

TECHNICAL MEMORANDUM

January 31, 2025

Project# 291900.004

To: Sharon Cino, Senior Planner
Lancaster County Planning Department
150 North Queen Street – Suite 320
Lancaster, PA 17603

From: Tara Hofferth, PE; Laura Ahramjian, AICP; Ryan Ford

RE: Lancaster County Planning Work Order 4: Borough Complete Streets Prioritization

Borough Complete Streets Prioritization

Kittelison & Associates, Inc. was contracted by the Lancaster County Planning Department (LCPD) to deliver a prioritized list of streets for Complete Streets recommendations across the boroughs in Lancaster County, Pennsylvania. This memorandum documents the tasks performed, including procedures, decisions, and results.

CONTEXT

The purpose of this task is to prioritize streets in Lancaster County for Complete Streets improvements. According to Smart Growth America¹, a Complete Streets approach to roadway design considers the needs of all people, including non-motorized road users like pedestrians, bicyclists, bus riders, and people riding horse and buggy. Complete Streets improvements might include sidewalks, bicycle facilities, improved crossing infrastructure, signal modifications, road diets, on-street parking modifications, lighting, streetscape improvements, traffic calming, bus stop amenities, narrower travel lanes, and intersection reconfiguration, among many other treatments and tools. Communities of all sizes across the United States are implementing Complete Streets to reduce fatal and serious injury crashes, especially among more vulnerable road users (VRUs). Complete Streets also provide increased access for people without a personal vehicle and those with various incomes, abilities, and needs. Addressing speed, visibility, and modal priority are key in moving the needle toward reducing serious crashes and creating a more equitable, sustainable transportation system.

This task primarily focuses on PennDOT-maintained streets in the county as a means of leveraging planned resurfacing projects to implement Complete Street changes that better accommodate more types of travelers. While many Complete Streets improvements involve curb modification and infrastructure construction, there are also several tools that can be achieved through pavement markings and street signs. Resurfacing projects present a feasible opportunity to implement improvements in the short-term while agencies pursue other funding buckets for larger-scale street redesign. This task

¹ <https://smartgrowthamerica.org/what-are-complete-streets/>

calculates weighted scores for each of the studied main streets. These scores are used to identify priority streets for Complete Streets improvements.

DATA COLLECTION AND EVALUATION

Data has been compiled for eighteen streets in Lancaster County. These streets were identified by LCPD and are considered the Borough "Main Streets." The streets are distributed throughout the county. They are shown in Attachment 1.

The studied streets are named and numbered in the attached data matrix (Attachment 2) along with their associated Borough. Street extents have been provided by LCPD and in some cases, these extents stretch beyond Borough boundaries. Market Street in Marietta is the only street that is not owned and operated by PennDOT. As such, some data for that street has been obtained through unique sources or is not available, as described in more detail herein. For the other studied streets, the state route number and segment number for the beginning and ending of each of the study corridors is included in the data matrix. The matrix also includes corridor length, which ranges from approximately 1 to 4 miles.

The data matrix includes data within the following categories:

- Traffic Speeds
- Roadway Conditions
- Bus Service
- Safety
- Supporting Plans and Policies
- Traffic Volumes
- Income and Racial Equity
- Demand

A few key assumptions and procedures were undertaken while calculating values in the data matrix:

- **Some metrics are normalized by corridor length.** This was done to ensure that streets are prioritized based on key needs and deficiencies rather than based on corridor length. For example, rather than tallying the total crashes along a corridor, which might be more along a longer street, the number of crashes per mile was calculated to understand where there is a concentrated safety concern.
- In some cases, **a weighted average has been used to develop corridor-level values.** Some data was provided at a segment level, such that there are different values for different parts of the corridor. A weighted average considers what proportion of the corridor each value is associated with. This results in a more accurate understanding of the needs and deficiencies along the corridor as compared to taking an extreme (maximum or minimum) value, which might only apply to a small portion of the street length. For example, a speed limit may be 35 mph along 90% of the corridor and 45 mph along 10% of the corridor. By taking the weighted average (36 mph), a more accurate picture of the speed limit of the corridor is understood.

The process for obtaining and evaluating the data within the categories is described herein. Generally, data was evaluated to determine where there are the greatest needs for Complete Streets improvements and thus, how the metric can be used to prioritize Complete Streets improvements. For each data metric, the "Interpreting the Data" section describes how the metric relates to Complete Streets prioritization.

TRAFFIC SPEEDS

According to FHWA, higher speeds contribute to more severe crash outcomes. Speeding is a contributing factor in about 29% of fatal crashes nationally². FHWA cites studies that indicates that a vehicle travelling at 23 mph has a 10% likelihood of killing a pedestrian in a collision. That percentage jumps to 50% when a vehicle is travelling at 42 mph³. Speeding decreases pedestrian level of comfort and increases bicycle level of traffic stress. As such, addressing vehicular speeding is critical to creating Complete Streets and reducing severe crashes.

Average Speeds

Average speeds were collected through PennDOT's INRIX account. INRIX is a data source that provides average speeds by collecting GPS location data from connected devices like smartphones and sensors in commercial vehicles. The corridor segments in INRIX do not match exactly with those under evaluation herein. Average speeds were derived for corridor extents that are largely similar to those being studied. The average speed is for the year of 2023, including an average across all days of the week. Average speed data was not found in INRIX for four study corridors, including those in the following Boroughs: Strasburg (#4), Denver (#7), Christiana (#8), and Marietta (#18). For the first three corridors mentioned, calculated free flow speed data provided by LCPD is listed in the data matrix instead. For most corridors where the INRIX data was available, average speeds were close to the calculated free flow speed data. Thus, that data was deemed an appropriate proxy where the INRIX data was missing. For Market Street in Marietta, neither INRIX nor LCPD free flow speed data was available.

Interpreting the Data: Streets with higher average speeds should be prioritized for Complete Streets implementation.

Posted Speeds

Posted speeds have been collected from Pennsylvania Spatial Data Access (PASDA). Since posted speeds changed along some of the study corridors, a weighted average was calculated to identify one best-representative posted speed limit along each corridor. Posted speed limits were also verified using Google Streetview via a high-level, spot-checking approach.

Interpreting the Data: Posted speed limit does not directly factor into Complete Streets prioritization.

Difference in Speeds

The posted speed limit (weighted average) was subtracted from the average speed of each street to determine the extent to which drivers are exceeding the speed limit.

Interpreting the Data: Streets with average speeds more greatly exceeding posted speed limits should be prioritized for Complete Streets implementation.

² <https://highways.dot.gov/safety/speed-management>

³ <https://highways.dot.gov/public-roads/winter-2022/05>

ROADWAY CONDITIONS

Understanding the existing infrastructure conditions along the Borough Main Streets clarifies where the largest gaps exist. This data also provides context on which streets are due for resurfacing.

Last Resurfacing

Resurfacing data was provided by LCPD at a segment level. A weighted average of the year last resurfaced has been derived for each study corridor. This was done to best predict where resurfacing is most likely to occur sooner. Resurfacing year data has not been identified for Market Street in Marietta.

Interpreting the Data: Streets that are due for resurfacing should be prioritized for Complete Streets implementation.

International Roughness Index (IRI)

The IRI is a measure of how rough the street pavement is. According to the Michigan Department of Transportation⁴, "the IRI describes how much total vertical movement a standard passenger vehicle's body would experience if driven over a 1-mile segment of the subject pavement at 50 mph." Streets with a higher IRI have a rougher pavement texture and thus, are more likely to need resurfacing sooner. Generally, streets that were resurfaced between 2014 and 2024 experienced a drop in IRI. IRI data was not provided or found for Market Street in Marietta.

Interpreting the Data: Streets with higher IRI in 2024 and those with high increases in IRI from 2014 to 2024 should be prioritized for Complete Streets improvements.

Sidewalk Inventory

Sidewalk coverage data was provided by LCPD. To calculate Sidewalk Ratio, the total length of sidewalk within a 50-foot buffer of each corridor was divided by twice the corridor length. The data is articulated as a percentage. A percentage of 100% would indicate full sidewalk coverage along both sides of the street. There was no consideration given to the width or condition of the sidewalk.

Interpreting the Data: Streets with less sidewalk coverage (a lower sidewalk ratio percentage) should be prioritized for Complete Streets improvements.

⁴ <https://www.michigan.gov/-/media/Project/Websites/MDOT/Programs/Planning/Asset-Management/International-Roughness-Index-IRI.pdf>

BUS SERVICE

The South Central Transit Authority (SCTA) operates bus service throughout Lancaster County. Bus service data was provided by SCTA. Bus operations and rider safety are key to developing Complete Streets. People can be more vulnerable walking to or waiting at a bus stop. Thus, it is key to prioritize improvements where people are more likely to be riding the bus.

Bus Routes

The data matrix includes the number of bus routes operating along the Borough Main Streets. Some streets have one route running along them, while others do not have any routes. No weight or consideration are given based on the length of the route or the number of stops along the street.

Interpreting the Data: Streets with a bus route should be prioritized for Complete Streets improvements.

Bus Ridership

Bus ridership data was provided by SCTA. This data includes the annual ridership per bus route between January 2023 and January 2024.

Interpreting the Data: Streets with a bus route with higher bus ridership should be prioritized for Complete Streets improvements.

SAFETY

Safety is a key component to Complete Streets and a clear goal for future implementation. Streets with larger existing safety concerns should be prioritized for improvement.

Highway Safety Network Screening (HSNS) Excess Cost

According to FHWA⁵, Network Screening is an objective, data-driven method for determining where to prioritize safety investment. HSNS uses crash history, roadway factors, and traffic characteristics to predict where crashes are likely to occur and where it would be most cost effective to reduce crashes with targeted intervention and investment. "Excess cost" is an output of the HSNS process. Most PennDOT-owned segments of roadway have an excess cost value assigned to them through the PennDOT Central Office HSNS process completed in 2024. A higher (more positive) excess cost value indicates that safety investment is especially pertinent. A lower (more negative) excess cost value indicates that safety investment is relatively less pertinent. Not all intersections in Pennsylvania have an excess cost value assigned in 2024. Given that Market Street in Marietta is not a PennDOT street, no excess cost value is provided for that street. For this effort, excess costs as summed, including the roadway segments and the intersections within the study corridor extents for which excess costs are provided. The excess cost values were then normalized by corridor length. Summing all of the excess cost values is the best way to articulate a full picture of this metric along the corridor, especially in the context of considering corridor-long projects.

Interpreting the Data: Streets with more positive excess cost values should be prioritized for Complete Streets improvements.

Vulnerable Road User (VRU) Priority

In 2023, PennDOT conducted a statewide VRU safety assessment to identify corridors in the state where pedestrians, bicyclists, and bus riders are most vulnerable on the roadway network⁶. This assessment is critical given that "the number of pedestrians and cyclists involved in fatalities and serious injuries on U.S. roadways has steadily risen." Page 3-24 of the report lists the corridors in Lancaster County that should be prioritized for addressing VRU safety. This metric is listed as a binary scale with 1 meaning that the corridor is listed as a statewide VRU priority and 0 meaning that the corridor is not listed as a statewide VRU priority.

Interpreting the Data: Streets that are a statewide VRU priority with a score of a 1 should be prioritized for Complete Streets improvements.

Crashes

Crash data is critical to understanding where there is the greatest need for Complete Streets improvements. Crash data was collected through PennDOT's Pennsylvania Crash Information Tool (PCIT),

⁵ <https://safety.fhwa.dot.gov/systemic/fhwasa17008/>

⁶ <https://www.pa.gov/content/dam/copapwp-pagov/en/penndot/documents/travelinpa/safety/documents/a-%20vru%20safety%20assessment%20report%20final%20-%20apr%2010%202024%20.pdf>

a publicly accessible crash database. Data was collected for the past 9 years (2015-2023) for Lancaster County with the goal of understanding both total crashes as well as the 5-year rolling average. There were four main crash data categories evaluated:

- All crashes;
- Non-motorized crashes;
- Speeding-related crashes and;
- Horse and buggy crashes.

The number of crashes was normalized by the length of each corridor for all crashes, non-motorized crashes, and speeding-related crashes. Given that there were few total horse and buggy crashes, this metric was evaluated on a binary scale with 1 assigned where at least 1 horse and buggy crash occurred between 2015 and 2023 and 0 assigned where no horse and buggy crash occurred during that timeframe.

The 5-year rolling averages for each crash category were calculated to understand how crash trends have changed over time. For all crashes, a percent change in average crashes between the first five years (2015-2020) and the last five years (2019-2023) was calculated and is listed in the data matrix.

Interpreting the Data: Streets with higher total crashes (for each studied category) should be prioritized for Complete Streets improvements. Streets with a higher percent increase in crashes from the first five years to the last five years should also be prioritized.

SUPPORTING PLANS AND POLICIES

Policy data was included to understand where Complete Streets improvements are already being considered in the County. The goal is to prioritize streets where known concerns and potential solutions have already been identified.

Active Transportation Mobility Hub

The Lancaster County Active Transportation Plan⁷ was adopted in 2016. It is a key component in programming Complete Streets throughout the County. On Page 4-5 is a map of Lancaster County's Recommended Active Transportation Network, including where mobility hubs are planned. These mobility hubs or activity nodes specify where there is concentrated pedestrian activity and high multimodal demand. For this task, primary hubs were assigned a value of 1; secondary hubs were assigned a value of 2; and tertiary hubs were assigned a value of 3.

Interpreting the Data: Streets with a primary mobility hub should be prioritized most for Complete Streets improvements, followed by those with a secondary mobility hub and then those with a tertiary mobility hub.

Complete Streets Policies

LCPD provided a list of Boroughs with Complete Streets policies. A binary score of 1 was assigned to the streets in these Boroughs while a score of 0 was assigned to the streets within a Borough without a Complete Streets policy.

Interpreting the Data: The streets in Boroughs with Complete Streets policies should be prioritized for Complete Streets improvements because some planning has already been done to feasibly realize these investments.

Active Transportation Plans and WalkWorks Evaluations

LCPD provided a list of Boroughs with Active Transportation Plans (ATPs). WalkWorks⁸ is a Department of Health initiative "that supports the development and adoption of Active Transportation Plans in communities across the Commonwealth." A binary score of 1 was assigned to the streets in the Boroughs with either an ATP and/or WalkWorks evaluation while a score of 0 was assigned to the streets within Boroughs without an ATP and/or WalkWorks evaluation.

Interpreting the Data: The streets in the Boroughs with ATPs and/or WalkWorks evaluations should be prioritized for Complete Streets improvement because some planning has already been done to feasibly realize these investments.

⁷ <https://lancastercountypartnership.org/DocumentCenter/View/1171/Full-Plan-Lo-Res?bidId=>

⁸ <https://www.pa.gov/en/agencies/health/programs/healthy-living/walkworks.html>

TRAFFIC VOLUMES

Higher volumes of traffic can contribute to safety challenges and discomfort for multimodal transportation users. Consistent with the priority of addressing streets with the most need, streets with higher traffic volumes are prioritized.

Average Annual Daily Traffic (AADT)

AADT data was provided by LCPD at a segment level. A weighted average was calculated to assign one AADT value to each street. AADT for Market Street in Marietta was not provided by LCPD but was obtained from PennDOT's Traffic Information Repository (TIRe)⁹. The year for these measurements is not consistent and instead ranges from 2017 to 2022.

Interpreting the Data: Streets with higher traffic volumes should be prioritized for Complete Streets improvements.

Truck Volumes

Truck volume data was also received from LCPD, except along Market Street in Marietta where TIRe was again used. Trucks tend to contribute to more discomfort among vulnerable road users and other roadway users.

Interpreting the Data: Streets with a higher truck volume should be prioritized for Complete Streets improvements.

⁹ <https://gis.penndot.gov/tire>

INCOME AND RACIAL EQUITY

Income and racial equity data was provided by Lancaster County. All demographic data used to calculate the environmental justice zones in Lancaster were taken from the U.S. Census Bureau. Understanding where there are historically disinvested communities and vulnerable populations is important for developing Complete Streets because these may be locations where people have less access to a personal vehicle.

Lower Income Population

LCPD provided geographic categories of low-income populations. These categories, ranging from Lancaster 1 through Lancaster 5, benchmark the percentage of low-income residents as compared to the County average. Lancaster 1 represents areas where there is much less low-income population as compared to the County average while Lancaster 5 represents areas where there is much more low-income population as compared to the County average. Since most streets run through more than one income zone, a weighted average was calculated. The resulting score therefore ranges from 1-5 and is not a whole number.

Interpreting the Data: Streets with a higher low-income population value represent greater disadvantage and should be prioritized for Complete Streets improvements.

Minority Population

LCPD provided geographic categories of minority populations. These categories, ranging from Lancaster 1 through Lancaster 5, benchmark the percentage of minority residents as compared to the County average. Minority residents are defined as populations that identify other than Non-Hispanic White. Lancaster 1 represents areas where there is much less minority population as compared to the County average while Lancaster 5 represents areas where there is much more minority population as compared to the County average. Since most streets run through more than one minority zone, a weighted average was calculated. The resulting score therefore ranges from 1-5 and is not a whole number.

Interpreting the Data: Streets with a higher minority population value represent greater disadvantage and should be prioritized for Complete Streets improvements.

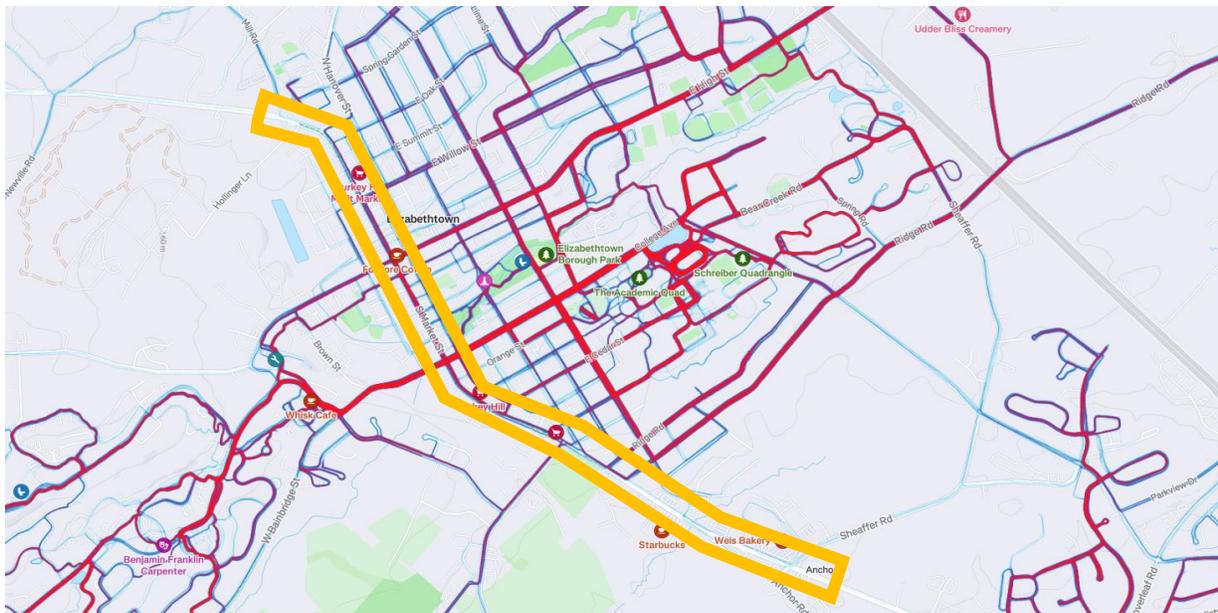
DEMAND

Demand for multimodal transportation infrastructure has been articulated through three metrics, including density of people walking, density of people biking, and population density. This data is an important factor in considering where vulnerable road users are most likely travelling when developing Complete Streets.

Walking Density

To articulate walking density, Strava heat maps were analyzed for “all foot sports,” which include walking and running. Strava is a fitness tracking app that tracks physical activity. It is an incomplete data set because it only tracks the patterns and movements of people using the app. In some cases, these people tend to be people that are travelling recreationally. Still, heat maps in Strava can represent where there might be more people walking, running, or cycling in larger volumes as compared to other nearby streets.

Data was not downloaded from Strava. To develop a metric for this effort, a scale of 1 to 4 was considered and applied based on how thick and dark (red) the heat map is for each corridor. This metric is more subjective than other metrics included in the matrix. An approximate weighted average was assumed to better articulate the changing demand along the corridor. For instance, if half of the corridor included the highest level of walking density (4) and the other half a more moderate level of walking density (2), those values were averaged (3). An example of this process is shown below.

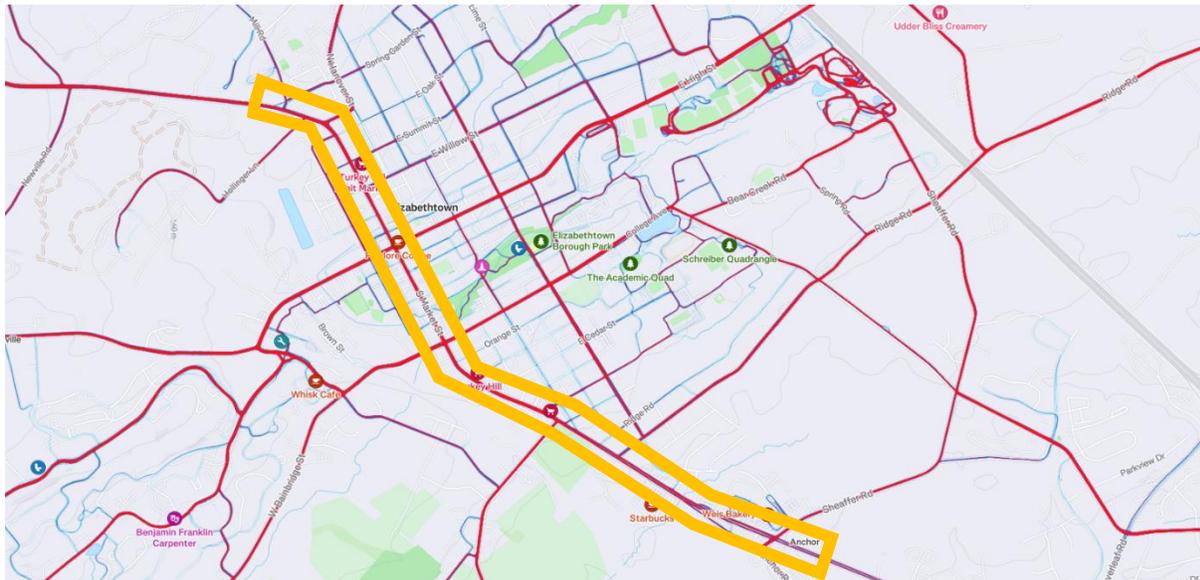


The Market Street corridor in Elizabethtown is shown within the yellow box in the above graphic. Strava heat map data is shown for “all foot sports.” Right in the heart of the Borough, the density data appears to be at the highest level and thus, is assigned a level 4. However, outside of the Borough’s downtown, the heat map shows fewer people walking. Here, the assignment is level 1 or 2. To balance these metrics, a score of 2.5 is assigned to this corridor.

Interpreting the Data: Streets with a higher walking density (closer to 4) are assumed to generate more multimodal demand and thus, should be prioritized for Complete Streets improvements.

Biking Density

To articulate biking density, Strava heat maps were analyzed for “all cycle sports,” which include biking and e-biking. The limitations of this data and the process for evaluating biking density paralleled that for the walking density metric. A scale of 1 to 4 was considered and applied based on how thick and dark (red) the heat map is for each corridor. In this way, this metric is more subjective than other metrics included in the matrix. An approximate weighted average was assumed to better articulate the changing demand along the corridor. For instance, if half of the corridor included the highest level of biking density (4) and the other half a more moderate level of biking density (2), those values were averaged (3). An example of this process is shown below.



The Market Street corridor in Elizabethtown is shown within the yellow box in the above graphic. Strava heat map data is shown for “all cycling sports.” This heat map shows a steady density of people biking along the full corridor. The line is darker and thicker compared to other streets in the network. As such, this corridor is assigned a high level of biking density (3.75).

Interpreting the Data: Streets with a higher biking density (closer to 4) are assumed to generate more multimodal demand and thus, should be prioritized for Complete Streets improvements.

Population Density

Population density data helps determine the level of non-motorized travel demand each corridor in the study area might generate. Population density data came from the U.S. Census Bureau’s 2020 Decennial Survey. Population density was calculated per square mile and represented in Block Group geographic areas. Each corridor in the study area has a weighted average of the surrounding block group population densities. To calculate the weighted average, the length of each corridor that bordered a specific population density was multiplied by the population density and then divided by the total length of the corridor. Each corridor segmented was added to get the resulting total.

Interpreting the Data: Streets with a higher population density are assumed to generate more multimodal demand and thus, should be prioritized for Complete Streets improvements.

SCORING AND PRIORITIZATION

The purpose of this overall task was to develop a prioritized list of corridors for Complete Streets improvements. To achieve this goal, the data metrics have been converted into scores for each of the corridors. They are then weighted based on feedback from the Boroughs.

Through discussion with LCPD, it was determined that corridors with greater need should be prioritized for Complete Streets improvements. Thus, streets with characteristics that make them less safe and more hostile to non-motorized users are scored more highly, such as those with higher speeds and volumes.

DEVELOPING SCORES

The prioritization scores for each corridor were developed based on the following categories:

- Traffic Speeds
- Roadway Conditions
- Bus Service
- Safety
- Supporting Plans and Policies
- Traffic Volumes
- Income and Racial Equity
- Demand

Each category was broken down into subcategories based on the data available. Within each subcategory, the corridor with a maximum value was given a score of 1 and the corridor with the minimum value was given a score of 0. The score for every other corridor was normalized and ranked according to their distance from the maximum.

Once the scores for subcategories were calculated, each corridor received an overall score for the category. Some categories had more subcategories than others. To weigh all categories equally, each corridor received an average category score. For example, the Speed category was comprised of 7 subcategories. Thus, the total Speed score was divided by 7. In this way, each overall category's score is between 0 and 1. Finally, each category's score was combined into a total score for the corridor. These scores are between 0 and 8.

The initial ranking (with raw scores) of the Borough main streets for Complete Streets implementation is as follows:

1. Columbia Borough – Chestnut Street/Fifth Street/Lincoln Highway/Columbia Avenue (SR 462)
2. Millersville Borough – Blue Rock Road/Manor Avenue/Millersville Pike (SR 999)
3. Elizabethtown Borough – Market Street (SR 230)
4. Mountville Borough – Columbia Avenue/Lincoln Highway (SR 462)
5. Denver Borough – Main Street/Church Street (SR 1051)
6. Akron Borough – 7th Street/State Street (SR 272)
7. Manheim Borough – Main Street/Lancaster Road/Lebanon Road (SR 72)
8. Ephrata Borough – Main Street (SR 322)
9. East Petersburg Borough – Main Street/Manheim Pike (SR 72)
10. Mount Joy Borough – Main Street (SR 230)
11. Quarryville Borough – Buck Road/State Street (SR 372)
12. Lititz Borough – Broad Street/Lititz Pike/Furnace Hills Pike (SR 501)
13. New Holland Borough – Main Street (SR 23)

14. Adamstown Borough – Reading Road (SR 272)
15. Marietta Borough – Market Street (No SR)
16. Strasburg Borough – Main Street/Miller Street/Village Road (SR 741)
17. Terre Hill Borough – Main Street/Weaverland Valley Road/Earle Street/Broad Street (SR 897)
18. Christiana Borough – Bridge Street/Newport Avenue (SR 2025)

BOROUGH PRIORITIZATION

The score categories were then weighed by the Boroughs. Decision Lens was used to ask Borough representatives to compare the relative priority of the scoring categories and subcategories. Decision Lens is a tool for efficiently seeking feedback and ranking priorities. Following the Borough's Association Meeting on January 22, 2025, Borough representatives were asked to log into the Decision Lens portfolio created by LCPD and provide input on pairwise comparisons.

The results in Decision Lens indicate how the Borough representatives value Complete Streets scoring categories over others. Overall, there was significant consistency in the responses. The percentages derived from Decision Lens were incorporated into the matrix to weigh the scores and deliver a final ranking of the Borough main streets.

The scoring results are presented in the matrix that is provided in Attachment 2. The scores with weightings are between 0 and 1. The scoring weights from Decision Lens used to determine the final ranking of the Borough main streets are as follows:

- Traffic Speeds – 6%
- Roadway Conditions – 12%
- Bus Service – 6%
- Safety – 18%
- Supporting Plans and Policies – 16%
- Traffic Volumes – 18%
- Income and Racial Equity – 6%
- Demand – 17%

The final ranking (with weighted scores) of the Borough main streets for Complete Streets implementation is as follows:

1. Columbia Borough – Chestnut Street/Fifth Street/Lincoln Highway/Columbia Avenue (SR 462)
2. Elizabethtown Borough – Market Street (SR 230)
3. Denver Borough – Main Street/Church Street (SR 1051)
4. Ephrata Borough – Main Street (SR 322)
5. Millersville Borough – Blue Rock Road/Manor Avenue/Millersville Pike (SR 999)
6. Akron Borough – 7th Street/State Street (SR 272)
7. Mount Joy Borough – Main Street (SR 230)
8. Lititz Borough – Broad Street/Lititz Pike/Furnace Hills Pike (SR 501)
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16. Strasburg Borough – Main Street/Miller Street/Village Road (SR 741)
17. Terre Hill Borough – Main Street/Weaverland Valley Road/Earle Street/Broad Street (SR 897)
18. Christiana Borough – Bridge Street/Newport Avenue (SR 2025)

The map of main streets in Attachment 1 includes colors to show these final street rankings.

CONCLUSION AND NEXT STEPS

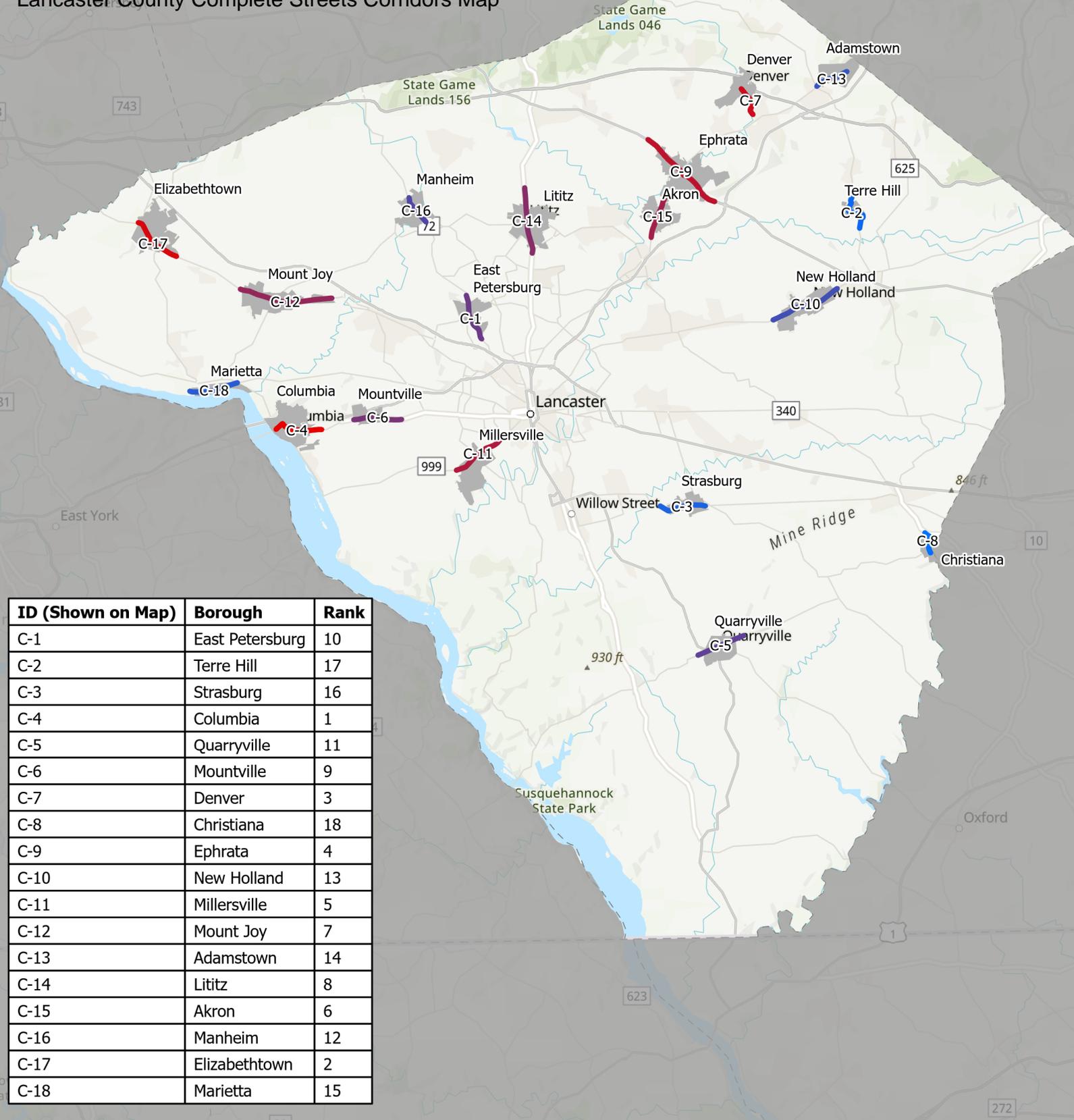
The purpose of this task was to prioritize streets in Lancaster County for Complete Streets improvements. This planning document is intended to serve as a tool for Boroughs and LCPD to use when PennDOT is resurfacing Borough main streets. The prioritization process illustrates where it is especially critical to consider multimodal users and Complete Streets best practices as part of a resurfacing, maintenance, or other project efforts.

NEXT STEPS

LCPD and the Boroughs should consider these next steps:

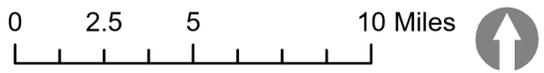
- Coordinate with PennDOT to incorporate Complete Streets improvements as part of upcoming and future resurfacing projects.
- Prioritize Complete Streets projects along Borough main streets through additional funding mechanisms and programs.
- Ensure resurfacing and other infrastructure maintenance and improvement efforts address the key concerns and deficiencies along the Borough main streets identified herein.

Attachment 1 Lancaster County Complete Streets Corridors Map

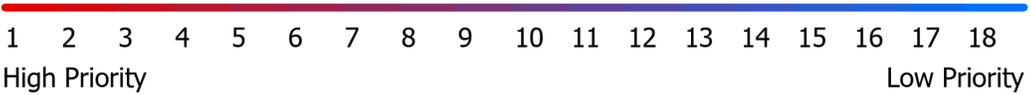


ID (Shown on Map)	Borough	Rank
C-1	East Petersburg	10
C-2	Terre Hill	17
C-3	Strasburg	16
C-4	Columbia	1
C-5	Quarryville	11
C-6	Mountville	9
C-7	Denver	3
C-8	Christiana	18
C-9	Ephrata	4
C-10	New Holland	13
C-11	Millersville	5
C-12	Mount Joy	7
C-13	Adamstown	14
C-14	Lititz	8
C-15	Akron	6
C-16	Manheim	12
C-17	Elizabethtown	2
C-18	Marietta	15

Lancaster County Complete Streets Corridors



Corridor Rank



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

High Priority

Low Priority

Attachment 2
Lancaster County Complete Streets Corridors Data Matrix | General Corridor Information, Traffic Speeds, Roadway Conditions

ID	Borough	Main Street Name	General Corridor Information								Traffic Speeds							Roadway Conditions									
			SR Number	Region	PennDOT Segment Begin	PennDOT Segment End	Street Name Begin	Street Name End	Corridor Length (feet)	Corridor Length (miles)	Average Travel Speed (mph)	Average Travel Speed Score	Average Posted Speed Limit (mph)	Highest Posted Speed Limit (mph)	Speed Difference (mph)	Speed Difference Score	Traffic Speeds Score	Year Last Resurfaced	Years Since Last Resurfacing	Resurfacing Score	2014 IRI Value (in/mi)	2024 IRI Value (in/mi)	Change in IRI over 10 Years (in/mi)	Change in IRI Score	Sidewalk Ratio	Sidewalk Ratio Score	Roadway Conditions Score
1	East Petersburg	Main Street/Manheim Pike (SR 72)	72	C	160	210	Near Delp Rd	Quarry Rd	10,498	1.99	33.6	0.43	31.03	45.00	2.61	0.53	0.48	2009.24	14.76	0.55	186.16	136.94	-49.22	0.45	45.0%	0.47	0.49
2	Terre Hill	Main Street/Weaverland Valley Road/Earle Street/Broad Street (SR 897)	897	E	290	330	Precast Rd	Wide Hollow Rd	11,905	2.25	34.4	0.47	33.90	45.00	0.49	0.41	0.44	1998.87	25.13	1.00	129.99	170.93	40.93	0.94	35.0%	0.60	0.85
3	Strasburg	Main Street/Miller Street/Village Road (SR 741)	741	E	350	380	Penn Grant Rd	George Town Rd	10,417	1.97	38.0	0.69	28.06	40.00	9.94	0.93	0.81	2001.77	22.23	0.87	131.75	154.55	22.80	0.84	69.0%	0.16	0.62
4	Columbia	Chestnut Street/Fifth Street/Lincoln Highway/Columbia Avenue (SR 462)	462	C	20	90	Commerce St	Oswego Dr	11,008	2.08	31.0	0.26	36.33	40.00	-5.38	0.09	0.18	2006.27	17.73	0.68	110.35	161.71	51.36	1.00	65.0%	0.21	0.63
5	Quarryville	Buck Road/State Street (SR 372)	372	S	210	230	Oak Bottom Rd	Past Groff Ave	10,906	2.07	37.5	0.66	36.16	55.00	1.37	0.46	0.56	2009.03	14.97	0.56	135.92	141.06	5.14	0.75	42.0%	0.51	0.60
6	Mountville	Columbia Avenue/Lincoln Highway (SR 462)	462	C	130	150	Edgemont Rd	Donerville Rd	10,679	2.02	34.9	0.50	38.85	45.00	-4.00	0.16	0.33	2007.00	17.00	0.65	86.13	105.05	18.92	0.82	34.0%	0.61	0.69
7	Denver	Main Street/Church Street (SR 1051)	1051	NE	140	170	Near Stevens Rd	4th St	6,707	1.27	39.0	0.75	35.00	35.00	4.00	0.60	0.68	2007.00	17.00	0.65	111.44	128.58	17.14	0.81	39.0%	0.55	0.67
8	Christiana	Bridge Street/Newport Avenue (SR 2025)	2025	S	10	30	Germantown Ave	Near Gap Newport Pike	5,495	1.04	28.0	0.09	25.00	25.00	3.00	0.55	0.32	2008.00	16.00	0.61	136.57	181.22	44.65	0.96	43.0%	0.49	0.69
9	Ephrata	Main Street (SR 322)	322	NE	210	290	Wood Corner Rd	Pleasant Valley Rd	21,666	4.10	26.6	0.00	33.19	35.00	-6.60	0.02	0.01	2011.50	12.50	0.45	138.17	131.81	-6.36	0.68	76.0%	0.06	0.40
10	New Holland	Main Street (SR 23)	23	E	480	530	Water Street	Short Street	16,018	3.03	31.7	0.31	32.14	35.00	-0.47	0.36	0.33	2013.11	10.89	0.38	158.53	144.25	-14.28	0.64	81.0%	0.00	0.34
11	Millersville	Blue Rock Road/Manor Avenue/Millersville Pike (SR 999)	999	C	130	170	Near Duke St	Fairview Ave	12,519	2.37	36.8	0.62	32.86	40.00	3.94	0.60	0.61	2009.70	14.30	0.53	158.63	121.20	-37.43	0.51	40.0%	0.53	0.53
12	Mount Joy	Main Street (SR 230)	230	NW	200	274	State Route 4017	Eby Chiques Rd	20,606	3.90	34.4	0.48	38.15	45.00	-3.74	0.18	0.33	2011.24	12.76	0.47	108.89	130.02	21.13	0.83	61.0%	0.26	0.52
13	Adamstown	Reading Road (SR 272)	272	NE	890	910	Old Lancaster Pike	Broad Street	7,512	1.42	43.1	1.00	35.95	45.00	7.10	0.78	0.89	2013.00	11.00	0.39	187.11	56.47	-130.64	0.00	4.0%	1.00	0.46
14	Lititz	Broad Street/Lititz Pike/Furnace Hills Pike (SR 501)	501	NE	110	150	Woods Dr	Newport Rd	14,559	2.76	30.7	0.25	37.62	45.00	-6.95	0.00	0.12	2016.52	7.48	0.24	189.04	107.74	-81.30	0.27	61.0%	0.26	0.26
15	Akron	7th Street/State Street (SR 272)	272	NE	660	690	Lauber Rd	Rothsville Rd	9,793	1.85	35.0	0.51	41.45	45.00	-6.44	0.03	0.27	2017.00	7.00	0.22	142.73	95.91	-46.82	0.46	27.0%	0.70	0.46
16	Manheim	Main Street/Lancaster Road/Lebanon Road (SR 72)	72	NW	290	320	Near Shimp St	Hamaker Rd	6,731	1.27	35.8	0.56	24.64	40.00	11.16	1.00	0.78	2019.00	5.00	0.13	155.98	122.27	-33.70	0.53	74.0%	0.09	0.25
17	Elizabethtown	Market Street (SR 230)	230	NW	60	120	Spring Garden St	Shaeffer Rd	11,690	2.21	31.8	0.31	34.31	45.00	-2.55	0.24	0.28	2022.00	2.00	0.00	171.09	138.14	-32.94	0.54	72.0%	0.12	0.22
18	Marietta	Market Street (No SR)	N/A	NW	N/A	N/A	Throughway Ave	441 River Road	10,864	2.06	No Data	0.00	No Data	No Data	0.0	0.00	0.00	No Data	No Data	0.00	No Data	No Data	No Data	No Data	46.8%	0.44	0.15

Attachment 2
Lancaster County Complete Streets Corridors Data Matrix | Bus Service, Safety

ID	Borough	Main Street Name	Bus Service			Safety																Safety Score
			Number of Bus Routes Along Corridor	2023 - 24 Annual Ridership per Bus Route	Bus Service Score	PennDOT HSNS Excess Cost	PennDOT HSNS Excess Cost per (\$/mile)	Excess Cost Score	Corridor is a PennDOT VRU Priority Corridor (0/1)	All Crashes (2015-2023)	All Crashes (2015-2023) per mile	All Crashes Score/mile	All Crashes - Change in Rolling Average (2015-2023)	All Crashes Change Score	Non-Motorized (NM) Crashes (2015-2023)	Non-Motorized (NM) Crashes (2015-2023) per mile	NM Crashes Score	Speeding Related (SR) Crashes (2015-2023)	Speeding Related (SR) Crashes (2015-2023) per mile	SR Crashes Score	Horse & Buggy Crashes (2015-2023) (0/1)	
1	East Petersburg	Main Street/Manheim Pike (SR 72)	1	56,261	0.63	-\$4,297,300	-\$2,161,340	0.00	0	200	100.59	0.74	3%	0.65	5.0	2.51	0.25	4.0	2.01	0.64	0	0.33
2	Terre Hill	Main Street/Weaverland Valley Road/Earle Street/Broad Street (SR 897)	0	0	0.00	-\$1,213,200	-\$538,068	0.68	0	54	23.95	0.08	-21%	0.14	1.0	0.44	0.04	4.0	1.77	0.56	0	0.22
3	Strasburg	Main Street/Miller Street/Village Road (SR 741)	0	0	0.00	-\$1,307,800	-\$662,876	0.63	0	68	34.47	0.17	-10%	0.37	5.0	2.53	0.26	3.0	1.52	0.48	0	0.27
4	Columbia	Chestnut Street/Fifth Street/Lincoln Highway/Columbia Avenue (SR 462)	1	213,826	1.00	\$295,900	\$141,929	0.97	1	254	121.83	0.93	5%	0.69	9.0	4.32	0.43	4.0	1.92	0.61	0	0.66
5	Quarryville	Buck Road/State Street (SR 372)	0	0	0.00	-\$288,700	-\$139,770	0.85	0	104	50.35	0.31	-14%	0.30	5.0	2.42	0.24	1.0	0.48	0.15	1	0.41
6	Mountville	Columbia Avenue/Lincoln Highway (SR 462)	1	213,826	1.00	\$454,600	\$224,767	1.00	0	176	87.02	0.63	-3%	0.53	6.0	2.97	0.30	2.0	0.99	0.31	0	0.40
7	Denver	Main Street/Church Street (SR 1051)	0	0	0.00	-\$563,200	-\$443,372	0.72	0	57	44.87	0.26	-6%	0.46	4.0	3.15	0.32	4.0	3.15	1.00	0	0.39
8	Christiana	Bridge Street/Newport Avenue (SR 2025)	0	0	0.00	-\$336,400	-\$323,238	0.77	0	15	14.41	0.00	291%	1.00	0.0	0.00	0.00	0.0	0.00	0.00	0	0.25
9	Ephrata	Main Street (SR 322)	1	49,591	0.62	-\$5,914,000	-\$1,441,241	0.30	1	397	96.75	0.71	-22%	0.13	32.0	7.80	0.78	0.0	0.00	0.00	1	0.56
10	New Holland	Main Street (SR 23)	1	86,161	0.70	-\$3,875,700	-\$1,277,544	0.37	0	250	82.41	0.59	1%	0.59	14.0	4.61	0.46	0.0	0.00	0.00	1	0.43
11	Millersville	Blue Rock Road/Manor Avenue/Millersville Pike (SR 999)	1	107,037	0.75	-\$1,619,700	-\$683,123	0.62	0	196	82.66	0.59	-10%	0.37	8.0	3.37	0.34	1.0	0.42	0.13	0	0.29
12	Mount Joy	Main Street (SR 230)	1	48,093	0.61	-\$6,802,800	-\$1,743,123	0.18	0	211	54.07	0.34	-13%	0.32	11.0	2.82	0.28	5.0	1.28	0.41	0	0.22
13	Adamstown	Reading Road (SR 272)	0	0	0.00	-\$662,400	-\$465,585	0.71	0	47	33.04	0.16	-2%	0.53	1.0	0.70	0.07	0.0	0.00	0.00	0	0.21
14	Lititz	Broad Street/Lititz Pike/Furnace Hills Pike (SR 501)	1	64,310	0.65	-\$5,465,700	-\$1,982,203	0.08	0	266	96.47	0.71	-11%	0.34	17.0	6.17	0.62	0.0	0.00	0.00	1	0.39
15	Akron	7th Street/State Street (SR 272)	1	49,591	0.62	-\$978,800	-\$527,730	0.68	0	242	130.48	1.00	-27%	0.01	9.0	4.85	0.49	2.0	1.08	0.34	0	0.36
16	Manheim	Main Street/Lancaster Road/Lebanon Road (SR 72)	1	56,261	0.63	-\$1,201,600	-\$942,571	0.51	0	116	90.99	0.66	20%	1.00	7.0	5.49	0.55	1.0	0.78	0.25	0	0.42
17	Elizabethtown	Market Street (SR 230)	1	48,093	0.61	-\$2,475,400	-\$1,118,059	0.44	0	287	129.63	0.99	-28%	0.00	22.0	9.94	1.00	6.0	2.71	0.86	0	0.47
18	Marietta	Market Street (No SR)	1	213,826	1.00	No Data	No Data	No Data	No Data	54	26.25	0.10	0%	0.58	1.0	0.49	0.05	1.0	0.49	0.15	0	0.13

Attachment 2
Lancaster County Complete Streets Corridors Data Matrix | Supporting Plans and Policies, Income and Racial Equity, Demand

ID	Borough	Main Street Name	Supporting Plans and Policies					Traffic Volumes						Income and Racial Equity					Demand						
			Active Transp. Mobility Hub Type (1, 2, 3)	Mobility Hub Score	Borough has a Complete Streets Policy (0/1)	Corridor Identified in a Local ATP or WalkWorks (0/1)	Supporting Plans and Policies Score	Average Annual Daily Traffic (AADT) (veh / day)	AADT Score	Truck Percentage (%)	Truck Volume (veh / day)	Truck Volume Score	Traffic Volumes Score	Low Income Metric	Low Income Score	Minority Metric	Minority Score	Income and Racial Equity Score	Stava Heat Map Value - All Foot Sports	Strave Walking Demand Score	Stava Heat Map Value - All Cycle Sports	Strave Biking Demand Score	Population Density (per sq mile)	Population Density Score	Demand Score
1	East Petersburg	Main Street/Manheim Pike (SR 72)	2	0.66	0	0	0.22	16,986	0.96	5.9	995	0.94	0.95	1.25	0.11	1.92	0.45	0.3	3.00	0.73	2.50	0.40	2,205.1	0.32	0.48
2	Terre Hill	Main Street/Weaverland Valley Road/Earle Street/Broad Street (SR 897)	0	0.00	0	0	0.00	4,421	0.11	8.3	365	0.25	0.18	1.99	0.42	1.00	0.03	0.2	3.50	0.91	3.00	0.60	1,572.6	0.20	0.57
3	Strasburg	Main Street/Miller Street/Village Road (SR 741)	3	0.33	0	0	0.11	5,689	0.20	5.0	284	0.16	0.18	2.95	0.83	1.64	0.32	0.6	3.75	1.00	3.50	0.80	607.6	0.00	0.60
4	Columbia	Chestnut Street/Fifth Street/Lincoln Highway/Columbia Avenue (SR 462)	1	1.00	1	0	0.67	11,356	0.58	4.0	455	0.35	0.46	3.35	1.00	2.92	0.90	1.0	3.75	1.00	4.00	1.00	5,552.4	1.00	1.00
5	Quarryville	Buck Road/State Street (SR 372)	3	0.33	1	1	0.78	6,492	0.25	8.0	518	0.42	0.34	2.72	0.73	2.44	0.69	0.7	2.25	0.45	3.00	0.60	1,655.1	0.21	0.42
6	Mountville	Columbia Avenue/Lincoln Highway (SR 462)	2	0.66	0	0	0.22	10,920	0.55	3.8	419	0.31	0.43	2.61	0.69	2.27	0.61	0.6	2.50	0.55	4.00	1.00	2,297.9	0.34	0.63
7	Denver	Main Street/Church Street (SR 1051)	3	0.33	1	1	0.78	6,823	0.28	8.0	546	0.45	0.36	2.95	0.83	2.35	0.65	0.7	3.25	0.82	4.00	1.00	1,904.5	0.26	0.69
8	Christiana	Bridge Street/Newport Avenue (SR 2025)	0	0.00	1	0	0.33	2,782	0.00	7.5	209	0.08	0.04	3.00	0.85	1.00	0.03	0.4	2.50	0.55	3.00	0.60	661.5	0.01	0.39
9	Ephrata	Main Street (SR 322)	2	0.66	1	0	0.55	13,946	0.76	5.4	747	0.67	0.71	2.03	0.44	1.43	0.23	0.3	3.25	0.82	3.00	0.60	3,968.4	0.68	0.70
10	New Holland	Main Street (SR 23)	2	0.66	0	0	0.22	12,642	0.67	5.3	669	0.58	0.63	1.70	0.30	2.00	0.49	0.4	3.25	0.82	3.00	0.60	2,535.7	0.39	0.60
11	Millersville	Blue Rock Road/Manor Avenue/Millersville Pike (SR 999)	0	0.00	1	0	0.33	11,522	0.59	2.7	307	0.19	0.39	3.25	0.96	3.13	1.00	1.0	3.00	0.73	4.00	1.00	3,939.1	0.67	0.80
12	Mount Joy	Main Street (SR 230)	1	1.00	1	0	0.67	12,625	0.67	4.4	556	0.46	0.56	1.00	0.00	1.75	0.37	0.2	3.75	1.00	3.50	0.80	2,608.2	0.40	0.73
13	Adamstown	Reading Road (SR 272)	0	0.00	1	0	0.33	9,726	0.47	7.0	681	0.60	0.53	2.13	0.48	2.13	0.55	0.5	3.00	0.73	4.00	1.00	1,334.0	0.15	0.62
14	Lititz	Broad Street/Lititz Pike/Furnace Hills Pike (SR 501)	2	0.66	1	0	0.55	17,572	1.00	3.7	648	0.56	0.78	1.57	0.24	1.83	0.41	0.3	2.75	0.64	3.00	0.60	2,923.7	0.47	0.57
15	Akron	7th Street/State Street (SR 272)	3	0.33	1	1	0.78	16,946	0.96	5.0	847	0.78	0.87	1.84	0.36	1.91	0.45	0.4	1.00	0.00	2.00	0.20	2,492.0	0.38	0.19
16	Manheim	Main Street/Lancaster Road/Lebanon Road (SR 72)	2	0.66	0	0	0.22	13,312	0.71	7.3	967	0.91	0.81	2.87	0.80	0.93	0.00	0.4	2.75	0.64	1.50	0.00	3,160.4	0.52	0.38
17	Elizabethtown	Market Street (SR 230)	1	1.00	1	1	1.00	13,012	0.69	8.1	1051	1.00	0.85	2.19	0.51	1.24	0.14	0.3	2.50	0.55	3.75	0.90	3,042.6	0.49	0.65
18	Marietta	Market Street (No SR)	2	0.66	1	1	0.89	2,731	0.00	5.0	137	0.00	0.00	3.00	0.85	2.47	0.70	0.8	2.75	0.64	3.00	0.60	3,497.0	0.58	0.61

Attachment 2
Lancaster County Complete Streets Corridors Data Matrix | Raw Scores, Score Weights, Total Scoring and Ranking

ID	Borough	Main Street Name	Total Raw Score	Ranking with Raw Score	Score Weights								Total Score with Weighted Categories	Ranking with Weighted Scores
					Speed Score Weight	Roadway Conditions Score Weight	Bus Service Score Weight	Safety Score Weight	Supporting Plans & Policies Score Weight	Traffic Volumes Score Weight	Income & Racial Equity Score Weight	Demand Score Weight		
1	East Petersburg	Main Street/Manheim Pike (SR 72)	3.86	9	6%	12%	6%	18%	16%	18%	6%	17%	0.49	10
2	Terre Hill	Main Street/Weaverland Valley Road/Earle Street/Broad Street (SR 897)	2.48	17	6%	12%	6%	18%	16%	18%	6%	17%	0.31	17
3	Strasburg	Main Street/Miller Street/Village Road (SR 741)	3.18	16	6%	12%	6%	18%	16%	18%	6%	17%	0.36	16
4	Columbia	Chestnut Street/Fifth Street/Lincoln Highway/Columbia Avenue (SR 462)	5.55	1	6%	12%	6%	18%	16%	18%	6%	17%	0.69	1
5	Quarryville	Buck Road/State Street (SR 372)	3.82	11	6%	12%	6%	18%	16%	18%	6%	17%	0.48	11
6	Mountville	Columbia Avenue/Lincoln Highway (SR 462)	4.35	4	6%	12%	6%	18%	16%	18%	6%	17%	0.50	9
7	Denver	Main Street/Church Street (SR 1051)	4.31	5	6%	12%	6%	18%	16%	18%	6%	17%	0.55	3
8	Christiana	Bridge Street/Newport Avenue (SR 2025)	2.46	18	6%	12%	6%	18%	16%	18%	6%	17%	0.30	18
9	Ephrata	Main Street (SR 322)	3.88	8	6%	12%	6%	18%	16%	18%	6%	17%	0.54	4
10	New Holland	Main Street (SR 23)	3.65	13	6%	12%	6%	18%	16%	18%	6%	17%	0.46	13
11	Millersville	Blue Rock Road/Manor Avenue/Millersville Pike (SR 999)	4.68	2	6%	12%	6%	18%	16%	18%	6%	17%	0.52	5
12	Mount Joy	Main Street (SR 230)	3.83	10	6%	12%	6%	18%	16%	18%	6%	17%	0.50	7
13	Adamstown	Reading Road (SR 272)	3.57	14	6%	12%	6%	18%	16%	18%	6%	17%	0.44	14
14	Lititz	Broad Street/Lititz Pike/Furnace Hills Pike (SR 501)	3.65	12	6%	12%	6%	18%	16%	18%	6%	17%	0.50	8
15	Akron	7th Street/State Street (SR 272)	3.95	6	6%	12%	6%	18%	16%	18%	6%	17%	0.52	6
16	Manheim	Main Street/Lancaster Road/Lebanon Road (SR 72)	3.90	7	6%	12%	6%	18%	16%	18%	6%	17%	0.47	12
17	Elizabethtown	Market Street (SR 230)	4.39	3	6%	12%	6%	18%	16%	18%	6%	17%	0.61	2
18	Marietta	Market Street (No SR)	3.54	15	6%	12%	6%	18%	16%	18%	6%	17%	0.39	15