

Environmental Justice Analysis

Harrisburg Area Transportation Study
FFY 2025-2028 Transportation Improvement Program

In 2018, South Central Pennsylvania MPOs, PennDOT District 8-0, PennDOT Central Office, the Federal Highway Administration, and the Federal Transit Administration worked with the Alan M. Voorhees Transportation Center at Rutgers University to develop the Environmental Justice Unified Process and Methodology Guide, which builds on PennDOT's Every Voice Counts guidance and provides specific practices to facilitate a more meaningful environmental justice process. The Guide provided a set of Core Elements that would form the backbone of this process, which this analysis will examine regarding the projects proposed for the 2025-2028 Transportation Improvement Program.

The Core Elements identified in the Guide are illustrated in Figure 1 below. The first two Core Elements, (1) Identify EJ Populations and (2) Assess Conditions and Identify Needs, are taken from the 2045 HATS Regional Transportation Plan (RTP), which was adopted in September 2021. As the HATS region's long range transportation plan, the 2045 RTP examines the location, distribution, and concentrations of our region's minority and low-income populations and how the existing condition of the transportation system, in terms of assets and performance, intersects with those populations. With one of the key functions and purposes of the RTP being to assess transportation conditions and determine transportation needs, the Environmental Justice analysis of the RTP provides an accurate framework for the existing conditions and transportation needs in relation to the region's environmental justice populations, and will serve as the backdrop against which the FFY 2025-2028 Transportation Improvement Program will be analyzed.

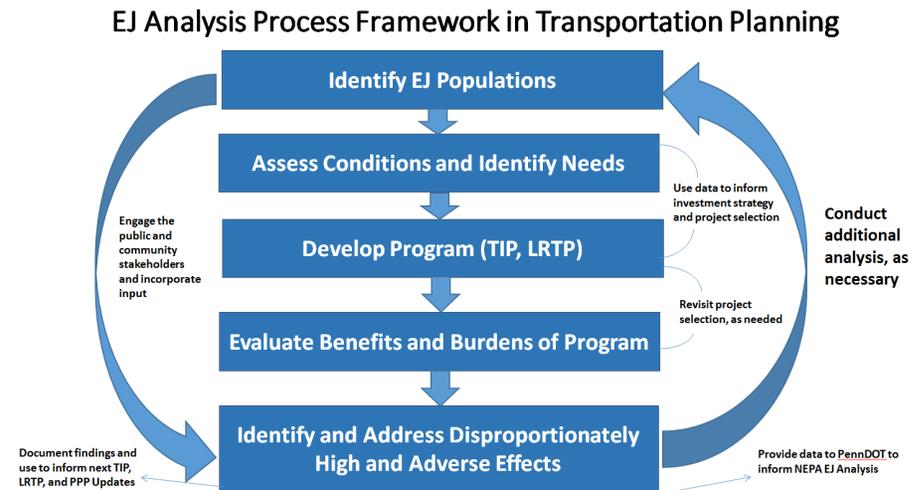


Figure 1. EJ Analysis Process Framework in Transportation Planning

Identifying Environmental Justice Populations

Title VI of the Civil Rights Act prohibits discrimination on the basis of race, color, or national origin. The Office of Management and Budget (OMB) issued Policy Directive 15, Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity, in 1997, establishing five minimum categories for data on race. Executive Order 12898 of 1994 and DOT Environmental Justice Order 5610.2(a) of 2012 address persons belonging to any of the following groups:

Minority, meaning a person is:

Black -- a person having origins in any of the black racial groups of Africa.

Hispanic or Latino -- 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, Central America, or South 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.

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.

American Community Survey data (2017-2021 5-year estimates) was compiled, analyzed, and mapped to show the concentrations and distribution of environmental justice populations in the HATS Region. In past environmental justice analyses, census block groups with minority or low-income higher than the regional average were identified as “environmental justice communities”. To provide a more nuanced and complete picture of the geographic location and needs of, as well as potential impacts on, the HATS region’s environmental justice populations, this analysis will examine statistically grouped concentrations, rather than solely using a threshold distinction.

Table 1 provides a demographic profile of the HATS region at the county and regional level. The minority population comprises 25.04% of the total regional population, with the vast majority (approximately 70%) located in Dauphin County. The low-income population accounts for 9.63% of the total regional population, a majority (approximately 60%) located in Dauphin County.

Table 2 and Table 3 show the distribution of minority and low-income populations by percentage interval. Approximately 36.02% of the region’s total population and 73.47% of the region’s minority population lives within a block group with higher than average minority population. Approximately 36.86% of the region’s total population and 76.91% of the region’s low-income population lives within a block group with higher than average low-income population. However, the percentages associated with the intervals show the minority population is much more concentrated in the region than the low-income population.

Table 4 shows cross-tabulation of minority and low-income populations by percentage interval. The cross-tabulation data shows minority populations are more likely to be low-income than non-minority populations, indicating a high degree of cross-over between minority and low-income populations in the region. [Examining the GIS data shows...](#)

Table 1. Profile of Low-Income and Minority Populations

Demographic Indicator	HATS MPO		Cumberland County		Dauphin County		Perry County	
	Population	Percentage	Population	Percentage	Population	Percentage	Population	Percentage
White, Non-Hispanic	440,313	74.96%	215,968	83.93%	181,085	63.72%	43,260	94.29%
Minority	147,098	25.04%	41,365	16.07%	103,114	36.28%	2,619	5.71%
Black or African American, Non-Hispanic	60,140	10.24%	10,054	3.91%	49,677	17.48%	409	0.89%
American Indian and Alaska Native, Non-Hispanic	546	0.09%	89	0.03%	386	0.14%	71	0.15%
Asian alone, Non-Hispanic	26,927	4.58%	12,194	4.74%	14,566	5.13%	167	0.36%
Native Hawaiian and Other Pacific Islander, Non-Hispanic	48	0.01%	19	0.01%	29	0.01%	0	0.00%
Some other race, Non-Hispanic	1,691	0.29%	497	0.19%	1,149	0.40%	45	0.10%
Two or more races, Non-Hispanic	16,598	2.83%	7,142	2.78%	8,568	3.01%	888	1.94%
Hispanic	41,148	7.00%	11,370	4.42%	28,739	10.11%	1,039	2.26%
Low-Income Population	54,420	9.63%	17,717	6.88%	32,801	11.54%	3,902	8.50%

Source: 2017-2021 American Community Survey 5-Year Estimates

Table 2. Distribution of Population by Minority Population Intervals

Population/Asset	Percent Minority Population Intervals					Total
	0 - 11.27%	11.28% - 25.04%	25.05% - 43.74%	43.75% - 69.19%	69.20% - 100%	
Total Population	208,258	167,581	104,809	60,337	46,426	587,411
Total Population (in %)	35.45%	28.53%	17.84%	10.27%	7.90%	100%
Minority Population	9,949	29,070	35,257	33,408	39,414	147,098
Minority Population (in %)	6.76%	19.76%	23.97%	22.71%	26.79%	25.04%

Source: 2017-2021 American Community Survey 5-Year Estimates

Table 3. Distribution of Population by Poverty Population Intervals

Population/Asset	Percent Below Poverty Population Intervals					Total
	0% - 5.25%	5.26% - 9.63%	9.78% - 24.48%	24.49% - 42.58%	42.59% - 100%	
Total Population	257,092	99,754	159,004	40,874	8,432	565,156
Total Population (in %)	45.49%	17.65%	28.13%	7.23%	1.49%	100%
Below Poverty Population	5,581	6,980	23,785	13,293	4,781	54,420
Below Poverty Population (in %)	10.26%	12.83%	43.71%	24.43%	8.79%	9.63%

Source: 2017-2021 American Community Survey 5-Year Estimates

Table 4. Poverty Rate among Racial/Ethnic Groups

		HATS MPO	Cumberland County	Dauphin County	Perry County
White, Non-Hispanic	Total	428,243	206,890	178,541	42,812
	Low-Income	28,265	11,596	13,144	3,525
	Percentage	6.60%	5.60%	7.36%	8.23%
Black, Non-Hispanic	Total	62,187	8,570	53,285	332
	Low-Income	16,007	2,518	13,446	43
	Percentage	25.74%	29.38%	25.23%	12.95%
American Indian, Non-Hispanic	Total	1,214	184	959	71
	Low-Income	332	20	275	37
	Percentage	27.35%	10.87%	28.68%	52.11%
Asian, Non-Hispanic	Total	26,608	11,919	14,522	167
	Low-Income	1,946	768	1,168	10
	Percentage	7.31%	6.44%	8.04%	5.99%
Native Hawaiian, Non-Hispanic	Total	141	39	90	12
	Low-Income	0	0	0	0
	Percentage	0.00%	0.00%	0.00%	0.00%
Some Other Race, Non-Hispanic	Total	10,319	2,476	7,608	235
	Low-Income	2,609	652	1,898	59
	Percentage	25.28%	26.33%	24.95%	25.11%
Two or More, Non-Hispanic	Total	23,589	9,205	13,346	1,038
	Low-Income	3,345	1,512	1,686	147
	Percentage	14.18%	16.43%	12.63%	14.16%
Hispanic	Total	39,326	10,209	28,151	966
	Low-Income	9,225	2,602	6,423	200
	Percentage	23.46%	25.49%	22.82%	20.70%

Source: 2017-2021 American Community Survey 5-Year Estimates

Map 1 and Map 3 also illustrate this data, by displaying percentage minority and low-income populations by census block groups. These maps illustrate significant concentrations of both low-income and minority populations in and around our urban centers of Harrisburg, Carlisle, and Shippensburg. Map 2 and Map 4 add dot densities for the demographic data, which depicts minority and low-income populations within census block groups that have

relatively low concentrations. It is important to note that these dot densities are a graphic devise used to illustrate a population within the entire census block group and should not be interpreted to be portraying an exact location.

Assess Conditions

To provide an accurate picture of the impacts of transportation planning on our region’s environmental justice populations, the current conditions of the transportation system must be evaluated in the context of environmental justice. This will allow us to not just evaluate the impact of any one plan or program, but to examine the impacts of the decades of decisions made that comprise our comprehensive transportation planning process while identifying additional areas of need and gaps in our system. Working cooperatively with PennDOT, a variety of indicators were compared to the distribution and concentration of environmental justice populations and are presented below.

As previously mentioned, the regional threshold will not be solely used to identify specific communities as “environmental justice communities”. However, the regional average will still be referenced in some of the following analyses.

Bridge Condition

Table 5 and Table 6 show the distribution of poor condition bridges and all bridges, respectively, by minority population interval. There are a total of 114 poor condition bridges in the HATS region, of which 23 (12.3%) are located within census block groups whose concentration of minority population exceeds the regional average. Conversely, there are a total of 1,334 bridges in the HATS region, of which 235 (17.8%) are located within census block groups whose concentration of minority population exceeds the regional average.

Table 5. Distribution of Poor Condition Bridges by Minority Population Intervals

Population/Asset	Percent Minority Population Intervals					Total
	0 - 11.27%	11.28% - 25.04%	25.05% - 43.74%	43.75% - 69.19%	69.20% - 100%	
Poor Condition Bridge Count	70	21	14	3	6	114
Percentage	61.4%	18.4%	12.3%	2.6%	5.3%	100%
Total Population	208,258	167,581	104,809	60,337	46,426	587,411
Total Population (in %)	35.5%	28.5%	17.8%	10.3%	7.9%	100%
Minority Population	9,949	29,070	35,257	33,408	39,414	147,098
Minority Population (in %)	6.8%	19.8%	24.0%	22.7%	26.8%	25%
Poor Condition Bridges Per 1000 Pop.	0.34	0.13	0.13	0.05	0.13	0.19

Source: 2017-2021 American Community Survey 5-Year Estimates, PennDOT

Table 6. Distribution of All Bridges by Minority Population Intervals

Population/Asset	Percent Minority Population Intervals					Total
	0 - 11.27%	11.28% - 25.04%	25.05% - 43.74%	43.75% - 69.19%	69.20% - 100%	
Total Bridge Count	823	276	137	51	47	1,334
Percentage	61.7%	20.7%	10.3%	3.8%	3.5%	100%
Total Population	208,258	167,581	104,809	60,337	46,426	587,411
Total Population (in %)	35.5%	28.5%	17.8%	10.3%	7.9%	100%
Minority Population	9,949	29,070	35,257	33,408	39,414	147,098
Minority Population (in %)	6.8%	19.8%	24.0%	22.7%	26.8%	25%
Total Bridges Per 1000 Pop.	3.95	1.65	1.31	0.85	1.01	2.27

Source: 2017-2021 American Community Survey 5-Year Estimates, PennDOT

Table 7. Distribution of Poor Condition Bridges by Low-income Population Intervals

Population/Asset	Percent Below Poverty Population Intervals					Total
	0% - 5.25%	5.26% - 9.63%	9.78% - 24.48%	24.49% - 42.58%	42.59% - 100%	
Poor Condition Bridge Count	31	26	51	4	2	114
Percentage	27.2%	22.8%	44.7%	3.5%	1.8%	100%
Total Population	257,092	99,754	159,004	40,874	8,432	552,146
Total Population (in %)	45.5%	17.7%	28.1%	7.2%	1.5%	100%
Below Poverty Population	5,581	6,980	23,785	13,293	4,781	53,947
Below Poverty Population (in %)	10.3%	12.8%	43.7%	24.4%	8.8%	10%
Poor Condition Bridges Per 1000 Pop.	0.12	0.26	0.32	0.10	0.24	0.21

Source: 2017-2021 American Community Survey 5-Year Estimates, PennDOT

Table 8. Distribution of All Bridges by Low-income Population Intervals

Population/Asset	Percent Below Poverty Population Intervals					Total
	0% - 5.25%	5.26% - 9.63%	9.78% - 24.48%	24.49% - 42.58%	42.59% - 100%	
Total Bridge Count	552	255	458	44	25	1,334
Percentage	41.4%	19.1%	34.3%	3.3%	1.9%	100%
Total Population	257,092	99,754	159,004	40,874	8,432	552,146
Total Population (in %)	45.5%	17.7%	28.1%	7.2%	1.5%	100%
Below Poverty Population	5,581	6,980	23,785	13,293	4,781	53,947
Below Poverty Population (in %)	10.3%	12.8%	43.7%	24.4%	8.8%	10%
Total Bridges Per 1000 Pop.	2.15	2.56	2.88	1.08	2.96	2.42

Source: 2017-2021 American Community Survey 5-Year Estimates, PennDOT

Table 7 and Table 8 show the distribution of poor condition bridges and all bridges, respectively, by low-income population interval. Of the 114 poor condition bridges in the HATS region, 59 (51.8%) are located within census block groups whose concentration of low-income population exceeds the regional average. Of the 1,328 total bridges in the HATS region, 527 (39.5%) are located within census block groups whose exceed the regional average. Map 5 and Map 6 display the distribution of poor condition bridges by minority population and low-income population, respectively.

Pavement Condition

Table 9 and Table 10 show the distribution of poor condition pavement and excellent condition pavement, respectively, by minority population interval. There are a total of 225.43 miles of poor condition pavement in the HATS region, of which 45.31 (20.1%) are located within census block groups whose concentration of minority population exceeds the regional average. Conversely, there are a total of 500.65 miles of excellent condition pavement in the HATS region, of which 75.94 (15.2%) are located within census block groups whose concentration of minority population exceeds the regional average.

Table 9. Distribution of Poor Pavement by Minority Population Intervals

Population/Asset	Percent Minority Population Intervals					Total
	0 - 11.27%	11.28% - 25.04%	25.05% - 43.74%	43.75% - 69.19%	69.20% - 100%	
Poor Pavement Mileage	149.76	30.36	18.62	10.66	16.03	225.43
Percentage	66.4%	13.5%	8.3%	4.7%	7.1%	100%
Total Population	208,258	167,581	104,809	60,337	46,426	587,411
Total Population (in %)	35.5%	28.5%	17.8%	10.3%	7.9%	100%
Minority Population	9,949	29,070	35,257	33,408	39,414	147,098
Minority Population (in %)	6.8%	19.8%	24.0%	22.7%	26.8%	25%
Poor Pavement Per 1000 Pop.	0.72	0.18	0.18	0.18	0.35	0.38

Source: 2017-2021 American Community Survey 5-Year Estimates, PennDOT

Table 10. Distribution of Excellent Pavement by Minority Population Intervals

Population/Asset	Percent Minority Population Intervals					Total
	0 - 11.27%	11.28% - 25.04%	25.05% - 43.74%	43.75% - 69.19%	69.20% - 100%	
Excellent Pavement Mileage	319.28	105.43	56.41	12.65	6.88	500.65
Percentage	63.8%	21.1%	11.3%	2.5%	1.4%	100%
Total Population	208,258	167,581	104,809	60,337	46,426	587,411
Total Population (in %)	35.5%	28.5%	17.8%	10.3%	7.9%	100%
Minority Population	9,949	29,070	35,257	33,408	39,414	147,098
Minority Population (in %)	6.8%	19.8%	24.0%	22.7%	26.8%	25%
Excellent Pavement Per 1000 Pop.	1.53	0.63	0.54	0.21	0.15	0.85

Source: 2017-2021 American Community Survey 5-Year Estimates, PennDOT

Table 11. Distribution of Poor Pavement by Low-income Population Intervals

Population/Asset	Percent Below Poverty Population Intervals					Total
	0% - 5.25%	5.26% - 9.63%	9.78% - 24.48%	24.49% - 42.58%	42.59% - 100%	
Poor Pavement Mileage	62.65	34.38	104.31	17.90	6.19	225.43
Percentage	27.8%	15.3%	46.3%	7.9%	2.7%	100%
Total Population	257,092	99,754	159,004	40,874	8,432	565,156
Total Population (in %)	45.5%	17.7%	28.1%	7.2%	1.5%	100%
Below Poverty Population	5,581	6,980	23,785	13,293	4,781	54,420
Below Poverty Population (in %)	10.3%	12.8%	43.7%	24.4%	8.8%	10%
Poor Pavement Per 1000 Pop.	0.24	0.34	0.66	0.44	0.73	0.40

Source: 2017-2021 American Community Survey 5-Year Estimates, PennDOT

Table 12. Distribution of Excellent Pavement by Low-income Population Intervals

Population/Asset	Percent Below Poverty Population Intervals					Total
	0% - 5.25%	5.26% - 9.63%	9.78% - 24.48%	24.49% - 42.58%	42.59% - 100%	
Excellent Pavement Mileage	193.14	113.58	173.16	15.53	5.24	500.65
Percentage	38.6%	22.7%	34.6%	3.1%	1.0%	100%
Total Population	257,092	99,754	159,004	40,874	8,432	565,156
Total Population (in %)	45.5%	17.7%	28.1%	7.2%	1.5%	100%
Below Poverty Population	5,581	6,980	23,785	13,293	4,781	54,420
Below Poverty Population (in %)	10.3%	12.8%	43.7%	24.4%	8.8%	10%
Excellent Pavement Per 1000 Pop.	0.75	1.14	1.09	0.38	0.62	0.89

Source: 2017-2021 American Community Survey 5-Year Estimates, PennDOT

Table 11 and Table 12 show the distribution of poor condition pavement and excellent condition pavement, respectively, by low-income population interval. Of the 225.43 miles of poor condition pavement in the HATS region, 128.40 (57.0%) are located within census block groups whose concentration of low-income population exceeds the regional average. Of the 500.65 miles of excellent condition pavement in the HATS region, 193.93 (38.7%) are located within census block groups whose exceed the regional average.

Map 7 and Map 8 display the distribution of poor and excellent condition pavement by minority population and low-income population, respectively.

Bicycle/Pedestrian Crashes

Table 13 shows the distribution of bicycle and pedestrian related crashes (2018-2022) by minority population interval. Of the total 765 bicycle and pedestrian related crashes in the HATS region, 419 (54.8%) occurred within census block groups whose concentration of minority population exceeds the regional average. Additionally, the number of bicycle and pedestrian crashes per 1000 population is more than twice as high in census block groups whose concentration of minority population exceeds the regional average (1.98) than in census block groups whose concentrations of minority population does not (0.92). The census block groups in the lowest minority population interval have the lowest number of crashes per 1000 population and the census block groups in the highest minority population interval have the highest number of crashes per 1000 population. This shows a strong connection between concentration of minority population and incidence of bicycle and pedestrian crashes.

Table 13. Distribution of Bicycle & Pedestrian related crashes by Minority Population Intervals

Population/Asset	Percent Minority Population Intervals					Total
	0 - 11.27%	11.28% - 25.04%	25.05% - 43.74%	43.75% - 69.19%	69.20% - 100%	
Bike-Pedestrian Crash Count	162	184	172	104	143	765
Percentage	21.2%	24.1%	22.5%	13.6%	18.7%	100%
Total Population	208,258	167,581	104,809	60,337	46,426	587,411
Total Population (in %)	35.5%	28.5%	17.8%	10.3%	7.9%	100%
Minority Population	9,949	29,070	35,257	33,408	39,414	147,098
Minority Population (in %)	6.8%	19.8%	24.0%	22.7%	26.8%	25%
Crashes Per 1000 Pop.	0.78	1.10	1.64	1.72	3.08	1.30

Source: 2017-2021 American Community Survey 5-Year Estimates, PennDOT

Table 14. Distribution of Bicycle & Pedestrian related crashes by Poverty Population Intervals

Population/Asset	Percent Below Poverty Population Intervals					Total
	0% - 5.25%	5.26% - 9.63%	9.78% - 24.48%	24.49% - 42.58%	42.59% - 100%	
Bike-Pedestrian Crash Count	199	89	289	157	31	765
Percentage	26.0%	11.6%	37.8%	20.5%	4.1%	100%
Total Population	257,092	99,754	159,004	40,874	8,432	565,156
Total Population (in %)	45.5%	17.7%	28.1%	7.2%	1.5%	100%
Below Poverty Population	5,581	6,980	23,785	13,293	4,781	54,420
Below Poverty Population (in %)	10.3%	12.8%	43.7%	24.4%	8.8%	10%
Crashes Per 1000 Pop.	0.77	0.89	1.82	3.84	3.68	1.35

Source: 2017-2021 American Community Survey 5-Year Estimates, PennDOT

Table 14 shows the distribution of bicycle and pedestrian related crashes (2018-2022) by low-income population interval. Of the 765 bicycle and pedestrian related crashes in the HATS region, 477 (62.4%) occurred within census block groups whose concentration of low-income population exceeds the regional average. The number of bicycle and pedestrian crashes per 1000 population is more than twice as high in census block groups whose concentrations of low-income population exceeds the regional average (2.29) than census block groups whose concentrations of low-income population does not (0.81). Similar to the trend discussed in the minority population data, census block groups in the lowest low-income population interval have the lowest number of crashes per 1000 population and the census block groups in the highest low-income population interval have the highest number of crashes per 1000 population. This shows a strong connection between concentration of low-income population and incidence of bicycle and pedestrian crashes.

Map 9 and Map 10 display the distribution of bicycle & pedestrian crashes by minority population and low-income population, respectively.

Table 15. Distribution of Injury & Fatal related crashes by Minority Population Intervals

Population/Asset	Percent Minority Population Intervals					Total
	0 - 11.27%	11.28% - 25.04%	25.05% - 43.74%	43.75% - 69.19%	69.20% - 100%	
Injury-Fatal Crash Count	497	274	205	127	135	1,238
Percentage	40.1%	22.1%	16.6%	10.3%	10.9%	100%
Total Population	208,258	167,581	104,809	60,337	46,426	587,411
Total Population (in %)	35.5%	28.5%	17.8%	10.3%	7.9%	100%
Minority Population	9,949	29,070	35,257	33,408	39,414	147,098
Minority Population (in %)	6.8%	19.8%	24.0%	22.7%	26.8%	25%
Crashes Per 1000 Pop.	2.39	1.64	1.96	2.10	2.91	2.11

Source: 2017-2021 American Community Survey 5-Year Estimates, PennDOT

Table 16. Distribution of Injury & Fatal related crashes by Poverty Population Intervals

Population/Asset	Percent Below Poverty Population Intervals					Total
	0% - 5.25%	5.26% - 9.63%	9.78% - 24.48%	24.49% - 42.58%	42.59% - 100%	
Injury-Fatal Crash Count	523	189	371	115	40	1,238
Percentage	42.2%	15.3%	30.0%	9.3%	3.2%	100%
Total Population	257,092	99,754	159,004	40,874	8,432	565,156
Total Population (in %)	45.5%	17.7%	28.1%	7.2%	1.5%	100%
Below Poverty Population	5,581	6,980	23,785	13,293	4,781	54,420
Below Poverty Population (in %)	10.3%	12.8%	43.7%	24.4%	8.8%	10%
Crashes Per 1000 Pop.	2.03	1.89	2.33	2.81	4.74	2.19

Source: 2017-2021 American Community Survey 5-Year Estimates, PennDOT

Fatal/Serious-Injury Crashes

Table 15 shows the distribution of fatal and serious-injury related crashes (2013-2017) by minority population interval. Of the 1,044 fatal and serious-injury related crashes in the HATS region, 340 (32.6%) occurred within census block groups whose concentration of minority population exceeds the regional average. While the average crashes per 1000 population was slightly higher in census blocks whose concentration of minority population exceeds the regional average than those that do not (1.95 average vs 1.84 average), the difference does not appear to be significant.

Table 16 shows the distribution of fatal and serious-injury related crashes (2013-2017) by low-income population interval. Of the 1,044 fatal and serious-injury related crashes in the HATS region, 122 (32.6%) occurred within census block groups whose concentration of low-income population exceeds the regional average. The average crashes per 1000 population was slightly higher in census blocks whose concentration of low-income population exceeds the regional average than those that do not (2.15 average vs 1.88 average), indicating a possible connection between concentration of low-income population and fatal and serious-injury related crashes.

Map 11 and Map 12 display the distribution of fatal and serious-injury related crashes by minority population and low-income population, respectively.

Transit Access

Figure 2 shows approximately 26% of the minority population and 58% of the non-minority population lives within a census block group with no designated CAT bus stops, while approximately 44% of the minority population and 17% of the non-minority population lives within a block group with more than 5 designated CAT bus stops. Figure 3 shows

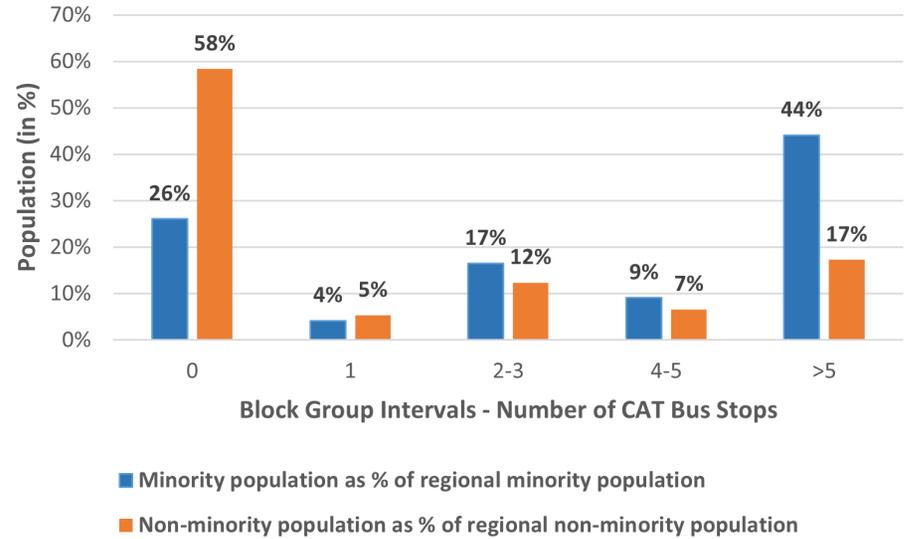


Figure 2. CAT Stops by Minority Population

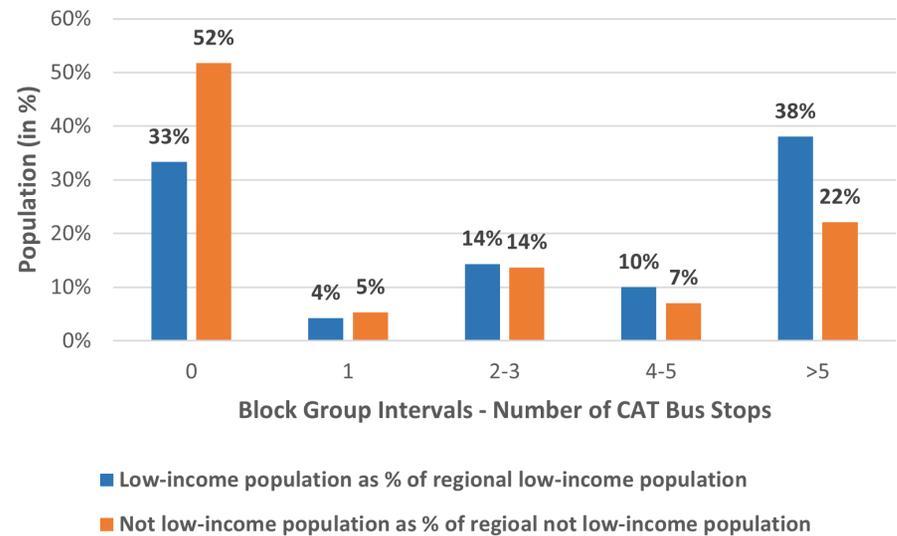


Figure 3. CAT Stops by Low-income Population

approximately 52% of the non-low-income population and 33% of the low-income population lives within a block group with no designated CAT bus stops, while approximately 38% of the low-income population and 22% of the non-low-income population lives within a block group with more than 5 designated CAT bus stops.

Map 13 and Map 14 display the distribution of poor condition bridges by minority population and low-income population, respectively.

Conclusions

Based on the above analyses, which is updated from the analysis performed for and included in the HATS 2045 Regional Transportation Plan, poor pavement condition is more prevalent in areas with higher than average concentrations of low-income populations and bicycle/pedestrian-related crashes are more prevalent in areas with higher than average concentrations of minority and/or low-income populations.

To mitigate or begin to address these discrepancies, and move toward a transportation system that improves the quality of life, promotes human health and provides a safe experience for all users, the 2045 RTP identified a few steps and strategies for implementation. The 2045 RTP Project Pipeline evaluation criteria included environmental justice populations, applying points along the population intervals discussed above. This evaluation criteria results in Transportation Needs being assigned a regional priority (High, Medium, or Low), with those identified as High Priorities being targeted for inclusion in the newly programmed projects for each round of TIP development.

In addition, HATS is pursuing other efforts that will help improve the equity within our region's transportation system by addressing some of the issues identified above as more prevalent in areas with higher than average concentrations of minority and/or low-income populations. These include the efforts being made to expand the capacity to collect and analyze data on locally-owned, federal-aid eligible assets, safety planning efforts focusing on non-motorized users, and the RTP Implementation Grant Program, which funds transportation studies and improvements that meet HATS Regional Transportation Plan and TCRPC Regional Growth Management Plan goals while "providing for safer, more walkable, bikeable and transit-friendly transportation systems."

Benefits and burdens

The benefits that the transportation improvement program can provide include improved access, mobility, safety and environmental quality. The burdens of the program can be a reduction in any of those areas to a community. Many transportation projects require a trade-off between those aspects of the transportation system and the distribution of the benefits and burdens. For example, a project that decreases congestion along one corridor can improve access, mobility, and safety for those who use that corridor, while decreasing the environmental quality for those that live or work along that corridor. Increased safety may require a trade off in access or mobility, and increased access may bring mobility concerns. These impacts can vary both community to community, and among populations or individuals within a single community. Benefits and burdens analysis in respect to environmental justice is done to ensure that the benefits of transportation investment are being shared equally and that the burdens created by new projects are not being borne by one part of the public over another.

Types of projects and distribution

While there is no singular, all-encompassing analysis that shows the environmental justice impacts a transportation improvement program will have, one method is to examine how the distribution of projects and allocation of funding compares to the location of our region’s environmental justice populations. Maps 15 and 16 show this distribution, while the analysis that follows discusses how funding was allocated among project categories in census block groups below and above the regional average for minority and low-income population.

While this analysis examined the projects included on the draft FFY 2025-2028 Highway & Bridge and Interstate TIPs, project costs and totals includes all project phases and costs programmed on the full FFY 2025-2036 Twelve Year Plan (TYP). This provides a fuller picture of the expected expenditures, beyond just the next four fiscal years. The projects included in the draft FFY TIPs total approximately \$2.49 billion (excluding line items) and include identified roadway and bridge projects, Bike/Ped projects, and interstate projects.

The quantitative analysis used GIS software to compare projected investment to the location of EJ populations in the HATS region. The analysis was heavily impacted by the programmed Interstate projects, which represents approximately 77% of the total estimated spending in the HATS region over the next 12 years.

Table 17. Project Distribution by Minority Populations

Percent Population Minority - Block Group Intervals		0 - 11.27%	11.28% - 25.04%	25.05% - 43.74%	43.75% - 69.19%	69.20% - 100%	TOTAL
Population Shares by Interval	Total Population	208,258	167,581	104,809	60,337	46,426	587,411
	Regional Share of Total Population	35.5%	28.5%	17.8%	10.3%	7.9%	100%
	Minority Population	9,949	29,070	35,257	33,408	39,414	147,098
	Regional Share of Minority Population	6.8%	19.8%	24.0%	22.7%	26.8%	100%
Bike-Ped Projects	Percentage of Funding	8.3%	17.9%	34.3%	2.1%	37.4%	
	Amount of Funding	\$1,589,834	\$3,426,825	\$6,576,739	\$403,084	\$7,182,446	\$19,178,928
Bridge Projects	Percentage of Funding	30.0%	12.4%	7.9%	35.7%	13.8%	
	Amount of Funding	\$105,605,636	\$43,760,936	\$27,944,513	\$125,649,788	\$48,558,000	\$351,518,873
Roadway Projects	Percentage of Funding	41.4%	19.7%	30.1%	7.1%	1.7%	
	Amount of Funding	\$75,922,339	\$36,100,056	\$55,093,570	\$13,098,859	\$3,099,094	\$183,321,418
All Projects (Without Interstate)	Percentage of Funding	33.1%	15.0%	16.2%	25.1%	10.6%	
	Amount of Funding	\$183,117,809	\$83,287,817	\$89,614,822	\$139,151,731	\$58,839,540	\$554,019,219
	Per Capita Funding	\$879.28	\$497.00	\$855.03	\$2,306.24	\$1,267.38	\$943.15
Interstate Projects	Percentage of Funding	0.3%	0.5%	0.0%	24.5%	74.7%	
	Amount of Funding	\$6,160,000	\$9,189,556	\$0	\$473,445,000	\$1,442,148,000	\$1,930,942,556
All Projects (With Interstate)	Percentage of Funding	7.6%	3.7%	3.6%	24.6%	60.4%	
	Amount of Funding	\$189,277,809	\$92,477,373	\$89,614,822	\$612,596,731	\$1,500,987,540	\$2,485,754,275
	Per Capita Funding	\$908.86	\$551.84	\$855.03	\$10,152.92	\$32,330.75	\$4,231.71

As shown in Table 17, per capita spending is higher in census block groups with minority populations higher than the regional average than those with minority populations lower than the regional average. This is true whether the Interstate projects (which, as discussed heavily skew this analysis) are included or not. Roadway and Bridge projects dominate the non-Interstate investments programmed on the TYP, accounting for more than 96% of the total. Approximately 49% of roadway and bridge investments are located within block groups below the regional average for minority population. However, as noted above, the per capita spending is higher in for block groups above the regional average than below the regional average. Bicycle/Pedestrian funding is concentrated in the third and fifth highest percent interval. On the FFY 2025-2026 TIP, intermodal projects consist exclusively of unmapped projects that aren't included in this quantitative analysis. It should be noted that these intermodal projects and investments includes support for transit, typically through the flexing of CMAQ funding, and ride-sharing, through the support of SRTP and Commuter Services, providing benefits to environmental justice populations by increasing access to transit.

Table 18. Project Distribution by Low-income Population

Percent Population Low-income - Block Group Intervals		0% - 5.25%	5.26% - 9.63%	9.78% - 24.48%	24.49% - 42.58%	42.59% - 100%	TOTAL
Population Shares by Interval	Total Population	257,092	99,754	159,004	40,874	8,432	565,156
	Regional Share of Total Population	45.5%	17.7%	28.1%	7.2%	1.5%	100%
	Low-income Population	5,581	6,980	23,785	13,293	4,781	54,420
	Regional Share of Low-income Population	10.3%	12.8%	43.7%	24.4%	8.8%	100%
Bike-Ped Projects	Percentage of Funding	17.3%	1.3%	25.7%	55.6%	0.0%	
	Amount of Funding	\$3,320,839	\$254,592	\$4,931,102	\$10,672,395	\$0	\$19,178,928
Bridge Projects	Percentage of Funding	17.6%	8.6%	24.2%	39.8%	9.9%	
	Amount of Funding	\$61,722,444	\$30,066,024	\$85,004,617	\$139,815,788	\$34,910,000	\$351,518,873
Roadway Projects	Percentage of Funding	30.0%	1.3%	63.7%	3.2%	1.7%	
	Amount of Funding	\$55,015,338	\$2,471,018	\$116,865,108	\$5,863,360	\$3,099,094	\$183,321,418
All Projects (Without Interstate)	Percentage of Funding	21.7%	5.9%	37.3%	28.2%	6.9%	
	Amount of Funding	\$120,058,621	\$32,791,634	\$206,800,827	\$156,351,543	\$38,009,094	\$554,019,219
	Per Capita Funding	\$466.99	\$328.73	\$1,300.60	\$3,825.21	\$4,507.72	\$980.29
Interstate Projects	Percentage of Funding	0.2%	0.1%	15.8%	83.8%	0.0%	
	Amount of Funding	\$3,360,000	\$2,800,000	\$306,039,556	\$1,618,743,000	\$0	\$1,930,942,556
All Projects (With Interstate)	Percentage of Funding	5.0%	1.4%	20.6%	71.4%	1.5%	
	Amount of Funding	\$123,418,621	\$35,591,634	\$512,840,383	\$1,775,094,543	\$38,009,094	\$2,485,754,275
	Per Capita Funding	\$480.06	\$356.79	\$3,225.33	\$43,428.45	\$4,507.72	\$4,398.35

As shown Table 18, per capita spending as it relates to low-income population percentage intervals are similar to the trends discussed for minority populations above – generally higher in the block groups above the regional average. Approximately 72% of roadway and bridge investments are located

in block groups above the regional average for low-income population. Bicycle/pedestrian projects and intermodal projects follow the same general pattern as discussed above as well, with investment concentrated in the third and fourth highest percent intervals.

Bridges represent the majority of funding allocated within block groups that have minority and low-income populations below the regional average. The need to maintain current facilities and continue making progress regarding PM2 requires investments in existing bridges, which are predominantly located within block groups with minority or low-income populations below the regional average, as is shown in Tables 5-8.

Because of the location and associated funding amounts of the Interstate Program, it has been considered and presented separately for this analysis. Significant investment (more than twice the amount of the Highway & Bridge TIP) is being made, which skews any examination of funding allocation, as shown in Tables 17 and 18. The Interstate Program will be discussed in more detail later in the analysis.

There are 19 bike/ped projects programmed totaling approximately \$19,178,928. The majority of the investments are located within census block groups that have higher than average minority and low-income populations. Significant projects, including the Lemoyne Bottleneck Improvements and the Paxtang Parkway Restoration is located adjacent to a census block with higher than average minority and low-income populations and will substantially improve bicycle and pedestrian access and safety between the City of Harrisburg and surrounding communities. In addition to these, several line items or projects with locations yet-to-be-determined are included on the draft FFY 2025-2028 TIP, including the RTP Implementation Program and HATS Bike Share. These bike/ped projects, and the intermodal projects discussed above, are particularly relevant because they offer residents a transportation option that does not require a car, thus improving the accessibility and mobility of the local population.

The interstate program includes 11 projects totaling approximately \$1.93 billion. These interstate investments are dominated by those required to improve and maintain I-83, which is located in multiple census block groups above the regional average for both minority and low-income populations. These projects provide capacity improvements, reduce congestion and delays, and improve safety to the system, and reduce the environmental impact of traffic on the interstate.

The draft 2025-2028 Transit TIP includes projects totaling \$183,355,167 which are dedicated to maintaining the existing transit and paratransit service for the Harrisburg Region. HATS traditionally flexes a portion of the federal CMAQ funds allocation to CAT to assist in providing quality transit service. Any increases in transit funding will allow for additional bus routing and stops, thus expanding the availability of alternative transportation and increasing mobility to access employment opportunities and health services.

Significant Interstate Projects

For the FFY 2025-2028 TIP, the vast majority of projects will not require significant right-of-way acquisition, require the displacement of people, or cause burdens on the mobility, access, or environmental health of any community or population group. This is because the vast majority of the HATS Highway & Bridge TIP is proposed to be programmed to maintain or enhance the existing transportation system.

The major exceptions to this are the projects associated with I-83 on the Interstate TIP, which will improve and significantly reconfigure the Eisenhower Interchange and expand I-83 to the South Bridge, which is an identified freight route and high congestion corridor. As these projects progress past

preliminary phases, right-of-way impacts and potential takings will be finalized and will be addressed throughout the project development process when identified.

While this projects will require displacement, they is also propose to improve the operations of the multiple interchanges and over-/under-passes, while also adding bicycle and pedestrian improvements, which would improve the mobility of both the impacted block group and other nearby populations. It should be noted that these projects pass through block groups with a total population of 15,886, a minority population of 7,572, and low-income population of 1,957. Overall these project will have widespread benefits for both the region and the state.

Moving Forward

The condition assessment in the 2045 RTP identified poor pavement condition and bicycle/pedestrian crashes as disproportionately located within areas with higher than average concentrations of low-income populations. While this doesn't necessarily indicate adverse or disparate impact, it is important to monitor moving forward. In our proposed program, the majority of roadway investments are located within areas with higher than average concentrations of minority (51.1%) or low-income populations (72.1%). The impact of those projects will be better gauged in the Environmental Justice Analysis done for future TIP and Regional Transportation Plan updates.

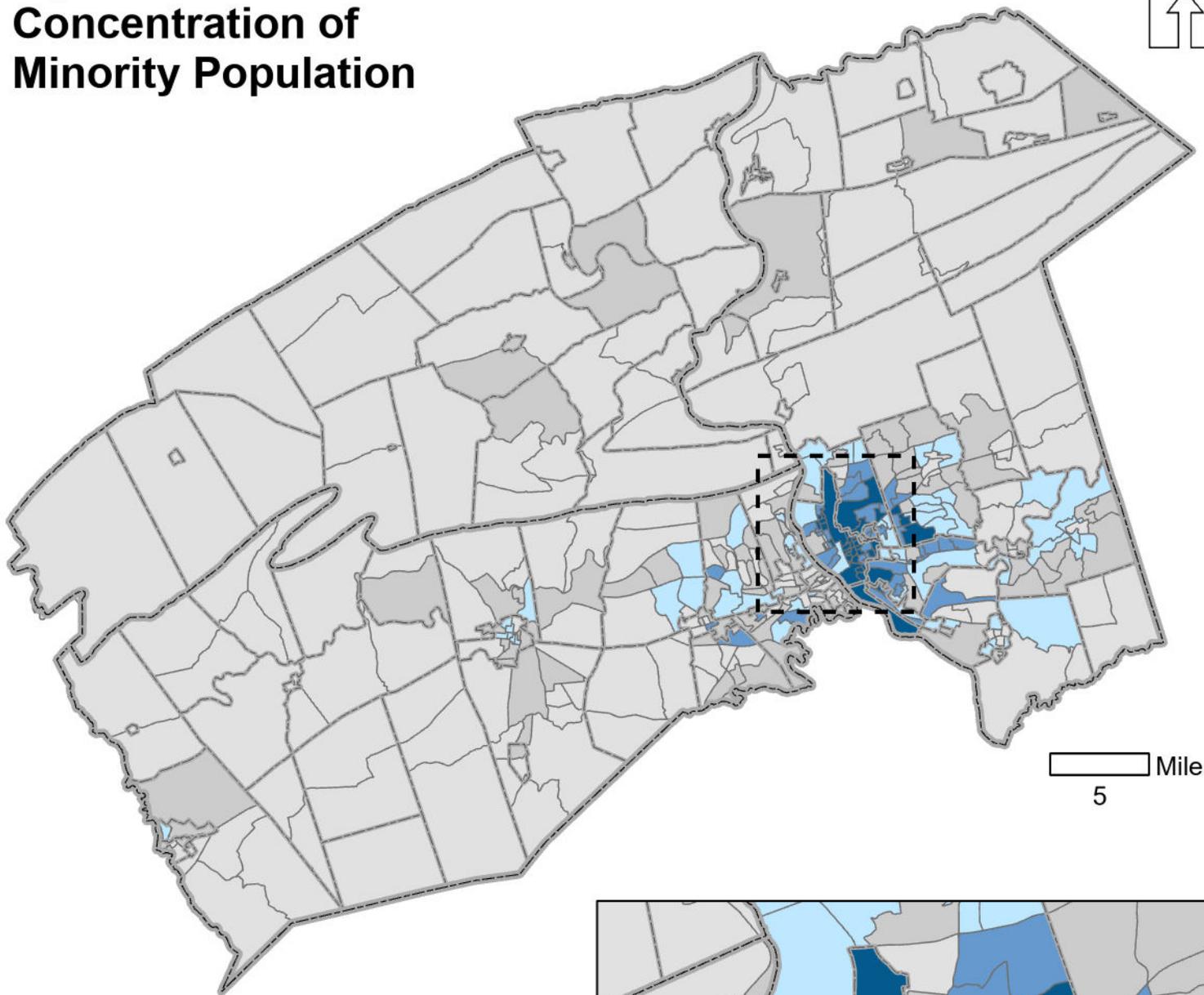
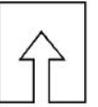
This analysis is a snapshot of the current conditions and how this proposed program will address them. Environmental Justice is incorporated into the evaluation criteria of our RTP Project Pipeline, which prioritizes locally identified transportation needs, and our RTP Project List. The FFY2025-2028 TIP includes 20 projects that have originated on the RTP Project Pipeline or been granted funding through the RTP Implementation Grant Program, totaling \$111,351,727. Many of these projects are either designated bicycle/pedestrian improvements or include them among the project elements. Because of the incorporation of minority and low-income populations into the evaluation criteria, the vast majority of these 22 projects are located in areas with higher than average concentrations of low-income and/pr minority populations.

No statistical analysis provides a complete picture. Our understanding of how the condition of our transportation system and our transportation programs impact and achieve environmental justice will continue to evolve over time. As that understanding of the causes improves, so does our ability mitigate or address them.

Conclusion

The majority of project funding proposed for the FFY 2025-2028 Transportation Improvement Program is located within block groups with higher than average minority and/or low-income populations. The majority of project funding located outside these block groups is due to bridge projects meant to address asset management concerns and continue progress on Performance Measure 2. While some statistical disparities were made apparent during the condition assessment conducted as part of this analysis, the FFY 2025-2028 Transportation Improvement Program will not exacerbate them and will provide an equitable distribution of benefits and burdens.

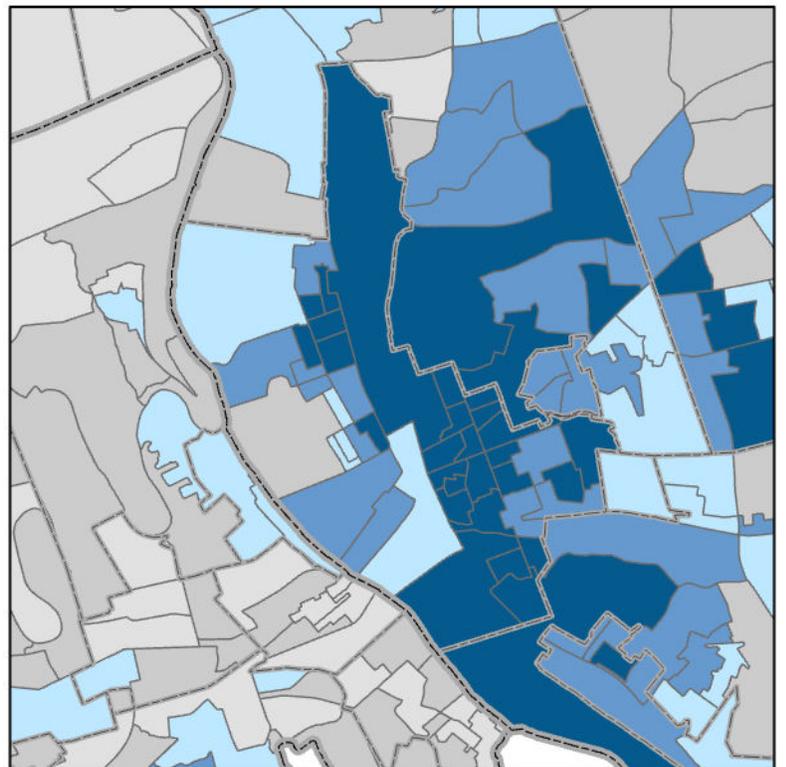
Map 1 Concentration of Minority Population



5 Miles

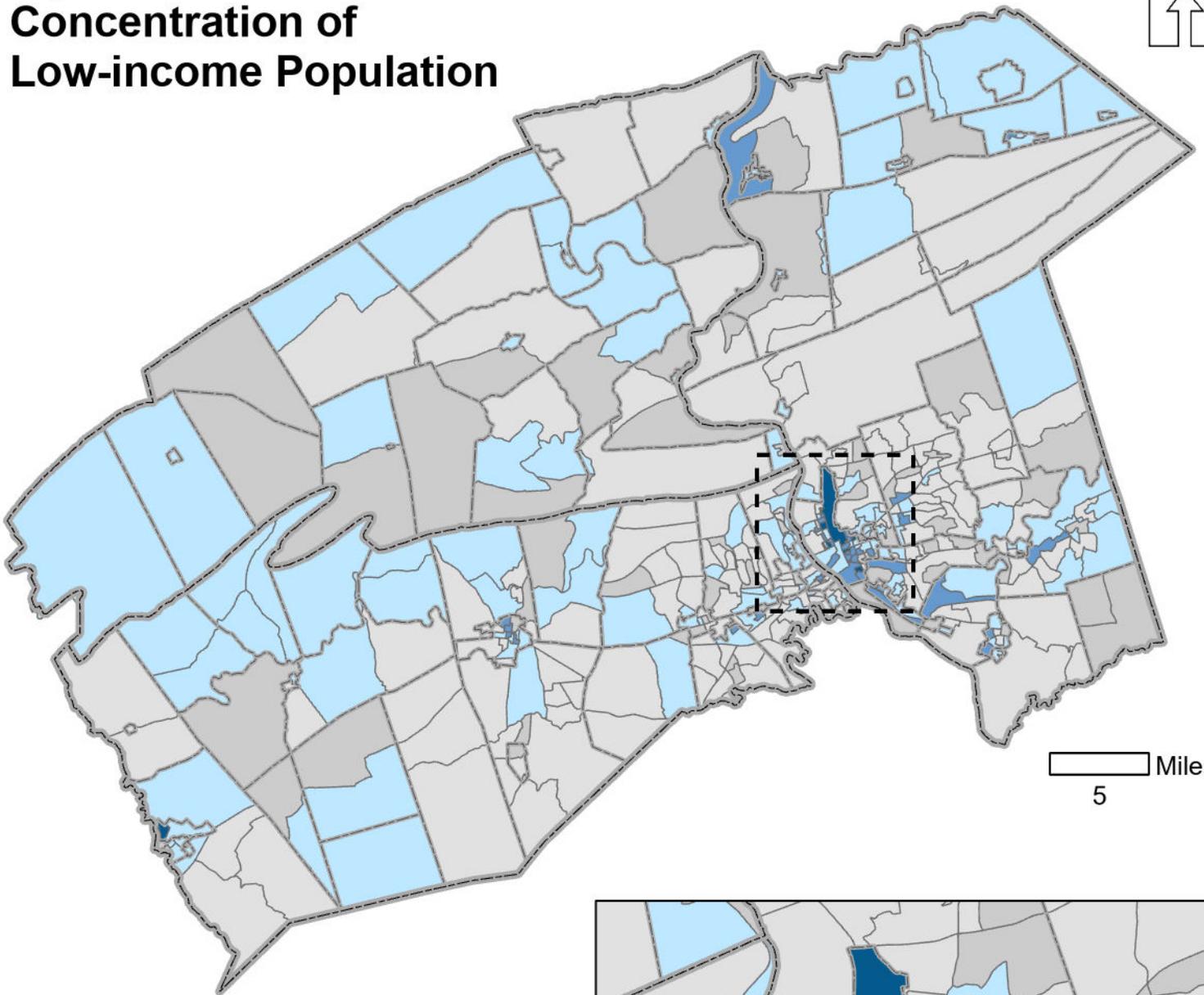
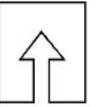
Minority Population Percentage by Block Group

- Less than 11.27%
- 11.27% - 25.04%
- 25.05% - 43.74%
- 43.75% - 69.18%
- Greater than 69.19%



Source: 2017-2021 American Community Survey 5-Year Estimates

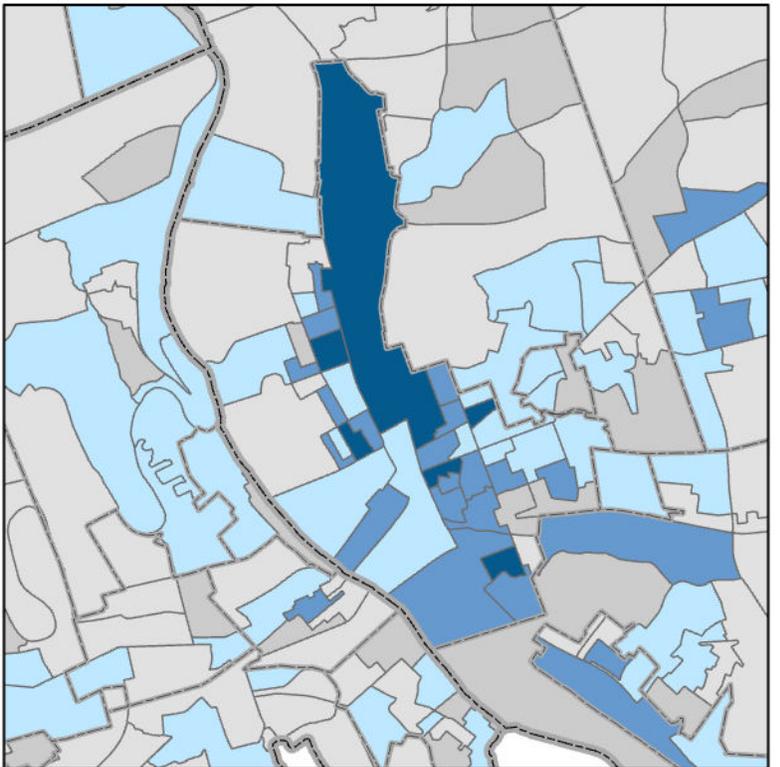
Map 2 Concentration of Low-income Population



5 Miles

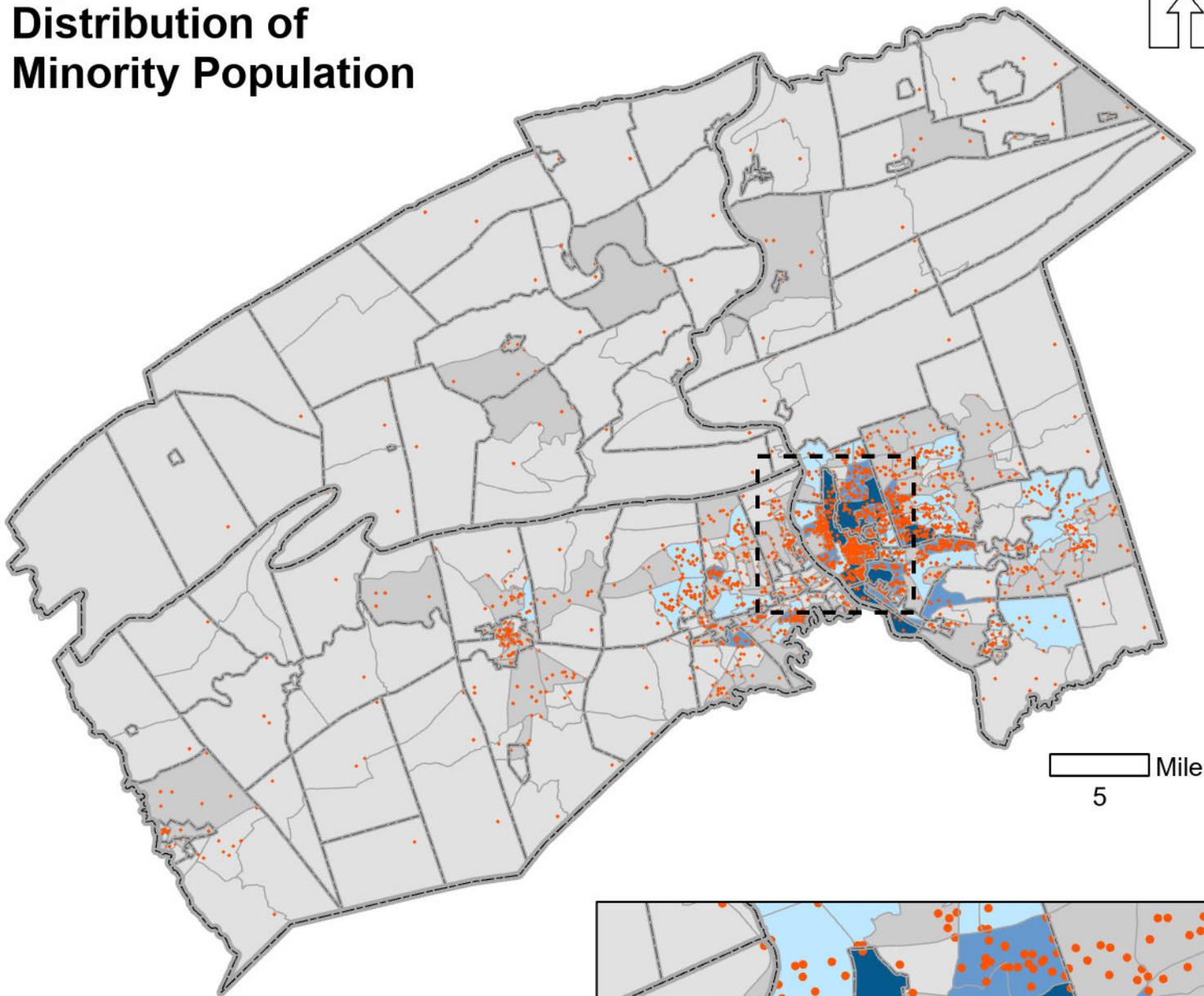
Low-income Population Percentage by Block Group

- Less than 5.26%
- 5.26% - 9.63%
- 9.64% - 24.48%
- 24.49% - 42.58%
- Greater than 42.58%



Source: 2017-2021 American Community Survey 5-Year Estimates

Map 3 Distribution of Minority Population



5 Miles

Minority Population

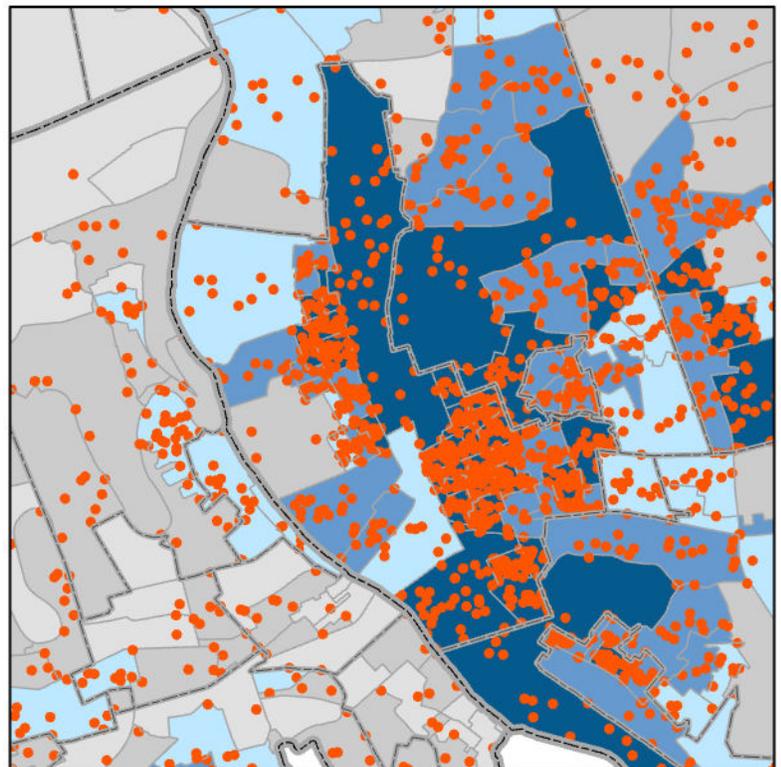
Percentage by Block Group

-  Less than 11.27%
-  11.27% - 25.04%
-  25.05% - 43.74%
-  43.75% - 69.18%
-  Greater than 69.19%

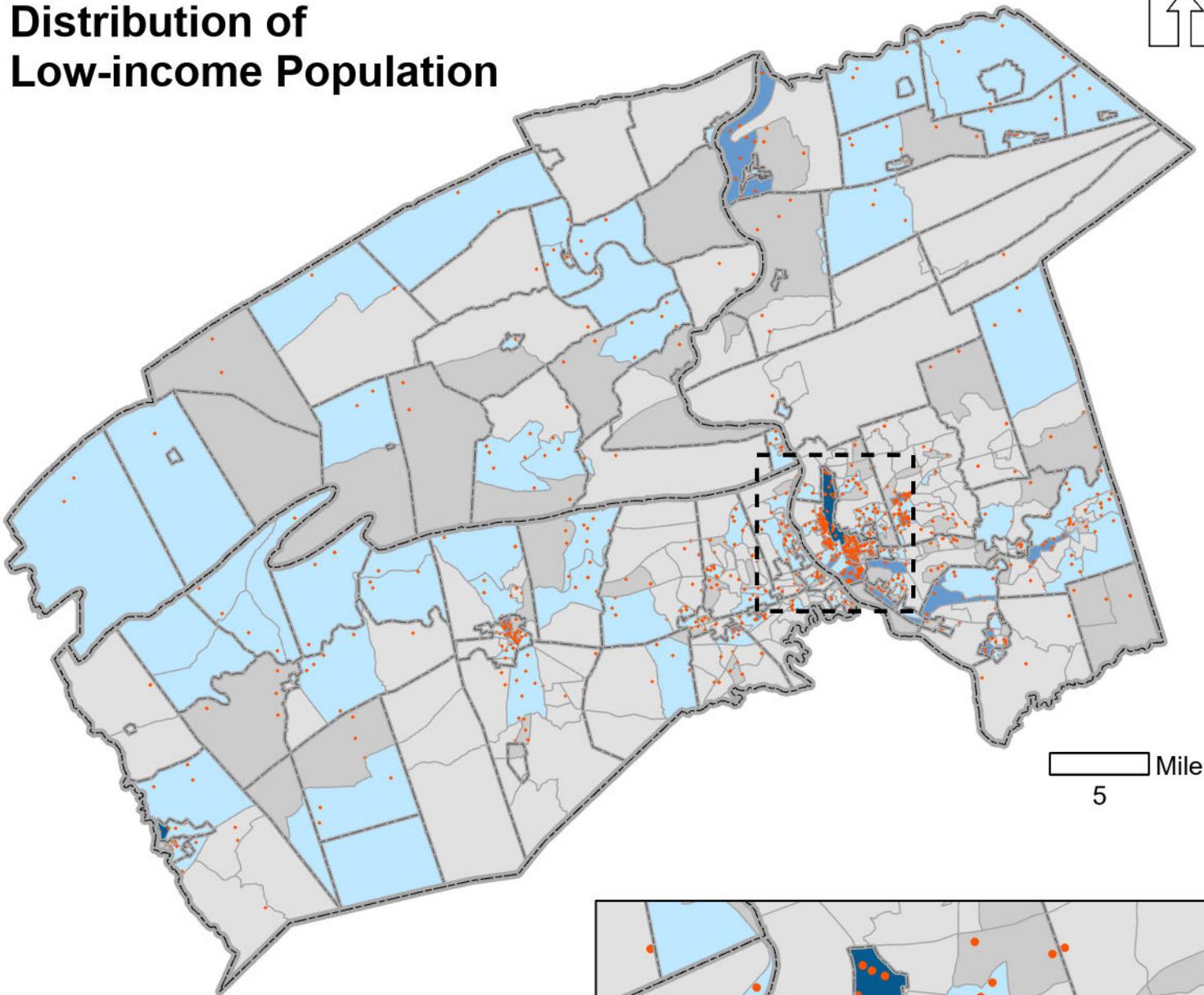
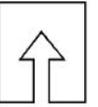
Dot Density

1 Dot = 50

 TOTALMIN



Map 4 Distribution of Low-income Population



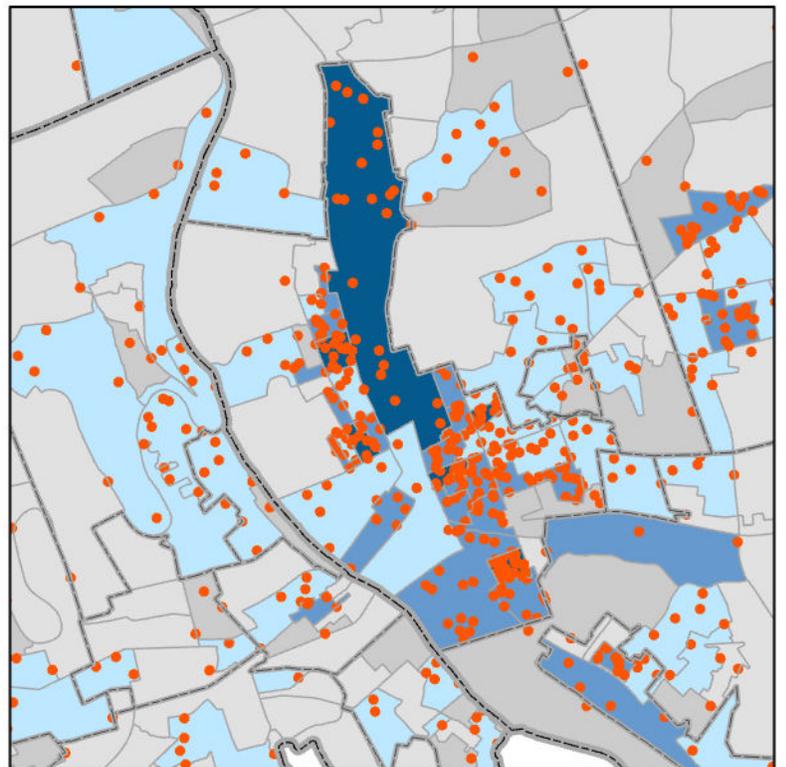
5 Miles

Low-income Population Percentage by Block Group

- Less than 5.26%
- 5.26% - 9.63%
- 9.64% - 24.48%
- 24.49% - 42.58%
- Greater than 42.58%

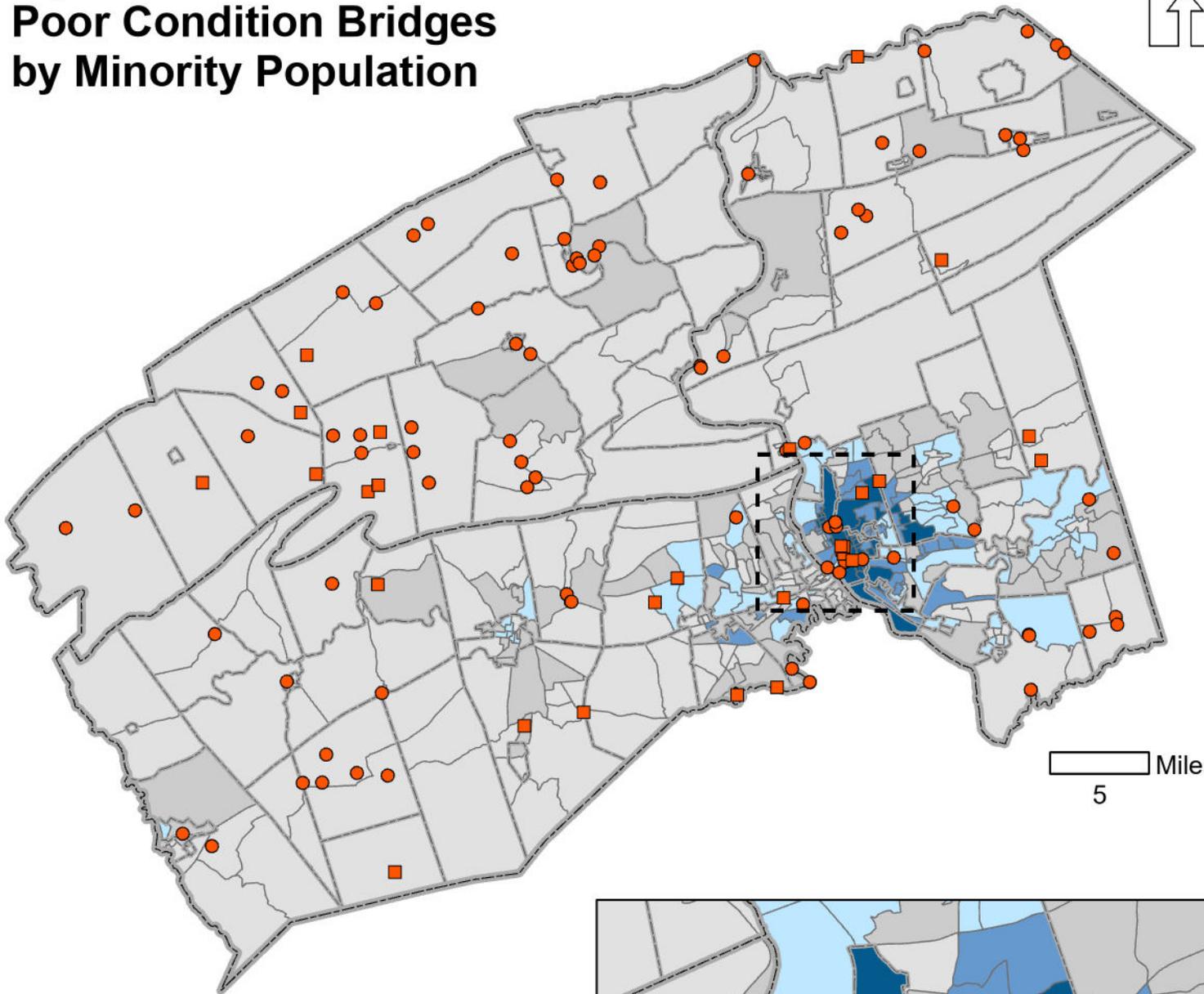
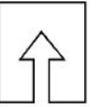
Low-income Population

- 1 Dot = 50**
- BPL



Source: 2017-2021 American Community Survey 5-Year Estimates

Map 5 Poor Condition Bridges by Minority Population



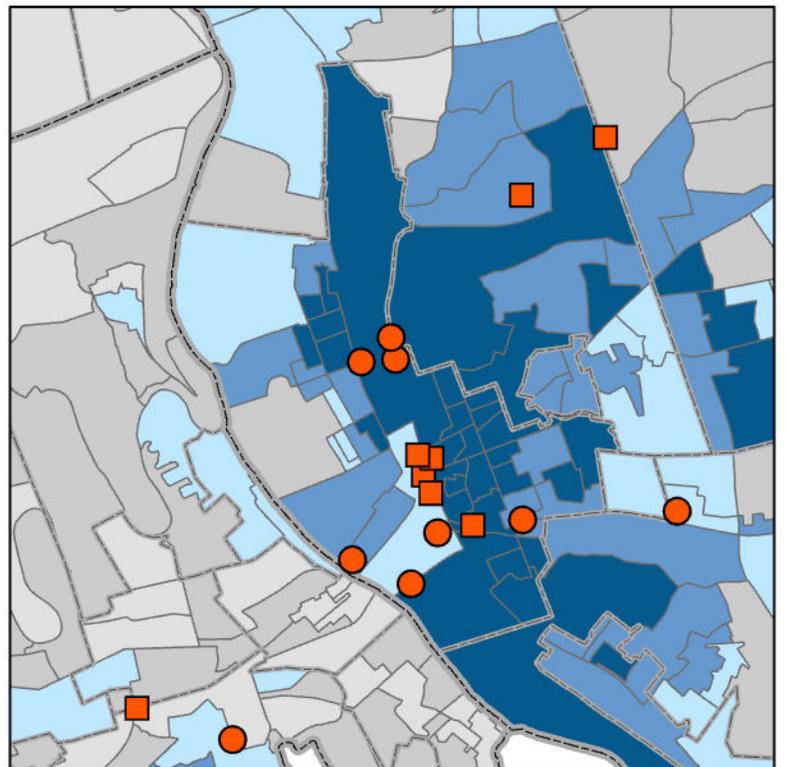
5 Miles

Minority Population Percentage by Block Group

- Less than 11.27%
- 11.27% - 25.04%
- 25.05% - 43.74%
- 43.75% - 69.18%
- Greater than 69.19%

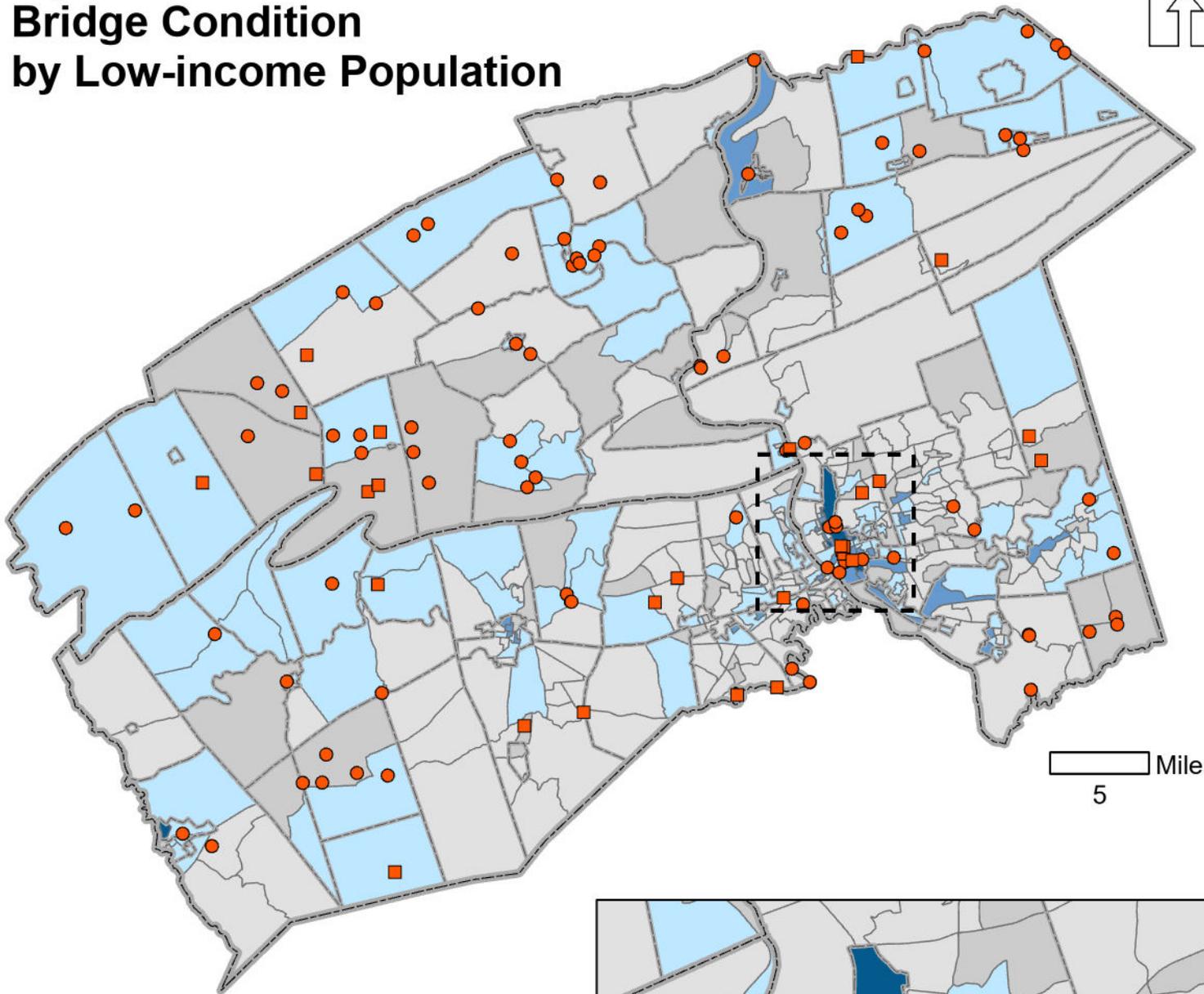
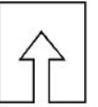
Poor Condition Bridges

- State Owned
- Locally Owned



Source: 2017-2021 American Community Survey 5-Year Estimates

Map 6 Bridge Condition by Low-income Population



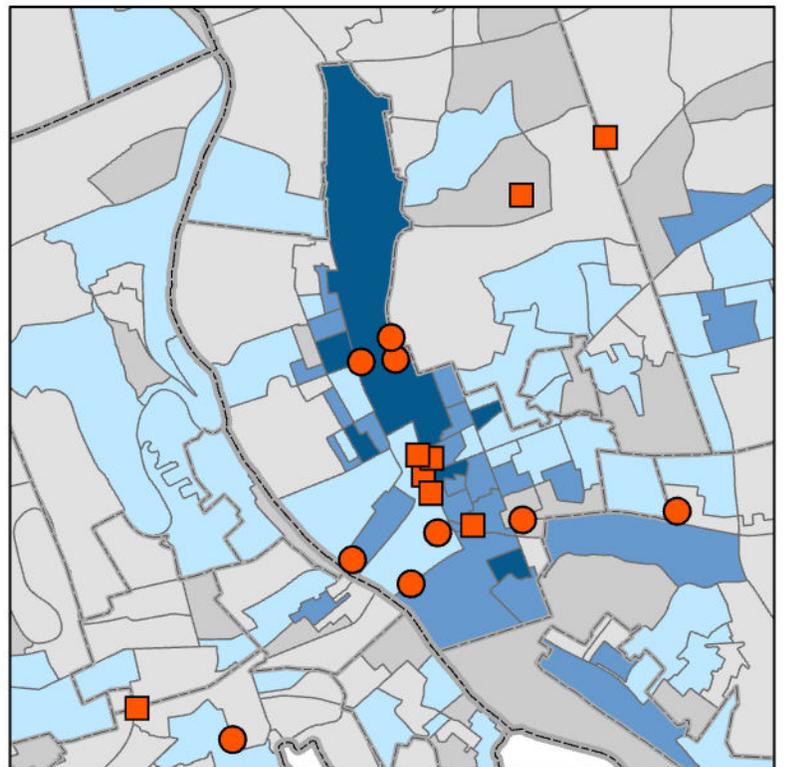
5 Miles

Low-income Population Percentage by Block Group

- Less than 5.26%
- 5.26% - 9.63%
- 9.64% - 24.48%
- 24.49% - 42.58%
- Greater than 42.58%

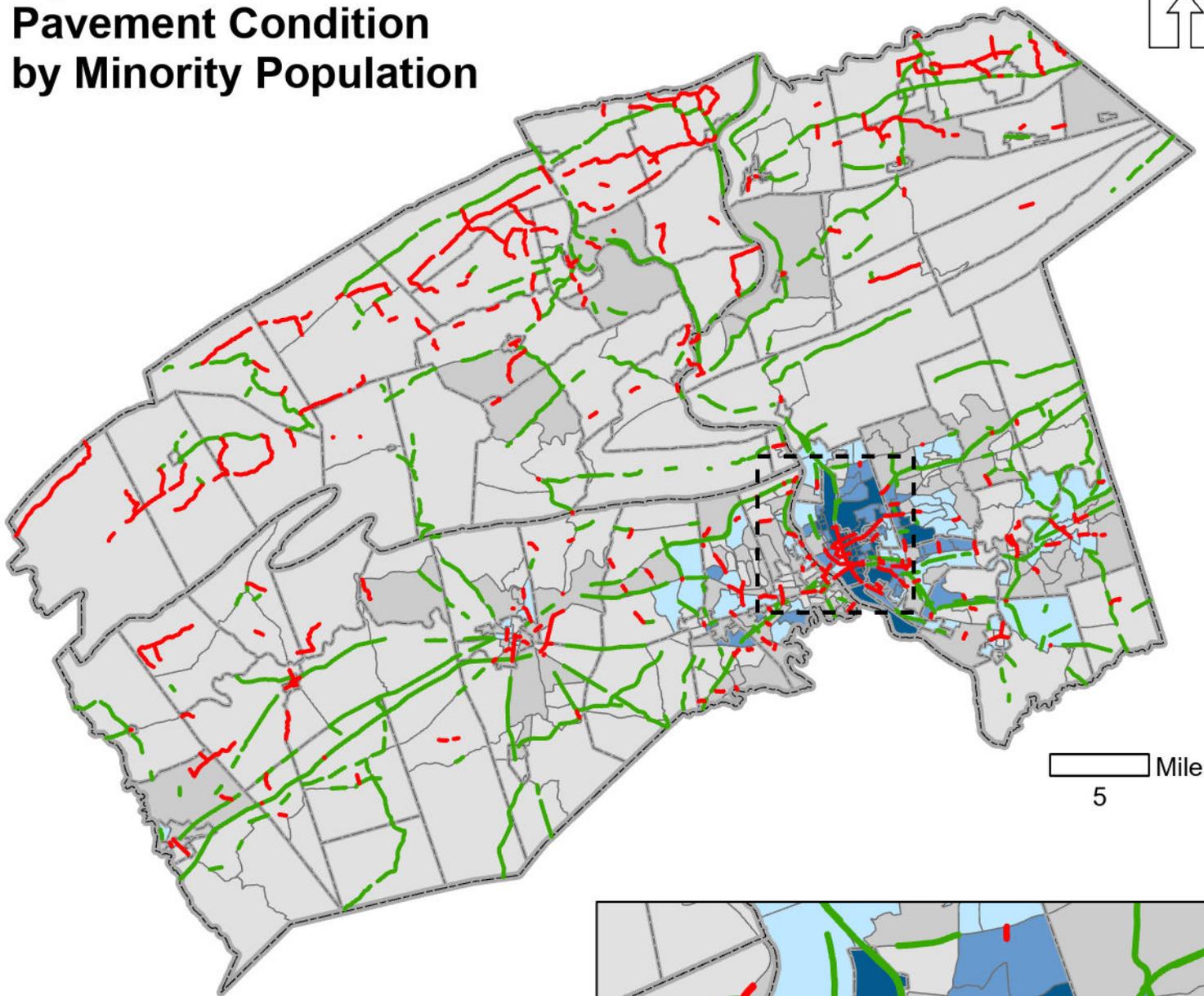
Poor Condition Bridges

- State Owned
- Locally Owned



Source: 2017-2021 American Community Survey 5-Year Estimates

Map 7 Pavement Condition by Minority Population



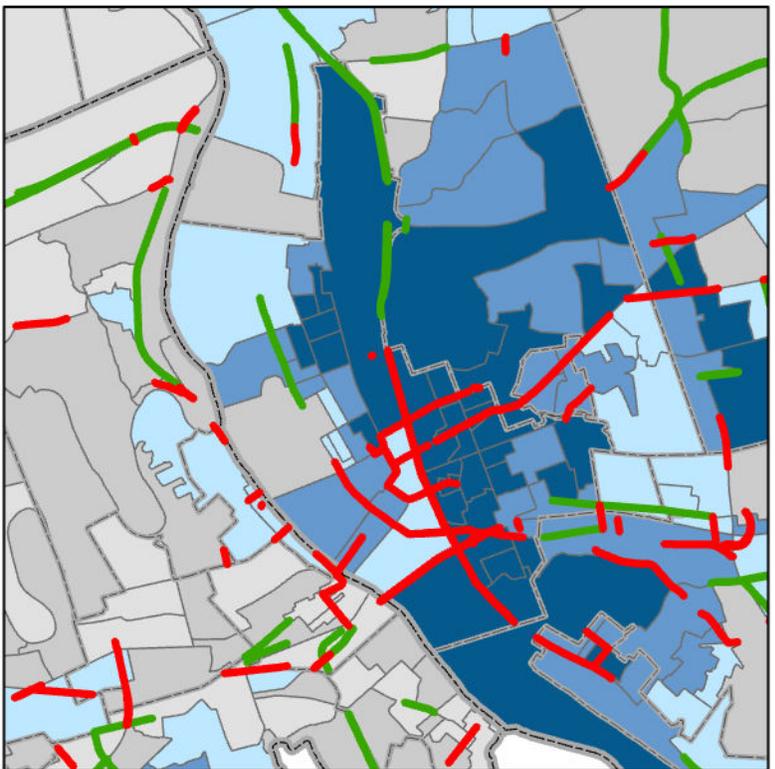
5 Miles

Minority Population Percentage by Block Group

- Less than 11.27%
- 11.27% - 25.04%
- 25.05% - 43.74%
- 43.75% - 69.18%
- Greater than 69.19%

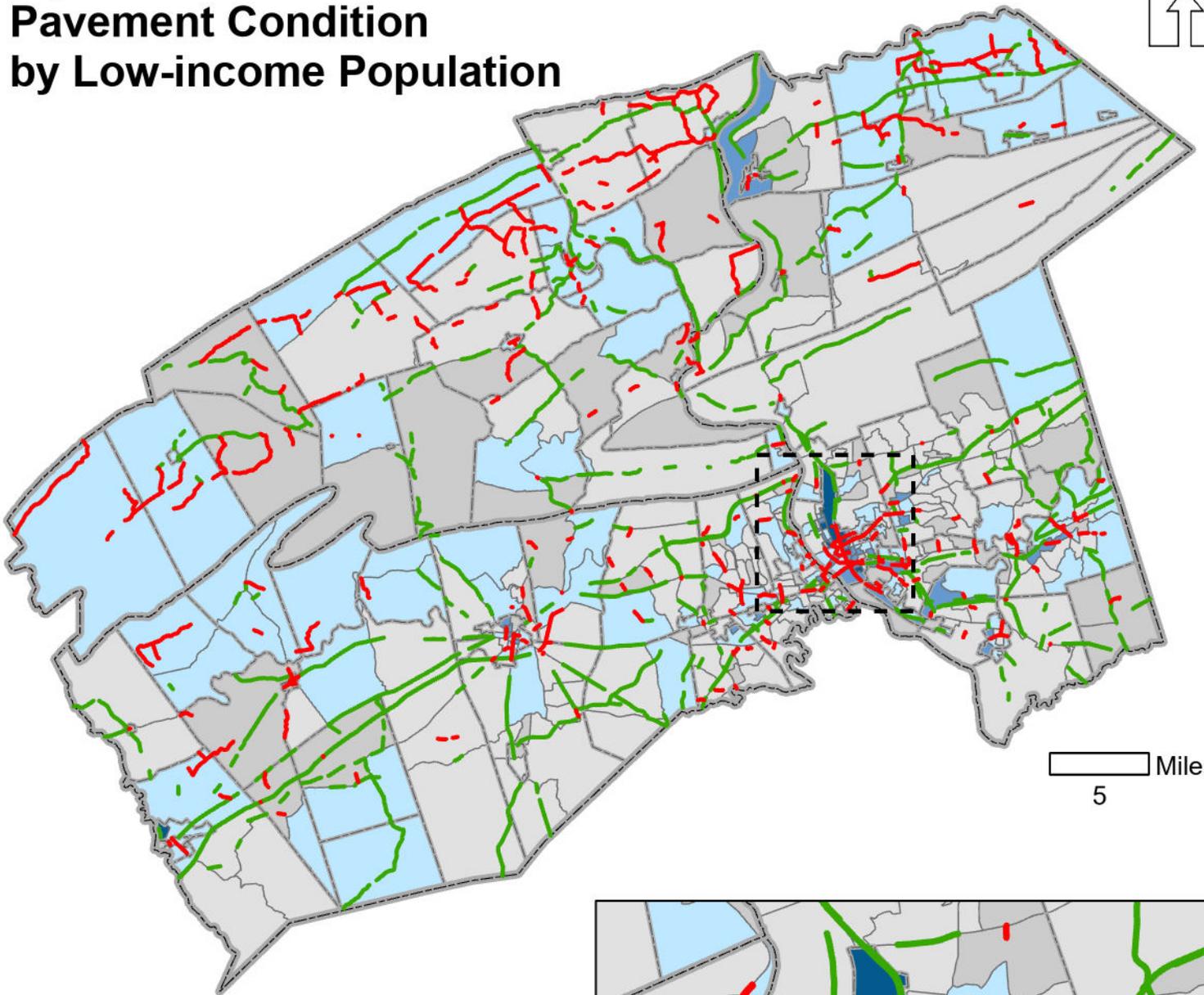
Pavement Condition

- Excellent
- Poor



Source: 2017-2021 American Community Survey 5-Year Estimates

Map 8 Pavement Condition by Low-income Population



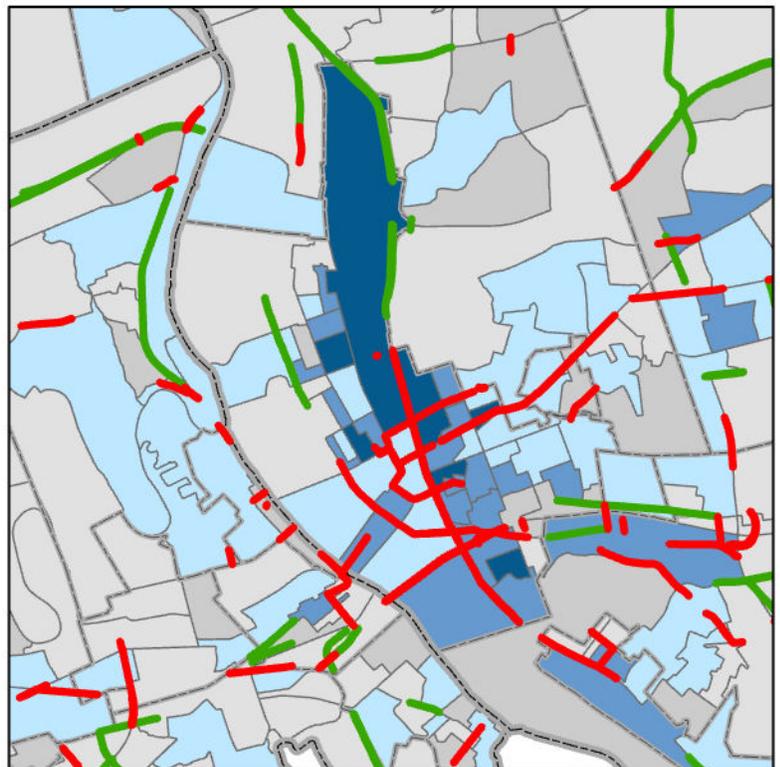
5 Miles

Low-income Population Percentage by Block Group

- Less than 5.26%
- 5.26% - 9.63%
- 9.64% - 24.48%
- 24.49% - 42.58%
- Greater than 42.58%

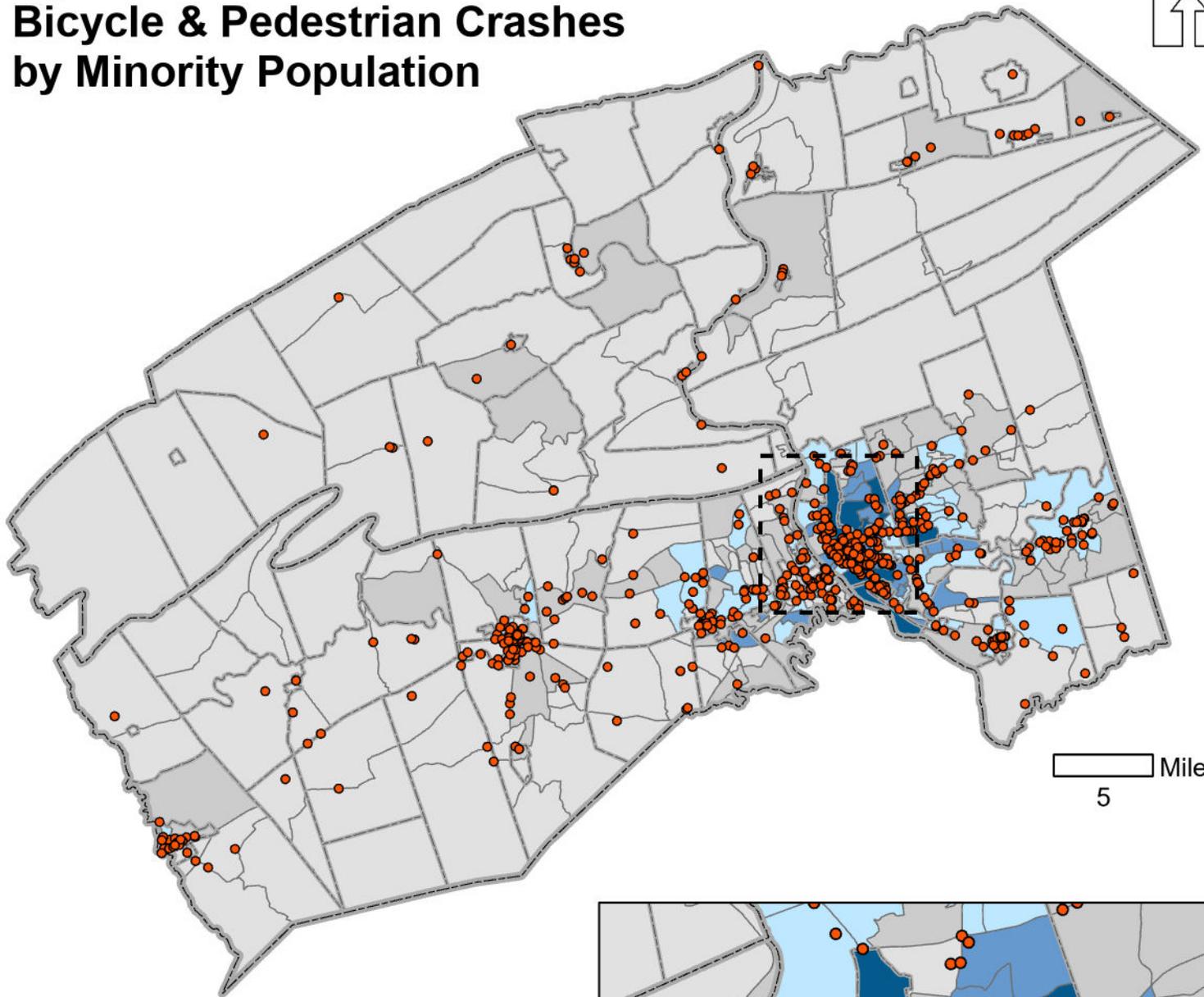
Pavement Condition

- Excellent
- Poor



Source: 2017-2021 American Community Survey 5-Year Estimates

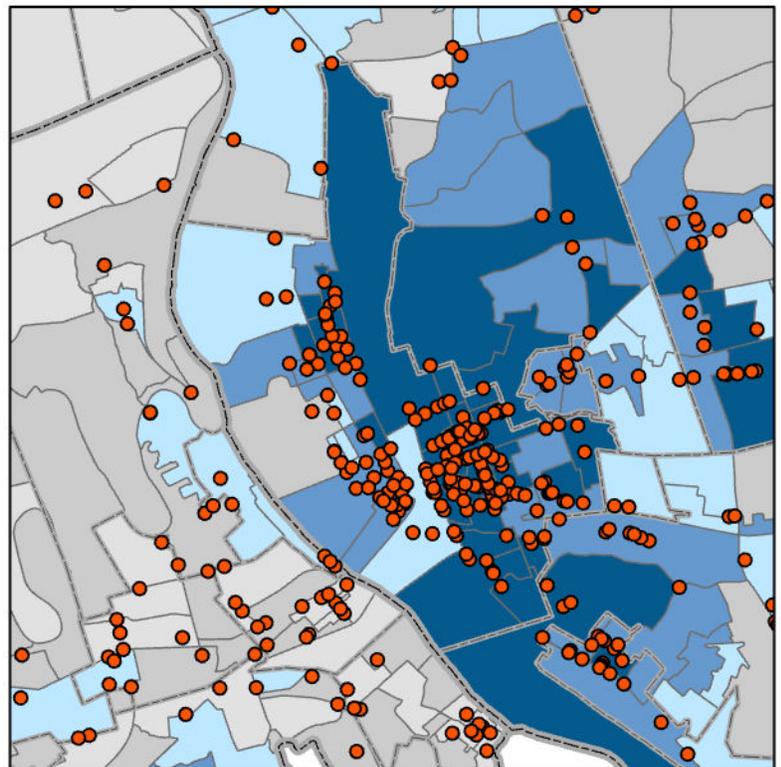
Map 9 Bicycle & Pedestrian Crashes by Minority Population



5 Miles

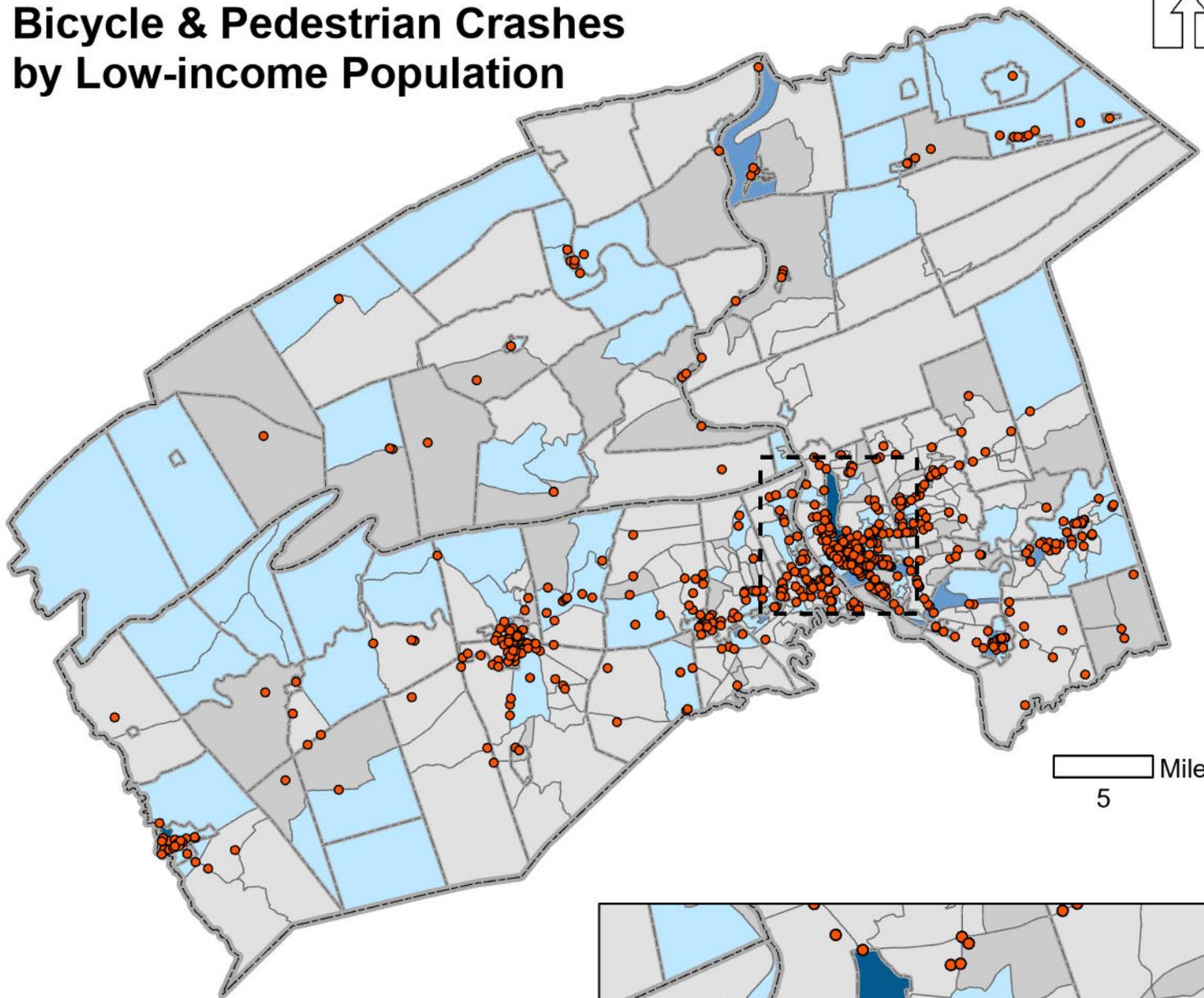
Minority Population Percentage by Block Group

-  Less than 11.27%
-  11.27% - 25.04%
-  25.05% - 43.74%
-  43.75% - 69.18%
-  Greater than 69.19%
-  **Bicycle & Pedestrian Crashes**



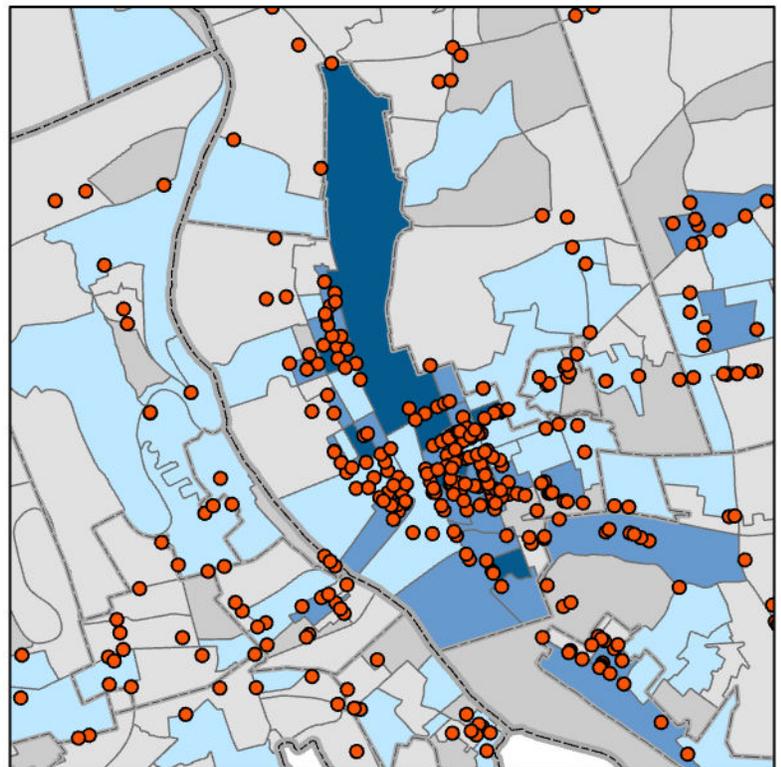
Source: 2017-2021 American Community Survey 5-Year Estimates

Map 10 Bicycle & Pedestrian Crashes by Low-income Population



Low-income Population Percentage by Block Group

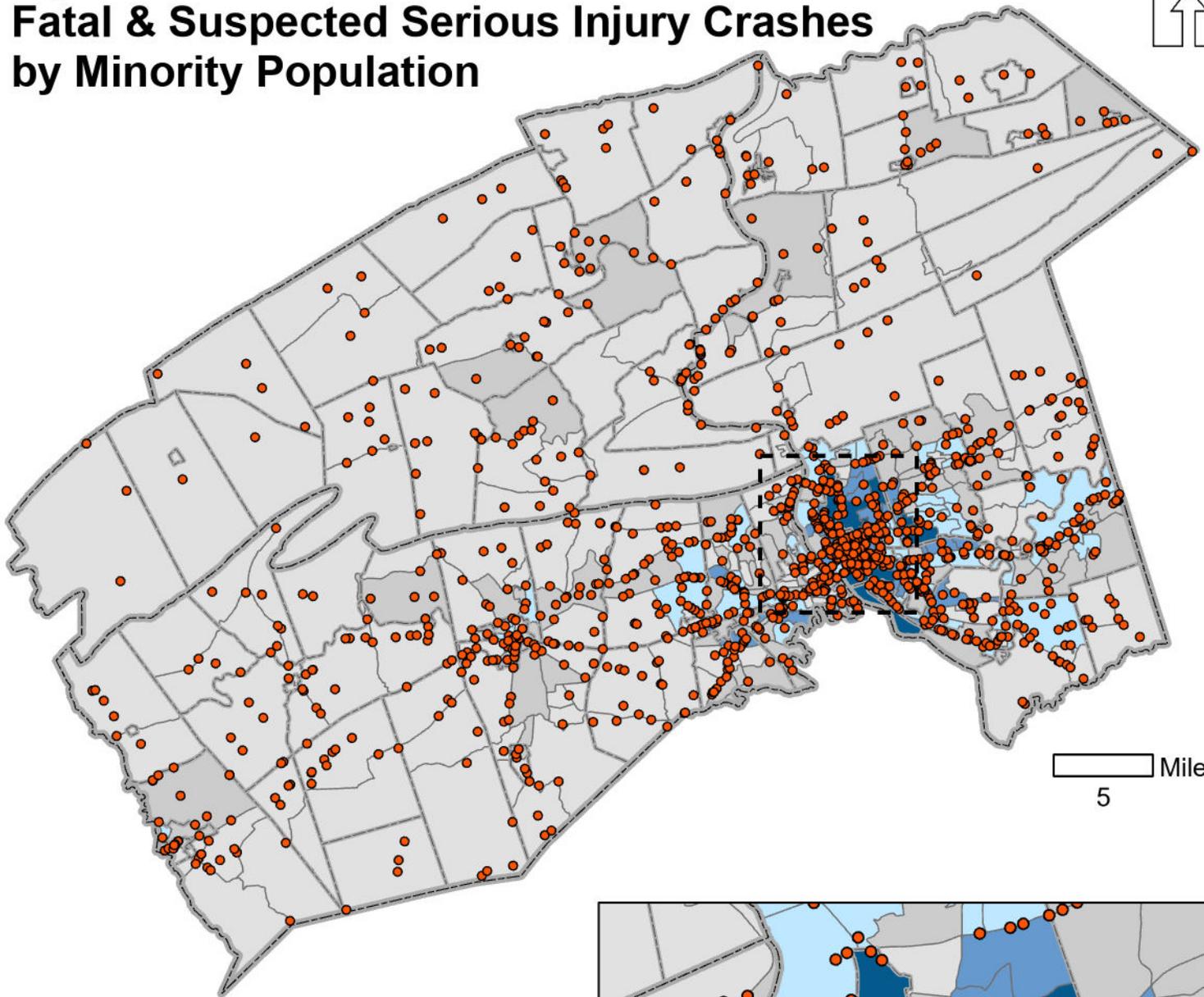
- Less than 5.26%
- 5.26% - 9.63%
- 9.64% - 24.48%
- 24.49% - 42.58%
- Greater than 42.58%
- Bicycle & Pedestrian Crashes**



Source: 2017-2021 American Community Survey 5-Year Estimates

Map 11

Fatal & Suspected Serious Injury Crashes by Minority Population

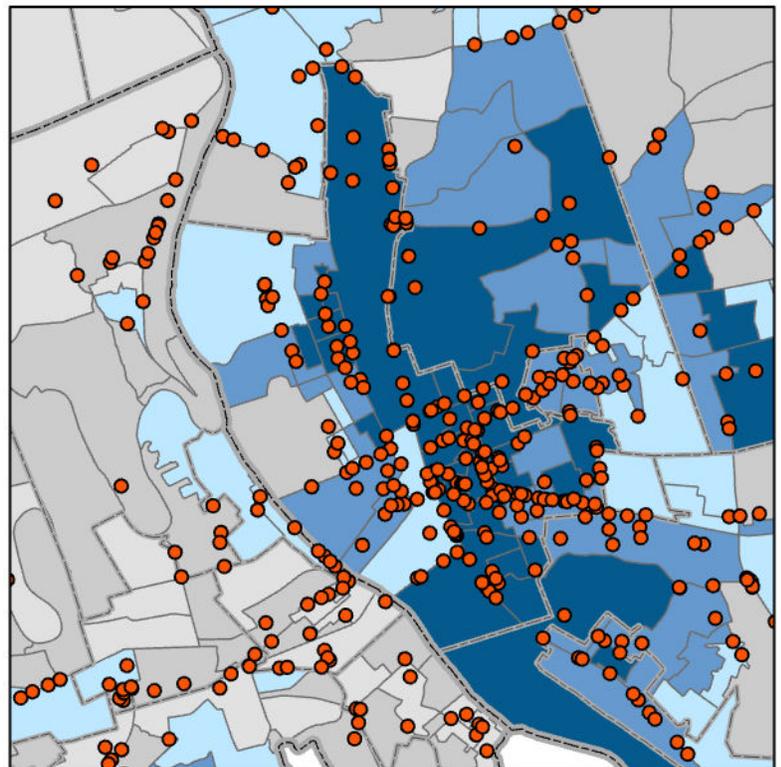


Minority Population

Percentage by Block Group

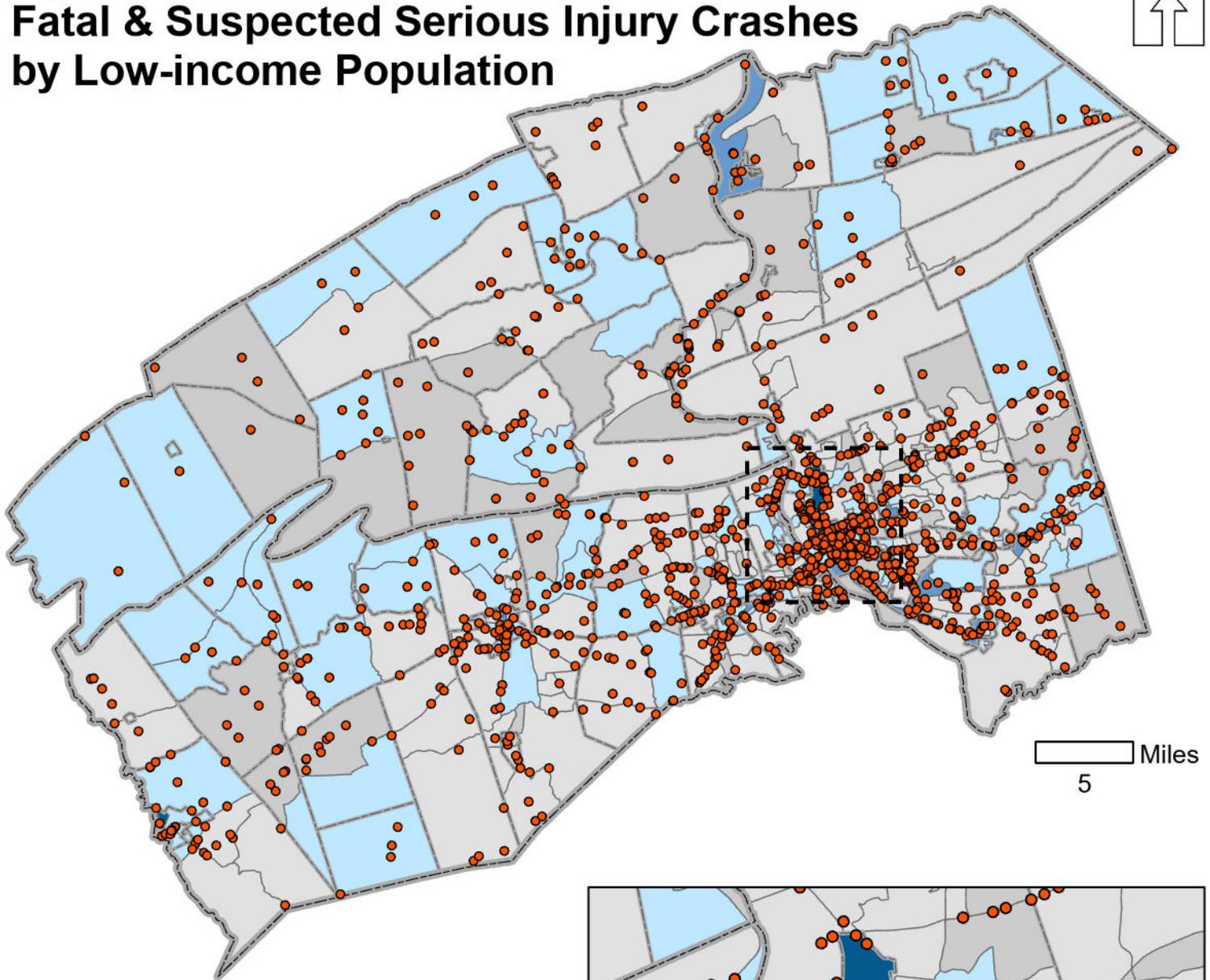
- Less than 11.27%
- 11.27% - 25.04%
- 25.05% - 43.74%
- 43.75% - 69.18%
- Greater than 69.19%

Fatal & Serious Injury Crashes



Map 12

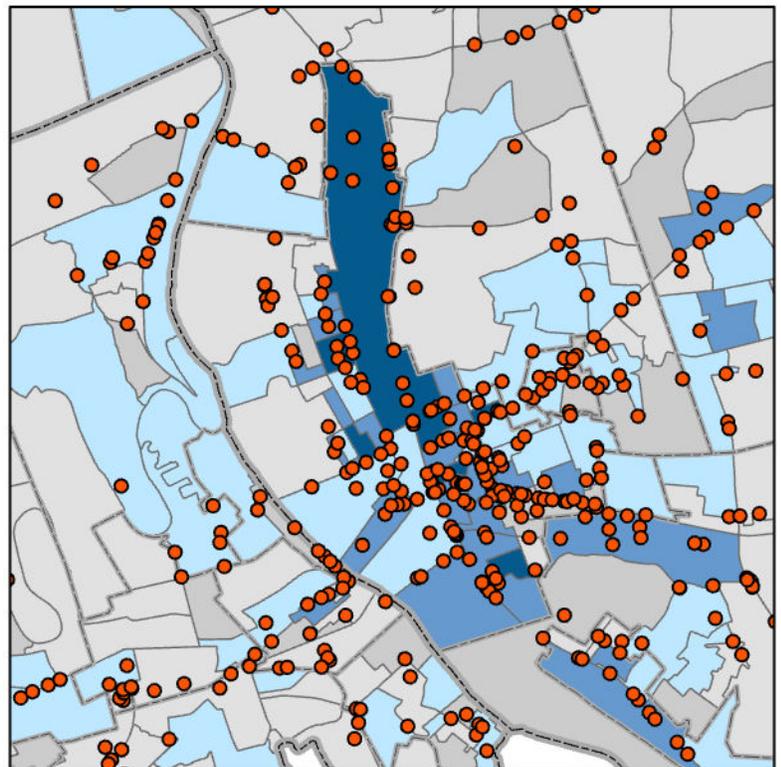
Fatal & Suspected Serious Injury Crashes by Low-income Population



Low-income Population Percentage by Block Group

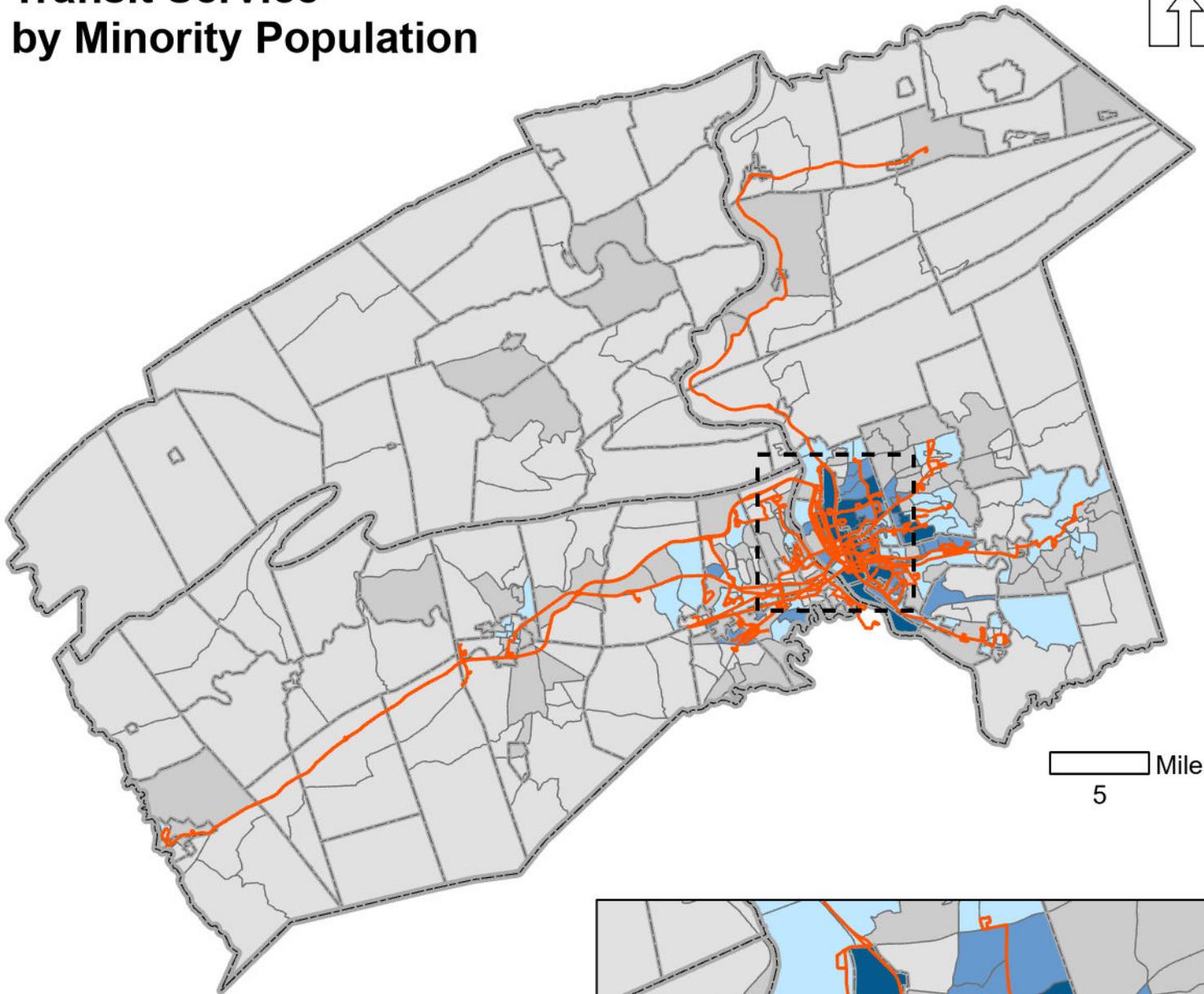
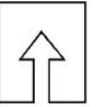
-  Less than 5.26%
-  5.26% - 9.63%
-  9.64% - 24.48%
-  24.49% - 42.58%
-  Greater than 42.58%

 **Fatal & Serious Injury Crashes**



Source: 2017-2021 American Community Survey 5-Year Estimates

Map 13 Transit Service by Minority Population

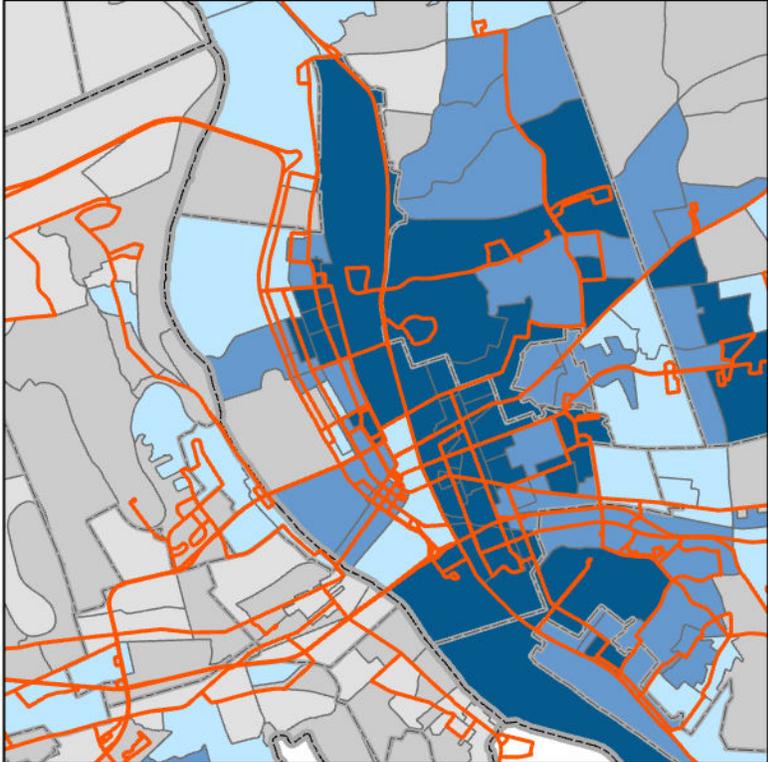


5 Miles

Minority Population Percentage by Block Group

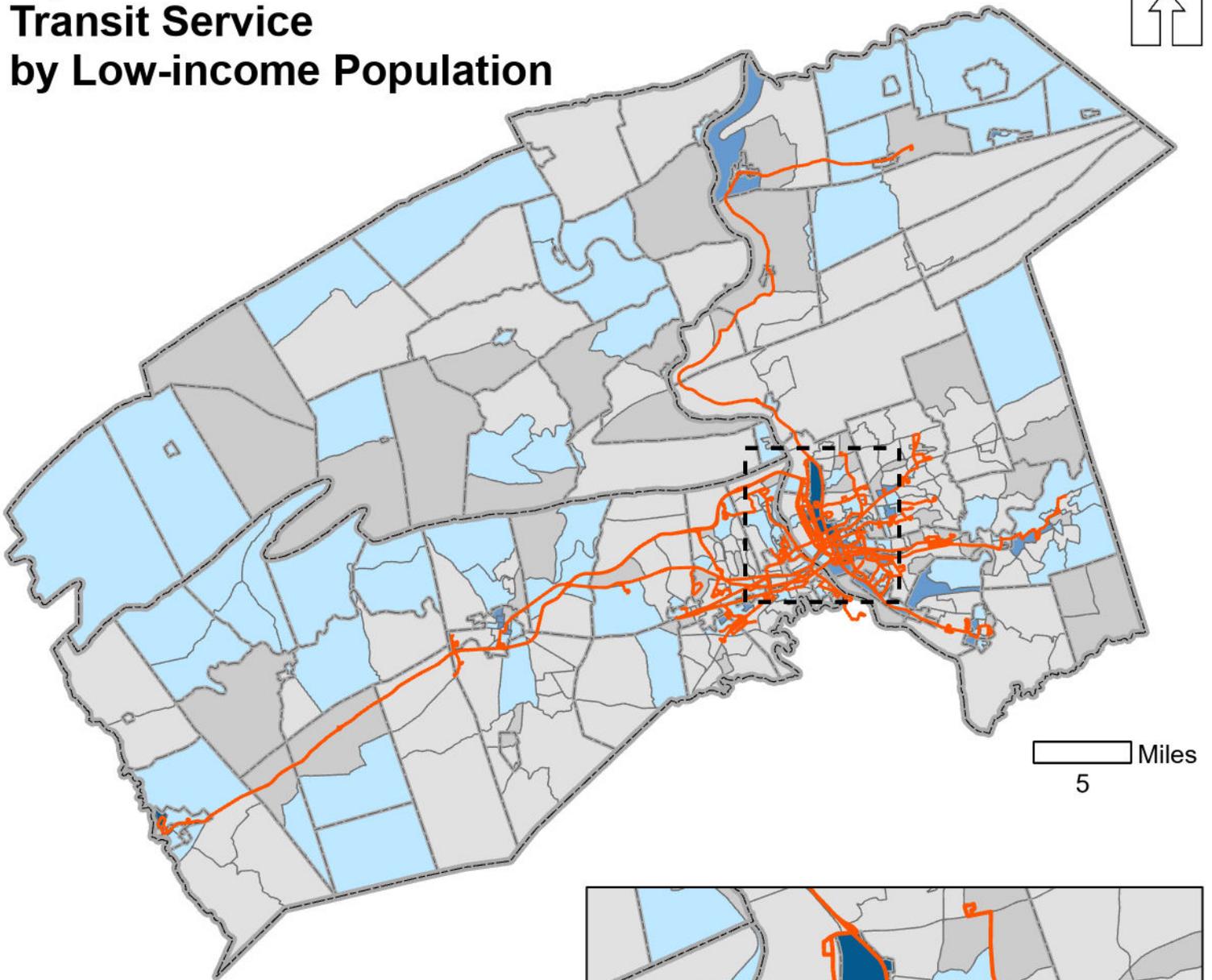
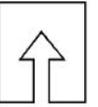
-  Less than 11.27%
-  11.27% - 25.04%
-  25.05% - 43.74%
-  43.75% - 69.18%
-  Greater than 69.19%

- ## Transit Service
-  CAT Routes



Source: 2017-2021 American Community Survey 5-Year Estimates

Map 14
Transit Service
by Low-income Population

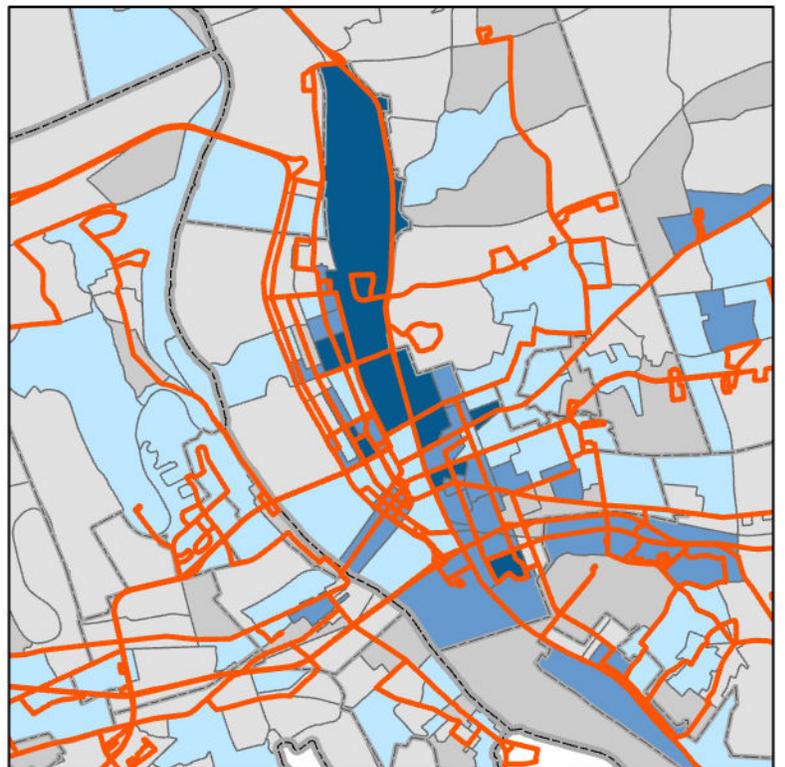


Low-income Population
Percentage by Block Group

- Less than 5.26%
- 5.26% - 9.63%
- 9.64% - 24.48%
- 24.49% - 42.58%
- Greater than 42.58%

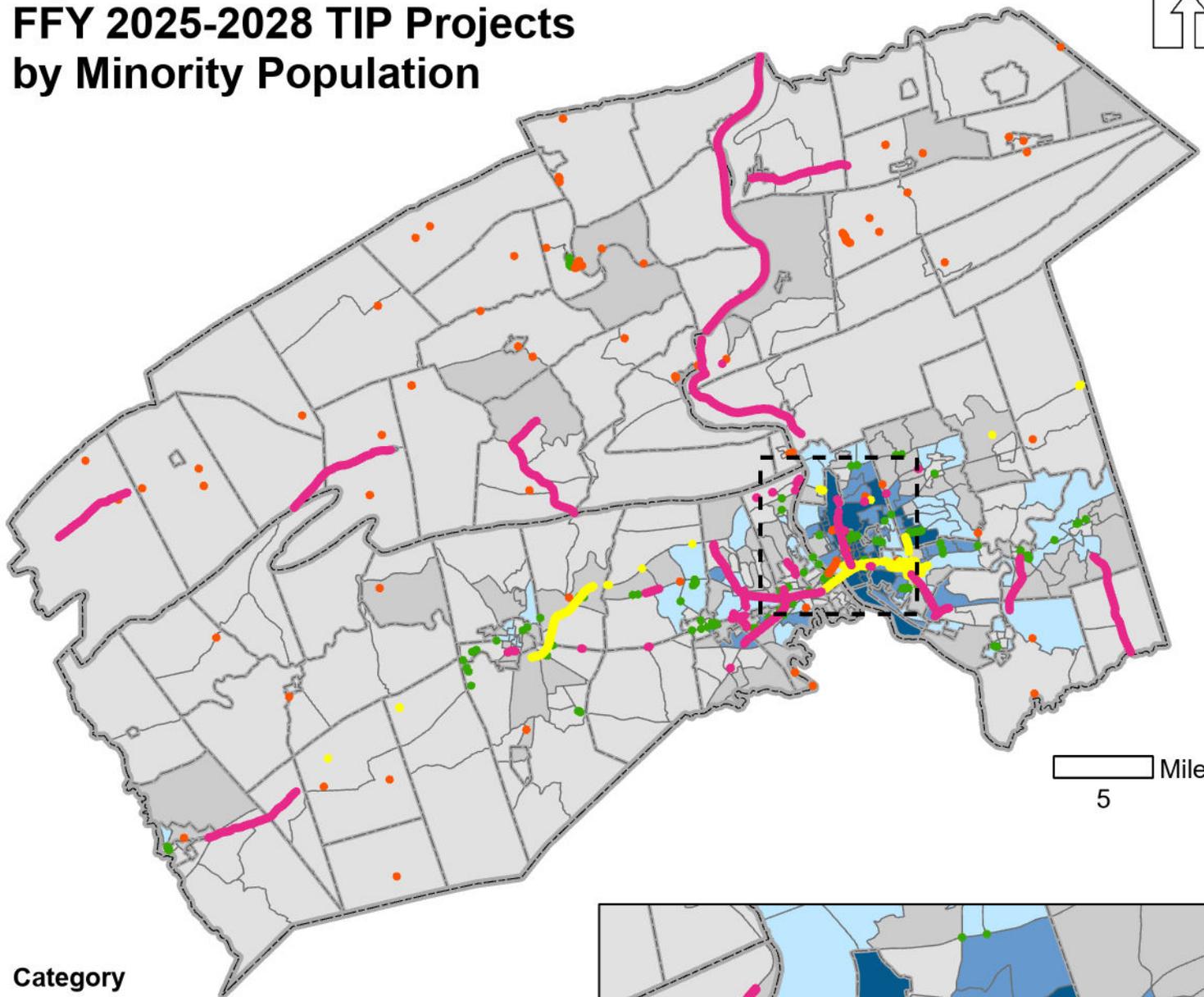
Transit Service

- CAT Routes



Source: 2017-2021 American Community Survey 5-Year Estimates

Map 15 FFY 2025-2028 TIP Projects by Minority Population



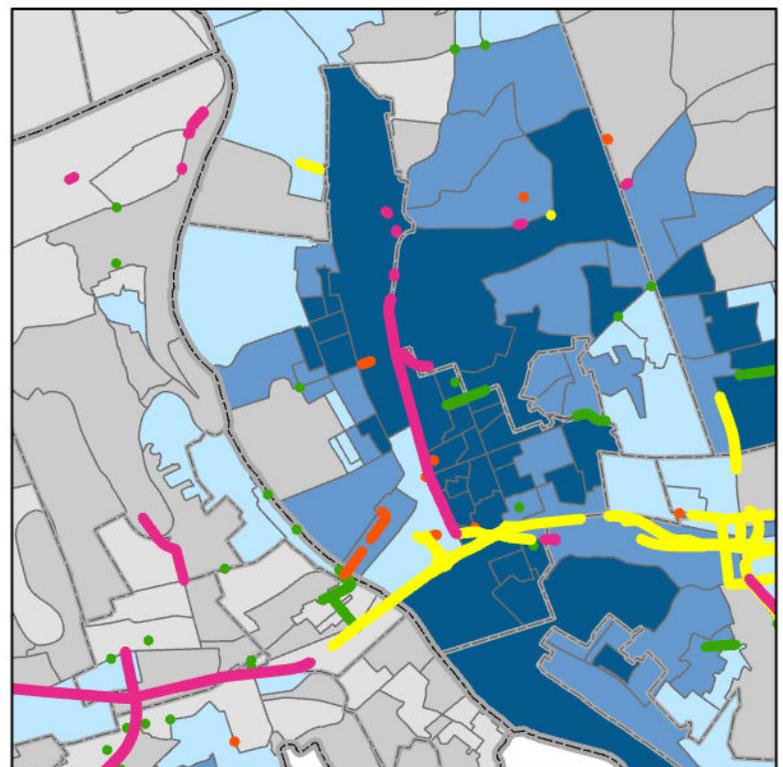
Category

- Bike/Ped
- Bridge
- Interstate
- Roadway

Minority Population

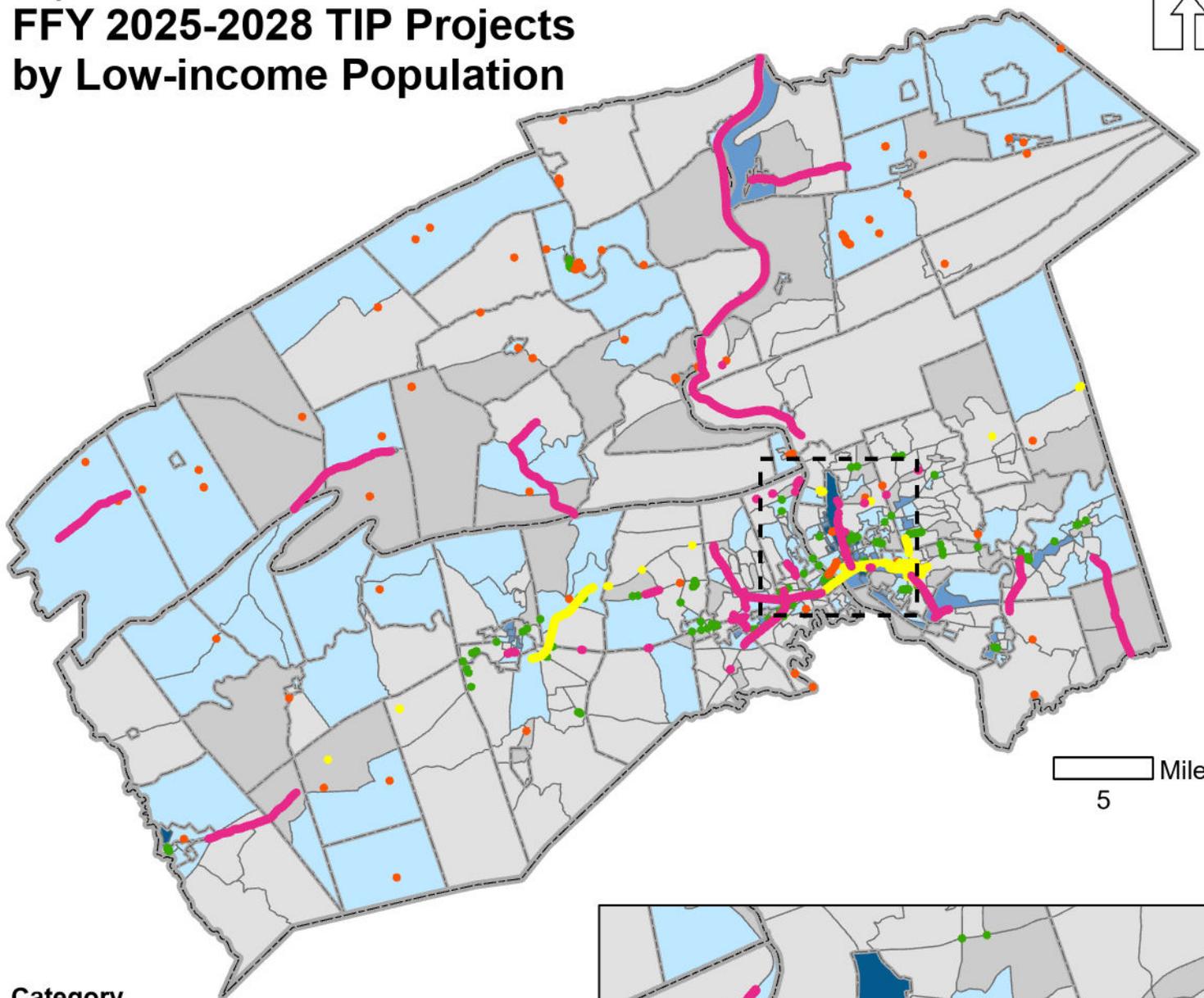
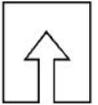
Percentage by Block Group

- Less than 11.27%
- 11.27% - 25.04%
- 25.05% - 43.74%
- 43.75% - 69.18%
- Greater than 69.19%



Source: 2017-2021 American Community Survey 5-Year Estimates

Map 16 FFY 2025-2028 TIP Projects by Low-income Population



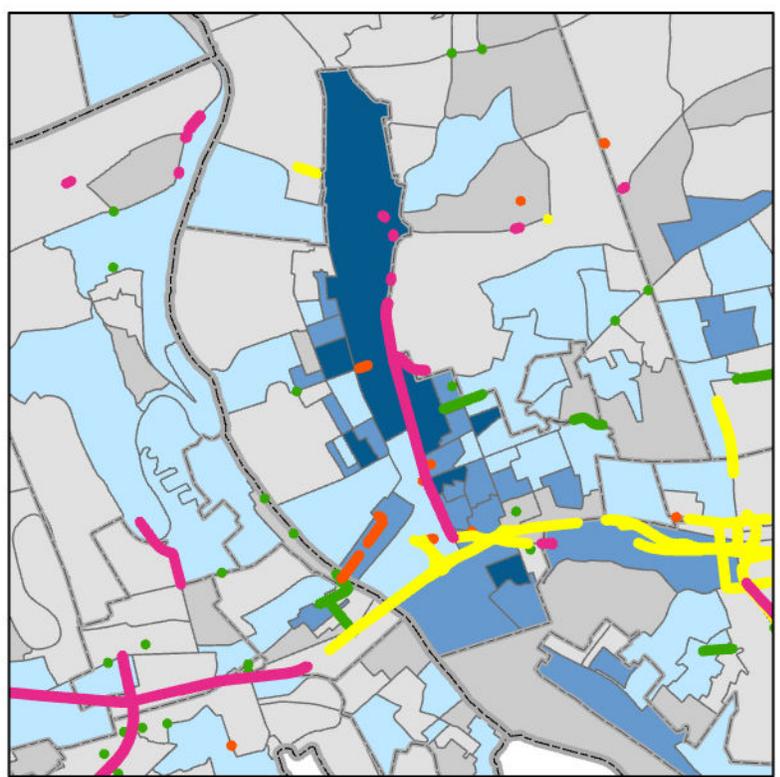
5 Miles

Category

- Bike/Ped
- Bridge
- Interstate
- Roadway

Low-income Population Percentage by Block Group

- Less than 5.26%
- 5.26% - 9.63%
- 9.64% - 24.48%
- 24.49% - 42.58%
- Greater than 42.58%



Source: 2017-2021 American Community Survey 5-Year Estimates