

# **October 2021 Service Changes**

DRAFT

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## EXECUTIVE SUMMARY

The services being analyzed are the emergency service reductions that occurred in October 2021; these were intended to be temporary service reductions. The service changes were the result of operator shortages that were causing IndyGo to perform poorly in the months prior. The service change resulted in significant modifications to nearly a third of IndyGo routes, while the remainder were unaffected.

The change were intended to be temporary; to continue until IndyGo could increase its total operator numbers. The changes, however, lasted beyond October 2022. The FTA allows a service provider to effect temporary service modifications (that trigger the major service change) without a service equity analysis as long as the modifications do not last longer than twelve months. With the twelve months elapsed, IndyGo staff analyzed the changes to understand if there was a disparate impact and/or disproportionate burden.

A service equity analysis is required when service changes trigger IndyGo’s Major Service Change policy; these October 2021 emergency changes meet or exceed thresholds established by the Major Service Change policy. Equity analyses are intended to evaluate the impacts of significant policy changes upon minority and low-income populations relative to non-minority and non-low-income populations pursuant to Title VI of the 1964 Civil Rights Act and federal guidance. Any changes that do not provide similar benefits to minority or low-income populations, as defined by IndyGo’s established Title VI policy,<sup>1</sup> are considered a disparate impact (DI) or disproportionate burden (DB), respectively.<sup>2</sup>

The October 2021 changes include minor, moderate, and significant changes. No routes were eliminated or added but some routes experienced a right-sizing of their frequency. These changes are a direct result of operator shortages which negatively affected on-time performance. The major service change was considered at the time temporary but lasted longer than twelve months.

The October 2021 emergency service changes resulted in a finding of no DI/DB. The service modification was intended to be temporary but lasted longer than twelve months, which required the service equity analysis. The emergency service cuts resulted in an overall loss of trips of 9 percent, largely affected by reducing peak trips for multiple routes. A summary of the service equity analysis is presented in Table I-1. A map of the block-level weekly trip changes between June 2021 and October 2021 is also presented in **Error! Reference source not found..**

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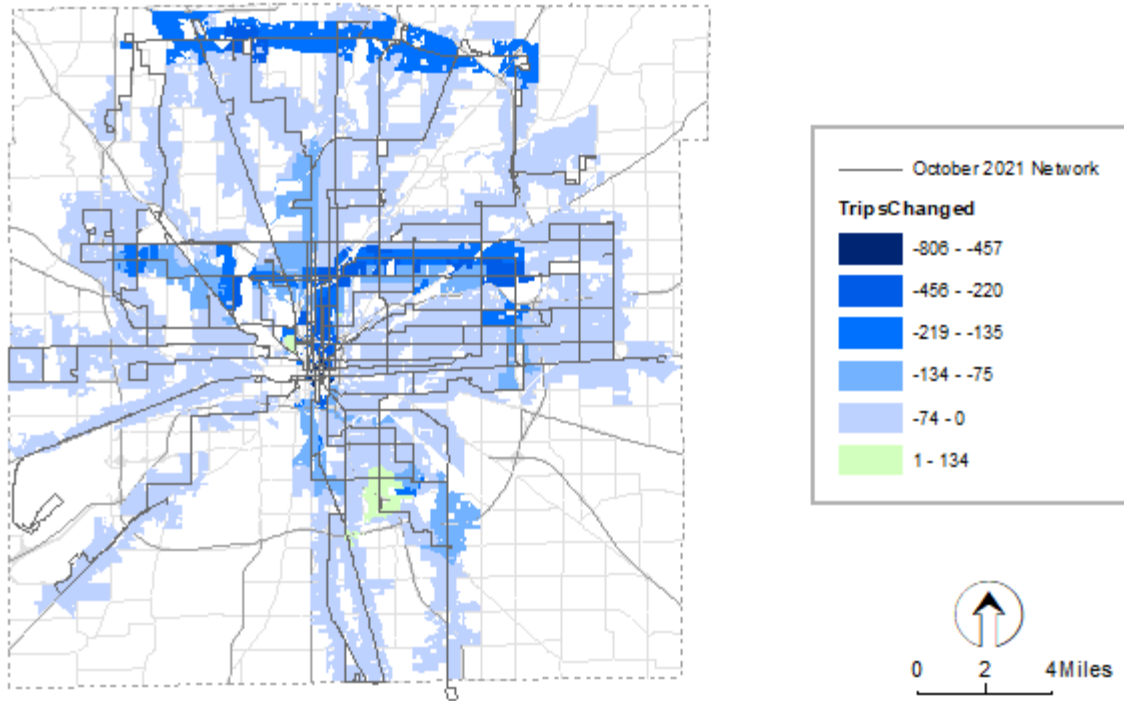
<sup>1</sup> Available from <https://www.indygo.net/about-indygo/title-vi/>

<sup>2</sup> A finding of a potential disparate impact and/or disproportionate burden requires transit agencies to modify the original proposal and re-analyze. If the modification does not resolve the DI/DB, then alternatives must be presented to the public for comment. The original proposal (or modification) can only be implemented if there is a substantial legitimate justification made and none of the proposed alternatives would have a less disparate impact, assuming all proposed alternatives can accomplish the program’s goals.

Table I-1 Summary of Service Equity Analysis

Title VI Metric	Disparate Impact	Disproportionate Burden
Total Transit Vehicle Trips to Blocks	Within	Within
Average Transit Vehicle Trips to Blocks	Within	Within
Transit Vehicle Trips Weighted by Population	Within	Within

Figure I-1 Map of Weekly Trips Changed for October 2021 Service Equity Analysis





## SECTION I. INTRODUCTION

The services being analyzed are the emergency service reductions that occurred in October 2021; these were intended to be temporary service reductions. The service changes were the result of operator shortages that were causing IndyGo to perform poorly in the months prior. The service change resulted in significant modifications to nearly a third of IndyGo routes, while the remainder were unaffected.

The change were intended to be temporary; to continue until IndyGo could increase its total operator numbers. The changes, however, lasted beyond October 2022. The FTA allows a service provider to effect temporary service modifications (that trigger the major service change) without a service equity analysis as long as the modifications do not last longer than twelve months. With the twelve months elapsed, IndyGo staff analyzed the changes to understand if there was a disparate impact and/or disproportionate burden.

### Title VI Background

Title VI of the Civil Rights Act of 1964, Section 601, states: “No persons in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance.”

In October 2012, the Federal Transit Administration issued Circular 4702.1B, providing guidance and instructions on compliance with Title VI regulations.<sup>3</sup> Combined with Executive Order 12898, which requires agencies to develop and implement an integrated approach to achieving Environmental Justice for minority and low-income populations, the Circular outlined requirements for transit operators to evaluate service and fare changes to determine potentially discriminatory impacts. Facially neutral policies or practices that result in disproportionate effects or disparate impacts violate the US DOT's Title VI regulations, unless the recipient can show the policies or practices are substantially justified and there is no less-discriminatory alternative.

Per C4702.1B, all transit operators with 50 or more fixed route vehicles in peak service must develop written procedures to conduct an Equity Analysis through which they evaluate, prior to implementation, any and all service changes that exceed the transit provider's major service change threshold, and to determine whether those changes would have a discriminatory impact based on race, color, or national origin.

Low-income individuals are not specifically a protected class under Title VI; however, the FTA recognizes an "inherent overlap of environmental justice principles" with a Title VI analysis, and also stresses the importance of evaluating the impacts of service changes on those who are transit-dependent, including low-income populations.<sup>4</sup> Consequently, FTA requires transit providers to also evaluate proposed service and fare changes to determine whether low-income populations will bear a "Disproportionate Burden" of those changes. Under this requirement, transit providers must also establish the threshold for determining when a change may cause a "Disproportionate Burden" as a result of a major service change.

Any change that exceeds the major service change definition of a transit provider requires a service equity analysis. IndyGo's major service change policy triggers an examination if any route has a change of 25 percent of its route miles, a change impacting 25 percent of its passengers, or the route is new.<sup>5</sup> The system-wide major service changes include the addition of new routes, although these routes do not cover service area not previously served by IndyGo's fixed-route.

## IndyGo's Title VI Policy

IndyGo's Title VI program and policies work to meet both federal and local expectations to ensure that service (and any service changes) are provided to riders in a non-discriminatory manner. IndyGo's Title VI policy, first adopted in 2013, states how IndyGo assesses disparate impact and disproportionate burden that could potentially result from a major service change. The policies currently in effect are defined in IndyGo Board Resolution 2013-03:

**Disparate Impact:** A determination of disparate impact shall be made if the effects of a major service change borne by the minority population, both adverse and beneficial, are not within 20 percent of the effects borne by the non-minority population.

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<sup>3</sup> FTA Circular C4702.1B, Chapter IV-15-18.

<sup>4</sup> FTA Circular C4702.1B, Chapter IV-16-17.

<sup>5</sup> See [IndyGo's 2020 Title VI Program Update](#).



**Disproportionate Burden:** A determination of disproportionate burden shall be made if the effects of a major service change borne by the low-income population, both adverse and beneficial, are not within 20 percent of the effects borne by the non-low-income population.

In practice, this means that for a change that creates a benefit/burden of ten times (10x) for the non-minority or non-low-income population, the benefit/burden for minority or low-income populations must be between eight and twelve times (8x to 12x). Any benefit or burden for the minority or low-income populations in excess of that range may be categorized as a disparate impact or disproportionate burden.

Any change that exceeds the major service change definition of a transit provider requires a service equity analysis. IndyGo's major service change policy triggers an examination if any route has a change of 25 percent of its route miles, a change impacting 25 percent of its passengers, or the route is new.<sup>6</sup>

In the event that a potential disparate impact and/or disproportionate burden is found, IndyGo staff would attempt to modify the original proposal and re-analyze the network. If the modified proposal continued to demonstrate a potential disparate impact and/or disproportionate burden, IndyGo staff would propose alternatives, analyze those alternatives compared to the original / modified proposal, and conduct public involvement regarding the alternatives. If none of the alternatives would have less a disparate impact and/or disproportionate burden and IndyGo has made a substantial legitimate justification, the original / modified proposal could be enacted.

### **Clarification of IndyGo Title VI Policy**

There are two distinctive points of clarification concerning the IndyGo Title VI policies. First, the IndyGo DI/DB policies consider an excessive beneficial effect to a minority or low-income population to be considered a finding of DI/DB. However, the intent of Title VI is to prohibit federal recipients from adversely impacting minority populations. Therefore, if an analysis were to find an overly-beneficial effect for minority and/or low-income populations, IndyGo staff would consider the analysis as not resulting in finding of DI and/or DB. IndyGo will acknowledge where beneficial effects occur but will not consider them a finding of DI and/or DB.

IndyGo's Major Service Change policy does not specify whether system-wide service changes should be reviewed in totality or at the individual route level. For network-wide service changes, such as a major redesign or a review of a comprehensive operational analysis, cumulative changes associated with the proposed network will be reviewed.

### **October 2021 Service Changes**

The October 2021 changes include minor, moderate, and significant changes. No routes were eliminated or added but some routes experienced a right-sizing of their frequency. These changes are a direct result of operator shortages which negatively affected on-time performance. The major service change was considered at the time temporary but lasted longer than twelve months.

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<sup>6</sup> See [IndyGo's 2020 Title VI Program Update](#).



Due to the significant number of individual route changes, the complete list of routes and the weekly trips changes is included as SECTION II. APPENDIX B.

- Routes 2 and 86 will transition from a 30-minute frequency to an one-hour frequency, Monday thru Saturday.
- Routes 12 and 13 will transition from a one-hour to two-hour frequency Monday thru Friday.
- All other routes listed above will maintain their current frequency throughout the day with no high frequency service during rush hour windows between 6-9 am and 3-6 pm. This includes Routes 4, 14, 15, 16, 18, 21, 24, 25, 28, 30, 31.

## Major Service Change Determination

A service equity analysis is required if a Major Service Change is proposed. IndyGo defines a Major Service Change as:

1. Any route has a change of 25% of its route miles;
2. Any route change affects 25% of its passengers; or
3. The addition of a route.

Major Service Change reasons two and three do not apply for October 2020 service changes based on the project outline. None of the changes will result in the removal of service from an area or the addition of a new route. The final reason to analyze is whether the changes modify 25% or more of a route's miles.

In reviewing the changes to the existing routes, IndyGo staff determined that enough routes were significantly affected, including a few that exceeded the Major Service Change, that a service equity analysis would be completed.



## SECTION II. SERVICE EQUITY ANALYSIS

The Federal Transit Administration (FTA) provides guidance for conducting a service equity analysis in Federal Circular 4702.1B. The guidance describes subjects of analysis and procedures to be used if proposed service changes result in disparate impacts or disproportionate burdens to Title VI protected populations. At a minimum, the FTA requires transit agencies to define the geography of analysis, datasets used for the analysis, and evaluate whether there is an adverse effect for minority and/or low-income populations compared to the service levels received by non-minority or non-low-income populations.

### Definitions

The following definitions will apply to the service equity analysis:

Average Transit Vehicle Trips per Block: This measure is based on Transit Vehicle Trips to Census Blocks, but the number of weekly transit trips is averaged over the number of blocks past which the trips were made. This reduces a distortion in the analysis that suggests more service is being provided to people of interest when in fact service may simply be passing more census blocks.

Disparate Impact: A determination of disparate impact shall be made if the effects of a major service change borne by the minority population, both adverse or beneficial, are not within 20 percent of the

effects borne by the non-minority population. This policy was established in IndyGo Board Resolution 2013-03. *For the purposes of this analyses, any beneficial DI finding beneficial to minority populations is not considered a DI.*

Disproportionate Burden: A determination of disproportionate burden shall be made if the effects of a major service change borne by the low-income population, both adverse or beneficial, are not within 20 percent of the effects borne by the non-low-income population. This policy was established in IndyGo Board Resolution 2013-03. *For the purposes of this analyses, any beneficial DI finding beneficial to low-income populations is not considered a DI.*

High Minority or High Poverty Census Block Groups: These census block groups are those in which the percentage of minority residents or residents in poverty is greater than the percent of Marion County residents who are minority or in poverty. Census blocks fall within census block groups.

High Minority or High Poverty Census Blocks: These census blocks are those which fall within an identified High Minority or High Poverty Census Block Group. US Census American Community Survey data are not available at the block level. To calculate the number of individuals in each block, the proportion of the population from the 2010 Decennial Census for each block will be calculated and then multiplied by the total block group population estimated in the 2014-2018 ACS. Only total population will be calculated for each census block for the purposes of determining access.

Low-Income: Low-income individuals are individuals within a household below the Department of Health and Human Services (DHHS) poverty guidelines; the definition is consistent with the FTA definition. This definition is consistent with the definition applied in the Service Monitoring Report completed for IndyGo's 2020 Title VI Program update. Because Department of Transportation (DOT) and FTA regulations and guidance refer to "low-income" individuals, that language is used here. However, data used are collected to determine poverty levels, which is why both terms may be used interchangeably when IndyGo staff recognizes that the terms "low-income" and "poverty" can refer to different definitions and categorizations of the economic condition of populations within the U.S. *Note: Spatial data uses the US Census Bureau's definition of poverty, which is more inclusive than the DHHS poverty guidelines.*

Minority: Minorities are defined as those individuals who identify themselves as non-white and/or Hispanic. This definition is consistent with definition applied in the Service Monitoring Report completed for IndyGo's 2020 Title VI Program update.

Service Area: IndyGo's service area is defined as the entirety of Marion County, including excluded cities. This definition is consistent with the service area defined in IndyGo's 2020 Title VI Program update.

Service Buffer: The service buffer established for this analysis was ½ mile wide for local routes (1/4 mile buffer) and 1 mile wide for bus rapid transit lines (½ mile buffer). The buffer was defined by individual transit stops. Specifically, buffers were created around each stop from the GTFS (General Transit Feed Specification) files for the respective service networks. The assumption that anyone in a census block that is touched by the buffer can access transit is obviously not true, nor is it the case that anyone in a census block outside that buffer *cannot* access transit, but these standards are applied for analytical consistency.

**Total Transit Vehicle Trips to Blocks:** This is the number of transit vehicle trips that occur within one week that pass within the service buffer of any part of the census blocks in question.

Existing 2021 and Proposed 2021 trips to census blocks were estimated using GTFS data exported from HASTUS scheduling software by IndyGo. For each route, weekday trips were multiplied by 5 and Saturday and/or Sunday services were added to obtain a weekly total. Those trips were then multiplied by the number of designated blocks they passed.

For example, if 100 trips pass by 10 blocks, this equals 1,000 Transit Vehicle Trips to Blocks. This accounts for all trips that may be realized for all blocks served and represents how much transit service is provided to how many census blocks.

**Transit Vehicle Trips x Population:** This measure estimates the usefulness of the service. It further reduces the distortion of Total Transit Vehicle Trips to Blocks (TTVTB), which can suggest that more service is being provided to populations within Title VI areas, when service is just passing more blocks but with potentially fewer people in them. In this measure, weekly transit trips on a route are weighted by the calculated total population within each census block.

For example, if 100 trips pass by a block that has 10 people living in it, that would equal 1,000 trips x population; if the next census block it passes has 50 people living in it, that would equal 5,000 trips x population, representing more access to service by more people.

This measure considers that census blocks are not home to equal numbers of people and estimates the level of service access provided to *people* rather than to geographic zones.

## Project Outline

The October 2021 changes include minor, moderate, and significant changes. No routes were eliminated or added but some routes experienced a right-sizing of their frequency. These changes are a direct result of operator shortages which negatively affected on-time performance. The major service change was considered at the time temporary but lasted longer than twelve months.

**Table II-1. Change Classification for Routes.**

Change Classification	General Description	Example Routes in Existing Network
<b>No Change</b>	No change to the route segments.	
<b>Minor</b>	Small deviations to a few segments.	
<b>Moderate</b>	An added/removed extension or other deviations; small change to span / frequency.	
<b>Significant</b>	Addition/deletion of an entire route, creation of multiple branches, or complete revision of a route; significant change to span/frequency.	

Due to the significant number of individual route changes, the complete list of routes and the weekly trips changes is included as APPENDIX B.

- Routes 2 and 86 will transition from a 30-minute frequency to an one-hour frequency, Monday thru Saturday.
- Routes 12 and 13 will transition from a one-hour to two-hour frequency Monday thru Friday.
- All other routes listed above will maintain their current frequency throughout the day with no high frequency service during rush hour windows between 6-9 am and 3-6 pm. This includes Routes 4, 14, 15, 16, 18, 21, 24, 25, 28, 30, 31.

**Table II-2. Summary of Route Changes.**

Route	Route Name	Change Classification	Route	Route Name	Change Classification
2	East 34 <sup>th</sup> Street	Significant	18	South Emerson	Minor
4	Fort Harrison	Minor	21	Mars Hill	Minor
12		Significant	24	West 16 <sup>th</sup> Street	Minor
13		Significant	25		Minor
14		Minor	28	St. Vincent	Minor
15		Minor	30	30 <sup>th</sup> Street	Minor
16		Minor	31	U.S. 31	Minor
86	86 <sup>th</sup> Street	Significant			

## Datasets Used

### Population, Minority, and Low-Income Data

The US Census American Community Survey (ACS) surveys a sample of the population, gathering valuable information on characteristics including income and race. The ACS is provided in 1-year and 5-year ranges. The 5-year datasets are averages of the intervening years and are the most comprehensive and precise datasets with all the information needed for this examination. The SEA uses the ACS 2015-2019 5-year estimates. Although a newer dataset is available, the data integrity challenges of the 2016-2020 5-year estimates warranted using the previous dataset. In future SEAs, IndyGo will likely note the challenges noted by the Census Bureau about the 2020 data collection. Census geographies are those developed as a result of the 2010 census.

- ACS Summarized Data 2015-2019 5-year file by block group
  - Table B03002 – Hispanic or Latino Origin by Race
  - Table B17021 – Poverty Status of Individuals in the Past 12 Months by Living Arrangement
- Decennial Census 2010, SF 100% by block and block group
  - Table P1 – Total Population

### Transit Service Data

IndyGo designs its routes in HASTUS, a transit scheduling software. The data used for transit trips was provided from a HASTUS export, in the form of a General Transit Feed Service (GTFS) file. The GTFS file was then visualized using a toolbox for ArcMap, a geographic information systems software. The two networks were:



- Existing Transit Network: 2021 Network (June)
  - Service provided from June 27, 2021 – October 9, 2021
- Proposed Transit Network :2021 Network (October)
  - Service proposed to begin on October 10, 2021

### Transit Service – Route Segment Eliminations or Additions

The service modification for October 2021 did not include significant segment eliminations or additions. Therefore, no visualizations are provided.

## Geography of Analysis

The ACS 5-year dataset can be explored at different geographies, including block groups. Data from the ACS are not available at the smallest Census geography, the census block. Based on the availability of data, census block groups were used as the geography of analysis for determining High Minority and High Low-Income designations for blocks, while census blocks were used to determine the population with access.

## Determining High Minority and High Poverty Blocks

The use of census block groups for transit access, in combination with using the population of an entire block group, can result in disingenuous access data. Specifically, using census block groups could count a person as having access who may be a mile away from the transit route due to the size of the census geography. To address this potential issue, IndyGo staff used census block data to identify populations who have access but used census block group data to determine and assign the High Minority or High Poverty designation. If a census block fell within a High Minority or High Poverty census block group, it was presumed that each census block within that census block group shared that designation. See Table II-3 for an example of this process.

**Table II-3. Example of Attributing Census Block Group Designation for High Minority to Census Blocks**

	<b>2019 Minority Population as a Percent of Block Group</b>	<b>Percent of Minority Population in Marion County</b>	<b>Does the BG % Exceed Marion County %?</b>	<b>Block Assignment</b>
<b>Block Group 1</b>	46%	44%	Yes	
<b>Block 1A</b>				High Minority
<b>Block 1B</b>				High Minority
<b>Block 1C</b>				High Minority
<b>Block 1D</b>				High Minority
<b>Block Group2</b>	35%	44%	No	
<b>Block 2A</b>				Non-Minority
<b>Block 2B</b>				Non-Minority
<b>Block 2C</b>				Non-Minority
<b>Block 2D</b>				Non-Minority

## Calculating Population Data for Census Blocks

ACS data is not available at the block level; therefore, the population of each block from the 2010 Decennial Census altered proportionate to the population change the block had experience given the 2015-2019 ACS population data. See Table II-4 for an example of this process.

**Table II-4. Example of Calculation Population for Blocks Using 2010 Population Proportions and 2015-2019 ACS Population.**

	2010 Population	% of 2010 Population	2019 Estimate	2019 Calculated Population
<b>Block Group 1</b>	1,000		1,800	
<b>Block 1A</b>	300	30%		540
<b>Block 1B</b>	200	20%		360
<b>Block 1C</b>	400	40%		720
<b>Block 1D</b>	100	10%		180

## Determining Access

Access to transit and transit amenities can be estimated by measuring the estimated distance a rider could walk to a stop. In previous Title VI analyses, IndyGo used ½ mile for all routes, regardless of route service levels. For this analysis and analyses moving forward, IndyGo will use ¼ mile for stops for non-rapid transit service and ½ mile for stations for rapid transit service.

## Determining Accessible Population

Population data are attributed geographically to census block groups evenly, which are represented by polygons in the spatial software. For the purposes of this analysis, census block groups were deemed too large to appropriately capture the accessibility of a transit line. Instead, census blocks, and the total calculated population within, are used as geographies for accessible population. Any population within a census block within the buffer, regardless of the percentage of the census block within the buffer, are used as population with access to transit.

## Service Equity Analysis Methodology

IndyGo used a Geographic Information System (GIS)-based approach to compare the distribution of impacts and benefits to all residents and to individuals residing in high minority and high poverty areas.

The analysis involved the following steps:

1. Determine which blocks were habitable.
2. Determine High Minority and/or High Low-Income block groups.
3. Develop map with current and proposed service routes, stops, and numbers of trips.
4. Determine which blocks were within access of a stop.
5. Allocate current and proposed transit trips to habitable census blocks based on whether any part of each census block falls within the stop-based service buffer.



6. Using Excel, determine the difference between the two scenarios for each census block and for the system in terms of: Total Transit Vehicle Trips to Blocks, Average Transit Vehicle Trips per Block, and Transit Vehicles Trips x Population. Join those data to the original block shapefiles containing census data.
7. Using a separate table, compare percent of change experienced by each group to the thresholds established in IndyGo’s Title VI Policy to determine if the proposed changes could result in discriminatory impacts.

The basis of this analysis, common to all three service-access measures used, is the number of weekly trips made by each route. Changes to transit frequency or span are captured in this way; in fact, even the addition or subtraction of one single vehicle trip on a route is captured by this method.

### Total Transit Trips for Analysis

For the purposes of this analysis, weekly trips are used to compare the differences in provided service from the existing to the proposed network (see Table II-5.) As this analysis used information calculated by a consulting firm (Nelson Nygaard) as a result of a data quality discrepancy found in the initial export of the 2106 GTFS, the change between the existing and proposed is not entirely accurate; some of the routes experience a minimal trip decrease. This issue should not significantly affect the analysis.

**Table II-5 Total Weekly Transit Trips by Network**

2106 Weekly Trips	2110 Weekly Trips	Change in Trips	Percent Change
12,146	11,066	1,080	-9%

### Total Transit Vehicle Trips to Blocks

Staff analyzed whether the change in Total Transit Vehicle Trips to Blocks for minority and poverty populations would be within 20 percent of the change for non-minority and non-poverty populations. The formula can be expressed as:

% Change in Transit Vehicle Trips to Blocks for a population of interest, if  $n$  is the number of blocks in the service area =

$$\frac{\text{Total Proposed 2021 Transit Vehicle Trips to Blocks} - \text{Total Existing 2021 Transit Vehicle Trips to Blocks}}{\text{Total Existing 2021 Transit Vehicle Trips to Blocks}} =$$

$$\frac{\sum_{i=1}^n (\text{Proposed 2021 Transit Vehicle Trips to Block } i) - \sum_{i=1}^n (\text{Existing 2021 Transit Vehicle Trips to Block } i)}{\sum_{i=1}^n (\text{Existing 2021 Transit Vehicle Trips to Block } i)}$$

### Average Transit Vehicle Trips per Block

The Average Trips per Blocks analysis reduces the positive effect of hypothetically drawing a route to simply touch more census blocks of unspecified population (and thus gaming the results). The formula can be expressed as:

% Change in Average Transit Vehicle Trips per Block for a population of interest =

$$\frac{(\text{Proposed 2021 Avg. Transit Vehicle Trips per Block} - \text{Existing 2021 Avg. Transit Vehicle Trips per Block})}{\text{Existing 2021 Avg. Transit Vehicle Trips per Block}} =$$

$$\frac{\left( \frac{\text{Total Proposed 2021 Transit Vehicle Trips to Blocks}}{\text{Served Blocks in Proposed 2021 Network for pop. of interest}} - \frac{\text{Total Existing 2021 Transit Vehicle Trips to Blocks}}{\text{Served Blocks in Existing 2021 Network for pop. of interest}} \right)}{\frac{\text{Existing 2021 Transit Vehicle Trips to Blocks}}{\text{Served Blocks in Existing 2021 Network for pop. of interest}}}$$

## Transit Vehicle Trips Weighted by Population

In this measure, weekly transit trips on a route are weighted by the estimated population of interest within each census block that is passed. If population were equal across all census blocks, this additional method would mirror other analyses. Because total population and demographics can vary widely among census blocks, this is the only measure that captures how many people can access transit service today relative to the Proposed 2020 changes.

This formula can be expressed as:

% Change in Weighted Transit Vehicle Trips for a population of interest =

$$\frac{\text{Total Proposed 2021 Weighted Transit Vehicle Trips} - \text{Total Existing 2021 Weighted Transit Vehicle Trips}}{\text{Total Existing 2021 Weighted Transit Vehicle Trips}}$$

$$\frac{\sum_{i=1}^n [(\text{residents of Block } i)(\text{Proposed 2021 Transit Vehicle Trips to Block } i - \text{Existing 2021 Transit Vehicle Trips to Block } i)]}{\sum_{i=1}^n [(\text{residents of Block } i)(\text{Existing 2021 Transit Vehicle Trips to Block } i)]}$$

## Service Equity Analysis Results

IndyGo staff performed the analysis as described in the methodologies above. The results are summarized per metric with additional, supporting tables. A map of the change in weekly trips to blocks is provided with Figure II-4.

### Minority and Poverty Populations

Title VI regulations require that IndyGo examine its service by comparing minority and non-minority populations. For this analysis, areas were classified as a Minority area if the census block group possessed a percentage of minority population that was greater than the service area as a whole (44.75%). The same approach was used to identify areas in poverty (17.79%). See Table II-6 for additional details.

**Table II-6. Number and Percent of Minority and Populations in Poverty in Marion County**

	<b>Total Number</b>	<b>Service Area %</b>
<b>Minority Population</b>	426,003	44.75%
<b>Population in Poverty<sup>7</sup></b>	165,969	17.79%
<b>Total Population</b>	951,869	100%

<sup>7</sup> The percent of low-income population is based off the estimate for total population with income data (932,652).

The following maps were developed to visualize the minority and poverty population densities within Marion County. Additional demographic maps can be found in 0The Proposed 2021 network and the High Minority and High Poverty census blocks are mapped in Figure II-3. High Minority and High Poverty Blocks.

**Figure II-1. Minority Density and Proposed 2021 Network**

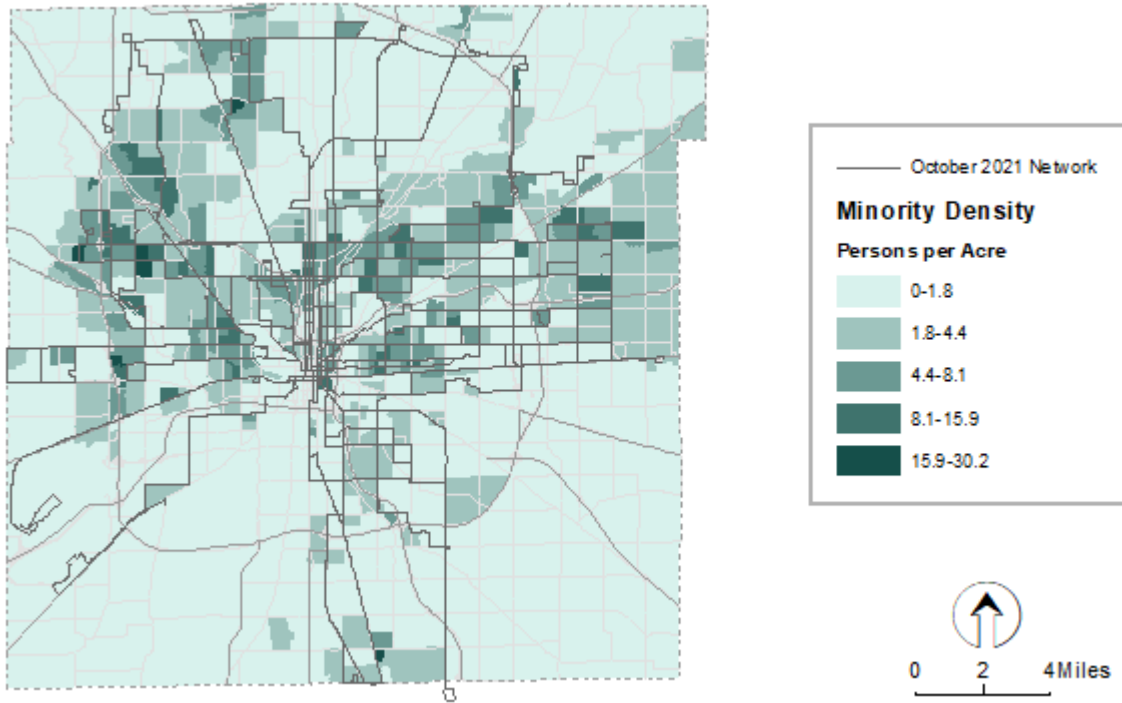


Figure II-2. Poverty Density and Proposed 2021 Network

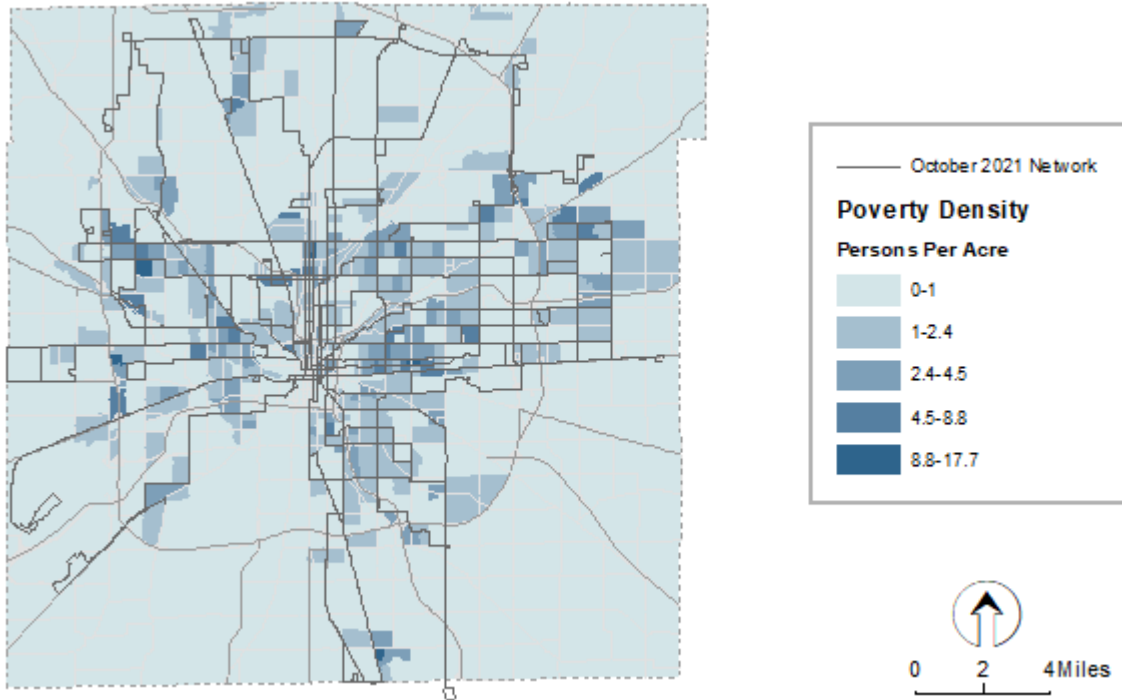


Figure II-3. High Minority and High Poverty Blocks

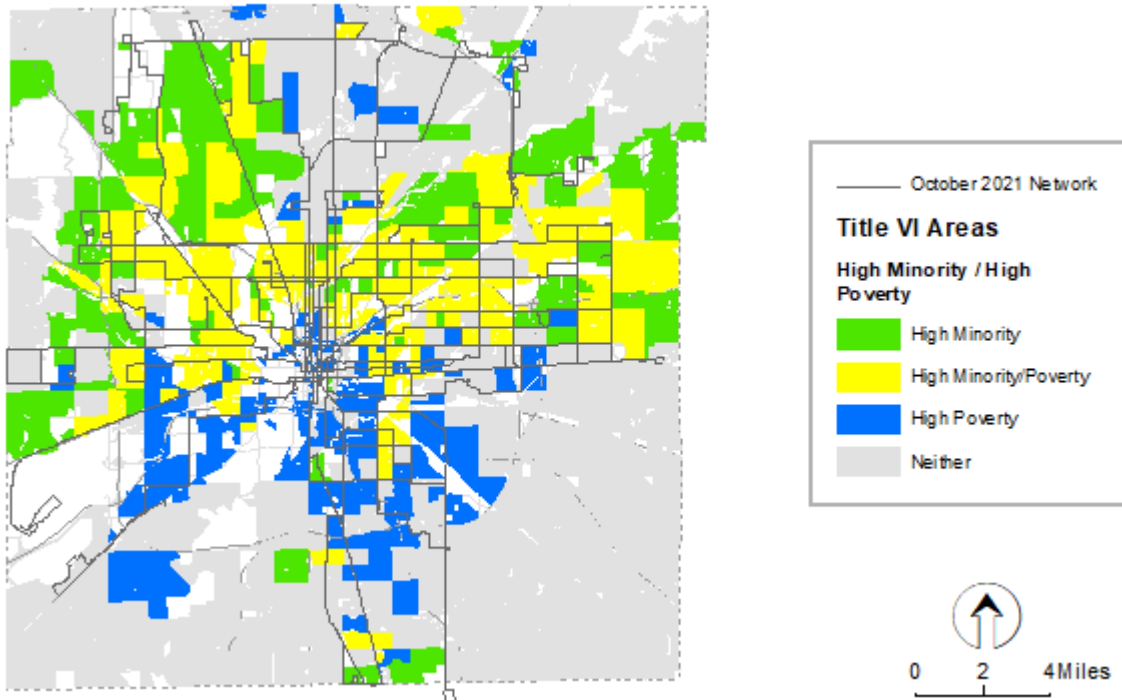
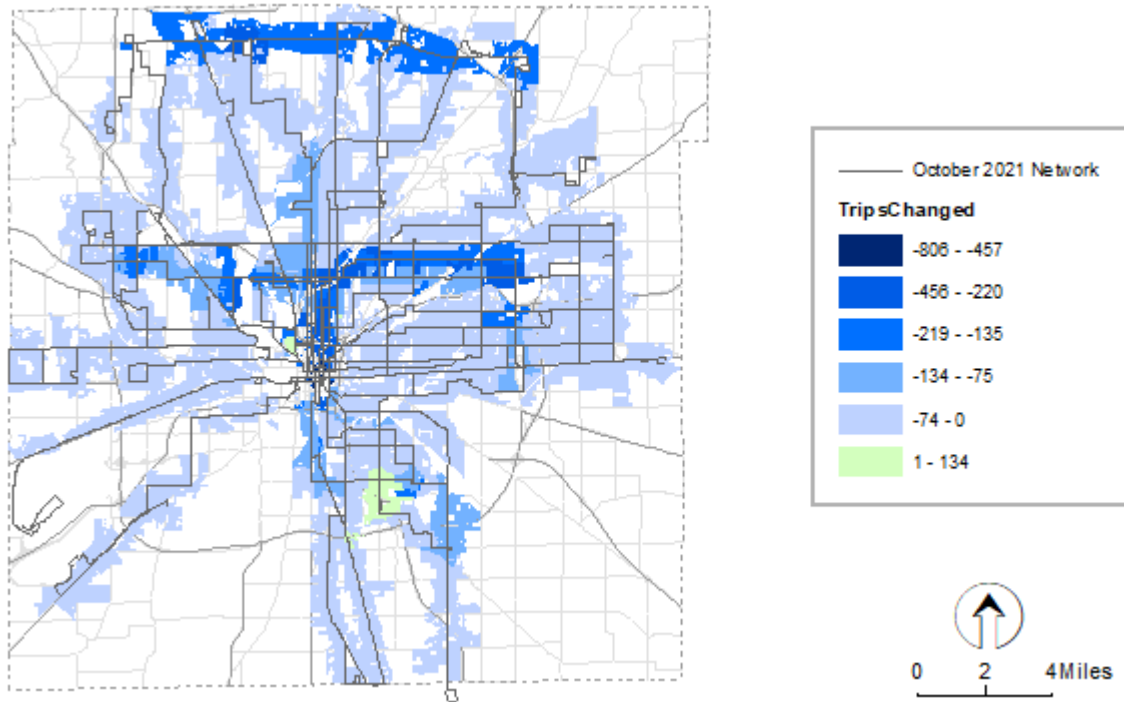


Figure II-4. Change in Weekly Trips to Blocks



### Total Transit Vehicle Trips to Blocks

The analysis identifies an overall decrease of 6.4 percent in trips to blocks. Non-High-Minority blocks experience a decrease of 5.8 percent. The resulting Title VI Acceptable Range of Change is -4.7 percent to -7.0 percent for High Minority blocks. The percent change for High Minority blocks is -7.0 percent, falling within the Title VI acceptable range.

Non-High-Poverty blocks experience a 6.5 percent decrease, resulting in a range of -5.2 percent to -7.8 percent. The High-Poverty blocks experience a 6.3 percent decrease in trips to blocks. Consistent with IndyGo definitions and policies, there is no finding of disproportionate burden. See Table II-7 for additional details.

Table II-7. Results of Transit Vehicle Trips to Blocks Analysis

Census Blocks	Existing Transit Vehicle Trips to Blocks	Proposed Transit Vehicle Trips to Blocks	Change in Trips to Blocks	Percent Change	Acceptable Range of Change	DI/DB?
<b>High Minority</b>	2,827,119	2,629,538	(197,581)	-7.0%	-7.0%	NO
<b>Non-High Minority</b>	3,254,425	3,064,122	(190,303)	-5.8%	-4.7%	
<b>High Poverty</b>	3,731,172	3,495,706	(235,466)	-6.3%	-7.8%	NO
<b>Non-High Poverty</b>	2,350,372	2,197,954	(152,418)	-6.5%	-5.2%	
<b>All habitable blocks</b>	6,081,544	5,693,660	(387,884)	-6.4%		

## Average Transit Vehicle Trips per Block

Similar to the analysis for the Total Transit Vehicle Trips to Blocks, the trip decreases for the October 2021 emergency service change are shown in the Average Transit Vehicle Trips per Block. A comparison of minority and non-minority populations reveal a finding of no disparate impact, as the provision of service to High Minority Blocks (-7.0 percent) falls within the Title VI Acceptable Range (-4.7 percent to -7.0 percent). The analysis determines a finding of no disproportionate burden. High Poverty Blocks experience a decrease of service of -6.3 percent, within the range of -5.2 to -7.8 percent. See Table II-8 for additional details.

**Table II-8. Results of Average Transit Vehicle Trips per Block Analysis**

Census Blocks	Existing 2020 Blocks	Average Existing Trips to Blocks Served	Proposed 2020 Blocks	Average Proposed Trips to Blocks Served	Change in Average Trips to Blocks	Percent Change in Average Trips per Block	Acceptable Range	DI/DB ?
<b>High Minority</b>	3904	724	3904	674	(51)	-7.0%	-7.0%	NO
<b>Non-High Minority</b>	3763	865	3763	814	(51)	-5.8%	-4.7%	
<b>High Poverty</b>	4334	861	4334	807	(54)	-6.3%	-7.8%	NO
<b>Non-High Poverty</b>	3333	705	3333	659	(46)	-6.5%	-5.2%	
<b>All habitable blocks</b>	7,667	793	7,667	743	-51	-6.4%		

## Transit Vehicle Trips Weighted by Population

The final metric follows a similar pattern as the first two metrics. Transit Vehicle Trips Weighted by Population (TVTwxP) results in a finding of no DI/DB. Results can be found in Table II-9.

**Table II-9. Analysis of Transit Vehicle Trips Weighted by Population**

	Existing TVTWxP	Proposed TVTWxP	Change in TVTWxP	% Change	Acceptable Range of % Change	DI/DB?
<b>High Minority</b>	243,724,726	226,283,303	(17,441,423)	-7.2%	-7.6%	NO
<b>Non-High Minority</b>	221,321,932	207,395,630	(13,926,302)	-6.3%	-5.0%	
<b>High Poverty</b>	273,592,388	256,582,538	(17,009,850)	-6.2%	-9.0%	NO
<b>Non-High Poverty</b>	191,454,270	177,096,395	(14,357,875)	-7.5%	-6.0%	
<b>All Habitable Blocks</b>	465,046,658	433,678,933	(31,367,725)	-6.7%		

## Summary

Based on the information provided in the tables above, Table II-10 summarizes the results of the Service Equity Analysis.

As explained above, while five of the six results technically fall outside IndyGo’s adopted Title VI range, all five are to the benefit of High Minority or High Poverty populations. As such, there is no finding of a disparate impact or disproportionate burden for any of the metrics and, therefore, no finding of a disparate impact or disproportionate burden for the system-wide Service Equity Analysis.

**Table II-10. Summary of Service Equity Analysis**

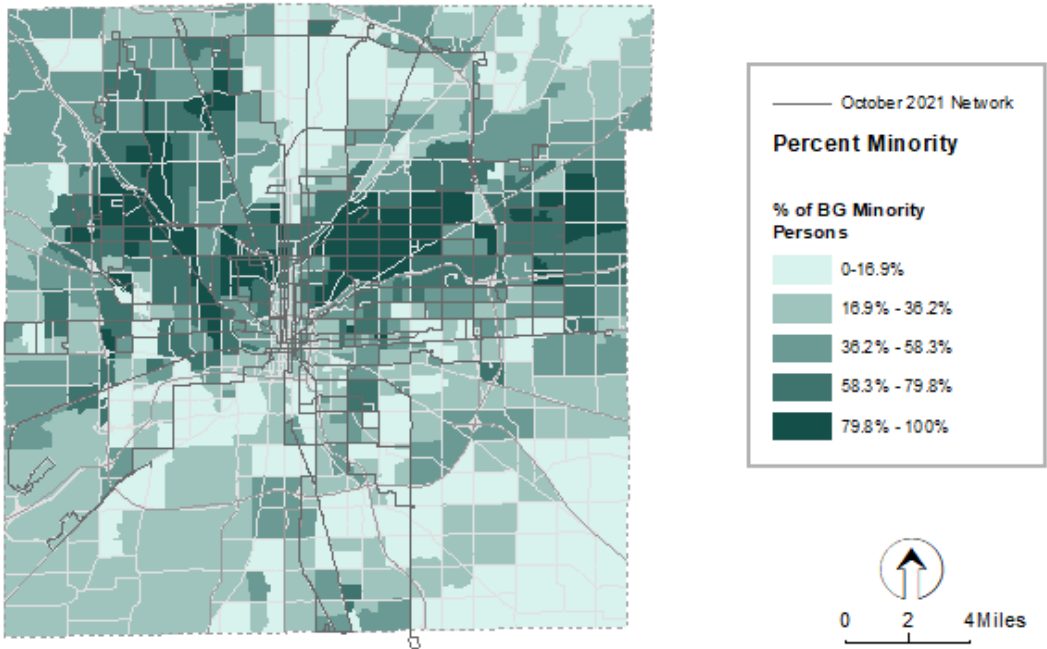
<b>Title VI Metric</b>	<b>Disparate Impact</b>	<b>Disproportionate Burden</b>
<b>Total Transit Vehicle Trips to Blocks</b>	Within	Within
<b>Average Transit Vehicle Trips to Blocks</b>	Within	Within
<b>Transit Vehicle Trips Weighted by Population</b>	Within	Within

DRAFT

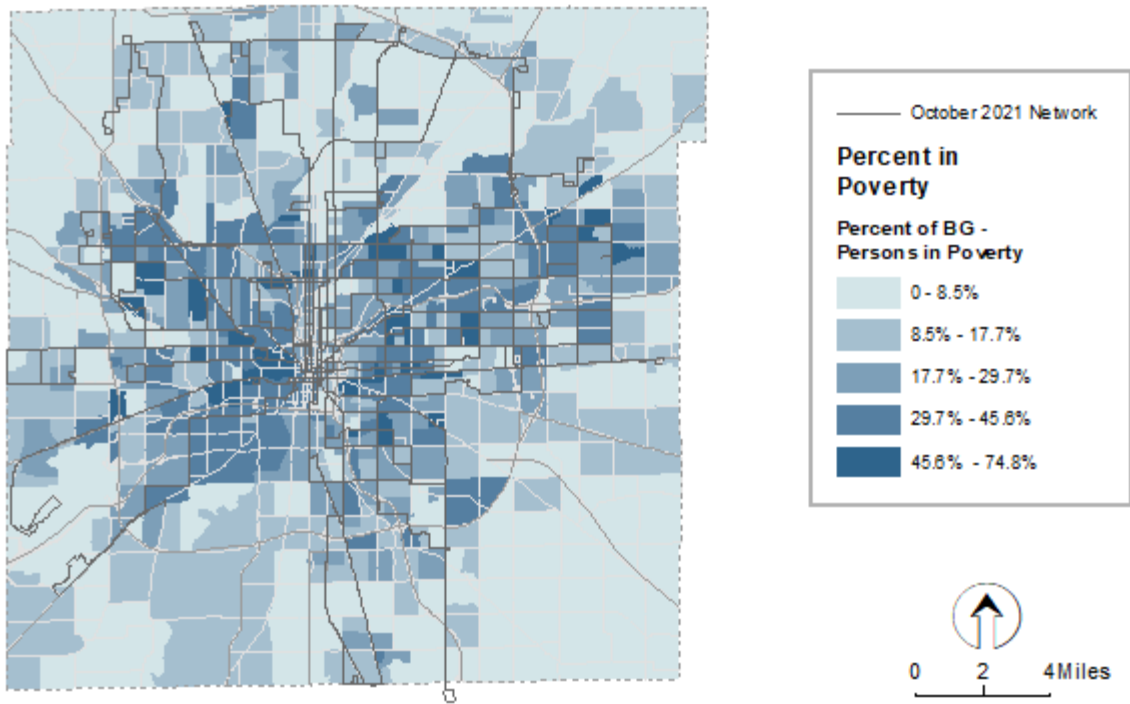


# APPENDIX A. DEMOGRAPHIC MAPS

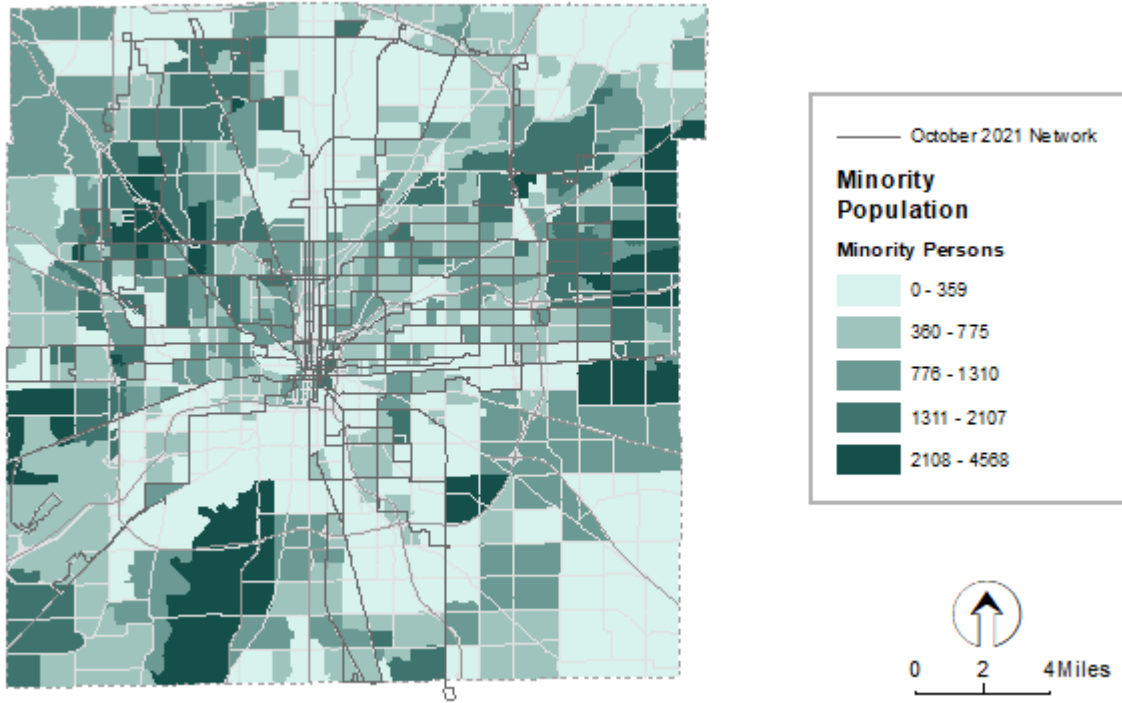
Appendix Figure A-1. Percent Minority Population per Block Group



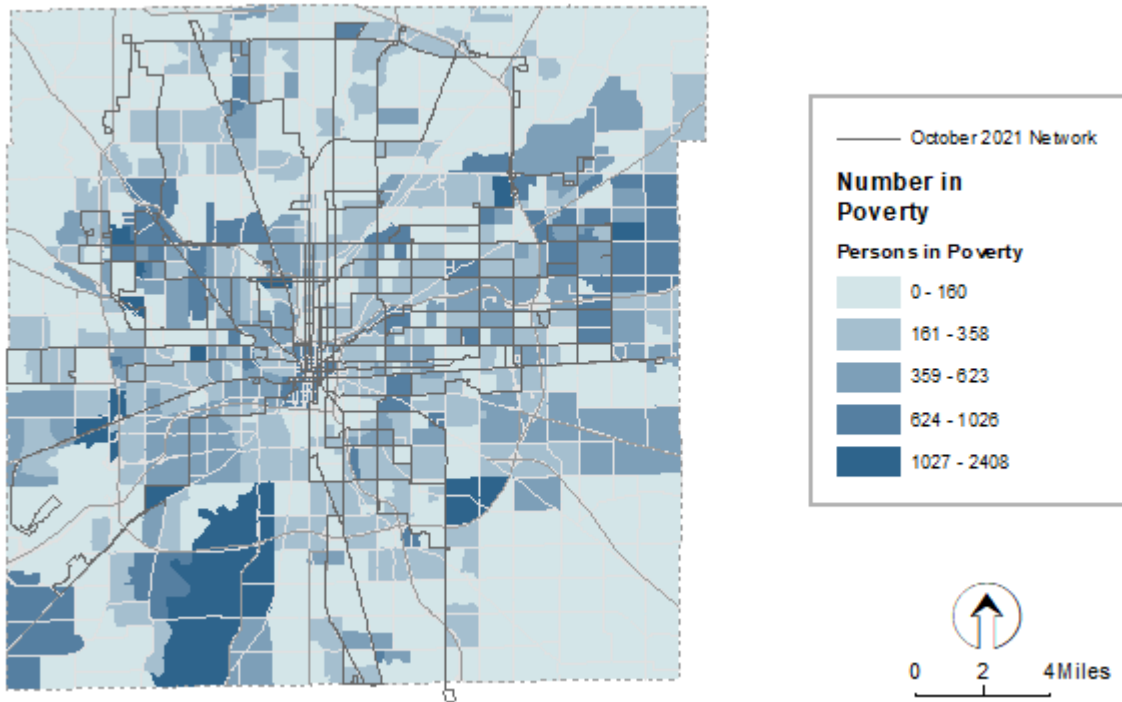
Appendix Figure A-2. Percent in Poverty per Block Group



Appendix Figure A-3. Number of Minority Persons per Block Group



Appendix Figure A-4. Number in Poverty per Block Group



## APPENDIX B. CHANGES BY ROUTE

The following table presents the change in weekly transit trips by network and by route. Weekly transit trips represent the trips provided in a normal transit week; five weekdays, a Saturday, and a Sunday. No holidays are represented with these trips.

Route ID	June 2021	October 2021	Trips Changed	% Change
10-97	663	662	-1	0%
11-97	219	218	0	0%
12-97	158	128	-30	-19%
13-97	159	135	-25	-16%
14-97	291	236	-55	-19%
15-97	313	234	-79	-25%
16-97	285	230	-55	-19%
18-97	263	228	-35	-13%
19-97	385	383	-2	0%
21-97	281	216	-65	-23%
24-97	281	216	-65	-23%
25-97	277	217	-60	-22%
26-97	241	240	-1	0%
28-97	273	228	-45	-16%
2-97	388	224	-163	-42%
30-97	309	229	-79	-26%
31-97	277	222	-55	-20%
34-97	377	375	-2	0%
37-97	376	374	-2	0%
38-97	447	446	-1	0%
3-97	363	361	-2	0%
4-97	284	229	-55	-19%
55-97	222	221	0	0%
5-97	388	386	-2	-1%
6-97	391	389	-2	-1%
86-97	408	219	-188	-46%
87-97	184	183	-1	0%
8-97	861	859	-2	0%
901-97	266	265	-1	0%
902-97	527	525	-2	0%
90-97	1,076	1,073	-3	0%
<b>Grand Total</b>	<b>12,146</b>	<b>11,066</b>	<b>-1,080</b>	<b>-9%</b>