Environmental Justice Benefits and Burdens Analysis

Introduction

Environmental Justice (EJ) refers to the implementation of Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, which directs procedures to be put in place to identify and address any disproportionately high and adverse human health or environmental effects on minority and low-income population groups. The fundamental principles of EJ can be defined as:

- To avoid, minimize, or mitigate disproportionately high and adverse human health or environmental effects, including social and economic effects, on minority and low-income populations.
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.
- To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

Title VI of the Civil Rights Act prohibits discrimination on the basis of race, color, or national origin. More importantly for this analysis, Executive Order (EO) 12898 requires Federal agencies to achieve environmental justice by identifying and addressing disproportionately high and adverse human health or environmental effects, including the interrelated social and economic effects of their programs, policies, and activities, on minority populations and low-income populations in the United States. This requirement applies to the Lancaster County MPO as a recipient of federal funding, and recognizes the importance given to addressing the needs of low-income and minority populations as outlined in the Metropolitan Transportation Planning regulations (23 CFR 450).

Based on the Office of Management and Budget (OMB) Policy Directive 15, *Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity*, issued in 1997, five minimum categories were established to address data on race. They are:

> *Black* – a person having origins in any of the black racial groups of Africa.
> *Hispanic* – a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.
> *Asian* – a person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent.
> *American Indian and Alaskan Native* – a person having origins in any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognition.
> *Native Hawaiian or Other Pacific Islander* – a person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.

In addition, low-income persons are defined as follows:

> *Low-Income* – a person whose household income (or in the case of a community or group, whose median household income) is at or below the U.S. Department of Health and Human Services poverty guidelines.

EO 12898, and the Department of Transportation (DOT) and Federal Highway Administration (FHWA) Orders on Environmental Justice address persons belonging to any of these groups, and these groups as they apply to Lancaster County are the basis for this analysis.
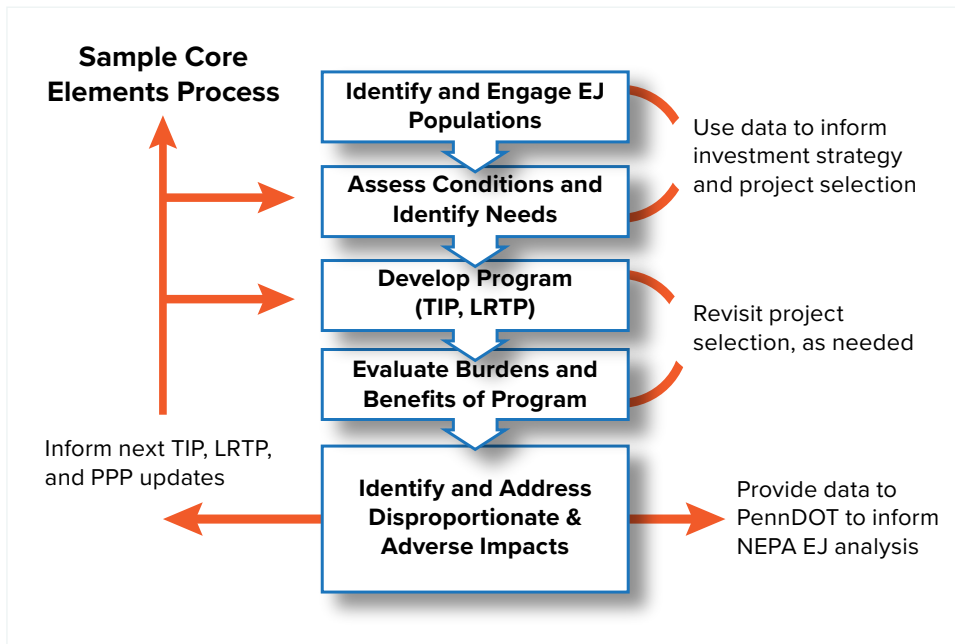
Core Elements Process

In the development of the 2025–2028 Transportation Improvement Program, the Lancaster County MPO conducted an Environmental Justice Benefits and Burdens analysis using the Core Elements Methodology **(Figure 1)** that has been recommended by FHWA and the Federal Transit Administration (FTA):

1. Identify environmental justice populations.
2. Assess conditions and identify needs.
3. Evaluate relative burdens and benefits.
4. Identify and address disproportionate and adverse impacts and inform future planning efforts.

The identification of these populations is essential to establishing effective strategies for engaging them in the transportation planning process. When meaningful opportunities for interaction are established, the transportation planning process can effectively draw upon the perspectives of communities to identify existing transportation needs, localized deficiencies, and the demand for transportation services. Mapping of these populations not only provides a baseline for assessing impacts of the transportation improvement program, but also aids in the development of an effective public involvement program.

Fundamentally, the principles of Environmental Justice are aimed at preventing the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations. The establishment of transportation funding as a performance measure is consistent with this principle by supporting the evaluation of funding priorities considered for *connects2040*, including the four-year TIP. Mapping and analyzing transportation funding can assist in making the prioritization process more open, transparent, and accountable to the public. In developing this funding performance measure, the core issue is whether the types of projects and the total project investment are equitably distributed throughout Lancaster County.

Identifying Minority and Low-Income Populations

A statistical analysis of Lancaster County was performed to determine population averages, minority population, and low-income population. If necessary, project alternatives will be developed to prevent disproportionately high or adverse effects on any identified minority or low-income populations.

Minority population is defined as any readily identifiable group of Black, Hispanic, Asian American, American Indian/Alaskan Native, and Native Hawaiian or Other Pacific Islander who lives in geographic proximity and whose members would be similarly affected by any proposed FHWA program, policy, or activity. Based on 2021 American Community Survey (ACS) Data, the average minority population rate in Lancaster County is 19.25 percent as shown in **Table 1**.

The low-income population is defined as any readily identifiable group of persons at or below the Department of Health and Human Services poverty guidelines who lives in geographic proximity and whose members would be similarly affected by any proposed FHWA program, policy, or activity. The average low-income rate based on the status of all ages in the 2021 ACS Data for Lancaster County is 8.60 percent as shown in **Table 2**.

Please refer to **Appendix A** on p. D-24 for an explanation of differences between total county population for minority and low-income populations.

Figure 1:
Core Elements Process Steps

The maps on the following pages depict the locations of environmental justice populations and households in Lancaster County. **Figure 2** shows the concentrations of minority populations by census block groups based on 2017–2021 ACS data. **Figure 3** shows the concentrations of households below the county average for low-income by census block groups, also based on 2017–2021 ACS data. **Figure 4** shows concentrations of minority populations by the density of those populations throughout the county. **Figure 5** shows concentrations of low-income populations by the density of those populations throughout the county.

Table 1:

Profile of Minority Populations, 2021

	Lancaster County, Pennsylvania	
Demographic Indicator	*County Population*	*County Percentage*
Total	**550,480**	
White, Non-Hispanic	444,487	80.72%
Minority	**105,993**	**19.25%**
Black or African American, Non-Hispanic	18,244	3.31%
American Indian and Alaska Native, Non-Hispanic	246	0.00%
Asian alone, Non-Hispanic	12,846	2.33%
Native Hawaiian and Other Pacific Islander, Non-Hispanic	98	0.00%
Some other race, Non-Hispanic	1,641	0.03%
Two or more races, Non-Hispanic	12,059	2.19%
Hispanic	60,859	11.06%

Source: 2017–2021 ACS.

Table 2:

Profile of Low-Income Populations, 2021

	Lancaster County, Pennsylvania	
Demographic Indicator	*County Population*	*County Percentage*
Total	**538,672**	
Low-Income Population	**46,315**	**8.60%**

Source: 2017–2021 ACS.

Figure 2:

Concentrations of Minority Populations by Census Block Group

Lancaster County, Pennsylvania

Concentration of Minority Populations
(Relative to the Lancaster County Average of 19.3%)

- Less than half
- Half to equal
- Greater than to twice as high
- Twice as high to four times as high
- Four times greater

Other Elements

- Other Road
- Municipality

North

Miles 0 — 3

Source: Lancaster County GIS, Copyright (c) 2024.
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This map is not a legally recorded plan, survey, or engineering
schematic and it is not intended to be used as such.

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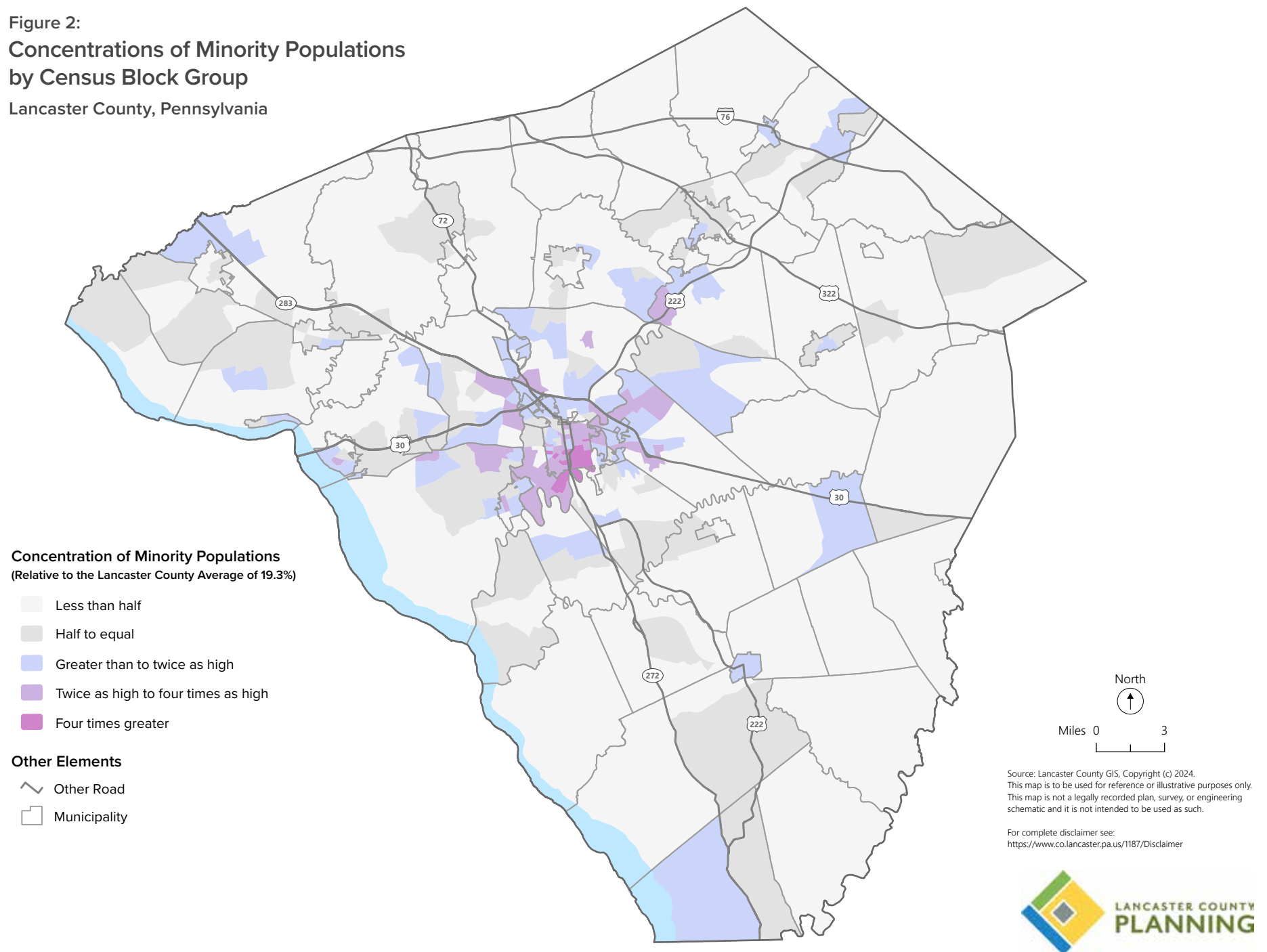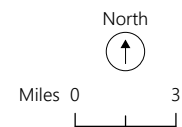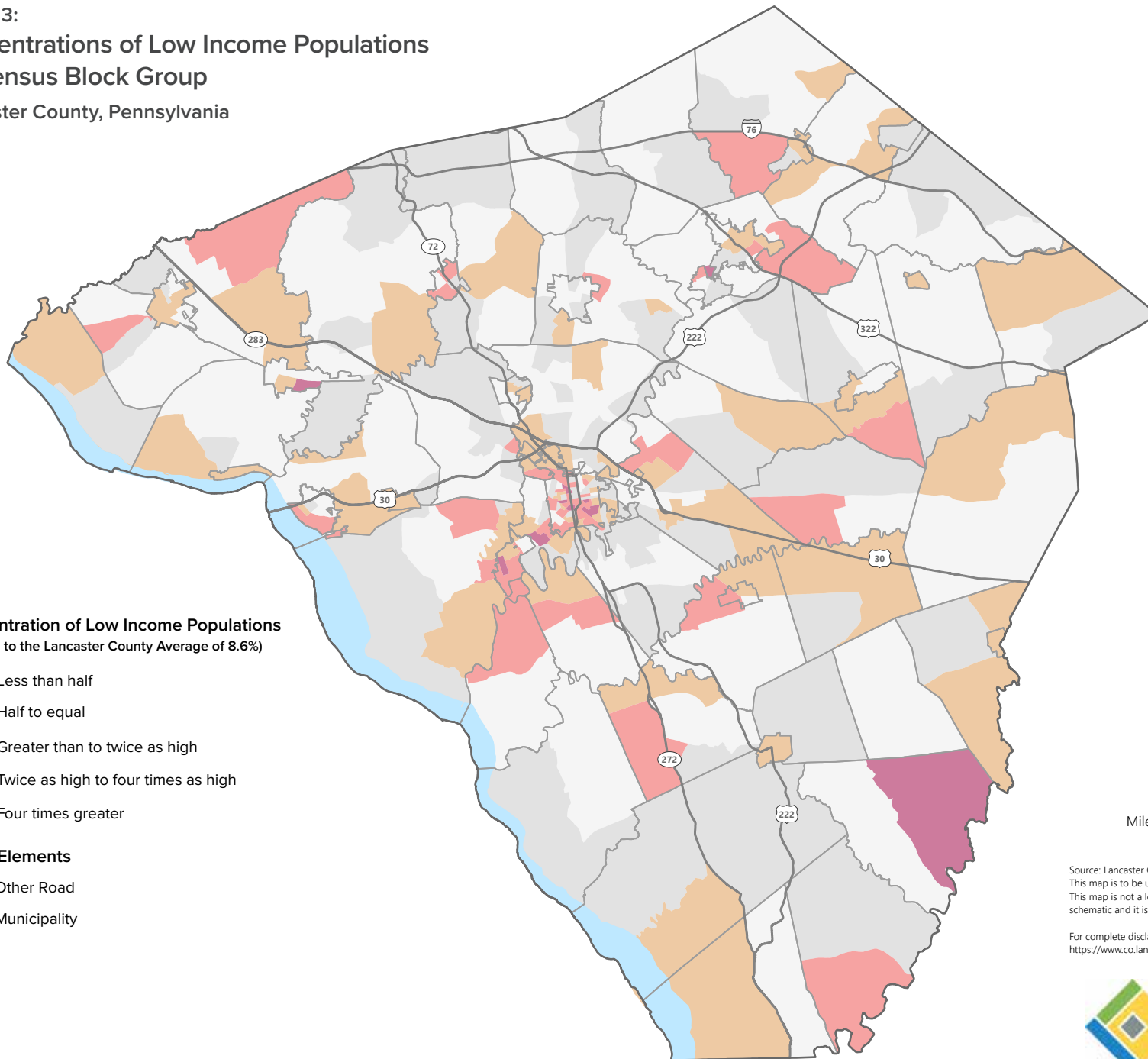https://www.co.lancaster.pa.us/1187/Disclaimer

LANCASTER COUNTY
PLANNING

Figure 3:
Concentrations of Low Income Populations by Census Block Group

Lancaster County, Pennsylvania

Concentration of Low Income Populations
(Relative to the Lancaster County Average of 8.6%)

- Less than half
- Half to equal
- Greater than to twice as high
- Twice as high to four times as high
- Four times greater

Other Elements

- Other Road
- Municipality

North

Miles 0 — 3

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Figure 4:
Minority Populations
Lancaster County, Pennsylvania

Minority Populations

1 dot = 25 people

- ● Black or African American, not Hispanic or Latino
- ● Asian, not Hispanic or Latino
- ● American Indian or Alaskan Native, not Hispanic or Latino
- ● Native Hawaiian or Pacific Islander, not Hispanic or Latino
- ● Other Race, not Hispanic or Latino
- ● Two or More Races, not Hispanic or Latino
- ● Hispanic or Latino

Other Elements

〰 Other Road
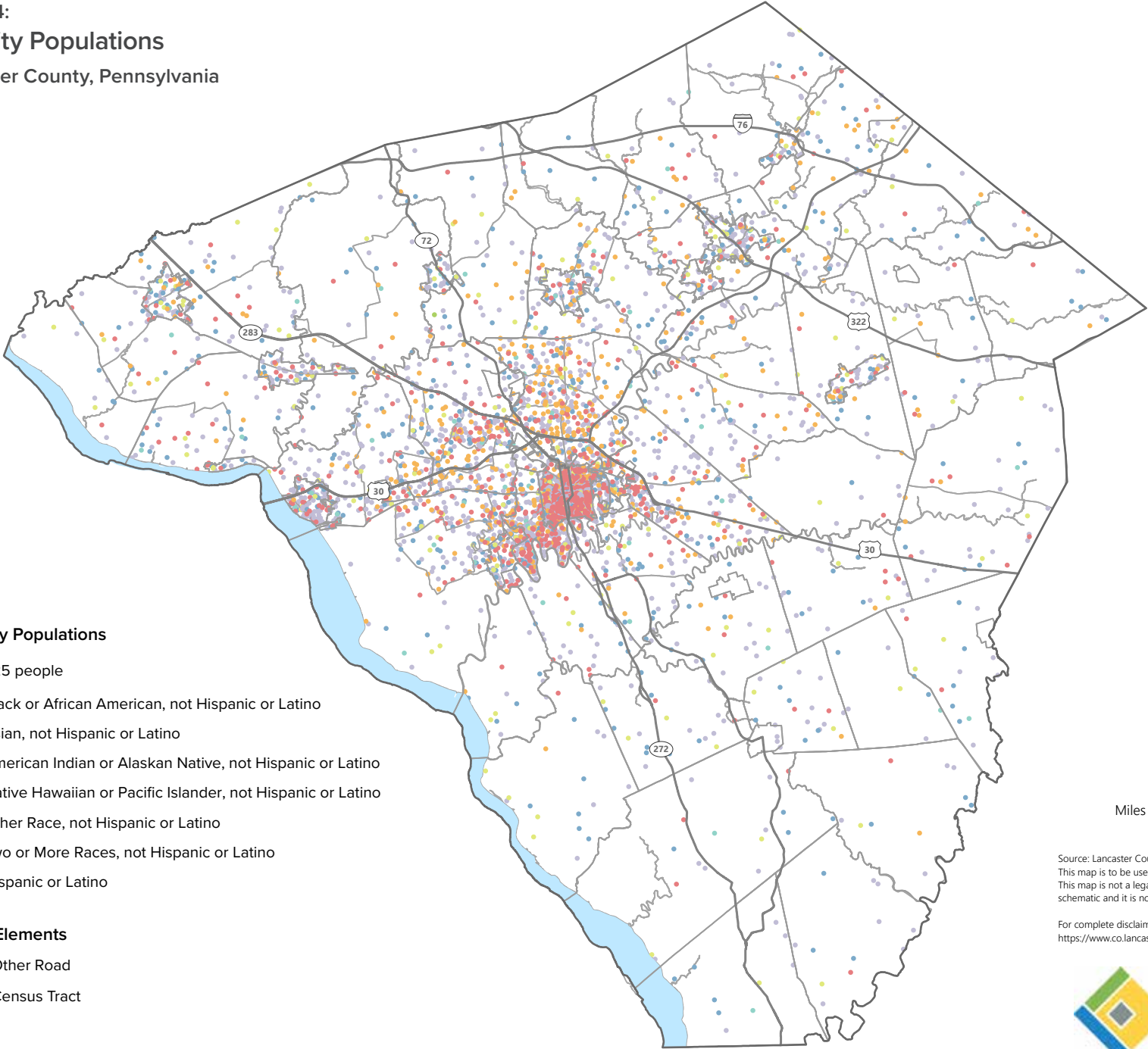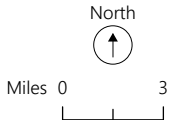
▢ Census Tract

North

Miles 0 — 3

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Low Income Populations

Lancaster County, Pennsylvania

Low Income Populations

1 dot = 25 people

- Population Whose Income in the Past 12
  Months is Below Federal Poverty Level

Other Elements

⌄ Other Road

▢ Census Tract

North

Miles 0 — 3

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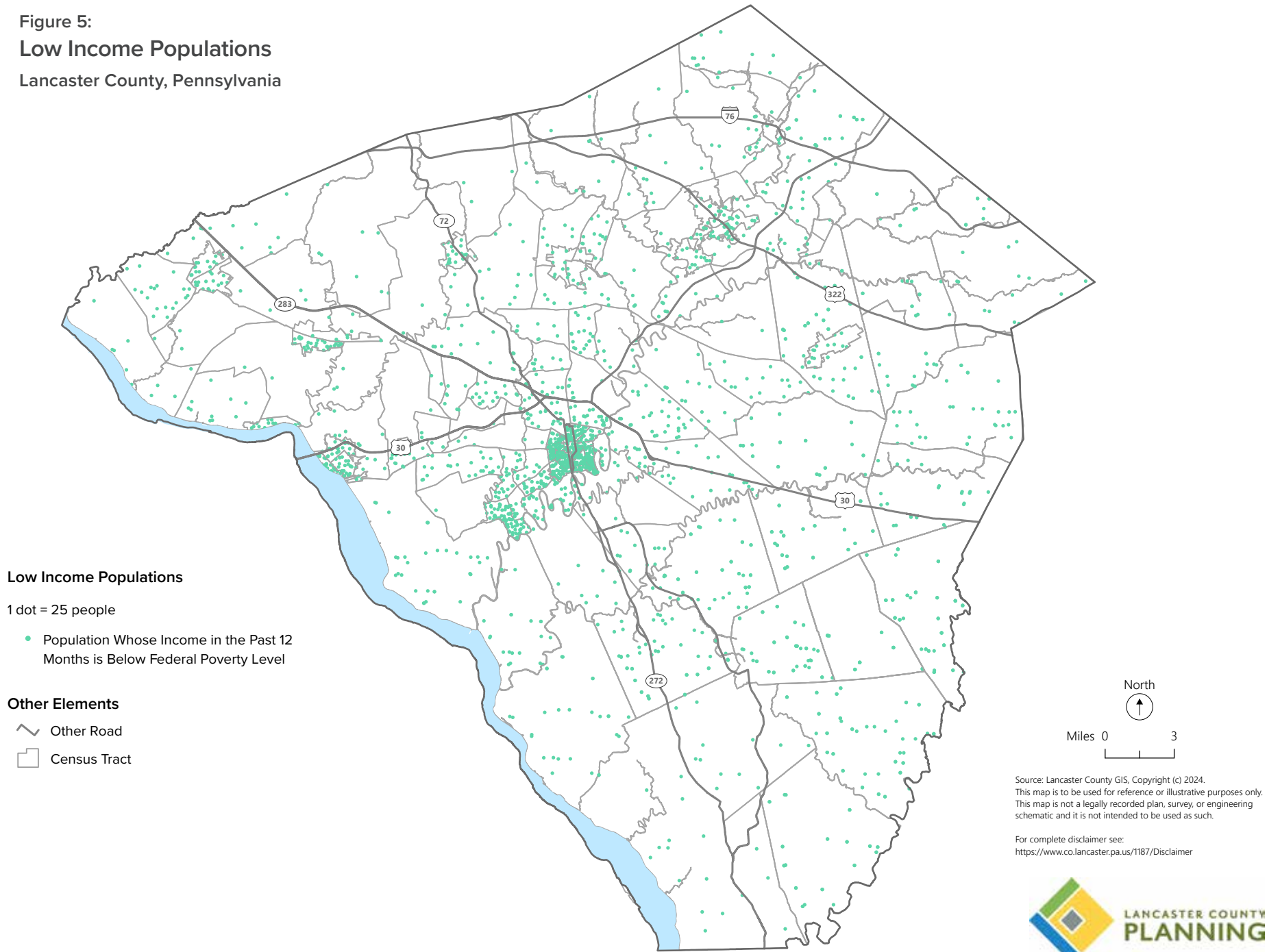
Existing Conditions Prior to 2025–2028 TIP

In order to analyze benefits and adverse effects of transportation system changes, the MPO examined existing conditions of transportation assets throughout the county and safety performance relative to the minority and low-income populations. The use of the tables below will allow the MPO to track performance relative to the number of poor condition bridges, mileage of poor condition pavement in the federal aid: primary category, and the number of non-motorized crashes in the county, and then identify performance disparities between minority and low-income populations and populations that are not minority or low-income.

Please refer to **Appendix A** on p. D-24 for an explanation of differences between total poor condition bridge counts, poor pavement mileage, and bicyclist-and pedestrian-related crash counts for minority population intervals and low-income population intervals.

Table 3:
Population Totals by Minority Population Intervals

POPULATION	Minority Population Intervals (Relative to Lancaster County Average of 19.25%)					Total
	Less than Half	Half to Equal	Greater than to Twice as High	Twice as High to 4 Times as High	4 Times Greater	
Total Population	246,131	117,059	103,276	64,818	19,196	550,480
Total Population (%)	45%	21%	19%	12%	3%	100%
Minority Population	10,276	16,266	27,842	34,911	16,698	105,993
Minority Population (%)	10%	15%	26%	33%	16%	100%

Source: 2017–2021 ACS.

Lancaster County currently has 21 bridges in poor condition located within or adjacent to high minority block groups, which consists of 11% of total bridges in poor condition across the county. These block groups are accounted for in the third, fourth, and fifth columns in the table below under the headings "Greater than to Twice as High," "Twice as High to 4 Times as High," and "4 Times Greater," respectively. This demonstrates that there is not a disproportionate number of poor bridges in high minority block groups within the county. Note that minority population interval boundaries do not correspond with the boundaries for low-income population intervals, so there is a discrepancy in total counts between the two.

Table 4:

Distribution of Total Bridges and Poor Condition Bridges by Minority Population Intervals

BRIDGES	Minority Population Intervals (Relative to Lancaster County Average of 19.25%)					Total
	Less than Half	Half to Equal	Greater than to Twice as High	Twice as High to 4 Times as High	4 Times Greater	
Total Bridge Count	839	605	580	142	2	2,168
Percentage	39%	28%	27%	7%	0%	100%
Poor Condition Bridge Count	89	52	59	13	0	213
Percentage of Poor Bridges	42%	24%	28%	6%	0%	100%
Total Bridge Deck Area (sq. ft.)	4,115,941.13	2,666,932.67	2,319,052.55	733,119.02	6,192.20	9,841,237.58
Percentage	42%	27%	24%	7%	0%	100%

Source: PennDOT.

2025–2028 TIP Goal

After the implementation of the 2025–2028 TIP program, Lancaster County will have 21 bridges in poor condition located within or adjacent to high minority block groups, which consists of 14% of total bridges in poor condition across the county. This demonstrates that there will not be a disproportionate number of poor bridges in high minority block groups in the county.

Table 5:

Distribution of Poor Condition Bridges and Total Bridge Deck Area by Minority Population Intervals

BRIDGES	Minority Population Intervals (Relative to Lancaster County Average of 19.25%)					Total
	Less than Half	Half to Equal	Greater than to Twice as High	Twice as High to 4 Times as High	4 Times Greater	
Poor Condition Bridge Count	89	52	59	13	0	213
Percentage	42%	24%	28%	6%	0%	100%
Total Bridge Deck Area (sq. ft.)	4,115,941.13	2,666,932.67	2,319,052.55	733,119.02	6,192.20	9,841,237.58
Percentage	42%	27%	24%	7%	0%	100%

Source: PennDOT.

The pavement condition chart below indicates that 62% of poor federal aid: primary pavement mileage in Lancaster County occurs in or adjacent to high minority block groups. This demonstrates that a disproportionately high percentage of poor pavement mileage is present in block groups with higher concentrations of minority interval populations. This is particularly true in the interval where the minority population is greater than to twice as high as the average county minority population rate of 19.25%.

Table 6:

Distribution of Total Federal Aid: Primary Pavement Mileage and Poor Pavement Mileage by Minority Population Intervals

PAVEMENT	Minority Population Intervals (Relative to Lancaster County Average of 19.25%)					Total
	Less than Half	Half to Equal	Greater than to Twice as High	Twice as High to 4 Times as High	4 Times Greater	
Federal Aid Segment Mileage	472.39	301.27	281.40	115.44	9.19	1,179.68
Percentage	40%	26%	24%	10%	1%	100%
Poor Pavement Mileage	8.91	16.58	21.95	16.06	4.87	68.37
Percentage of Poor Pavement	13%	24%	32%	23%7%	7%	100%

Source: PennDOT.

Carryover Projects

In addition to the projects selected for this TIP cycle, some projects from the implementation of the 2023–2026 TIP program were not completed prior to the planning of the 2025–2028 TIP program. Mileage for these planned projects was clipped to each interval group so that the impacts upon each interval could be calculated.

Table 7:

Distribution of Total Federal Aid: Primary Pavement Project Mileage by Minority Population Intervals

PAVEMENT (Planned Projects)	Minority Population Intervals (Relative to Lancaster County Average of 19.25%)					Total
	Less than Half	Half to Equal	Greater than to Twice as High	Twice as High to 4 Times as High	4 Times Greater	
Federal Aid Segment Mileage	472.39	301.27	281.40	115.44	9.19	1,179.68
Percentage	40%	26%	24%	10%	1%	100%
Current Poor Pavement Mileage	8.91	16.58	21.95	16.06	4.87	68.37
Percentage of Poor Pavement	13%	24%	32%	23%	7%	100%
Planned Project Mileage	3.48	0.35	0.00	0.00	0.38	4.21
Percentage of Project Mileage	83%	8%	0%	0%	9%	100%

Source: PennDOT.

2025–2028 TIP Goal

After the implementation of the 2025–2028 TIP program and the completion of carryover projects from the 2023–2026 TIP program, 65% of poor federal aid: primary pavement mileage in Lancaster County will be located within or adjacent to high minority block groups. This demonstrates that a disproportionately high percentage of poor pavement mileage will be present in block groups with higher concentrations of minority interval populations. This will be the case in particular in the interval where the minority population is greater than to twice as high as the average county minority population rate of 19.25%. This demonstrates that a disproportionate percentage of poor pavement repair projects that were selected for the 2023–2026 and 2025–2028 TIP programs were located outside of minority intervals.

Table 8:

Distribution of Total Pavement Mileage and Poor Federal Aid: Primary Pavement Mileage by Minority Population Intervals

PAVEMENT	Minority Population Intervals (Relative to Lancaster County Average of 19.25%)					Total
	Less than Half	*Half to Equal*	*Greater than to Twice as High*	*Twice as High to 4 Times as High*	*4 Times Greater*	
Federal Aid Segment Mileage	472.39	301.27	281.40	115.44	9.19	1,179.68
Percentage	40%	26%	24%	10%	1%	100%
Poor Pavement Mileage	5.43	16.23	21.95	16.06	4.49	64.16
Percentage of Poor Pavement	8%	25%	34%	25%	7%	100%

Source: PennDOT.

40% of bicyclist-related crashes with fatalities and suspected serious injuries in the county occur within or adjacent to high minority block groups, demonstrating that there is not a disproportionately high percentage of this type of crash in high minority block groups within the county. It should be noted that all crash data in the three tables below specifically refers to fatal crashes or crashes with suspected serious injuries (SSI). This includes bicyclist-related crashes, pedestrian-related crashes, and combined bicyclist- and pedestrian-related crashes.

Table 9:

Distribution of Bicyclist-Related Crashes by Minority Population Intervals

BICYCLE SAFETY	Minority Population Intervals (Relative to Lancaster County Average of 19.25%)					Total
	Less than Half	Half to Equal	Greater than to Twice as High	Twice as High to 4 Times as High	4 Times Greater	
Total Crashes (Fatalities/SSI)	1,024	566	505	314	49	2,458
Percentage	42%	23%	21%	13%	2%	100%
Bicycle Crashes (Fatalities/SSI)	30	17	16	13	3	79
Percentage of Bike Crashes	38%	22%	20%	16%	4%	100%

Source: PennDOT Statewide Crash Data, 2017–2021.

43% of pedestrian-related crashes in the county occur within or adjacent to high minority block groups, demonstrating that there is not a disproportionately high percentage of this type of crash in high minority block groups within the county. The distribution of these crashes is shown in **Table 10**.

Table 10:

Distribution of Pedestrian-Related Crashes by Minority Population Intervals

PEDESTRIAN SAFETY	Minority Population Intervals (Relative to Lancaster County Average of 19.25%)					Total
	Less than Half	Half to Equal	Greater than to Twice as High	Twice as High to 4 Times as High	4 Times Greater	
Total Crashes (Fatalities/SSI)	1,024	566	505	314	49	2,458
Percentage	42%	23%	21%	13%	2%	100%
Pedestrian Crashes (Fatalities/SSI)	93	57	70	26	19	265
Percentage of Ped Crashes	35%	22%	26%	10%	7%	100%

Source: PennDOT Statewide Crash Data, 2017–2021.

42% of bicyclist- and pedestrian-related crashes in the county occur within or adjacent to high minority block groups, demonstrating that there is not a disproportionately high percentage of this type of crash in high minority block groups within the county. The distribution of these crashes is shown in **Table 11**.

Table 11:

Distribution of Bicyclist- and Pedestrian-Related Crashes by Minority Population Intervals

BIKE/PED SAFETY	Minority Population Intervals (Relative to Lancaster County Average of 19.25%)					Total
	Less than Half	Half to Equal	Greater than to Twice as High	Twice as High to 4 Times as High	4 Times Greater	
Total Crashes (Fatalities/SSI)	1,024	566	505	314	49	2,458
Percentage	42%	23%	21%	13%	2%	100%
Bike+Ped Crashes (Fatalities/SSI)	123	74	86	39	22	344
Percentage of Bike-Ped Crashes	36%	22%	25%	11%	6%	100%

Source: PennDOT Statewide Crash Data, 2017–2021.

Safety projects do not have an **after implementation of the 2025–2028 TIP program** because there are too many variables associated with projected safety benefits of projects to calculate this factor.

Figure 6:

2025–2028 TIP Project Locations and Concentrations of Minority Populations by Census Block Group

Lancaster County, Pennsylvania

Improvement Type

- 🔴 — Bridge
- 🟢 — Bicycle/Pedestrian
- 🟠 — Congestion Reduction
- 🟣 — Railroad Crossings
- 🔵 — Roadway Reconstruction/Resurfacing
- 🟢 — Safety
- 🟡 — Traffic Signals/Intersection Improvements

Concentration of Minority Populations
(Relative to the Lancaster County Average of 19.3%)

- Less than half
- Half to equal
- Greater than to twice as high
- Twice as high to four times as high
- Four times greater

Other Elements
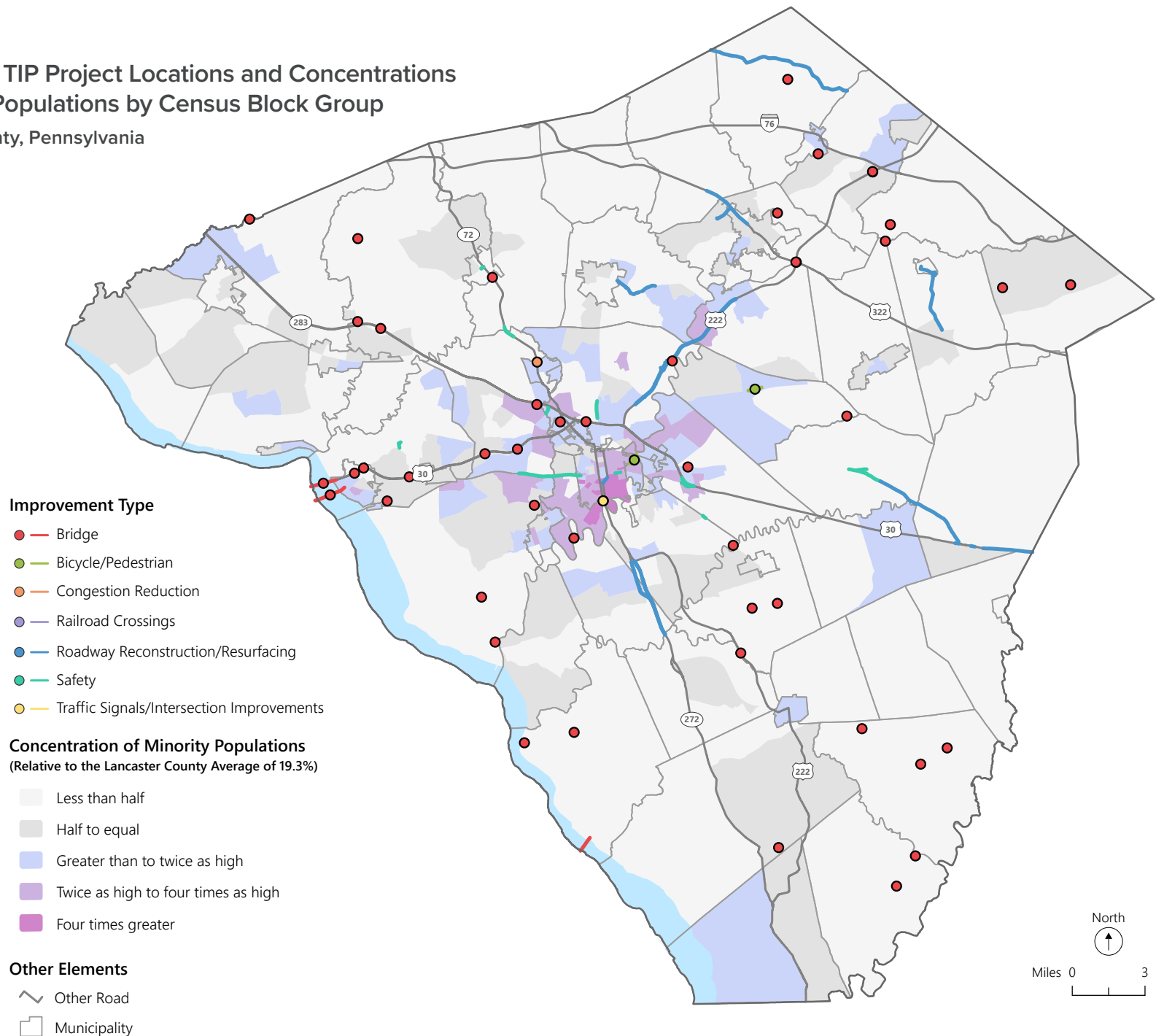
- Other Road
- Municipality

North

Miles 0 — 3

Table 12:

Population Totals by Low-Income Population Intervals

POPULATION	Low-Income Population Intervals (Relative to Lancaster County Average of 8.60%)					Total
	Less than Half	Half to Equal	Greater than to Twice as High	Twice as High to 4 Times as High	4 Times Greater	
Total Population	230,765	124,147	113,468	70,554	11,546	550,480
Total Population (%)	42%	23%	21%	13%	2%	100%
Low-Income Population	4,379	7,440	13,891	15,726	4,879	46,315
Low-Income Population (%)	9%	16%	30%	34%	11%	100%

Source: 2017–2021 ACS.

Lancaster County currently has 91 bridges in poor condition located within or adjacent to low-income block groups, which consists of 36% of total bridges in poor condition across the county. These block groups are accounted for in the third, fourth, and fifth columns in the table below under the headings "Greater than to Twice as High," "Twice as High to 4 Times as High," and "4 Times Greater," respectively. This demonstrates that there is not an imbalanced number of poor bridges within block groups with a higher concentration of low-income populations in the county. Note that low-income population interval boundaries do not correspond with the boundaries for minority intervals, so there is a discrepancy in total counts between the two.

Table 13:

Distribution of Total Bridges and Poor Condition Bridges by Low-Income Population Intervals

BRIDGES	Low-Income Population Intervals (Relative to Lancaster County Average of 8.60%)					Total
	Less than Half	Half to Equal	Greater than to Twice as High	Twice as High to 4 Times as High	4 Times Greater	
Total Bridge Count	839	605	580	142	2	2.168
Percentage	39%	28%	27%	7%	0%	100%
Poor Condition Bridge Count	89	52	59	13	0	213
Percentage of Poor Bridges	42%	24%	28%	6%	0%	100%
Total Bridge Deck Area (sq. ft.)	4,115,941.13	2,666,932.67	2,319,052.55	733,119.02	6,192.20	9,841,237.58
Percentage	42%	27%	24%	7%	0%	100%

Source: PennDOT.

2025–2028 TIP Goal

After the implementation of the 2025–2028 TIP program, Lancaster County will have 44 bridges in poor condition located within or adjacent to low-income block groups, which consists of 28% of total bridges in poor condition across the county. This demonstrates that there will not be an imbalanced number of poor bridges within block groups with a higher concentration of low-income populations in the county.

Table 14:

Distribution of Poor Condition Bridges and Total Bridge Deck Area by Low-Income Population Intervals

BRIDGES	Low-Income Population Intervals (Relative to Lancaster County Average of 8.60%)					Total
	Less than Half	Half to Equal	Greater than to Twice as High	Twice as High to 4 Times as High	4 Times Greater	
Poor Condition Bridge Count	89	52	59	13	0	213
Percentage of Poor Bridges	42%	24%	28%	6%	0%	100%
Total Bridge Deck Area (sq. ft.)	4,115,941.13	2,666,932.67	2,319,052.55	733,119.02	6,192.20	9,841,237.58
Percentage	42%	27%	24%	7%	0%	100%

Source: PennDOT.

The pavement condition chart below indicates 52% of poor federal aid: primary pavement mileage in Lancaster County occurs within or adjacent to low-income block groups. This demonstrates that a disproportionately high percentage of poor federal aid: primary pavement mileage is present in block groups with higher concentrations of low-income interval populations. This is particularly true in the interval where the low-income population is twice as high to 4 times as high as the average county low-income population rate of 8.60%.

Table 15:

Distribution of Total Pavement Mileage and Poor Federal Aid: Primary Pavement Mileage by Low-Income Population Intervals

PAVEMENT	Low-Income Population Intervals (Relative to Lancaster County Average of 8.60%)					Total
	Less than Half	*Half to Equal*	*Greater than to Twice as High*	*Twice as High to 4 Times as High*	*4 Times Greater*	
Federal Aid Segment Mileage	487.05	409.58	331.17	146.69	19.34	1,387.82
Percentage	35%	30%	24%	10%	1%	100%
Poor Pavement Mileage	15.79	26.00	10.95	22.76	10.90	86.40
Percentage of Poor Pavement	18%	30%	13%	26%	13%	100%

Source: PennDOT.

Carryover Projects

In addition to the projects selected for this TIP cycle, some projects from the implementation of the 2023–2026 TIP program were not completed prior to the planning of the 2025–2028 TIP program. Mileage for these planned projects was clipped to each interval group so that the impacts upon each interval could be calculated.

Table 16:

Distribution of Total Federal Aid: Primary Pavement Project Mileage by Low-Income Population Intervals

PAVEMENT (Planned Projects)	Low-Income Population Intervals (Relative to Lancaster County Average of 8.60%)					Total
	Less than Half	*Half to Equal*	*Greater than to Twice as High*	*Twice as High to 4 Times as High*	*4 Times Greater*	
Federal Aid Segment Mileage	487.05	409.58	331.17	146.69	19.34	1,387.82
Percentage	35%	30%	24%	10%	1%	100%
Current Poor Pavement Mileage	15.79	26.00	10.95	22.76	10.90	86.40
Percentage of Poor Pavement	18%	30%	13%	26%	13%	100%
Planned Project Mileage	1.32	0.02	0.73	0.30	0.01	2.37
Percentage of Project Mileage	56%	1%	31%	13%	1%	100%

Source: PennDOT.

2025–2028 TIP Goal

After the implementation of the 2025–2028 TIP program and the completion of carryover projects from the 2023–2026 TIP program, 52% of poor federal aid: primary pavement mileage in Lancaster County will be located within or adjacent to high low-income block groups. This demonstrates that a disproportionately high percentage of poor pavement mileage will be present in block groups with higher concentrations of low-income interval populations. This will be the case in particular in the interval where the low-income population is twice as high to 4 times as high as the average county low-income population rate of 8.60%.

Table 17:

Distribution of Total Federal Aid: Primary Pavement Mileage and Poor Pavement Mileage by Low-Income Population Intervals

PAVEMENT	Low-Income Population Intervals (Relative to Lancaster County Average of 8.60%)					Total
	Less than Half	Half to Equal	Greater than to Twice as High	Twice as High to 4 Times as High	4 Times Greater	
Federal Aid Segment Mileage	487.05	409.58	331.17	146.69	19.34	1,387.82
Percentage	35%	30%	24%	10%	1%	100%
Poor Pavement Mileage	14.47	25.98	10.22	22.46	10.89	84.03
Percentage of Poor Pavement	17%	31%	12%	27%	13%	100%

Source: PennDOT.

37% of bicyclist-related crashes occur within or adjacent to low-income block groups, which demonstrates that there is not an imbalanced number of this type of crash within block groups with a higher concentration of low-income populations in the county. It should be noted that all crash data in the three tables below specifically refers to fatal crashes or crashes with suspected serious injuries (SSI). The distribution of these crashes is shown in **Table 18.**

Table 18:

Distribution of Bicyclist-Related Crashes by Low-Income Population Intervals

BICYCLE SAFETY	Low-Income Population Intervals (Relative to Lancaster County Average of 8.60%)					Total
	Less than Half	*Half to Equal*	*Greater than to Twice as High*	*Twice as High to 4 Times as High*	*4 Times Greater*	
Total Crashes (Fatalities/SSI)	1,244	692	633	313	79	2,961
Percentage	42%	23%	21%	11%	3%	100%
Bicyclist Crashes (Fatalities/SSI)	36	36	12	19	3	90
Percentage of Bike Crashes	40%	22%	13%	21%	3%	100%

Source: PennDOT Statewide Crash Data, 2017–2021.

48% of pedestrian-related crashes occur within or adjacent to low-income block groups. This indicates that a higher percentage of this type of crash occurs in block groups with higher concentrations of low-income interval populations in the county. The distribution of these crashes is shown in **Table 19**.

Table 19:

Distribution of Bicyclist-Related Crashes by Low-Income Population Intervals

PEDESTRIAN SAFETY	Low-Income Population Intervals (Relative to Lancaster County Average of 8.60%)					Total
	Less than Half	*Half to Equal*	*Greater than to Twice as High*	*Twice as High to 4 Times as High*	*4 Times Greater*	
Total Crashes (Fatalities/SSI)	1,244	692	633	313	79	2,961
Percentage	42%	23%	21%	11%	3%	100%
Pedestrian Crashes (Fatalities/SSI)	87	104	75	82	24	372
Percentage of Ped Crashes	23%	28%	20%	22%	6%	100%

Source: PennDOT Statewide Crash Data, 2017–2021.

47% of bicyclist- and pedestrian-related crashes occur within or adjacent to low-income block groups. This demonstrates that, collectively, a slightly higher percentage of this type of crash occurs in block groups with higher concentrations of low-income interval populations in the county. The distribution of these crashes is shown in **Table 20.**

Safety projects do not have an **after implementation of the 2025–2028 TIP**

Table 20:

Distribution of Bicyclist- and Pedestrian-Related Crashes by Low-Income Population Intervals

BIKE/PED SAFETY	Low-Income Population Intervals (Relative to Lancaster County Average of 8.60%)					*Total*
	Less than Half	*Half to Equal*	*Greater than to Twice as High*	*Twice as High to 4 Times as High*	*4 Times Greater*	
Total Crashes (Fatalities/SSI)	1,244	692	633	313	79	2,961
Percentage	42%	23%	21%	11%	3%	100%
Bike+Ped Crashes (Fatalities/SSI)	123	124	87	101	27	462
Percentage of Bike-Ped Crashes	27%	27%	19%	22%	6%	100%

Source: PennDOT Statewide Crash Data, 2017–2021.

program because there are too many variables associated with projected safety benefits of projects to calculate this factor.

Figure 7:

2025–2028 TIP Project Locations and Concentrations of Low Income Populations by Census Block Group

Lancaster County, Pennsylvania

Improvement Type

🔴 ── Bridge
🟢 ── Bicycle/Pedestrian
🟠 ── Congestion Reduction
🟣 ── Railroad Crossings
🔵 ── Roadway Reconstruction/Resurfacing
🟢 ── Safety
🟡 ── Traffic Signals/Intersection Improvements

Concentration of Low Income Populations
(Relative to the Lancaster County Average of 8.6%)

Less than half
Half to equal
Greater than to twice as high
Twice as high to four times as high
Four times greater

Other Elements

Other Road
Municipality

North

Miles 0   3
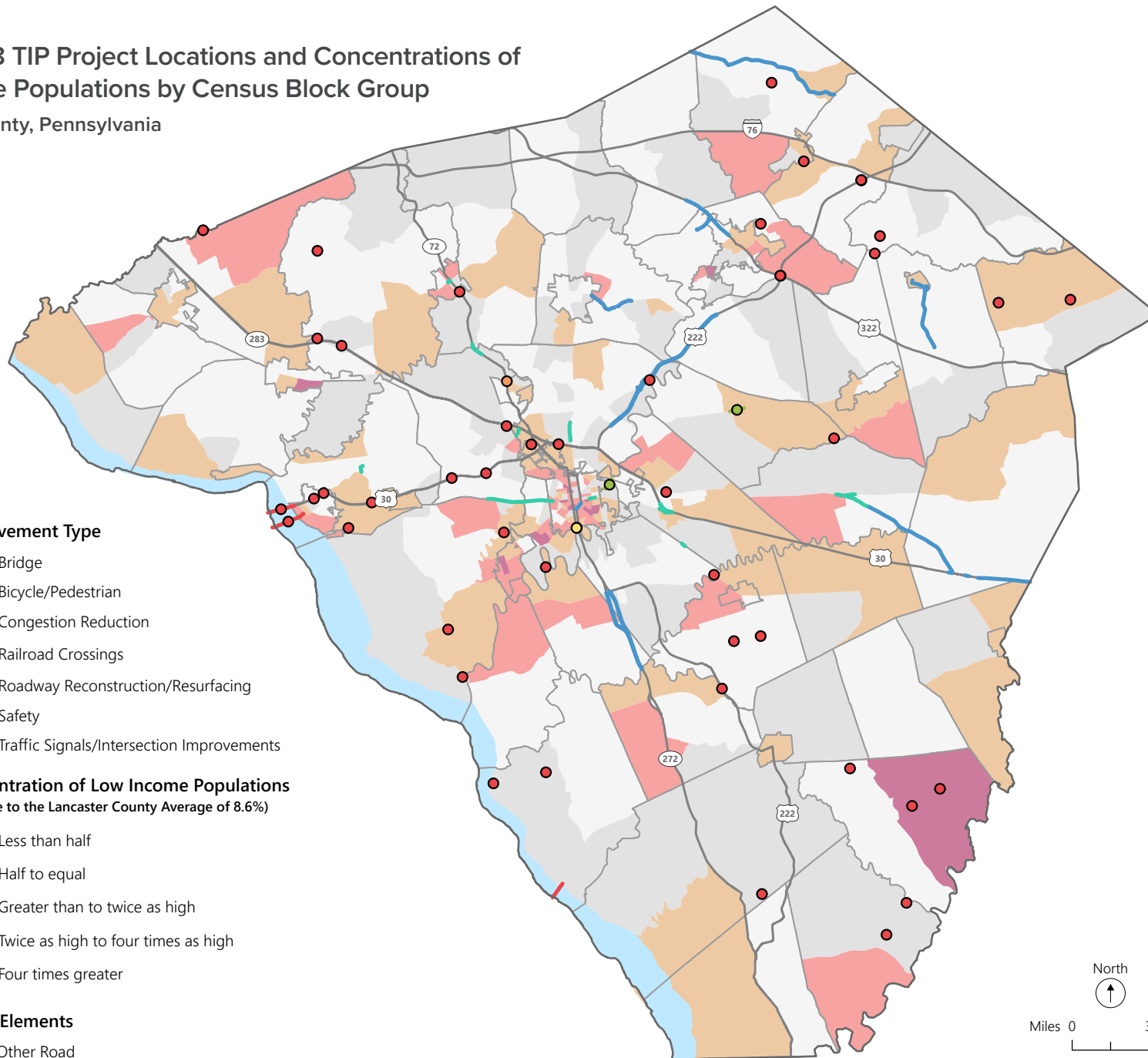
Appendix A

Difference between total county population counts for minority and low-income population intervals:
The total population for Lancaster County appears differently for minority population intervals and low-income population intervals in this environmental justice benefits and burdens analysis. The data set for both is the U.S. Census Bureau's 2017–2021 American Community Survey 5-Year Estimates, but the total County population figure for minority population intervals is derived from Table B03002: Hispanic or Latino Origin by Race and the figure for the low-income population intervals is derived from Table S1701: Poverty Status in the Past 12 Months. Table B03002 lists the total Lancaster County population as 550,480. Table S1701 lists the total population as 538,672 and indicates that this is the "population for whom poverty status is determined". Poverty status cannot be determined for people in institutional group quarters (such as prisons or nursing homes), college dormitories, military barracks, and living situations without conventional housing (and who are not in shelters).

Differences in total transportation assets and bicyclist- and pedestrian-related crash counts between high minority and low-income block groups:
The data process document titled *Methodology Statewide Environmental Justice Analysis Methodology: 2023–2026 Pennsylvania Transportation Improvement Program* notes that "a map layer was created from dissolving together block groups of the same interval classification within each county and region for low-income and minority concentration. These 'interval areas' describe the contiguous areas within a county that fall within the same classification. Transportation assets and crash locations were considered in the analysis of an interval area if located within 50 meters of the boundary of the dissolved interval area. In other words, the dissolved interval areas were buffered 50 meters for the analysis. This would allow the capture of features on the border of block groups or providing access to them." The data process document titled *FY 2025–2028 TIP Statewide Environmental Justice Analysis Methodology* states that it was "built upon the substantial work and documentation previously developed" for the FY 2023–2026 analysis." As well, the boundaries of block groups previously used for the 2023–2026 analysis were updated for the 2025–2028 analysis using information from the 2020 Census.

Figure 8 is a graphic representation of how the data process described above can result in differing counts for transportation assets. While the example applies to counts for total bridges and poor condition bridges, it is also applicable to pavement mileage, and bicyclist- and pedestrian-related crash counts. In the example, there are ten bridges total. However, due to the buffering methodology described above, the total count is 16 for the high minority intervals and 13 for the low-income intervals. This difference is due to the geography of where block groups that fall within the same classification are located. The "strict" count does not rely on the dissolving block group methodology, and therefore there is no overlap in counts between neighboring block groups that fall within the same classification.

Hypothetical Bridge Counts in High Minority and Low-Income Block Groups

High Minority Block Groups

		75%+	60-74%	51-59%	35-50%	20-34%	0-20%	
Strict	Total	2	3	0	3	2	0	10
	Poor	1	2	0	0	2	0	5
Buffer	Total	3	3	2	4	2	2	16
	Poor	2	2	1	0	2	0	7

Low Income Block Groups

		75%+	60-74%	51-59%	35-50%	20-34%	0-20%	
Strict	Total	0	0	2	5	0	3	10
	Poor	0	0	2	1	0	2	5
Buffer	Total	0	0	3	6	0	4	13
	Poor	0	0	2	2	0	2	6