



Major Change
and
Service Equity Analysis

January 2019 Schedule Changes



This Page Intentionally Left Blank

Table of Contents

Overview	5
Service and Fare Equity (SAFE)	5
Identifying Fare Change	5
Identifying Major Service Change	5
a. Change in number of trips (route level) – Major Change	7
b. Change in service span (route level) – N/A	7
c. Redirecting a route (route level) – N/A	7
d. Change in total miles serviced by the route (route level) – N/A	7
e. Shortlining or longlining (route level) – N/A	8
f. Eliminating routes (route level) – N/A	8
g. Adding new route(s) (system level) – N/A	8
h. Change total daily revenue hours (system level) – Minor Change	8
Disparate Impact Analysis	9
Methodology	9
Results	10
Disproportionate Burden Analysis	10
Methodology	11
Results	11
Conclusion	12
Board Approval Signatures	12



This Page Intentionally Left Blank

Overview

This report summarizes the results of the Major Change and Service Equity analysis conducted on the January 2019 service changes. The proposed service change is the headway change on the 4A and 4B from every 15 minutes to every 30 minutes. The proposed changes were identified as Major Service Changes from the current September 2018 schedule, requiring the performance of a service equity analysis, per the requirement of GRTC's Title VI Program – Service and Fare Equity Policy (February 2017). The analysis results determined that the new schedule will not have a disparate impact on minority populations or impose a disproportionate burden on low income populations.

Service and Fare Equity (SAFE)

GRTC has a fare and service equity analysis policy and process to evaluate proposed service and fare changes. The Service and Fare Equity (SAFE) process shall be performed in any and all of the following conditions:

- Any fare change (increase or reduction) is considered on one or more routes or services (local, express, specialized or other)
- A major service change (increase or reduction) is considered on one or more routes or services

All major service changes shall undergo a service equity analysis to ensure that these changes do not have disparate impacts on minority populations, or impose a disproportionate on low-income populations, consistent with the intent and requirements of FTA Circular 4702.1B and Title VI of the Civil Rights Act of 1964.


Identifying Fare Change

There are no proposed fare changes with this schedule.

Identifying Major Service Change

The table below lists the metrics and thresholds that identify whether a service change is identified as major. There are six metrics (a-f) that determine if a change to an individual route is a major change, and two metrics (g-h) that determine if a change is a system level major change. The table describes the metric, the threshold, provides an example, and lists the identified major changes respective to each metric. All metrics that were triggered as major changes have the route listed in red in the table and have a star. The full analysis for each metric follows the table.

Route Level Metrics

Route Level Metric	Level of Change Required to be Classified as a Major Change	Example	Sept 2018 Proposed Changes
a. Change in number of trips 	25% change in number of scheduled one-way trips on the Weekday, Saturday or Sunday schedule.	Decreasing number of trips from 80 daily one-way trips to 50 one-way trips.	<ul style="list-style-type: none"> • Route 4A – Above 25% Change • Route 4B – Above 25% Change
b. Change in service span	25% change in the number of hours between the beginning and end of the Weekday, Saturday or Sunday schedule, in either direction.	Changing Weekday span on a route from 20 hours to 15 hours or less.	<ul style="list-style-type: none"> • N/A
c. Re-directing a route	Rerouting at least 25% of a route's path onto a different street or road, measured in single-direction route miles.	Moving two miles of an eight-mile route to another street or road (even if the new routing is very near the current routing).	<ul style="list-style-type: none"> • N/A
d. Change in total miles serviced by the route	25% change in total miles on a route's path	Extending or shortening a line.	<ul style="list-style-type: none"> • N/A

Route Level Metric	Level of Change Required to be Classified as a Major Change	Example	Sept 2018 Proposed Changes
e. Shortlining or Longlining	25% change in number of scheduled one-way trips ending at a route's terminal points.	On a route originally going from points A to B to C, terminating certain trips at B. On a route originally going from A to B, extending certain trips to travel all the way to point C.	<ul style="list-style-type: none"> • N/A
f. Eliminating Route(s)	Eliminating one or more routes.	Discontinuing an existing route (even if replacing this route with nearby service).	<ul style="list-style-type: none"> • N/A

Figure 1

a. Change in number of trips (route level) – Major Change
Routes 4A and 4B are above the 25 percent threshold for Weekday and Saturday schedule type.

Jurisdiction	Route	Review	Weekday				Saturday				Sunday				Change Category
			Change	Current	New	% Change	Change	Current	New	% Change	Change	Current	New	% Change	
Richmond	4A	x	-57	135	78	-42%	-42	120	78	-35%	0	69	69	0%	Major
Richmond	4B	x	-57	135	78	-42%	-42	120	78	-35%	0	69	69	0%	Major

Figure 2

Change Area – Saturday and Sunday Impact

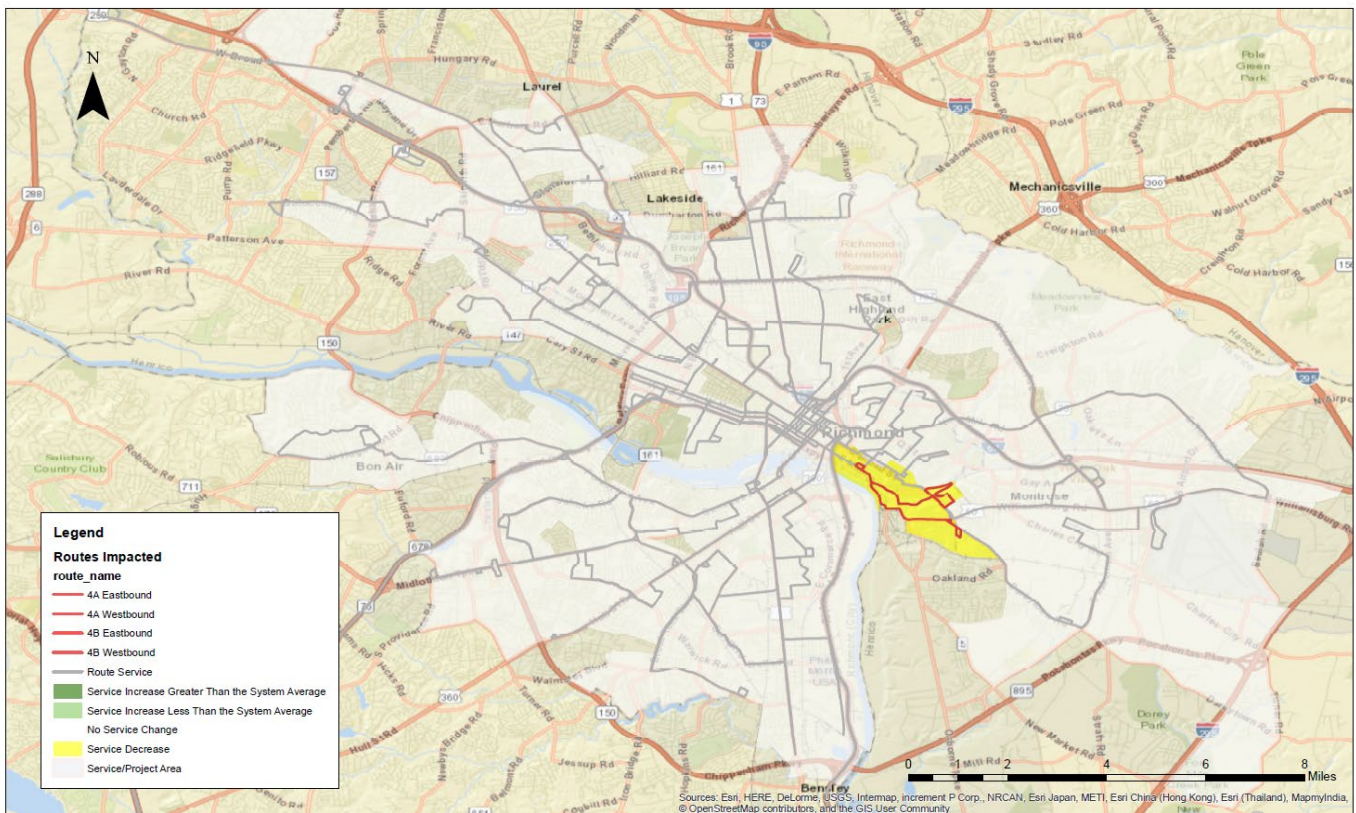


Figure 3

b. Change in service span (route level) – N/A

c. Redirecting a route (route level) – N/A

d. Change in total miles serviced by the route (route level) – N/A

e. Shortlining or longlining (route level) – N/A

f. Eliminating routes (route level) – N/A

System Level Metrics

System Level Metric	Level of Change Required to be Classified as a Major Change	Example	September 2018 Scenario B Major Changes
g. Adding new route(s)	Adding one or more new routes.	Creating a new route to reaching a previously unserved area.	• N/A
h. Change total daily revenue hours	25% change in revenue hours over the system on the Weekday, Saturday or Sunday schedule.	Reduction of 30% of weekday revenue hours due to a budget shortfall.	• Below 25% Change

Figure 4

g. Adding new route(s) (system level) – N/A
No routes are being added.

h. Change total daily revenue hours (system level) – Minor Change
The percent change is below the threshold of 25 percent.

Change in Total Daily Revenue Hours				
Schedule	Change	Current	New	% Change
Weekday	-22.19	1,185.75	1,163.56	-2%
Saturday	-16.79	904.75	887.96	-2%
Sunday	0.00	719.00	719.00	0%
Total	-38.98	2,809.50	2,770.52	-1%

Figure 5

Disparate Impact Analysis

“Disparate impact refers to a facially neutral policy or practice that disproportionately affects members of a group identified by race, color, or national origin, where the recipient’s policy or practice lacks a substantial legitimate justification and where there exist one or more alternatives that would serve the same legitimate objectives but with less disproportionate effect on the basis of race, color, or national origin.” (FTA) Title VI of the Civil Rights Act prevents discrimination based on race, color and national origin in federally-funded programs or activities. GRTC will ensure that all service changes will be equitable in terms of Title VI. In order to ensure equity in access to transit service across the service area, major service changes shall not adversely affect minority populations more than non-minority populations, by more than the threshold defined below. Furthermore, service changes that result in increases in service shall not benefit non-minority populations more than minority populations, by more than that same threshold defined below. If the difference in measured effects on minority and non-minority populations is greater than the set threshold, the proposed change would be considered to have a **disparate impact** on minority populations.

The threshold shall be a **20-percentage point** difference between:

1. The percentage of impacts borne by minority populations in the proposed service change.
2. The percentage of minority populations in GRTC’s service area.

Given that minorities are approximately 54% of the population within one-quarter of a mile of the route 4A. This means that:

- If service increases, minorities must receive at least 34% of the benefit.
- If service decreases, minorities cannot bear more than 74% of the burden.

Given that minorities are approximately 61% of the population within one-quarter of a mile of the route 4B. This means that:

- If service increases, minorities must receive at least 41% of the benefit.

If service decreases, minorities cannot bear more than 81% of the burden

Methodology

GRTC uses the methodology of people trips to analyze the burden of service change borne by minority populations. The 4/5th rule is used identifying 20% as the threshold against the system minority average based on ACS census block group data. GRTC’s service area includes Henrico County, City of Richmond, and Chesterfield County. 2018 ACS 5-year estimates were used as the data source for population. Total population by block group is identified using line for local routes and stop for express routes. Total minority population is identified, and non-minority. These population numbers are multiplied by the number of annual trips traveling through each block group and aggregated. This process is done for both the status quo service scenario and the service change scenario. The resultant changes in minority and non-minority people trips between scenarios is contrasted. The minority burden of the change is identified. This number is subtracted from the route minority average. If the difference between two numbers is less than 20% then the proposed scenario service change does not have a disparate impact on the minority population. Transit Boardings Estimation and Simulation Tool (TBEST) was used in the Service Equity Analysis.

Results

The disparate impact for each route is below 20%.

Route	Minority Population	Minority Burden/Benefit of Change	Disparate Impact	Disparate Impact Threshold
4A	54.6%	53.1%	1.5%	20%
4B	61.0%	62.5%	1.5%	20%

Route 4A	Description	Minority	Non-Minority	Total
Scenario A (Sept 2018) vs Scenario B (Jan 2019)	Existing People-Trips	96	85	181
	New People-Trips	55	48	103
	Change	-41	-37	-78
	Change	-43%	-43%	-43%
	Percent of burden/benefit	53%	47%	100%
	Allowed range for percent of benefit	+34% or higher		

Route 4B	Description	Minority	Non-Minority	Total
Scenario A (Sept 2018) vs Scenario B (Jan 2019)	Existing People-Trips	114	68	182
	New People-Trips	65	39	104
	Change	-48	-29	-77
	Change	-43%	-43%	-43%
	Percent of burden/benefit	63%	38%	100%
	Allowed range for percent of benefit	+41% or higher		

*People trips in millions

Figure 6

Disproportionate Burden Analysis

“Disproportionate burden refers to a neutral policy or practice that disproportionately affects low-income populations more than non-low-income populations. A finding of disproportionate burden requires the recipient to evaluate alternatives and mitigate burdens where practicable.” (FTA)

Per the requirements of FTA Circular 4702.1B, and understanding the linked nature of civil rights and environmental justice issues, GRTC will also ensure that all service changes will be equitable with respect to low-income populations. In order to ensure equity in access to transit service across the service area, major service changes shall not adversely affect low-income populations more than non-low-income populations, by more than the threshold defined below.

Furthermore, service changes that result in increases in service shall not benefit non-low-income populations more than low-income populations, by more than that same threshold defined below. If the difference in measured effects on minority and non-minority populations is greater than the set threshold, the proposed change would be considered to have a **disproportionate burden** on low-income populations. GRTC shall also describe alternatives available to low-income passengers affected by the service change.

The threshold shall be a **20-percentage point** difference between:

1. The percentage of impacts borne by low-income populations in the proposed service change.
2. The percentage of low-income populations in GRTC’s service area.

Given that low-income populations are approximately 35% of the population within one-quarter of a mile of the routes 4A and 4B. This means that:

- If service increases, low-income populations must receive at least 15% of the benefit.
- If service decreases, low-income populations cannot bear more than 55% of the burden

Methodology

GRTC uses the methodology of people trips to analyze the burden of service change borne by low-income populations. The 4/5th rule is used identifying 20% as the threshold against the system low-income average based on ACS census block group data. GRTC’s service area includes Henrico County, City of Richmond, and Chesterfield County. 2018 ACS 5-year estimates were used as the data source for population. Total population by block group is identified using line for local routes and stop for express routes. Total low-income population is identified, and non-low income. These population numbers are multiplied by the number of annual trips traveling through each block group and aggregated. This process is done for both the status quo service scenario and the service change scenario. The resultant changes in low-income and non-low-income people trips between scenarios is contrasted. The low-income burden of the change is identified. This number is subtracted from the system low-income average. If the difference between two numbers is less than 20% then the proposed scenario service change does not have a disproportionate burden on the low-income population. Transit Boardings Estimation and Simulation Tool (TBEST) was used in the Service Equity Analysis.

Results

The disparate impact for each route is below 20%.

Route	Low-income Population	Minority Burden/Benefit of Change	Disparate Impact	Disparate Impact Threshold
4A	35%	34%	1%	20%
4B	35%	36%	1%	20%

Route 4A	Description	Low-income	Non-low-income	Total
Scenario A (Sept 2018) vs Scenario B (Jan 2019)	Scenario A People-Trips	32	62	93
	Scenario B People-Trips	18	35	53
	Change	-14	-27	-40
	Change	-43%	-43%	-43%
	Percent of burden/benefit	34%	66%	100%
	Allowed range for percent of burden	+14% or higher		

*People trips in millions

Figure 7

Conclusion

The proposed changes to the schedule for the routes 4A and 4B for January 2019 were identified as major changes, triggering one of the six route level major change thresholds, and zero of the two system level major change thresholds. The change identification did require GRTC to perform a fare and service equity analysis to determine if the changes would cause a disparate impact for minority populations or disproportionate burden for low-income populations. The results of the analysis determined that the proposed alternative is within the acceptable change limits resulting in a sustained equitable distribution of service.

Board Approval Signatures

The GRTC Board of Directors has reviewed the Major Change and Service and Fare Equity Analysis and agrees with its findings, acknowledging that this a minor change and does not require a disparate impact or disproportionate burden analysis. Based on the results of the analysis, the GRTC board of directors approves the schedule changes proposed for January 2019.

Gary Armstrong
President/ Chair (Chesterfield County)

Date

Benjamin P. Campbell
Vice-President/ Vice-Chair (City of Richmond)

Date