.8
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	31	114	13	41	206	31	22	111	31	43	181	52
Future Vol, veh/h	31	114	13	41	206	31	22	111	31	43	181	52
Peak Hour Factor	0.92	0.80	0.92	0.92	0.80	0.92	0.92	0.80	0.92	0.92	0.80	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	47	200	20	62	361	47	33	194	47	65	317	79
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0












Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	26.6	82.5	27.1	72.1
HCM LOS	D	F	D	F

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	13%	20%	15%	16%
Vol Thru, %	68%	72%	74%	66%
Vol Right, %	19%	8%	11%	19%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	164	158	278	276
LT Vol	22	31	41	43
Through Vol	111	114	206	181
RT Vol	31	13	31	52
Lane Flow Rate	275	266	470	461
Geometry Grp	1	1	1	1
Degree of Util (X)	0.652	0.64	1.041	1.002
Departure Headway (Hd)	8.888	8.985	8.082	8.122
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	410	405	451	452
Service Time	6.888	6.985	6.082	6.122
HCM Lane V/C Ratio	0.671	0.657	1.042	1.02
HCM Control Delay	27.1	26.6	82.5	72.1
HCM Lane LOS	D	D	F	F
HCM 95th-tile Q	4.5	4.3	14.4	13

# HCM Unsignalized Intersection Capacity Analysis

## 3: CO 620 & RT 519












07/27/2020

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	216	11	192	259	11	202
Future Volume (Veh/h)	216	11	192	259	11	202
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.80	0.90	0.90	0.80	0.90
Hourly flow rate (vph)	278	16	247	334	16	260
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	539	247			247	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	539	247			247	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	44	98			99	
cM capacity (veh/h)	497	792			1319	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1		
Volume Total	294	247	334	276		
Volume Left	278	0	0	16		
Volume Right	16	0	334	0		
cSH	520	1700	1700	1319		
Volume to Capacity	0.57	0.15	0.20	0.01		
Queue Length 95th (ft)	87	0	0	1		
Control Delay (s)	20.6	0.0	0.0	0.6		
Lane LOS	C			A		
Approach Delay (s)	20.6	0.0		0.6		
Approach LOS	C					
Intersection Summary						
Average Delay			5.4			
Intersection Capacity Utilization			43.3%		ICU Level of Service	A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 3: CO 620 & RT 519










07/27/2020

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	314	11	290	328	8	242
Future Volume (Veh/h)	314	11	290	328	8	242
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.80	0.90	0.90	0.80	0.90
Hourly flow rate (vph)	405	16	374	423	12	312
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	710	374			374	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	710	374			374	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	98			99	
cM capacity (veh/h)	396	672			1184	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1		
Volume Total	421	374	423	324		
Volume Left	405	0	0	12		
Volume Right	16	0	423	0		
cSH	404	1700	1700	1184		
Volume to Capacity	1.04	0.22	0.25	0.01		
Queue Length 95th (ft)	342	0	0	1		
Control Delay (s)	88.6	0.0	0.0	0.4		
Lane LOS	F			A		
Approach Delay (s)	88.6	0.0		0.4		
Approach LOS	F					
Intersection Summary						
Average Delay		24.3				
Intersection Capacity Utilization		49.1%		ICU Level of Service		A
Analysis Period (min)		15				

# HCM Unsignalized Intersection Capacity Analysis

## 3: CR 519 Belvidere Rd & Foul Lift Rd

07/24/2020










						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	4	0	0	433	486	6
Future Volume (Veh/h)	4	0	0	433	486	6
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.90	0.90	0.80
Hourly flow rate (vph)	6	0	0	558	626	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1188	630	635			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1188	630	635			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	100	100			
cM capacity (veh/h)	208	481	958			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	6	558	635			
Volume Left	6	0	0			
Volume Right	0	0	9			
cSH	208	958	1700			
Volume to Capacity	0.03	0.00	0.37			
Queue Length 95th (ft)	2	0	0			
Control Delay (s)	22.8	0.0	0.0			
Lane LOS	C					
Approach Delay (s)	22.8	0.0	0.0			
Approach LOS	C					
<b>Intersection Summary</b>						
Average Delay		0.1				
Intersection Capacity Utilization		40.1%		ICU Level of Service		A
Analysis Period (min)		15				









# HCM Unsignalized Intersection Capacity Analysis

## 3: CR 519 Belvidere Rd & Foul Lift Rd

07/24/2020

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	3	1	2	499	529	7
Future Volume (Veh/h)	3	1	2	499	529	7
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.90	0.90	0.80
Hourly flow rate (vph)	4	1	3	643	682	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1336	687	692			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1336	687	692			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	100	100			
cM capacity (veh/h)	170	450	912			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	5	646	692			
Volume Left	4	3	0			
Volume Right	1	0	10			
cSH	195	912	1700			
Volume to Capacity	0.03	0.00	0.41			
Queue Length 95th (ft)	2	0	0			
Control Delay (s)	24.0	0.1	0.0			
Lane LOS	C	A				
Approach Delay (s)	24.0	0.1	0.0			
Approach LOS	C					
<b>Intersection Summary</b>						
Average Delay		0.1				
Intersection Capacity Utilization		42.8%		ICU Level of Service		A
Analysis Period (min)		15				

















Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	10	427	1	11	366
Future Vol, veh/h	8	10	427	1	11	366
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	80	80	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	15	538	1	14	461
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1028	539	0	0	539	0
Stage 1	539	-	-	-	-	-
Stage 2	489	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	259	542	-	-	1029	-
Stage 1	585	-	-	-	-	-
Stage 2	616	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	254	542	-	-	1029	-
Mov Cap-2 Maneuver	254	-	-	-	-	-
Stage 1	585	-	-	-	-	-
Stage 2	605	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	15.8	0		0.2		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	-	360	1029	-	
HCM Lane V/C Ratio	-	-	0.073	0.013	-	
HCM Control Delay (s)	-	-	15.8	8.5	0	
HCM Lane LOS	-	-	C	A	A	
HCM 95th %tile Q(veh)	-	-	0.2	0	-	

Intersection						
Int Delay, s/veh	0.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	16	12	474	0	18	511
Future Vol, veh/h	16	12	474	0	18	511
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	80	80	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	17	598	0	23	644
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1288	598	0	0	598	0
Stage 1	598	-	-	-	-	-
Stage 2	690	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	181	502	-	-	979	-
Stage 1	549	-	-	-	-	-
Stage 2	498	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	174	502	-	-	979	-
Mov Cap-2 Maneuver	174	-	-	-	-	-
Stage 1	549	-	-	-	-	-
Stage 2	480	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	22.9	0	0.3			
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	242	979	-	
HCM Lane V/C Ratio	-	-	0.168	0.023	-	
HCM Control Delay (s)	-	-	22.9	8.8	0	
HCM Lane LOS	-	-	C	A	A	
HCM 95th %tile Q(veh)	-	-	0.6	0.1	-	

# HCM Unsignalized Intersection Capacity Analysis

## 3: CR 519 Belvidere Rd & CR 622 Roxbury Station Rd/CR 622 Roxbury Hill Rd

07/24/2020

















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	1	6	7	1	10	8	444	3	1	415	11
Future Volume (Veh/h)	16	1	6	7	1	10	8	444	3	1	415	11
Sign Control	Stop				Stop				Free			
Grade	0%				0%				0%			
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.90	0.80	0.80	0.90	0.80
Hourly flow rate (vph)	23	1	9	10	1	15	12	577	4	1	540	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1168	1155	548	1162	1161	579	556				581	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1168	1155	548	1162	1161	579	556				581	
tC, single (s)	7.2	6.5	6.5	7.2	6.5	6.3	4.2				4.1	
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.6	3.6	4.0	3.4	2.3				2.2	
p0 queue free %	86	99	98	94	99	97	99				100	
cM capacity (veh/h)	160	196	486	157	194	500	976				1003	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	33	26	593	557								
Volume Left	23	10	12	1								
Volume Right	9	15	4	16								
cSH	197	264	976	1003								
Volume to Capacity	0.17	0.10	0.01	0.00								
Queue Length 95th (ft)	15	8	1	0								
Control Delay (s)	26.9	20.2	0.3	0.0								
Lane LOS	D	C	A	A								
Approach Delay (s)	26.9	20.2	0.3	0.0								
Approach LOS	D	C										
Intersection Summary												
Average Delay			1.3									
Intersection Capacity Utilization			44.6%	ICU Level of Service				A				
Analysis Period (min)			15									



# HCM Unsignalized Intersection Capacity Analysis

## 3: CR 519 Belvidere Rd & CR 622 Roxbury Station Rd/CR 622 Roxbury Hill Rd

07/24/2020





												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	1	23	4	1	1	12	501	3	4	385	18
Future Volume (Veh/h)	20	1	23	4	1	1	12	501	3	4	385	18
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.90	0.80	0.80	0.90	0.80
Hourly flow rate (vph)	29	1	34	6	1	1	18	651	4	6	501	26
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1216	1217	514	1250	1228	653	527			655		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1216	1217	514	1250	1228	653	527			655		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.6			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.7			2.2		
p0 queue free %	81	99	94	96	99	100	98			99		
cM capacity (veh/h)	151	177	557	138	175	471	836			942		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	64	8	673	533								
Volume Left	29	6	18	6								
Volume Right	34	1	4	26								
cSH	248	156	836	942								
Volume to Capacity	0.26	0.05	0.02	0.01								
Queue Length 95th (ft)	25	4	2	0								
Control Delay (s)	24.5	29.3	0.6	0.2								
Lane LOS	C	D	A	A								
Approach Delay (s)	24.5	29.3	0.6	0.2								
Approach LOS	C	D										
Intersection Summary												
Average Delay			1.8									
Intersection Capacity Utilization			49.8%	ICU Level of Service					A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 3: CR 519 Belvidere Rd & CR 621 Brainards Rd

07/24/2020







Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	7	54	45	361	389	7
Future Volume (Veh/h)	7	54	45	361	389	7
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.90	0.90	0.80
Hourly flow rate (vph)	10	78	65	465	501	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1101	506	511			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1101	506	511			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	86	94			
cM capacity (veh/h)	220	566	1065			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	88	65	465	511		
Volume Left	10	65	0	0		
Volume Right	78	0	0	10		
cSH	481	1065	1700	1700		
Volume to Capacity	0.18	0.06	0.27	0.30		
Queue Length 95th (ft)	17	5	0	0		
Control Delay (s)	14.2	8.6	0.0	0.0		
Lane LOS	B	A				
Approach Delay (s)	14.2	1.1	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			1.6			
Intersection Capacity Utilization			41.9%	ICU Level of Service		A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 3: CR 519 Belvidere Rd & CR 621 Brainards Rd

07/24/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	14	66	97	426	453	8
Future Volume (Veh/h)	14	66	97	426	453	8
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.90	0.90	0.80
Hourly flow rate (vph)	20	96	141	549	584	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1421	590	596			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1421	590	596			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	84	81	86			
cM capacity (veh/h)	129	508	990			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	116	141	549	596		
Volume Left	20	141	0	0		
Volume Right	96	0	0	12		
cSH	337	990	1700	1700		
Volume to Capacity	0.34	0.14	0.32	0.35		
Queue Length 95th (ft)	37	12	0	0		
Control Delay (s)	21.2	9.2	0.0	0.0		
Lane LOS	C	A				
Approach Delay (s)	21.2	1.9	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			2.7			
Intersection Capacity Utilization			50.1%		ICU Level of Service	
Analysis Period (min)			15			
			A			

# HCM Unsignalized Intersection Capacity Analysis

## 2: CR 646 Belvidere Rd/CR 519 Belvidere Rd & CR 519 Uniontown Rd

07/24/2020



Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (veh/h)	2	151	276	7	260	257
Future Volume (Veh/h)	2	151	276	7	260	257
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.80	0.90	0.90	0.80	0.90	0.90
Hourly flow rate (vph)	3	195	356	10	335	331
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1362	361			366	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1362	361			366	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	71			72	
cM capacity (veh/h)	118	677			1176	
Direction, Lane #	NB 1	NE 1	SW 1			
Volume Total	198	366	666			
Volume Left	3	0	335			
Volume Right	195	10	0			
cSH	632	1700	1176			
Volume to Capacity	0.31	0.22	0.28			
Queue Length 95th (ft)	33	0	30			
Control Delay (s)	13.3	0.0	6.3			
Lane LOS	B		A			
Approach Delay (s)	13.3	0.0	6.3			
Approach LOS	B					
Intersection Summary						
Average Delay			5.5			
Intersection Capacity Utilization			70.7%		ICU Level of Service	C
Analysis Period (min)			15			



# HCM Unsignalized Intersection Capacity Analysis

## 2: CR 646 Belvidere Rd/CR 519 Belvidere Rd & CR 519 Uniontown Rd

07/24/2020

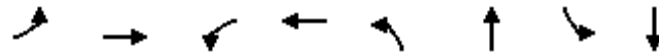


Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (veh/h)	10	293	285	4	217	288
Future Volume (Veh/h)	10	293	285	4	217	288
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.80	0.90	0.90	0.80	0.90	0.90
Hourly flow rate (vph)	15	378	367	6	280	371
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1301	370			373	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1301	370			373	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	44			76	
cM capacity (veh/h)	136	669			1169	
Direction, Lane #	NB 1	NE 1	SW 1			
Volume Total	393	373	651			
Volume Left	15	0	280			
Volume Right	378	6	0			
cSH	582	1700	1169			
Volume to Capacity	0.67	0.22	0.24			
Queue Length 95th (ft)	128	0	23			
Control Delay (s)	23.1	0.0	5.5			
Lane LOS	C		A			
Approach Delay (s)	23.1	0.0	5.5			
Approach LOS	C					
Intersection Summary						
Average Delay			8.9			
Intersection Capacity Utilization			80.9%		ICU Level of Service	D
Analysis Period (min)			15			

# Timings

## 3: CR 519 Uniontown Rd & NJ 57

07/24/2020



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕		↕		↕		↕
Traffic Volume (vph)	29	307	24	250	31	79	3	101
Future Volume (vph)	29	307	24	250	31	79	3	101
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	50.0	50.0	50.0	50.0	15.0	15.0	15.0	15.0
Minimum Split (s)	57.0	57.0	57.0	57.0	23.0	23.0	23.0	23.0
Total Split (s)	57.0	57.0	57.0	57.0	33.0	33.0	33.0	33.0
Total Split (%)	63.3%	63.3%	63.3%	63.3%	36.7%	36.7%	36.7%	36.7%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		0.0		0.0		0.0		0.0
Total Lost Time (s)		7.0		7.0		8.0		8.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	Min	Min	Min
Act Effect Green (s)		56.5		56.5		18.5		18.5
Actuated g/C Ratio		0.63		0.63		0.21		0.21
v/c Ratio		0.45		0.35		0.69		0.53
Control Delay		10.9		9.8		40.4		33.6
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		10.9		9.8		40.4		33.6
LOS		B		A		D		C
Approach Delay		10.9		9.8		40.4		33.6
Approach LOS		B		A		D		C

### Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 10.9 (12%), Referenced to phase 4:EBTL and 8:WBTL, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 19.4

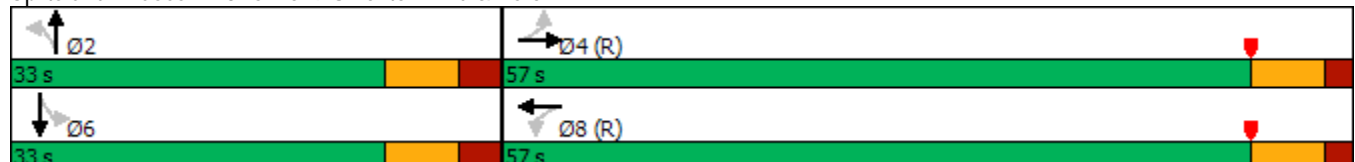
Intersection LOS: B

Intersection Capacity Utilization 83.1%

ICU Level of Service E

Analysis Period (min) 15

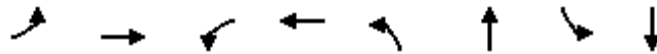
### Splits and Phases: 3: CR 519 Uniontown Rd & NJ 57



# Timings

## 3: CR 519 Uniontown Rd & NJ 57

07/24/2020



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕		↕		↕		↕
Traffic Volume (vph)	27	228	82	277	29	213	3	124
Future Volume (vph)	27	228	82	277	29	213	3	124
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	50.0	50.0	50.0	50.0	15.0	15.0	15.0	15.0
Minimum Split (s)	57.0	57.0	57.0	57.0	23.0	23.0	23.0	23.0
Total Split (s)	57.0	57.0	57.0	57.0	33.0	33.0	33.0	33.0
Total Split (%)	63.3%	63.3%	63.3%	63.3%	36.7%	36.7%	36.7%	36.7%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		0.0		0.0		0.0		0.0
Total Lost Time (s)		7.0		7.0		8.0		8.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	Min	Min	Min
Act Effect Green (s)		51.7		51.7		23.3		23.3
Actuated g/C Ratio		0.57		0.57		0.26		0.26
v/c Ratio		0.41		0.56		0.85		0.41
Control Delay		12.2		15.7		50.0		28.7
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		12.2		15.7		50.0		28.7
LOS		B		B		D		C
Approach Delay		12.2		15.7		50.0		28.7
Approach LOS		B		B		D		C

### Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 10.9 (12%), Referenced to phase 4:EBTL and 8:WBTL, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.85

Intersection Signal Delay: 25.5

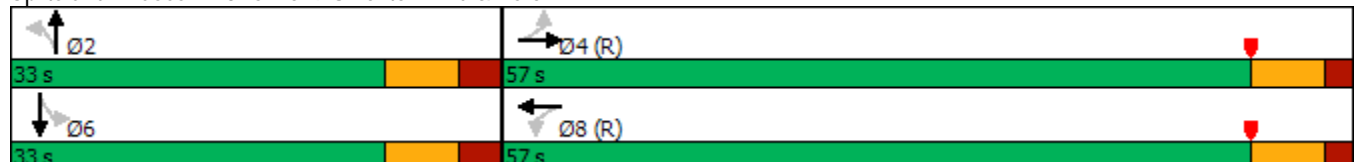
Intersection LOS: C

Intersection Capacity Utilization 89.6%

ICU Level of Service E

Analysis Period (min) 15











Splits and Phases: 3: CR 519 Uniontown Rd & NJ 57



# HCM Unsignalized Intersection Capacity Analysis

## 4: CR 519 Uniontown Rd & Strykers Rd

07/29/2020

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	88	213	77	128	222	58
Future Volume (Veh/h)	88	213	77	128	222	58
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.90	0.90	0.80
Hourly flow rate (vph)	128	309	112	165	286	84
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	717	328	370			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	717	328	370			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	65	57	91			
cM capacity (veh/h)	362	718	1200			
Direction, Lane #	EB 1	EB 2	NB 1	SB 1		
Volume Total	128	309	277	370		
Volume Left	128	0	112	0		
Volume Right	0	309	0	84		
cSH	362	718	1200	1700		
Volume to Capacity	0.35	0.43	0.09	0.22		
Queue Length 95th (ft)	39	54	8	0		
Control Delay (s)	20.3	13.7	3.9	0.0		
Lane LOS	C	B	A			
Approach Delay (s)	15.7		3.9	0.0		
Approach LOS	C					
Intersection Summary						
Average Delay			7.3			
Intersection Capacity Utilization			46.1%		ICU Level of Service	A
Analysis Period (min)			15			







# HCM Unsignalized Intersection Capacity Analysis

## 4: CR 519 Uniontown Rd & Strykers Rd

07/29/2020













Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	115	143	185	320	303	104
Future Volume (Veh/h)	115	143	185	320	303	104
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.90	0.90	0.80
Hourly flow rate (vph)	167	207	268	412	391	151
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1414	466	542			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1414	466	542			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	66	74			
cM capacity (veh/h)	114	600	1037			
Direction, Lane #	EB 1	EB 2	NB 1	SB 1		
Volume Total	167	207	680	542		
Volume Left	167	0	268	0		
Volume Right	0	207	0	151		
cSH	114	600	1037	1700		
Volume to Capacity	1.47	0.34	0.26	0.32		
Queue Length 95th (ft)	298	38	26	0		
Control Delay (s)	322.1	14.1	5.8	0.0		
Lane LOS	F	B	A			
Approach Delay (s)	151.6		5.8	0.0		
Approach LOS	F					
Intersection Summary						
Average Delay			38.0			
Intersection Capacity Utilization			74.6%	ICU Level of Service		D
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 4: CO 632 & I-78 WB ramp











06/25/2020

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	50	55	0	72	63	0
Future Volume (Veh/h)	50	55	0	72	63	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	64	71	0	92	81	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	173	81	81			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	173	81	81			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	92	93	100			
cM capacity (veh/h)	817	979	1517			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	135	92	81			
Volume Left	64	0	0			
Volume Right	71	0	0			
cSH	1723	1700	1700			
Volume to Capacity	0.08	0.05	0.05			
Queue Length 95th (ft)	6	0	0			
Control Delay (s)	9.4	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	9.4	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay		4.1				
Intersection Capacity Utilization		14.6%		ICU Level of Service		A
Analysis Period (min)		15				

# HCM Unsignalized Intersection Capacity Analysis

## 4: CO 632 & I-78 WB ramp

06/25/2020

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	52	40	0	88	24	0
Future Volume (Veh/h)	52	40	0	88	24	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	67	51	0	113	31	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	144	31	31			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	144	31	31			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	92	95	100			
cM capacity (veh/h)	849	1043	1582			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	118	113	31			
Volume Left	67	0	0			
Volume Right	51	0	0			
cSH	1494	1700	1700			
Volume to Capacity	0.08	0.07	0.02			
Queue Length 95th (ft)	6	0	0			
Control Delay (s)	9.2	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	9.2	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay		4.1				
Intersection Capacity Utilization		15.5%		ICU Level of Service		A
Analysis Period (min)		15				

## **2045 NO-BUILD MID-BLOCK ANALYSIS**



# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	CR 519, northeast of CO 610	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	3
Speed Limit, mi/h	50	Access Point Density, pts/mi	9.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	343	Opposing Demand Flow Rate, veh/h	291
Peak Hour Factor	0.92	Total Trucks, %	2.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.20

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	52.6
Speed Slope Coefficient	3.18564	Speed Power Coefficient	0.51703
PF Slope Coefficient	-1.25954	PF Power Coefficient	0.78214
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.8
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	51.0

## Vehicle Results

Average Speed, mi/h	51.0	Percent Followers, %	42.1
Segment Travel Time, minutes	1.18	Followers Density, followers/mi/ln	2.8
Vehicle LOS	B		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	CR 519, northeast of CO 610	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	3
Speed Limit, mi/h	50	Access Point Density, pts/mi	9.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	291	Opposing Demand Flow Rate, veh/h	343
Peak Hour Factor	0.92	Total Trucks, %	2.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.17

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	52.6
Speed Slope Coefficient	3.20083	Speed Power Coefficient	0.50667
PF Slope Coefficient	-1.26944	PF Power Coefficient	0.77916
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.2
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	51.2

## Vehicle Results

Average Speed, mi/h	51.2	Percent Followers, %	38.5
Segment Travel Time, minutes	1.17	Followers Density, followers/mi/ln	2.2
Vehicle LOS	A		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	CR 519, northeast of CO 610	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	3
Speed Limit, mi/h	50	Access Point Density, pts/mi	9.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	303	Opposing Demand Flow Rate, veh/h	399
Peak Hour Factor	0.92	Total Trucks, %	2.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.18

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	52.6
Speed Slope Coefficient	3.21576	Speed Power Coefficient	0.49701
PF Slope Coefficient	-1.27872	PF Power Coefficient	0.77628
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.4
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	51.1

## Vehicle Results

Average Speed, mi/h	51.1	Percent Followers, %	39.7
Segment Travel Time, minutes	1.17	Followers Density, followers/mi/ln	2.4
Vehicle LOS	A		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	CR 519, northeast of CO 610	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	3
Speed Limit, mi/h	50	Access Point Density, pts/mi	9.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	399	Opposing Demand Flow Rate, veh/h	303
Peak Hour Factor	0.92	Total Trucks, %	2.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.23

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	52.6
Speed Slope Coefficient	3.18924	Speed Power Coefficient	0.51453
PF Slope Coefficient	-1.26192	PF Power Coefficient	0.78143
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.6
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	50.9

## Vehicle Results

Average Speed, mi/h	50.9	Percent Followers, %	46.0
Segment Travel Time, minutes	1.18	Followers Density, followers/mi/ln	3.6
Vehicle LOS	B		



# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/17/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	CR 519, Stone Hedge Rd to Hope Crossing Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	0.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	385	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.80	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.23

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	56.9
Speed Slope Coefficient	3.64416	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.32222	PF Power Coefficient	0.75266
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.3
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	54.7

## Vehicle Results

Average Speed, mi/h	54.7	Percent Followers, %	47.5
Segment Travel Time, minutes	1.10	Followers Density, followers/mi/ln	3.3
Vehicle LOS	B		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/17/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	CR 519, Stone Hedge Rd to Hope Crossing Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	0.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	386	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.84	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.23

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	56.9
Speed Slope Coefficient	3.64416	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.32222	PF Power Coefficient	0.75266
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.4
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	54.7

## Vehicle Results

Average Speed, mi/h	54.7	Percent Followers, %	47.6
Segment Travel Time, minutes	1.10	Followers Density, followers/mi/ln	3.4
Vehicle LOS	B		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/17/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	CR 519, Stone Hedge Rd to Hope Crossing Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	0.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	334	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.90	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.20

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	56.9
Speed Slope Coefficient	3.64416	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.32222	PF Power Coefficient	0.75266
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.7
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	54.9

## Vehicle Results

Average Speed, mi/h	54.9	Percent Followers, %	44.0
Segment Travel Time, minutes	1.09	Followers Density, followers/mi/ln	2.7
Vehicle LOS	B		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/17/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	CR 519, Stone Hedge Rd to Hope Crossing Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	0.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	427	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.82	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.25

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	56.9
Speed Slope Coefficient	3.64416	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.32222	PF Power Coefficient	0.75266
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.9
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	54.6

## Vehicle Results

Average Speed, mi/h	54.6	Percent Followers, %	50.2
Segment Travel Time, minutes	1.10	Followers Density, followers/mi/ln	3.9
Vehicle LOS	B		



# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	CR 519, CO 623 Brass Castle Rd to Pequest Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	4.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	567	Opposing Demand Flow Rate, veh/h	445
Peak Hour Factor	0.88	Total Trucks, %	0.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.33

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.7
Speed Slope Coefficient	3.39642	Speed Power Coefficient	0.48975
PF Slope Coefficient	-1.27423	PF Power Coefficient	0.78308
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	5.9
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.4

## Vehicle Results

Average Speed, mi/h	53.4	Percent Followers, %	55.8
Segment Travel Time, minutes	1.12	Followers Density, followers/mi/ln	5.9
Vehicle LOS	C		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	CR 519, CO 623 Brass Castle Rd to Pequest Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	4.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	426	Opposing Demand Flow Rate, veh/h	542
Peak Hour Factor	0.92	Total Trucks, %	0.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.25

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.7
Speed Slope Coefficient	3.41906	Speed Power Coefficient	0.47664
PF Slope Coefficient	-1.28592	PF Power Coefficient	0.77876
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.8
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.7

## Vehicle Results

Average Speed, mi/h	53.7	Percent Followers, %	48.4
Segment Travel Time, minutes	1.12	Followers Density, followers/mi/ln	3.8
Vehicle LOS	B		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	CR 519, CO 623 Brass Castle Rd to Pequest Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	4.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	647	Opposing Demand Flow Rate, veh/h	481
Peak Hour Factor	0.85	Total Trucks, %	7.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.38

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.5
Speed Slope Coefficient	3.39239	Speed Power Coefficient	0.48463
PF Slope Coefficient	-1.27901	PF Power Coefficient	0.78178
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	7.3
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	52.9

## Vehicle Results

Average Speed, mi/h	52.9	Percent Followers, %	59.8
Segment Travel Time, minutes	1.13	Followers Density, followers/mi/ln	7.3
Vehicle LOS	C		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	CR 519, CO 623 Brass Castle Rd to Pequest Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	4.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	431	Opposing Demand Flow Rate, veh/h	579
Peak Hour Factor	0.95	Total Trucks, %	7.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.25

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.5
Speed Slope Coefficient	3.41442	Speed Power Coefficient	0.47228
PF Slope Coefficient	-1.29002	PF Power Coefficient	0.77761
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.9
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.4

## Vehicle Results

Average Speed, mi/h	53.4	Percent Followers, %	48.8
Segment Travel Time, minutes	1.12	Followers Density, followers/mi/ln	3.9
Vehicle LOS	B		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	CR 519, CO 620 to Brookfield Dr	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	11	Shoulder Width, ft	5
Speed Limit, mi/h	50	Access Point Density, pts/mi	2.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	369	Opposing Demand Flow Rate, veh/h	281
Peak Hour Factor	0.85	Total Trucks, %	2.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.22

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.1
Speed Slope Coefficient	3.32075	Speed Power Coefficient	0.51921
PF Slope Coefficient	-1.24938	PF Power Coefficient	0.79052
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.0
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.5

## Vehicle Results

Average Speed, mi/h	53.5	Percent Followers, %	43.4
Segment Travel Time, minutes	1.12	Followers Density, followers/mi/ln	3.0
Vehicle LOS	B		



# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	CR 519, CO 620 to Brookfield Dr	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	11	Shoulder Width, ft	5
Speed Limit, mi/h	50	Access Point Density, pts/mi	2.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	275	Opposing Demand Flow Rate, veh/h	361
Peak Hour Factor	0.87	Total Trucks, %	2.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.16

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.1
Speed Slope Coefficient	3.34386	Speed Power Coefficient	0.50350
PF Slope Coefficient	-1.26381	PF Power Coefficient	0.78594
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.9
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.7

## Vehicle Results

Average Speed, mi/h	53.7	Percent Followers, %	36.7
Segment Travel Time, minutes	1.12	Followers Density, followers/mi/ln	1.9
Vehicle LOS	A		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	CR 519, CO 620 to Brookfield Dr	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	11	Shoulder Width, ft	5
Speed Limit, mi/h	50	Access Point Density, pts/mi	2.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	374	Opposing Demand Flow Rate, veh/h	292
Peak Hour Factor	0.91	Total Trucks, %	2.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.22

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.1
Speed Slope Coefficient	3.32416	Speed Power Coefficient	0.51681
PF Slope Coefficient	-1.25158	PF Power Coefficient	0.78984
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.1
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.4

## Vehicle Results

Average Speed, mi/h	53.4	Percent Followers, %	43.7
Segment Travel Time, minutes	1.12	Followers Density, followers/mi/ln	3.1
Vehicle LOS	B		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	CR 519, CO 620 to Brookfield Dr	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	11	Shoulder Width, ft	5
Speed Limit, mi/h	50	Access Point Density, pts/mi	2.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	296	Opposing Demand Flow Rate, veh/h	378
Peak Hour Factor	0.90	Total Trucks, %	2.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.17

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.1
Speed Slope Coefficient	3.34841	Speed Power Coefficient	0.50055
PF Slope Coefficient	-1.26651	PF Power Coefficient	0.78505
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.1
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.7

## Vehicle Results

Average Speed, mi/h	53.7	Percent Followers, %	38.5
Segment Travel Time, minutes	1.12	Followers Density, followers/mi/ln	2.1
Vehicle LOS	A		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	CR 519, Reeder Rd to Grist Mill Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	5.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	467	Opposing Demand Flow Rate, veh/h	438
Peak Hour Factor	0.92	Total Trucks, %	7.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.27

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.2
Speed Slope Coefficient	3.36841	Speed Power Coefficient	0.49086
PF Slope Coefficient	-1.27444	PF Power Coefficient	0.78305
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	4.4
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.2

## Vehicle Results

Average Speed, mi/h	53.2	Percent Followers, %	50.5
Segment Travel Time, minutes	1.13	Followers Density, followers/mi/ln	4.4
Vehicle LOS	B		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	CR 519, Reeder Rd to Grist Mill Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	5.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	438	Opposing Demand Flow Rate, veh/h	467
Peak Hour Factor	0.92	Total Trucks, %	7.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.26

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.2
Speed Slope Coefficient	3.37556	Speed Power Coefficient	0.48656
PF Slope Coefficient	-1.27833	PF Power Coefficient	0.78168
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	4.0
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.2

## Vehicle Results

Average Speed, mi/h	53.2	Percent Followers, %	48.9
Segment Travel Time, minutes	1.13	Followers Density, followers/mi/ln	4.0
Vehicle LOS	B		



# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	CR 519, Reeder Rd to Grist Mill Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	5.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	547	Opposing Demand Flow Rate, veh/h	557
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.32

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.4
Speed Slope Coefficient	3.40322	Speed Power Coefficient	0.47492
PF Slope Coefficient	-1.28868	PF Power Coefficient	0.77760
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	5.7
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.0

## Vehicle Results

Average Speed, mi/h	53.0	Percent Followers, %	55.3
Segment Travel Time, minutes	1.13	Followers Density, followers/mi/ln	5.7
Vehicle LOS	C		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	CR 519, Reeder Rd to Grist Mill Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	5.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	557	Opposing Demand Flow Rate, veh/h	547
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.33

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.4
Speed Slope Coefficient	3.40106	Speed Power Coefficient	0.47611
PF Slope Coefficient	-1.28762	PF Power Coefficient	0.77801
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	5.9
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.0

## Vehicle Results

Average Speed, mi/h	53.0	Percent Followers, %	55.8
Segment Travel Time, minutes	1.13	Followers Density, followers/mi/ln	5.9
Vehicle LOS	C		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/17/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	CR 519, Fairway Rd to Hillside Ave	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	5
Speed Limit, mi/h	50	Access Point Density, pts/mi	4.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	242	Opposing Demand Flow Rate, veh/h	372
Peak Hour Factor	0.78	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.14

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	54.9
Speed Slope Coefficient	3.33416	Speed Power Coefficient	0.50158
PF Slope Coefficient	-1.26634	PF Power Coefficient	0.78482
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.5
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.6

## Vehicle Results

Average Speed, mi/h	53.6	Percent Followers, %	34.1
Segment Travel Time, minutes	1.12	Followers Density, followers/mi/ln	1.5
Vehicle LOS	A		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/17/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	CR 519, Fairway Rd to Hillside Ave	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	5
Speed Limit, mi/h	50	Access Point Density, pts/mi	4.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	312	Opposing Demand Flow Rate, veh/h	203
Peak Hour Factor	0.93	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.18

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	54.9
Speed Slope Coefficient	3.28206	Speed Power Coefficient	0.53834
PF Slope Coefficient	-1.23245	PF Power Coefficient	0.79531
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.3
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.5

## Vehicle Results

Average Speed, mi/h	53.5	Percent Followers, %	38.6
Segment Travel Time, minutes	1.12	Followers Density, followers/mi/ln	2.3
Vehicle LOS	A		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/17/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	CR 519, Fairway Rd to Hillside Ave	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	5
Speed Limit, mi/h	50	Access Point Density, pts/mi	4.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	481	Opposing Demand Flow Rate, veh/h	319
Peak Hour Factor	0.78	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.28

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	54.9
Speed Slope Coefficient	3.31949	Speed Power Coefficient	0.51132
PF Slope Coefficient	-1.25738	PF Power Coefficient	0.78770
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	4.6
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	52.9

## Vehicle Results

Average Speed, mi/h	52.9	Percent Followers, %	50.6
Segment Travel Time, minutes	1.13	Followers Density, followers/mi/ln	4.6
Vehicle LOS	B		



# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/17/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	CR 519, Fairway Rd to Hillside Ave	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	5
Speed Limit, mi/h	50	Access Point Density, pts/mi	4.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	286	Opposing Demand Flow Rate, veh/h	431
Peak Hour Factor	0.87	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.17

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	54.9
Speed Slope Coefficient	3.34950	Speed Power Coefficient	0.49192
PF Slope Coefficient	-1.27520	PF Power Coefficient	0.78186
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.0
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.4

## Vehicle Results

Average Speed, mi/h	53.4	Percent Followers, %	38.1
Segment Travel Time, minutes	1.12	Followers Density, followers/mi/ln	2.0
Vehicle LOS	A		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	CR 632, Shurts Rd to Halls Mill Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	3
Speed Limit, mi/h	45	Access Point Density, pts/mi	8.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	275	Opposing Demand Flow Rate, veh/h	216
Peak Hour Factor	0.92	Total Trucks, %	6.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.16

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	46.7
Speed Slope Coefficient	2.84231	Speed Power Coefficient	0.53479
PF Slope Coefficient	-1.25072	PF Power Coefficient	0.76831
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.2
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	45.6

## Vehicle Results

Average Speed, mi/h	45.6	Percent Followers, %	37.1
Segment Travel Time, minutes	1.32	Followers Density, followers/mi/ln	2.2
Vehicle LOS	A		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	CR 632, Shurts Rd to Halls Mill Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	3
Speed Limit, mi/h	45	Access Point Density, pts/mi	8.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	216	Opposing Demand Flow Rate, veh/h	275
Peak Hour Factor	0.92	Total Trucks, %	6.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.13

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	46.7
Speed Slope Coefficient	2.86175	Speed Power Coefficient	0.52056
PF Slope Coefficient	-1.26516	PF Power Coefficient	0.76441
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.5
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	45.8

## Vehicle Results

Average Speed, mi/h	45.8	Percent Followers, %	32.5
Segment Travel Time, minutes	1.31	Followers Density, followers/mi/ln	1.5
Vehicle LOS	A		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	CR 632, Shurts Rd to Halls Mill Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	3
Speed Limit, mi/h	45	Access Point Density, pts/mi	8.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	263	Opposing Demand Flow Rate, veh/h	334
Peak Hour Factor	0.92	Total Trucks, %	4.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.15

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	46.8
Speed Slope Coefficient	2.88282	Speed Power Coefficient	0.50851
PF Slope Coefficient	-1.27779	PF Power Coefficient	0.76093
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.1
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	45.6

## Vehicle Results

Average Speed, mi/h	45.6	Percent Followers, %	37.0
Segment Travel Time, minutes	1.32	Followers Density, followers/mi/ln	2.1
Vehicle LOS	A		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	CR 632, Shurts Rd to Halls Mill Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	3
Speed Limit, mi/h	45	Access Point Density, pts/mi	8.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	334	Opposing Demand Flow Rate, veh/h	263
Peak Hour Factor	0.92	Total Trucks, %	4.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.20

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	46.8
Speed Slope Coefficient	2.86158	Speed Power Coefficient	0.52326
PF Slope Coefficient	-1.26260	PF Power Coefficient	0.76509
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.1
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	45.4

## Vehicle Results

Average Speed, mi/h	45.4	Percent Followers, %	42.0
Segment Travel Time, minutes	1.32	Followers Density, followers/mi/ln	3.1
Vehicle LOS	B		



















## **2045 BUILD INTERSECTION ANALYSIS**

# Timings

## 3: RT 519 & US 46

06/25/2020

										
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	24	287	132	450	37	206	58	235	441	56
Future Volume (vph)	24	287	132	450	37	206	58	235	441	56
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	40.0	40.0	40.0	40.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	47.0	47.0	47.0	47.0	12.0	12.0	12.0	12.0	12.0	12.0
Total Split (s)	47.0	47.0	47.0	47.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (%)	65.3%	65.3%	65.3%	65.3%	34.7%	34.7%	34.7%	34.7%	34.7%	34.7%
Yellow Time (s)	5.0	5.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)		7.0		7.0		5.0	5.0		5.0	5.0
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max	Max
Act Efect Green (s)		40.0		40.0		20.0	20.0		20.0	20.0
Actuated g/C Ratio		0.56		0.56		0.28	0.28		0.28	0.28
v/c Ratio		0.46		1.06		2.68	0.14		2.40	0.14
Control Delay		11.3		65.8		800.2	6.6		659.2	8.0
Queue Delay		0.0		0.0		0.0	0.0		0.0	0.0
Total Delay		11.3		65.8		800.2	6.6		659.2	8.0
LOS		B		E		F	A		F	A
Approach Delay		11.3		65.8		638.1			605.8	
Approach LOS		B		E		F			F	
Intersection Summary										
Cycle Length: 72										
Actuated Cycle Length: 72										
Natural Cycle: 150										
Control Type: Semi Act-Uncoord										
Maximum v/c Ratio: 2.68										
Intersection Signal Delay: 315.9					Intersection LOS: F					
Intersection Capacity Utilization 135.3%					ICU Level of Service H					
Analysis Period (min) 15										

Splits and Phases: 3: RT 519 & US 46



# Timings

## 3: RT 519 & US 46

06/25/2020



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔		↔	↔		↔	↔
Traffic Volume (vph)	51	380	59	498	80	388	102	118	213	43
Future Volume (vph)	51	380	59	498	80	388	102	118	213	43
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	40.0	40.0	40.0	40.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	47.0	47.0	47.0	47.0	12.0	12.0	12.0	12.0	12.0	12.0
Total Split (s)	47.0	47.0	47.0	47.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (%)	65.3%	65.3%	65.3%	65.3%	34.7%	34.7%	34.7%	34.7%	34.7%	34.7%
Yellow Time (s)	5.0	5.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)		7.0		7.0		5.0	5.0		5.0	5.0
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max	Max
Act Effect Green (s)		40.0		40.0		20.0	20.0		20.0	20.0
Actuated g/C Ratio		0.56		0.56		0.28	0.28		0.28	0.28
v/c Ratio		0.65		0.82		2.48	0.24		5.70	0.11
Control Delay		15.3		22.3		695.8	5.6		2155.2	6.0
Queue Delay		0.0		0.0		0.0	0.0		0.0	0.0
Total Delay		15.3		22.3		695.8	5.6		2155.2	6.0
LOS		B		C		F	A		F	A
Approach Delay		15.3		22.3		568.7			1899.0	
Approach LOS		B		C		F			F	

### Intersection Summary

Cycle Length: 72

Actuated Cycle Length: 72

Natural Cycle: 100

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 5.70

Intersection Signal Delay: 514.4

Intersection LOS: F

Intersection Capacity Utilization 102.6%

ICU Level of Service G

Analysis Period (min) 15

















Splits and Phases: 3: RT 519 & US 46



# HCM Unsignalized Intersection Capacity Analysis

## 3: CR 519 & CR 623

















06/25/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	74	315	44	227	598	199	7	237	62	152	561	152
Future Volume (vph)	74	315	44	227	598	199	7	237	62	152	561	152
Peak Hour Factor	0.92	0.80	0.92	0.92	0.80	0.92	0.92	0.80	0.92	0.92	0.80	0.92
Hourly flow rate (vph)	80	394	48	247	748	216	8	296	67	165	701	165
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	522	1211	371	1031								
Volume Left (vph)	80	247	8	165								
Volume Right (vph)	48	216	67	165								
Hadj (s)	0.01	-0.03	-0.07	-0.03								
Departure Headway (s)	9.5	9.5	9.5	9.5								
Degree Utilization, x	1.38	3.19	0.98	2.72								
Capacity (veh/h)	387	393	371	390								
Control Delay (s)	213.2	1011.0	72.5	799.1								
Approach Delay (s)	213.2	1011.0	72.5	799.1								
Approach LOS	F	F	F	F								
Intersection Summary												
Delay				697.4								
Level of Service				F								
Intersection Capacity Utilization				156.5%	ICU Level of Service	H						
Analysis Period (min)				15								

# HCM Unsignalized Intersection Capacity Analysis

## 3: CR 519 & CR 623

06/25/2020












																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Sign Control		Stop			Stop			Stop			Stop									
Traffic Volume (vph)	105	397	48	57	288	43	155	802	224	60	253	73								
Future Volume (vph)	105	397	48	57	288	43	155	802	224	60	253	73								
Peak Hour Factor	0.92	0.80	0.92	0.92	0.80	0.92	0.92	0.80	0.92	0.92	0.80	0.92								
Hourly flow rate (vph)	114	496	52	62	360	47	168	1003	243	65	316	79								
Direction, Lane #	EB 1	WB 1	NB 1	SB 1																
Volume Total (vph)	662	469	1414	460																
Volume Left (vph)	114	62	168	65																
Volume Right (vph)	52	47	243	79																
Hadj (s)	0.02	0.00	-0.05	-0.04																
Departure Headway (s)	9.6	9.6	9.5	9.5																
Degree Utilization, x	1.76	1.25	3.74	1.22																
Capacity (veh/h)	380	382	382	383																
Control Delay (s)	376.7	159.7	1257.9	148.5																
Approach Delay (s)	376.7	159.7	1257.9	148.5																
Approach LOS	F	F	F	F																
Intersection Summary																				
Delay	722.6																			
Level of Service	F																			
Intersection Capacity Utilization	132.3%				ICU Level of Service				H											
Analysis Period (min)	15																			



# HCM Unsignalized Intersection Capacity Analysis

## 3: CO 620 & RT 519












07/27/2020

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1501	75	843	300	13	1734
Future Volume (Veh/h)	1501	75	843	300	13	1734
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.80	0.90	0.90	0.80	0.90
Hourly flow rate (vph)	1668	94	937	333	16	1927
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2896	937			937	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2896	937			937	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	71			98	
cM capacity (veh/h)	17	321			731	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1		
Volume Total	1762	937	333	1943		
Volume Left	1668	0	0	16		
Volume Right	94	0	333	0		
cSH	18	1700	1700	731		
Volume to Capacity	97.24	0.55	0.20	0.02		
Queue Length 95th (ft)	Err	0	0	2		
Control Delay (s)	Err	0.0	0.0	0.1		
Lane LOS	F			A		
Approach Delay (s)	Err	0.0		0.1		
Approach LOS	F					
Intersection Summary						
Average Delay		3541.4				
Intersection Capacity Utilization		191.4%		ICU Level of Service		H
Analysis Period (min)		15				

# HCM Unsignalized Intersection Capacity Analysis

## 3: CO 620 & RT 519

07/27/2020

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	364	513	2236	1280	9	756
Future Volume (Veh/h)	364	513	2236	1280	9	756
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.80	0.90	0.90	0.80	0.90
Hourly flow rate (vph)	404	641	2484	1422	11	840
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	3346	2484			2484	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3346	2484			2484	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	0			94	
cM capacity (veh/h)	8	38			185	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1		
Volume Total	1045	2484	1422	851		
Volume Left	404	0	0	11		
Volume Right	641	0	1422	0		
cSH	16	1700	1700	185		
Volume to Capacity	65.12	1.46	0.84	0.06		
Queue Length 95th (ft)	Err	0	0	5		
Control Delay (s)	Err	0.0	0.0	3.3		
Lane LOS	F			A		
Approach Delay (s)	Err	0.0		3.3		
Approach LOS	F					
Intersection Summary						
Average Delay		1801.4				
Intersection Capacity Utilization		156.1%		ICU Level of Service		H
Analysis Period (min)		15				

# HCM Unsignalized Intersection Capacity Analysis

## 3: CR 519 Belvidere Rd & Foul Lift Rd

07/24/2020












Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	650	50	750	1128	1838	1607
Future Volume (Veh/h)	650	50	750	1128	1838	1607
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.90	0.90	0.80
Hourly flow rate (vph)	813	63	938	1253	2042	2009
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	6176	3046	4051			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	6176	3046	4051			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	0	0			
cM capacity (veh/h)	0	17	44			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	876	2191	4051			
Volume Left	813	938	0			
Volume Right	63	0	2009			
cSH	0	44	1700			
Volume to Capacity	Err	21.39	2.38			
Queue Length 95th (ft)	Err	Err	0			
Control Delay (s)	Err	9346.8	0.0			
Lane LOS	F	F				
Approach Delay (s)	Err	9346.8	0.0			
Approach LOS	F					
<b>Intersection Summary</b>						
Average Delay			Err			
Intersection Capacity Utilization		344.9%		ICU Level of Service		H
Analysis Period (min)		15				

# HCM Unsignalized Intersection Capacity Analysis

## 3: CR 519 Belvidere Rd & Foul Lift Rd










07/24/2020

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1103	1001	2	1129	1064	458
Future Volume (Veh/h)	1103	1001	2	1129	1064	458
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.90	0.90	0.80
Hourly flow rate (vph)	1379	1251	3	1254	1182	573
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2728	1468	1755			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2728	1468	1755			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	0	99			
cM capacity (veh/h)	23	158	361			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	2630	1257	1755			
Volume Left	1379	3	0			
Volume Right	1251	0	573			
cSH	38	361	1700			
Volume to Capacity	68.46	0.01	1.03			
Queue Length 95th (ft)	Err	1	0			
Control Delay (s)	Err	0.5	0.0			
Lane LOS	F	A				
Approach Delay (s)	Err	0.5	0.0			
Approach LOS	F					
<b>Intersection Summary</b>						
Average Delay		4661.1				
Intersection Capacity Utilization		213.0%		ICU Level of Service		H
Analysis Period (min)		15				

# HCM Unsignalized Intersection Capacity Analysis

## 3: RT 519 & CO 626

06/25/2020










						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	188	250	427	1	100	3060
Future Volume (Veh/h)	188	250	427	1	100	3060
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.80	0.80	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	235	313	464	1	109	3326
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	4008	464			465	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	4008	464			465	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	48			90	
cM capacity (veh/h)	3	598			1096	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	548	465	3435			
Volume Left	235	0	109			
Volume Right	313	1	0			
cSH	7	1700	1096			
Volume to Capacity	81.69	0.27	0.10			
Queue Length 95th (ft)	Err	0	8			
Control Delay (s)	Err	0.0	0.3			
Lane LOS	F		A			
Approach Delay (s)	Err	0.0	0.3			
Approach LOS	F					
Intersection Summary						
Average Delay		1232.1				
Intersection Capacity Utilization		224.9%		ICU Level of Service		H
Analysis Period (min)		15				



# HCM Unsignalized Intersection Capacity Analysis

3: RT 519 & CO 626

















06/25/2020

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	65	50	1654	12	32	992
Future Volume (Veh/h)	65	50	1654	12	32	992
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.80	0.80	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	81	63	1798	13	35	1078
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2952	1804			1811	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2952	1804			1811	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	36			90	
cM capacity (veh/h)	14	99			339	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	144	1811	1113			
Volume Left	81	0	35			
Volume Right	63	13	0			
cSH	23	1700	339			
Volume to Capacity	6.23	1.07	0.10			
Queue Length 95th (ft)	Err	0	9			
Control Delay (s)	Err	0.0	5.1			
Lane LOS	F		A			
Approach Delay (s)	Err	0.0	5.1			
Approach LOS	F					
<b>Intersection Summary</b>						
Average Delay		471.2				
Intersection Capacity Utilization		101.1%		ICU Level of Service		G
Analysis Period (min)		15				

# HCM Unsignalized Intersection Capacity Analysis

## 3: CR 519 Belvidere Rd & CR 622 Roxbury Station Rd/CR 622 Roxbury Hill Rd

















07/24/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	189	1	17	8	51	12	1055	1735	4	1	656	1485
Future Volume (Veh/h)	189	1	17	8	51	12	1055	1735	4	1	656	1485
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.90	0.80	0.80	0.90	0.80
Hourly flow rate (vph)	236	1	21	10	64	15	1319	1928	5	1	729	1856
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	6274	6230	1657	6249	7156	1930	2585			1933		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	6274	6230	1657	6249	7156	1930	2585			1933		
tC, single (s)	7.2	6.5	6.5	7.2	6.5	6.3	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.6	3.6	4.0	3.4	2.3			2.2		
p0 queue free %	0	0	80	0	0	81	0			100		
cM capacity (veh/h)	0	0	103	0	0	79	157			309		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	258	89	3252	2586								
Volume Left	236	10	1319	1								
Volume Right	21	15	5	1856								
cSH	0	0	157	309								
Volume to Capacity	Err	Err	8.40	0.00								
Queue Length 95th (ft)	Err	Err	Err	0								
Control Delay (s)	Err	Err	1372.7	0.0								
Lane LOS	F	F	F	A								
Approach Delay (s)	Err	Err	1372.7	0.0								
Approach LOS	F	F										
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization			304.0%	ICU Level of Service					H			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 3: CR 519 Belvidere Rd & CR 622 Roxbury Station Rd/CR 622 Roxbury Hill Rd

07/24/2020





												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	570	430	1027	5	1	1	14	586	4	1144	450	471
Future Volume (Veh/h)	570	430	1027	5	1	1	14	586	4	1144	450	471
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.90	0.80	0.80	0.90	0.80
Hourly flow rate (vph)	713	538	1284	6	1	1	18	651	5	1430	500	589
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None								None			
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	4346	4346	794	5897	4638	654	1089			656		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	4346	4346	794	5897	4638	654	1089			656		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.6			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.7			2.2		
p0 queue free %	0	0	0	0	0	100	96			0		
cM capacity (veh/h)	0	0	385	0	0	471	491			941		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	2535	8	674	2519								
Volume Left	713	6	18	1430								
Volume Right	1284	1	5	589								
cSH	0	0	491	941								
Volume to Capacity	Err	Err	0.04	1.52								
Queue Length 95th (ft)	Err	Err	3	1723								
Control Delay (s)	Err	Err	1.1	253.4								
Lane LOS	F	F	A	F								
Approach Delay (s)	Err	Err	1.1	253.4								
Approach LOS	F	F										
Intersection Summary												
Average Delay	Err											
Intersection Capacity Utilization	272.3%			ICU Level of Service					H			
Analysis Period (min)	15											

# HCM Unsignalized Intersection Capacity Analysis

## 3: CR 519 Belvidere Rd & CR 621 Brainards Rd

07/23/2020







Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1158	113	1494	1419	451	215
Future Volume (Veh/h)	1158	113	1494	1419	451	215
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.90	0.90	0.80
Hourly flow rate (vph)	1448	141	1868	1577	501	269
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	5948	636	770			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	5948	636	770			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	71	0			
cM capacity (veh/h)	0	478	854			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	1589	1868	1577	770		
Volume Left	1448	1868	0	0		
Volume Right	141	0	0	269		
cSH	0	854	1700	1700		
Volume to Capacity	Err	2.19	0.93	0.45		
Queue Length 95th (ft)	Err	3303	0	0		
Control Delay (s)	Err	551.8	0.0	0.0		
Lane LOS	F	F				
Approach Delay (s)	Err	299.2		0.0		
Approach LOS	F					
Intersection Summary						
Average Delay			Err			
Intersection Capacity Utilization			200.6%	ICU Level of Service		H
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 3: CR 519 Belvidere Rd & CR 621 Brainards Rd

07/23/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	86	1477	189	494	925	409
Future Volume (Veh/h)	86	1477	189	494	925	409
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.90	0.90	0.80
Hourly flow rate (vph)	108	1846	236	549	1028	511
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2304	1284	1539			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2304	1284	1539			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	0	46			
cM capacity (veh/h)	19	201	438			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	1954	236	549	1539		
Volume Left	108	236	0	0		
Volume Right	1846	0	0	511		
cSH	133	438	1700	1700		
Volume to Capacity	14.71	0.54	0.32	0.91		
Queue Length 95th (ft)	Err	78	0	0		
Control Delay (s)	Err	22.5	0.0	0.0		
Lane LOS	F	C				
Approach Delay (s)	Err	6.8		0.0		
Approach LOS	F					
Intersection Summary						
Average Delay			4568.3			
Intersection Capacity Utilization			190.2%	ICU Level of Service		H
Analysis Period (min)			15			



# HCM Unsignalized Intersection Capacity Analysis

## 2: CR 646 Belvidere Rd/CR 519 Belvidere Rd & CR 519 Uniontown Rd

07/23/2020



Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (veh/h)	2	754	1176	8	302	430
Future Volume (Veh/h)	2	754	1176	8	302	430
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.80	0.90	0.90	0.80	0.90	0.90
Hourly flow rate (vph)	3	838	1307	10	336	478
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2462	1312			1317	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2462	1312			1317	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	75	0			35	
cM capacity (veh/h)	12	191			515	
Direction, Lane #	NB 1	NE 1	SW 1			
Volume Total	841	1317	814			
Volume Left	3	0	336			
Volume Right	838	10	0			
cSH	181	1700	515			
Volume to Capacity	4.64	0.77	0.65			
Queue Length 95th (ft)	Err	0	116			
Control Delay (s)	Err	0.0	22.8			
Lane LOS	F		C			
Approach Delay (s)	Err	0.0	22.8			
Approach LOS	F					
Intersection Summary						
Average Delay		2835.7				
Intersection Capacity Utilization		158.5%		ICU Level of Service		H
Analysis Period (min)		15				

# HCM Unsignalized Intersection Capacity Analysis

## 2: CR 646 Belvidere Rd/CR 519 Belvidere Rd & CR 519 Uniontown Rd

07/23/2020

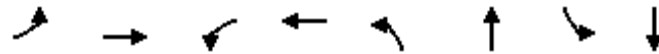


Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (veh/h)	12	340	358	5	702	1334
Future Volume (Veh/h)	12	340	358	5	702	1334
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.80	0.90	0.90	0.80	0.90	0.90
Hourly flow rate (vph)	15	378	398	6	780	1482
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	3443	401			404	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3443	401			404	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	41			31	
cM capacity (veh/h)	2	643			1139	
Direction, Lane #	NB 1	NE 1	SW 1			
Volume Total	393	404	2262			
Volume Left	15	0	780			
Volume Right	378	6	0			
cSH	59	1700	1139			
Volume to Capacity	6.66	0.24	0.69			
Queue Length 95th (ft)	Err	0	144			
Control Delay (s)	Err	0.0	14.7			
Lane LOS	F		B			
Approach Delay (s)	Err	0.0	14.7			
Approach LOS	F					
Intersection Summary						
Average Delay		1295.5				
Intersection Capacity Utilization		159.9%		ICU Level of Service		H
Analysis Period (min)		15				

# Timings

## 3: CR 519 Uniontown Rd & NJ 57

07/24/2020



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕		↕		↕		↕
Traffic Volume (vph)	284	356	28	290	36	330	3	125
Future Volume (vph)	284	356	28	290	36	330	3	125
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	50.0	50.0	50.0	50.0	15.0	15.0	15.0	15.0
Minimum Split (s)	57.0	57.0	57.0	57.0	23.0	23.0	23.0	23.0
Total Split (s)	57.0	57.0	57.0	57.0	33.0	33.0	33.0	33.0
Total Split (%)	63.3%	63.3%	63.3%	63.3%	36.7%	36.7%	36.7%	36.7%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		0.0		0.0		0.0		0.0
Total Lost Time (s)		7.0		7.0		8.0		8.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	Min	Min	Min
Act Effect Green (s)		50.0		50.0		25.0		25.0
Actuated g/C Ratio		0.56		0.56		0.28		0.28
v/c Ratio		1.18		0.47		1.09		0.42
Control Delay		120.2		13.7		100.2		27.4
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		120.2		13.7		100.2		27.4
LOS		F		B		F		C
Approach Delay		120.2		13.7		100.2		27.4
Approach LOS		F		B		F		C

### Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 10.9 (12%), Referenced to phase 4:EBTL and 8:WBTL, Start of Yellow

Natural Cycle: 140

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.18

Intersection Signal Delay: 81.5

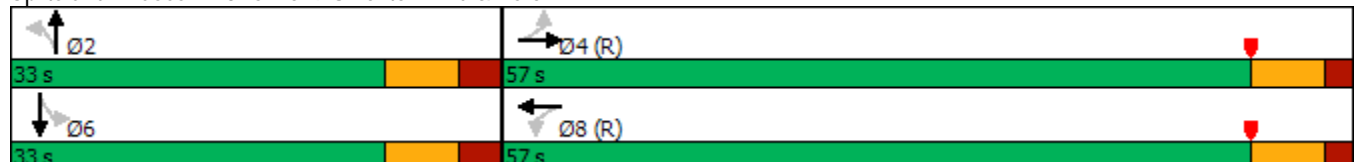
Intersection LOS: F

Intersection Capacity Utilization 142.5%

ICU Level of Service H

Analysis Period (min) 15

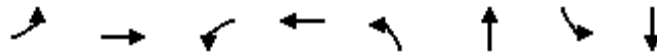
Splits and Phases: 3: CR 519 Uniontown Rd & NJ 57



# Timings

## 3: CR 519 Uniontown Rd & NJ 57

07/24/2020



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕		↕		↕		↕
Traffic Volume (vph)	31	264	145	571	34	295	3	294
Future Volume (vph)	31	264	145	571	34	295	3	294
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	50.0	50.0	50.0	50.0	15.0	15.0	15.0	15.0
Minimum Split (s)	57.0	57.0	57.0	57.0	23.0	23.0	23.0	23.0
Total Split (s)	57.0	57.0	57.0	57.0	33.0	33.0	33.0	33.0
Total Split (%)	63.3%	63.3%	63.3%	63.3%	36.7%	36.7%	36.7%	36.7%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		0.0		0.0		0.0		0.0
Total Lost Time (s)		7.0		7.0		8.0		8.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	Min	Min	Min
Act Effect Green (s)		50.0		50.0		25.0		25.0
Actuated g/C Ratio		0.56		0.56		0.28		0.28
v/c Ratio		0.45		1.00		1.57		1.50
Control Delay		13.3		52.8		298.6		259.2
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		13.3		52.8		298.6		259.2
LOS		B		D		F		F
Approach Delay		13.3		52.8		298.6		259.2
Approach LOS		B		D		F		F

### Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 10.9 (12%), Referenced to phase 4:EBTL and 8:WBTL, Start of Yellow

Natural Cycle: 140

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.57

Intersection Signal Delay: 157.5

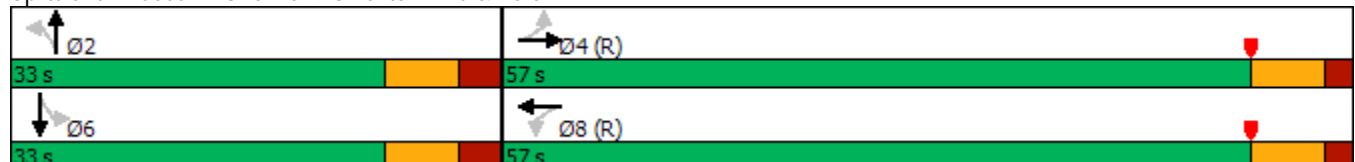
Intersection LOS: F

Intersection Capacity Utilization 125.5%

ICU Level of Service H

Analysis Period (min) 15











Splits and Phases: 3: CR 519 Uniontown Rd & NJ 57



# HCM Unsignalized Intersection Capacity Analysis

## 4: CR 519 Uniontown Rd & Strykers Rd

07/29/2020











						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	102	254	89	386	326	67
Future Volume (Veh/h)	102	254	89	386	326	67
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.90	0.80	0.80	0.90	0.80
Hourly flow rate (vph)	128	282	111	483	362	84
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1109	404	446			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1109	404	446			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	39	57	90			
cM capacity (veh/h)	211	651	1125			
Direction, Lane #	EB 1	EB 2	NB 1	SB 1		
Volume Total	128	282	594	446		
Volume Left	128	0	111	0		
Volume Right	0	282	0	84		
cSH	211	651	1125	1700		
Volume to Capacity	0.61	0.43	0.10	0.26		
Queue Length 95th (ft)	87	55	8	0		
Control Delay (s)	45.3	14.7	2.6	0.0		
Lane LOS	E	B	A			
Approach Delay (s)	24.3		2.6	0.0		
Approach LOS	C					
Intersection Summary						
Average Delay			7.9			
Intersection Capacity Utilization			62.1%		ICU Level of Service	B
Analysis Period (min)			15			



# HCM Unsignalized Intersection Capacity Analysis

## 4: CR 519 Uniontown Rd & Strykers Rd











07/29/2020

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	133	178	215	474	556	121
Future Volume (Veh/h)	133	178	215	474	556	121
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.90	0.90	0.90	0.80
Hourly flow rate (vph)	166	223	239	527	618	151
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1698	694	769			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1698	694	769			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	50	72			
cM capacity (veh/h)	74	447	854			
Direction, Lane #	EB 1	EB 2	NB 1	SB 1		
Volume Total	166	223	766	769		
Volume Left	166	0	239	0		
Volume Right	0	223	0	151		
cSH	74	447	854	1700		
Volume to Capacity	2.25	0.50	0.28	0.45		
Queue Length 95th (ft)	388	68	29	0		
Control Delay (s)	691.7	20.8	6.4	0.0		
Lane LOS	F	C	A			
Approach Delay (s)	307.1		6.4	0.0		
Approach LOS	F					
Intersection Summary						
Average Delay			64.6			
Intersection Capacity Utilization			90.8%	ICU Level of Service		E
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 4: CO 632 & I-78 WB ramp











06/25/2020

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1059	129	0	385	105	0
Future Volume (Veh/h)	1059	129	0	385	105	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1151	140	0	418	114	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	532	114	114			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	532	114	114			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	85	100			
cM capacity (veh/h)	508	939	1475			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	1291	418	114			
Volume Left	1151	0	0			
Volume Right	140	0	0			
cSH	536	1700	1700			
Volume to Capacity	2.41	0.25	0.07			
Queue Length 95th (ft)	2482	0	0			
Control Delay (s)	657.2	0.0	0.0			
Lane LOS	F					
Approach Delay (s)	657.2	0.0	0.0			
Approach LOS	F					
<b>Intersection Summary</b>						
Average Delay		465.4				
Intersection Capacity Utilization		85.6%		ICU Level of Service		E
Analysis Period (min)		15				

# HCM Unsignalized Intersection Capacity Analysis

## 4: CO 632 & I-78 WB ramp

06/25/2020

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	261	52	0	124	328	0
Future Volume (Veh/h)	261	52	0	124	328	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	1.00	0.92	0.92	1.00
Hourly flow rate (vph)	284	57	0	135	357	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	492	357	357			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	492	357	357			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	47	92	100			
cM capacity (veh/h)	536	687	1202			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	341	135	357			
Volume Left	284	0	0			
Volume Right	57	0	0			
cSH	644	1700	1700			
Volume to Capacity	0.53	0.08	0.21			
Queue Length 95th (ft)	78	0	0			
Control Delay (s)	17.6	0.0	0.0			
Lane LOS	C					
Approach Delay (s)	17.6	0.0	0.0			
Approach LOS	C					
<b>Intersection Summary</b>						
Average Delay		7.2				
Intersection Capacity Utilization		38.4%		ICU Level of Service		A
Analysis Period (min)		15				

## **2045 BUILD MID-BLOCK ANALYSIS**

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	CR 519, northeast of CO 610	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	3
Speed Limit, mi/h	50	Access Point Density, pts/mi	9.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	343	Opposing Demand Flow Rate, veh/h	879
Peak Hour Factor	0.92	Total Trucks, %	2.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.20

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	52.6
Speed Slope Coefficient	3.31611	Speed Power Coefficient	0.44498
PF Slope Coefficient	-1.32825	PF Power Coefficient	0.75770
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.0
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	50.8

## Vehicle Results

Average Speed, mi/h	50.8	Percent Followers, %	44.6
Segment Travel Time, minutes	1.18	Followers Density, followers/mi/ln	3.0
Vehicle LOS	B		



# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	CR 519, northeast of CO 610	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	3
Speed Limit, mi/h	50	Access Point Density, pts/mi	9.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	879	Opposing Demand Flow Rate, veh/h	343
Peak Hour Factor	0.92	Total Trucks, %	2.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.52

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	52.6
Speed Slope Coefficient	3.20083	Speed Power Coefficient	0.50667
PF Slope Coefficient	-1.26944	PF Power Coefficient	0.77916
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	12.1
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	49.8

## Vehicle Results

Average Speed, mi/h	49.8	Percent Followers, %	68.3
Segment Travel Time, minutes	1.21	Followers Density, followers/mi/ln	12.1
Vehicle LOS	D		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	CR 519, northeast of CO 610	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	3
Speed Limit, mi/h	50	Access Point Density, pts/mi	9.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	614	Opposing Demand Flow Rate, veh/h	399
Peak Hour Factor	0.92	Total Trucks, %	2.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.36

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	52.6
Speed Slope Coefficient	3.21576	Speed Power Coefficient	0.49701
PF Slope Coefficient	-1.27872	PF Power Coefficient	0.77628
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	7.1
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	50.3

## Vehicle Results

Average Speed, mi/h	50.3	Percent Followers, %	58.3
Segment Travel Time, minutes	1.19	Followers Density, followers/mi/ln	7.1
Vehicle LOS	C		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	CR 519, northeast of CO 610	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	3
Speed Limit, mi/h	50	Access Point Density, pts/mi	9.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	399	Opposing Demand Flow Rate, veh/h	303
Peak Hour Factor	0.92	Total Trucks, %	2.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.23

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	52.6
Speed Slope Coefficient	3.18924	Speed Power Coefficient	0.51453
PF Slope Coefficient	-1.26192	PF Power Coefficient	0.78143
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.6
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	50.9

## Vehicle Results

Average Speed, mi/h	50.9	Percent Followers, %	46.0
Segment Travel Time, minutes	1.18	Followers Density, followers/mi/ln	3.6
Vehicle LOS	B		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/17/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	CR 519, Stone Hedge Rd to Hope Crossing Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	0.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	385	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.80	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.23

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	56.9
Speed Slope Coefficient	3.64416	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.32222	PF Power Coefficient	0.75266
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.3
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	54.7

## Vehicle Results

Average Speed, mi/h	54.7	Percent Followers, %	47.5
Segment Travel Time, minutes	1.10	Followers Density, followers/mi/ln	3.3
Vehicle LOS	B		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/17/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	CR 519, Stone Hedge Rd to Hope Crossing Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	0.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	887	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.84	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.52

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	56.9
Speed Slope Coefficient	3.64416	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.32222	PF Power Coefficient	0.75266
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	11.6
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.6

## Vehicle Results

Average Speed, mi/h	53.6	Percent Followers, %	70.1
Segment Travel Time, minutes	1.12	Followers Density, followers/mi/ln	11.6
Vehicle LOS	D		



# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/17/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	CR 519, Stone Hedge Rd to Hope Crossing Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	0.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	334	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.90	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.20

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	56.9
Speed Slope Coefficient	3.64416	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.32222	PF Power Coefficient	0.75266
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.7
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	54.9

## Vehicle Results

Average Speed, mi/h	54.9	Percent Followers, %	44.0
Segment Travel Time, minutes	1.09	Followers Density, followers/mi/ln	2.7
Vehicle LOS	B		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/17/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	CR 519, Stone Hedge Rd to Hope Crossing Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	0.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	427	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.82	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.25

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	56.9
Speed Slope Coefficient	3.64416	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.32222	PF Power Coefficient	0.75266
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.9
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	54.6

## Vehicle Results

Average Speed, mi/h	54.6	Percent Followers, %	50.2
Segment Travel Time, minutes	1.10	Followers Density, followers/mi/ln	3.9
Vehicle LOS	B		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	CR 519, CO 623 Brass Castle Rd to Pequest Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	4.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	567	Opposing Demand Flow Rate, veh/h	1159
Peak Hour Factor	0.88	Total Trucks, %	0.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.33

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.7
Speed Slope Coefficient	3.53055	Speed Power Coefficient	0.42884
PF Slope Coefficient	-1.32485	PF Power Coefficient	0.75803
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	6.2
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.2

## Vehicle Results

Average Speed, mi/h	53.2	Percent Followers, %	57.8
Segment Travel Time, minutes	1.13	Followers Density, followers/mi/ln	6.2
Vehicle LOS	C		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	CR 519, CO 623 Brass Castle Rd to Pequest Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	4.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	1109	Opposing Demand Flow Rate, veh/h	542
Peak Hour Factor	0.92	Total Trucks, %	0.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.65

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.7
Speed Slope Coefficient	3.41906	Speed Power Coefficient	0.47664
PF Slope Coefficient	-1.28592	PF Power Coefficient	0.77876
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	15.9
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	52.3

## Vehicle Results

Average Speed, mi/h	52.3	Percent Followers, %	75.2
Segment Travel Time, minutes	1.15	Followers Density, followers/mi/ln	15.9
Vehicle LOS	E		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	CR 519, CO 623 Brass Castle Rd to Pequest Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	4.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	971	Opposing Demand Flow Rate, veh/h	481
Peak Hour Factor	0.85	Total Trucks, %	7.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.57

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.5
Speed Slope Coefficient	3.39239	Speed Power Coefficient	0.48463
PF Slope Coefficient	-1.27901	PF Power Coefficient	0.78178
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	13.2
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	52.3

## Vehicle Results

Average Speed, mi/h	52.3	Percent Followers, %	71.3
Segment Travel Time, minutes	1.15	Followers Density, followers/mi/ln	13.2
Vehicle LOS	D		



# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	CR 519, CO 623 Brass Castle Rd to Pequest Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	4.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	431	Opposing Demand Flow Rate, veh/h	868
Peak Hour Factor	0.95	Total Trucks, %	7.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.25

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.5
Speed Slope Coefficient	3.47048	Speed Power Coefficient	0.44577
PF Slope Coefficient	-1.31265	PF Power Coefficient	0.76717
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	4.0
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.3

## Vehicle Results

Average Speed, mi/h	53.3	Percent Followers, %	49.7
Segment Travel Time, minutes	1.12	Followers Density, followers/mi/ln	4.0
Vehicle LOS	B		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	CR 519, CO 620 to Brookfield Dr	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	11	Shoulder Width, ft	5
Speed Limit, mi/h	50	Access Point Density, pts/mi	2.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	369	Opposing Demand Flow Rate, veh/h	1759
Peak Hour Factor	0.85	Total Trucks, %	2.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.22

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.1
Speed Slope Coefficient	3.58166	Speed Power Coefficient	0.41151
PF Slope Coefficient	-1.33664	PF Power Coefficient	0.74144
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.3
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.0

## Vehicle Results

Average Speed, mi/h	53.0	Percent Followers, %	47.2
Segment Travel Time, minutes	1.13	Followers Density, followers/mi/ln	3.3
Vehicle LOS	B		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	CR 519, CO 620 to Brookfield Dr	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	11	Shoulder Width, ft	5
Speed Limit, mi/h	50	Access Point Density, pts/mi	2.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	1718	Opposing Demand Flow Rate, veh/h	361
Peak Hour Factor	0.87	Total Trucks, %	2.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	1.01

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.1
Speed Slope Coefficient	3.34386	Speed Power Coefficient	0.50350
PF Slope Coefficient	-1.26381	PF Power Coefficient	0.78594
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.9
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.7

## Vehicle Results

Average Speed, mi/h	53.7	Percent Followers, %	36.7
Segment Travel Time, minutes	1.12	Followers Density, followers/mi/ln	1.9
Vehicle LOS	F		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	CR 519, CO 620 to Brookfield Dr	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	11	Shoulder Width, ft	5
Speed Limit, mi/h	50	Access Point Density, pts/mi	2.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	1420	Opposing Demand Flow Rate, veh/h	292
Peak Hour Factor	0.91	Total Trucks, %	2.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.84

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.1
Speed Slope Coefficient	3.32416	Speed Power Coefficient	0.51681
PF Slope Coefficient	-1.25158	PF Power Coefficient	0.78984
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	22.4
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	51.3

## Vehicle Results

Average Speed, mi/h	51.3	Percent Followers, %	80.8
Segment Travel Time, minutes	1.17	Followers Density, followers/mi/ln	22.4
Vehicle LOS	E		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	CR 519, CO 620 to Brookfield Dr	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	11	Shoulder Width, ft	5
Speed Limit, mi/h	50	Access Point Density, pts/mi	2.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	296	Opposing Demand Flow Rate, veh/h	1436
Peak Hour Factor	0.90	Total Trucks, %	2.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.17

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.1
Speed Slope Coefficient	3.53968	Speed Power Coefficient	0.41853
PF Slope Coefficient	-1.33454	PF Power Coefficient	0.74933
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.3
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.3

## Vehicle Results

Average Speed, mi/h	53.3	Percent Followers, %	41.5
Segment Travel Time, minutes	1.12	Followers Density, followers/mi/ln	2.3
Vehicle LOS	A		



# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	CR 519, Reeder Rd to Grist Mill Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	5.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	2948	Opposing Demand Flow Rate, veh/h	635
Peak Hour Factor	0.92	Total Trucks, %	7.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	1.73

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.2
Speed Slope Coefficient	3.36841	Speed Power Coefficient	0.49086
PF Slope Coefficient	-1.27444	PF Power Coefficient	0.78305
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	4.4
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.2

## Vehicle Results

Average Speed, mi/h	53.2	Percent Followers, %	50.5
Segment Travel Time, minutes	1.13	Followers Density, followers/mi/ln	4.4
Vehicle LOS	F		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	CR 519, Reeder Rd to Grist Mill Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	5.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	635	Opposing Demand Flow Rate, veh/h	2948
Peak Hour Factor	0.92	Total Trucks, %	7.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.37

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.2
Speed Slope Coefficient	3.71426	Speed Power Coefficient	0.41457
PF Slope Coefficient	-1.31276	PF Power Coefficient	0.71807
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	7.4
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	52.4

## Vehicle Results

Average Speed, mi/h	52.4	Percent Followers, %	61.2
Segment Travel Time, minutes	1.15	Followers Density, followers/mi/ln	7.4
Vehicle LOS	C		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	CR 519, Reeder Rd to Grist Mill Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	5.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	547	Opposing Demand Flow Rate, veh/h	1650
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.32

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.4
Speed Slope Coefficient	3.57974	Speed Power Coefficient	0.41336
PF Slope Coefficient	-1.33472	PF Power Coefficient	0.74476
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	5.9
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	52.8

## Vehicle Results

Average Speed, mi/h	52.8	Percent Followers, %	57.3
Segment Travel Time, minutes	1.14	Followers Density, followers/mi/ln	5.9
Vehicle LOS	C		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	CR 519, Reeder Rd to Grist Mill Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	5.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	1650	Opposing Demand Flow Rate, veh/h	547
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.97

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.4
Speed Slope Coefficient	3.40106	Speed Power Coefficient	0.47611
PF Slope Coefficient	-1.28762	PF Power Coefficient	0.77801
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	27.4
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	51.2

## Vehicle Results

Average Speed, mi/h	51.2	Percent Followers, %	85.1
Segment Travel Time, minutes	1.17	Followers Density, followers/mi/ln	27.4
Vehicle LOS	E		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/17/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	CR 519, Fairway Rd to Hillside Ave	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	5
Speed Limit, mi/h	50	Access Point Density, pts/mi	4.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	985	Opposing Demand Flow Rate, veh/h	372
Peak Hour Factor	0.78	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.58

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	54.9
Speed Slope Coefficient	3.33416	Speed Power Coefficient	0.50158
PF Slope Coefficient	-1.26634	PF Power Coefficient	0.78482
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	13.6
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	51.8

## Vehicle Results

Average Speed, mi/h	51.8	Percent Followers, %	71.4
Segment Travel Time, minutes	1.16	Followers Density, followers/mi/ln	13.6
Vehicle LOS	D		



# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/17/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	CR 519, Fairway Rd to Hillside Ave	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	5
Speed Limit, mi/h	50	Access Point Density, pts/mi	4.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	312	Opposing Demand Flow Rate, veh/h	826
Peak Hour Factor	0.93	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.18

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	54.9
Speed Slope Coefficient	3.43217	Speed Power Coefficient	0.44894
PF Slope Coefficient	-1.31349	PF Power Coefficient	0.76638
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.4
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	53.2

## Vehicle Results

Average Speed, mi/h	53.2	Percent Followers, %	41.6
Segment Travel Time, minutes	1.13	Followers Density, followers/mi/ln	2.4
Vehicle LOS	A		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/17/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	CR 519, Fairway Rd to Hillside Ave	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	5
Speed Limit, mi/h	50	Access Point Density, pts/mi	4.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	481	Opposing Demand Flow Rate, veh/h	896
Peak Hour Factor	0.78	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.28

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	54.9
Speed Slope Coefficient	3.44460	Speed Power Coefficient	0.44381
PF Slope Coefficient	-1.31778	PF Power Coefficient	0.76409
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	4.8
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	52.7

## Vehicle Results

Average Speed, mi/h	52.7	Percent Followers, %	52.9
Segment Travel Time, minutes	1.14	Followers Density, followers/mi/ln	4.8
Vehicle LOS	B		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/17/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	CR 519, Fairway Rd to Hillside Ave	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	5
Speed Limit, mi/h	50	Access Point Density, pts/mi	4.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	803	Opposing Demand Flow Rate, veh/h	431
Peak Hour Factor	0.87	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.47

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	54.9
Speed Slope Coefficient	3.34950	Speed Power Coefficient	0.49192
PF Slope Coefficient	-1.27520	PF Power Coefficient	0.78186
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	10.2
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	52.1

## Vehicle Results

Average Speed, mi/h	52.1	Percent Followers, %	65.9
Segment Travel Time, minutes	1.15	Followers Density, followers/mi/ln	10.2
Vehicle LOS	D		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	CR 632, Shurts Rd to Halls Mill Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	3
Speed Limit, mi/h	45	Access Point Density, pts/mi	8.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	565	Opposing Demand Flow Rate, veh/h	305
Peak Hour Factor	0.92	Total Trucks, %	6.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.33

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	46.7
Speed Slope Coefficient	2.87101	Speed Power Coefficient	0.51408
PF Slope Coefficient	-1.27182	PF Power Coefficient	0.76259
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	7.1
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	44.8

## Vehicle Results

Average Speed, mi/h	44.8	Percent Followers, %	56.1
Segment Travel Time, minutes	1.34	Followers Density, followers/mi/ln	7.1
Vehicle LOS	C		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	CR 632, Shurts Rd to Halls Mill Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	3
Speed Limit, mi/h	45	Access Point Density, pts/mi	8.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	590	Opposing Demand Flow Rate, veh/h	529
Peak Hour Factor	0.92	Total Trucks, %	4.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.35

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	46.8
Speed Slope Coefficient	2.93196	Speed Power Coefficient	0.47827
PF Slope Coefficient	-1.30994	PF Power Coefficient	0.75172
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	7.7
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	44.7

## Vehicle Results

Average Speed, mi/h	44.7	Percent Followers, %	58.6
Segment Travel Time, minutes	1.34	Followers Density, followers/mi/ln	7.7
Vehicle LOS	C		



# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	CR 632, Shurts Rd to Halls Mill Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	3
Speed Limit, mi/h	45	Access Point Density, pts/mi	8.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	305	Opposing Demand Flow Rate, veh/h	565
Peak Hour Factor	0.92	Total Trucks, %	6.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.18

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	46.7
Speed Slope Coefficient	2.93629	Speed Power Coefficient	0.47388
PF Slope Coefficient	-1.31456	PF Power Coefficient	0.75033
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.8
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	45.3

## Vehicle Results

Average Speed, mi/h	45.3	Percent Followers, %	41.7
Segment Travel Time, minutes	1.32	Followers Density, followers/mi/ln	2.8
Vehicle LOS	B		

# HCS7 Two-Lane Highway Report

## Project Information

Analyst	MAA	Date	6/16/2020
Agency	WSP	Analysis Year	2020
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	CR 632, Shurts Rd to Halls Mill Rd	Unit	United States Customary

## Segment 1

## Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	3
Speed Limit, mi/h	45	Access Point Density, pts/mi	8.0

## Demand and Capacity

Directional Demand Flow Rate, veh/h	529	Opposing Demand Flow Rate, veh/h	590
Peak Hour Factor	0.92	Total Trucks, %	4.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.31

## Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	46.8
Speed Slope Coefficient	2.94529	Speed Power Coefficient	0.47099
PF Slope Coefficient	-1.31790	PF Power Coefficient	0.74929
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	6.6
%Improved % Followers	0.0	% Improved Avg Speed	0.0

## Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	44.8

## Vehicle Results

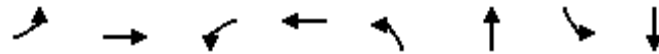
Average Speed, mi/h	44.8	Percent Followers, %	55.9
Segment Travel Time, minutes	1.34	Followers Density, followers/mi/ln	6.6
Vehicle LOS	C		

## **2045 BUILD MITIGATION ANALYSIS**

# Timings

## 3: RT 519 & US 46

06/25/2020



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕		↕	↗	↖	↗	↖
Traffic Volume (vph)	24	287	132	450	37	206	235	441
Future Volume (vph)	24	287	132	450	37	206	235	441
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	40.0	40.0	40.0	40.0	7.0	7.0	7.0	7.0
Minimum Split (s)	47.0	47.0	47.0	47.0	12.0	12.0	12.0	12.0
Total Split (s)	58.0	58.0	58.0	58.0	32.0	32.0	32.0	32.0
Total Split (%)	64.4%	64.4%	64.4%	64.4%	35.6%	35.6%	35.6%	35.6%
Yellow Time (s)	5.0	5.0	5.0	5.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.0		7.0	5.0	5.0	5.0	5.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	Max	Max	Max	Max
Act Effect Green (s)		51.0		51.0	27.0	27.0	27.0	27.0
Actuated g/C Ratio		0.57		0.57	0.30	0.30	0.30	0.30
v/c Ratio		0.45		1.05	0.56	0.52	1.07	1.07
Control Delay		13.0		65.7	56.3	28.5	110.0	91.6
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		13.0		65.7	56.3	28.5	110.0	91.6
LOS		B		E	E	C	F	F
Approach Delay		13.0		65.7		32.3		97.1
Approach LOS		B		E		C		F

### Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Natural Cycle: 110

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 1.07

Intersection Signal Delay: 63.0

Intersection LOS: E

Intersection Capacity Utilization 118.7%

ICU Level of Service H

Analysis Period (min) 15

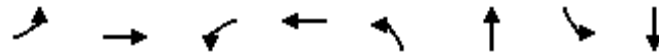
Splits and Phases: 3: RT 519 & US 46



# Timings

## 3: RT 519 & US 46

06/25/2020



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕		↕	↗	↗	↗	↗
Traffic Volume (vph)	51	380	59	498	80	388	118	213
Future Volume (vph)	51	380	59	498	80	388	118	213
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	40.0	40.0	40.0	40.0	7.0	7.0	7.0	7.0
Minimum Split (s)	47.0	47.0	47.0	47.0	12.0	12.0	12.0	12.0
Total Split (s)	47.0	47.0	47.0	47.0	43.0	43.0	43.0	43.0
Total Split (%)	52.2%	52.2%	52.2%	52.2%	47.8%	47.8%	47.8%	47.8%
Yellow Time (s)	5.0	5.0	5.0	5.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.0		7.0	5.0	5.0	5.0	5.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	Max	Max	Max	Max
Act Effect Green (s)		40.0		40.0	38.0	38.0	38.0	38.0
Actuated g/C Ratio		0.44		0.44	0.42	0.42	0.42	0.42
v/c Ratio		0.86		1.05	0.26	0.77	0.94	0.39
Control Delay		37.6		73.4	19.2	29.7	88.0	19.0
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		37.6		73.4	19.2	29.7	88.0	19.0
LOS		D		E	B	C	F	B
Approach Delay		37.6		73.4		28.2		41.5
Approach LOS		D		E		C		D

### Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Natural Cycle: 90

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 1.05

Intersection Signal Delay: 46.6

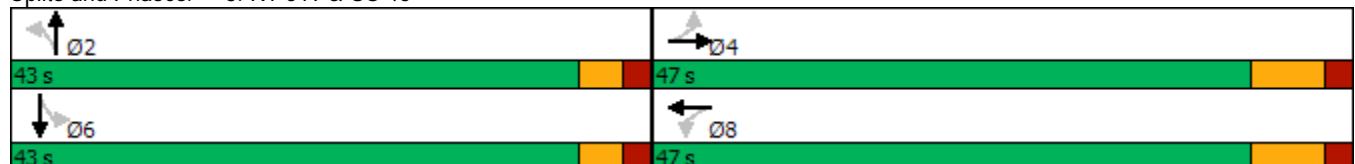
Intersection LOS: D

Intersection Capacity Utilization 93.2%

ICU Level of Service F

Analysis Period (min) 15

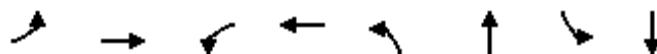
Splits and Phases: 3: RT 519 & US 46



# Timings

## 3: CR 519 & CR 623

07/27/2020



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↰	↱	↰	↱		↕		↕
Traffic Volume (vph)	74	315	227	598	7	237	152	561
Future Volume (vph)	74	315	227	598	7	237	152	561
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	48.0	48.0	48.0	48.0	42.0	42.0	42.0	42.0
Total Split (%)	53.3%	53.3%	53.3%	53.3%	46.7%	46.7%	46.7%	46.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5		4.5		4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effect Green (s)	43.5	43.5	43.5	43.5		36.2		36.2
Actuated g/C Ratio	0.49	0.49	0.49	0.49		0.41		0.41
v/c Ratio	0.96	0.49	0.70	1.08		0.28		0.93
Control Delay	119.7	17.4	30.9	78.1		16.3		39.2
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	119.7	17.4	30.9	78.1		16.3		39.2
LOS	F	B	C	E		B		D
Approach Delay		33.1		68.5		16.3		39.2
Approach LOS		C		E		B		D

### Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 88.7

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.08

Intersection Signal Delay: 46.8

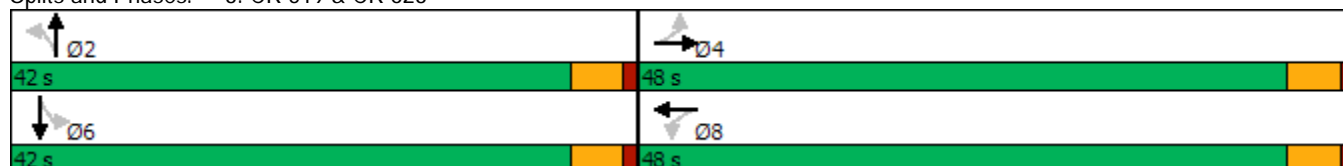
Intersection LOS: D

Intersection Capacity Utilization 96.3%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 3: CR 519 & CR 623

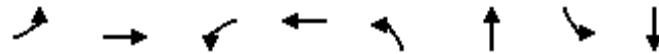




# Timings

## 3: CR 519 & CR 623

07/27/2020



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	105	397	57	288	155	802	60	253
Future Volume (vph)	105	397	57	288	155	802	60	253
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	35.0	35.0	35.0	35.0	55.0	55.0	55.0	55.0
Total Split (%)	38.9%	38.9%	38.9%	38.9%	61.1%	61.1%	61.1%	61.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5		4.5		4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effect Green (s)	28.3	28.3	28.3	28.3		47.8		47.8
Actuated g/C Ratio	0.33	0.33	0.33	0.33		0.56		0.56
v/c Ratio	0.62	0.89	0.71	0.66		0.91		0.37
Control Delay	41.6	46.4	70.7	30.5		27.2		10.5
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	41.6	46.4	70.7	30.5		27.2		10.5
LOS	D	D	E	C		C		B
Approach Delay		45.5		35.9		27.2		10.5
Approach LOS		D		D		C		B

### Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 85.2

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 30.0

Intersection LOS: C

Intersection Capacity Utilization 87.9%

ICU Level of Service E

Analysis Period (min) 15
















Splits and Phases: 3: CR 519 & CR 623



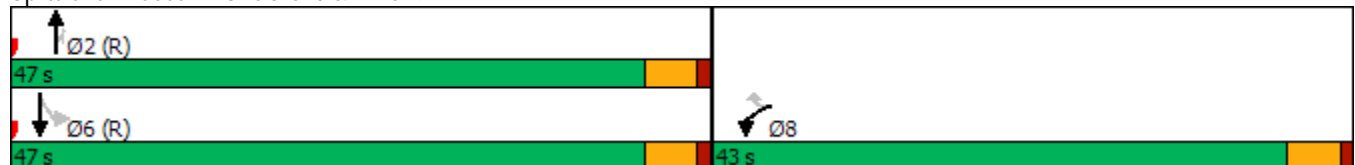
# Timings

## 3: CO 620 & RT 519

07/27/2020

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	 		 			 
Traffic Volume (vph)	1501	75	843	300	13	1734
Future Volume (vph)	1501	75	843	300	13	1734
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	43.0	43.0	47.0	47.0	47.0	47.0
Total Split (%)	47.8%	47.8%	52.2%	52.2%	52.2%	52.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	38.5	38.5	42.5	42.5	42.5	42.5
Actuated g/C Ratio	0.43	0.43	0.47	0.47	0.47	0.47
v/c Ratio	1.14	0.13	0.56	0.36	0.09	1.15
Control Delay	96.7	5.6	18.7	2.8	14.8	101.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	96.7	5.6	18.7	2.8	14.8	101.2
LOS	F	A	B	A	B	F
Approach Delay	91.9		14.5			100.5
Approach LOS	F		B			F
Intersection Summary						
Cycle Length: 90						
Actuated Cycle Length: 90						
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green						
Natural Cycle: 130						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 1.15						
Intersection Signal Delay: 75.5				Intersection LOS: E		
Intersection Capacity Utilization 98.3%				ICU Level of Service F		
Analysis Period (min) 15						













Splits and Phases: 3: CO 620 & RT 519



# Timings

3: CO 620 & RT 519

07/27/2020

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	364	513	2236	1280	9	756
Future Volume (vph)	364	513	2236	1280	9	756
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	30.0	30.0	60.0	60.0	60.0	60.0
Total Split (%)	33.3%	33.3%	66.7%	66.7%	66.7%	66.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max
Act Efect Green (s)	25.5	25.5	55.5	55.5	55.5	55.5
Actuated g/C Ratio	0.28	0.28	0.62	0.62	0.62	0.62
v/c Ratio	0.42	1.42	1.14	1.02	0.13	0.38
Control Delay	27.8	230.6	88.3	36.0	11.9	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.8	230.6	88.3	36.0	11.9	9.3
LOS	C	F	F	D	B	A
Approach Delay	152.2		69.3			9.3
Approach LOS	F		E			A
Intersection Summary						
Cycle Length: 90						
Actuated Cycle Length: 90						
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green						
Natural Cycle: 100						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 1.42						
Intersection Signal Delay: 75.4				Intersection LOS: E		
Intersection Capacity Utilization 101.1%				ICU Level of Service G		
Analysis Period (min) 15						

Splits and Phases: 3: CO 620 & RT 519



# Timings

## 3: CR 519 Belvidere Rd & Foul Lift Rd

07/24/2020



Lane Group	EBL	NBL	NBT	SBT	SBR
Lane Configurations	TTT	TTT	TTT	TTT	TTT
Traffic Volume (vph)	650	750	1128	1838	1607
Future Volume (vph)	650	750	1128	1838	1607
Turn Type	Prot	Perm	NA	NA	Perm
Protected Phases	4		2	6	
Permitted Phases		2			6
Detector Phase	4	2	2	6	6
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5
Total Split (s)	24.0	66.0	66.0	66.0	66.0
Total Split (%)	26.7%	73.3%	73.3%	73.3%	73.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)	19.5	61.5	61.5	61.5	61.5
Actuated g/C Ratio	0.22	0.68	0.68	0.68	0.68
v/c Ratio	1.17	5.72	0.53	0.87	0.79
Control Delay	125.4	2146.1	8.1	16.5	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	125.4	2146.1	8.1	16.5	3.1
LOS	F	F	A	B	A
Approach Delay	125.4		923.4	9.9	
Approach LOS	F		F	A	

### Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 5.72

Intersection Signal Delay: 305.3

Intersection LOS: F

Intersection Capacity Utilization 103.6%

ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 3: CR 519 Belvidere Rd & Foul Lift Rd



# Timings

## 3: CR 519 Belvidere Rd & Foul Lift Rd

07/24/2020



Lane Group	EBL	NBL	NBT	SBT	SBR
Lane Configurations	↔↔	↔↔	↑↑	↑↑	↔↔
Traffic Volume (vph)	1103	2	1129	1064	458
Future Volume (vph)	1103	2	1129	1064	458
Turn Type	Prot	Perm	NA	NA	Perm
Protected Phases	4		2	6	
Permitted Phases		2			6
Detector Phase	4	2	2	6	6
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5
Total Split (s)	55.0	35.0	35.0	35.0	35.0
Total Split (%)	61.1%	38.9%	38.9%	38.9%	38.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)	50.5	30.5	30.5	30.5	30.5
Actuated g/C Ratio	0.56	0.34	0.34	0.34	0.34
v/c Ratio	1.40	0.02	1.08	1.01	0.43
Control Delay	206.7	20.5	79.7	60.9	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	206.7	20.5	79.7	60.9	3.0
LOS	F	C	E	E	A
Approach Delay	206.7		79.6	42.0	
Approach LOS	F		E	D	

### Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.40

Intersection Signal Delay: 127.2

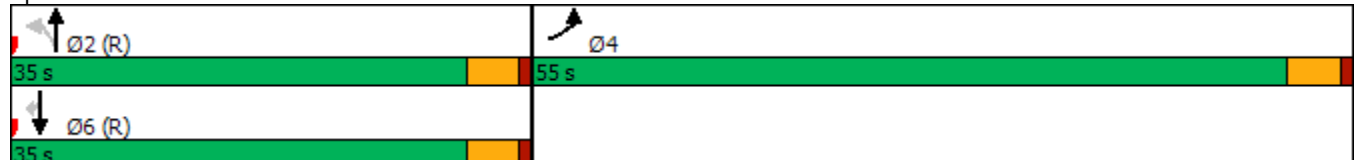
Intersection LOS: F

Intersection Capacity Utilization 101.8%

ICU Level of Service G

Analysis Period (min) 15










Splits and Phases: 3: CR 519 Belvidere Rd & Foul Lift Rd



# Timings

3: RT 519 & CO 626

06/25/2020

					
Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	188	250	427	100	3060
Future Volume (vph)	188	250	427	100	3060
Turn Type	Prot	Perm	NA	Perm	NA
Protected Phases	8		2		6
Permitted Phases		8		6	
Detector Phase	8	8	2	6	6
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	67.5	67.5	67.5
Total Split (%)	25.0%	25.0%	75.0%	75.0%	75.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0
Total Lost Time (s)	4.5	4.5	4.5		4.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	Min	Min	Min
Act Efect Green (s)	15.4	15.4	63.1		63.1
Actuated g/C Ratio	0.18	0.18	0.72		0.72
v/c Ratio	0.75	0.58	0.18		1.05
Control Delay	50.0	8.7	4.4		45.6
Queue Delay	0.0	0.0	0.0		0.0
Total Delay	50.0	8.7	4.4		45.6
LOS	D	A	A		D
Approach Delay	26.4		4.4		45.6
Approach LOS	C		A		D
Intersection Summary					
Cycle Length: 90					
Actuated Cycle Length: 87.5					
Natural Cycle: 110					
Control Type: Actuated-Uncoordinated					
Maximum v/c Ratio: 1.05					
Intersection Signal Delay: 38.9				Intersection LOS: D	
Intersection Capacity Utilization 94.7%				ICU Level of Service F	
Analysis Period (min) 15					

Splits and Phases: 3: RT 519 & CO 626














# Timings

3: RT 519 & CO 626

06/25/2020

					
Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	65	50	1654	32	992
Future Volume (vph)	65	50	1654	32	992
Turn Type	Prot	Perm	NA	Perm	NA
Protected Phases	8		2		6
Permitted Phases		8		6	
Detector Phase	8	8	2	6	6
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	67.5	67.5	67.5
Total Split (%)	25.0%	25.0%	75.0%	75.0%	75.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0
Total Lost Time (s)	4.5	4.5	4.5		4.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	Min	Min	Min
Act Effct Green (s)	9.1	9.1	55.8		55.8
Actuated g/C Ratio	0.13	0.13	0.80		0.80
v/c Ratio	0.35	0.27	0.64		0.32
Control Delay	35.7	20.7	5.7		3.2
Queue Delay	0.0	0.0	0.0		0.0
Total Delay	35.7	20.7	5.7		3.2
LOS	D	C	A		A
Approach Delay	29.2		5.7		3.2
Approach LOS	C		A		A
Intersection Summary					
Cycle Length: 90					
Actuated Cycle Length: 69.6					
Natural Cycle: 60					
Control Type: Actuated-Uncoordinated					
Maximum v/c Ratio: 0.64					
Intersection Signal Delay: 5.9				Intersection LOS: A	
Intersection Capacity Utilization 57.8%				ICU Level of Service B	
Analysis Period (min) 15					

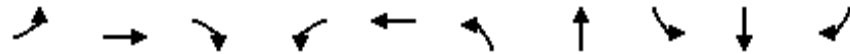
Splits and Phases: 3: RT 519 & CO 626



# Timings

## 3: CR 519 Belvidere Rd & CR 622 Roxbury Station Rd/CR 622 Roxbury Hill Rd

08/18/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱	↰	↱	↰	↱
Traffic Volume (vph)	189	1	17	8	51	1055	1735	1	656	1485
Future Volume (vph)	189	1	17	8	51	1055	1735	1	656	1485
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases		4			8		2		6	
Permitted Phases	4		4	8		2		6		6
Detector Phase	4	4	4	8	8	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	22.5	67.5	67.5	67.5	67.5	67.5
Total Split (%)	25.0%	25.0%	25.0%	25.0%	25.0%	75.0%	75.0%	75.0%	75.0%	75.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)		18.0	18.0		18.0	63.0	63.0	63.0	63.0	63.0
Actuated g/C Ratio		0.20	0.20		0.20	0.70	0.70	0.70	0.70	0.70
v/c Ratio		0.98	0.08		0.25	3.05	0.83	0.01	0.31	1.58
Control Delay		91.4	13.3		29.1	944.8	13.6	5.0	5.6	280.9
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		91.4	13.3		29.1	944.8	13.6	5.0	5.6	280.9
LOS		F	B		C	F	B	A	A	F
Approach Delay		85.0			29.1		391.3		203.2	
Approach LOS		F			C		F		F	

### Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 3.05

Intersection Signal Delay: 294.7

Intersection LOS: F

Intersection Capacity Utilization 165.8%

ICU Level of Service H

Analysis Period (min) 15



















Splits and Phases: 3: CR 519 Belvidere Rd & CR 622 Roxbury Station Rd/CR 622 Roxbury Hill Rd



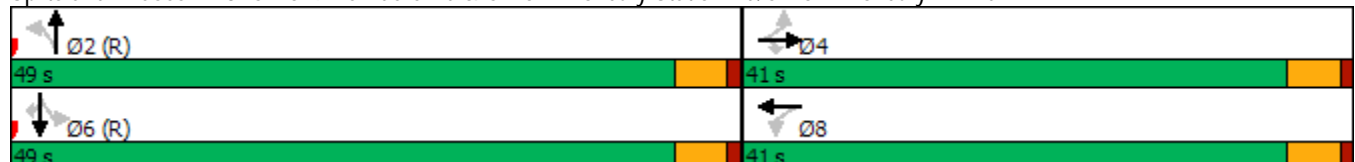
# Timings

## 3: CR 519 Belvidere Rd & CR 622 Roxbury Station Rd/CR 622 Roxbury Hill Rd

08/18/2020

										
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	570	430	1027	5	1	14	586	1144	450	471
Future Volume (vph)	570	430	1027	5	1	14	586	1144	450	471
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases		4			8		2		6	
Permitted Phases	4		4	8		2		6		6
Detector Phase	4	4	4	8	8	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	41.0	41.0	41.0	41.0	41.0	49.0	49.0	49.0	49.0	49.0
Total Split (%)	45.6%	45.6%	45.6%	45.6%	45.6%	54.4%	54.4%	54.4%	54.4%	54.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)		36.5	36.5		36.5	44.5	44.5	44.5	44.5	44.5
Actuated g/C Ratio		0.41	0.41		0.41	0.49	0.49	0.49	0.49	0.49
v/c Ratio		2.04	1.60		0.02	0.07	0.40	4.41	0.31	0.65
Control Delay		495.5	295.2		15.3	12.9	15.3	1554.9	14.2	5.0
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		495.5	295.2		15.3	12.9	15.3	1554.9	14.2	5.0
LOS		F	F		B	B	B	F	B	A
Approach Delay		394.0			15.3		15.2		886.7	
Approach LOS		F			B		B		F	
Intersection Summary										
Cycle Length: 90										
Actuated Cycle Length: 90										
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green										
Natural Cycle: 150										
Control Type: Actuated-Coordinated										
Maximum v/c Ratio: 4.41										
Intersection Signal Delay: 565.3										
Intersection LOS: F										
Intersection Capacity Utilization 148.8%										
ICU Level of Service H										
Analysis Period (min) 15										

Splits and Phases: 3: CR 519 Belvidere Rd & CR 622 Roxbury Station Rd/CR 622 Roxbury Hill Rd



# Timings

## 3: CR 519 Belvidere Rd & CR 621 Brainards Rd

07/24/2020



Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	1158	113	1494	1419	451
Future Volume (vph)	1158	113	1494	1419	451
Turn Type	Prot	Perm	Perm	NA	NA
Protected Phases	4			2	6
Permitted Phases		4	2		
Detector Phase	4	4	2	2	6
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5
Total Split (s)	41.0	41.0	49.0	49.0	49.0
Total Split (%)	45.6%	45.6%	54.4%	54.4%	54.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	C-Max	C-Max	C-Max
Act Effect Green (s)	36.5	36.5	44.5	44.5	44.5
Actuated g/C Ratio	0.41	0.41	0.49	0.49	0.49
v/c Ratio	2.02	0.21	3.55	0.93	0.45
Control Delay	485.3	9.8	1166.8	32.5	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	485.3	9.8	1166.8	32.5	12.4
LOS	F	A	F	C	B
Approach Delay	443.1			647.6	12.4
Approach LOS	F			F	B

### Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 3.55

Intersection Signal Delay: 507.3

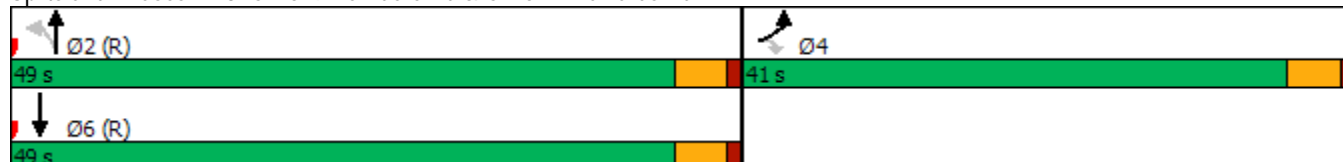
Intersection LOS: F

Intersection Capacity Utilization 137.4%

ICU Level of Service H

Analysis Period (min) 15











### Splits and Phases: 3: CR 519 Belvidere Rd & CR 621 Brainards Rd



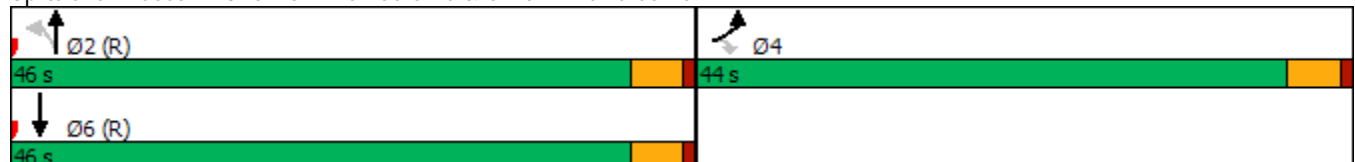
# Timings

## 3: CR 519 Belvidere Rd & CR 621 Brainards Rd

07/24/2020

					
Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	86	1477	189	494	925
Future Volume (vph)	86	1477	189	494	925
Turn Type	Prot	Perm	Perm	NA	NA
Protected Phases	4			2	6
Permitted Phases		4	2		
Detector Phase	4	4	2	2	6
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5
Total Split (s)	44.0	44.0	46.0	46.0	46.0
Total Split (%)	48.9%	48.9%	51.1%	51.1%	51.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	C-Max	C-Max	C-Max
Act Effct Green (s)	39.5	39.5	41.5	41.5	41.5
Actuated g/C Ratio	0.44	0.44	0.46	0.46	0.46
v/c Ratio	0.14	2.55	1.45	0.35	0.96
Control Delay	15.7	717.8	257.6	16.3	37.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	15.7	717.8	257.6	16.3	37.9
LOS	B	F	F	B	D
Approach Delay	679.0			88.9	37.9
Approach LOS	F			F	D
Intersection Summary					
Cycle Length: 90					
Actuated Cycle Length: 90					
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green					
Natural Cycle: 90					
Control Type: Actuated-Coordinated					
Maximum v/c Ratio: 2.55					
Intersection Signal Delay: 340.1				Intersection LOS: F	
Intersection Capacity Utilization 137.6%				ICU Level of Service H	
Analysis Period (min) 15					

### Splits and Phases: 3: CR 519 Belvidere Rd & CR 621 Brainards Rd



## Timings

### 2: CR 646 Belvidere Rd/CR 519 Belvidere Rd & CR 519 Uniontown Rd

07/24/2020



Lane Group	NBL	NET	SWL	SWT
Lane Configurations				
Traffic Volume (vph)	2	1176	302	430
Future Volume (vph)	2	1176	302	430
Turn Type	Prot	NA	Perm	NA
Protected Phases	2	4		8
Permitted Phases			8	
Detector Phase	2	4	8	8
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	35.0	55.0	55.0	55.0
Total Split (%)	38.9%	61.1%	61.1%	61.1%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effect Green (s)	30.5	50.5	50.5	50.5
Actuated g/C Ratio	0.34	0.56	0.56	0.56
v/c Ratio	1.50	1.30	4.20	0.47
Control Delay	258.1	164.1	1480.9	13.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	258.1	164.1	1480.9	13.7
LOS	F	F	F	B
Approach Delay	258.1	164.1		619.3
Approach LOS	F	F		F

#### Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 4.20

Intersection Signal Delay: 315.4

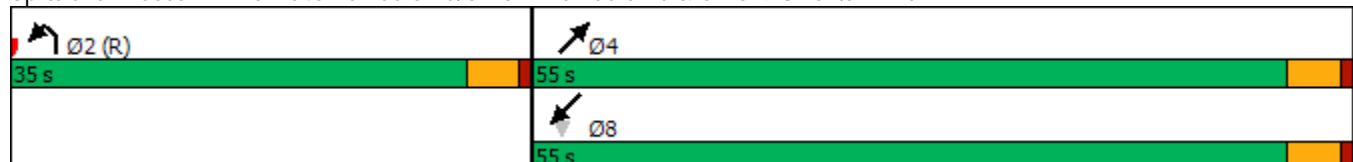
Intersection LOS: F

Intersection Capacity Utilization 137.2%

ICU Level of Service H

Analysis Period (min) 15

Splits and Phases: 2: CR 646 Belvidere Rd/CR 519 Belvidere Rd & CR 519 Uniontown Rd





## Timings

### 2: CR 646 Belvidere Rd/CR 519 Belvidere Rd & CR 519 Uniontown Rd

07/24/2020



Lane Group	NBL	NET	SWL	SWT
Lane Configurations				
Traffic Volume (vph)	12	358	702	1334
Future Volume (vph)	12	358	702	1334
Turn Type	Prot	NA	Perm	NA
Protected Phases	2	4		8
Permitted Phases			8	
Detector Phase	2	4	8	8
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	23.0	67.0	67.0	67.0
Total Split (%)	25.6%	74.4%	74.4%	74.4%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effect Green (s)	18.5	62.5	62.5	62.5
Actuated g/C Ratio	0.21	0.69	0.69	0.69
v/c Ratio	0.63	0.32	1.25	1.18
Control Delay	9.3	6.2	145.0	107.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	9.3	6.2	145.0	107.3
LOS	A	A	F	F
Approach Delay	9.3	6.2		120.3
Approach LOS	A	A		F

#### Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.25

Intersection Signal Delay: 91.0

Intersection LOS: F

Intersection Capacity Utilization 99.4%

ICU Level of Service F

Analysis Period (min) 15

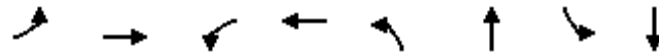
Splits and Phases: 2: CR 646 Belvidere Rd/CR 519 Belvidere Rd & CR 519 Uniontown Rd



# Timings

## 3: CR 519 Uniontown Rd & NJ 57

08/18/2020



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	284	356	28	290	36	330	3	125
Future Volume (vph)	284	356	28	290	36	330	3	125
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	50.0	50.0	50.0	50.0	15.0	15.0	15.0	15.0
Minimum Split (s)	57.0	57.0	57.0	57.0	23.0	23.0	23.0	23.0
Total Split (s)	57.0	57.0	57.0	57.0	33.0	33.0	33.0	33.0
Total Split (%)	63.3%	63.3%	63.3%	63.3%	36.7%	36.7%	36.7%	36.7%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	8.0	8.0	8.0	8.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	Min	Min	Min
Act Effect Green (s)	50.0	50.0	50.0	50.0	25.0	25.0	25.0	25.0
Actuated g/C Ratio	0.56	0.56	0.56	0.56	0.28	0.28	0.28	0.28
v/c Ratio	0.69	0.43	0.07	0.39	0.14	0.95	0.04	0.41
Control Delay	23.3	13.2	9.9	12.2	25.9	62.6	25.3	27.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.3	13.2	9.9	12.2	25.9	62.6	25.3	27.1
LOS	C	B	A	B	C	E	C	C
Approach Delay		17.7		12.0		59.5		27.1
Approach LOS		B		B		E		C

### Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 10.9 (12%), Referenced to phase 4:EBTL and 8:WBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.95

Intersection Signal Delay: 28.7

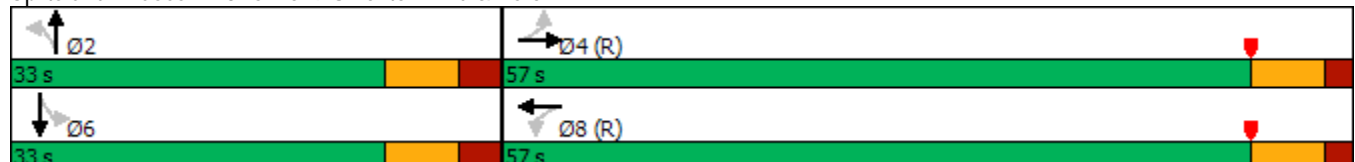
Intersection LOS: C

Intersection Capacity Utilization 131.6%

ICU Level of Service H

Analysis Period (min) 15

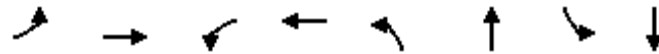
Splits and Phases: 3: CR 519 Uniontown Rd & NJ 57



# Timings

## 3: CR 519 Uniontown Rd & NJ 57

08/18/2020



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	31	264	145	571	34	295	3	294
Future Volume (vph)	31	264	145	571	34	295	3	294
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	50.0	50.0	50.0	50.0	15.0	15.0	15.0	15.0
Minimum Split (s)	57.0	57.0	57.0	57.0	23.0	23.0	23.0	23.0
Total Split (s)	57.0	57.0	57.0	57.0	33.0	33.0	33.0	33.0
Total Split (%)	63.3%	63.3%	63.3%	63.3%	36.7%	36.7%	36.7%	36.7%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	8.0	8.0	8.0	8.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	Min	Min	Min
Act Effect Green (s)	50.0	50.0	50.0	50.0	25.0	25.0	25.0	25.0
Actuated g/C Ratio	0.56	0.56	0.56	0.56	0.28	0.28	0.28	0.28
v/c Ratio	0.12	0.38	0.34	0.63	0.51	0.78	0.02	1.50
Control Delay	10.8	12.1	13.3	17.3	52.1	41.6	24.3	259.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.8	12.1	13.3	17.3	52.1	41.6	24.3	259.6
LOS	B	B	B	B	D	D	C	F
Approach Delay		12.0		16.4		42.6		258.4
Approach LOS		B		B		D		F

### Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 10.9 (12%), Referenced to phase 4:EBTL and 8:WBTL, Start of Yellow

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.50

Intersection Signal Delay: 99.3

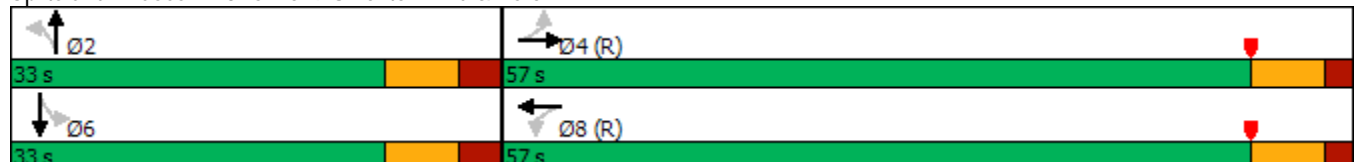
Intersection LOS: F

Intersection Capacity Utilization 139.9%

ICU Level of Service H

Analysis Period (min) 15

Splits and Phases: 3: CR 519 Uniontown Rd & NJ 57



# Timings

## 4: CR 519 Uniontown Rd & Strykers Rd

07/29/2020



Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	102	254	89	386	326
Future Volume (vph)	102	254	89	386	326
Turn Type	Prot	Perm	Perm	NA	NA
Protected Phases	4			2	6
Permitted Phases		4	2		
Detector Phase	4	4	2	2	6
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5
Total Split (s)	25.0	25.0	65.0	65.0	65.0
Total Split (%)	27.8%	27.8%	72.2%	72.2%	72.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	Min	Min	Min
Act Effect Green (s)	8.8	8.8		22.3	22.3
Actuated g/C Ratio	0.22	0.22		0.55	0.55
v/c Ratio	0.33	0.49		0.70	0.45
Control Delay	18.1	6.4		11.8	6.7
Queue Delay	0.0	0.0		0.0	0.0
Total Delay	18.1	6.4		11.8	6.7
LOS	B	A		B	A
Approach Delay	10.0			11.8	6.7
Approach LOS	B			B	A

### Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 40.6

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 9.7

Intersection LOS: A

Intersection Capacity Utilization 63.4%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 4: CR 519 Uniontown Rd & Strykers Rd



# Timings

## 4: CR 519 Uniontown Rd & Strykers Rd

07/29/2020



Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	133	178	215	474	556
Future Volume (vph)	133	178	215	474	556
Turn Type	Prot	Perm	Perm	NA	NA
Protected Phases	4			2	6
Permitted Phases		4	2		
Detector Phase	4	4	2	2	6
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	67.5	67.5	67.5
Total Split (%)	25.0%	25.0%	75.0%	75.0%	75.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	C-Max	C-Max	C-Max
Act Effect Green (s)	13.4	13.4		67.6	67.6
Actuated g/C Ratio	0.15	0.15		0.75	0.75
v/c Ratio	0.62	0.52		1.09	0.57
Control Delay	45.5	9.3		77.1	7.3
Queue Delay	0.0	0.0		0.0	0.0
Total Delay	45.5	9.3		77.1	7.3
LOS	D	A		E	A
Approach Delay	24.7			77.1	7.3
Approach LOS	C			E	A

### Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.09

Intersection Signal Delay: 38.6

Intersection LOS: D

Intersection Capacity Utilization 92.1%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 4: CR 519 Uniontown Rd & Strykers Rd



# Timings

## 4: CO 632 & I-78 WB ramp

06/25/2020



Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	1059	129	385	105
Future Volume (vph)	1059	129	385	105
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	64.0	64.0	26.0	26.0
Total Split (%)	71.1%	71.1%	28.9%	28.9%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effect Green (s)	59.2	59.2	21.3	21.3
Actuated g/C Ratio	0.66	0.66	0.24	0.24
v/c Ratio	0.98	0.13	0.94	0.26
Control Delay	39.2	2.3	65.8	29.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	39.2	2.3	65.8	29.6
LOS	D	A	E	C
Approach Delay	35.2		65.8	29.6
Approach LOS	D		E	C

### Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 89.6

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.98

Intersection Signal Delay: 41.9

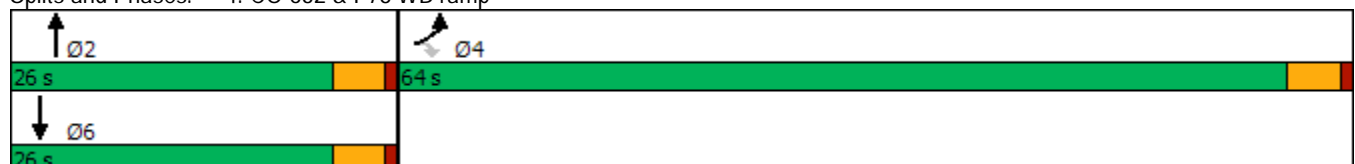
Intersection LOS: D

Intersection Capacity Utilization 86.4%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 4: CO 632 & I-78 WB ramp













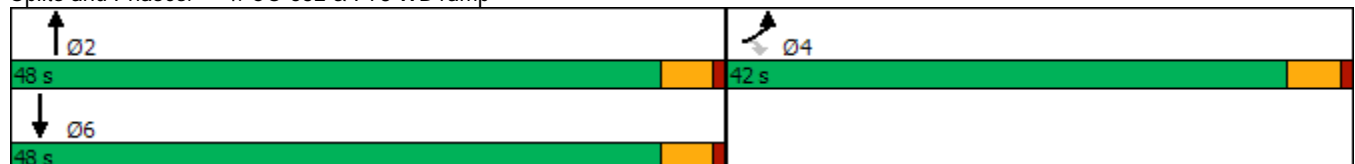
# Timings

## 4: CO 632 & I-78 WB ramp

06/25/2020

				
Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	261	52	124	328
Future Volume (vph)	261	52	124	328
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	42.0	42.0	48.0	48.0
Total Split (%)	46.7%	46.7%	53.3%	53.3%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	11.5	11.5	14.0	14.0
Actuated g/C Ratio	0.33	0.33	0.40	0.40
v/c Ratio	0.49	0.10	0.18	0.47
Control Delay	12.7	3.8	8.1	10.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	12.7	3.8	8.1	10.7
LOS	B	A	A	B
Approach Delay	11.2		8.1	10.7
Approach LOS	B		A	B
Intersection Summary				
Cycle Length: 90				
Actuated Cycle Length: 34.7				
Natural Cycle: 45				
Control Type: Actuated-Uncoordinated				
Maximum v/c Ratio: 0.49				
Intersection Signal Delay: 10.5			Intersection LOS: B	
Intersection Capacity Utilization 39.2%			ICU Level of Service A	
Analysis Period (min) 15				

Splits and Phases: 4: CO 632 & I-78 WB ramp



## APPENDIX E - CRASH TABLES

Table 1: Crash Analysis Summary

## US 22, Downtown Phillipsburg

		Crash Hotspot Location					
Category	Statewide/ Average (reference)	Morning Peak Period (07:00 AM - 09:00 AM)		Evening Peak Period (04:00 PM - 06:00 PM)		All Day (24 Hours)	
	% of Total	Number	% of Total	Number	% of Total	Number	% of Total
By Type							
Same Direction - Rear End	47.82%	23	19.66%	65	31.86%	272	22.52%
Right Angle	10.27%	22	<b>18.80%</b>	38	<b>18.63%</b>	211	<b>17.47%</b>
Same Direction - Sideswipe	19.11%	18	15.38%	31	15.20%	235	<b>19.45%</b>
Fixed Object	8.78%	22	<b>18.80%</b>	13	6.37%	142	<b>11.75%</b>
Struck Parked Vehicle	1.31%	18	<b>15.38%</b>	25	<b>12.25%</b>	192	<b>15.89%</b>
Left Turn/U Turn	2.29%	2	1.71%	3	1.47%	12	0.99%
Opposite Direction (Head On	1.61%	1	0.85%	3	1.47%	23	<b>1.90%</b>
Overtaken	0.53%	1	<b>0.85%</b>	1	0.49%	4	0.33%
Backing	0.84%	4	<b>3.42%</b>	8	<b>3.92%</b>	45	<b>3.73%</b>
Non-fixed Object	0.88%	0	0.00%	0	0.00%	4	0.33%
Animal	4.13%	0	0.00%	1	0.49%	8	0.66%
Pedestrian	0.85%	3	<b>2.56%</b>	4	<b>1.96%</b>	19	<b>1.57%</b>
Other	1.58%	3	<b>2.56%</b>	12	<b>5.88%</b>	41	<b>3.39%</b>
Total	100.00%	117	100.00%	204	100.00%	1208	100.00%
By Surface Condition							
Dry	79.65%	78	66.67%	166	<b>81.37%</b>	918	75.99%
Wet	17.89%	30	<b>25.64%</b>	33	16.18%	238	<b>19.70%</b>
Other	2.46%	9	<b>7.69%</b>	5	2.45%	52	<b>4.30%</b>
Total	100.00%	117	100.00%	204	100.00%	1208	100.00%
By Lighting Conditions							
Daylight	70.21%	110	<b>94.02%</b>	157	<b>76.96%</b>	893	<b>73.92%</b>
Dusk	2.59%	1	0.85%	8	<b>3.92%</b>	23	1.90%
Night	25.32%	0	0.00%	0	0.00%	0	0.00%
Other	1.88%	6	<b>5.13%</b>	39	<b>19.12%</b>	292	<b>24.17%</b>
Total	100.00%	117	100.00%	204	100.00%	1208	100.00%
By Severity							
Property Damage Only	74.26%	93	<b>79.49%</b>	161	<b>78.92%</b>	978	<b>80.96%</b>
Complaint of Pain	21.22%	18	15.38%	38	18.63%	186	15.40%
Moderate Injury	3.82%	5	<b>4.27%</b>	5	2.45%	40	3.31%
Killed	0.28%	1	<b>0.85%</b>	0	0.00%	1	0.08%
Incapacitated	0.42%	0	0.00%	0	0.00%	3	0.25%
Total	100.00%	117	100.00%	204	100.00%	1208	100.00%
Vehicle Type							
Autos	#N/A	107	91.45%	190	93.14%	1105	91.47%
Heavy Vehicles	#N/A	10	8.55%	14	6.86%	103	8.53%
Total	#N/A	117	100.00%	204	100.00%	1208	100.00%

Source: New Jersey Department of Transportation

Note: Statewide Average (2016-2018)

Table 2: Crash Analysis Summary

## US 46, NJ 182, CR 517, & CR 604

		Crash Hotspot Location					
Category	Statewide	Morning Peak Period		Morning Peak Period		All Day	
		(07:00 AM - 09:00 AM)		(07:00 AM - 09:00 AM)		(24 Hours)	
	% of Total	Number	% of Total	Number	% of Total	Number	% of Total
By Type							
Same Direction - Rear End	47.82%	25	38.46%	32	31.37%	227	37.90%
Right Angle	10.27%	14	<b>21.54%</b>	23	<b>22.55%</b>	146	<b>24.37%</b>
Same Direction - Sideswipe	19.11%	8	12.31%	10	9.80%	50	8.35%
Fixed Object	8.78%	4	6.15%	2	1.96%	26	4.34%
Struck Parked Vehicle	1.31%	4	<b>6.15%</b>	9	<b>8.82%</b>	63	<b>10.52%</b>
Left Turn/U Turn	2.29%	2	<b>3.08%</b>	5	<b>4.90%</b>	18	<b>3.01%</b>
Opposite Direction (Head On)	1.61%	1	1.54%	6	<b>5.88%</b>	13	<b>2.17%</b>
Overtaken	0.53%	0	0.00%	0	0.00%	1	0.17%
Backing	0.84%	2	<b>3.08%</b>	4	<b>3.92%</b>	17	<b>2.84%</b>
Non-fixed Object	0.88%	0	0.00%	1	<b>0.98%</b>	2	0.33%
Animal	4.13%	0	0.00%	3	2.94%	7	1.17%
Pedestrian	0.85%	2	<b>3.08%</b>	1	<b>0.98%</b>	8	<b>1.34%</b>
Other	1.58%	3	<b>4.62%</b>	6	<b>5.88%</b>	21	<b>3.51%</b>
Total	100.00%	65	100.00%	102	100.00%	599	100.00%
By Surface Condition							
Dry	79.65%	49	75.38%	82	<b>80.39%</b>	482	<b>80.47%</b>
Wet	17.89%	15	<b>23.08%</b>	16	15.69%	104	17.36%
Other	2.46%	1	1.54%	4	<b>3.92%</b>	13	2.17%
Total	100.00%	65	100.00%	102	100.00%	599	100.00%
By Lighting Conditions							
Daylight	70.21%	61	<b>93.85%</b>	80	<b>78.43%</b>	468	<b>78.13%</b>
Dusk	2.59%	0	0.00%	6	<b>5.88%</b>	13	2.17%
Night	25.32%	0	0.00%	0	0.00%	0	0.00%
Other	1.88%	4	<b>6.15%</b>	16	<b>15.69%</b>	118	<b>19.70%</b>
Total	100.00%	65	100.00%	102	100.00%	599	100.00%
By Severity							
Property Damage Only	74.26%	49	<b>75.38%</b>	83	<b>81.37%</b>	457	<b>76.29%</b>
Complaint of Pain	21.22%	14	<b>21.54%</b>	12	11.76%	114	19.03%
Moderate Injury	3.82%	2	3.08%	6	<b>5.88%</b>	25	<b>4.17%</b>
Killed	0.28%	0	0.00%	0	0.00%	1	0.17%
Incapacitated	0.42%	0	0.00%	1	<b>0.98%</b>	2	0.33%
Total	100.00%	65	100.00%	102	100.00%	599	100.00%
Vehicle Type							
Autos	#N/A	60	92.31%	99	97.06%	554	92.49%
Heavy Vehicles	#N/A	5	7.69%	3	2.94%	45	7.51%
Total	#N/A	65	100.00%	102	100.00%	599	100.00%

Source: New Jersey Department of Transportation

Note: Statewide Average (2016-2018)

Table 3: Crash Analysis Summary

## US @ CR 638 and @ CR 519

		Crash Hotspot Location					
Category	Statewide/ Average (reference)	Morning Peak Period (07:00 AM - 09:00 AM)		Evening Peak Period (04:00 PM - 06:00 PM)		All Day (24 Hours)	
	% of Total	Number	% of Total	Number	% of Total	Number	% of Total
By Type							
Same Direction - Rear End	47.82%	17	<b>58.62%</b>	45	<b>53.57%</b>	205	<b>51.25%</b>
Right Angle	10.27%	1	3.45%	6	7.14%	35	8.75%
Same Direction - Sideswipe	19.11%	9	<b>31.03%</b>	19	<b>22.62%</b>	101	<b>25.25%</b>
Fixed Object	8.78%	0	0.00%	2	2.38%	8	2.00%
Struck Parked Vehicle	1.31%	0	0.00%	1	1.19%	2	0.50%
Left Turn/U Turn	2.29%	0	0.00%	2	<b>2.38%</b>	7	1.75%
Opposite Direction (Head On)	1.61%	0	0.00%	0	0.00%	6	1.50%
Overtaken	0.53%	0	0.00%	0	0.00%	0	0.00%
Backing	0.84%	0	0.00%	1	<b>1.19%</b>	8	<b>2.00%</b>
Non-fixed Object	0.88%	0	0.00%	0	0.00%	1	0.25%
Animal	4.13%	0	0.00%	1	1.19%	3	0.75%
Pedestrian	0.85%	0	0.00%	0	0.00%	0	0.00%
Other	1.58%	2	<b>6.90%</b>	7	<b>8.33%</b>	24	<b>6.00%</b>
Total	100.00%	29	100.00%	84	100.00%	400	100.00%
By Surface Condition							
Dry	79.65%	21	72.41%	69	<b>82.14%</b>	321	<b>80.25%</b>
Wet	17.89%	7	<b>24.14%</b>	15	17.86%	73	<b>18.25%</b>
Other	2.46%	1	<b>3.45%</b>	0	0.00%	6	1.50%
Total	100.00%	29	100.00%	84	100.00%	400	100.00%
By Lighting Conditions							
Daylight	70.21%	28	<b>96.55%</b>	59	<b>70.24%</b>	301	<b>75.25%</b>
Dusk	2.59%	0	0.00%	5	<b>5.95%</b>	8	2.00%
Night	25.32%	0	0.00%	0	0.00%	0	0.00%
Other	1.88%	1	<b>3.45%</b>	20	<b>23.81%</b>	91	<b>22.75%</b>
Total	100.00%	29	100.00%	84	100.00%	400	100.00%
By Severity							
Property Damage Only	74.26%	23	<b>79.31%</b>	64	<b>76.19%</b>	309	<b>77.25%</b>
Complaint of Pain	21.22%	6	20.69%	19	<b>22.62%</b>	80	20.00%
Moderate Injury	3.82%	0	0.00%	1	1.19%	11	2.75%
Killed	0.28%	0	0.00%	0	0.00%	0	0.00%
Incapacitated	0.42%	0	0.00%	0	0.00%	0	0.00%
Total	100.00%	29	100.00%	84	100.00%	400	100.00%
Vehicle Type							
Autos	-	26	89.66%	75	89.29%	362	90.50%
Heavy Vehicles	-	3	10.34%	9	10.71%	38	9.50%
Total	-	29	100.00%	84	100.00%	400	100.00%

Source: New Jersey Department of Transportation

Note: Statewide Average (2016-2018)

Table 4: Crash Analysis Summary

## US 22 @ CR 519

		Crash Hotspot Location					
Category	Statewide Average	Morning Peak Period  (07:00 AM - 09:00 AM)		Evening Peak Period  (04:00 PM - 06:00 PM)		All Day  (24 Hours)	
		Number	% of Total	Number	% of Total	Number	% of Total
By Type							
Same Direction - Rear End	47.82%	1	20.00%	4	25.00%	38	41.30%
Right Angle	10.27%	0	0.00%	2	<b>12.50%</b>	13	<b>14.13%</b>
Same Direction - Sideswipe	19.11%	3	<b>60.00%</b>	5	<b>31.25%</b>	21	<b>22.83%</b>
Fixed Object	8.78%	0	0.00%	0	0.00%	1	1.09%
Struck Parked Vehicle	1.31%	0	0.00%	0	0.00%	0	0.00%
Left Turn/U Turn	2.29%	0	0.00%	1	<b>6.25%</b>	1	1.09%
Opposite Direction (Head On)	1.61%	0	0.00%	0	0.00%	0	0.00%
Overturned	0.53%	0	0.00%	0	0.00%	0	0.00%
Backing	0.84%	0	0.00%	0	0.00%	4	<b>4.35%</b>
Non-fixed Object	0.88%	0	0.00%	0	0.00%	0	0.00%
Animal	4.13%	0	0.00%	0	0.00%	0	0.00%
Pedestrian	0.85%	0	0.00%	0	0.00%	0	0.00%
Other	1.58%	1	<b>20.00%</b>	4	<b>25.00%</b>	14	<b>15.22%</b>
Total	100.00%	5	100.00%	16	100.00%	92	100.00%
By Surface Condition							
Dry	79.65%	3	60.00%	13	<b>81.25%</b>	73	79.35%
Wet	17.89%	1	<b>20.00%</b>	3	<b>18.75%</b>	16	17.39%
Other	2.46%	1	<b>20.00%</b>	0	0.00%	3	<b>3.26%</b>
Total	100.00%	5	100.00%	16	100.00%	92	100.00%
By Lighting Conditions							
Daylight	70.21%	4	<b>80.00%</b>	12	<b>75.00%</b>	72	<b>78.26%</b>
Dusk	2.59%	0	0.00%	1	<b>6.25%</b>	1	1.09%
Night	25.32%	0	0.00%	0	0.00%	0	0.00%
Other	1.88%	1	<b>20.00%</b>	3	<b>18.75%</b>	19	<b>20.65%</b>
Total	100.00%	5	100.00%	16	100.00%	92	100.00%
By Severity							
Property Damage Only	74.26%	5	<b>100.00%</b>	15	<b>93.75%</b>	75	<b>81.52%</b>
Complaint of Pain	21.22%	0	0.00%	1	6.25%	14	15.22%
Moderate Injury	3.82%	0	0.00%	0	0.00%	3	3.26%
Killed	0.28%	0	0.00%	0	0.00%	0	0.00%
Incapacitated	0.42%	0	0.00%	0	0.00%	0	0.00%
Total	100.00%	5	100.00%	16	100.00%	92	100.00%
Vehicle Type							
Autos	-	5	100.00%	14	87.50%	89	96.74%
Heavy Vehicles	-	0	0.00%	2	12.50%	3	3.26%
Total	-	5	100.00%	16	100.00%	92	100.00%

Source: New Jersey Department of Transportation

Note: Statewide Average (2016-2018)



Table 5: Crash Analysis Summary

## US 46 @ CR 517

		Crash Hotspot Location					
Category	Statewide Average	Morning Peak Period (07:00 AM - 09:00 AM)		Evening Peak Period (04:00 PM - 06:00 PM)		All Day (24 Hours)	
	% of Total	Number	% of Total	Number	% of Total	Number	% of Total
By Type							
Same Direction - Rear End	47.82%	5	<b>55.56%</b>	3	27.27%	23	37.70%
Right Angle	10.27%	0	0.00%	2	<b>18.18%</b>	10	<b>16.39%</b>
Same Direction - Sideswipe	19.11%	1	11.11%	4	<b>36.36%</b>	6	9.84%
Fixed Object	8.78%	1	<b>11.11%</b>	0	0.00%	9	<b>14.75%</b>
Struck Parked Vehicle	1.31%	0	0.00%	1	<b>9.09%</b>	4	<b>6.56%</b>
Left Turn/U Turn	2.29%	0	0.00%	0	0.00%	0	0.00%
Opposite Direction (Head On)	1.61%	0	0.00%	0	0.00%	0	0.00%
Overturned	0.53%	0	0.00%	0	0.00%	0	0.00%
Backing	0.84%	0	0.00%	0	0.00%	2	<b>3.28%</b>
Non-fixed Object	0.88%	0	0.00%	0	0.00%	0	0.00%
Animal	4.13%	0	0.00%	0	0.00%	0	0.00%
Pedestrian	0.85%	0	0.00%	1	<b>9.09%</b>	2	<b>3.28%</b>
Other	1.58%	2	<b>22.22%</b>	0	0.00%	5	<b>8.20%</b>
Total	100.00%	9	100.00%	11	100.00%	61	100.00%
By Surface Condition							
Dry	79.65%	6	66.67%	10	<b>90.91%</b>	49	<b>80.33%</b>
Wet	17.89%	3	<b>33.33%</b>	1	9.09%	12	<b>19.67%</b>
Other	2.46%	0	0.00%	0	0.00%	0	0.00%
Total	100.00%	9	100.00%	11	100.00%	61	100.00%
By Lighting Conditions							
Daylight	70.21%	7	<b>77.78%</b>	11	<b>100.00%</b>	43	<b>70.49%</b>
Dusk	2.59%	0	0.00%	0	0.00%	3	<b>4.92%</b>
Night	25.32%	0	0.00%	0	0.00%	0	0.00%
Other	1.88%	2	<b>22.22%</b>	0	0.00%	15	<b>24.59%</b>
Total	100.00%	9	100.00%	11	100.00%	61	100.00%
By Severity							
Property Damage Only	74.26%	7	<b>77.78%</b>	9	<b>81.82%</b>	47	<b>77.05%</b>
Complaint of Pain	21.22%	2	<b>22.22%</b>	1	9.09%	11	18.03%
Moderate Injury	3.82%	0	0.00%	1	<b>9.09%</b>	2	3.28%
Killed	0.28%	0	0.00%	0	0.00%	1	<b>1.64%</b>
Incapacitated	0.42%	0	0.00%	0	0.00%	0	0.00%
Total	100.00%	9	100.00%	11	100.00%	61	100.00%
Vehicle Type							
Autos	-	9	100.00%	11	100.00%	57	93.44%
Heavy Vehicles	-	0	0.00%	0	0.00%	4	6.56%
Total	-	9	100.00%	11	100.00%	61	100.00%

Source: New Jersey Department of Transportation

Note: Statewide Average (2016-2018)

Table 6: Crash Analysis Summary

## I-80 @ CR 517

		Crash Hotspot Location					
Category	Statewide Average	Morning Peak Period (07:00 AM - 09:00 AM)		Evening Peak Period (04:00 PM - 06:00 PM)		All Day (24 Hours)	
	% of Total	Number	% of Total	Number	% of Total	Number	% of Total
By Type							
Same Direction - Rear End	47.82%	2	28.57%	4	<b>57.14%</b>	21	43.75%
Right Angle	10.27%	0	0.00%	2	<b>28.57%</b>	4	8.33%
Same Direction - Sideswipe	19.11%	1	14.29%	0	0.00%	3	6.25%
Fixed Object	8.78%	2	<b>28.57%</b>	0	0.00%	5	<b>10.42%</b>
Struck Parked Vehicle	1.31%	0	0.00%	0	0.00%	0	0.00%
Left Turn/U Turn	2.29%	0	0.00%	0	0.00%	4	<b>8.33%</b>
Opposite Direction (Head On)	1.61%	0	0.00%	0	0.00%	2	<b>4.17%</b>
Overturned	0.53%	0	0.00%	1	<b>14.29%</b>	1	<b>2.08%</b>
Backing	0.84%	1	<b>14.29%</b>	0	0.00%	3	<b>6.25%</b>
Non-fixed Object	0.88%	0	0.00%	0	0.00%	0	0.00%
Animal	4.13%	1	<b>14.29%</b>	0	0.00%	3	<b>6.25%</b>
Pedestrian	0.85%	0	0.00%	0	0.00%	0	0.00%
Other	1.58%	0	0.00%	0	0.00%	2	<b>4.17%</b>
Total	100.00%	7	100.00%	7	100.00%	48	100.00%
By Surface Condition							
Dry	79.65%	6	<b>85.71%</b>	5	71.43%	39	<b>81.25%</b>
Wet	17.89%	1	14.29%	2	<b>28.57%</b>	6	12.50%
Other	2.46%	0	0.00%	0	0.00%	3	<b>6.25%</b>
Total	100.00%	7	100.00%	7	100.00%	48	100.00%
By Lighting Conditions							
Daylight	70.21%	7	<b>100.00%</b>	5	<b>71.43%</b>	36	<b>75.00%</b>
Dusk	2.59%	0	0.00%	2	<b>28.57%</b>	4	<b>8.33%</b>
Night	25.32%	0	0.00%	0	0.00%	0	0.00%
Other	1.88%	0	0.00%	0	0.00%	8	<b>16.67%</b>
Total	100.00%	7	100.00%	7	100.00%	48	100.00%
By Severity							
Property Damage Only	74.26%	7	<b>100.00%</b>	5	71.43%	41	<b>85.42%</b>
Complaint of Pain	21.22%	0	0.00%	0	0.00%	4	8.33%
Moderate Injury	3.82%	0	0.00%	1	<b>14.29%</b>	2	<b>4.17%</b>
Killed	0.28%	0	0.00%	0	0.00%	0	0.00%
Incapacitated	0.42%	0	0.00%	1	<b>14.29%</b>	1	<b>2.08%</b>
Total	100.00%	7	100.00%	7	100.00%	48	100.00%
Vehicle Type							
Autos	-	5	71.43%	7	#####	43	89.58%
Heavy Vehicles	-	2	28.57%	0	0.00%	5	10.42%
Total	-	7	100.00%	7	100.00%	48	100.00%

Source: New Jersey Department of Transportation

Note: Statewide Average (2016-2018)

Table 7: Crash Analysis Summary

## US 22 @ Morris St and CR 646

		Crash Hotspot Location					
Category	Statewide Average	Morning Peak Period (07:00 AM - 09:00 AM)		Evening Peak Period (04:00 PM - 06:00 PM)		All Day (24 Hours)	
	% of Total	Number	% of Total	Number	% of Total	Number	% of Total
By Type							
Same Direction - Rear End	47.82%	5	<b>83.33%</b>	4	<b>80.00%</b>	23	<b>58.97%</b>
Right Angle	10.27%	0	0.00%	0	0.00%	0	0.00%
Same Direction - Sideswipe	19.11%	0	0.00%	0	0.00%	5	12.82%
Fixed Object	8.78%	0	0.00%	1	<b>20.00%</b>	5	<b>12.82%</b>
Struck Parked Vehicle	1.31%	1	<b>16.67%</b>	0	0.00%	4	<b>10.26%</b>
Left Turn/U Turn	2.29%	0	0.00%	0	0.00%	0	0.00%
Opposite Direction (Head On)	1.61%	0	0.00%	0	0.00%	0	0.00%
Overturned	0.53%	0	0.00%	0	0.00%	0	0.00%
Backing	0.84%	0	0.00%	0	0.00%	1	<b>2.56%</b>
Non-fixed Object	0.88%	0	0.00%	0	0.00%	0	0.00%
Animal	4.13%	0	0.00%	0	0.00%	0	0.00%
Pedestrian	0.85%	0	0.00%	0	0.00%	0	0.00%
Other	1.58%	0	0.00%	0	0.00%	1	<b>2.56%</b>
Total	100.00%	6	100.00%	5	100.00%	39	100.00%
By Surface Condition							
Dry	79.65%	4	66.67%	4	<b>80.00%</b>	28	71.79%
Wet	17.89%	2	<b>33.33%</b>	1	<b>20.00%</b>	10	<b>25.64%</b>
Other	2.46%	0	0.00%	0	0.00%	1	<b>2.56%</b>
Total	100.00%	6	100.00%	5	100.00%	39	100.00%
By Lighting Conditions							
Daylight	70.21%	6	<b>100.00%</b>	3	60.00%	30	<b>76.92%</b>
Dusk	2.59%	0	0.00%	0	0.00%	0	0.00%
Night	25.32%	0	0.00%	0	0.00%	0	0.00%
Other	1.88%	0	0.00%	2	<b>40.00%</b>	9	<b>23.08%</b>
Total	100.00%	6	100.00%	5	100.00%	39	100.00%
By Severity							
Property Damage Only	74.26%	5	<b>83.33%</b>	2	40.00%	32	<b>82.05%</b>
Complaint of Pain	21.22%	0	0.00%	3	<b>60.00%</b>	4	10.26%
Moderate Injury	3.82%	1	<b>16.67%</b>	0	0.00%	2	<b>5.13%</b>
Killed	0.28%	0	0.00%	0	0.00%	0	0.00%
Incapacitated	0.42%	0	0.00%	0	0.00%	1	<b>2.56%</b>
Total	100.00%	6	100.00%	5	100.00%	39	100.00%
Vehicle Type							
Autos	-	6	100.00%	5	#####	37	94.87%
Heavy Vehicles	-	0	0.00%	0	0.00%	2	5.13%
Total	-	6	100.00%	5	100.00%	39	100.00%

Source: New Jersey Department of Transportation

Note: Statewide Average (2016-2018)

Table 8: Crash Analysis Summary

## CR 630 @ CR 640

		Crash Hotspot Location					
Category	Statewide Average	Morning Peak Period  (07:00 AM - 09:00 AM)		Evening Peak Period  (04:00 PM - 06:00 PM)		All Day  (24 Hours)	
		Number	% of Total	Number	% of Total	Number	% of Total
By Type							
Same Direction - Rear End	47.82%	6	85.71%	5	71.43%	23	58.97%
Right Angle	10.27%	0	0.00%	0	0.00%	2	5.13%
Same Direction - Sideswipe	19.11%	0	0.00%	1	14.29%	4	10.26%
Fixed Object	8.78%	1	14.29%	0	0.00%	5	12.82%
Struck Parked Vehicle	1.31%	0	0.00%	0	0.00%	0	0.00%
Left Turn/U Turn	2.29%	0	0.00%	0	0.00%	1	2.56%
Opposite Direction (Head On)	1.61%	0	0.00%	1	14.29%	2	5.13%
Overturned	0.53%	0	0.00%	0	0.00%	1	2.56%
Backing	0.84%	0	0.00%	0	0.00%	0	0.00%
Non-fixed Object	0.88%	0	0.00%	0	0.00%	0	0.00%
Animal	4.13%	0	0.00%	0	0.00%	0	0.00%
Pedestrian	0.85%	0	0.00%	0	0.00%	0	0.00%
Other	1.58%	0	0.00%	0	0.00%	1	2.56%
Total	100.00%	7	100.00%	7	100.00%	39	100.00%
By Surface Condition							
Dry	79.65%	5	71.43%	7	100.00%	29	74.36%
Wet	17.89%	2	28.57%	0	0.00%	10	25.64%
Other	2.46%	0	0.00%	0	0.00%	0	0.00%
Total	100.00%	7	100.00%	7	100.00%	39	100.00%
By Lighting Conditions							
Daylight	70.21%	7	100.00%	4	57.14%	32	82.05%
Dusk	2.59%	0	0.00%	0	0.00%	0	0.00%
Night	25.32%	0	0.00%	0	0.00%	0	0.00%
Other	1.88%	0	0.00%	3	42.86%	7	17.95%
Total	100.00%	7	100.00%	7	100.00%	39	100.00%
By Severity							
Property Damage Only	74.26%	4	57.14%	6	85.71%	25	64.10%
Complaint of Pain	21.22%	3	42.86%	0	0.00%	12	30.77%
Moderate Injury	3.82%	0	0.00%	1	14.29%	2	5.13%
Killed	0.28%	0	0.00%	0	0.00%	0	0.00%
Incapacitated	0.42%	0	0.00%	0	0.00%	0	0.00%
Total	100.00%	7	100.00%	7	100.00%	39	100.00%
Vehicle Type							
Autos	-	7	100.00%	7	100.00%	38	97.44%
Heavy Vehicles	-	0	0.00%	0	0.00%	1	2.56%
Total	-	7	100.00%	7	100.00%	39	100.00%

Source: New Jersey Department of Transportation

Note: Statewide Average (2016-2018)

Table 9: Crash Analysis Summary

## CR 521 @ CR 621

		Crash Hotspot Location					
Category	Statewide Average	Morning Peak Period (07:00 AM - 09:00 AM)		Evening Peak Period (04:00 PM - 06:00 PM)		All Day (24 Hours)	
	% of Total	Number	% of Total	Number	% of Total	Number	% of Total
By Type							
Same Direction - Rear End	47.82%	1	33.33%	0	0.00%	7	25.93%
Right Angle	10.27%	1	<b>33.33%</b>	0	0.00%	2	7.41%
Same Direction - Sideswipe	19.11%	0	0.00%	0	0.00%	0	0.00%
Fixed Object	8.78%	1	<b>33.33%</b>	0	0.00%	3	<b>11.11%</b>
Struck Parked Vehicle	1.31%	0	0.00%	3	<b>37.50%</b>	7	<b>25.93%</b>
Left Turn/U Turn	2.29%	0	0.00%	1	<b>12.50%</b>	1	<b>3.70%</b>
Opposite Direction (Head On)	1.61%	0	0.00%	1	<b>12.50%</b>	1	<b>3.70%</b>
Overturned	0.53%	0	0.00%	0	0.00%	0	0.00%
Backing	0.84%	0	0.00%	2	<b>25.00%</b>	5	<b>18.52%</b>
Non-fixed Object	0.88%	0	0.00%	0	0.00%	0	0.00%
Animal	4.13%	0	0.00%	1	<b>12.50%</b>	1	3.70%
Pedestrian	0.85%	0	0.00%	0	0.00%	0	0.00%
Other	1.58%	0	0.00%	0	0.00%	0	0.00%
Total	100.00%	3	100.00%	8	100.00%	27	100.00%
By Surface Condition							
Dry	79.65%	2	66.67%	7	<b>87.50%</b>	24	<b>88.89%</b>
Wet	17.89%	0	0.00%	1	12.50%	2	7.41%
Other	2.46%	1	<b>33.33%</b>	0	0.00%	1	<b>3.70%</b>
Total	100.00%	3	100.00%	8	100.00%	27	100.00%
By Lighting Conditions							
Daylight	70.21%	3	<b>100.00%</b>	4	50.00%	21	<b>77.78%</b>
Dusk	2.59%	0	0.00%	0	0.00%	0	0.00%
Night	25.32%	0	0.00%	0	0.00%	0	0.00%
Other	1.88%	0	0.00%	4	<b>50.00%</b>	6	<b>22.22%</b>
Total	100.00%	3	100.00%	8	100.00%	27	100.00%
By Severity							
Property Damage Only	74.26%	3	<b>100.00%</b>	8	<b>100.00%</b>	26	<b>96.30%</b>
Complaint of Pain	21.22%	0	0.00%	0	0.00%	1	3.70%
Moderate Injury	3.82%	0	0.00%	0	0.00%	0	0.00%
Killed	0.28%	0	0.00%	0	0.00%	0	0.00%
Incapacitated	0.42%	0	0.00%	0	0.00%	0	0.00%
Total	100.00%	3	100.00%	8	100.00%	27	100.00%
Vehicle Type							
Autos	-	1	33.33%	8	100.00%	25	92.59%
Heavy Vehicles	-	2	66.67%	0	0.00%	2	7.41%
Total	-	3	100.00%	8	100.00%	27	100.00%

Source: New Jersey Department of Transportation

Note: Statewide Average (2016-2018)