



Loudoun County Transit

Title VI Service Equity Report

Fiscal Year 2019 Service Changes for Implementation July 2018

June 21, 2018

Prepared by:  
Loudoun County Department of Transportation & Capital Infrastructure

with assistance from:  
Loudoun County Office of Mapping and Geographic Information  
Loudoun County Department of Planning and Zoning





## Contents

Executive Summary .....	v
Board of Supervisors' Approval of Service Equity Analysis .....	vii
Introduction .....	1
Background Information .....	1
Loudoun County Transit Title VI Policies .....	3
Major Service Change Policy .....	3
Disparate Impact Policy .....	3
Disproportionate Burden Policy .....	3
Public Engagement and Board of Supervisors' Approval of Policies .....	4
Proposed FY 2019 Service Changes .....	6
Determination of Major Service Change .....	6
Route Descriptions & Planned Service Changes .....	8
Local Fixed Route Bus Routes (includes Metro Connection Routes) .....	8
Premium Long-Haul Commuter Bus Routes .....	9
Service Equity Analysis for Major Service Changes .....	11
Service Area Demographics .....	11
Local Fixed-Route Bus .....	11
Premium Long-Haul Commuter Bus .....	12
Summary of Adverse and Beneficial Service Changes – Local Fixed-Route Bus .....	13
Adverse Service Changes .....	13
Beneficial Service Changes .....	14
Local Fixed-Route Bus Service Restoration as Additional Funds become available .....	15
Summary of Adverse and Beneficial Service Changes – Premium Long-Haul Commuter Bus .....	15
Adverse Service Changes .....	15
Premium Long-Haul Commuter Service Restoration as Additional Funds become available .....	16
Beneficial Service Changes .....	16
Analytical Framework .....	17
Datasets and Techniques Used in Analysis .....	17
Analytical Methodology .....	18
Overlay Maps with Service Changes and Demographic Data .....	19

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## Executive Summary

The Federal Transit Administration (FTA) requires all transit providers that operate 50 or more fixed route vehicles in peak service and that are located in an urbanized area of 200,000 or more people, to conduct a Title VI equity analysis prior to implementing fare changes or major service changes. The Federal statute for Title VI provides that “no person 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.” Additionally, the FTA requires the integration of environmental justice principals into recipient’s public transportation decision-making process. Loudoun County is a recipient of FTA funds, in the form of a Transportation Infrastructure Finance and Innovation Act (TIFIA) loan for Metrorail expansion, and meets the thresholds for population and peak service operations.

When planning for Major Service Changes, DTCI must consider potential adverse effects. Loudoun County government is committed to providing high quality service to the public and holds among its values – treating all people equally and without prejudice. The Disparate Impact and Disproportionate Burden Policies adopted by Loudoun County establish statistical thresholds for comparing the impacts borne by minority populations and low-income households to those within the service area overall. These policies, which can be found on **Page 3**, were developed through a public decision-making process and were approved by the Board of Supervisors on June 7, 2016. Through conscientious evaluation, DTCI’s program goal is to avoid, minimize or mitigate adverse impacts where practicable.

Using the Major Service Change and Disproportionate Burden Policies, DTCI concluded that the planned service changes for Fiscal Year 2019 (FY 19), to be implemented in July 2018, do not result in a disproportionate burden to low-income households. However, the beneficial effects of adding Run 823 (Premium Long-Haul Commuter Route) was determined to create a disparate impact to minority populations based on the Disparate Impact Policy and low percentage of minority populations within the service area. A substantial legitimate justification for this change is provided in the Service Equity Analysis beginning on **Page 11**. The Service Equity Analysis compares the percentage of minority populations impacted by a Major Service Change to the Disparate Impact Threshold and compares the percentage of low-income households impacted by a Major Service Change to the Disproportionate Burden Threshold. Supplementing and supporting the Service Equity Analysis are descriptions of all bus routes planned for service changes, demographic maps, data sources, and methodology.

Data used in the service equity analysis came from the latest American Community Survey five-year estimates from 2012 to 2016. Using Loudoun County adopted policies, demographic information for the service population was obtained from census blocks within one-quarter mile of Local Fixed-Route bus stops or within three miles of Premium Long-Haul Commuter Bus stops. Maps of the routes overlain on demographic information of the service area are provided for each Major Service Change planned for FY 19.

In accordance with FTA requirements and Loudoun County’s 2017-2020 Title VI Program for transit services, DTCI evaluated the fifty-four (54) bus routes/runs that are planned to be modified, eliminated, or added to determine if the change qualified as a Major Service Change. Any change in service that adds

or eliminates more than 25% of the route's weekly revenue miles or weekly revenue hours is considered a Major Service Change. **Table 1** represents the change in weekly revenue miles and weekly revenue hours for each proposed service change. Service changes that meet the criteria for Major Service Changes were further analyzed for their impact on minority and low-income populations.

Table 1. FY 19 Service Changes				Existing		Proposed		Major Service Change Test		
	Bus Route	Route Name	Type of Change	Ex. Weekly Revenue Miles	Ex. Weekly Revenue Hours	Sched. Weekly Revenue Miles	Sched. Weekly Revenue Hours	Change in Revenue Miles	Change in Revenue Hours	Service Equity Analysis Required
Local	70 Weekday	Leesburg - Sterling	R	199	269.65	199	269.65	0%	0%	No
	72	Wiehle Express	R	3910	130.65	3680	130.65	-6%	0%	No
	83	Pacific Connector	E	1040	66.15	0	0	-100%	-100%	Yes
	87x	Dulles Town Center - Wiehle	R	2287.5	83.35	1248	43.15	-45%	-48%	Yes
	88x	East Gate - Wiehle	R	1711.5	77	3607.5	122.25	111%	59%	Yes
Metro	921	AM Harmony/Leesburg - Wiehle	R	1275	35	1195.5	38.75	-6%	11%	No
	922	PM Harmony/Leesburg - Wiehle	R	1276	36.67	1162	30	-9%	-18%	No
	980	Sterling - Wiehle	N	0	0	1575	56.25	100%	100%	Yes
	990	AM Loudoun - Wiehle	R	550	21.25	786	31	43%	46%	Yes
	Run 991	7:00 AM Wiehle - CFC	E	110	4.9	0	0	-100%	-100%	Yes
Commuter	992	PM Loudoun - Wiehle	R	615	19.83	675	22.9	10%	15%	No
	Run 101	5:20 AM DN/AN/CFC to DC	R	253	7.1	247	6.4	-2%	-10%	No
	Run 103	5:28 AM Telos/AN/CFC to DC	R	194.5	5.9	185	5.15	-5%	-13%	No
	Run 104	5:58 AM Telos/AN/CFC to DC	R	194.5	5.25	185	4.5	-5%	-14%	No
	Run 105	6:18 AM Telos/AN/CFC to Crystal City/Pentagon	R	201.5	5.9	192	5.15	-5%	-13%	No
	Run 106	6:28 AM Telos/AN/CFC to DC	R	194.5	5.9	185	5.15	-5%	-13%	No
	Run 107	6:38 AM Telos/AN/CFC to Rosslyn/DC	R	206	6.4	196.5	5.65	-5%	-12%	No
	Run 108	7:01 AM AN/CFC to Rosslyn/DC	R	190	6.15	180.5	5.4	-5%	-12%	No
	Run 109	7:21 AM AN/CFC to DC	R	187	6.1	177.5	5.35	-5%	-12%	No
	Run 110	7:17 AM Telos/AN/CFC to Rosslyn/Crystal City/Pentagon	R	201	7.1	191.5	6.35	-5%	-11%	No
	Run 111	7:43 AM Telos/AN/CFC to Rosslyn/DC	R	206	7	196.5	6.25	-5%	-11%	No
	Run 407	5:58 AM Harmony to Rosslyn/DC	R	242.5	8.6	279.5	9.6	15%	12%	No
	Run 415	6:40 AM Harmony to Rosslyn/DC	R	242.5	8.6	279.5	9.6	15%	12%	No
	Run 501	3:00 PM DC to CFC/AN	R	183	5.9	175.5	5.15	-4%	-13%	No
	Run 502	3:15 PM DC to DN/CFC/AN	R	202.5	8.35	195	7.7	-4%	-8%	No
	Run 503	3:42 PM DC to CFC/AN/Telos	R	207.5	7.9	200	7.1	-4%	-10%	No
	Run 504	4:29 PM Crystal City to CFC/AN/Telos	R	207	6.15	199.5	5.5	-4%	-11%	No
	Run 505	4:28 PM Pentagon to CFC/AN/Telos	R	114	6	106.5	5.35	-7%	-11%	No
	Run 506	4:10 PM NW DC to CFC/AN/Telos	R	181	6.25	173.5	5.6	-4%	-10%	No
	Run 507	4:10 PM DC to CFC/AN/Telos	R	207.5	8.35	200	7.7	-4%	-8%	No
	Run 508	4:13 PM DC to DN/CFC/AN/Telos	R	218.5	9.85	211	9.2	-3%	-7%	No
	Run 509	5:15 PM Crystal City to CFC/AN/Telos	R	206	6.15	198.5	5.5	-4%	-11%	No
	Run 510	5:00 PM DC to CFC/AN/Telos	R	207.5	8.65	200	8	-4%	-8%	No
	Run 511	6:01 PM DC to CFC/AN/Telos	R	198	5.85	190.5	5.2	-4%	-11%	No
	Run 802	3:35 PM DC to Leesburg/Harmony/Purcellville	R	277	9.15	197	6.8	-29%	-26%	Yes
	Run 803	3:35 PM DC to Leesburg/Harmony/Purcellville	R	279.5	9.75	276.0	9.50	-1%	-3%	No
	Run 804	4:09 PM NW DC/Rosslyn to Leesburg/Harmony/Purcellville	R	263.0	7.50	259.5	7.25	-1%	-3%	No
	Run 805	3:38 PM DC to Leesburg/Harmony/Purcellville	R	284.0	8.92	280.5	8.67	-1%	-3%	No
	Run 806	4:08 PM Pentagon/Rosslyn to Leesburg/Harmony/Purcellville	R	267.5	7.75	264.0	7.50	-1%	-3%	No
	Run 807	4:08 PM Crystal City to Leesburg/Harmony/Purcellville	R	270.5	7.33	267.0	7.08	-1%	-3%	No
	Run 808	3:47 PM DC/Rosslyn to Leesburg/Harmony/Purcellville	R	281.0	10.58	277.5	10.33	-1%	-2%	No
	Run 809	4:08 PM DC to Leesburg/Harmony/Purcellville	R	291.0	9.92	287.5	9.67	-1%	-3%	No
	Run 810	4:07 PM DC/Rosslyn to Leesburg/Harmony/Purcellville	R	281.0	10.08	277.5	9.83	-1%	-2%	No
	Run 812	4:40 PM Crystal City/Pentagon to Leesburg/Harmony/Purcellville	R	278.5	8.33	275.0	8.08	-1%	-3%	No
	Run 813	4:25 PM DC/Rosslyn to Leesburg/Harmony/Purcellville	R	285.0	9.50	281.5	9.25	-1%	-3%	No
	Run 815	5:27 PM Rosslyn to Leesburg/Harmony/Purcellville	E	50.6	1.33	0	0	-100%	-100%	Yes
	Run 816	4:37 PM DC to Leesburg/Harmony/Purcellville	R	279.5	9.92	276.0	9.67	-1%	-3%	No
	Run 817	4:53 PM DC to Leesburg/Harmony/Purcellville	R	277.0	9.17	273.5	8.92	-1%	-3%	No
	Run 818	5:10 PM Crystal City/Pentagon to Leesburg/Harmony/Purcellville	R	278.5	8.25	280	8.4	1%	2%	No
	Run 819	4:53 PM DC/Rosslyn to Leesburg/Harmony/Purcellville	R	285.0	11.25	281.5	11.00	-1%	-2%	No
	Run 820	5:21 PM DC/Rosslyn to Leesburg/Harmony/Purcellville	R	220.0	10.58	216.5	10.33	-2%	-2%	No
	Run 821	5:42 PM DC/Rosslyn to Leesburg/Harmony/Purcellville	R	286.0	10.42	282.5	10.17	-1%	-2%	No
	Run 822	6:12 PM DC/Rosslyn to Leesburg/Harmony/Purcellville	R	286.0	11.00	282.5	10.75	-1%	-2%	No
	Run 823	3:40 PM DC to Harmony/Purcellville	N	0	0	272	7.9	100%	100%	Yes

R = Reconfigure Route; E = Eliminate Route; N = New Route

## Board of Supervisors' Approval of Service Equity Analysis

In accordance with the Federal Transit Administration Circular 4702.1B, upon completion of a service or fare equity analysis, the transit provider shall brief its appropriate governing entity responsible for policy decisions regarding the service and/or fare change(s) and the associated equity impacts. The transit provider shall submit documentation with the Title VI Program as evidence of the consideration, awareness, and approval of the analysis.

Loudoun County Transit is managed by Loudoun County's Department of Transportation and Capital Infrastructure (DTCI). The Loudoun County Board of Supervisors (Board) is the governing entity responsible for policy decisions regarding transit services. On June 21, 2018, DTCI presented the results of the service equity analysis to the Board at their regular business meeting. Documentation of the Board's consideration, awareness, and approval of the analysis is provided in **Figure 1**.



Loudoun County, Virginia

[www.loudoun.gov](http://www.loudoun.gov)

Office of the County Administrator

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At a business meeting of the Board of Supervisors of Loudoun County, Virginia, held in the County Government Center, Board of Supervisors Meeting Room, 1 Harrison Street, S.E., Leesburg, Virginia, on Thursday, June 21, 2018 at 5:00 p.m.

IN RE: Fiscal Year 2019 Service Equity Analysis for Loudoun County Transit Title VI Program  
(Countywide)

Vice Chairman Buona moved that the Board of Supervisors acknowledge their awareness and consideration of the Service Equity Analysis for the FY 2019 Transit Service Changes, and approve the Service Equity Analysis presented within the June 21, 2018, Board of Supervisors Business Meeting Action Item.

Seconded by Supervisor Volpe.

Voting on the Motion: Supervisors Buffington, Buona, Higgins, Letourneau, Meyer, Randall, Saines, Umstattd, and Volpe – Yes; None – No.

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DEPUTY CLERK TO THE LOUDOUN COUNTY  
BOARD OF SUPERVISORS

Item 08, Fiscal Year 2019 Service Equity Analysis for Loudoun County Transit Title VI Program (Countywide)

## Introduction

Loudoun County's Department of Transportation & Capital Infrastructure (DTCI) with mapping support from the Office of Mapping and Geographic Information and demographic data support from the Department of Planning and Zoning, along with technical support from Foursquare Integrated Transportation Planning has prepared this Title VI Service Equity Report for the bus service changes that are planned to go into effect July 2, 2018 (Fiscal Year 2019). While this report provides the general public, the Loudoun County Board of Supervisors, and the Federal Transit Administration with general information about the scheduled service changes, the intention of this report is to analyze the service equity implications of Major Service Changes, as defined by DCTI's 2017-2020 Title VI Program. Service equity, in this context, relates to ensuring that the level and quality of public transportation service is provided in a nondiscriminatory manner without regard to race, color or national origin.

The sections of this report provide **Background Information** with an overview of the regulatory requirement to consider the beneficial and adverse impacts of or burdens associated with service changes; the **Loudoun County Transit Title VI Policies** that define what levels of service modifications are classified as Major Service Changes and how to determine when a Disparate Impact or Disproportionate Burden are created; a description of the **Proposed FY 2019 Service Changes** with an overview of why the service changes are necessary; the **Service Area Demographics** with route maps relative to minority populations and low-income households; a **Summary of Adverse and Beneficial Service Changes – Local Fixed-Route Bus and Premium Long-Haul Commuter Bus**; and the **Analytical Framework** with data sources and methodology.

## Background Information

In December 2014, Loudoun County accepted a low-interest loan of \$195 million through the U.S. Department of Transportation's Transportation Infrastructure Finance and Innovation Act (TIFIA). TIFIA funding is being used to help finance the County's share of construction costs for the Dulles Corridor Metrorail Phase 2 project, which extends the Silver Line Metro into Loudoun County.

The Federal Transit Administration (FTA) requires all recipients of federal funding to ensure that their programs, policies and activities comply with U.S. Department of Transportation's regulations under Title VI of the Civil Rights Act of 1964. FTA Circular 4702.1B, *Title VI Requirements and Guidelines for Federal Transit Administration Recipients*, specifies that all transit providers located in an urbanized area of 200,000 or more people and operating 50 or more fixed route vehicles in peak service, must conduct a Title VI equity analysis prior to implementing fare changes or service changes, including elimination of routes, creation of new routes, or modification to alignments, headways, or span of service of existing routes. The equity analysis is used to determine whether the proposed service change creates a disparate impact on minority populations or whether low-income households will bear a disproportion burden from the service change. According to the 2010 U.S. Census, the Washington, DC – VA – MD Urbanized Area extends into the eastern portion of Loudoun County. Loudoun County Transit meets the FTA criteria that requires equity analyses to be completed for service changes.

In summary, the FTA Circular states that the analysis should include:

- A statement of the agency's "major service change" policy and corresponding numerical standards along with a threshold for determining whether a major service change results in a "disparate impact" to minority populations or a "disproportionate burden" to low-income communities, as well as how the public was engaged in developing those policies across all transit modes.
- A clear explanation of how the proposed service change meets or exceeds the operator's Major Service Change Policy.
- A description of the public engagement process for setting the Major Service Change Policy.
- Inclusion of a copy of the operator's Board of Directors meeting minutes or a resolution demonstrating the Board of Supervisor's consideration, awareness, and approval of the major service change policy, disparate impact policy, and disproportionate burden policy.
- An analysis that takes into effect any adverse effects related to a major service change. Demonstration that the operator has analyzed service between the existing and proposed service, and has considered the degree of adverse effects when planning service changes.
- Description of data and methodology used in service equity analysis.
- Overlay maps and tables showing how the proposed service changes would impact minority and low-income populations.
- If a disparate impact is found, the operator will clearly demonstrate substantial legitimate justification for the proposed service change and analysis of alternatives for disparate impacts or that they have sought to avoid, minimize, or mitigate the impacts of a finding of disproportionate burden.

A finding of disparate impacts or disproportionate burden does not mean necessarily that the service change cannot go into effect. If adverse impacts are found, the transit provider is obligated to analyze alternatives that would serve the same legitimate objectives but with less impact. In accordance with FTA guidelines, the transit provider shall provide a meaningful opportunity for public comment on any proposed mitigation measures, including the less discriminatory alternatives that may be available.

The results of the service equity analysis (and fare equity analyses if applicable) are to be included with Loudoun County's Title VI Program along with evidence that the Loudoun County Board of Supervisors considered, was aware of, and approved the analysis. Loudoun County is currently required to update and submit its Title VI Program to the Federal Transit Administration at least every three years. This Loudoun County Transit Title VI Service Equity Report, Fiscal Year 2019 Service Changes for Implementation July 2018 will need to be included with the next triennial Title VI Program update, which is due to the FTA on December 1, 2019.

## Loudoun County Transit Title VI Policies

In accordance with the Federal Transit Administration's Title VI Requirements and Guidelines for Federal Transit Administration Recipients, Circular FTA C 4702.1B, dated October 1, 2012, and the Loudoun County 2017-2020 Title VI Program, approved by the Board of Supervisors on October 20, 2016, Loudoun County has established the following policies to evaluate service changes and their impact on minority and low-income populations.

### *Major Service Change Policy*

The Major Service Change Policy establishes numerical standards used for comparing between the existing and proposed service in order to determine whether the change or modification exceeds the set threshold for which a Service Equity Analysis or Fare Equity Analysis must be conducted.

Loudoun County Transit's (LCT) Title VI Program, defines a major service change as:

- Adding or eliminating a bus route.
- Any change in service on any individual bus route that would add or eliminate more than 25% of the route's weekly revenue miles (the number of miles a bus operates while carrying paying passengers).
- Any change in service on any individual bus route that would add or eliminate more than 25% of the route's weekly revenue hours (the number of hours a bus operates while carrying paying passengers).

### *Disparate Impact Policy*

Disparate Impact refers to a facially neutral policy or practice that disproportionately affects members of a group identified by race, color, or national origin. Loudoun County has established a threshold for determining whether adverse effects that occur in the context of major service changes are borne disproportionately by minority populations.

For service reductions, a disparate impact occurs when the average fare or service change affects minority riders 15 percent or greater than non-minority riders. Loudoun County Transit applies the disparate impact policy uniformly to all major service changes, regardless of mode. These policies will be reviewed on a cumulative basis.

Datasets and techniques used to determine the percentages of minority and non-minority riders impacted by a service change are described on **Page 17** within the Analytical Framework portion of the section on Service Equity Analysis for Major Service Changes.

### *Disproportionate Burden Policy*

Disproportionate Burden refers to a neutral policy or practice that disproportionately affects low-income populations more than non-low-income populations. Loudoun County has established a threshold for determining whether adverse effects that occur in the context of major service changes are borne disproportionately by low-income populations.

For service reductions, a disproportionate burden occurs when the average fare or service change affects low-income riders 15 percent or greater than non-low-income riders. Loudoun County Transit applies the disproportionate burden policy uniformly to all major service changes, regardless of mode. These policies will be reviewed on a cumulative basis.

Datasets and techniques used to determine the percentages of low-income and non-low-income riders impacted by a service change are described on **Page 17** within the Analytical Framework portion of the section on Service Equity Analysis for Major Service Changes.

### ***Public Engagement and Board of Supervisors' Approval of Policies***

The established definitions and policies for *Major Service Change*, *Disparate Impact*, and *Disproportionate Burden* were developed through a public engagement process that took place from April 15, 2016, through May 16, 2016. LCT's Title VI policy outreach efforts were implemented in coordination with the county's public outreach for the update of the 2017-2022 Transit Development Plan. These outreach efforts included:

- Pop-Up Events (2);
- Public Workshops (5); and
- Online Outreach (with opportunities for submitting comments via email, paper mail, or online form).

On June 7, 2016, the Loudoun County Board of Supervisors approved (9-0) the Title VI policies for a Major Service Change, Disparate Impact, and Disproportionate Burden. **Figure 2** is a copy of the Board of Supervisors' vote of approval of the Major Service Change Policy, Disparate Impact Policy, and Disproportional Burden Policy.



Loudoun County, Virginia

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At a business meeting of the Board of Supervisors of Loudoun County, Virginia, held in the County Government Center, Board of Supervisors' Meeting Room, 1 Harrison Street, S.E., Leesburg, Virginia, on Tuesday, June 7, 2016 at 5:00 p.m.

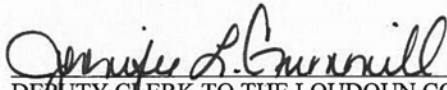
IN RE: Title VI Policies for Transit Service (Countywide)

Vice Chairman Buona moved that the Board of Supervisors approve the Title VI policies for a major service change, disparate impact, and disproportional burden as shown on Attachment 1 to the June 7, 2016 Action Item.

Seconded by Supervisor Meyer.

Voting on the Motion: Supervisors Buffington, Buona, Higgins, Letourneau, Meyer, Randall, Saines, Umstattd and Volpe – Yes; None – No.

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DEPUTY CLERK TO THE LOUDOUN COUNTY  
BOARD OF SUPERVISORS

(Item #7, Title VI Policies for Transit Service)

FIGURE 2 | LOUDOUN COUNTY BOARD OF SUPERVISORS APPROVAL OF TITLE VI POLICIES

## Proposed FY 2019 Service Changes

The proper fiscal management of Loudoun County's transit system involves continual evaluation of route performance throughout all service types (i.e., Premium Long-Haul Commuter, Metro Connection, and Local Fixed Route). The Office of Transit & Commuter Services (staff) within the Loudoun County Department of Transportation and Capital Infrastructure (DTCI) monitors ridership metrics including rider boardings per revenue mile and rider boardings per revenue hour along with net costs per rider to gauge the performance of each route and to ensure that the transit system is effective and efficient. In accordance with the policies established in the 2018-2028 Transit Development Plan (TDP), any route that performs at less than ½ of the average for that route's service type should be a candidate for adjustment or elimination. Additionally, staff solicits and considers input from stakeholders along with recommendations from the TDP. The TDP was prepared with public input and near and long-term considerations for new land development projects and service needs. Stakeholders include the public, the Board of Supervisors, the Transit Advisory Board, the Disability Services Board, and other various boards and individual towns throughout the County.

On an annual basis as part of the budget process and available funding, staff proposes bus service changes, such as additions and eliminations of bus stops or entire routes, based on service performance measures and stakeholder input. In addition to the annual review, staff became aware in the Fall of 2017 that the Christian Fellowship Church property was being sold and that the leased park & ride lot would need to close, thus triggering the need for service and route modifications. Proposed service changes were published for 30 days to allow the public an opportunity to provide feedback. The comments received were evaluated to determine if adjustments to the proposed service changes were warranted and feasible. Based on the performance metrics and input received, Loudoun County Transit proposes to modify, add or eliminate fifty-four (54) bus routes/runs beginning on July 2, 2018. In accordance with FTA requirements and Loudoun County's 2017-2020 Title VI Program for transit services, staff evaluated the proposed modifications for impacts to minority and low income populations within each service area.

## Determination of Major Service Change

In compliance with Loudoun County's 2017-2020 Title VI Program, each route proposed for reconfiguration or elimination was evaluated against the numerical thresholds established in the Major Service Change Policy. Service Changes that qualify as a Major Service Change were further analyzed for Service Equity impacts.

In accordance with the Major Service Change Policy, any route elimination or reduction of more than 25% of the route's revenue miles or revenue hours was considered as a Major Service Change. All service changes that met or exceeded the Major Service Change Policy were further analyzed for their impact on minority and low-income populations. Both beneficial and adverse impacts of the service change were evaluated.

**Table 1** lists all routes and runs that are planned for service changes for FY 19, with a start date of July 2, 2018. The table provides a comparison of the existing weekly revenue miles and weekly revenue hours versus the scheduled miles and hours as a result of the route's reconfiguration or elimination.

Table 1. FY 19 Service Changes				Existing		Proposed		Major Service Change Test		
	Bus Route	Route Name	Type of Change	Ex. Weekly Revenue Miles	Ex. Weekly Revenue Hours	Sched. Weekly Revenue Miles	Sched. Weekly Revenue Hours	Change in Revenue Miles	Change in Revenue Hours	Service Equity Analysis Required
Local	70 Weekday	Leesburg - Sterling	R	199	269.65	199	269.65	0%	0%	No
	72	Wiehle Express	R	3910	130.65	3680	130.65	-6%	0%	No
	83	Pacific Connector	E	1040	66.15	0	0	-100%	-100%	Yes
	87x	Dulles Town Center - Wiehle	R	2287.5	83.35	1248	43.15	-45%	-48%	Yes
	88x	East Gate - Wiehle	R	1711.5	77	3607.5	122.25	111%	59%	Yes
Metro	921	AM Harmony/Leesburg - Wiehle	R	1275	35	1195.5	38.75	-6%	11%	No
	922	PM Harmony/Leesburg - Wiehle	R	1276	36.67	1162	30	-9%	-18%	No
	980	Sterling - Wiehle	N	0	0	1575	56.25	100%	100%	Yes
	990	AM Loudoun - Wiehle	R	550	21.25	786	31	43%	46%	Yes
	Run 991	7:00 AM Wiehle - CFC	E	110	4.9	0	0	-100%	-100%	Yes
Commuter	992	PM Loudoun - Wiehle	R	615	19.83	675	22.9	10%	15%	No
	Run 101	5:20 AM DN/AN/CFC to DC	R	253	7.1	247	6.4	-2%	-10%	No
	Run 103	5:28 AM Telos/AN/CFC to DC	R	194.5	5.9	185	5.15	-5%	-13%	No
	Run 104	5:58 AM Telos/AN/CFC to DC	R	194.5	5.25	185	4.5	-5%	-14%	No
	Run 105	6:18 AM Telos/AN/CFC to Crystal City/Pentagon	R	201.5	5.9	192	5.15	-5%	-13%	No
	Run 106	6:28 AM Telos/AN/CFC to DC	R	194.5	5.9	185	5.15	-5%	-13%	No
	Run 107	6:38 AM Telos/AN/CFC to Rosslyn/DC	R	206	6.4	196.5	5.65	-5%	-12%	No
	Run 108	7:01 AM AN/CFC to Rosslyn/DC	R	190	6.15	180.5	5.4	-5%	-12%	No
	Run 109	7:21 AM AN/CFC to DC	R	187	6.1	177.5	5.35	-5%	-12%	No
	Run 110	7:17 AM Telos/AN/CFC to Rosslyn/Crystal City/Pentagon	R	201	7.1	191.5	6.35	-5%	-11%	No
	Run 111	7:43 AM Telos/AN/CFC to Rosslyn/DC	R	206	7	196.5	6.25	-5%	-11%	No
	Run 407	5:58 AM Harmony to Rosslyn/DC	R	242.5	8.6	279.5	9.6	15%	12%	No
	Run 415	6:40 AM Harmony to Rosslyn/DC	R	242.5	8.6	279.5	9.6	15%	12%	No
	Run 501	3:00 PM DC to CFC/AN	R	183	5.9	175.5	5.15	-4%	-13%	No
	Run 502	3:15 PM DC to DN/CFC/AN	R	202.5	8.35	195	7.7	-4%	-8%	No
	Run 503	3:42 PM DC to CFC/AN/Telos	R	207.5	7.9	200	7.1	-4%	-10%	No
	Run 504	4:29 PM Crystal City to CFC/AN/Telos	R	207	6.15	199.5	5.5	-4%	-11%	No
	Run 505	4:28 PM Pentagon to CFC/AN/Telos	R	114	6	106.5	5.35	-7%	-11%	No
	Run 506	4:10 PM NW DC to CFC/AN/Telos	R	181	6.25	173.5	5.6	-4%	-10%	No
	Run 507	4:10 PM DC to CFC/AN/Telos	R	207.5	8.35	200	7.7	-4%	-8%	No
	Run 508	4:13 PM DC to DN/CFC/AN/Telos	R	218.5	9.85	211	9.2	-3%	-7%	No
	Run 509	5:15 PM Crystal City to CFC/AN/Telos	R	206	6.15	198.5	5.5	-4%	-11%	No
	Run 510	5:00 PM DC to CFC/AN/Telos	R	207.5	8.65	200	8	-4%	-8%	No
	Run 511	6:01 PM DC to CFC/AN/Telos	R	198	5.85	190.5	5.2	-4%	-11%	No
	Run 802	3:35 PM DC to Leesburg/Harmony/Purcellville	R	277	9.15	197	6.8	-29%	-26%	Yes
	Run 803	3:35 PM DC to Leesburg/Harmony/Purcellville	R	279.5	9.75	276.0	9.50	-1%	-3%	No
	Run 804	4:09 PM NW DC/Rosslyn to Leesburg/Harmony/Purcellville	R	263.0	7.50	259.5	7.25	-1%	-3%	No
	Run 805	3:38 PM DC to Leesburg/Harmony/Purcellville	R	284.0	8.92	280.5	8.67	-1%	-3%	No
	Run 806	4:08 PM Pentagon/Rosslyn to Leesburg/Harmony/Purcellville	R	267.5	7.75	264.0	7.50	-1%	-3%	No
	Run 807	4:08 PM Crystal City to Leesburg/Harmony/Purcellville	R	270.5	7.33	267.0	7.08	-1%	-3%	No
	Run 808	3:47 PM DC/Rosslyn to Leesburg/Harmony/Purcellville	R	281.0	10.58	277.5	10.33	-1%	-2%	No
	Run 809	4:08 PM DC to Leesburg/Harmony/Purcellville	R	291.0	9.92	287.5	9.67	-1%	-3%	No
	Run 810	4:07 PM DC/Rosslyn to Leesburg/Harmony/Purcellville	R	281.0	10.08	277.5	9.83	-1%	-2%	No
	Run 812	4:40 PM Crystal City/Pentagon to Leesburg/Harmony/Purcellville	R	278.5	8.33	275.0	8.08	-1%	-3%	No
	Run 813	4:25 PM DC/Rosslyn to Leesburg/Harmony/Purcellville	R	285.0	9.50	281.5	9.25	-1%	-3%	No
	Run 815	5:27 PM Rosslyn to Leesburg/Harmony/Purcellville	E	50.6	1.33	0	0	-100%	-100%	Yes
	Run 816	4:37 PM DC to Leesburg/Harmony/Purcellville	R	279.5	9.92	276.0	9.67	-1%	-3%	No
	Run 817	4:53 PM DC to Leesburg/Harmony/Purcellville	R	277.0	9.17	273.5	8.92	-1%	-3%	No
	Run 818	5:10 PM Crystal City/Pentagon to Leesburg/Harmony/Purcellville	R	278.5	8.25	280	8.4	1%	2%	No
	Run 819	4:53 PM DC/Rosslyn to Leesburg/Harmony/Purcellville	R	285.0	11.25	281.5	11.00	-1%	-2%	No
	Run 820	5:21 PM DC/Rosslyn to Leesburg/Harmony/Purcellville	R	220.0	10.58	216.5	10.33	-2%	-2%	No
	Run 821	5:42 PM DC/Rosslyn to Leesburg/Harmony/Purcellville	R	286.0	10.42	282.5	10.17	-1%	-2%	No
	Run 822	6:12 PM DC/Rosslyn to Leesburg/Harmony/Purcellville	R	286.0	11.00	282.5	10.75	-1%	-2%	No
	Run 823	3:40 PM DC to Harmony/Purcellville	N	0	0	272	7.9	100%	100%	Yes

R = Reconfigure Route; E = Eliminate Route; N = New Route

## Route Descriptions & Planned Service Changes

A description of each major service change is provided below.

### *Local Fixed Route Bus Routes (includes Metro Connection Routes)*

#### Route 83 Pacific Connector – Route Eliminated

Route will be eliminated (absorbed by Route 990). 72% of the current Route 83 riders travel from Dulles Town Center to the Wiehle-Reston East Metrotrail station. Routes 87x and Route 84 provide service from Dulles Town Center to Wiehle-Reston East Metrorail station. Route 83 stops on Pacific Boulevard, south of Waxpool Road will still be served by Route 990. There will be no loss of Paratransit service to current passengers of the Rt. 83 because of service will be provided by these other routes.

#### Route 87x Dulles Town Center to Wiehle – Reduce number of buses

Due to low ridership, service on the 87x will be reduced from two buses to one bus. This change will cause the wait time between buses to increase from 20 minutes to 40 minutes.

There was no feedback that indicated a need to adjust the proposed service.

#### Route 88x East Gate to Wiehle – Expand service to include stops at the Stone Ridge Park & Ride lot and the StoneSprings Hospital

Currently, Route 88x provides service between the East Gate park and ride lot and the Wiehle-Reston East Metrorail Station. County staff recommended extending the service west to both the Stone Ridge Park & ride, located at the Stone Ridge Village Center and to the StoneSprings Hospital. This change will improve access to the Metrorail system for south county residents as well as provide hospital employees with a transit commuting option. With this change, the current service will be increased from two buses to three buses in order to keep the wait times between buses reasonable.

Public feedback indicated two primary needs for change. One was to keep the departure times as close to the existing schedule as possible, and another was to have a departure from the Wiehle-Reston East Metrorail Station closer to 3:00pm. Staff reviewed the proposed timetable and made adjustments that minimized the changes to the existing departures. In addition, a departure time at 3:00pm from Wiehle-Reston East Metrorail Station was added.

#### Route 980/Route 985 (new route numbering) Sterling to Wiehle – New service with direct connection between Sterling Park and the Wiehle-Reston East Metrorail Station

Currently, passengers wanting to connect to the Wiehle-Reston East Metrorail station from the Sterling Park area must ride three miles in the opposite direction to Dulles Town Center where they must transfer to a different bus to continue to Wiehle-Reston East Metrorail Station. County staff proposed a route that will provide direct connection to Wiehle from Sterling Park. The route will also improve circulation within Sterling Park by:

- a) Connecting with Sterling routes 80 and 82 on Enterprise Street.
- b) Adding stops along Church Rd. between Holly Ave. and Sterling Blvd.

- c) Adding a stop near the entrance to the Newberry neighborhood and the Chase Heritage Apartments on Sterling Blvd

Based upon comments received at a public comment meeting, the starting point for the route was changed so that it now starts on Church Road in order to provide service from the neighborhoods along Church Road.

Also, due to Fairfax County having a route 980 serving the Wiehle-Reston East Metrorail Station, the new route will be re-numbered as the 985. However, within this service equity analysis it will be referred to as “Route 980.”

#### **Route 990 (AM only) Loudoun to Wiehle – Combine and optimize Route 990 and Route 83 to better serve the area in and around Quantum Park/AOL/Pacific Blvd**

Routes 990 and 83 are both experiencing very low ridership. Changes to the Route 83 are described above. Staff recommended combining the 990 and 83. Route 83 stops on Pacific Boulevard, south of Waxpool Road will still be served by Route 990. Route 990 service to the Christian Fellowship Church and to the County Government Center will be eliminated. The streamlined Route 990 will:

- a) AM - Serve Quantum Park and Raytheon/Oath, with stops along Pacific Blvd near Raytheon
- b) PM - Serve Pacific Blvd, Business Ct, Raytheon/Oath and Quantum Park

Based upon comments received from current riders of Route 990, the timetable was adjusted to coordinate better with Metrorail service and employer start times. Additionally, Route 993/994 will serve the Loudoun County Government Center in Leesburg.

#### **Run 991 (7:00 AM run) Wiehle to Christina Fellowship Church – Service Eliminated**

Run 991, providing 7:00am service from Wiehle to Christian Fellowship Church will be eliminated due to pending closure of the Park & Ride Lot.

### ***Premium Long-Haul Commuter Bus Routes***

#### **Run 802 (3:35 PM run) Washington, DC, to Leesburg/Harmony/Purcellville – Relieve overcrowding**

Currently, Run 802 with 3:35pm service from Washington, DC, to Leesburg/Harmony/Purcellville Park & Ride Lots has experienced standee loads on 62% of the service days since the start of the fiscal year on July 1, 2017. In an effort to relieve that crowding, staff proposed adding a bus to the schedule starting at 3:40pm at the Washington Navy Yard which will pick up the western stops in Washington DC. The new bus would mirror the 802 route and then travel directly to the Harmony and Purcellville Park & Ride Lots. The existing Route 802 would continue to serve the same pick-ups in Washington DC but would now serve only the Leesburg Park & Ride Lot.

Multiple comments were received supporting the addition of the new route. The positive comments focused on both relieving the overcrowding on the 802, as well as reducing the time to get to Purcellville

and Harmony. Going forward the new route will be named the 823 and will operate as it was originally proposed.

#### **Run 815 (5:27 PM run) Rosslyn to Leesburg/Harmony/Purcellville – Address Underperformance**

Currently, Run 815 with 5:27pm service from Rosslyn to Leesburg/Harmony/Purcellville Park & Ride Lots has shown significantly lower ridership than other routes in the commuter bus system. In an effort to help meet the mandated financial performance of the entire system, staff recommended deleting Run 815. In order to still provide service between Rosslyn and the Dulles North Transit Center, Leesburg, Harmony and Purcellville Park and Ride lots, staff further proposed to add a stop in Rosslyn to Run 818. The 818 would serve Rosslyn at 5:34pm, seven minutes later than the current 815 time. The current average ridership on the 815 can be accommodated with the current average available seats on Run 818.

Concern was expressed that the additional riders on the 818 would cause the 818 to become overcrowded and that adding the Rosslyn stop to the 818 would significantly lengthen the trip time for riders from Crystal City. Currently, the 818 has been averaging slightly over 33 passengers per trip on the peak days of Tuesdays, Wednesday and Thursdays. During the same period, Run 815 has been averaging slightly over 11 passengers per trip. In addition, since the beginning of the year, there have been only 8 occasions on which the combined 818 and 815 ridership exceeded 55 passengers. The second concern raised was the time that would be added to the 818 by adding the Rosslyn stop. A time study of our routes that travel from the Pentagon to Rosslyn shows that they typically take 8 minutes to do so.

#### **Run 823 (3:40 run) DC to Harmony/Purcellville – New Run to split overcrowding on existing Run 802**

New trips on a new run that mirrors the pre-service change Run 802. See description of Run 802.

## Service Equity Analysis for Major Service Changes

When planning for Major Service Changes, Loudoun County Transit must consider potential adverse effects. The Disparate Impact Policy and Disproportionate Burden Policy establish a statistical threshold for comparing the impacts borne by minority and low-income populations to the overall service population.

This section of the report provides the substance of the service equity analysis. Beginning with the service area demographics, which are the basis of the Disparate Impact and Disproportionate Burden statistical thresholds, the report then provides summaries of the service populations affected by Major Service Changes. The technical data resources used for the analysis and the procedural methods implemented to determine the beneficial and adversarial impacts are described in the Analytical Framework. The analysis is based on Census Block Group-level Census demographic data and therefore does not represent ridership directly. Bus route maps overlaid on U.S. Census Block Groups for affected minority and low-income populations are provided at the end of the report.

### Service Area Demographics

Based on U.S. Census Bureau American Community Survey (ACS) five-year estimates from 2012 to 2016, measured at the Census Block Group level, and georeferenced bus stop data provided by Loudoun County's Office of Mapping and Geographic Information, the following thresholds for assessing Major Service Change impacts were determined for each service type.

#### *Local Fixed-Route Bus*

Minority populations comprised approximately 44.5 percent of the Loudoun County Transit (LCT) Local Fixed-Route Bus service area population (comprised of all Census Block Groups within one-quarter of a mile of local fixed-route bus stops). After applying LCT's Disparate Impact policy, the threshold for a Disparate Impact is 59.5 percent (44.5 percent system-wide plus 15 percent) for adverse changes and 29.5 percent (44.5 percent system-wide minus 15 percent) for beneficial changes.

Low-income households comprised approximately 18.3 percent of the households in the LCT Local Fixed-Route Bus service area (comprised of all Census Block Groups within one quarter of a mile of local fixed-route bus stops). After applying LCT's Disproportionate Burden policy, the threshold for a Disproportionate Burden is 33.3 percent (18.3 percent plus 15 percent) for adverse changes and 3.3 percent (18.3 percent minus 15 percent) for beneficial changes.

The population and impact thresholds for assessing Disparate Impact and Disproportionate Burden for Local Fixed-Route Bus routes are provided in **Table 2**.

**TABLE 2 LOUDOUN COUNTY TRANSIT LOCAL FIXED-ROUTE BUS MINORITY AND LOW-INCOME POPULATIONS (2012-2016 ACS)**

Disparate Impact				
Service Area Population	Minority Population	Percent Minority	Adverse Disparate Impact Threshold	Beneficial Disparate Impact Threshold
215,968	96,173	44.5%	59.5%	29.5%
Disproportionate Burden				
Service Area Households	Low-Income Households	Percent Low-Income Households	Adverse Disproportionate Burden Threshold	Beneficial Disproportionate Burden Threshold
71,459	13,084	18.3%	33.3%	3.3%

### ***Premium Long-Haul Commuter Bus***

Minority populations comprised approximately 43.1 percent of the Loudoun County Transit (LCT) Premium Long-Haul Commuter Bus service area population (comprised of all Census Block Groups within three miles of Commuter Bus stops in Loudoun County). After applying LCT's Disparate Impact policy, the threshold for a Premium Long-Haul Commuter Bus Disparate Impact is 58.1 percent (43.1 percent system-wide plus 15 percent) for adverse changes and 28.1 percent (43.1 percent system-wide minus 15 percent) for beneficial changes.

Low-income households comprised approximately 14.7 percent of the households in the LCT Premium Long-Haul Commuter Bus service area (comprised of all Census Block Groups within three miles of Commuter Bus Park & Ride stops in Loudoun County). After applying LCT's Disproportionate Burden policy, the threshold for a Premium Long-Haul Commuter Bus Disproportionate Burden is 29.7 percent (14.7 percent plus 15 percent) for adverse changes and 0.0 percent (14.7 percent minus 15 percent) for beneficial changes.<sup>1</sup>

The population and impact thresholds for assessing Disparate Impact and Disproportionate Burden for Premium Long-Haul Commuter Bus routes are provided in **Table 3**.

<sup>1</sup> With updated ACS 2012-2016 demographic data, the service area for Premium Long-Haul Commuter Bus is below 15 percent low-income, which is also the Commuter Bus Beneficial Disproportionate Burden Threshold. DCTI will review its demographics and thresholds during the development of its next Title VI Program.

**TABLE 3 | LOUDOUN COUNTY TRANSIT PREMIUM LONG-HAUL COMMUTER BUS MINORITY AND LOW-INCOME POPULATIONS (2012-2016 ACS)**

Disparate Impact				
Service Area Population	Minority Population	Percent Minority	Adverse Disparate Impact Threshold	Beneficial Disparate Impact Threshold
<b>340,615</b>	146,712	43.1%	58.1%	28.1%
Disproportionate Burden				
Service Area Households	Low-Income Households	Percent Low-Income Households	Adverse Disproportionate Burden Threshold	Beneficial Disproportionate Burden Threshold
<b>109,282</b>	16,103	14.7%	29.7%	0.0%

### Summary of Adverse and Beneficial Service Changes – Local Fixed-Route Bus

To determine whether this package of Local Fixed-Route Bus changes complies with the Loudoun County Transit Title VI policies, aggregated percentages of minority and low-income populations were determined for all adverse Local Fixed-Route Bus major service changes, as well as all beneficial Local Fixed-Route Bus major service changes. Overall, this package of Local Fixed-Route Bus service changes has no disparate impact on minority populations or disproportionate burden on low-income households.

#### Adverse Service Changes

**Table 4** breaks down the number and percent of minority population residing in Census Block Groups within one-quarter mile of each Local Fixed-Route Bus stop on the routes experiencing an *adverse* Major Service Change. When compared to the disparate impact threshold for adverse changes (59.5 percent and higher), neither the individual routes nor the aggregate affected population met the criteria for potential disparate impact.

**TABLE 4 DISPARATE IMPACT - SUMMARY OF ADVERSE LOCAL FIXED-ROUTE BUS SERVICE CHANGES**

Route	Adverse or Beneficial?	Service Area Population	Service Area Minority Population	Percent Minority Population
<b>Route 87x</b>	Adverse	5,420	2,633	48.6%
<b>Route 83</b>	Adverse	10,550	5,498	52.1%
<b>Run 991</b>	Adverse	2,454	1,199	48.9%
<b>SUBTOTAL</b>		18,424	9,330	<b>50.6%</b>
<b>Disparate Impact Threshold for Adverse Changes</b>				<b>59.5%</b>
<b>Does this package of changes meet the Disparate Impact Threshold?</b>				<b>No</b>

**Table 5** breaks down the number and percent of low-income households residing in Census Block Groups within one-quarter mile of each Local Fixed-Route Bus stop on the routes experiencing an *adverse* major service change. When compared to the disproportionate burden threshold for adverse changes (33.3

percent and higher), neither the individual routes nor the aggregate affected households met the criteria for potential disproportionate burden.

**TABLE 5 DISPROPORTIONATE BURDEN - SUMMARY OF ADVERSE SERVICE CHANGES**

Route	Adverse or Beneficial?	Service Area Households	Service Area Low-Income Households	Percent Low-Income Households
Route 87x	Adverse	2,234	710	31.8%
Route 83	Adverse	3,880	1,022	26.3%
Run 991	Adverse	738	30	4.1%
<b>SUBTOTAL</b>		6,852	1,762	<b>25.7%</b>
<b>Disproportionate Burden Threshold for Adverse Changes</b>				<b>33.3%</b>
<b>Does this package of changes meet the Disproportionate Burden Threshold?</b>				<b>No</b>

### Beneficial Service Changes

**Table 6** breaks down the number and percent of minority population residing in Census Block Groups within one-quarter mile of each Local Fixed-Route bus stop on the route experiencing a *beneficial* major service change. When compared to the disparate impact threshold for beneficial changes (29.5 percent and lower), no disparate impact was found.

**TABLE 6 | DISPARATE IMPACT - SUMMARY OF BENEFICIAL LOCAL FIXED-ROUTE BUS SERVICE CHANGES**

Route	Adverse or Beneficial?	Service Area Population	Service Area Minority Population	Percent Minority Population
Route 88x	Beneficial	4,438	2,814	63.4%
Route 980	Beneficial	30,514	18,822	61.7%
Route 990	Beneficial	2,676	1,666	62.3%
<b>SUBTOTAL</b>		37,628	23,302	<b>61.9%</b>
<b>Disparate Impact Threshold for Beneficial Changes</b>				<b>29.5%</b>
<b>Does this package of changes meet the Disparate Impact Threshold?</b>				<b>No</b>

**Table 7** breaks down the number and percent of low-income households residing in Census Block Groups within one-quarter mile of each Local Fixed-Route bus stop on the route experiencing a *beneficial* major service change. When compared to the disproportionate burden threshold for beneficial changes (3.3% and below), no disproportionate burden was found.

**TABLE 7 | DISPROPORTIONATE BURDEN - SUMMARY OF BENEFICIAL LOCAL FIXED-ROUTE BUS SERVICE CHANGES**

Route	Adverse or Beneficial?	Service Area Households	Service Area Low-Income Households	Percent Low-Income Households
Route 88x	Beneficial	1,664	181	10.9%
Route 980	Beneficial	9,790	2,328	23.8%
Route 990	Beneficial	908	282	31.1%

Route	Adverse or Beneficial?	Service Area Households	Service Area Low-Income Households	Percent Low-Income Households
<b><i>SUBTOTAL</i></b>		12,362	2,791	<b>22.6%</b>
<b>Disproportionate Burden Threshold for Beneficial Changes</b>				<b>3.3%</b>
<b>Does this package of changes meet the Disproportionate Burden Threshold?</b>				<b>No</b>

### ***Local Fixed-Route Bus Service Restoration as Additional Funds become available***

The Department of Transportation & Capital Infrastructure has selected these routes to be modified or eliminated based on the number of riders using the service. The selection of these routes for modification was performance based rather than budgetary. However, if additional funding were to become available and once the Silver Line Metro extension into Loudoun County is complete, DTCl would consider adding new Local Bus service or expanding the existing routes.

## **Summary of Adverse and Beneficial Service Changes – Premium Long-Haul Commuter Bus**

To determine whether this package of changes complies with Loudoun County Transit’s Title VI policies, aggregated percentages of minority and low-income populations were determined for all adverse Premium Long-Haul Commuter Bus major service changes and all beneficial Premium Long-Haul Commuter Bus major service changes. Overall, these Premium Long-Haul Commuter Bus service changes have no disproportionate burden on low-income households. Using the Major Service Change and Disparate Impact Policies, a beneficial change to Run 823 was found to have a disparate impact, but a substantial legitimate justification for this change is provided below **Table 10**.

### ***Adverse Service Changes***

**Table 8** breaks down the number and percent of minority population residing in Census Block Groups within three miles of each stop on Premium Long-Haul Commuter routes experiencing an *adverse* Major Service Change. When compared to the disparate impact threshold for adverse major service changes (58.1 percent and higher), no route met the criteria for potential disparate impact.

**TABLE 8 | DISPARATE IMPACT - SUMMARY OF ADVERSE PREMIUM LONG-HAUL COMMUTER BUS SERVICE CHANGES**

Route	Adverse or Beneficial?	Service Area Population	Service Area Minority Population	Percent Minority Population
<b>Run 802</b>	Adverse	38,674	6,397	16.5%
<b>Run 815</b>	Adverse	176,413	72,055	40.8%
<b>SUBTOTAL</b>		215,087	78,452	<b>36.5%</b>
<b>Disproportionate Burden Threshold for Adverse Changes</b>				<b>58.1%</b>
<b>Does this package of changes meet the Disproportionate Burden Threshold?</b>				<b>No</b>

**Table 9** breaks down the number and percent of low-income households residing in Census Block Groups within three miles of each stop on Premium Long-Haul Commuter routes experiencing an *adverse* Major Service Change. When compared to the disproportionate burden threshold for adverse changes (29.7 percent and higher), no route met the criteria for a potential disproportionate burden.

**TABLE 9 | DISPROPORTIONATE BURDEN - SUMMARY OF ADVERSE PREMIUM LONG-HAUL COMMUTER BUS SERVICE CHANGES**

Route	Adverse or Beneficial?	Service Area Households	Service Area Low-Income Households	Percent Low-Income Households
Run 802	Adverse	12,137	1,703	14.0%
Run 815	Adverse	56,478	9,878	17.5%
<b>SUBTOTAL</b>		68,615	11,581	<b>16.9%</b>
<b>Disparate Impact Threshold for Adverse Changes</b>				<b>29.7%</b>
<b>Does this package of changes meet the Disparate Impact Threshold?</b>				<b>No</b>

### *Premium Long-Haul Commuter Service Restoration as Additional Funds become available*

The Department of Transportation & Capital Infrastructure has selected these routes for modification based on the number of riders using the service. However, if additional funding were to become available, DTCI would consider adding new Premium Long-Haul Commuter service and park & ride lots.

### *Beneficial Service Changes*

**Table 10** breaks down the number and percent of minority population residing in Census Block Groups within three miles of each stop on Premium Long-Haul Commuter routes experiencing a *beneficial* Major Service Change. When compared to the disparate impact threshold for beneficial changes (28.1 percent and lower), Run 823 met the criteria for potential disparate impact; the “Justification” section below **Table 10** provides a description of this new service, and a justification for the Disparate Impact finding for a beneficial service change.

**TABLE 10 | DISPARATE IMPACT - SUMMARY OF BENEFICIAL PREMIUM LONG-HAUL COMMUTER BUS SERVICE CHANGES**

Route	Adverse or Beneficial?	Service Area Population	Service Area Minority Population	Percent Minority Population
Run 823	Beneficial	36,468	6,025	16.5%
<b>SUBTOTAL</b>		36,468	6,025	16.5%
<b>Disparate Impact Threshold for Adverse Changes</b>				<b>28.1%</b>
<b>Does this package of changes meet the Disparate Impact Threshold?</b>				<b>Yes</b>

### *Substantial Legitimate Justification*

*Run 823 is a new name for an existing service – before the July 2018 service change, Run 802 (an afternoon run between Washington, DC and Loudoun County) started at 3:35 p.m. on weekdays at the*

Navy Yard Metro Station and picked up passengers at stops in Washington DC, then traveled to Loudoun County, where it served the Harmony, Purcellville, and Leesburg Park & Ride Lots. After the July 2018 service change to relieve overcrowding, Run 802 will operate on the same alignment in Washington, D.C., but only serve the Leesburg Park & Ride in Loudoun County. The new Run 823 will start at 3:40 p.m. on weekdays at the Navy Yard, then travel along the old Run 802 alignment to pick up passengers at stops in Washington, DC, before serving the Harmony and Purcellville Park & Ride Lots in Loudoun County. While the reclassification of this alignment created a beneficial “new” route with “new” service to the Purcellville and Harmony Park & Ride Lots, it is actually a continuation of an existing service, and riders will experience the same service as they did before the July 2018 service change.

**Table 11** breaks down the number and percent of low-income households residing in Census Block Groups within three miles of each stop on Premium Long-Haul Commuter routes experiencing a *beneficial* major service change. When compared to the disproportionate burden threshold for beneficial changes (zero percent), no disproportionate burden was found.

**TABLE 11 | DISPROPORTIONATE IMPACT - SUMMARY OF BENEFICIAL PREMIUM LONG-HAUL COMMUTER BUS SERVICE CHANGES**

Route	Adverse or Beneficial?	Service Area Households	Service Area Low-Income Households	Percent Low-Income Households
Run 823	Beneficial	11,273	1,530	13.6%
<b>SUBTOTAL</b>		11,273	1,530	13.6%
<b>Disparate Impact Threshold for Adverse Changes</b>				<b>0.0%</b>
<b>Does this package of changes meet the Disparate Impact Threshold?</b>				<b>No</b>

## Analytical Framework

This section describes in detail the sources of data and the procedural methods used in the analysis. The end of this section contains the service area maps with demographic information showing minority and low-income Census Block Groups.

### Datasets and Techniques Used in Analysis

For this analysis, the primary data source was the U.S. Census Bureau American Community Survey (ACS) five-year estimates from 2012 to 2016, measured at the Census Block Group level. Geographic data provided by Loudoun County’s Office of Mapping and Geographic Information was also used to determine the service areas within Loudoun County for the entire Loudoun County Transit (LCT) Bus network, as well as the service areas of the current route alignments that have planned service changes.

For the Disparate Impact analysis, the primary ACS table utilized was Table B03002, “Hispanic or Latino Origin by Race.” This table identifies all minority and non-minority populations within a block group, including Hispanic or Latino. To determine minority population for the LCT Bus service area, total population estimates and minority population estimates (total population minus non-Hispanic White population) for Census Block Groups were used along with bus stop point data and route line data within Geographic Information System (GIS) software.

For the Disproportionate Burden analysis, the primary ACS table utilized was Table B19001, “Household Income in the Past 12 Months (In 2015 Inflation-Adjusted Dollars).” This table provides an aggregate of households reporting incomes under half of the Area Median Income, which includes all income categories under \$50,000. To determine low-income households for the LCT Bus service area, Census Block Groups with household incomes below \$50,000 were used along with bus stop point data within Geographic Information System (GIS) software.

The same LCT service areas were evaluated for both the Disparate Impact analysis and Disproportionate Burden analysis. Using GIS, a one-quarter mile buffer was placed around each Local Fixed-Route Bus stop; the resulting area was considered as the Local Fixed-Route Bus service area. The Premium Long-Haul Commuter Bus service area was defined by a three-mile buffer around stops serving the route. Census Block Groups contained either partially or wholly within those service areas were used as part of the calculation.

### **Analytical Methodology**

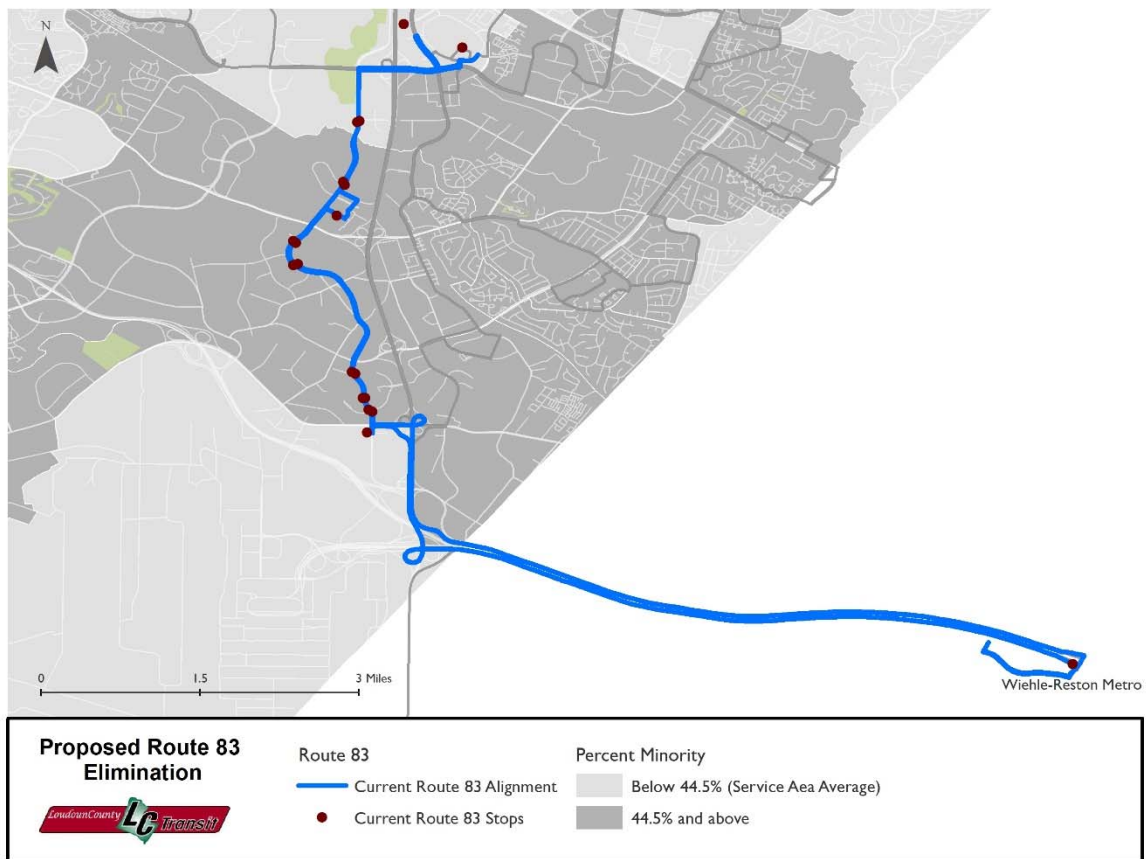
Loudoun County Transit used the procedures noted below to conduct this service equity analysis.

1. All proposed changes were examined to see if they met the Loudoun County Transit’s definition of a Major Service Change.
2. For routes that qualified as Major Service Changes, each route was categorized by whether the change was considered as an adverse change or a beneficial change for the population currently served by the route. Loudoun County Transit (LCT) considers modifications such as route discontinuation, truncating or eliminating a route segment, rerouting an existing route, headway increases, and reduction of service span to be service changes that may have an adverse effect. LCT considers the degree of adverse effects, and analyzed those effects, when planning service changes. A beneficial change would have positive impacts on those within the service area of the route, such as the addition of new service, an increase in frequency, or an increase in span of an existing service.
3. Using geo-referenced point data and Census Block data, the service area population and the total number of households were determined for all current Local Fixed-Route bus service areas and current Premium Long-Haul Commuter bus service areas.
  - a. Local Fixed-Route Bus: For this analysis, LCT’s Local Fixed-Route Bus Service Area was defined by a one-quarter mile buffer around every LCT Local Fixed-Route bus stop, including any diversions, i.e., any variations from the trunk line, even if the route only makes that variation trip a small number of times. Total population and households, as well as minority populations and low-income households, were then determined for the Local Fixed-Route Bus Service Area.
  - b. Premium Long-Haul Commuter Bus: For this analysis, LCT’s Premium Long-Haul Commuter Bus Service Area was defined as a three-mile buffer around every LCT Commuter Bus stop. Total population and households, as well as minority populations and low-income households, were then determined for the Premium Long-Haul Commuter Bus Service Area.

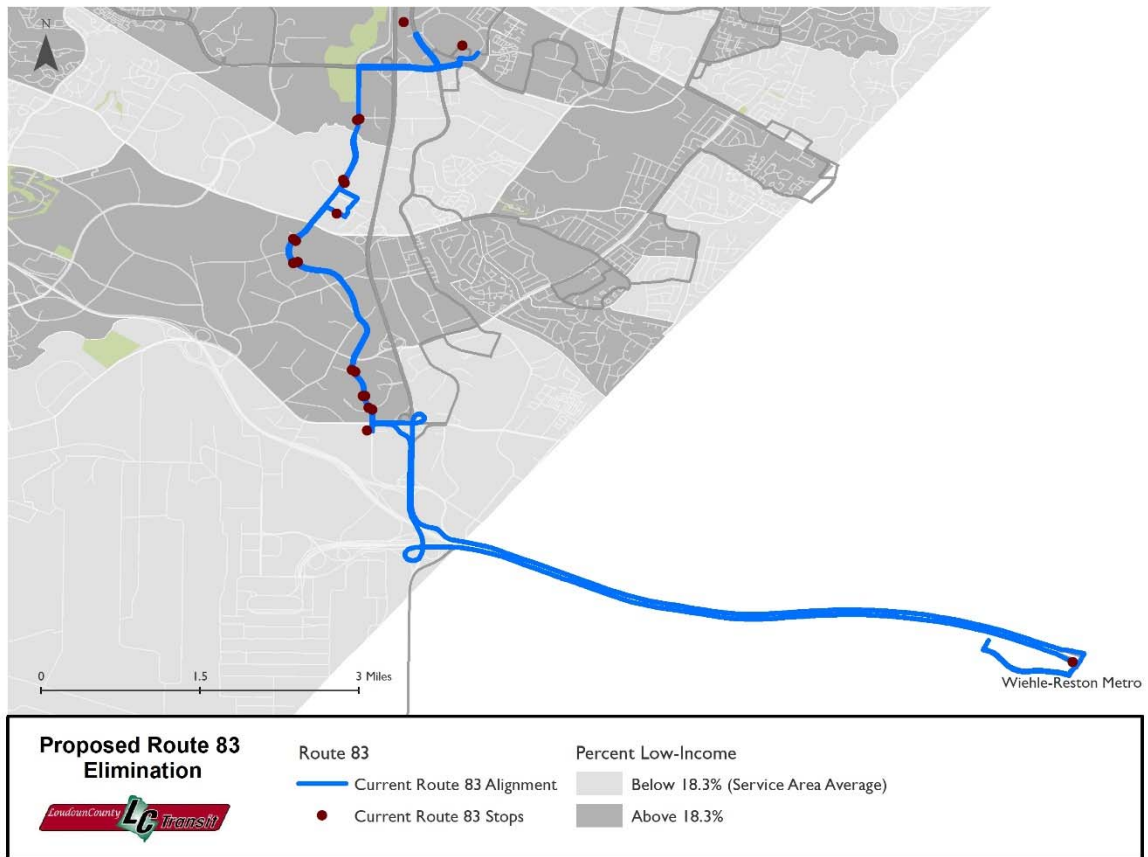
4. Next, the populations and households affected by the Major Service Change were determined for the route or run by the same means used to calculate the totals as described in Step 3, except that the calculation was focused on only the specific route or run rather than the all routes or runs within the service type (Local Fixed-Route Bus or Premium Long-Haul Commuter Bus) generally.
5. For each of the adverse and beneficial changes, totals were then found for minority populations and low-income households impacted by each of the identified major service changes.
6. Based on the definitions of disparate impact and disproportionate burden, explained above, the overall thresholds were determined as follows:
  - a. Disparate Impact Threshold for adverse changes: Loudoun County Transit's service area percentage of population that is minority, plus 15 percent.
  - b. Disparate Impact Threshold for beneficial changes: Loudoun County Transit's service area percentage of population that is minority, minus 15 percent.
  - c. Disproportionate Burden Threshold for adverse changes: Loudoun County Transit's service area percentage of households that earn less than half of the area median income, plus 15 percent.
  - d. Disproportionate Burden Threshold for beneficial changes: Loudoun County Transit's service area percent of households that earn less than half of the area median income, minus 15 percent.
7. Finally, for the adverse and for the beneficial changes separately, the aggregated percent of minority populations and the aggregated percent of low-income households were compared to the appropriate Disparate Impact / Disproportionate Burden thresholds in order to determine if a statistical disparate impact or disproportionate burden had occurred.

### ***Overlay Maps with Service Changes and Demographic Data***

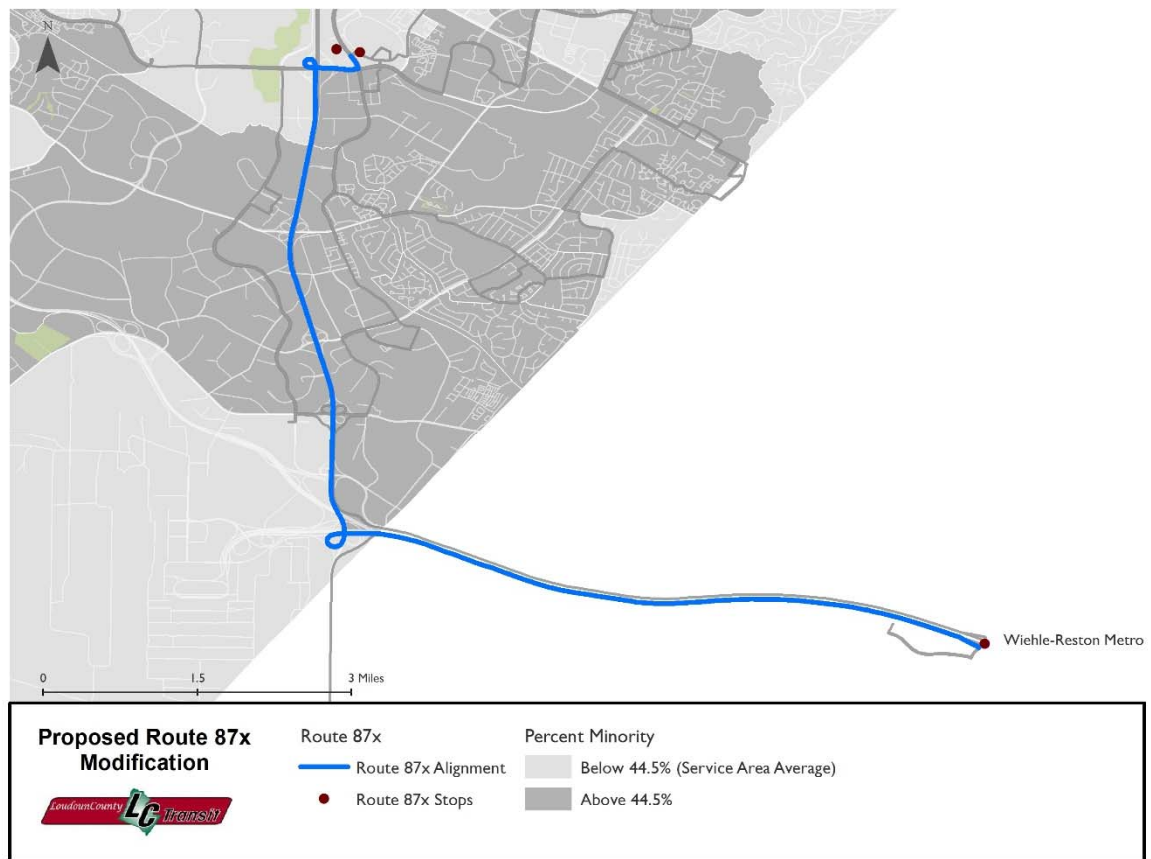
Route maps for each Major Service Change have been overlain on population demographics for the service area and are provided in Figures 3 through 20. Separate maps are provided to illustrate minority populations and low-income populations based on Census Blocks.



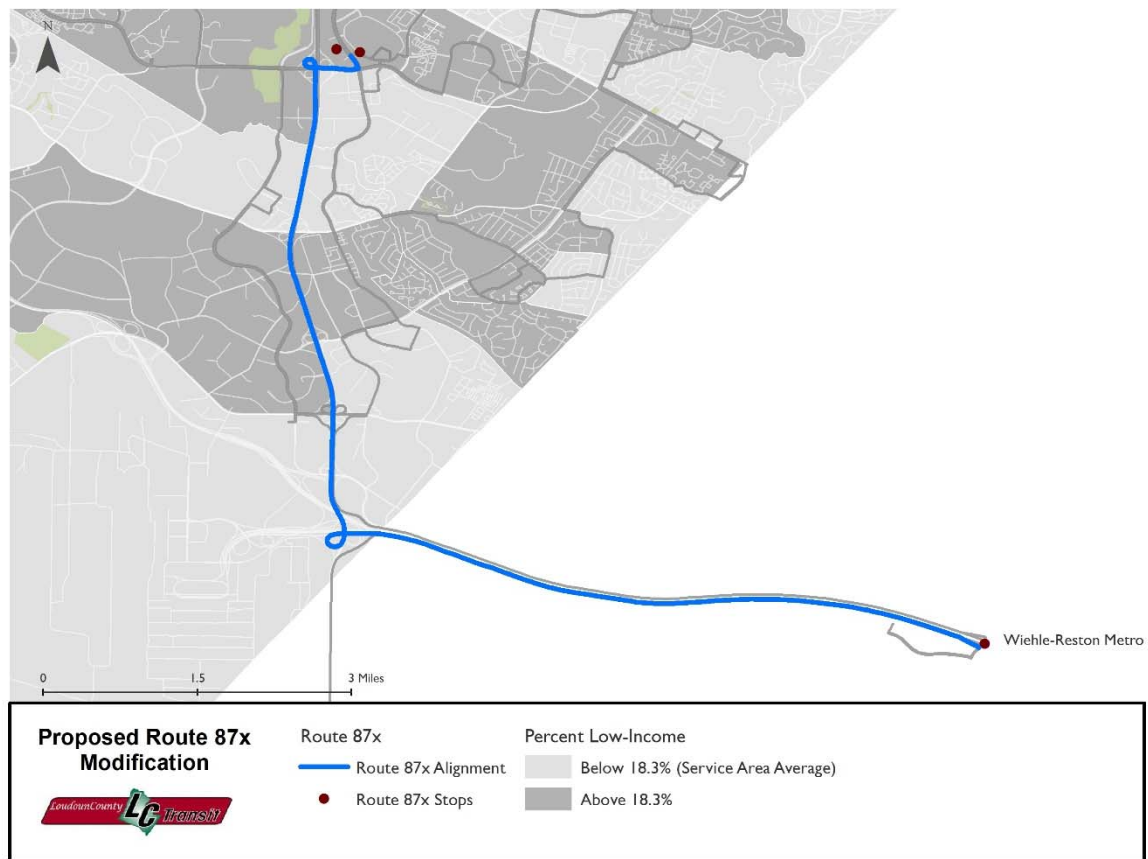
**FIGURE 3 | PROPOSED ROUTE 83 SERVICE CHANGE - MINORITY**



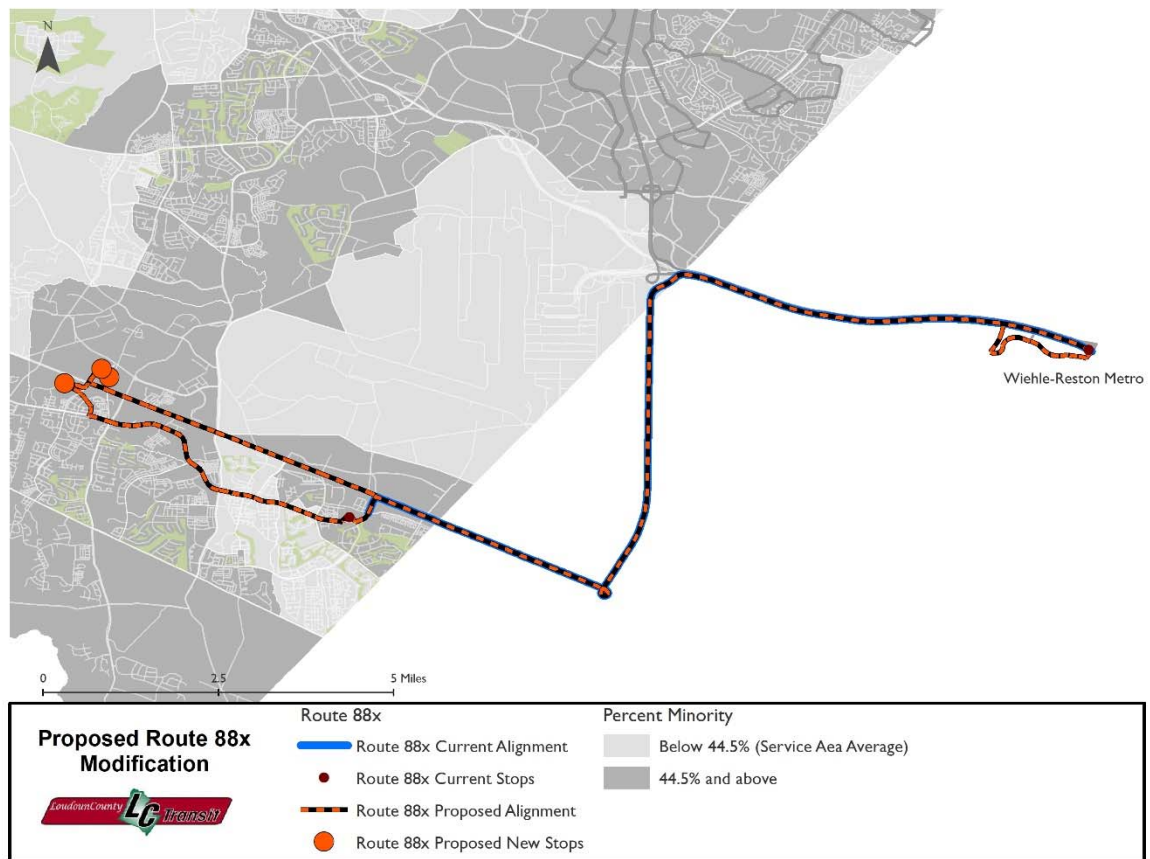
**FIGURE 4 | PROPOSED ROUTE 83 SERVICE CHANGE - LOW-INCOME**



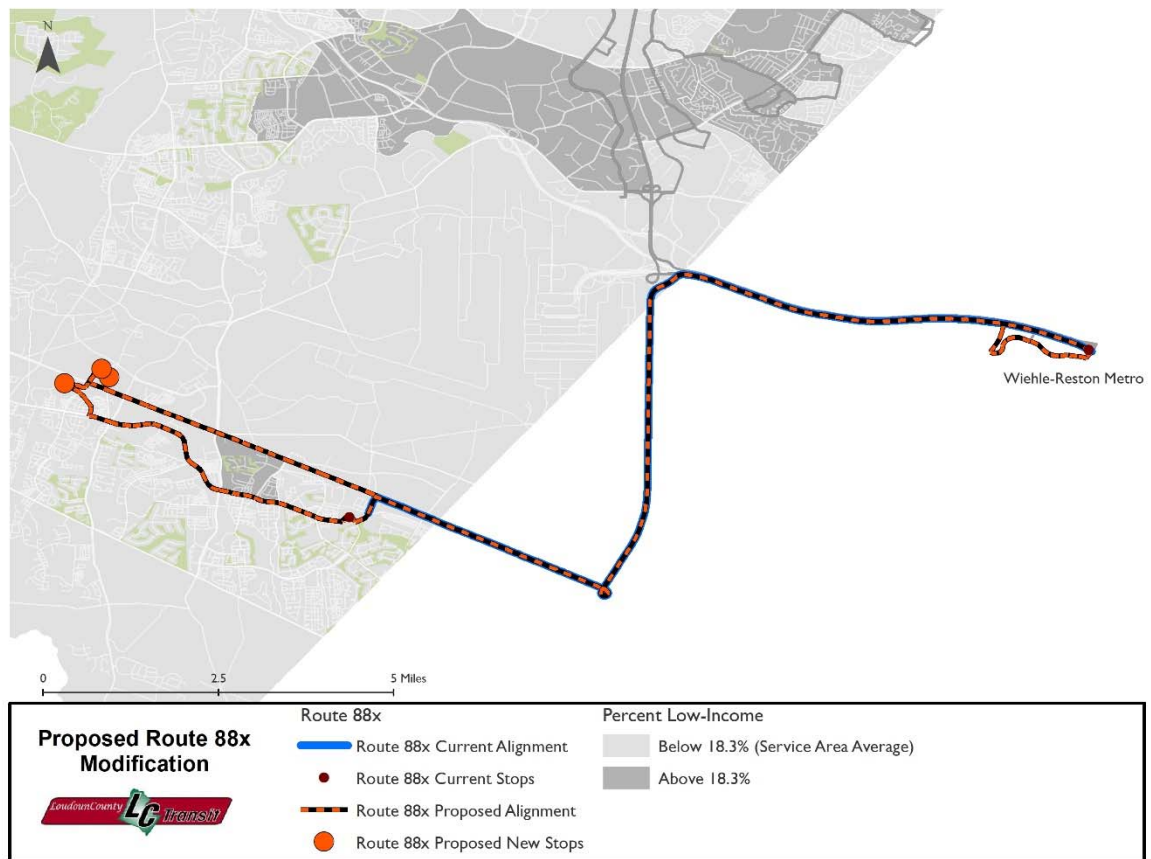
**FIGURE 5 | PROPOSED ROUTE 87x SERVICE CHANGE – MINORITY**



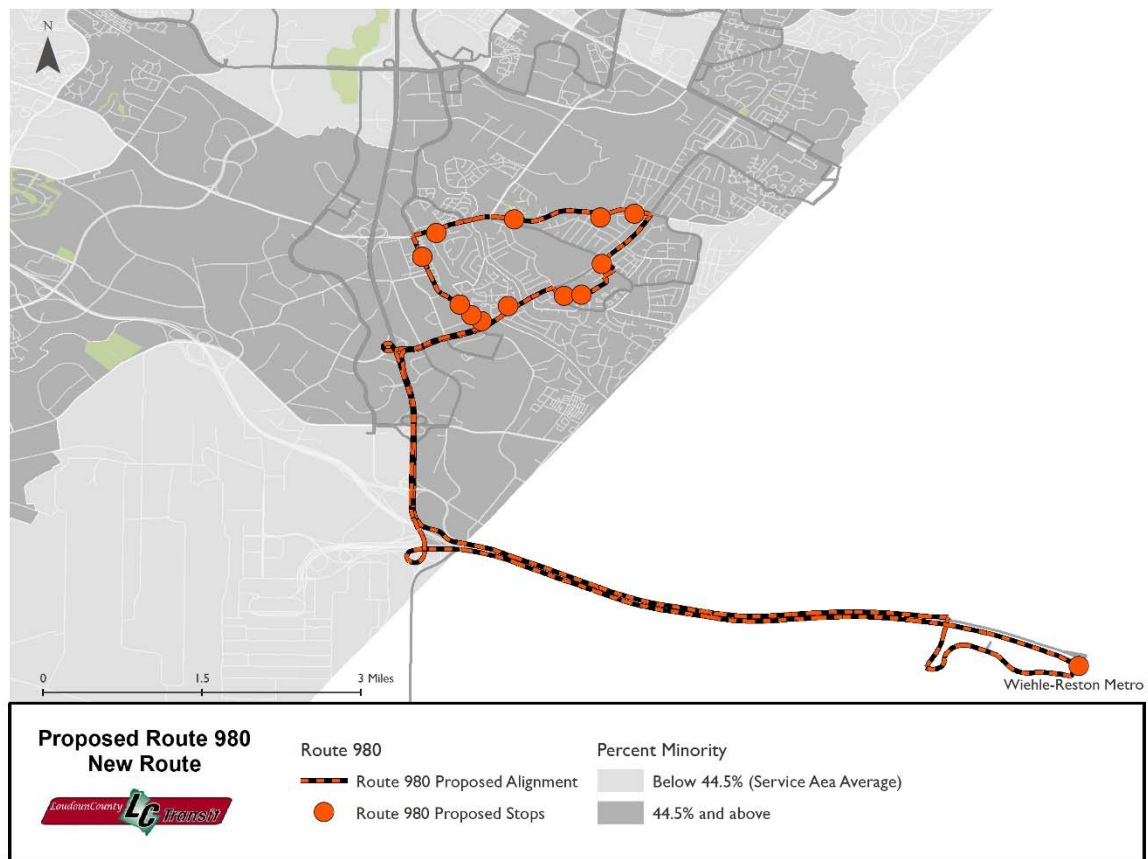
**FIGURE 6 | PROPOSED ROUTE 87x SERVICE CHANGE – LOW-INCOME**



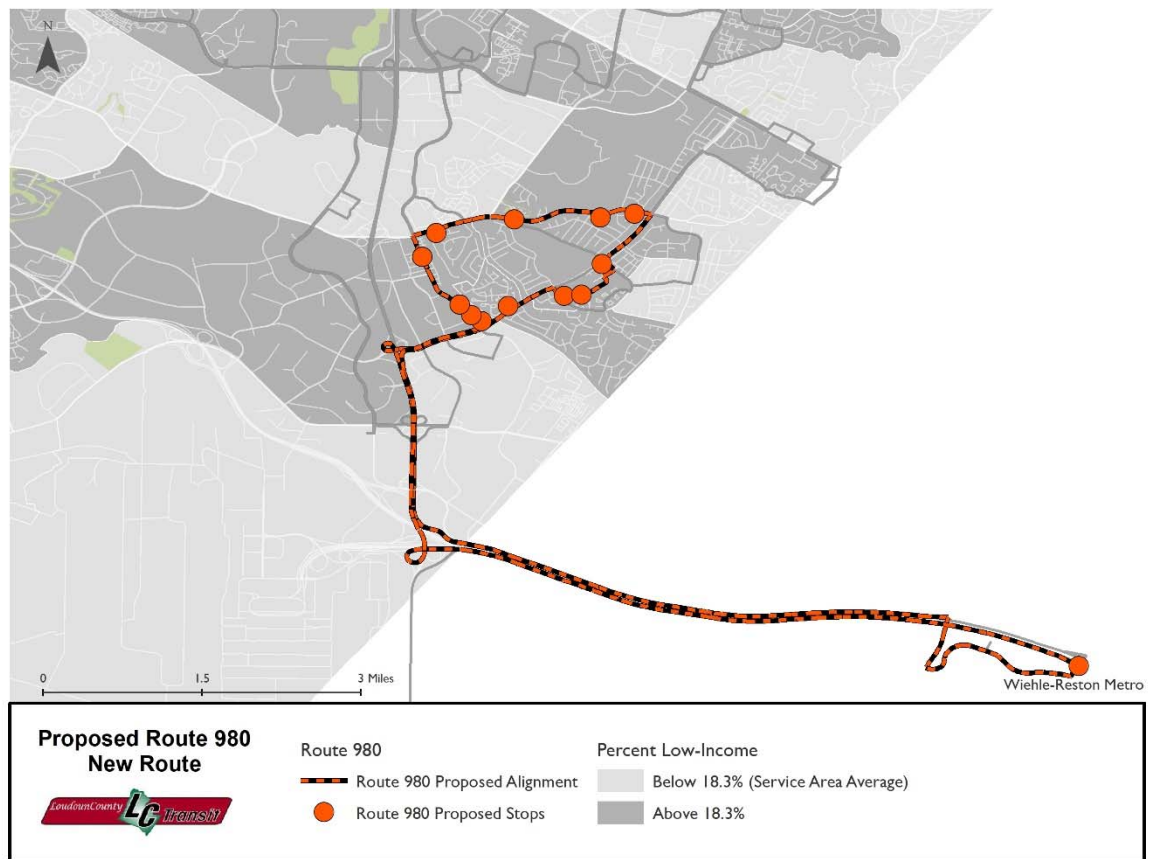
**FIGURE 7 | PROPOSED ROUTE 88x SERVICE CHANGE - MINORITY**



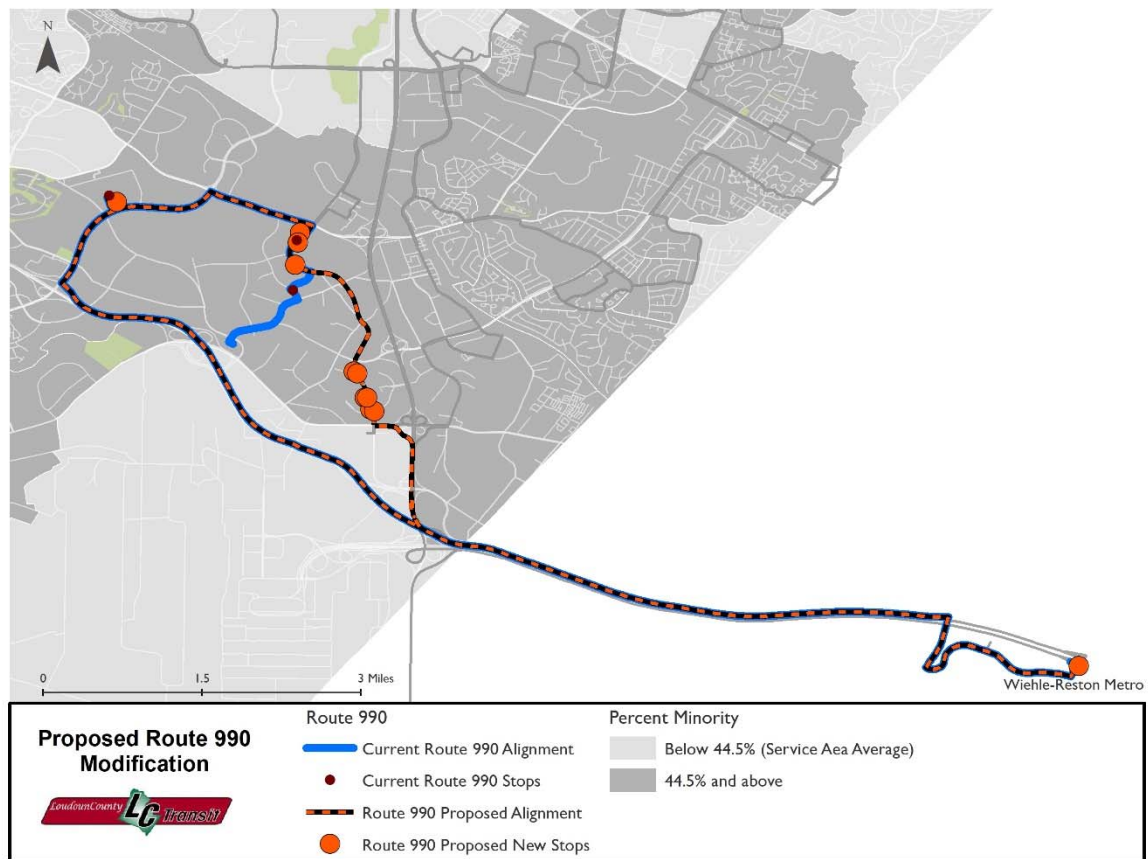
**FIGURE 8 | PROPOSED ROUTE 88x SERVICE CHANGE – LOW-INCOME**



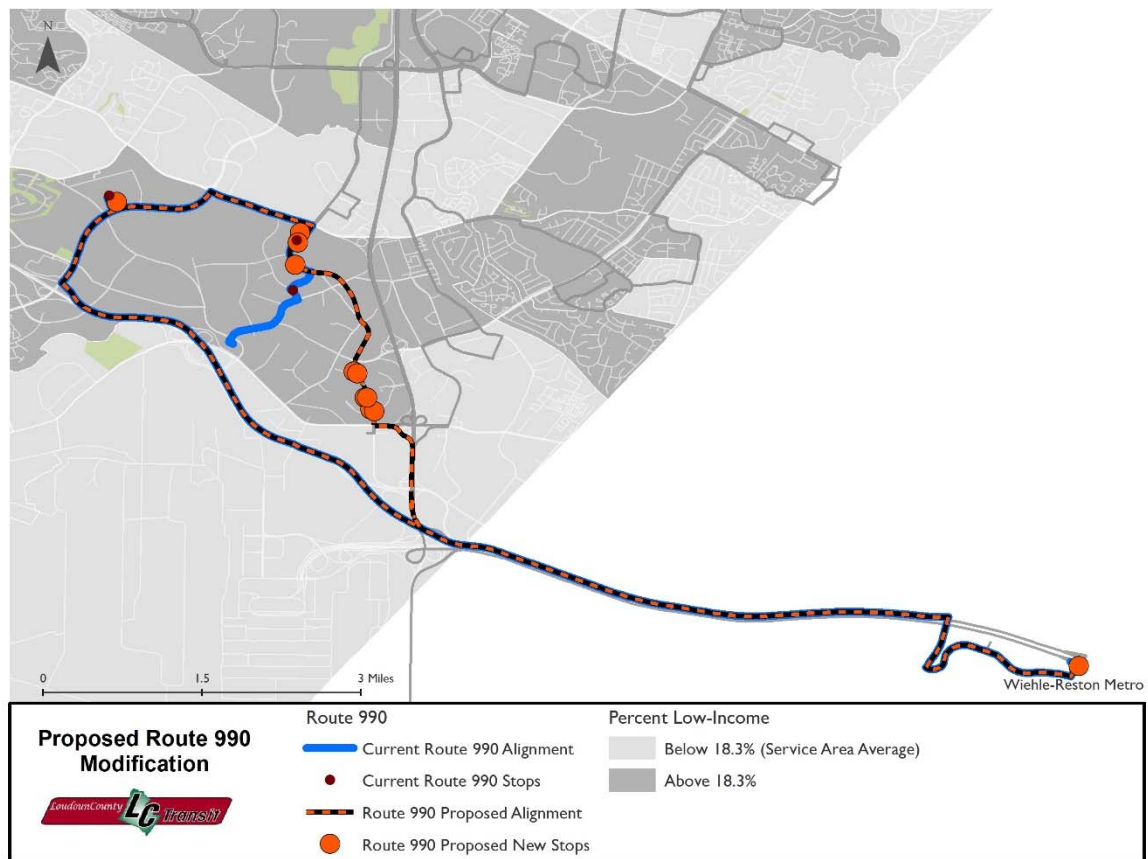
**FIGURE 9 | PROPOSED ROUTE 980 SERVICE CHANGE – MINORITY**



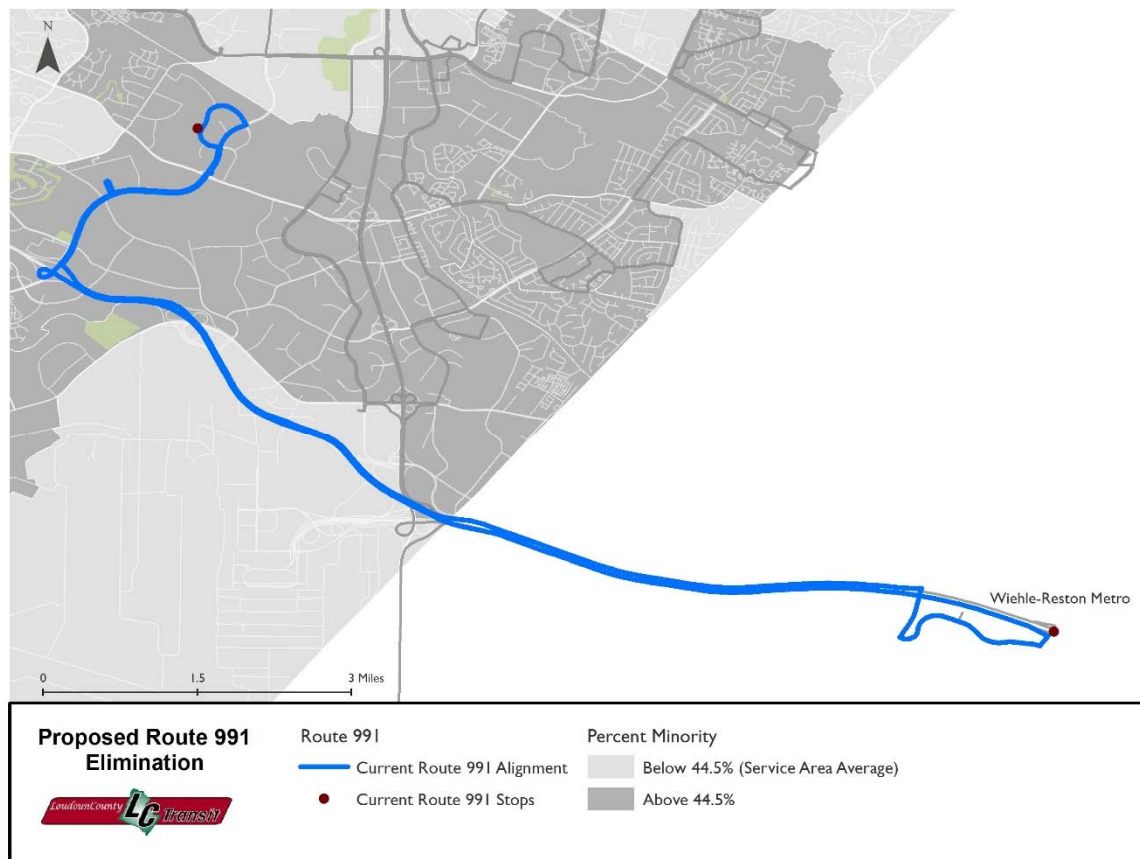
**FIGURE 10 | PROPOSED ROUTE 980 SERVICE CHANGE – LOW INCOME**



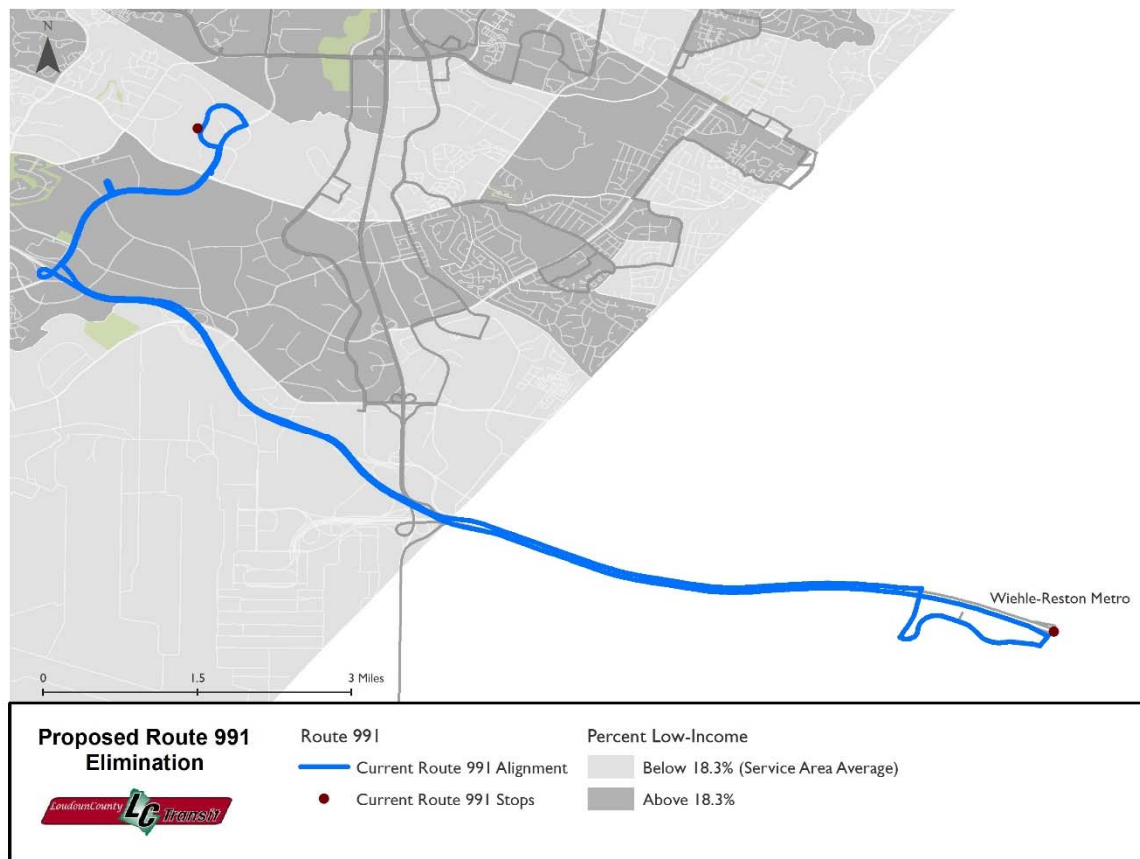
**FIGURE 11 | PROPOSED ROUTE 990 SERVICE CHANGE – MINORITY**



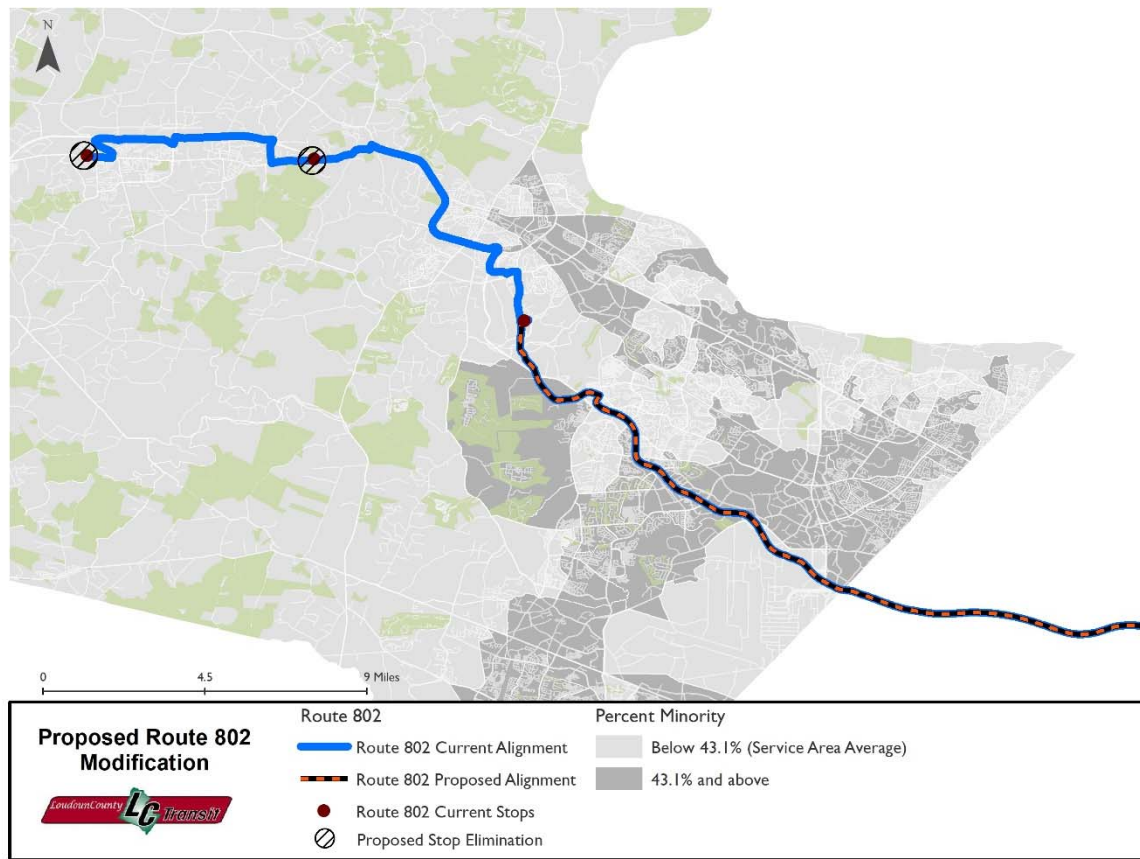
**FIGURE 12 | PROPOSED ROUTE 990 SERVICE CHANGE – LOW-INCOME**



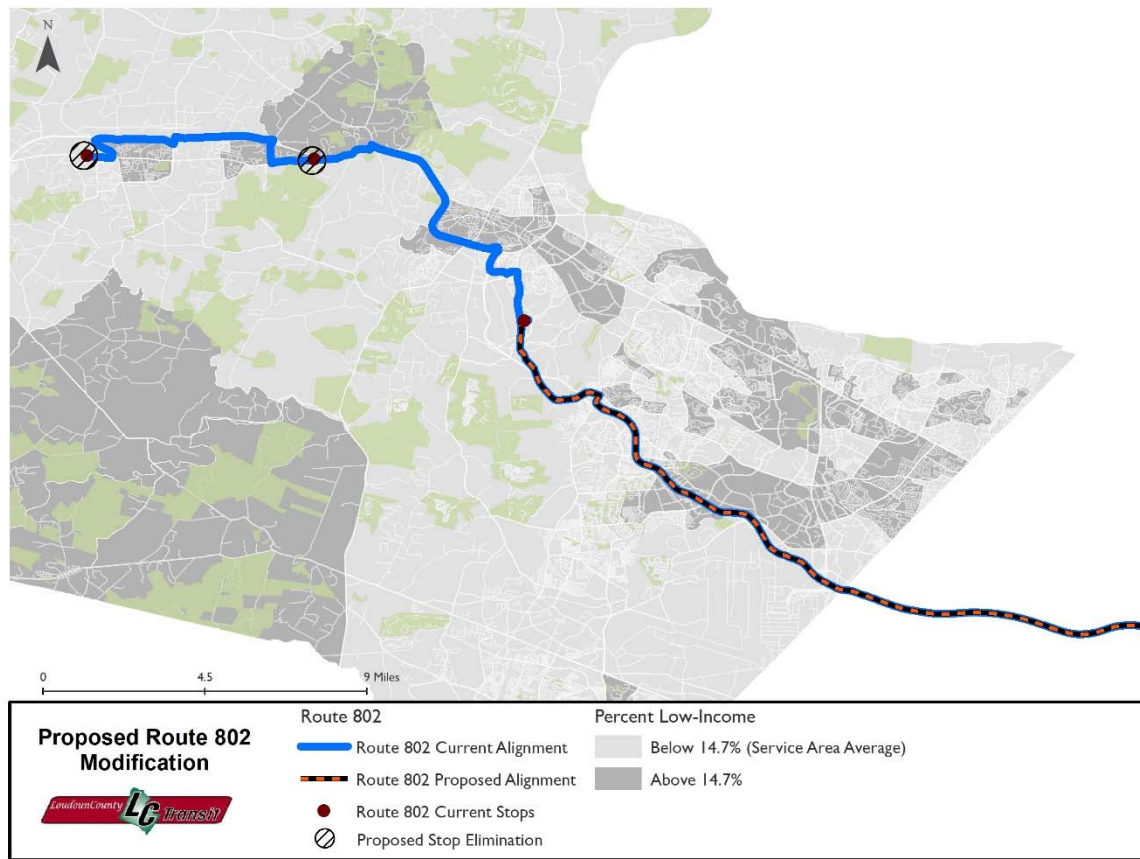
**FIGURE 13 | PROPOSED RUN 991 SERVICE CHANGE – MINORITY**



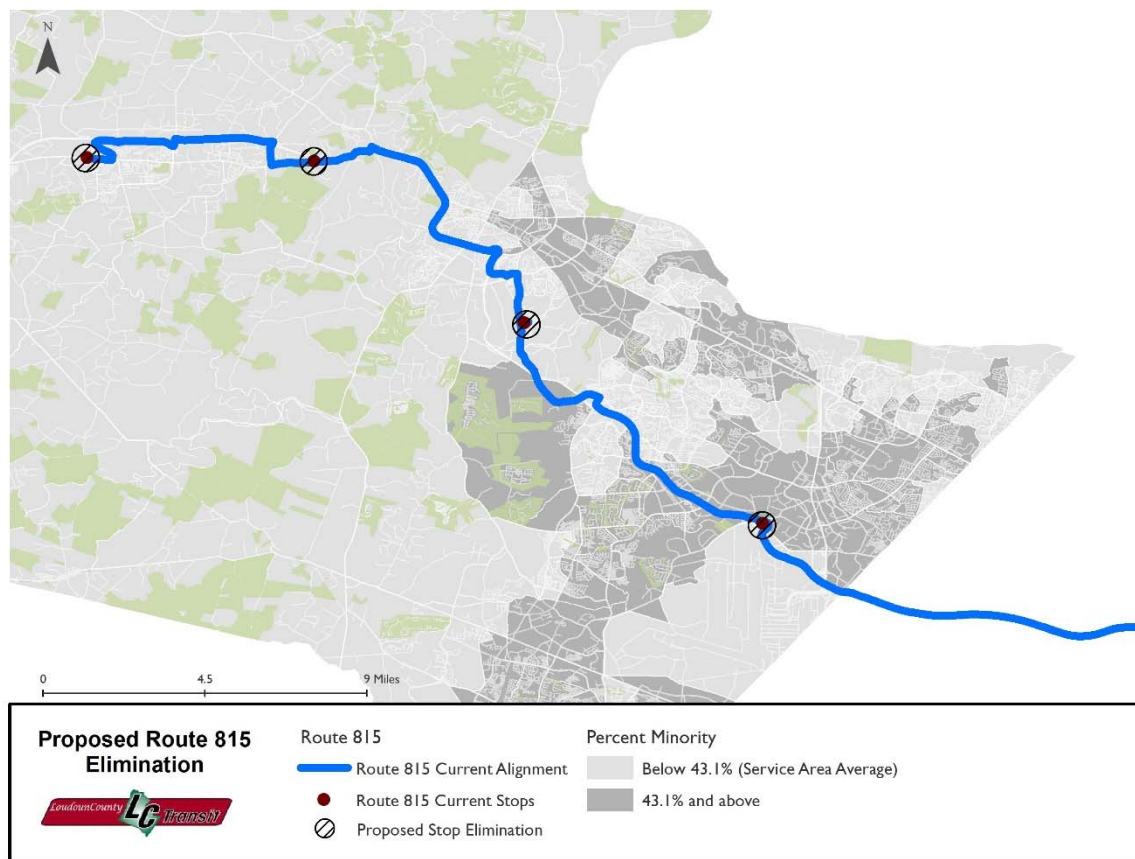
**FIGURE 14 | PROPOSED RUN 991 SERVICE CHANGE –LOW INCOME**



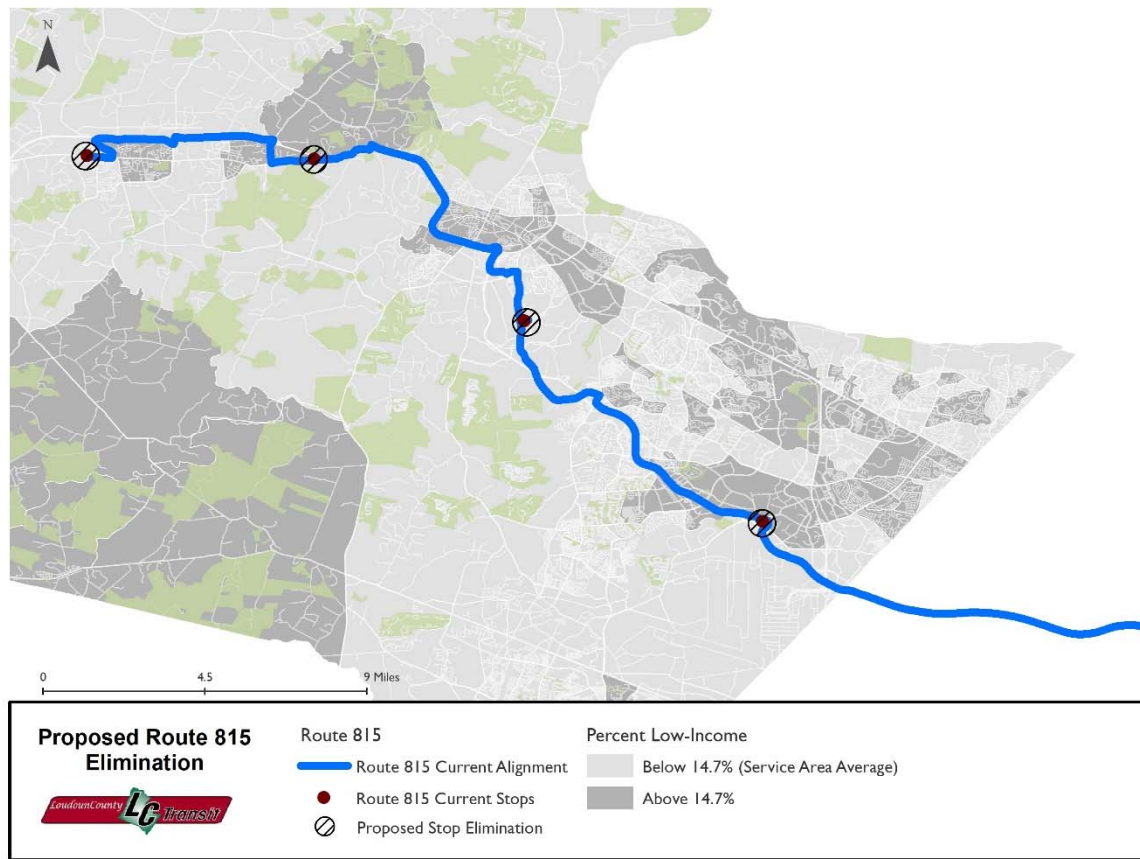
**FIGURE 15 | PROPOSED RUN 802 SERVICE CHANGE – MINORITY**



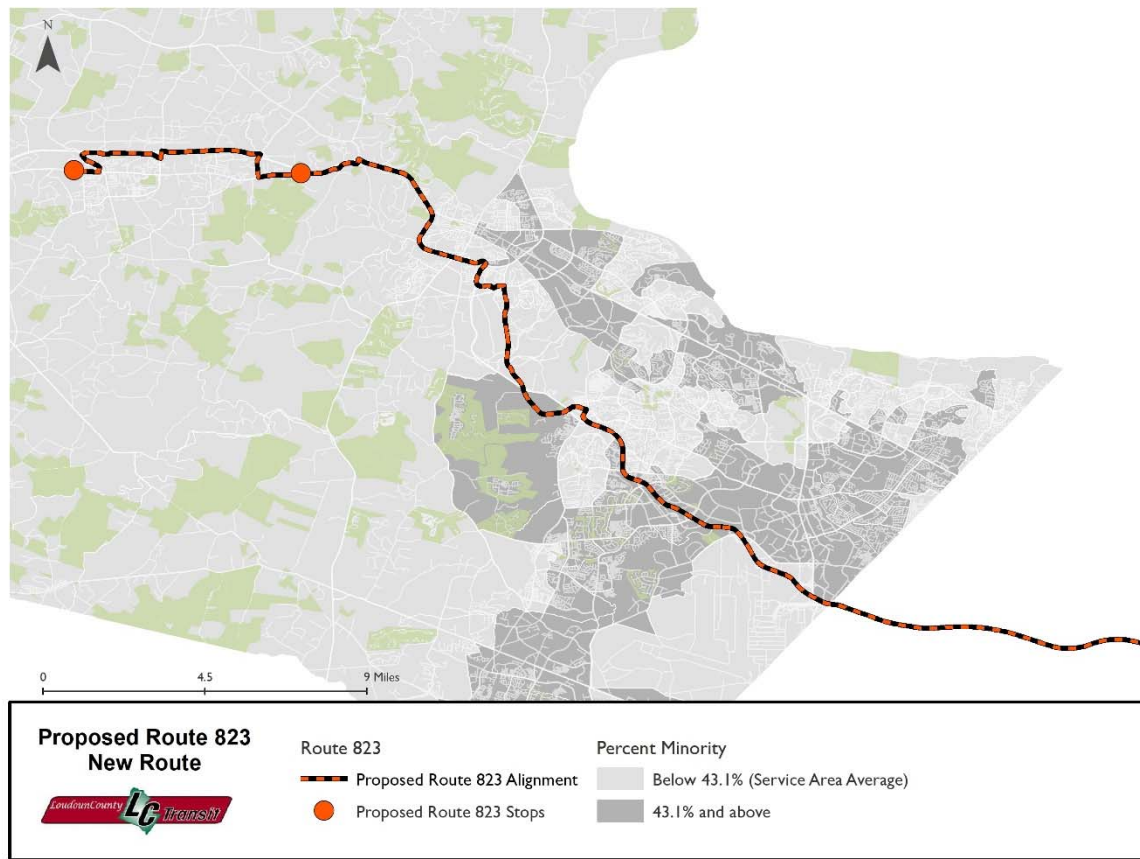
**FIGURE 16 | PROPOSED RUN 802 SERVICE CHANGE – LOW-INCOME**



**FIGURE 17 | PROPOSED RUN 815 SERVICE CHANGE – MINORITY**



**FIGURE 18 | PROPOSED RUN 815 SERVICE CHANGE – LOW-INCOME**



**FIGURE 19 | PROPOSED RUN 823 SERVICE CHANGE – MINORITY**



**FIGURE 20| PROPOSED RUN 823 SERVICE CHANGE – LOW-INCOME**

