Detailed Hotspot Performance Profiles and Screening

Synopsis:

This section contains an inventory of current conditions of each hotspot that were selected as part of the system-wide congestion assessment. Recognizing that the CMP is intended to address multimodal performance, this section provides insights into how multiple transportation modes operate within each of the identified hotspots. Each hotspot in the region presents its own unique mobility challenges, and this review will be taken into account when suggesting strategies that best fit the conditions, goals, and character of the area under consideration.

Hotspot Evaluation & Screening Criteria:

A screening effort designed to present a clearer picture of the current conditions along each of the identified hotspots was performed. Included are current operational and usage statistics that is available on multiple modes of transportation to help guide which of the congestion strategies would be appropriate for each location. The evaluation and screening pulls data and information from a wide assortment of available sources. The full list of criteria (including definition and sources) is available on Tables 1-3. The focus of the evaluation is to capture the these three main categories regarding each hotspot: Transportation Inventory, General Area Details and Journey to Work and Employment Characteristics

The main goal is to provide decision-makers with a performance-based mix of strategies to mitigate congestion and improve the mobility of people and goods traversing the transportation system. In addition, it should address other CMP objectives as applicable, such as improving safety, accessibility, security, and supporting principles developed in the WILMAPCO 2050 Regional Transportation Plan.

Evaluation & Screening Criteria

Category #1—Transportation Inventory:

- Roadway classifications and other FHWA program designations
- Current traffic volumes, speeds and delay conditions
- Current multi-modal infrastructure and operations
- Safety (Crash Frequency, severity and types)

Category #2—General Area Details:

- Socio– Economic conditions
- Relationship with Environmental Justice and Mobility– Challenged areas
- Relationship with WILMAPCO RTP Transportation Investment Areas (TIAs)

Category #3—Journey to Work and Employment Characteristics:

- Employment Concentrations and job types
- Journey to Work Mode Share
- Transit Investment Suitability Analysis

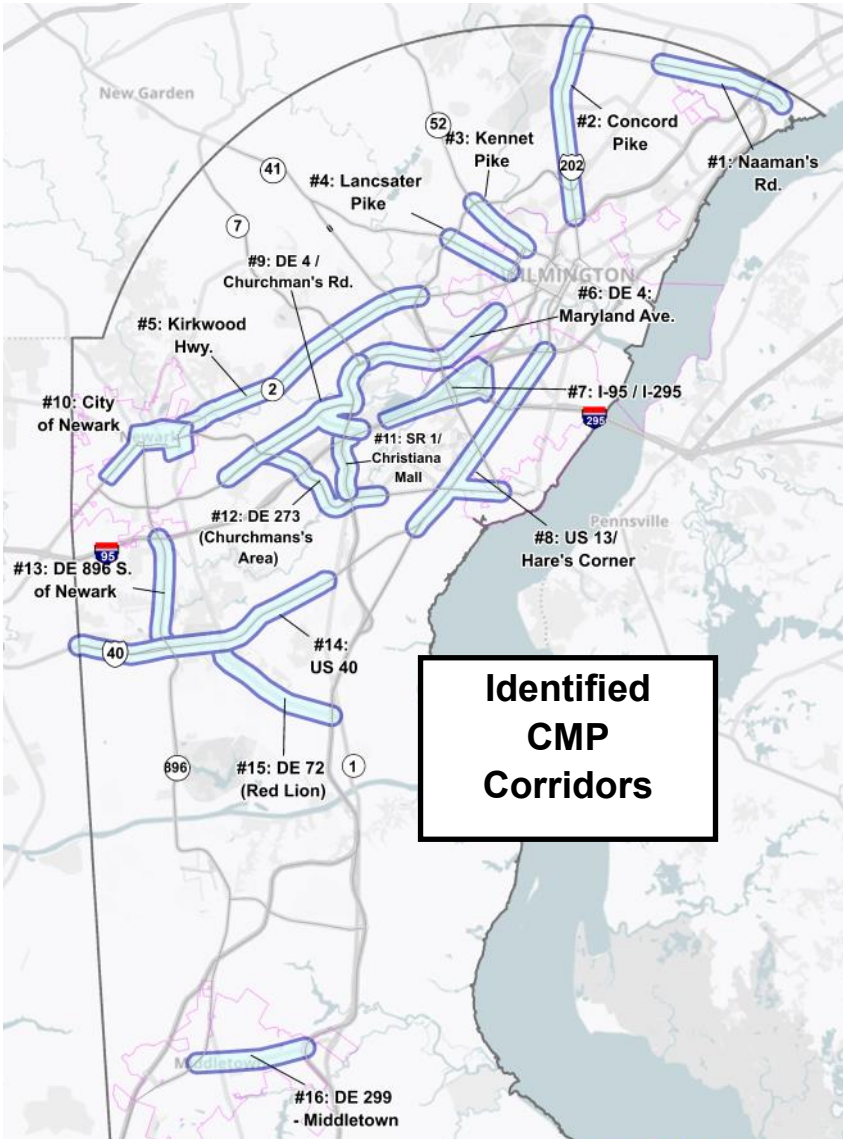


Table 1: Summary of Detailed Evaluation Criteria

Transportation Inventory	
Criteria	**Definition/Source**
Daily AADT Range	DelDOT Traffic Counts (2021)
Functional Classification	Based on FHWA Classification System (2015)
National Freight Highway Network (NHFN) designation	National Highway Freight Program (NHFP) in 23 U.S.C. 167
U.S. DOD's Strategic Highway Network (STRAHNET),	Public highways that provide access and emergency transportation of personnel and equipment for defense purposes.
Corridor within a Designated Truck Bottleneck (and Ranking)	DelDOT Truck Bottleneck Analysis (2018 & 2020)
Total Daily Hours of Person Delay (if available)	Performance metric from § 490.707—National performance management measures for traffic congestion. Measured in Total Person-Hours of Peak Hour Excessive Delay (PHED) measured along the NHS in Urbanized Areas within the hours of 6-10am and 3-7pm. Source: National Performance Management Research Data Set (NPMRDS)
Non-Motorized Facilities Coverage	Percentage of mileage (both directions) which have existing non-motorized facilities along main corridor roadway frontage. (2021) Source: WILMAPCO
Intersections in top 20% of Statewide Crash Rankings	Combines the use of three crash criteria: frequency, severity, and Manner of impact at each intersection. Analysis includes a 3-year average of crashes (2019-2021) at signalized and non-signalized intersections that average 10 or more crashes per year. Source: WILMAPCO, DelDOT
Average Bus trip frequency by Route (AM Peak/PM Peak)	Average number of trips on individual routes during the AM Peak (6-9am) and PM Peak (3-6pm). Source: Delaware Transit Corporation 2022
Number of Park and Rides and % Usage	Inventory of any designated Park & Ride/ Pool locations along corridor and their overall usage in 2022 Source: WILMAPCO, DelDOT
Last Signal Retiming (if applicable)	Year of last signalized corridor re-timing effort, if applicable

Other General Area Details	
Criteria	**Definition/Source**
Population Along Corridor within Moderate & Significant Environmental Justice Areas	WILMAPCO Transportation Justice Plan (2019)
Population Along Corridor within areas of high concentrations of Particulate Matter Emissions (80-100th Percentile of Statewide average)	Data from EJScreen: Environmental Justice Screening and Mapping Tool. Developed by the EPA. 2019
Population Along Corridor within Moderate & Significant Mobility Challenged Areas	WILMAPCO Transportation Justice Plan (2019)
WILMAPCO Transportation Investment Area(s)	WILMAPCO Regional Transportation Plan (2019)
Corridor inclusion in recent areawide studies	Any portion of corridor included in a recent Areawide / Subregional Master Plan or Study. Includes Transportation Improvement Districts (TIDs)

Table 2: Summary of Traffic and Travel Conditions Criteria

Criteria	Definition/Source
AM & PM Travel Time Reliability	Road segments with deficient Travel Time Reliability (TTR) from DelDOT Traffic Operations Management Plan (TOMP) for AM peak (7-9am) and PM peak (4-6pm) and Summer Mid-Day (10am-6pm). Breakdowns are as follows: - Severe Recurring: TTR (95th percentile/uncongested travel time) >= 2.5 and TTI (50th percentile/uncongested travel time) >= 1.5 - Severe Non-recurring: TTR >= 2.5 and TTI < 1.5 - Not Severe: TTR < 2.5 Full report can be found at https://deldot.gov/Programs/itms/index.shtml?dc=tomp ** Note: Bluetooth data was not available for corridors #6 and #12. NPMRDS data was used in its place to assess travel time reliability (Fall 2021)*
Substandard Intersections	Critical Movement Summation (CMS): A measurement which focuses on the raw intersection capacity and the ability for an intersection to process a given traffic demand (volume) with a given lane use configuration and given phase sequence. Level of Service (LOS) is determined by the peak hour volumes for the AM and PM periods. Breakdowns are as follows: - LOS A: Less than 1,000 vehicles/hour - LOS B: 1,000 to 1,150 vehicles/hour - LOS C: 1,151 to 1,300 vehicles/hour - LOS D: 1,301 to 1,450 vehicles/hour - LOS E: 1,451 to 1,600 vehicles/hour - LOS F: More than 1,600 vehicles/hour Year of data varies. Details on specific intersection locations can be found on the interactive map on the WILMAPCO CMP project homepage http://www.wilmapco.org/cms
Hourly Travel Speeds	Hourly travel speed averages are collected AM/PM weekday and Summer weekends using the following data timeframes: - Weekdays: Mondays-Thursdays from 2nd Monday in September to 2nd Thursday in November 2021 - Weekends: Second Friday in June to Second Sunday in August. Overnight average speed is a measurement of travel speeds during the hours of 11pm-5am Source: National Performance Management Research Data Set (NPMRDS)

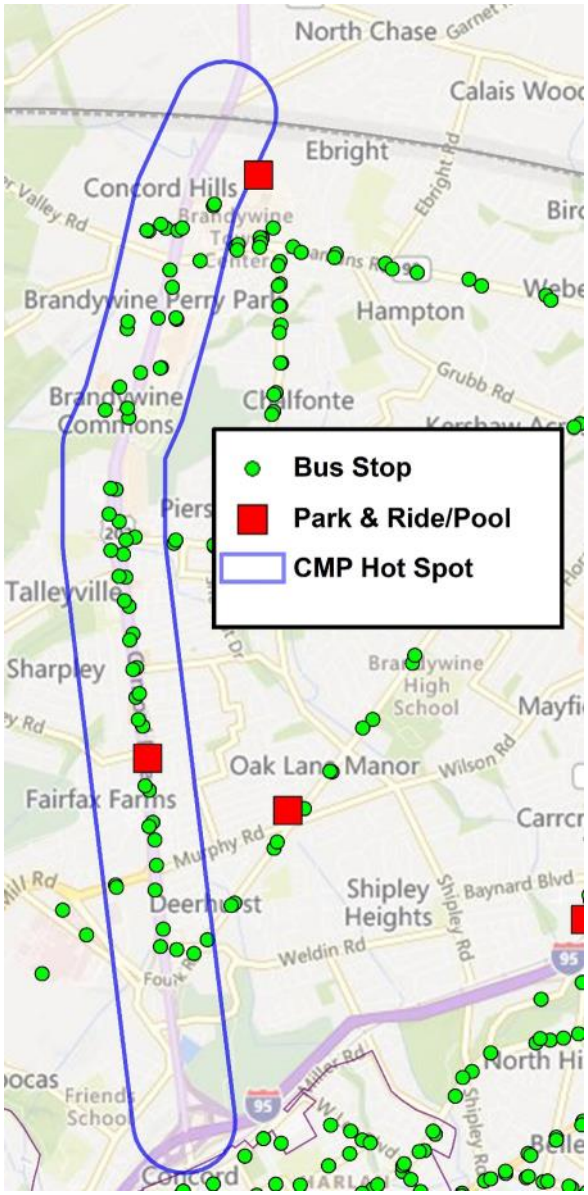
Table 3: Journey to Work and Employment Characteristics Criteria

Criteria	Definition/Source
Sub-Area Journey-to-Work Mode Splits	Journey to Work mode share of communities near identified corridor. Local mode share compared against the Countywide average. Source: American Community Survey (2015-2019 5-year avg.) at the block group level.
Corridor Employment by type and density	Breakdown of employment grouped by NAICS supersectors. Based on 2020 Traffic Analysis Zone data developed by WILMAPCO for use in the DelDOT Peninsula Model.
Appropriateness of Transit Service Intensity/Investment	Adaptation of analysis developed by the Delaware Valley Regional Planning Commission (DVRPC) titled *"Creating a Regional Transit Score Protocol"* which analyzes the relationship of land use, transit dependency and public transportation. Using gross densities of population, employment and zero-car households, it correlates transit service investments deemed appropriate based on the intensity of the variables used in developing a five category transit score. Full Report : https://www.dvrpc.org/reports/07005.pdf Source: Traffic Analysis Zone data developed by WILMAPCO for use in the DelDOT Peninsula Model (year 2020)

Corridor #2: Concord Pike Profile and Screening

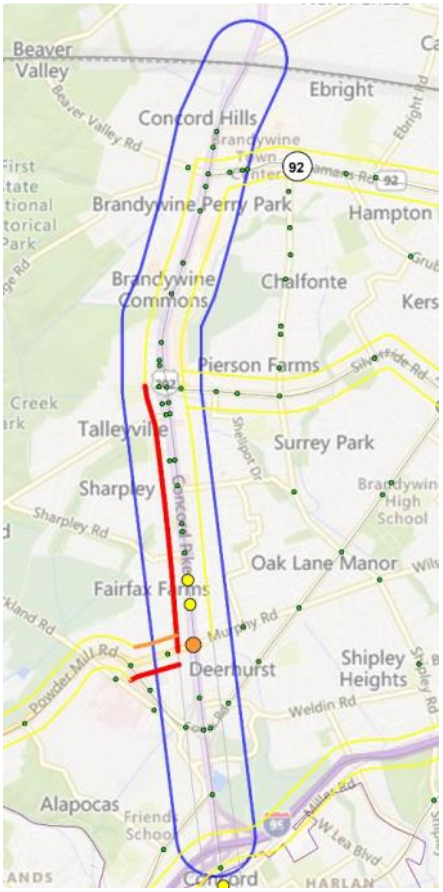
Transportation Inventory	
Corridor Length (miles)	5.1
Daily AADT Range	8,100 - 54,100
Functional Classification	Principal Arterial
National Freight Highway Network (NHFN)	Critical Urban Freight Corridor (CUFC)
Total Person-Hours of Peak Hour Excessive Delay (PHED)	169,332
Non-Motorized Facilities Coverage along main corridor roadway frontage	61.1%
Intersections in top 20% of Statewide Crash Rankings	US 202 @ Murphy Rd. (#48)
Average Total Transit Trips by Route (AM Peak Trips /PM Peak Trips)	Route 35 Brandywine Town Center / Shipley Rd (2 trips / 2 trips)
	Route 2 Concord Pike (15 trips / 18 trips)
Number of Park and Rides and % Usage	2 Locations - 5% Usage
Last Signal Retiming (if applicable)	2019
Other General Area Details	
Population Along Corridor within Moderate & Significant Environmental Justice Areas	No EJ Areas within corridor
Population Along Corridor within Moderate & Significant Mobility Challenged Areas	No MC Areas within corridor
WILMAPCO Transportation Investment Area(s)	Core
Corridor within a designated truck bottleneck (and Ranking)	No
Population Along Corridor within areas of high concentrations of Particulate Matter Emissions (80-100th Percentile of Statewide average)	0
Corridor inclusion in recent area-wide studies	Concord Pike Master Plan (2021)

Corridor #2: Concord Pike



Corridor #2: Concord Pike Traffic and Travel Conditions

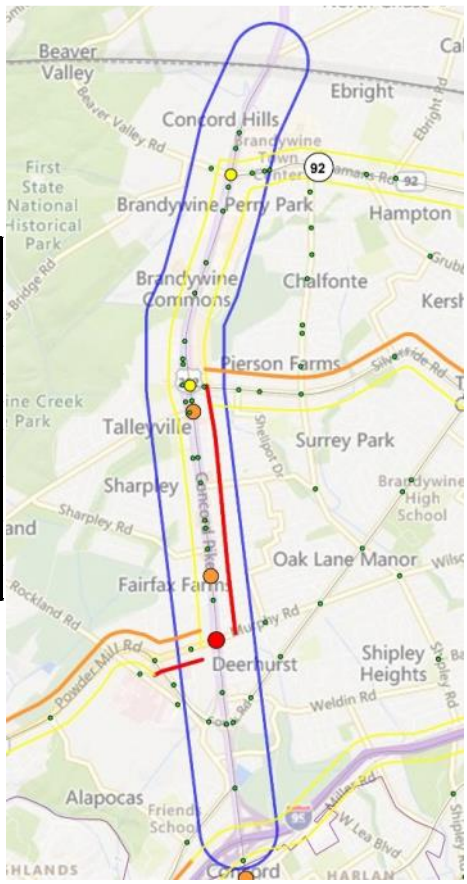
AM Peak Travel Conditions (7-9am)



Map Legend

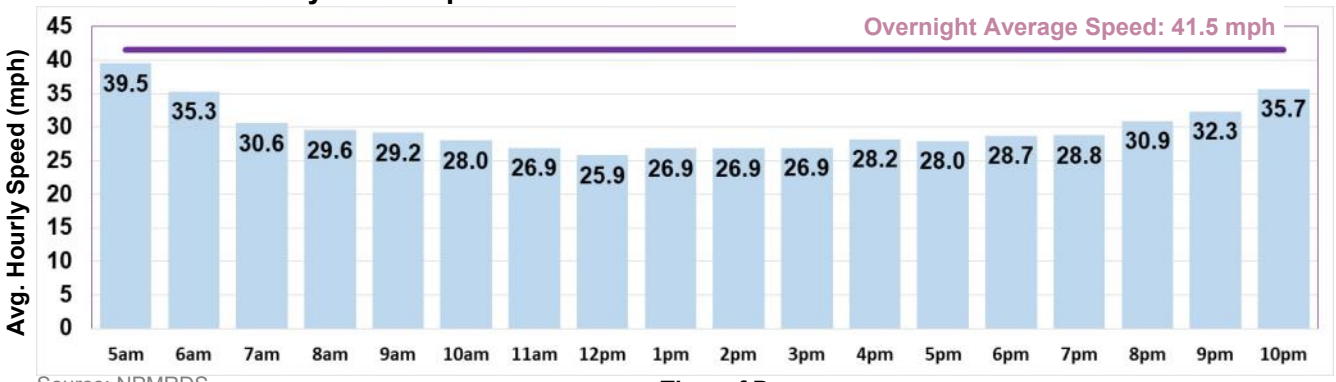
Intersection Level of Service (Critical Movement Summation)	
	LOS C+ less than 1,300 vehicles/hr.
	LOS D: 1,301 to 1,450 vehicles/hour
	LOS E: 1,451 to 1,600 vehicles/hour
	LOS F: Over 1,600 vehicles/hour
Travel Time Reliability	
	Areas with no Significant recurring or non-recurring congestion
	Areas with significant non-recurring congestion
	Areas with significant recurring congestion
	CMP Hot Spot

PM Peak Travel Conditions (4-6pm)



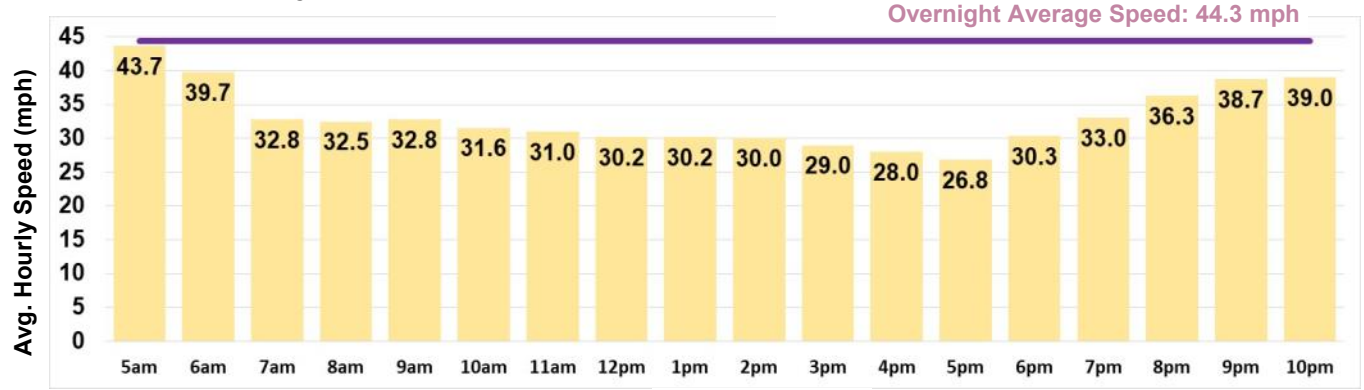
Source: DelDOT TOMP

NORTHBOUND Hourly Travel Speeds: I-95 to PA-491



Source: NPMRDS

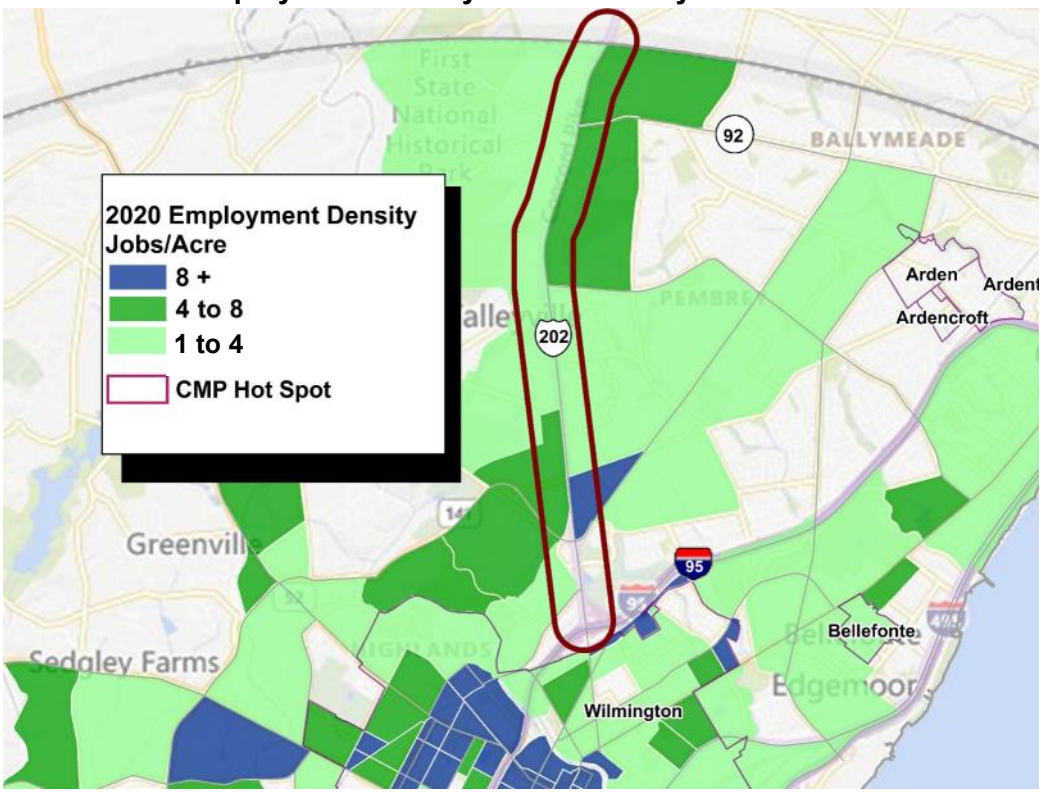
SOUTHBOUND Hourly Travel Speeds: PA-491 to I-95



Source: NPMRDS

Corridor #2: Concord Pike Journey to Work and Employment Characteristics

2020 Employment Density– Total Jobs by Place of Work



Source: WILMAPCO Traffic Analysis Zones

2020 Employment By Job Type

Employment Type	Corridor %	County %
Construction/ Manufacturing	15%	11%
Wholesale/Retail/Transp. & Utilities	22%	18%
Finance / Information	12%	11%
Prof. & Business Services	6%	14%
Health & Education	27%	24%
Leisure & Hospitality	12%	10%
Other Service & Public Admin.	5%	12%

Source: WILMAPCO Traffic Analysis Zones

Mode Share: ACS Journey to Work

Journey to Work Mode Split	Corridor Avg.	County Avg.
SOV	79.3%	79.8%
Carpool	7.8%	8.5%
Transit/Taxi	3.9%	3.8%
Walk/Bike	1.2%	2.8%
Other	0.4%	0.6%
Work at Home	7.4%	4.5%

Source: American Community Survey: 2015-19 5-year data.

Appropriateness of Transit Service Intensity/ Investment by Transit Score Category

Modal Investment	Appropriateness of New Investment
Heavy Urban Rail	Not Appropriate
Light Rail Transit	Not Appropriate
Commuter Rail	Not Appropriate
Bus Rapid Transit	Possible
Bus Lane Expansion	Appropriate
Bus Priority Treatment	Appropriate
Fixed Routes	Appropriate
Express Bus	Appropriate
Local Circulator	Appropriate

Adaptation of analysis developed by the DVRPC titled *"Creating a Regional Transit Score Protocol"* which analyzes the relationship of land use, transit dependency and public transportation. Correlates transit investments deemed appropriate based on the intensity of the variables used in developing the transit score. Based on 2020 Traffic Analysis Zone data developed by WILMAPCO.