BUS TRANSFORMATION PROJECT

Draft strategy

May 2019

WASHINGTON AREA
BUS TRANSFORMATION
PROJECT

Table of Contents

www.BusTransformationProject.com

WASHINGTON AREA
BUS TRANSFORMATION
PROJECT

Make the Bus Work Better for You!

Learn how and get involved:
BusTransformationProject.com

Tell Us What You Think!
Visit our website to let your voice be heard
By providing comments, you can enter for a chance
to WIN one of five $50 SmarTrip® Cards

Follow us on Facebook for the latest updates and news
#BusTransformationProject
#BetterWayToGetThere

I. Introduction

Congestion, affordability, and mobility are major problems in the DC region that will only continue to grow

It is past time for this region to transform its bus system.

A transformed bus system will meet these challenges and provide real results for the region:

- Reduced congestion and emissions
- Increased transit ridership
- Better and faster transportation
- Affordable transportation for more people
- More efficient use of resources
- Better travel experience for riders

The alternative is unaffordable, and harms regional competitiveness and livability.

4

The National Capital Region must overcome its transportation challenges in order to continue to grow and compete with other regions around the country

Transportation issues contribute to a range of regional problems:

Commuters spend **82 hours** each year stuck in traffic, degrading quality of life

Congestion imposes a cost premium on centrally located neighborhoods, pushing affordable housing options further into the suburbs

May limit regional economic growth by discouraging businesses from locating here

The National Capital Region is adding 40,000–60,000 jobs and households each year, but its transportation system is struggling to keep pace, leading to some of the longest commutes and worst traffic congestion in the nation.

Source: 2015 TTI Mobility Scorecard, MWCOG Cooperative Regional Land Use Forecasts

www.BusTransformationProject.com

Bus is a key element in our regional transportation solution

Reduces **emissions**

Reduces **congestion**

Provides **affordable** transportation

Delivers **access** throughout the region

Uses roadway space **efficiently**

Reduces space devoted to **parking**

What can we do?

In the DC region, rail transit emerged as a highly-effective tool to combat these forces, but its effectiveness has limits.

- Metrorail currently only reaches about 25% of the region, and any rail system expansion is many billions of dollars and decades away.

Meanwhile, the world of transportation is innovating rapidly, and our bus system has not kept pace.

- Many technology-driven mobility options threaten to make congestion worse, not better, as they add even more vehicles to already gridlocked streets.

- Ridership is declining and operators are feeling the pinch, making buses less able to combat roadway congestion, provide time-competitive access to jobs, and remedy the region's economic divide.
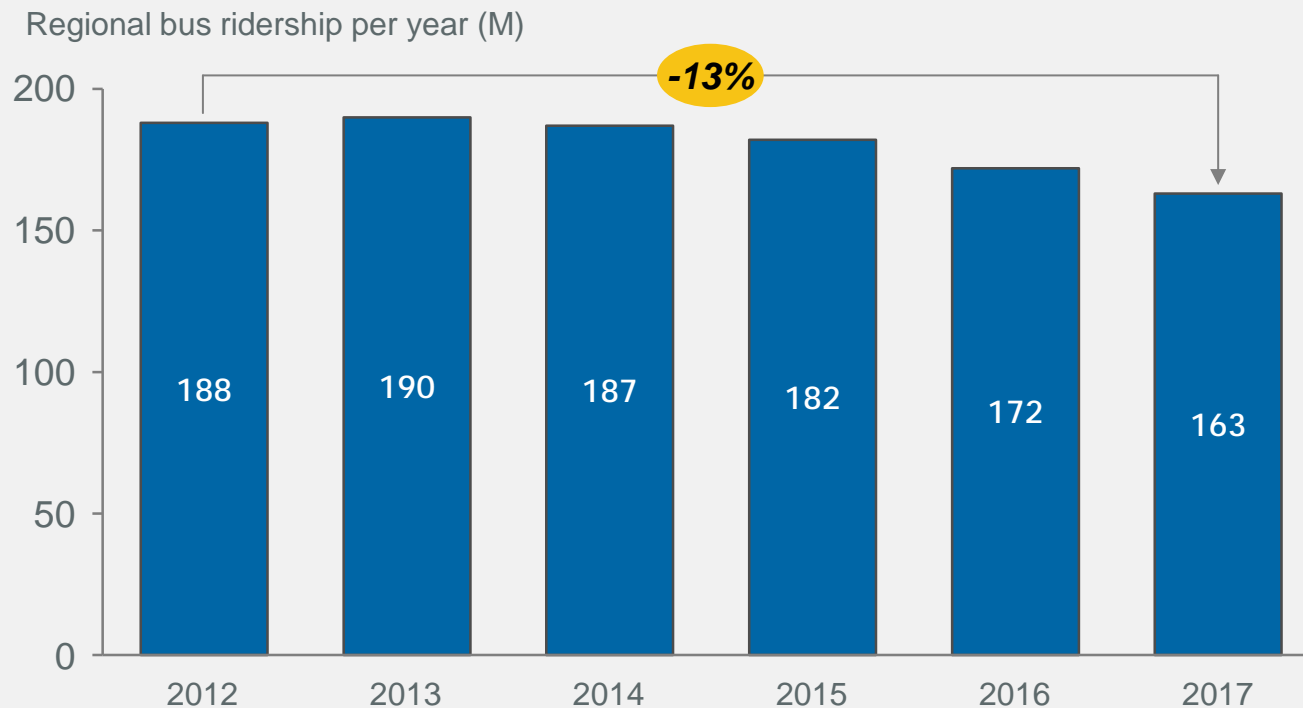
There is a better way to get there.

The Challenge:

Customers are turning to other travel options. Traditional definitions of bus service are not keeping pace with rapid technology and social change.

Since 2012, bus ridership has fallen by 13 percent across the region.

Regional bus ridership per year (M)

188	190	187	182	172	163
2012	2013	2014	2015	2016	2017

-13%

Bus faces several core challenges that will continue to grow unless changes are made today:

Meet changing **customer needs**

Keep up with **changing technology**

Coordinating across region

Maintain **sustainable** cost structure
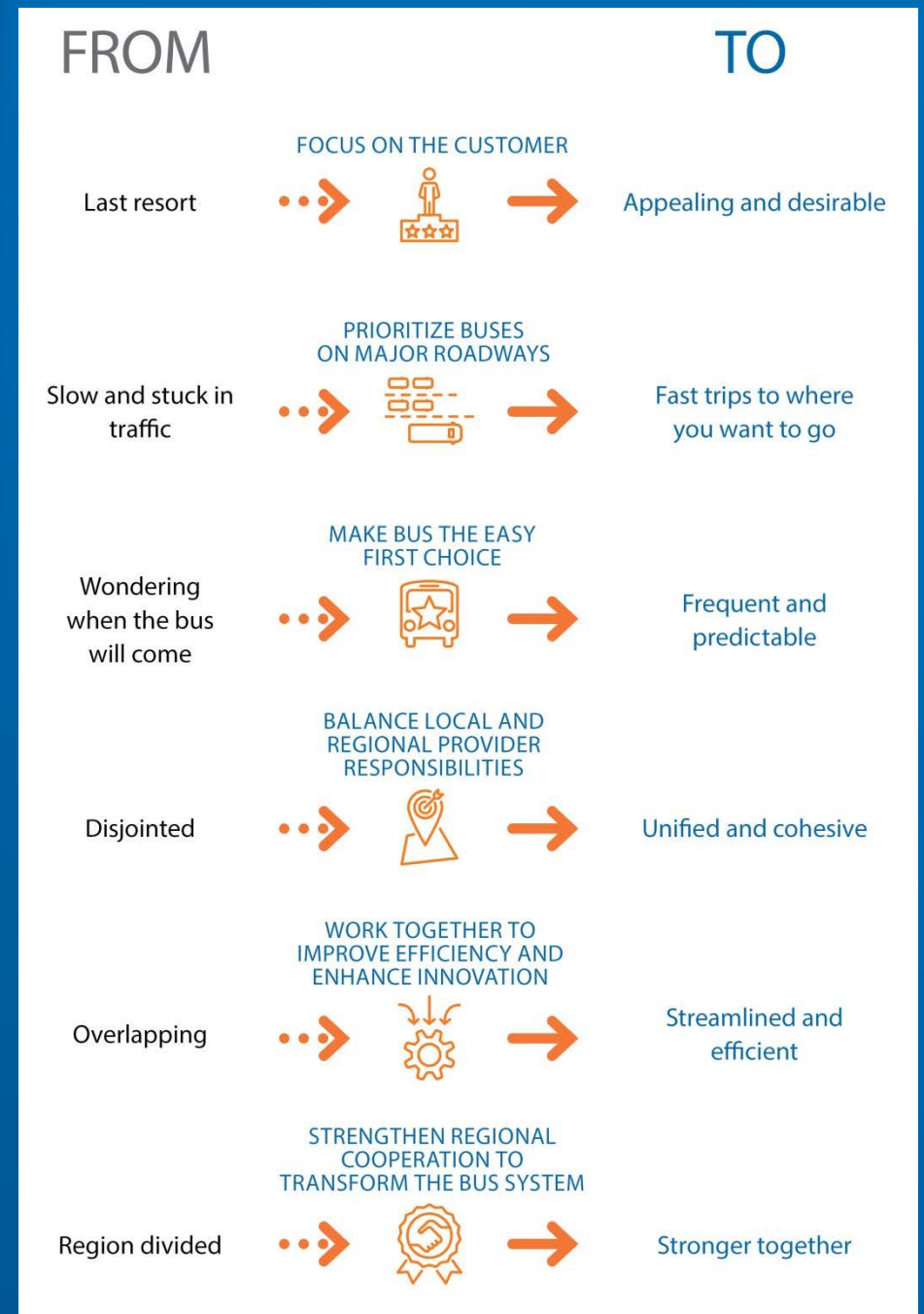
Deciding how service is paid for

8

To solve these problems, the region must **transform its approach to bus**

The outcomes of the Strategy will transform our region's bus system by:

- Facilitating fast, frequent, desirable, affordable, and seamless travel connections for customers

- Aligning the high-frequency and high-capacity regional bus network with roadways where buses are given priority

- Clearly delineating and effectively coordinating regionally provided services and locally managed bus systems

- Empowering organizations to coordinate functions, leverage transformative technologies, and transparently track progress

FROM → TO

FOCUS ON THE CUSTOMER
Last resort → Appealing and desirable

PRIORITIZE BUSES ON MAJOR ROADWAYS
Slow and stuck in traffic → Fast trips to where you want to go

MAKE BUS THE EASY FIRST CHOICE
Wondering when the bus will come → Frequent and predictable

BALANCE LOCAL AND REGIONAL PROVIDER RESPONSIBILITIES
Disjointed → Unified and cohesive

WORK TOGETHER TO IMPROVE EFFICIENCY AND ENHANCE INNOVATION
Overlapping → Streamlined and efficient

STRENGTHEN REGIONAL COOPERATION TO TRANSFORM THE BUS SYSTEM
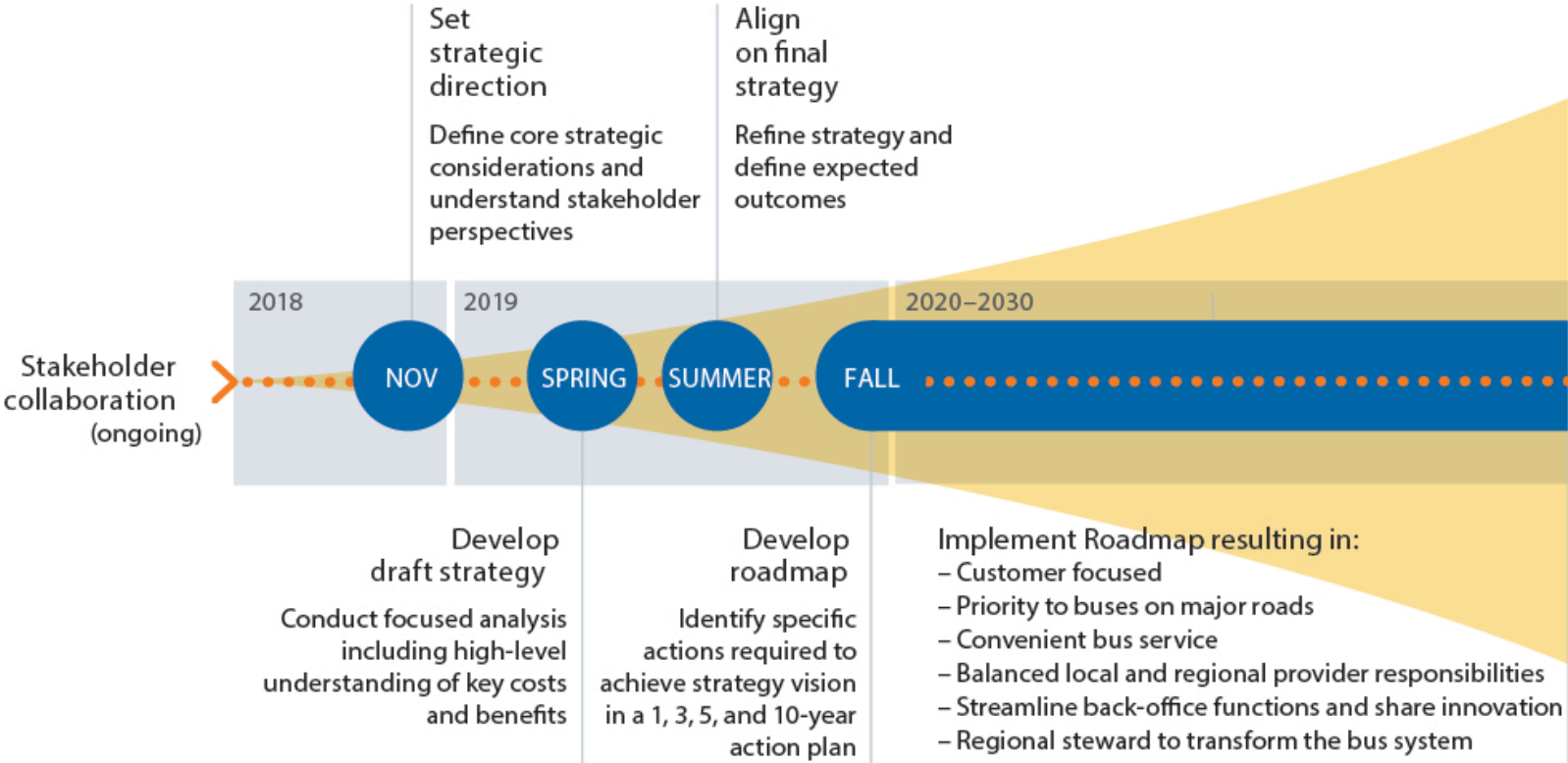Region divided → Stronger together

The Transformation starts immediately, while tactical solutions will continue to be developed as we move through implementation

This Strategy lays out the desired **direction for the regional bus system**, and is not a detailed implementation guide.

Once finalized, the Strategy will inform a **10-year Roadmap** that will lay out a series of specific implementation steps that will help the Bus Transformation gain momentum over time.

Set strategic direction

Define core strategic considerations and understand stakeholder perspectives

Align on final strategy

Refine strategy and define expected outcomes

2018   2019   2020–2030

Stakeholder collaboration (ongoing)

NOV   SPRING   SUMMER   FALL

Develop draft strategy

Conduct focused analysis including high-level understanding of key costs and benefits

Develop roadmap

Identify specific actions required to achieve strategy vision in a 1, 3, 5, and 10-year action plan

Implement Roadmap resulting in:
– Customer focused
– Priority to buses on major roads
– Convenient bus service
– Balanced local and regional provider responsibilities
– Streamline back-office functions and share innovation
– Regional steward to transform the bus system

www.BusTransformationProject.com

II. Overview of draft strategy

Strategy Elements

The strategy to achieve the vision and goals is built around six elements – with a set of recommendations underlying each:

	1	**Customer Focused**	The bus system should be customer-focused and an easy-to-use option that people want to ride
	2	**Priority to Buses on Major Roads**	Prioritizing buses on major roads is the fiscally responsible way to move the most people quickly and reliably
	3	**Convenient Bus Service**	Frequent and convenient bus service is fundamental to accessing opportunity, building an equitable region, and ensuring high quality of life
	4	**Balanced local and regional provider responsibilities**	Balance local and regional provider responsibilities by positioning local bus systems to meet their jurisdictional needs and the regional bus system to meet regional needs and deliver regional benefits
	5	**Streamline Back-Office Functions and Share Innovation**	Optimize back-office functions through sharing, streamlining and shared innovation by consolidating regional resources and devoting more resources to operating bus service
	6	**Regional Steward to Transform the Bus System**	Customers in a region with multiple bus providers need a regional steward to transform the bus system

www.BusTransformationProject.com

Principles to keep in mind:

The scope of this project, and what is meant by "bus"

- Adopting an outcomes-focused mindset, references to "bus" in the strategy mean any vehicle that makes efficient use of roadways by transporting a large number of riders safely, conveniently and affordably

- This definition includes large buses on fixed routes and shuttle buses operating on-demand; vehicles with drivers and autonomous vehicles; publicly-owned as well as private commercial operations

- This project focuses on local bus, as distinct from commuter bus services which serve many parts of the region. This project does not explicitly address paratransit services which also make up an important part of the transportation service network

Designing a solution to meet the majority of business needs

- This Draft Strategy lays out several elements that are recommended as the framework for transforming the regional bus system. However, it is acknowledged that there may need to be exceptions to these recommendations based on truly localized needs. Nothing in this Strategy should be seen as precluding those possibilities.
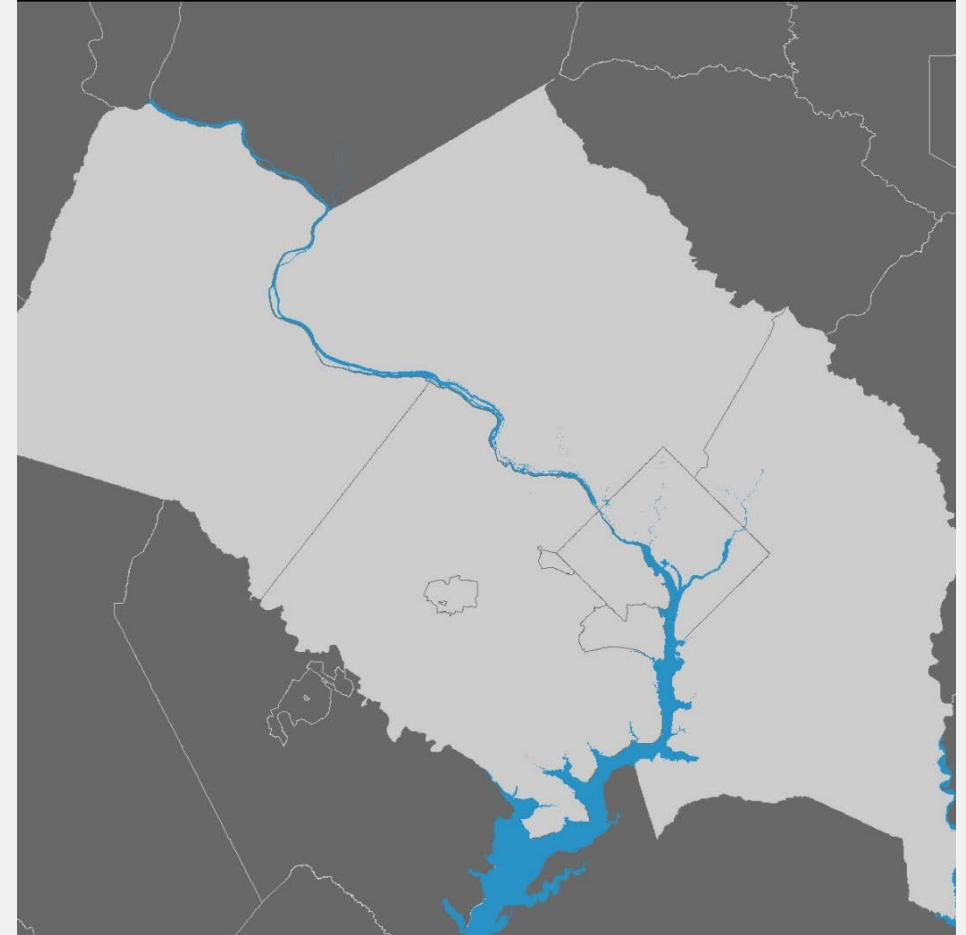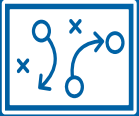

14

The Bus Transformation Study is focused on local bus service in the WMATA Compact Area region

This includes nine bus service providers:
- ART
- CUE
- DASH
- DC Circulator
- Fairfax County Connector
- Loudoun County Transit
- RideOn
- The Bus
- WMATA

Long-distance and commuter bus services, and paratransit have not been included.

www.BusTransformationProject.com

This document presents a set of draft strategy elements and recommendations for regional bus transformation

What is this strategy document?

The draft Strategy elements and recommendations outlined in this paper are based on insights from extensive stakeholder input, a public survey, and research on global best practices.

However, this paper does not represent the final set of recommendations for bus in the region. The purpose of the paper is to provide a draft strategy for consideration by the broad range of public stakeholders across this region that relies so extensively on transit.

16
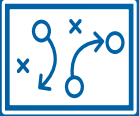
What is this strategy document?

This document provides supporting analyses and case studies relevant to each strategy recommendation

The supporting information included in the paper is not exhaustive; it is only meant to provide perspective on the high-level reasoning behind each recommendation.

Any recommendation included in the final strategy will be further analyzed to understand the specific outcomes and inform implementation.

The Bus Transformation Project has completed significant **analysis of the region's bus** systems…

…which are not included in the Draft Strategy document

A comprehensive assessment of the region's bus system concluded in November 2018 and can be found on the Bus Transformation Project website under Resources/Project Documents.

III. Vision & goals as voiced by stakeholders

The vision, goals, and objectives for bus in the region are the result of collective effort

Since the Bus Transformation Project Kickoff Summit in September 2018, stakeholders across the region have provided perspectives and focused input on the role of bus in the region and the key features of an effective bus system.

Stakeholder outreach has included:
- 5,679 responses to survey
- 20 regional pop-up events
- 25 committee meetings
- 13 Metrobus Division Engagement events
- 40 stakeholder interviews
- 33 project briefings/meetings with elected officials
- 10,056 people reached by the project Facebook page

These inputs have been synthesized into a set of aspirational goals for bus in the region, which have been reviewed and/or approved by the Executive Steering Committee, Technical Team, WMATA Leadership Team and Strategic Advisory Panel.

Project Vision:

Bus will be the mode of choice on the region's roads by 2030, serving as the backbone of a strong and inclusive regional mobility system.

Goals for bus in the region as voiced by stakeholders

1 **Regional connectivity**	• Provide reliable on-street transit options that efficiently connect people to places and improve mobility
2 **Rider experience**	• Ensure a convenient, easy-to-use, user-centered mobility option
3 **Financial stewardship**	• Maintain a transit mode that is financially sustainable in the long term
4 **Sustainable economic health & access to opportunity**	• Encourage vibrant, economically-thriving and sustainable communities
5 **Equity**	• Create a bus system that is affordable and equitable

22

The six Strategy Elements have been developed to achieve the goals for Bus Transformation

Strategy Elements

Goals	Customer Focused	Priority to Buses on Major Roads	Convenient Bus Service	Balanced local and regional provider responsibilities	Streamline Back-Office Functions and Share Innovation	Regional Steward to Transform the Bus System
1 Regional connectivity	✓	✓	✓	✓	✓	✓
2 Rider experience	✓	✓	✓		✓	✓
3 Financial stewardship	✓	✓		✓	✓	✓
4 Sustainable economic health & access to opportunity	✓	✓	✓			✓
5 Equity	✓		✓			✓

23

IV. Draft Strategy: elements and detailed recommendations

1

The bus system should be **customer-focused** and an easy-to-use option that people want to ride

Element: The bus system should be customer-focused and an easy-to-use option that people want to ride

Recommendations to drive strategy:

A Expand **marketing** efforts related to bus to enhance visibility of bus options and benefits

B Make buses easy to understand with **legible maps and consistent route naming** conventions

C Create a **mobile solution** that allows riders to plan and pay for trips and access real-time service information

D Make **bus fares** clear and consistent across the region

E Introduce pass products that work across **all bus systems**

F Enhance **reduced fare products** for low-income residents

G Allow customers to **transfer for free** between bus and rail

H Incentivize more employers to offer **transit benefits**

I Make **bus stops** safe, convenient, and accessible across the region

J Modernize the region's **bus fleet** with advanced technologies that improve the environment, safety, and the rider experience

What the strategy will achieve:

If bus agencies deliver outstanding end-to-end trip experiences for all riders, the region will see:

- Increased **customer satisfaction**
- Reduced **safety incident rates** at bus stops and on buses
- Reduced **environmental impact** of transportation
- **Increased transit ridership**
- **More affordable transportation** for residents that need it most
- **Less congestion** on our region's roads

26

Recommendation: Expand marketing efforts related to bus to enhance visibility of bus options and benefits

Current state ——— Future state of bus marketing ———

Limited bus marketing

Information on bus routes and special passes are not pro-actively shared with broad swath of the population; customers often have to seek out the information themselves
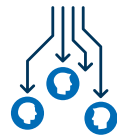
Omni-channel approach

Deliver information on bus to customers using range of channels e.g.,
- Digital modes (apps, social media, other websites)
- Public signage
- Well-designed paper schedules

Data-driven strategy

Use data to better understand customer segments and provide tailored marketing to each segment (e.g., reach students on social media, and seniors using TV ads)

Best-in-class experience

Raise awareness of comfortable, modern, and safe bus fleets and bus stops to keep existing customers and attract new ones (See Recommendations I & J for more details)

Key considerations: Expanding marketing efforts would boost awareness of bus, and could be rolled out in a phased way to maximize effectiveness

Benefits

Marketing drives awareness about available bus routes and fare products, making new and existing customers more likely to use bus. Result is increased transit ridership and reduced congestion (Links to Goal 1b)

Costs

Cost of marketing expansion highly dependent on strategy and channels used

Risks

Risk that expanded marketing efforts won't significantly increase ridership

Mitigating factors

Set up marketing pilots / assessments in select areas to start; use these as testing grounds to determine which strategies work best for key demographics, and then scale up based on results

Context: Bus maps in metro areas tend to be too complex for the average rider

Transportation maps in large metro areas have become too complex for our brains to understand

A 2016 research study suggests that transportation maps in large metropolitan cities like London, Paris, Tokyo, and New York, could be too big and complex for our brains to easily process

Science indicates that we can only deal with around 8 "bits" (i.e. binary, yes/no decisions) at once, which means we are unlikely to be able to easily read a map with 250+ connection points (WMATA alone has 240+ bus routes and 11k+ stops). As a result, traditional maps that represent all existing bus routes in a large city have limited utility

As the mobility landscape in the DC region becomes increasingly complex and inter-modal, there is a need for more user-friendly ways to present and use bus routes (e.g., simpler maps, apps, guides)

Example: Detailed map of Tokyo transit system - difficult for riders to digest

Source: CityMetric (2016).

www.BusTransformationProject.com
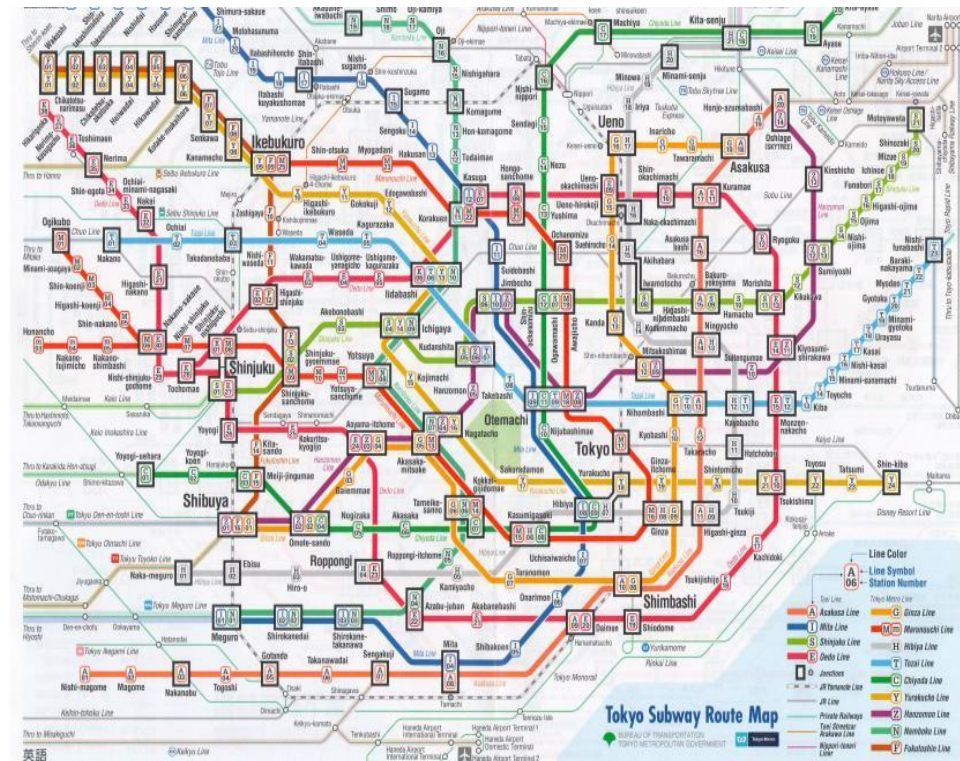
Context: Route naming conventions across the region are not easy for customers to understand

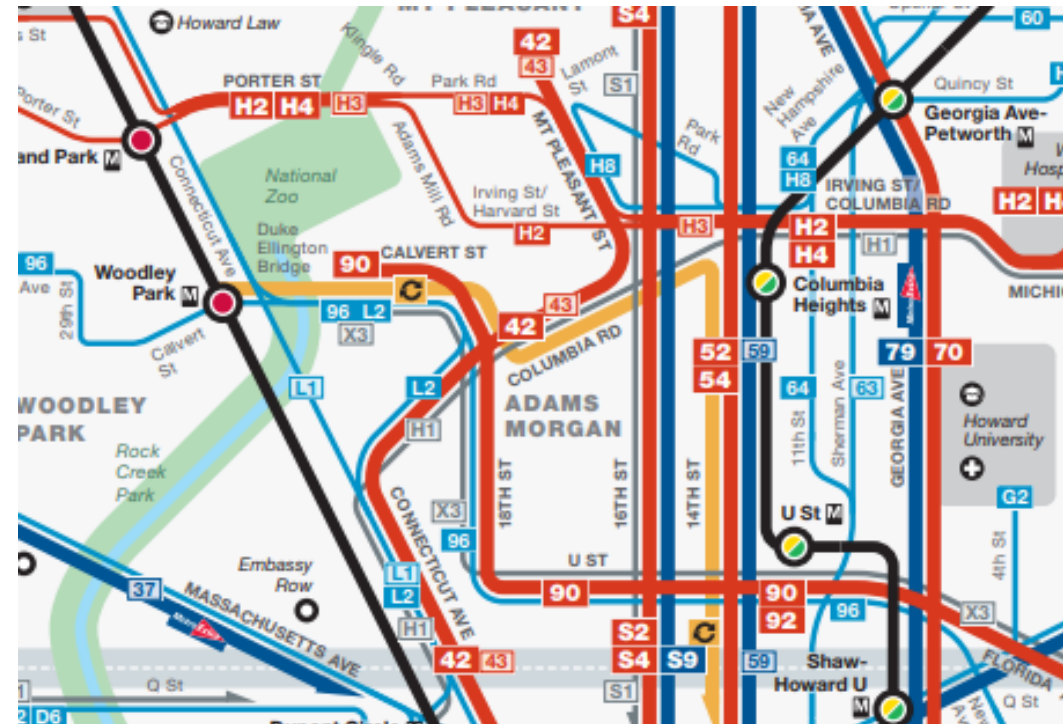## Route naming and numbering today

Inter-agency route names: No consistency across operators on how route names are generated, which makes it difficult for riders who use multiple providers to understand/ recall what route names mean

Intra-agency route names: Even within agencies, route naming patterns are not always clear

For example, Metrobus uses a mix of two-digit numbers, letters followed by one or two digits, and letters preceded by one or two digits. There are some patterns, but they are not definitive, e.g.,

- Routes without letters are generally major radial lines in DC (but routes with letters are too)
- Routes with numbers before letters are mostly in Virginia, but not always
- Routes with letters followed by numbers might be in DC or Maryland

Example: Metrobus route names in DC

Source: Greater Greater Washington: 80W? 30N? U7? How Metrobus Numbers came to be (2018)

www.BusTransformationProject.com

Context: Varied naming conventions across local bus operators

Fairfax Connector
100s: Mount Vernon area

200s: Van Dorn area

300s: Springfield area

400s: Tysons area

500s: Reston area

600s: Fair Oaks, I-66 corridor

700s: McLean area

800s: not yet in use

900s: Herndon area

ART
40s: East/West, Columbia Pike

50s: Ballston area

60s: Courthouse area

70s: North/South, Connector

80s: Army Navy Drive area

DASH
Routes are named in the order that DASH introduced them, and have no geographical reference

CUE (City of Fairfax)
Two routes, one gold and one green (George Mason U. colors)

Ride On (Montgomery County Transit)
Low numbers (1 – 22) generally serve Silver Spring

30s: Bethesda

40s: Upcounty (beyond Rockville)

50s: Lake Forest mall feeders

60s: Germantown

70s: Express

90s: Damascus

Prince George's county Maryland
10s: North County

20s: Mid County

30s: South County

50s: Upper Marlborough

The Bus
Routes are named by their destinations, with letter abbreviations, no numbers

www.BusTransformationProject.com

Recommendation: Make buses easy to understand with legible maps and consistent route naming conventions

Opportunities to improve trip-planning tools without needing a smartphone

Legible maps

Most people do not use all of the bus lines – they are most interested in bus lines that travel near specific locations

Potential to simplify regional route maps at bus shelters to only show nearby routes / bus stops, making it easier for riders to understand what neighborhoods a bus travels through

TRANSPORT FOR LONDON
EVERY JOURNEY MATTERS

Consistent, customer-focused route naming

Opportunity for bus agencies to work together to make bus routes easier to understand
- Reduce confusion by using same naming conventions within and across operators
- Develop naming conventions with a customer focus instead of a transit planner perspective (e.g., use prefixes that indicate route type, numbers that indicate origin and destination)

MTA

TRANSPORT FOR LONDON
EVERY JOURNEY MATTERS

RATP

www.BusTransformationProject.com

Supporting information: As part of Seoul's 2004 bus revitalization, the city renamed bus routes systematically

The entire Seoul area was divided into eight zones...

...these zones were used to assign names to each route

www.BusTransformationProject.com

Supporting information: Other cities have also incorporated user-friendly route naming conventions

Paris RATP

Bus lines in Paris are color-coded and numbered, and directions are indicated by the station name at the end of the line

Each bus line has two "names"
- Last station of the route
- Direction you're traveling on a particular bus route to get to that station

Transport for London

London uses prefixes to connote what type of route is being covered, e.g.,…
- C stands for Central
- X stands for Express routes
- N denotes a night bus

…or location where the route operates, e.g.,
- P for routes in Peckham
- E for route in Ealing

New York MTA

Local bus routes in New York are labeled with a number and a prefix identifying the primary borough of operation
- B for Brooklyn
- Bx for the Bronx
- M for Manhattan
- Q for Queens
- S for Staten Island

Express bus routes to Manhattan generally use a two-letter prefix with an "M" at the end e.g.,
- Express route from Brooklyn is BM
- Express from the Bronx is BxM

Source: Why Go Paris, Londonist (2016), MTA.

Supporting information: London uses simple "spider maps" at each bus shelter to enable trip planning

TRANSPORT FOR LONDON
EVERY JOURNEY MATTERS

Case study

What are spider maps?

In 2002, London began using "spider maps" – schematic diagrams of bus services in a particular area

The maps are much simpler than maps of the entire city's bus routes; they only include information relevant to the local area – including nearby bus routes / bus stops

These maps are mounted at all bus shelters, and enable riders to easily figure out what buses they should take and where they should get off the bus

Sample spider map: Manor Park area of London

Source: Transport for London

www.BusTransformationProject.com
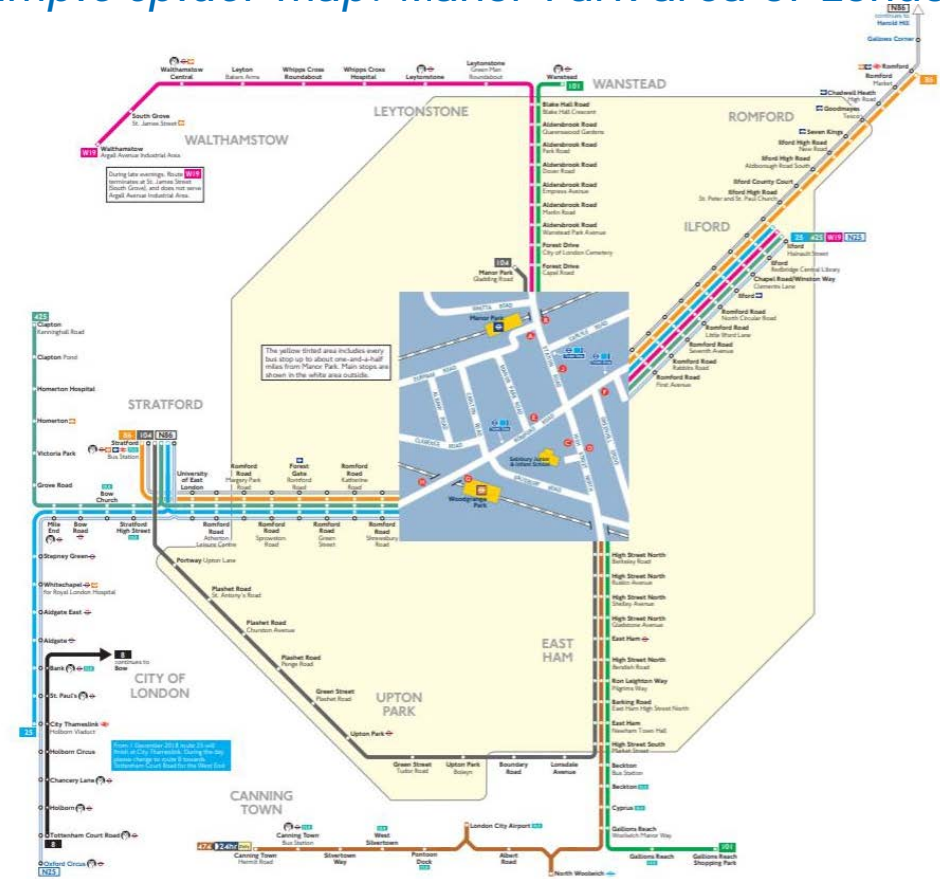
Key considerations: Consistent route naming conventions and legible maps would make trip planning easier, at a relatively low cost to the region

Benefits

Easier for customers to understand / recall how route names work, therefore making it easier to plan and ride bus which should result in higher ridership (Links to Goal 2b)

Increased convenience for customers because they can easily understand and leverage maps to plan their trips (Links to Goal 2b)

Costs

Cost of re-naming and engaging in extensive marketing / awareness campaign to ensure customers understand the changes

All bus stop signage in the region would need to be replaced

Cost of improving bus maps highly dependent on specific changes bus agencies / developers decide to make

Risks

Reduced jurisdictional flexibility to update route names based on local changes

Mitigating factors

Set up regular cadence for reviewing regional route naming, to ensure that all jurisdictions in the region have a formal opportunity to raise any emerging naming / numbering issues, and request an update if needed

Context: Current mobile applications for bus are not meeting customer needs

Many bus apps available...
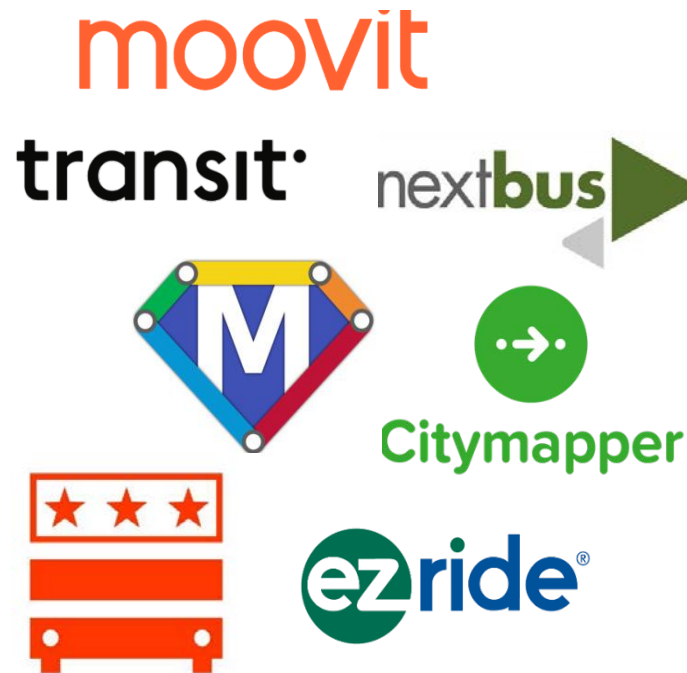
...but some customers cite challenges using these apps

Reliability: Data on bus arrival times are not always accurate, often due to issues with GPS tracking of buses

User interfaces: Applications aren't always user-friendly. Sample customer reviews:
- "The app kicks me off instead of bringing me to the page where I can see the times and routes around me"
- "This app is made for a PC, not a phone"
- "It would be nice if it would get information about cancellations, instead of perpetually promising busses that don't come"

Lack of mobile payment integration: Customers are increasingly looking to plan and pay in one interface, but these applications don't offer that feature

Limited modes: Not all apps allow for multi-modal trip planning, despite increasing number of customers using multiple modes
- 60% of Metrobus passengers use multiple modes of transit to get to their destinations
- 70% of millennials around the country use multiple travel options several times per week

Crowded space: 30+ applications available on iTunes store when searching WMATA; puts the burden on customers to sort find an application that works for them

Source: iTunes. WMATA passenger survey (2014), APTA (2013).

Context: Challenges associated with current fare payment mode in the Washington region today

Most customers pay using SmarTrip card…

Today, the majority of customers pay using a SmarTrip card – a reloadable fare card that can be used on:
- ART
- CUE
- DASH
- DC Circulator
- Fairfax County Connector
- Loudoun County Transit commuter buses
- Maryland Transit Administration Local Bus, Light Rail and Metro Subway[1]
- PRTC OmniRide
- Ride On
- TheBus
- WMATA Metrorail and Metrobus

…but there are challenges associated with this method

Convenience: Need to have physical SmarTrip card or ticket on hand order to pay for and board the bus

Balance information: SmarTrip card balance isn't immediately accessible – riders typically need to go to kiosk or visit website to see card balance

Availability: In most cases, SmarTrip cards have to be purchased online (takes ~5 business days for delivery), at a Metrorail station or at other select locations – not always available at the exact moment it is needed

38

1. Baltimore light rail and local buses are moving away from SmarTrip technology.

Recommendation: Create a mobile solution that allows riders to plan and pay for trips, and access real-time service information

1 **Easy trip planning**: Allows riders to easily plan trips on one seamless interface

2 **Multi-modal options**: Creates opportunity to offer multi-modal options to complete trips (e.g., rail, TNCs, bike-shares)

3 **Seamless payment**: Gives customers a secure, electronic purse that they can load remotely, from any location

4 **Real-time information**: Gives travelers up-to-date information about the trip, connections, emergency messages

5 **Real-time information**: Provides platform to share advertisements and special offers with travelers

Supporting information: DART developed a user-friendly, integrated GoPass mobile application
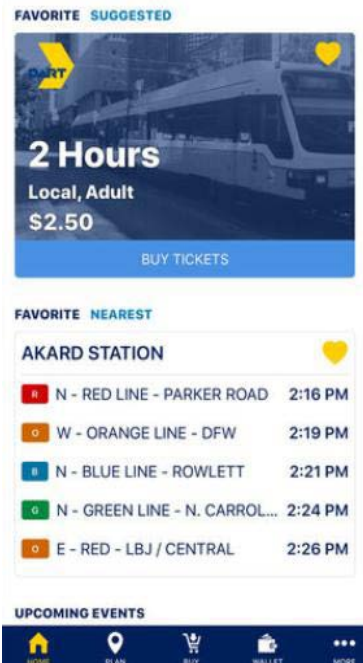
GoPass *Case study*

Easy trip-planning	Multi-modal options	Seamless cash or card payment	Real-time information	Relevant advertisements
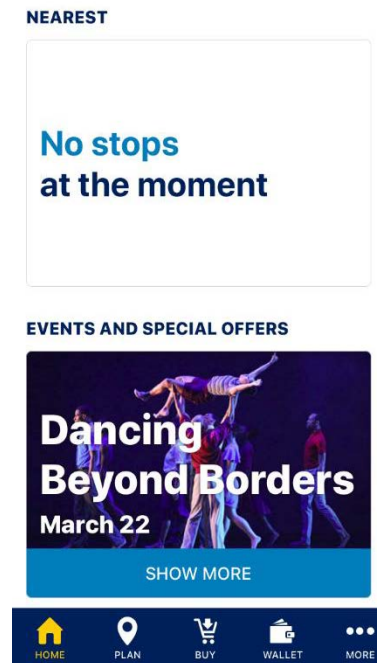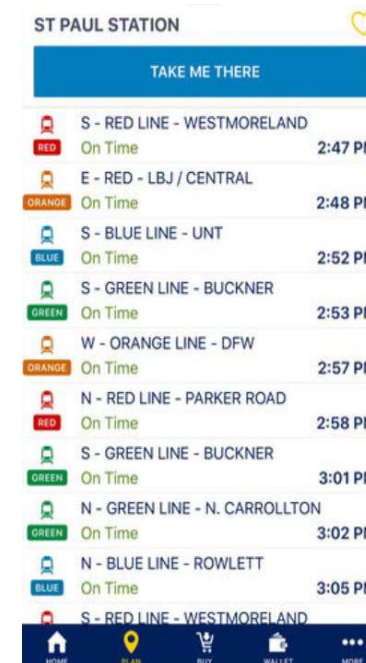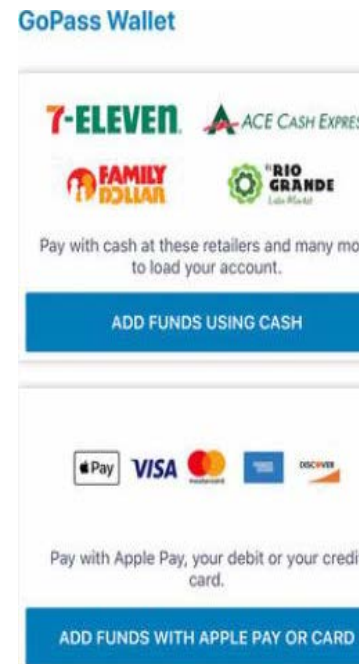
"This app really works fast. It's convenient without the hassle of finding a ticket vending machine."
-Customer review ⭐⭐⭐⭐⭐

40

Supporting information: 4x increase in fare sales made through Hop – Portland's user-friendly mobile payment platform – within one year of launch

Case study

Hop System is the first account-based regional virtual transit card on Google Pay in the world

The Hop system is a contactless, smart, and mobile ticketing system launched in July 2017 with a price tag of $36M. Hop is managed by TriMet, but can be used on most transit systems in the region, including TriMet buses, light rail, and commuter rail, C-Tran buses, and Portland Streetcar.

Consumers can pay transit fare using either a virtual Hop card via the Hop application or a Credit/Debit card stored in mobile wallet facilitated by Google Pay, Apple Pay, or Samsung Pay. Customers who prefer to pay in cash can also pay transit fares at various retail locations.

TriMet is now phasing out it's old mobile ticket application (described as a "first-generation" electronic fare model) in favor of the more user-friendly Hop platform.

Customers rapidly switching to Hop Fastpass as preferred payment mode

% of fare sales

Legend: 2017 | 2018

4x

Mode of payment

Axis labels: Farebox (on a bus), Ticket vending machines (at station), Paper tickets sold to orgs, Retail paper, First-gen mobile ticket app, Hop Fastpass

www.BusTransformationProject.com
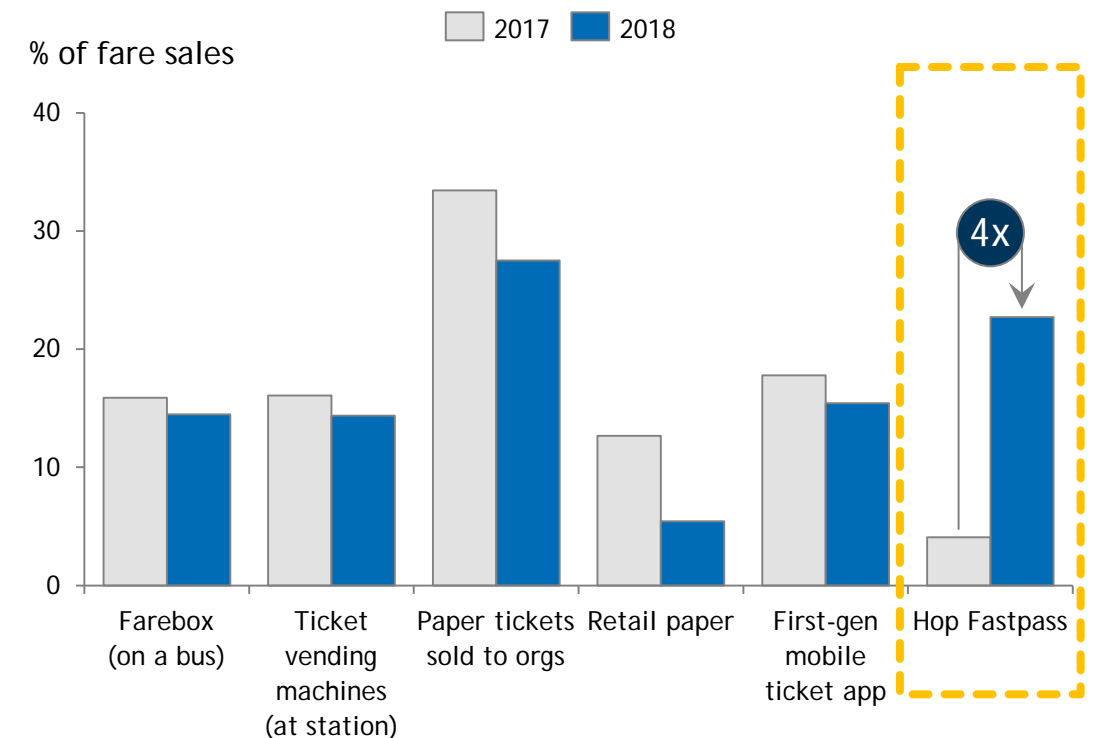
Supporting information: WMATA making strides in this space, with plans for mobile application already underway

Case study

WMATA's mobile payment solution

As part of Metro's initiative to upgrade its fare collection system, Metro is developing a new fare payment solution that will allow customers a quick and easy way to pay and manage their SmarTrip account from anywhere

The new mobile fare payment platform will work with Metro's existing infrastructure, eventually allowing customers to tap their mobile device to the white target at the faregate

Using the app, customers will be able to check fares, get real-time service information, and add money to their SmarTrip account instantly through Auto-Reload when the value is low

Approach to fare modernization

The modernization project will be done in three parts:

1. Metro will upgrade existing fareboxes, faregates, and fare vending machines to support mobile payments and extend their useful life until they can be replaced

2. Metro will install new faregates at more than 900 entry/exit lanes at all 91 stations

3. Metro will install new fare vending machines that will be more user friendly with large touchscreens, better accessibility for customers with disabilities, multi-language support, and a smaller physical footprint

Source: WMATA (2018).

42

Key considerations: Creating a mobile payment and trip planning solution would require significant investment, but remove some existing hurdles to using transit

Benefits

Increased convenience for customers when they can pay via smartphone app which should increase ridership (Links to Goal 2b)

Enables all-door boarding which speeds up bus (Links to Goals 2b, 3c)

Costs

Cost to develop mobile solution, upgrade existing fare boxes, gates, and other infrastructure to support mobile payments

Risks

Risk that customers who prefer cash (e.g., who don't use smartphones, SmarTrip card) will not see benefits

Mitigating factors

Need to establish user-friendly system that enables customers who don't use smartphones / SmarTrip to easily make payments

Source: TriMet(2018), Oregon Live (2019). The Verge (2016).

www.BusTransformationProject.com

Context: Varied fare policy across bus operators can be difficult for riders to understand and remember

Fare structure across regional bus operators ($)

Operator	Base Fare amount	Senior Fare	Fare for people with disabilities	Student fare
ART	2.00	1.00	1.00	1.00
CUE	1.75	0.85	0.85	0.00 for middle and high school students with FCPS bus pass;0.85 for all other students
DASH	1.75	--	--	--
DC Circulator	0.00	0.00	0.00	0.00
Fairfax County Connector	2.00	1.00	1.00	0.00 from 5am-10pm 7 days a week
Loudoun County Transit	1.00	--	--	varies
Metrobus	2.00	1.00	1.00	varies
Ride On	2.00	up to 1.00	up to 1.00	0.00 from 2-8pm M-F on certain routes
TheBus	1.25	0.00	0.00	0.00 from 2-7pm M-F

Inconsistent availability and structure of fares across segments

44

Recommendation: Make bus fares clear and consistent across the region

Today's disparate pricing structure is difficult for riders to understand...

Availability of discounted fares: Different bus providers offer lower fares to different segments, e.g.,
- DASH does not offer discounted fares for seniors or students, while many other operators do

Discounted fare level: Even among those who offer discounts to certain riders, the fare level varies, e.g.,
- Student fare for ART is $1.00, for CUE it's $0.85 for students holding FCPS monthly pass

...resulting in several potential opportunities to create a simplified fare structure

Agree on segments that will receive discounted fares across all bus operators, e.g.,
- All low-income, customers with disabilities, students, and seniors receive discounted fares across bus operators

Offer uniform discounts to these groups across bus operators, e.g.,
- All students ride for free
- Seniors and passengers with disabilities pay half-price

45

Recommendation: Introduce pass products that work across all bus systems

Today: Bus pass products are often available for use in certain local areas / with specific operators, e.g.,

- A SmarTrip 7-day regional bus pass is available but not accepted by all local bus providers

- The Montgomery County Ride On (MCRO) Monthly pass offers customers unlimited rides on Ride On buses for the entire calendar month purchased

- DASH Pass is valid for unlimited rides on all DASH and Fairfax Connector buses during the calendar month

- Transit Link Cards (TLC) work like a monthly pass on MARC, VRE, or MTA Commuter Buses and also provide unlimited regular Metrobus rides for a full month (an upcharge is applied for express buses)

Future: Create regional pass products to make it easier for customers to use bus

Develop a standard set of pass products that are available and usable across the region on all bus operators, e.g., universally accepted 7-day regional bus passes, monthly bus passes

Consider creating and expanding monthly **pass products for specific user groups** across the region to support accessibility or affordability goals e.g., 1-month SelectPass for Metrobus coming in July 2019 could be expanded to other bus systems

Sources: Montgomery County, DASH, WMATA.

www.BusTransformationProject.com

Key considerations: Integrated fare policy and cross-jurisdictional products will enhance the trip payment experience, but may impact revenue generation

Benefits

Easier for customers to understand / recall how pricing works, therefore making it easier to plan and ride bus increasing ridership (Links to Goal 2b)

Increased ridership – SelectPass users currently take 14 additional trips per month (Links to Goal 5a)

Costs

Cost of simplifying fare structure dependent on specific changes made (e.g., introducing free student fares across the region could result in fare revenue changes for some operators)

Risks

Reduced jurisdictional flexibility to set and change prices and/or price structure to meet local needs

Mitigating factors

Set up regular cadence for reviewing regional fare policy and products, to ensure that all jurisdictions in the region have a formal opportunity to raise any emerging pricing structure issues, and request a pricing structure update if needed

www.BusTransformationProject.com

Context: Low-income population heavily-dependent on bus, and are seeking more affordable fares

No fare discount programs exist for low-income riders in the region...

Does operator offer discounted-fare program?

Operator	Senior	Disability	Youth	Low-Income
Metrobus	✓	✓	✓	✕
RideOn	✓	✓	✓	✕
Fairfax Connector	✓	✓	✓	✕
DC Circulator	✓	✓	✓	✓
TheBus	✓	✓	✓	✕
DASH	✕	✕	✕	✕
ART	✓	✓	✓	✕
CUE	✓	✓	✓	✕

The DC Circulator which is free for all riders

...despite heavy reliance on public transport and strong interest in more affordable fares

Transit-dependence: 52% of Metrobus riders are low-income (household income less than $30,000, less than half of the median household income in the region) and 55% do not own a personal vehicle

Current spend on transit: On average, low-income riders spend more than 2x as much of their of after-tax income on public transportation, vs. riders who are not low-income

Affordable fares: In the Bus Transformation Project Mobility Survey, regional investment in more affordable fares was the fourth highest priority among low-income respondents, following reliability, frequency, and travel time improvements

Source: WMATA 2014 Passenger Survey; US Census 2011-2016 5-Year Estimates. Bureau of Labor Statistics Consumer Expenditure Survey (2017) National Average (Table 1203); BCG analysis

www.BusTransformationProject.com

Recommendation: Enhance reduced fare products for low-income residents

Key Elements in reduced fare products:

1 Provide **discounted access to transit**, including bus, for travelers in the region who need it the most

2 **Limit overhead costs** of the program by tying qualification to another regional program (e.g. SNAP) and ensure that discounted pass products are distributed by these other partner agencies as much as possible

3 Benefits and qualification criteria should be the **same across the region** to lessen the burden on users

4 **Flexibility** should allow users to use the transit system that best suits their needs, including unlimited passes where available

Supporting Information: Many large agencies have implemented fare products for low-income residents

Case studies

Los Angeles

LA Metro, in collaboration with 11 transit operators in the region, offers discounted monthly and weekly passes to low-income riders via the LIFE program

Eligible riders can save up to $24 a month on local transit trips

Adult riders, Senior/Disabled, K-12 grade students and full-time College/Vocational students are eligible if they meet the criteria

Children over 5 years old whose parents qualify are automatically also eligible to receive LIFE coupons

King County

King County (WA) Metro and 6 transit operators in the Puget Sound region offer discounted transit fares to low-income riders via the ORCA LIFT program.

Eligible riders pay $1.50 per ride, a $1.25 saving from the regular fare $2.75

Riders with a household income of less than double the federal poverty level qualify for ORCA LIFT

To get an ORCA LIFT card, riders must be between 19 and 64 years of age

New York

Fair Fares NYC is a City program to help New Yorkers with low incomes manage their transportation costs

Using the Fair Fares MetroCard, eligible New York City residents receive a 50% discount on subway and eligible bus fares

Riders must be receiving SNAP and/or Cash Assistance from the NYC Human Resources Administration and also meet an income threshold in order to qualify

Pay-per-ride, weekly unlimited, and monthly unlimited options are all available

Source: LA Metro, King County Metro, NYC.gov

50

Key considerations: Introducing a low-income fare product would increase access to bus for those who need it most, but may reduce fare revenue

Benefits

Increases equity in access to bus services – providing affordable fares to those who need it most (Links to Goal 5a)

Increased ridership – SelectPass users currently take 14 additional trips per month (Links to Goal 5a)

Costs

Lost fare revenue due to low-income customers paying lower fares (Note: could be offset by increase in ridership from new offering)

Potential impact on Metrorail ridership and revenue, if program also includes Metrorail

Risks

If operating costs for bus continue to increase (and subsidy remains the same), region will may find it difficult to create / maintain low-fare programs

Mitigating factors

Pursue other operating efficiency opportunities to reduce financial pressure on bus agencies, enabling them to offer more affordable bus fares

www.BusTransformationProject.com

Context: Today, ~16% of bus ridership across the region transfers to or from rail

% Bus ridership transferring to or from rail
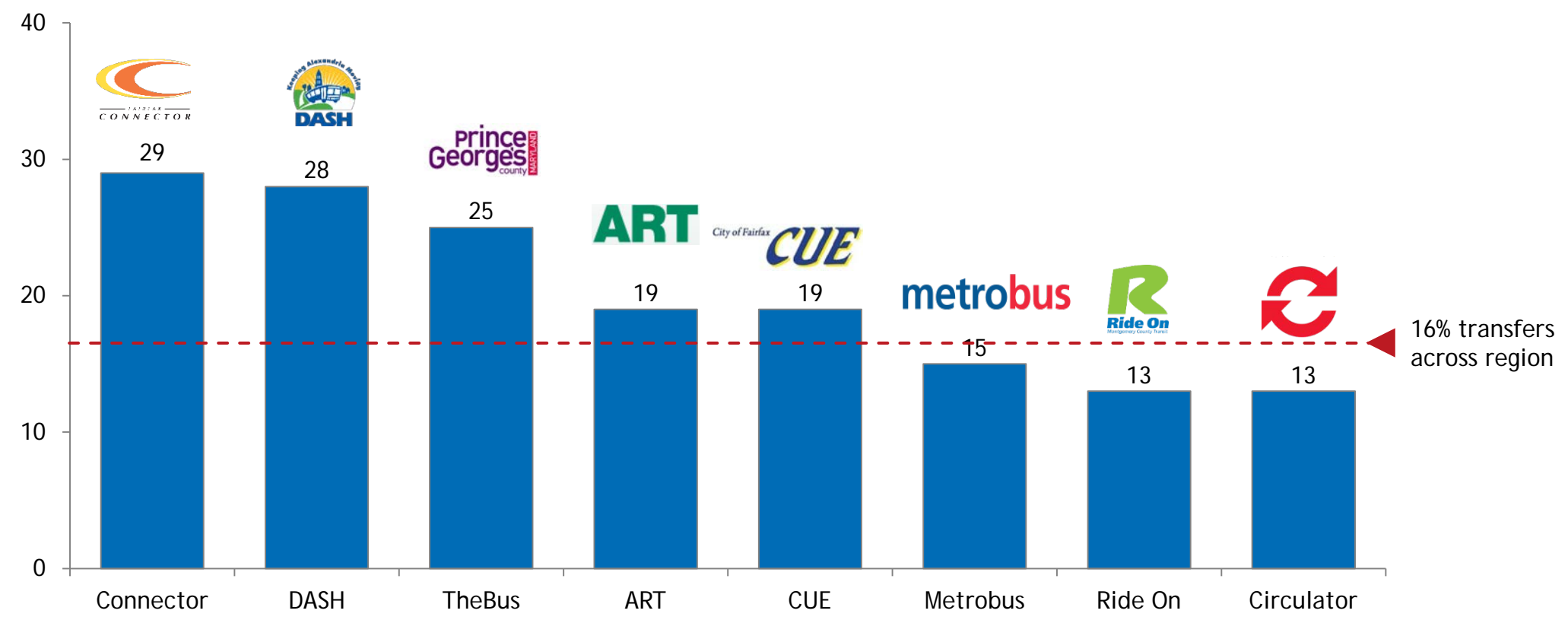
16% transfers across region

Source: Estimates based on SmarTrip data, 2017. Loudoun County local buses data not available.

www.BusTransformationProject.com

Context: Rail to bus transfer cost in the DC region is high when compared to other large metropolitan areas in the U.S.

New York
Bus fare: $2.75
Bus after rail or rail after bus: **Free within two hours**

Boston
Bus fare: $1.70
Rail-to-bus: **Free within 2 hours**
Bus-to-rail: **Full fare discount within two hours**

Chicago
Bus fare: $2.25
Bus after rail: **$2.00 discount within two hours**
Rail after bus: **$2.25 discount within two hours**

San Francisco
Bus fare: $2.50
Bus after rail or rail after bus: **Free within 90 minutes**

DC region
Bus fare: $2.00
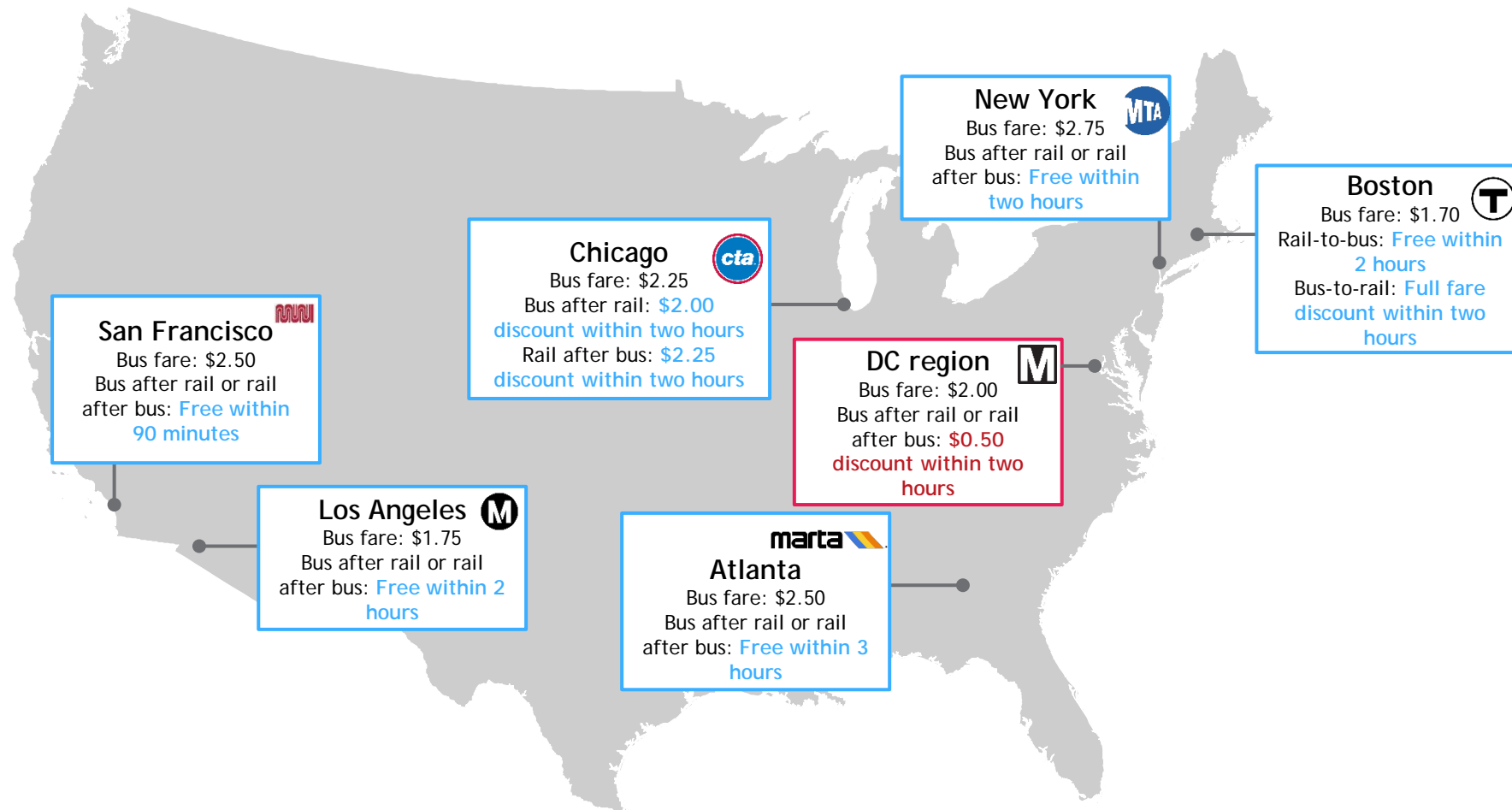Bus after rail or rail after bus: **$0.50 discount within two hours**

Los Angeles
Bus fare: $1.75
Bus after rail or rail after bus: **Free within 2 hours**

marta
Atlanta
Bus fare: $2.50
Bus after rail or rail after bus: **Free within 3 hours**

All fares listed are based on smartcard payment. If paying in cash / single ticket, Chicago bus fare is $2.50, San Francisco is $2.75, Boston is $2.00, New York is $3.00.
Source: CTA. SF MUNI, LA Metro, MARTA, MTA

53

www.BusTransformationProject.com

Recommendation: Allow customers to transfer for free between bus and rail

MTA   *Case study*

Approach

In July 1997, MTA introduced free transfers between the bus and subway up to two hours after first boarding

The objective was to increase affordability of total transit fare for riders using both bus and rail

Other fare incentives were introduced at the same time, including 7-day and 30-day passes for unlimited rides on the bus and subway for $32 and $121 respectively

Key Outcomes

The new fare offerings spurred an unprecedented increase in transit ridership in New York City, which was up 6% due to non-economic factors in 1998 and the first half of 1999

Free transfers alone produced approximately 2% incremental growth in ridership

A 2002 study found that 46% of regular MetroCard users take trips because of the free transfers that they would not have otherwise taken

Key considerations: Free transfers between bus and Metrorail would make trips more affordable for all riders, but may affect fare revenue

Benefits

Could significantly improve the affordability of transit for multi-modal users and decrease travel times for low-income riders (Links to Goal 5a, 5b)

Improves integration of the rail and bus networks, potentially increasing transit ridership by 3 million trips (Links to Goal 1c)

Expands the reach of the Metrorail system (Links to Goal 3e)

Costs

Reduction in bus revenue from rail to bus and bus to rail transfers

Depending on how revenues would be allocated, potential impact to Metrorail revenue

Risks

Risk that elimination of transfer penalty will disproportionately affect bus fare revenue vs. rail

Mitigating factors

Need to determine how free transfers will be funded to ensure costs are fairly split across bus and rail

Context: Examples of employer transit benefit programs in the region today

IRS

IRS provides a tax credit for employer transit benefits

A maximum of $260 per month ($3,120 per year) is allowable tax-free or pre-tax to employees as a transit benefit towards their use of Transit or Vanpools to commute to work

An employer can offer Transit Benefits as a salary increase, bonus, award, or other incentive. Amounts over $260/month are taxable

Employees can receive their benefits as a pre-tax payroll deduction from their paycheck. When employees use their pre-tax dollars to pay for their commute, they reduce their taxable income. That leaves less taxable payroll, which saves the company money

does
DEPARTMENT OF EMPLOYMENT SERVICES

DC has a mandatory employer transit benefit program

In DC, employers with 20 or more employees must offer access to one or more transit benefit options:
- Employee-paid, pre-tax benefit (most popular)
  - Employees use their own pre-tax funds, saving up to 40%
  - Employers save on payroll taxes
  - Funds can be used on buses, Metrorail, commuter rail, and vanpools
- Employer-paid, direct benefit
  - Offer a more competitive benefits package
  - Provide a transit subsidy of your choosing, up to $260/month
- Employer-provided transit
  - Provide shuttle service to/from nearby transit OR provide vanpool service at no cost to employees

MDOT
MARYLAND DEPARTMENT OF TRANSPORTATION

MD gives tax credit to employers who provide transit benefits

MD Commuter Choice Tax Credit allows employers to receive a 50% tax credit of the amount they spend on employee commuting benefits - up to a maximum of $50 per month for each participating employee

Any combination of benefits can be used, and employers can take this credit against the State Income Tax, the Financial Institution Tax, or the Insurance premium Tax

Vanpools, seating eight or more adults, and provided by the employer: Van purchase and leases, fuel, insurance, safety, and equal-access upgrades can qualify for the tax credit if paid directly by the employer

56

Source: DOES, MCDOT.

Recommendation: Incentivize more employers to offer transit benefits

Why increase number of employers offering transit benefits?

Transit benefits are significant driver for increasing the number of individuals using public transit to get to work

Key benefits:
- Reduces the cost of transit through the use of pre-tax dollars and puts transit passes in the hands of more people
- Improves air quality
- Reduces congestion

Among employers that offer mass transportation incentive programs across the country, nearly one-third of workers (31.1%) participate

Bus riders stand to benefit: Only 19% of bus riders in the region receive transit benefits as compared to 58% of rail riders

City ordinances: One way to increase participation

Currently, three major cities (San Francisco, New York City, Washington, DC) have passed ordinances that require employers who employ a certain number of people (ranging between 25-50) to provide their employees with the transit benefit (either pre-tax or as a subsidy)

These mandatory transit benefit ordinances have been passed without opposition and in several instances with the support of the business community, which is generally opposed to mandates

Sources: Association for Commuter Transportation, SHRM (2017), 2016 WMATA Rail Passenger Survey, 2014 WMATA Bus Passenger Survey, IFEBP Survey.

Key considerations: Increasing employer participation in providing transit benefits would mitigate congestion and increase affordability of bus

Benefits

Increased transit benefit program offerings could increase ridership and mitigate congestion (Links to Goal 1b)

Transit benefit programs increase affordability of bus (Links to Goal 5b)

Costs

Costs dependent on strategies used to encourage employers to participate in transit benefit programs

Risks

Risks dependent on strategies used to encourage employers to participate in transit benefit programs; For example, mandatory city ordinances may be met with more resistance from business community than "softer" push for participation

Mitigating factors

Working within existing jurisdictional Travel Demand Management (TDM) programs, where relationships with major employers already exist, to understand the most appropriate strategies for each jurisdiction

Context: Many bus stops in the region lack key amenities that matter to riders

We know what bus stop amenities matter most to riders in the Washington area...

WMATA Survey: Top 10 most important individual amenities	Average score (range of 1-5)
Real-time information	4.72
Schedule and route information	4.62
Lighting	4.60
Crosswalks	4.41
Connected sidewalks	4.34
Trash cans	4.34
Paved area	4.24
Bench	4.23
Security camera	4.21
Removal of items blocking access	4.19

...but the region has not yet been able to make bus stops consistently convenient and accessible for all riders

Bus stop quality is not consistent across the region
- Many stops today lack real-time information, shelters, and connected sidewalks, among others
- Even bus stops that have expected amenities / ADA accessibility are not always adequately maintained

Part of the reason for these disparities is a lack of regional guidelines for determining how and where bus stop amenities and sidewalk / crosswalk enhancements are applied
- WMATA and DDOT have published bus stop amenity guidelines, but they are not fully aligned; other agencies do not have publicly available guidelines

Source: WMATA Bus Livability Public Outreach: Executive Summary (2014).

Recommendation: Make bus stops safe, convenient, and accessible across the region

Four-part process to improve bus passenger facilities

Collect information on conditions of existing bus stops	**Align existing guidelines** for bus stop amenities / ADA access	**Establish ground rules** for collaboration on bus stop improvement	**Increase the budget** for bus stop improvement
Update data in existing shared regional bus stop database format, and share it publicly with municipal, advertising, or other partners Give riders an easy way to share stop conditions to alert maintenance crews	Review and align existing bus stop guidelines Communicate long-term plan for bus stops to regional stakeholders, and use guidelines to support decisions to invest in particular stops / amenities	Identify which municipal, transit, or private organizations in the region do (or can) contribute to bus stops Draft agreements with agencies and contracts with other partners to delineate responsibilities for investment and maintenance of bus stops and surroundings	Identify funding sources that are available and appropriate to devote to the regional bus stop program Create an annual budget item for bus stop amenities and maintenance, and increase spending as needed

Supporting information: University of Utah study found that stops with better amenities had greater ridership and lower increases in ADA paratransit demand

Case study

UTA

Context

During 2014-16, Utah Transit Authority upgraded stops along several selected bus routes in the Salt Lake County portion of the agency's five-county service area

With some minor variations, the improvements involved:
- Upgrading stops from simple sign poles in roadside planting strips
- Construction of ADA-compliant concrete pads connected to surrounding sidewalk networks
- Installation of shelters, benches, and trashcans

Approach

Before

After
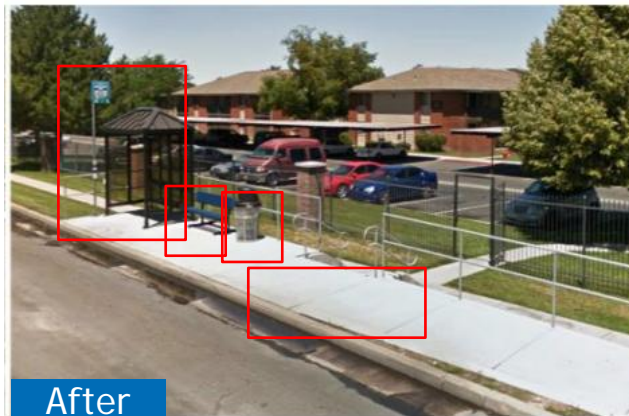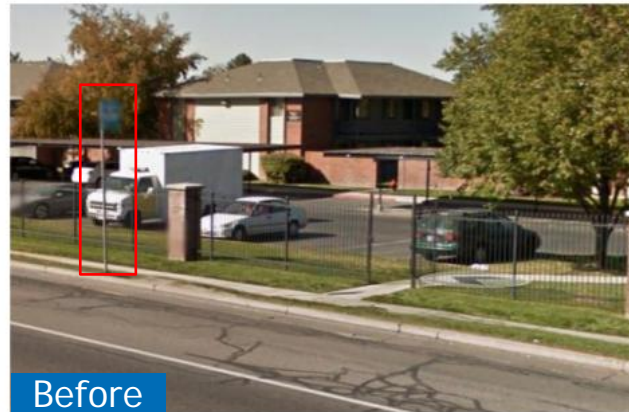
Results

Improved bus stops are associated with a statistically significant increase in overall ridership and a decrease in paratransit demand, compared to the control group stops
- Between 2013 and 2016, improved bus stops saw ridership increases that were 92% higher than increases at the control group stops
- ADA paratransit demand increases were 94% lower at improved bus stops than at the control stops (supporting the possibility that the sidewalk connections and concrete pads, facilitated a shift from paratransit service to regular bus service for riders with mobility limitations)

1. Based on study, cannot claim that full increase was due to new ridership – it's possible that the difference in ridership was comprised of preexisting riders who simply switched from using unimproved stops to stops with improvements. Even if the change was due to "switchers" only, results still demonstrate attractiveness / popularity of improved bus stops vs. old ones
Source: Utah Department of Transportation Research Division (2018)

Key considerations: Making bus stops consistently safe and convenient across the region could enhance customer preference for bus over other modes

Benefits

Enables provision of consistent, accurate, integrated customer information for all riders (Links to Goal 2a)

Ensures all bus stops across the region are comfortable for riders while waiting for the bus which should increase ridership (Links to Goal 2c)

Enhances mobility options for people with disabilities (Links to Goal 5c)

Costs

Cost of improving bus stop infrastructure to meet regional bus stop amenity and ADA accessibility guidelines is dependent on agreed-upon guidelines

Risks

Potential reduction in jurisdictional flexibility to change bus stop amenities to meet emerging local demands

Mitigating factors

Consider guidelines as 'minimum amenity standards' and allow jurisdictions flexibility to provide additional amenities to match on-the-ground conditions as needed

Recommendation: Modernize the region's bus fleet with advanced technologies that improve the environment, safety, and the rider experience

Opportunities to modernize bus fleets

Enhance Comfort

- Install comfortable seating
- Invest in internal aesthetics of bus (e.g., paint, décor, advertising)
- Ensure optimal temperature control (e.g., heating, air conditioning)

Preserve the Environment

- Invest in electric vehicles which can reduce emissions, energy usage, and noise associated with buses
- Consider charging facilities and other infrastructure needs

Embrace Innovation

- Improve safety and operating efficiency by incorporating connected technologies that can save lives, speed up buses, and ease the burden on bus drivers
- Investigate potential cost efficiencies and customer service enhancements made possible through automation

Embed Technology

- Improve data-collection technology on bus, to drive better real-time service information
- Consider offering electrical outlets, WiFi on select routes
- Invest in technology that improves safety and security of passengers

Supporting Information: Air pollution is an urgent global challenge, driving shift towards clean energy solutions

Unhealthy air

~95% of people globally live in areas where ambient particles (small dust or soot particles in the outside air) exceed the World Health Organization's guideline, and global air pollution is on the rise

Link to illness

Research indicates that people who live in more polluted locations are more likely to become ill with heart and lung disease, strokes, and lung cancer

Growing pollution

Global air pollution has increased 24% since 1990; Transportation emission sources contribute up to 23% of pollution

Bus contribution

Global bus fleet is responsible for an estimated 15% of all emissions from on-road transportation

Policy change

In January 2019, the City Council in Washington DC passed a climate bill with the goal of reaching 100% of all energy from renewable sources

Source: State of Global Air, WHO (2018), ITDP (2018). Renewable Energy World (2019)

www.BusTransformationProject.com

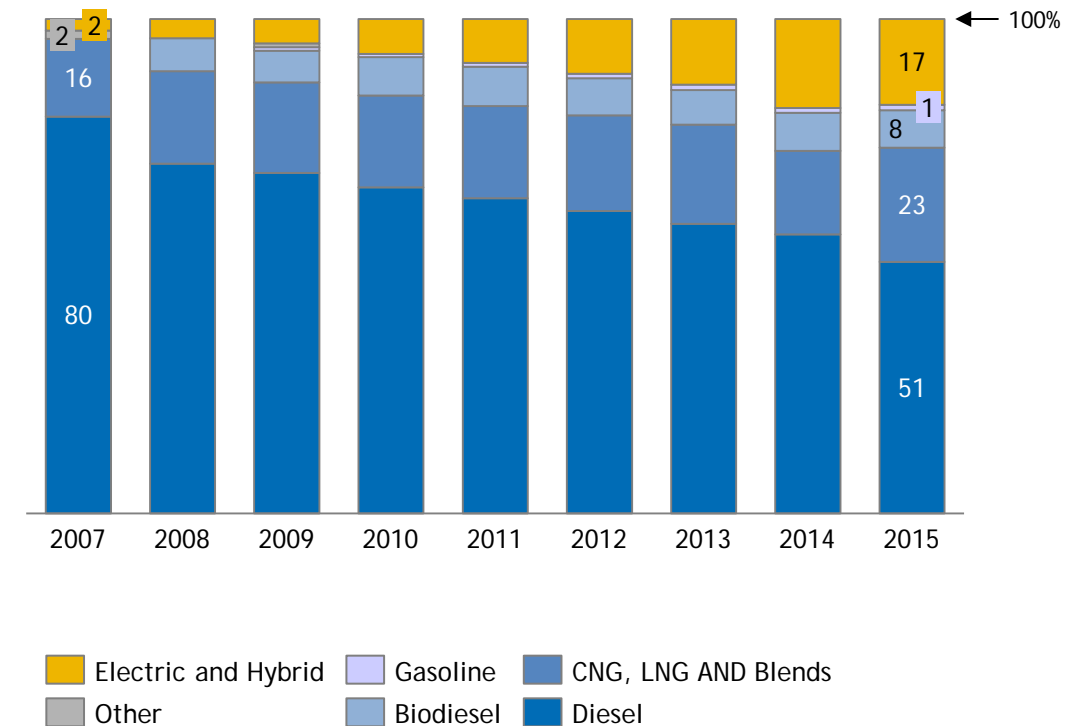# Supporting Information: Increasing proportion of transit buses powered by electric propulsion across the country

What is electric propulsion?

Electric propulsion makes use of electricity to power vehicles. Propulsion may be self-contained within a battery, solar panels, or an electric generator that converts fuel to electricity

In the mobility landscape, such propulsion powers Electric Vehicles (EVs), which can come in two forms:

- **Hybrid vehicles**: Combines conventional internal combustion engine with an electric propulsion system

- **Fully electric vehicles**: Operates solely on electric propulsion systems, significantly reducing emissions

US Transit buses by fuel type, 2007-2015

Legend:
- Electric and Hybrid
- Other
- Gasoline
- Biodiesel
- CNG, LNG AND Blends
- Diesel

Source: https://www.afdc.energy.gov/data/10302

65

www.BusTransformationProject.com

Supporting information: Electric bus has significant benefits regionally and around the world

Cities around the world are committing to electric bus

In 2017, twelve cities signed the C40 Fossil-Fuel Free Streets Declaration, committing to only procuring electric buses from 2025 onwards (more cities have signed the Declaration since 2017)

Los Angeles, San Francisco, and New York announced that they would transition to a 100% electric bus fleet by 2030, 2035, and 2040, respectively

In the DC region, electrification is occurring in pockets, for example:

In May 2018, 14 new Proterra E2 Catalyst Electric Buses were added to DC Circulator fleet. The 100% battery-electric vehicles bring clean, quiet, zero-emission transportation to more than 4.8 million annual riders on all six Circulator routes

59% of Metrobus' 1,500+ bus fleet are hybrid vehicles and one bus is fully electric, compared to 29% CNG, 9% Clean diesel, and 3% standard diesel

Reasons to transition to electric bus across the region

Energy efficiency: Reduced environmental footprint of bus, and transportation in general

Ridership experience: Quiet motors offer a more pleasant ride over their noisy diesel counterparts

Lower operating cost: Lower maintenance costs over the lifetime of the vehicle, thus decreasing the costs of providing transit service

Garages: Electric bus garages are more community-friendly than existing bus garages; as a result, less pushback from NIMBYs

Supporting information: Chicago undergoing $54M effort to modernize bus fleet

Case study

Context

In 2017, the city of Chicago announced a $54 million plan to overhaul 208 hybrid articulated buses – the longest buses in its fleet serving many of the busiest bus routes in the city. The overhaul program was intended to provide CTA customers with cleaner, greener, and more reliable buses while also creating 100 new jobs.

Since 2011, the CTA acquired an almost entirely new bus fleet, providing customers with safe, reliable, and more comfortable transportation. This included purchasing more than 500 new buses and overhauling more than 1,000 buses to make them like new and extend their lifespans.

With the overhaul or "gut rehab" of another 208 buses, 94 percent of the CTA's bus fleet will be new or like new.

Approach & expected outcomes

By performing these overhauls, CTA is expected to see a 20% reduction in hours needed for repairs – ultimately saving millions of dollars in deferred maintenance costs.

A complete bus overhaul will take approximately one month to complete and includes:
- Rebuilt engines and suspension systems
- New hybrid batteries with increased capacity
- Rehabilitated heating and air conditioning systems
- New cooling systems with electric fans for improved fuel efficiency
- New seat inserts
- External body repairs and painting as needed

Project work is expected to continue through 2019.

Source: Transit Chicago (2017).

Key considerations: Modern bus fleets offer more pleasant and energy-efficient rides, but require significant infrastructure investment and planning

Benefits

Reduced emissions from clean-energy buses lead to healthier communities (Links to Goal 4c, 3a)

Modern bus fleets with quieter engines, better amenities, and embedded tech enhance customer experience on bus which should increase ridership (Links to Goal 2c)

Lower maintenance costs over the lifetime of the electric bus – savings could be reinvested in customer experience (Links to Goal 3a)

Costs

Cost of modernizing bus fleet dependent on timing and specifications of new bus procurement

Risks

Risk that electric bus infrastructure will not be sufficient to support proliferation of electric buses

Connectivity and Automation technologies are still evolving, and pace of adoption is unsure

Mitigating factors

Region must ensure that electric bus charging and maintenance needs are considered in operations planning and garage locations

Region must commit to staying abreast of technology developments that would benefit riders, which may be facilitated by the regional mobility Innovation Lab (see recommendation 5B)

68

2

Prioritizing buses on major roads is the fiscally responsible way to move the most people quickly and reliably

Element: Prioritizing buses on major roads is the fiscally responsible way to move the most people quickly and reliably.

Recommendations to drive strategy:

A Obtain commitments from each local and state jurisdiction to prioritize bus on major corridors within their boundaries

B Adopt consistent priority guidelines for corridors across the region

C Develop enforcement programs that maximize the effectiveness of bus priority efforts

D Offer incentives to jurisdictions to encourage implementation of the regional priority guidelines

E Coordinate with regional congestion mitigation efforts, including congestion pricing, curb access management, and parking limitations to move more people more efficiently

What the strategy will achieve:

If the region commits to priority treatment of bus, it will experience:

- Reduced **journey time** for bus riders
- Increased **ridership**
- Greater **on-time performance** for bus
- Decreased **bus operating costs**
- Improved **traffic conditions** across modes
- Improved **regional productivity and competitiveness**

70

Context: Traffic congestion slows down buses and the whole region.

Significant congestion in the Washington region today….

2nd Most congested metropolitan area in the U.S.

19th Most congested metropolitan area in the world

23% of driver time spent in congestion during morning and evening commutes

….resulting in negative consequences for transit and society at large

- Slower bus services
- Wasted fuel and increased emissions
- Increased stress and fatigue for drivers
- Reduced personal time for other activities
- Inability to forecast travel time accurately
- Economic loss (e.g., decreased business productivity)
- Higher risk of collision due to tight space on roadways
- Difficult passage for emergency vehicles
- Increased wear and tear on vehicles

Source: INRIX Global Traffic Scorecard (2018).

Context: While bus remains the most efficient roadway mode, it is no longer competitive based on time and cost considerations, compared to other options.

Bus is the most efficient way to move people on roadways...

60 vehicles for 60 passengers

1 bus for 60 passengers

...but buses are traveling slower today than 10 years ago...

9%

11 mph

10 mph

2008

2018

This speed decrease represents more than 3.8M hours lost to regional residents each year, and a cost to WMATA of more than $30 million annually.

...as a result of several landscape changes

Increased congestion from vehicles on the road, including TNCs
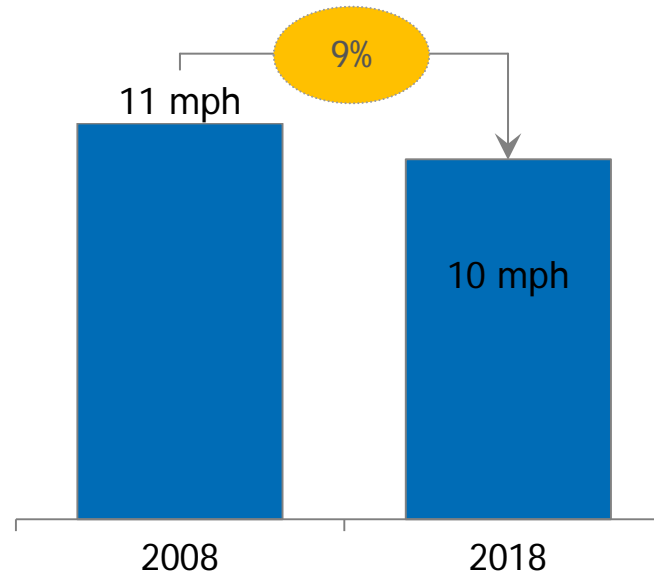
On-street parking

Proliferation of bus stops

Curbside developments

Lack of enforcement for deliveries, taxis, etc. in bus lanes and at stops

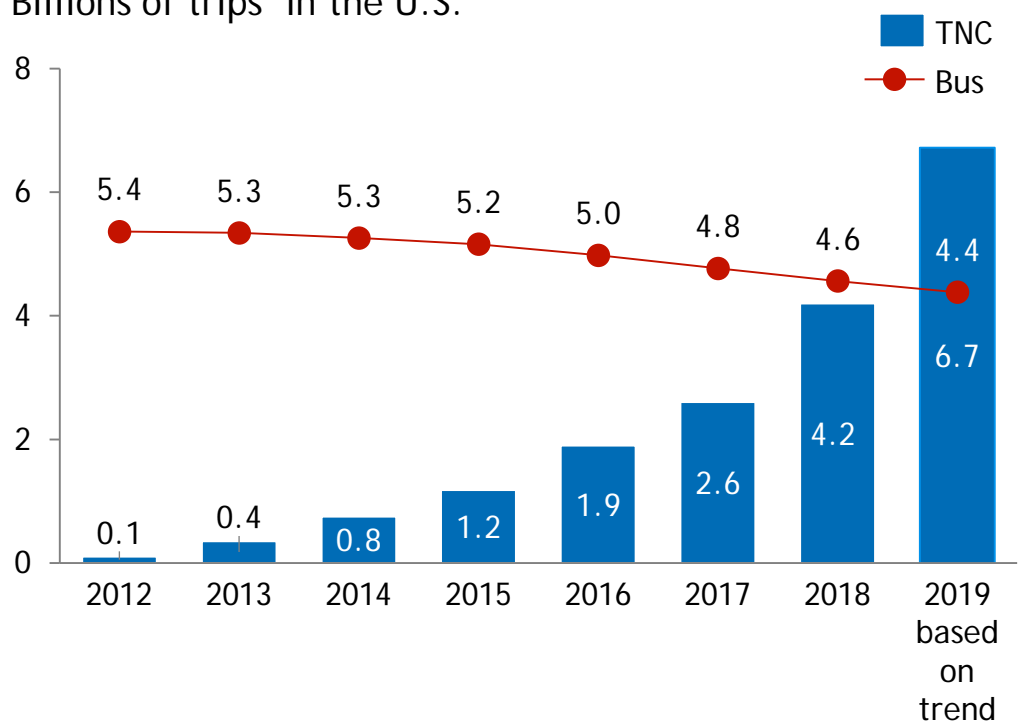Elimination of historical bus lanes

Source: 2017 NTD data

Context: Today, jurisdictions plan and execute bus priority interventions in a de-centralized fashion, rather than taking an integrated regional approach
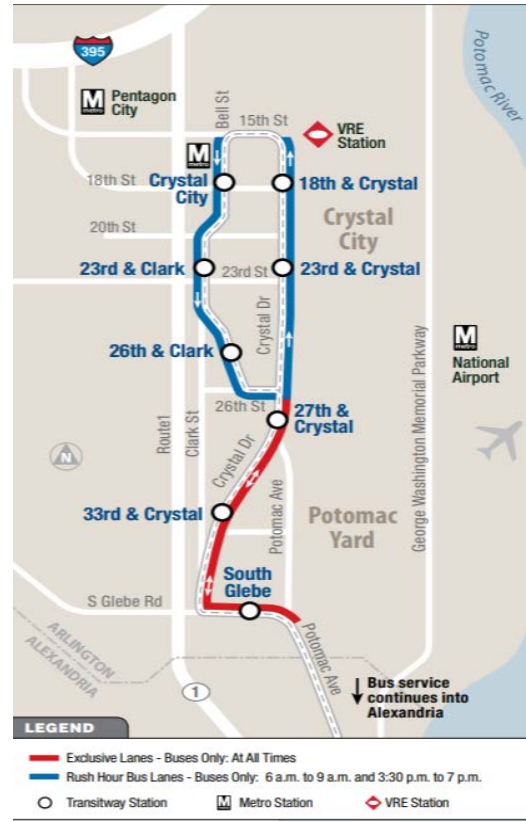
Bus priority interventions have been driven independently by jurisdictions so far…

….and upcoming bus priority interventions are still decided and planned on a local level.

Arlington & Alexandria: In 2016, dedicated bus lanes were introduced in Crystal City and Potomac Yard, providing faster, more reliable trips for bus riders along the U.S. 1/Jefferson Davis Highway corridor

DC: In 2018, D.C. set up a bus lane on 5th Street and Rhode Island Avenue Northeast, expediting G8, G9, and other special shuttle service

Jurisdictions face challenges in balancing regional goals of dedicated bus lanes with local issues like on-street parking and side street traffic operations.

Source: Transportation.arlingtonva.us, Greater Greater Washington (June 2018), Greater Greater Washington (Oct. 2018), WTOP (2016)

www.BusTransformationProject.com
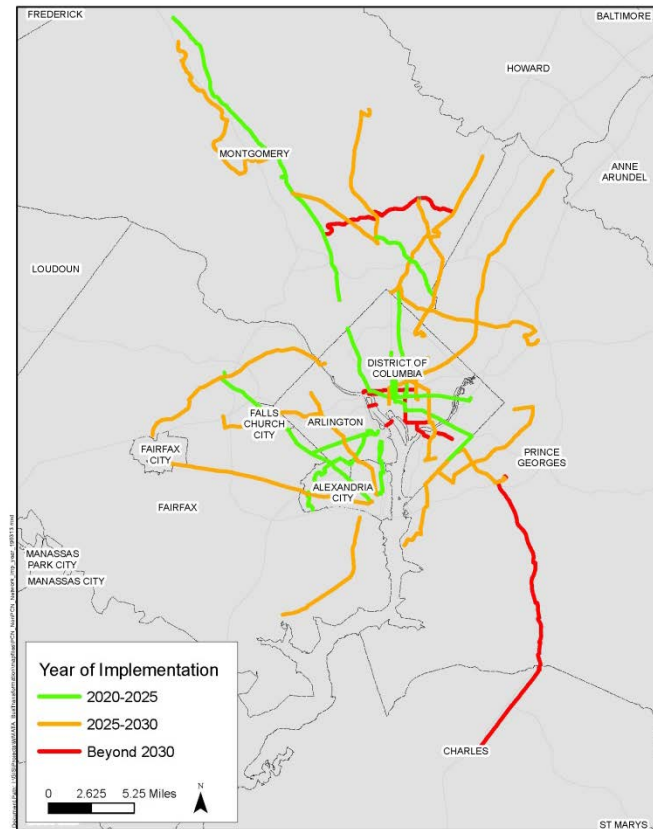
Context: Buses cannot take full advantage of priority treatments without regulation and enforcement

Without enforcement of bus facilities, buses cannot take full advantage of priority treatments, reducing the return on priority investments

Vehicles blocking bus facilities impact overall roadway operations:

- Slow travel speeds in bus lanes

- Force buses to merge into general traffic to get around stopped vehicles

- Cause passengers to board and alight in unsafe traffic conditions

www.BusTransformationProject.com

Recommendation: Obtain commitments from each local and state jurisdiction to prioritize bus on major corridors within their boundaries

Obtain formal agreement across the region to commit to implementing bus priority together

Bus operators and state/local roadway owners formally agree to jointly pursue bus priority interventions across the region

Agreement includes intention to establish regional bus priority guidelines to drive implementation

Commitment to operational enforcement from the beginning is essential to success

Ensure regional bus investments are prioritized in capital allocation planning

WMATA prioritizes bus in capital plan by creating competitive grant program to implement on-street bus priority measures that will have the largest regional impact

Jurisdictions pursue enhancements needed for successful bus priority implementation

Identify additional funding sources for bus priority interventions (if needed)

Jurisdictions and WMATA work together to estimate total cost of implementing agreed-upon priority interventions

If needed, region identifies additional standalone funding sources for implementation (e.g., car tab fees, sales taxes)

Recommendation: Adopt consistent priority guidelines for corridors across the region (I)

Establish regional guidelines for identifying select <u>corridors</u> to receive priority treatment

Alignment on key metrics /thresholds for designating a corridor to receive priority treatment based on potential benefits to the region, e.g.,

Bus Service Frequency:
Prioritization on high-frequency corridors helps to eliminate bus bunching

Bus Passenger Volumes:
Prioritization on high-volume corridors will provide benefits to the greatest number of users

Bus Stop Density:
Prioritization on corridors with a high number of bus stops per mile will help eliminate additional, unnecessary stopping along the route

Land Use Characteristics:
Prioritization on corridors with high density, transit friendly land-use will help to make bus an even more attractive option and improve service efficiency

Recommendation: Adopt consistent priority guidelines for corridors across the region (II)

Establish regional guidelines for identifying types of bus priority _interventions_ to implement

Agreement on type of intervention to pursue in each priority corridor, e.g.,

Transit Signal Priority: Techniques used to reduce delay for bus at intersections controlled by traffic signals

Dedicated Bus Lanes/ Guideways: Lanes restricted to buses, potentially only on certain days and times

Queue Jumps: Segment of a lane (usually adjacent to heavy traffic) that allows bus to "jump" over other queued vehicles approaching an intersection and merge back beyond signal

2x **All-Door Boarding:** Allowing passengers to board through front and rear doors can decrease the amount of time spent loading passengers at bus stops

$ **Off-Board Fare Payment:** Requiring passengers to pay fares before boarding decreases the amount of time spent loading passengers at stops
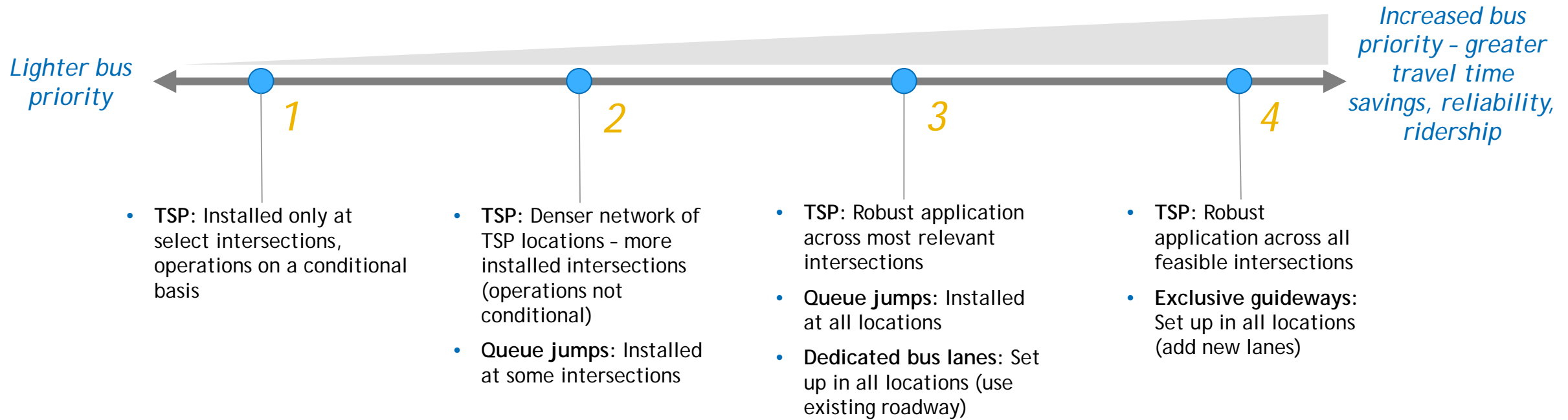
P **Parking Limitations:** Limiting parking and/or pick-up/drop-off during certain times can eliminate delays caused when buses encounter stopped vehicles in the travel lane

All treatments should consider the continued need for pedestrian and bicycle accommodation.

www.BusTransformationProject.com

Recommendation: Adopt consistent priority guidelines for corridors across the region (III)

ILLUSTRATIVE: Potential levels of bus priority on each corridor – to be decided based on need and potential regional benefit

Increased bus priority – greater travel time savings, reliability, ridership

Lighter bus priority

1

2

3

4

- **TSP:** Installed only at select intersections, operations on a conditional basis

- **TSP:** Denser network of TSP locations – more installed intersections (operations not conditional)
- **Queue jumps:** Installed at some intersections

- **TSP:** Robust application across most relevant intersections
- **Queue jumps:** Installed at all locations
- **Dedicated bus lanes:** Set up in all locations (use existing roadway)

- **TSP:** Robust application across all feasible intersections
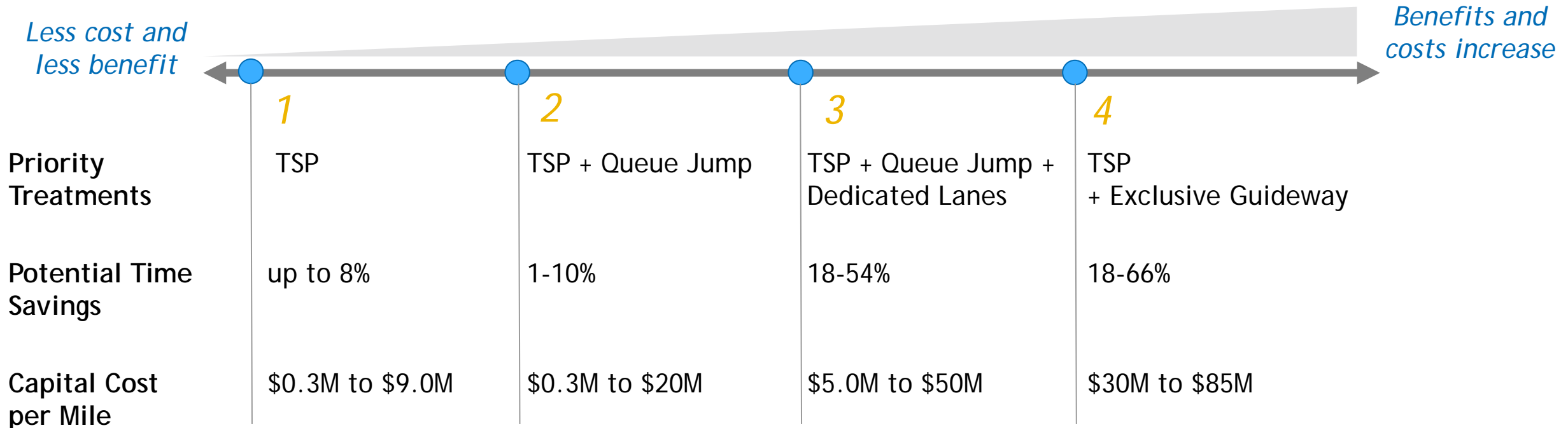- **Exclusive guideways:** Set up in all locations (add new lanes)

Greater bus priority investment must be **aligned with high bus ridership corridors** that reinforce connections between major activity centers

Each corridor may have different levels of intervention – **one size does not fit all**

79

Supporting Analysis: Greater benefits often may require a larger capital investment

Adhering to regional guidelines amplifies the network effects of priority treatments and ensures that the maximum return on investment is achieved for the region

Less cost and less benefit

Benefits and costs increase

	1	**2**	**3**	**4**
Priority Treatments	TSP	TSP + Queue Jump	TSP + Queue Jump + Dedicated Lanes	TSP + Exclusive Guideway
Potential Time Savings	up to 8%	1-10%	18-54%	18-66%
Capital Cost per Mile	$0.3M to $9.0M	$0.3M to $20M	$5.0M to $50M	$30M to $85M

Run-time improvements and costs are highly dependent on site-specific conditions

www.BusTransformationProject.com

Key considerations: Key benefit of approach is to maximize return on investment (ROI) for bus priority treatment investments

Benefits

Regional application of priority treatments will optimize trip time and reliability for riders which should increase ridership (Links to Goals 1d)

Increased operational cost savings resulting from improved bus run times (Links to Goal 3a and 3b)

Elimination of bus bunching allowing for high -frequency services to operate as planned (Links to Goal 1d)

Costs

Capital costs may be significant for some treatments, but should always be deployed in locations that will have the greatest impacts

Risks

Cars and taxis may use priority infrastructure intended for bus (e.g., bus lanes, queue jumps)

Small areas where treatments may not be applied can have a large negative impact on network performance and limit the overall benefit of investment

Mitigating factors

Invest in enforcement mechanisms where necessary, e.g., dedicated personnel and/or technology to monitor bus priority infrastructure

Recommendation: Develop enforcement programs that maximize the effectiveness of bus priority efforts

The design and implementation of priority treatment guidelines should incorporate enforcement strategies and agencies from the outset

Stakeholder Coordination – Individuals responsible for planning, design, construction, enforcement, and maintenance all need to be at the table from the beginning to establish effective and lasting coordination procedures.

Enforcement mechanisms – Police enforcement and automated camera enforcement are the two most common tools used to minimize bus lane violations

Legislation to enable - ticketing or automated camera enforcement

Education – outreach campaigns are critical to increase knowledge and promote correct use of treatments by all road users

82

Supporting information: San Francisco and New York have implemented automated enforcement practices that generate citations for both moving and parking violations

Compared to active police enforcement, automated enforcement can have significant fiscal and enforcement benefits at a lower cost.

California
California's initial automated bus lane enforcement legislation was made permanent in 2015, establishing the Transit-Only Lane Enforcement (TOLE) program.

New York
Due to the heavy volume of traffic on streets, bus lane enforcement cameras have been useful in automating a process that would otherwise require significant human capital.

Before photo enforcement was implemented, officers were placed along route to issue moving and parking violations to vehicles illegally obstructing the bus lane.

San Francisco uses forward facing cameras on its buses. If a vehicle is using a lane illegally, the bus camera automatically takes a photograph of the vehicle's license plate and a citation is issued to the vehicle's owner.

After legislation, the city was able to implement on-bus cameras to record standing violations; stationary cameras are used to record driving violations.

In 2017, cameras issued 133,000 citations to motorists for driving in bus lanes.

Supporting information: DC, Maryland, and Virginia all have existing legislation for certain types of automated camera enforcement

Local examples

Virginia

Existing enabling legislation allows localities to use photo-monitoring to enforce traffic signals.

Other existing enabling legislation allows governments to install video monitoring systems on school buses to record vehicles that fail to stop until schoolchildren have crossed the street.

Legislation includes:
- provisions for violation processing and notifications
- requirements for minimum number of recorded images needed to issue a citation

Maryland

Existing enabling legislation allows local law enforcement to issue citations for violations of state or local traffic laws or regulations recorded on cameras in several types of locations, including work zones.

Other enabling legislation allows cameras on school buses, and red light cameras at intersections.

District of Columbia

Existing enabling legislation allows automated camera-based enforcement for red light violations and for illegally parked vehicles during street sweeping.

Red-light cameras are attached to traffic lights, and street-sweeping cameras are attached to the street sweepers themselves.

Key considerations: Enforcing priority treatments will increase bus speeds, improve reliability, reduce costs, and improve attractiveness of transit.

Benefits

For transit agencies, enforcement of priority treatment contributes to:
• Shorter running times
• Increased reliability
• Reduced costs
• Revenue stream from enforcement actions
(Links to Goals 1d and 3a)

For transit riders, enforcement of priority treatment contributes to:
• Shorter trips
• Less waiting
(Links to Goals 1b and 1d)

Costs

Developing an enforcement program includes upfront costs related to:
• Planning, design, and stakeholder engagement
• Drafting enabling legislation

Ongoing costs of implementing enforcement tools, including police presence and automated equipment

Risks

Enforcement program requires coordination across transit agencies, roadway operators, and law enforcement agencies

Mitigating factors

Educational program to increase knowledge of new policies and benefits of the program

www.BusTransformationProject.com

Recommendation: Offer incentives to jurisdictions to encourage implementation of the regional priority guidelines

Models to encourage implementation of bus priority:

Capital cost-sharing through a dedicated regional fund for bus priority infrastructure

Operating cost incentives pass on cost savings to jurisdictions that comply with priority guidelines (e.g. incentive structure could be based on reduction in revenue hours due to higher speeds, reduction in vehicle maintenance costs, etc.)

Center of excellence for designing and implementing bus priority treatments

Key factors to consider when selecting incentive model:

Bus service costs more to operate when priority treatments are not implemented:
- Additional labor hours to operate the same level of service
- Necessitates ownership and maintenance of extra buses to operate the same level of service

Prioritizing capital investment on the most important projects

Corridors without appropriate priority treatments make buses less attractive:
- More people will drive and make traffic even worse
- Inefficient use of roadway space and decreased person-throughput

Key considerations: Incentives should encourage capital investment in priority treatments to achieve maximum regional benefit

Benefits

Encourages jurisdictions to make capital investments to achieve operational incentives (Links to Goal 3e)

Encourages quicker implementation of a regional network of bus priority treatments (Links to Goals 3a, 3b)

Jurisdictions have access to greater capital pool for implementing bus priority, instead of relying solely on local investment (Links to Goal 3b)

Costs

All cost sharing models encourage most efficient use of funds for implementing bus priority treatments

Risks

Incremental costs and benefits of different levels of priority treatments are highly location specific depending on right-of-way availability, traffic conditions, etc.

Mitigating factors

Develop clear methodology and performance metrics for quantifying incremental costs and benefits

Allow jurisdictions to make incremental improvements, achieving maximum return on investment for the region

www.BusTransformationProject.com

Recommendation: Coordinate with regional congestion mitigation efforts, including congestion pricing, curb access management, and parking limitations to move more people more efficiently

Methods of reducing low-occupancy vehicle usage:

Pricing mechanisms, e.g.,
- *Dynamic tolling*: Variable toll amounts charged based on roadway congestion
- *Cordon zone pricing*: Fees charged to vehicles traveling within specific area
- *Vehicle miles traveled fee:* Charge for motorists based on road usage measured in mileage; fee can be flat or variable
- *Curb access fees*: Charge to motorists/deliveries for use of curbside space

Parking restrictions: Limitation on parking for motorists, either by charging / increasing a fee or reducing number of parking spaces available

"No stopping" zone fines: Charges to motorists for stopping in specified "no stopping" zones that restrict traffic movement (e.g., in loading areas)

Ways regional bus system can support these efforts:

Policy: Bus agencies can work with entities leading congestion reduction efforts to push policies that dis-incentivize usage of low-occupancy vehicles

Planning: Bus agencies can support the planning process to ensure that these initiatives are aligned with and enabled by upcoming bus system improvements

Extended service: Bus agencies can increase service hours / frequency to accommodate increase in riders resulting from reduced personal vehicle usage

Supporting information: In Stockholm, the Swedish Transport Administration implemented congestion pricing with the support of local bus providers

TRAFIKVERKET

Case study

Context

The Swedish Transport Administration (STA) launched a resource pricing mechanism in 2007, using automatic number plate recognition to charge low-occupancy vehicles traffic-based fees within a 13-square mile cordon zone

The STA's primary goals were to:
- Reduce congestion
- Improve air quality / public health
- Improve journey time reliability

Role of bus providers

While the congestion pricing effort was led by the STA, Stockholm transit providers were critical stakeholders in the process, providing support in the form of increased bus services

The extended bus services were motivated partly to meet increased demand for public transport, and partly by a political will to provide "carrots" (higher capacity transit services) and not just "sticks" (congestion charge)

Outcomes

- Transit ridership (bus and rail) increased by 6%
- Traffic to and from the inner city cordon was reduced by 20%
- Traffic delays decreased by 30-50%
- Vehicle miles traveled decreased by 14% in the cordon zone
- Annual revenue: 1.3B Krona (USD $155M)

www.BusTransformationProject.com

Key considerations: Encouraging shift away from low-occupancy vehicle has benefits for transit riders and the region as a whole

Benefits

Increased attractiveness of transit over single-occupancy vehicles, which leads to reduced congestion and increased ridership (Links to Goal 1b)

Reduced emissions, which improves health of the community (Links to Goal 4c)

More sustainable land use development - less space needed for personal vehicles and can be used for other purposes (Links to Goal 4b)

Costs

Costs are heavily dependent on what type of support the bus system provides to congestion reduction initiatives

Risks

Incentive mechanisms (e.g., curb access fee / dynamic tolling) can be regressive if they take a higher percentage of income from lower-income individuals

Mitigating factors

Where possible / relevant, ensure congestion pricing mechanism charges differential pricing based on factors like income
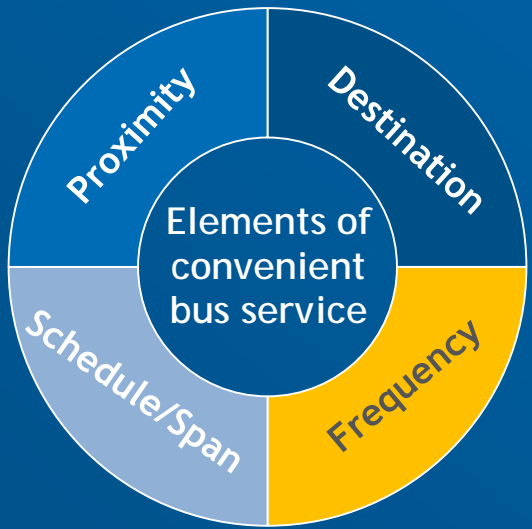
3

Frequent and **convenient bus service** is fundamental to accessing opportunity, building an equitable region, and ensuring high quality of life

Element: Frequent and convenient bus service is fundamental to accessing opportunity, building an equitable region, and ensuring high quality of life

Recommendations to drive strategy:

A Develop a regional bus network plan that realigns routes to create the most efficient and customer focused bus system

B Adopt consistent guidelines across the region to provide customers with the right amount of bus service by location and time of day

C Provide flexible, on-demand transit services to markets where customers are not well-served by conventional bus service

Elements of convenient bus service
- Proximity
- Destination
- Frequency
- Schedule/Span

What the strategy will achieve:

Strategic investment in enhancing access to bus will result in:

- Increased **responsiveness to customer demand** for service
- Increased **access to transit (frequency, schedule, span)**
- Increased bus **ridership**
- More **efficient use of resources**

Context: Four key drivers for improving convenience of bus service

Elements of convenient bus service

Proximity · Destination · Frequency · Schedule/Span
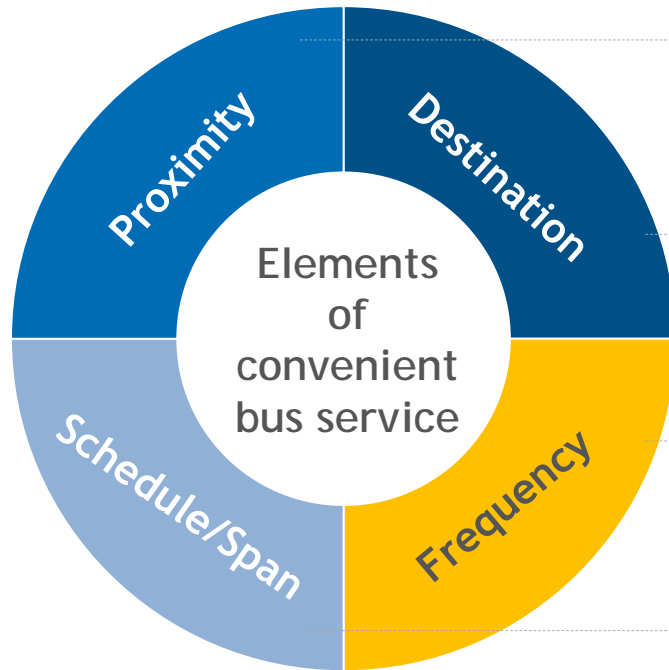
Proximity: Bus is available within ¼ of a mile
Compare today: 81% of Washington area population (94% of transit-dependent population) has a bus within ¼ mile, but span, frequency, and destination limit utility

Destination: Bus takes rider to desired location
Compare today: Third most common reason for not riding bus is the region is "Buses don't go where I need to go"

Frequency: Bus departs at frequent intervals
Compare today: 48% of the population in the region has access to high-frequency (15-minutes or less) bus within ¼ mile during peak periods, but that number decreases significantly during other time periods
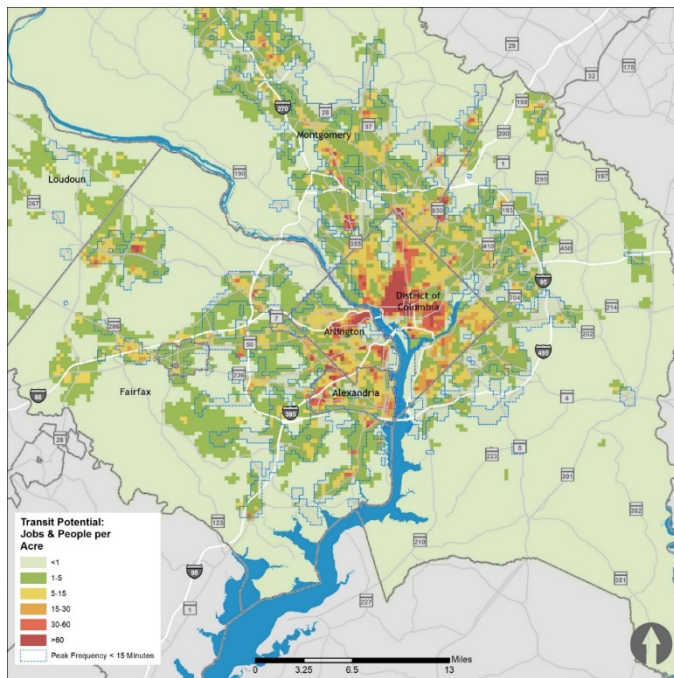
Schedule/Span: Bus is available when people need it
Compare today: Many areas of the region have very little or service outside of 7am-7pm, in addition to significantly reduced service on the weekends.
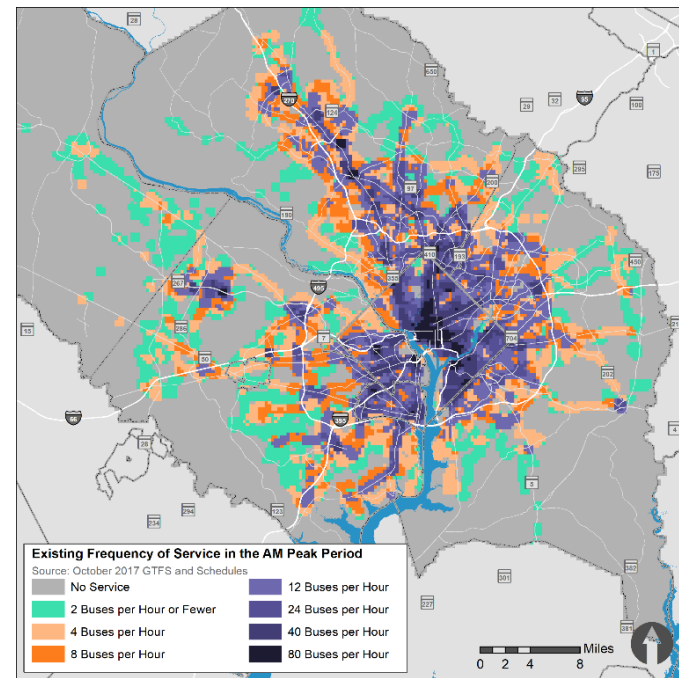
While most of the region has bus stops within ¼ of a mile, there is significant opportunity for improvement on destination, frequency, schedule, & span

www.BusTransformationProject.com

Context: Assuming service levels should meet demand, gaps exist in current service frequency and coverage, especially during off-peak periods

Current level of activity (population/employment) in the region today

Transit Potential: Jobs & People per Acre
- <1
- 1-5
- 5-15
- 15-30
- 30-60
- >60
- Peak Frequency < 15 Minutes

Current level of AM Peak bus service in the region today

Existing Frequency of Service in the AM Peak Period
Source: October 2017 GTFS and Schedules
- No Service
- 2 Buses per Hour or Fewer
- 4 Buses per Hour
- 8 Buses per Hour
- 12 Buses per Hour
- 24 Buses per Hour
- 40 Buses per Hour
- 80 Buses per Hour

While service in the peak periods is generally well matched to demand, weekday midday frequencies across much of the region are not

Jurisdiction	% of Jurisdiction with Midday High Frequency (<15 minutes) Service
City of Alexandria	85%
Washington D.C.	83%
Arlington County	76%
City of Falls Church	61%
Fairfax City	52%
Montgomery County	47%
Prince George's County	34%
Fairfax County	24%
Loudoun County	8%

www.BusTransformationProject.com
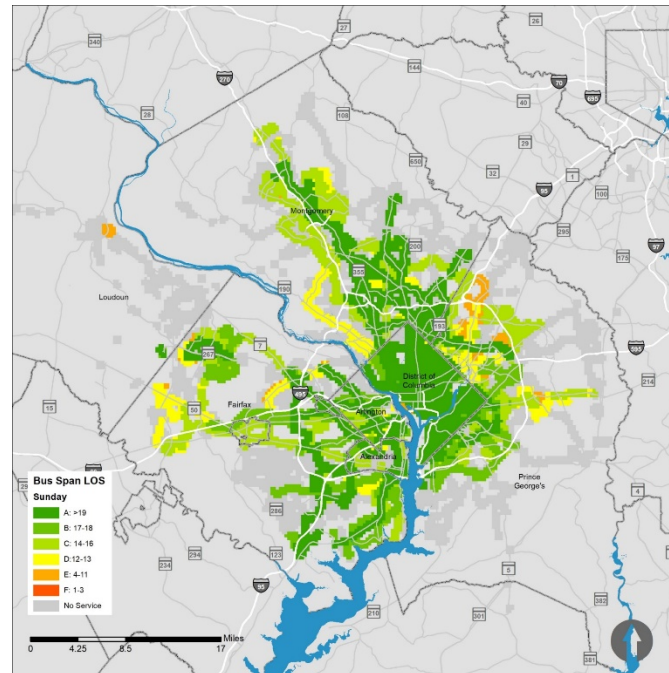
Context: Assuming service levels should meet demand, gaps exist in current schedule and span

Weekday Span of Service
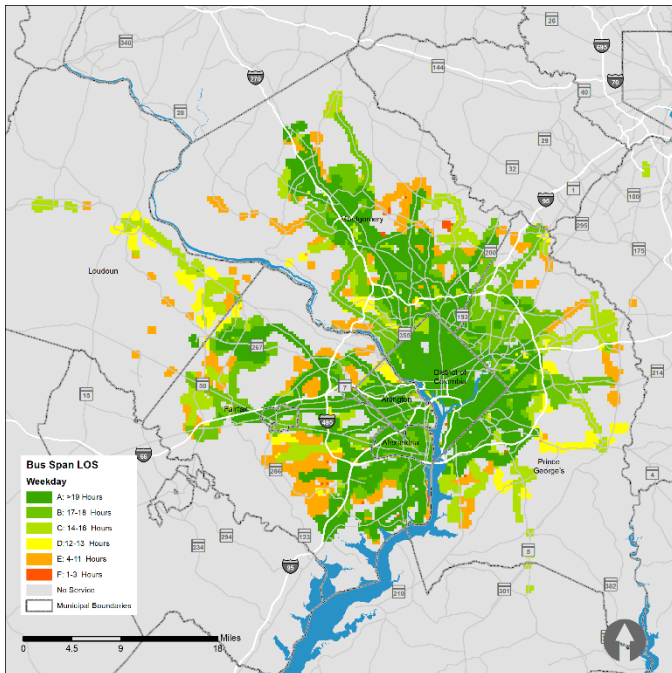

Sunday Span of Service

A long span of service in a specific location does not indicate that all routes or destinations are available.

Reductions in service outside peak hours and on weekends negatively impacts mobility

- Late night and early morning services are not offered across the region

- The level of service declines in most areas after the afternoon peak period

  - For example, on weekdays, 81 percent of the areas served by bus in both Montgomery and Prince George's County have service for at least 14 hours a day compared to Alexandria, Washington D.C, and City of Fairfax that have 100 percent of areas served being served over 14 hours a day on weekdays

- Overall, service declines across the region on weekends in a similar pattern

  - For example, only 60 percent of the areas served on weekdays in Prince George's County are served on Saturdays, and 53 percent on Sundays.

Context: Region currently operates a high number of traditional fixed route routes with low ridership

Today, 79 low-productivity routes carry 10 or fewer passengers per hour

Passengers per Hour
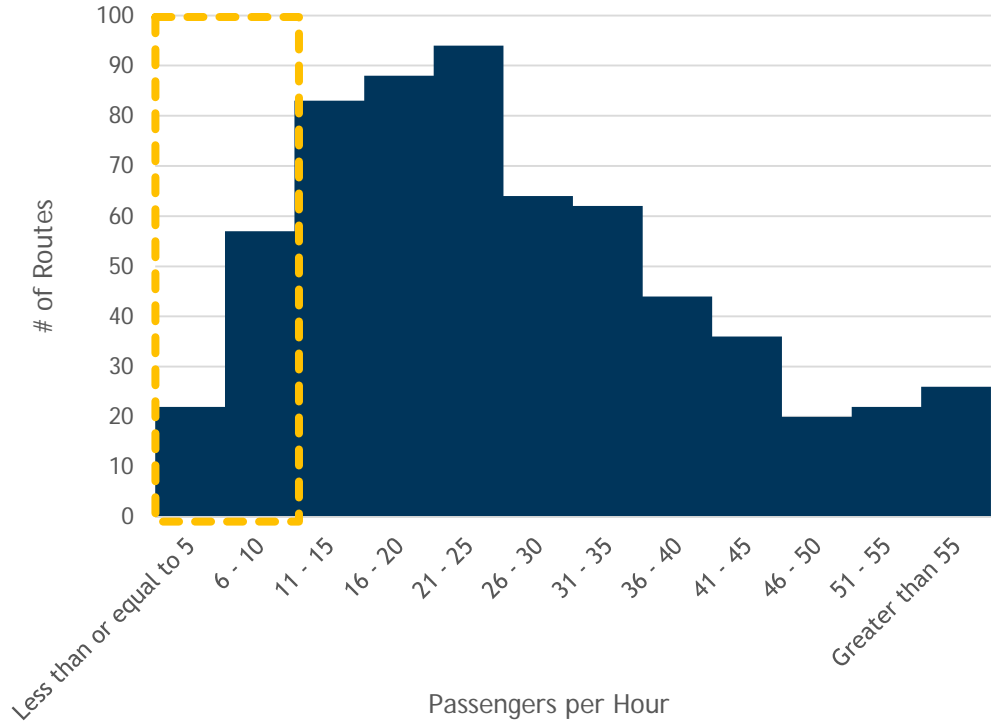
Low-demand routes are costly and typically offer poor service

Costly and Unproductive: Unproductive routes cost the region approximately $60 million annually, or $760K on average per route
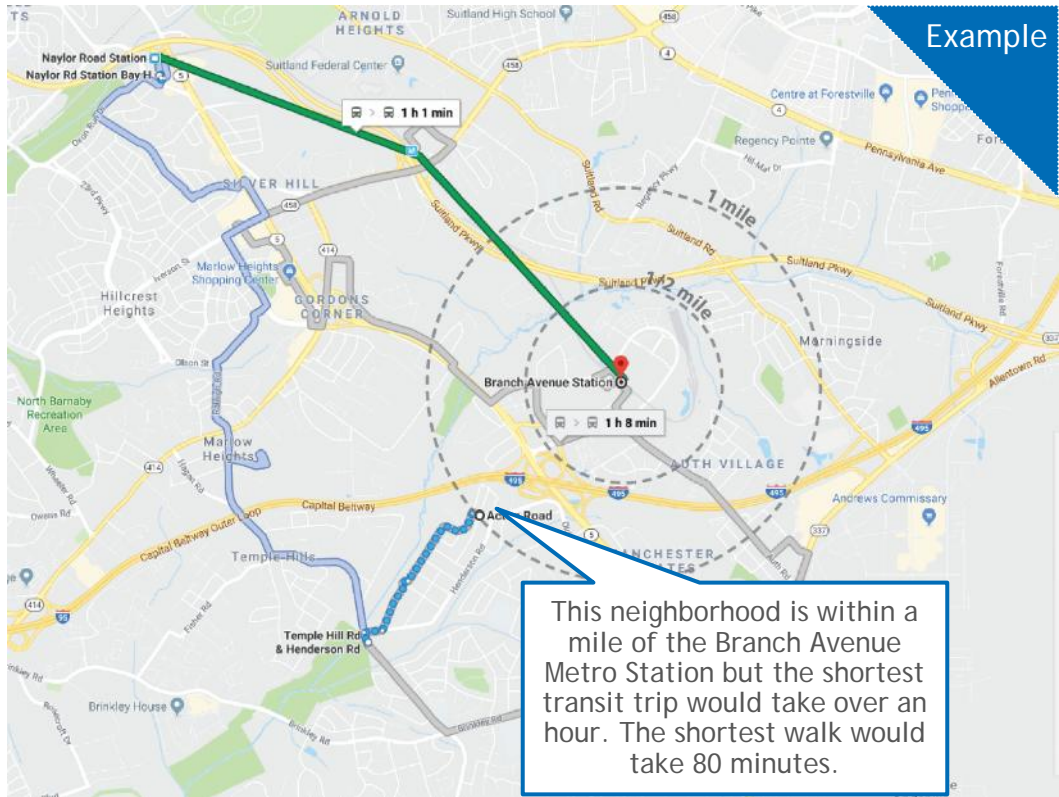
Poor Service: These routes operate on average every 52 minutes, with an average span of 12 hours

Poor Access: On average, only 3 stops per mile

96

www.BusTransformationProject.com

Context: Traditional bus is not able to efficiently provide access in certain areas or to destinations, like Metrorail stations

Traditional bus service is not able to effectively provide access to low density areas with circuitous roadways

Example

This neighborhood is within a mile of the Branch Avenue Metro Station but the shortest transit trip would take over an hour. The shortest walk would take 80 minutes.

Flexible service offers a number of advantages over traditional bus in low demand areas

Increase access: Flexible service models can provide a transit option for a wide range of neighborhoods that could not be served by local bus

Door-to-door: Service can directly connect passengers to their destination or high frequency transit, like Metrorail stations, serving a greater range of needs

Better service to high-need users: Users with mobility issues, such as seniors and persons with disabilities, can be better served with on-demand transit
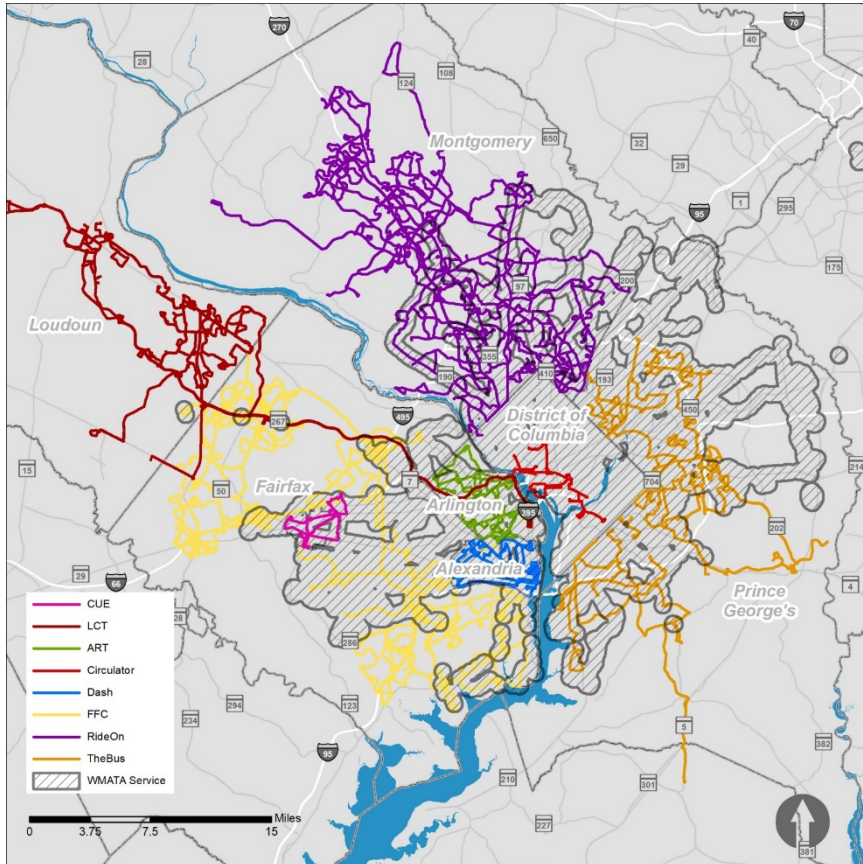
Technology-enabled: App-based on-demand services provide a convenient way to request and pay for services

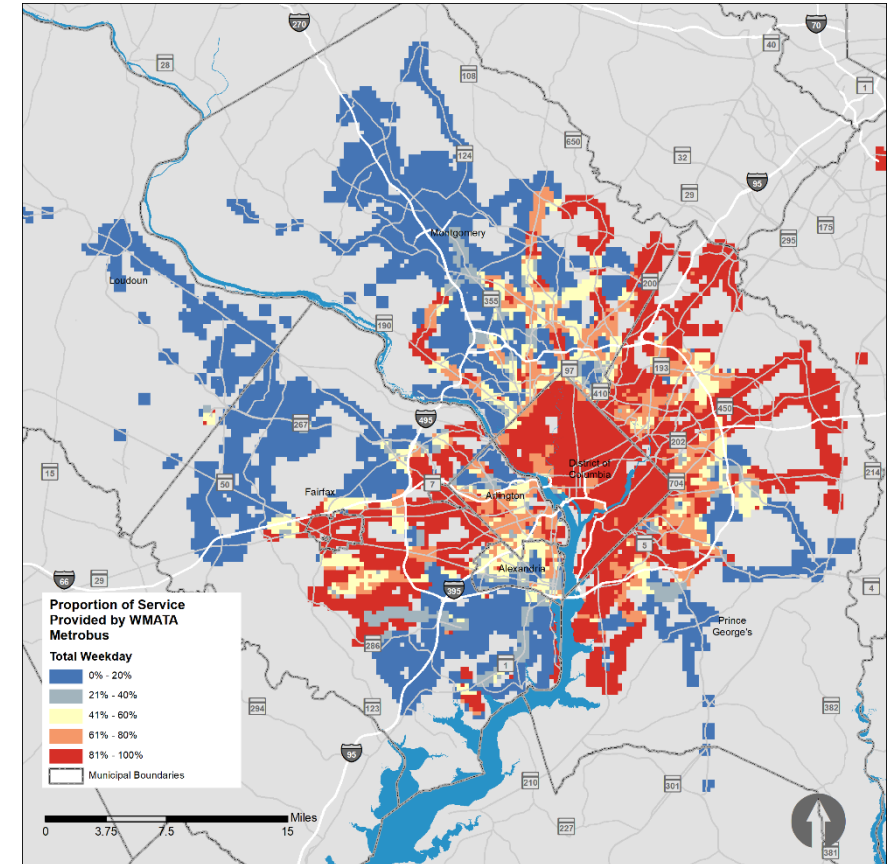**Release resources:** Free-up larger vehicles for other routes

3

Context: Planning for bus service does not occur regionally

Bus service planning is done by each agency and not part of a regional planning process

WMATA participates in each plan with each agency individually, there is no regional bus plan to guide local efforts

98

Recommendation: Develop a regional bus network plan that realigns routes to create the most efficient and customer focused bus system
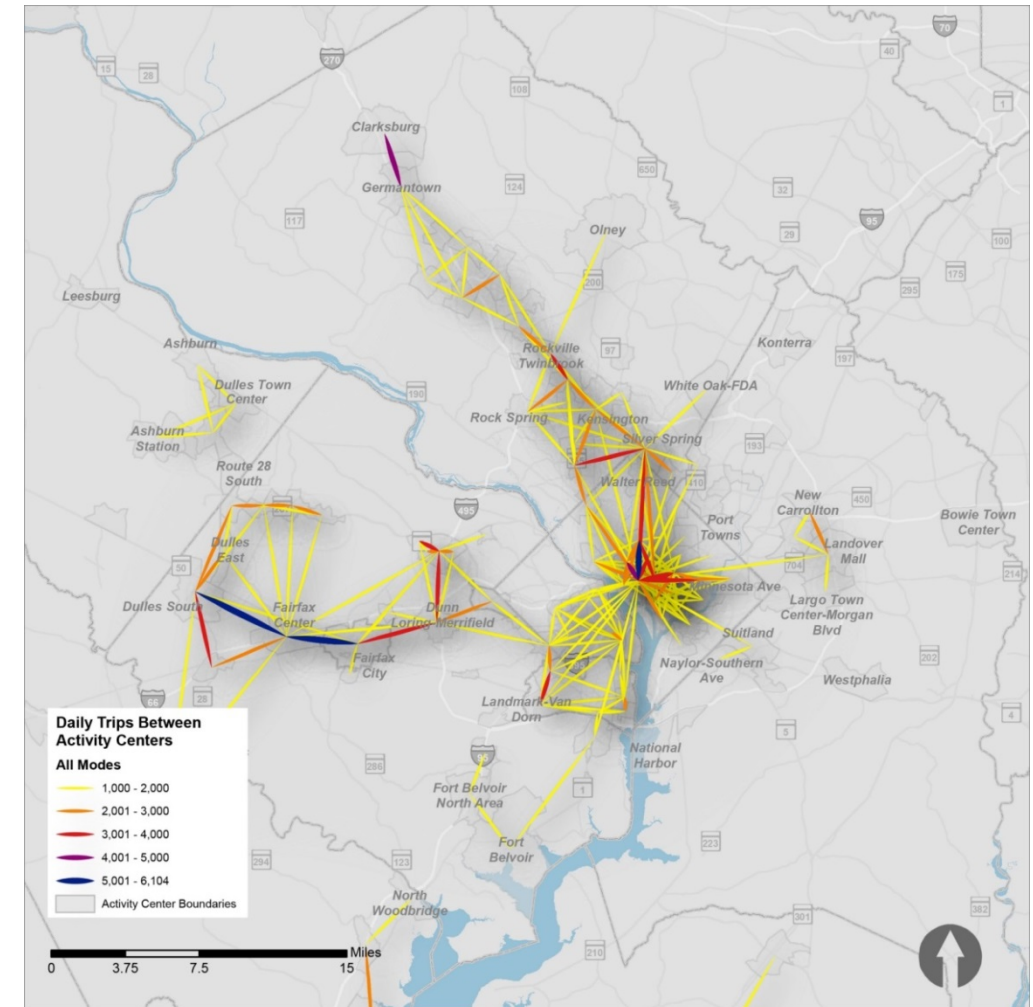
Regional Bus Network Plan

As recommended by the 2017 LaHood report, a regional bus network refresh based on the new criteria for regional routes (see Element 4) would include planning and implementation of significant changes to the network of bus routes, informed by an evaluation of the network structure as a whole rather than solely as a collection of routes

The goals of the refresh will be to improve the quality and utility of transit service by better meeting the current and future travel patterns and needs of both current and potential riders

Objectives

The primary objectives include:

- Simplifying the system for ease of public use

- Improving rider satisfaction

- Increasing ridership (or counteracting ridership losses)

- Improving on-time performance and reliability

- Increasing operational efficiency and effectiveness

Daily Trips Between Activity Centers
All Modes
— 1,000 - 2,000
— 2,001 - 3,000
— 3,001 - 4,000
— 4,001 - 5,000
— 5,001 - 6,104
Activity Center Boundaries

Miles
0   3.75   7.5   15

99

Supporting information: Bus network redesigns have additional benefits that go beyond those realized by the customers

Data, Efficiency, and Costs

Most agencies that have undertaken a redesign used on-board surveys, census data, and automated vehicle location (AVL) and automated passenger counter (APC) data, along with extensive input from the public.

The plethora of good data on bus performance existing today provides a way to tighten up service, focus on performance, and keep operating costs in-check.

Many redesigns are developed with a cost-neutral operating plan, with limited resources being redeployed to other parts of the network.

Opportunities

Network redesigns are seen as an opportunity to introduce new service philosophies, performance standards, and/or design standards.

They are also an opportunity to redefine – and better enforce –service standards and design guidelines as part of opening up the entire network for changes.

Agencies often experience improved communications as the whole agency comes together to plan and implement such a wide-reaching program.

Many agencies use redesigns as an opportunity to make supporting policy changes that are long overdue, such as changes to operations practice, fare policy, rebranding, and the organizational structure.

Technology and Performance

A holistic evaluation of regional bus service is an opening to pilot new vehicle types and technologies in a rapidly changing transportation environment. Agencies can more easily deploy new service models and coordinate improved integration with new mobility options.

Measurement and quantification of anticipated and actual improvements from bus network redesigns can be a key tool in obtaining buy-in for the plan and making decisions between different network scenarios.

Some of the most commonly considered metrics are service area and coverage, impact on cost, equity implications, ridership, travel time, and transit accessibility.

Source: TCRP Synthesis 140, Comprehensive Bus Network Redesigns, In Press

www.BusTransformationProject.com

Supporting information: Other agencies that have undertaken system redesign efforts have realized significant benefits

Case studies

Houston, TX

Between 1999 and 2012 ridership on the Houston Metro bus system had dropped 20% and three new light rail lines were being completed.

The Board decided to shift resources, with 80 percent going to building ridership, and 20 percent to maintaining coverage.

The agency added $12M to the annual budget (4% increase) to offset service decreases in some areas.

Post-redesign bus trips increased by 1.2% while other cities in Texas saw decreases of 5-6% in bus ridership.

Columbus, OH

The Central Ohio Transit Authority (COTA) redesign plan had four key priorities:

- Expand the frequent service network
- Better reach suburban job centers
- Make the network more efficient and useful to a larger portion of the population
- Increase ridership

The network redesign resulted in more evenly distributed high-frequency service, supported easier transfers, and greatly expanded weekend service.

Post-redesign ridership declines slowed and later in 2018 ridership increased 3% over 2017.

Austin, TX

Year over year decreases in bus ridership of 2-6% led Capital Metro to a system redesign effort that began in 2016.

During the process they were able to convince the City of Austin to make nineteen signal, bus stop location, and intersection changes to help the success of the network redesign.

The redesign increased high-frequency routes from six to 14, including on the weekends.

Over the first six months post-redesign, ridership increased 2.8%.

www.BusTransformationProject.com

Key considerations: A regional bus plan will result in the delivery of better service to more riders

Benefits

Better service levels for customers across the region – more frequent, affordable service taking customers where they want to go (Links to Goals 1a, 5a) which should increase ridership.

Enhanced route coordination across regional bus operators – reduced gaps / overlap in coverage (Links to Goal 1a)

Costs

System redesigns can be accomplished in a cost-neutral manner. Improvements by roadway owners and priority treatments (see Element 2) can reduce costs, potentially offsetting the cost of increases in service.

Risks

A system redesign in this region will be a significant undertaking and highly complex. Highly localized or parochial concerns could slow the process or limit its benefits.

Mitigating factors

Utilize best practices and lessons learned from peers.

Develop common visions and goals for improving the system comprehensively, from operational efficiency to providing service that would meet the needs of the riders.

Plan for extensive public and internal agency communication and coordination that must occur both during the planning process and prior to implementation.

102

Recommendation: Adopt consistent guidelines across the region to provide customers with the right amount of bus service by location and time of day

Regional service guidelines applied consistently across the region will improve service in an equitable manner

Data Driven

Guidelines should be developed based on readily available and regularly reproduceable data such as census data, land use characteristics, and existing service metrics.

Regional

Guidelines should be arrived at through regional consensus and be flexible enough that all bus service providers can apply them across our diverse region. Mechanisms should be developed to ensure guidelines are followed.

User Focused

Guidelines should be developed to ensure the best possible service for bus riders, to meet their needs in the most convenient, frequent, fast, and reliable manner that is financially sustainable.

Supporting Information: New data sources and planning tools allow for matching service levels to demand in an objective manner

Tools for Advancement

Planning practice has advanced in recent years and is now using more and richer data sources. Data mining, analysis, and new planning tools and techniques provide agencies and their planners with better information for better decision making.

Given advances in data collection, processing, analysis, and visualization it is time that bus service planning in this region take advantage of these resources and use an objective data-driven process to deliver bus service.

Service Levels Matched to Activity and Need

Using these tools, a wide array of data points can be used to better understand:

- How much bus service is needed where by time of day (frequency and span)

- How to better match service to trip demand to better connect user origins and destinations for all types of trips

Efficient and Cost Effective

Right-sizing service to activity and need by location and time of day reduces the occurrence of inefficient service.

The more convenient bus service becomes, and the more utility it has, the more people will take advantage of it helping the region realize broader goals.

Supporting Information: Minimum service guidelines applied consistently across the region will improve service in an equitable manner

Component	What it affects	Type of guidelines and targets	Key outcome
Service design	Which routes go where	• Coverage by residential density • Coverage by commercial density • Connections with major activity generators and employment centers	Network matching routes to today's demand for bus services
Service availability	How much bus capacity per route	• Vehicle Load Factor • Frequency • Span • Bus Stop Spacing • Route Directness • Percent of Population Covered	Service levels meeting demand at the right time in the right place
Service dependability	Reliability of scheduled service	• Percentage of Missed Trips • Schedule Adherence/On-time Performance • Vehicle Breakdowns	High levels of confidence in reliability of bus schedule
Financial sustainability	Cost of operating the service	• Farebox Recovery Ratio • Cost per Passenger/Trip • Subsidy per Passenger/Trip • Revenue per Passenger/Trip • Passengers per Hour/Mile/Trip • Unique Segment Ridership/Productivity per Branch	Efficient and cost-effective operations that maximize impact of taxpayer subsidies

Key considerations: Consistent service guidelines will deliver better service to more riders, better match service to demand, and more efficiently deploy scarce resources

Benefits

Better service levels for customers across the region – more frequent, affordable service taking customers where they want to go (Links to Goals 1a, 5a) which should increase ridership.

Enhanced route coordination across regional bus operators – reduced gaps / overlap in coverage (Links to Goal 1a).

Costs

Impact to costs dependent on the content of the service guidelines that are developed by the region.

Risks

Adherence to guidelines reduces jurisdictions' ability to quickly modify service to meet local needs.

Mitigating factors

Build mechanisms into the regional bus planning process that provide jurisdictions with short-term flexibility in adapting to rapidly changing transportation environment.

Recommendation: Provide flexible, on-demand transit services to markets where customers are not well served by conventional bus service

Introducing flexible service pilots through the regional bus plan effort would realize the following benefits:

- Improved **access to transit** service

- Reduced **wait times**

- Reduced **travel times**

- More **direct** service

- More **convenient** service

- Free up **resources**

Assumptions for potential on-demand service pilots

Identify areas where:
- The estimated demand falls below a reasonable threshold for local bus
- The roadway conditions (network, circuity, etc.) suggest the use of flexible service

Service Assumptions:
- 1 vehicle for every 3 square miles of flex zone
- 15 hours of service on weekdays
- 13 hours of service on weekends

Service Assumptions Source: OCTA - OCFlex: Pilot Project White Paper (2017)

www.BusTransformationProject.com

Key considerations: Flexible service offers relatively cost-efficient solution in low-demand areas

Benefits

Expanded accessibility of transit throughout the region – particularly in areas of lower demand (Links to Goal 1a).

Improve quality of service in lower demand areas by reducing wait time and improving proximity and directness (Links to Goal 1a).

Costs

Implementing flexible service pilots would not reduce costs, but would improve service for approximately the same cost as infrequent fixed-route service with a limited span of service.

Risks

Riders in low-demand areas may not take advantage of dynamic micro-transit service.

Mitigating factors

Pilot model in select areas to understand demand patterns; limit flexible service offering to hours with enough demand to warrant service.

Supporting information: Range of flexible services already used in other regions

Range of potential flexible service types

Stop request service

- Fixed route
- Regular schedule
- Plus serve limited number of undefined stops along route in response to requests

Shelton, WA

Route deviation

- Fixed route
- Regular schedule
- With/without marked bus stops
- Bus deviates to serve demand-responsive requests within a predefined zone along route

Napa Valley, CA

Flexible route segments

- Fixed route / regular schedule service switches to demand-responsive service for limited portion of the route

Raleigh, NC

Demand-responsive connector

- Scheduled transfer points connecting to fixed-route network
- Serve demand-responsive requests within zone with opportunity to connect to fixed-route via transfer

Portland, OR

Zone route

- Fixed corridor
- Serve demand-responsive requests within zone along corridor
- Fixed departure/arrival time at one or more end points

Akron, OH

Point deviation

- Limited fixed stops, no fixed route between stops
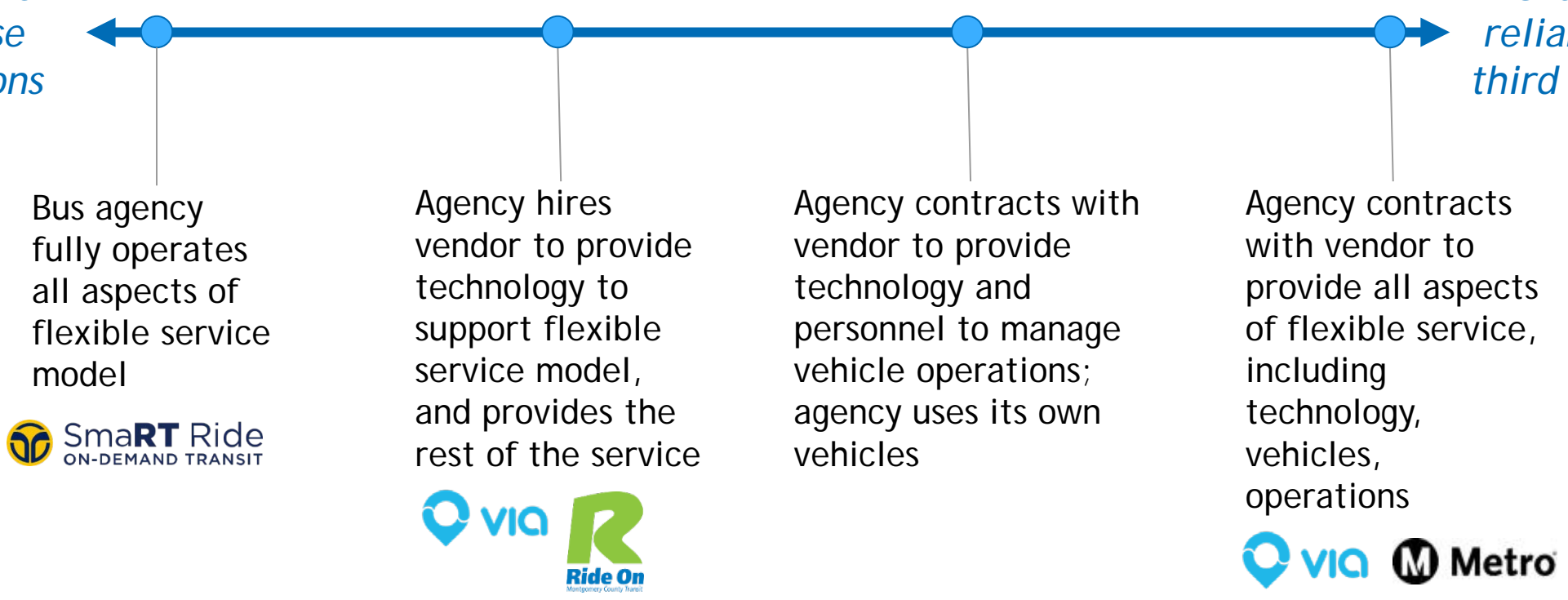- Serve demand-responsive requests within predefined zone

Granite City, IL

www.BusTransformationProject.com

Supporting information: Delivery models range from in-house to fully outsourced

Potential delivery models

Emphasis on in-house operations

Greater reliance on third parties

Bus agency fully operates all aspects of flexible service model

Agency hires vendor to provide technology to support flexible service model, and provides the rest of the service

Agency contracts with vendor to provide technology and personnel to manage vehicle operations; agency uses its own vehicles

Agency contracts with vendor to provide all aspects of flexible service, including technology, vehicles, operations

Supporting information: Systems around the country have started offering micro-transit services in select areas to meet rider needs

Los Angeles, CA Metro / via

Context:
- In January 2019, Los Angeles Metro and Via began a micro-transit pilot allowing riders who live near three Metro stations to download an app and have a car show up at their door—or within a few blocks—and take them to their desired station

Approach:
- Pilot focuses on the El Monte, Artesia, and North Hollywood Metro stations, all of which are in minority and relatively low-income communities
- Riders share their car trips with between two and five others
- People without smartphones will able to hail rides by telephone, and those without access to credit cards will be able to pay through debit or prepaid cards

Outcomes:
- Details not yet available

Sacramento, CA SmaRT Ride ON-DEMAND TRANSIT

Context:
- SacRT began piloting SmaRT Ride, an on-demand micro-transit service, in Citrus Heights in February 2018

Approach:
- All SacRT fare media is accepted, including single ride tickets, daily and monthly passes, smart card, mobile fare app (ZipPass), and cash
- Service relies on small, neighborhood-friendly shuttle buses to easily maneuver on residential streets

Outcomes:
- Within six weeks of launch, the pilot was expanded to Orangevale and Antelope
- Ridership on the service has jumped by more than six times since inception
- SmaRT Ride received $12 million grant from the Sacramento Transportation Authority (STA) to expand the service to 12 Sacramento communities

Montgomery County, MD Ride On / via

Context:
- Ride On is developing a micro-transit pilot, to be launched in June 2019 in Glemont, Rockville, and Wheaton

Approach:
- Ride On is working with Via to create customized on-demand technology suitable for Ride On's operating environment
- Ride On will operate service using its own vehicles and operators (no outsourcing)
- All vehicles will be equipped with fareboxes so that customer can pay with SmarTrip card
- Service provided on ~24-foot buses that seat ~11 passengers and can navigate narrower residential streets

Outcomes:
- Details not yet available

111

www.BusTransformationProject.com

4

Balance local and regional provider responsibilities by positioning local bus systems to meet their jurisdictional needs and the regional bus system to meet regional needs and deliver regional benefits

Element: Balance local and regional provider responsibilities by positioning local bus systems to meet their jurisdictional needs and the regional bus system to meet regional needs and deliver regional benefits

Recommendations to drive strategy:

A Position the regional bus system to provide the services that meet regional needs

B Revise the cost local jurisdictions pay WMATA for local service to better match the actual cost to provide service

C Develop a 10-year plan to optimally allocate services between bus systems for applicable routes

What the strategy will achieve:

Balancing local and regional provider responsibilities will:

- Better **align bus service** with regional needs
- **Reduce cost** of bus service regionally
- Improve **regional coordination** of bus service delivery
- Improve responsiveness of bus service to **rider needs**

Context: WMATA currently operates two types of services

Two service types defined by Blue Ribbon Mobility Panel (1997) to stabilize an integrated regional bus network

Regional Routes

WMATA maintains overall responsibility for planning and operations, in coordination with jurisdictions

Funded regionally

Non-Regional Routes

Planned by each of the individual jurisdictions, operated by WMATA at the jurisdiction's request

Funded by jurisdiction

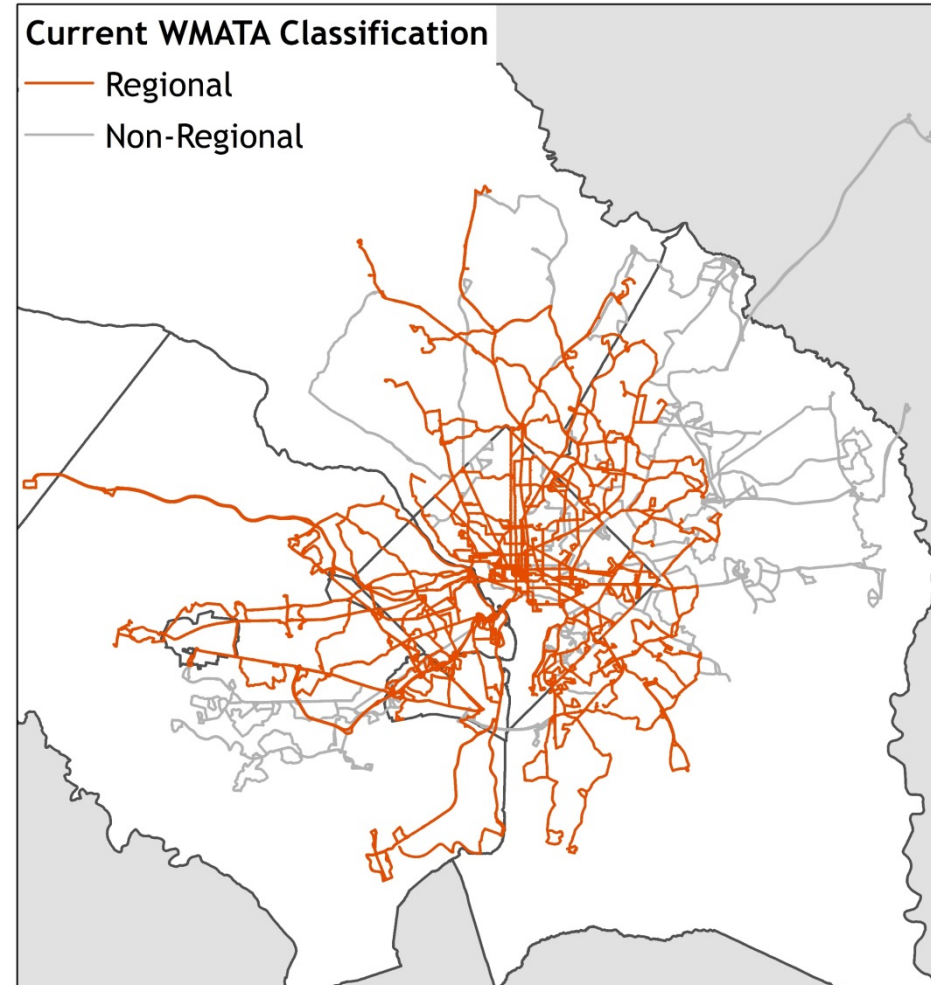Source: Blue Ribbon Mobility Panel, 1997

Context: WMATA Regional bus network works with Metrorail as the backbone of the regional transit network – and both are funded jointly by the region

Metrorail network

WMATA Regional bus network (shown in orange)

Current WMATA Classification
— Regional
— Non-Regional

Context: Designation currently determines difference in how Metrobus service is funded and by whom
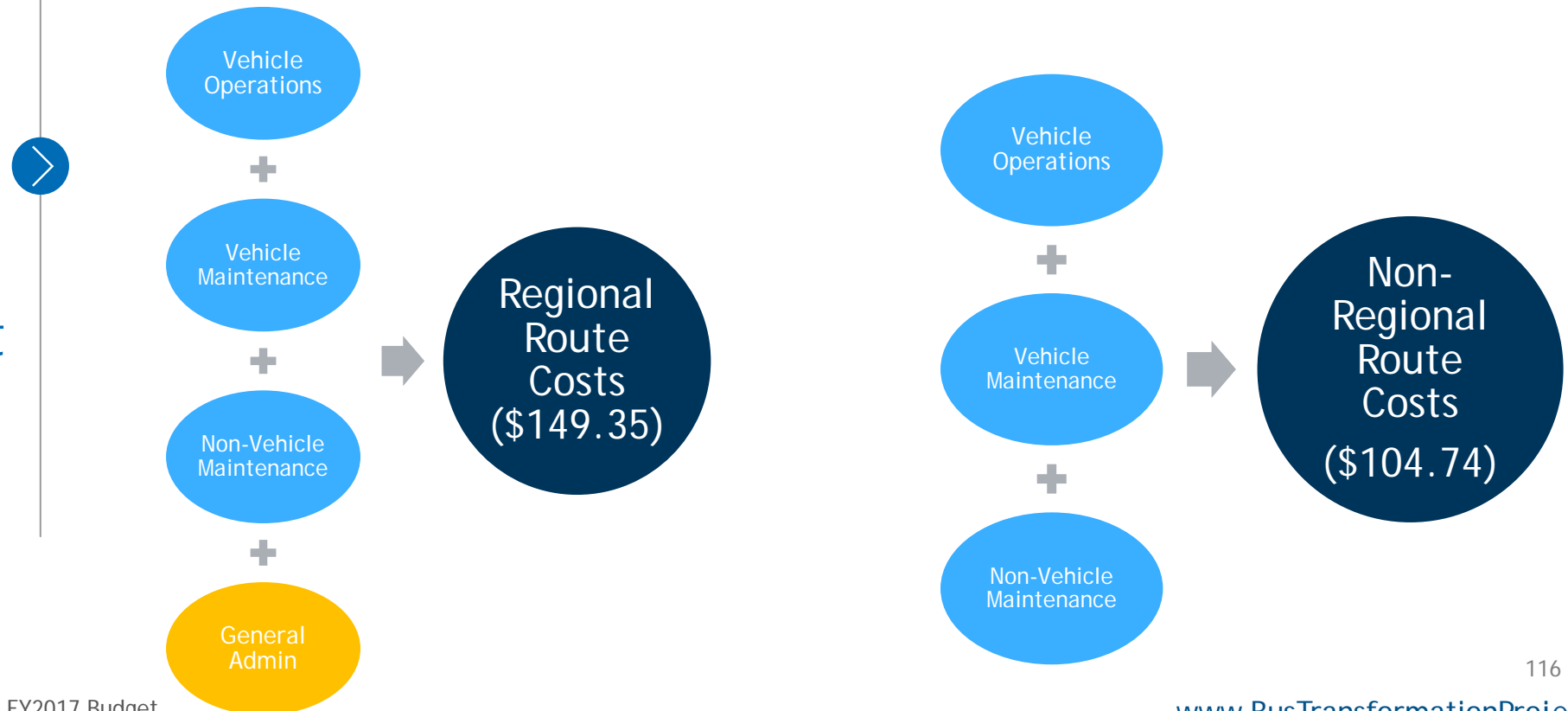
Regional Routes

Non-Regional Routes

Who pays?

Funded jointly by the region, amount paid by multiple jurisdictions is allocated according to formula

Jurisdictions pay WMATA directly for operated services

How much does it cost?

Vehicle Operations

+

Vehicle Maintenance

+

Non-Vehicle Maintenance

+

General Admin

→ Regional Route Costs ($149.35)

Vehicle Operations

+

Vehicle Maintenance

+

Non-Vehicle Maintenance

→ Non-Regional Route Costs ($104.74)

Source: Blue Ribbon Mobility Panel, 1997; WMATA FY2017 Budget

116

www.BusTransformationProject.com

Context: Current criteria that defines what service is funded regionally

**WMATA-adopted definitions of Regional and Non-Regional Bus Routes**

	Regional Routes	**Non-Regional Routes**
Interjurisdictional Connection (at least ½ mile in each jurisdiction) **OR**	• Serves at least 1 COG Regional Activity Center • Travels "considerable distance" on arterial roads • Achieves cost efficiency	Any routes that do not meet the criteria of a regional route

Context: Many routes do not meet purpose of providing interjurisdictional connections

Today 63% of Metrobus routes are designated as Regional...

The current criteria for WMATA Regional routes result in 159 routes (63% of total) being designated as "Regional"
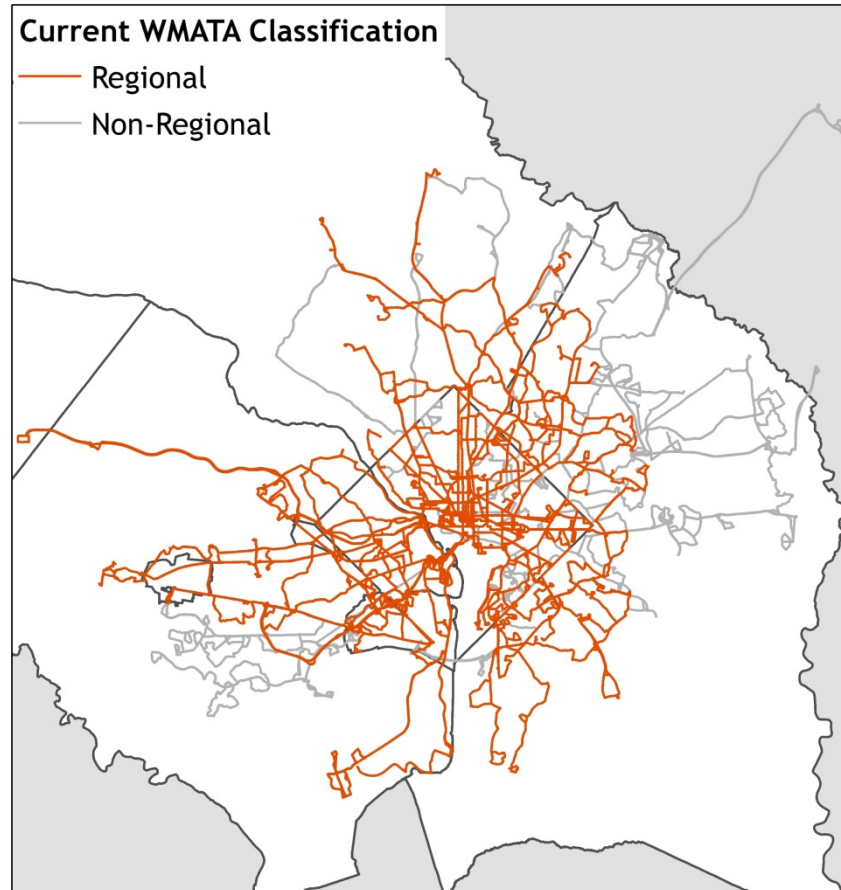
... Of those Regional routes, only 66% cross jurisdictional boundaries

54 of the 159 Regional routes do not cross jurisdiction lines. Considering Metrobus as a whole, 113 routes (44% of total) connect areas *within* jurisdictions, and 141 routes (56% of total) provide regional connectivity *between* jurisdictions.
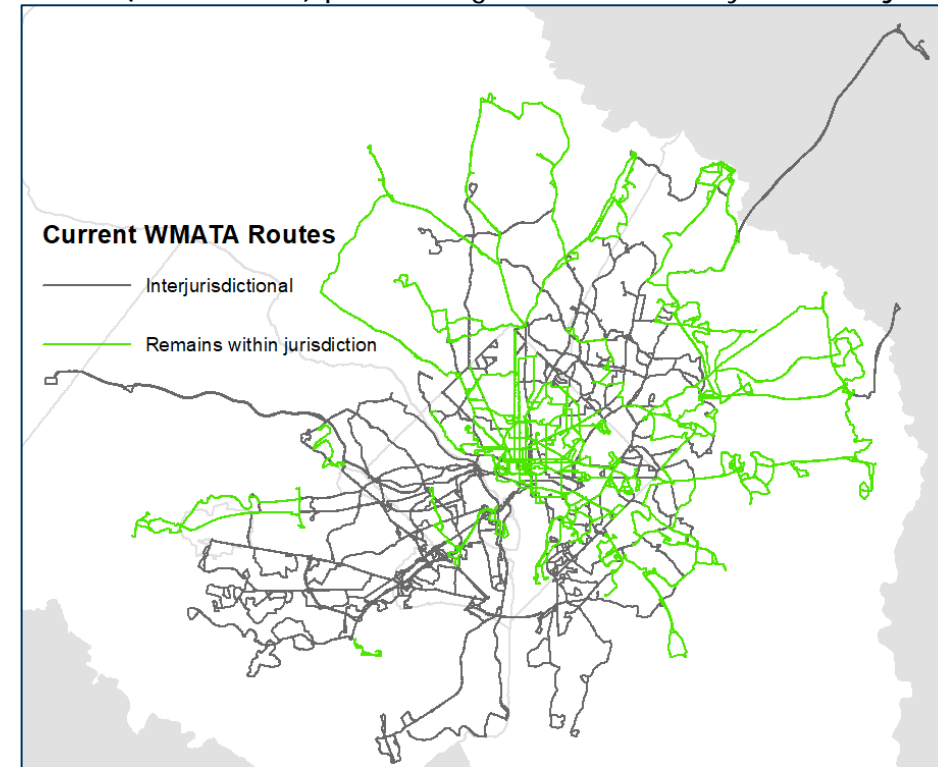
Note: For analysis purposes, the City of Falls Church and the City of Fairfax were included in Fairfax County.

118

Context: Other changes have changed the usefulness of the Regional Activity Center criteria for "Regional" routes
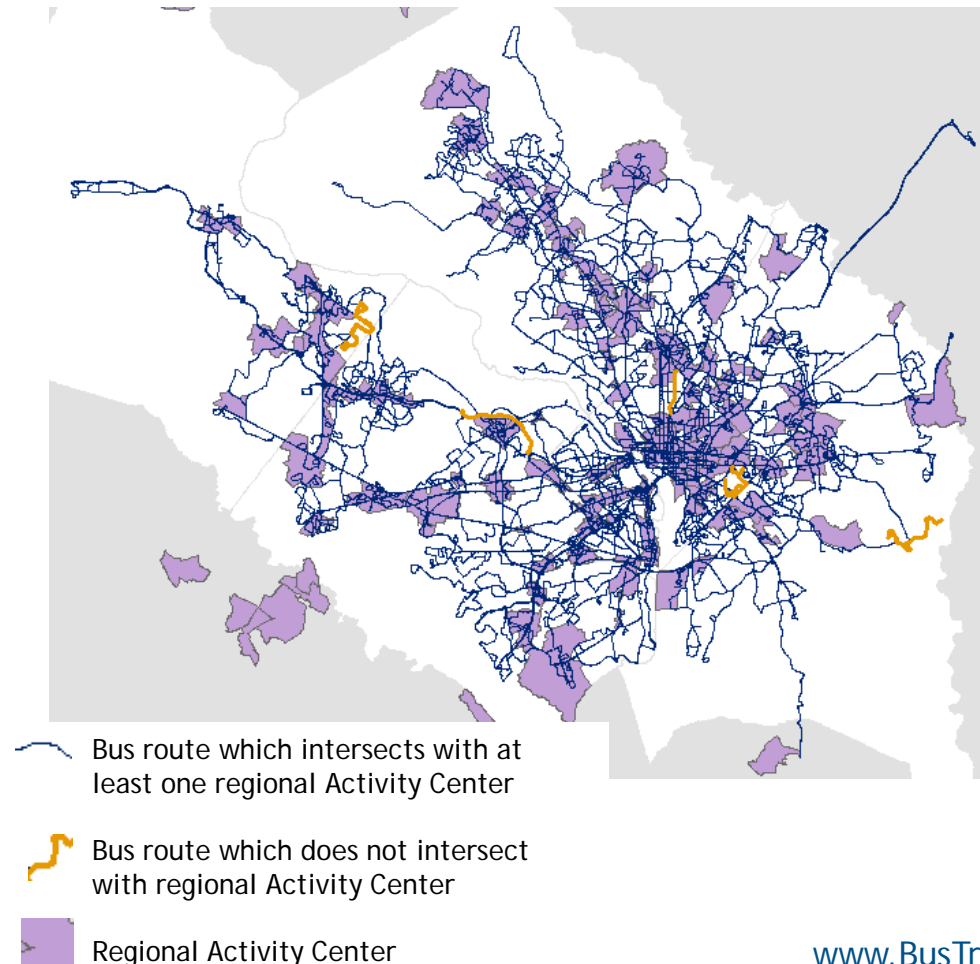
The vast majority of bus routes in the region touch at least one Regional Activity Center but...

When definitions were developed, there were only 58 Regional Activity Centers...

...while today there are 141.

Only **six routes** do not physically intersect with a current Regional Activity Center

Bus Routes & Regional Activity Centers

— Bus route which intersects with at least one regional Activity Center

Bus route which does not intersect with regional Activity Center

Regional Activity Center

Source: WMATA 2017

www.BusTransformationProject.com

Context: The arterial roads criteria for "regional" routes is both broad and vague
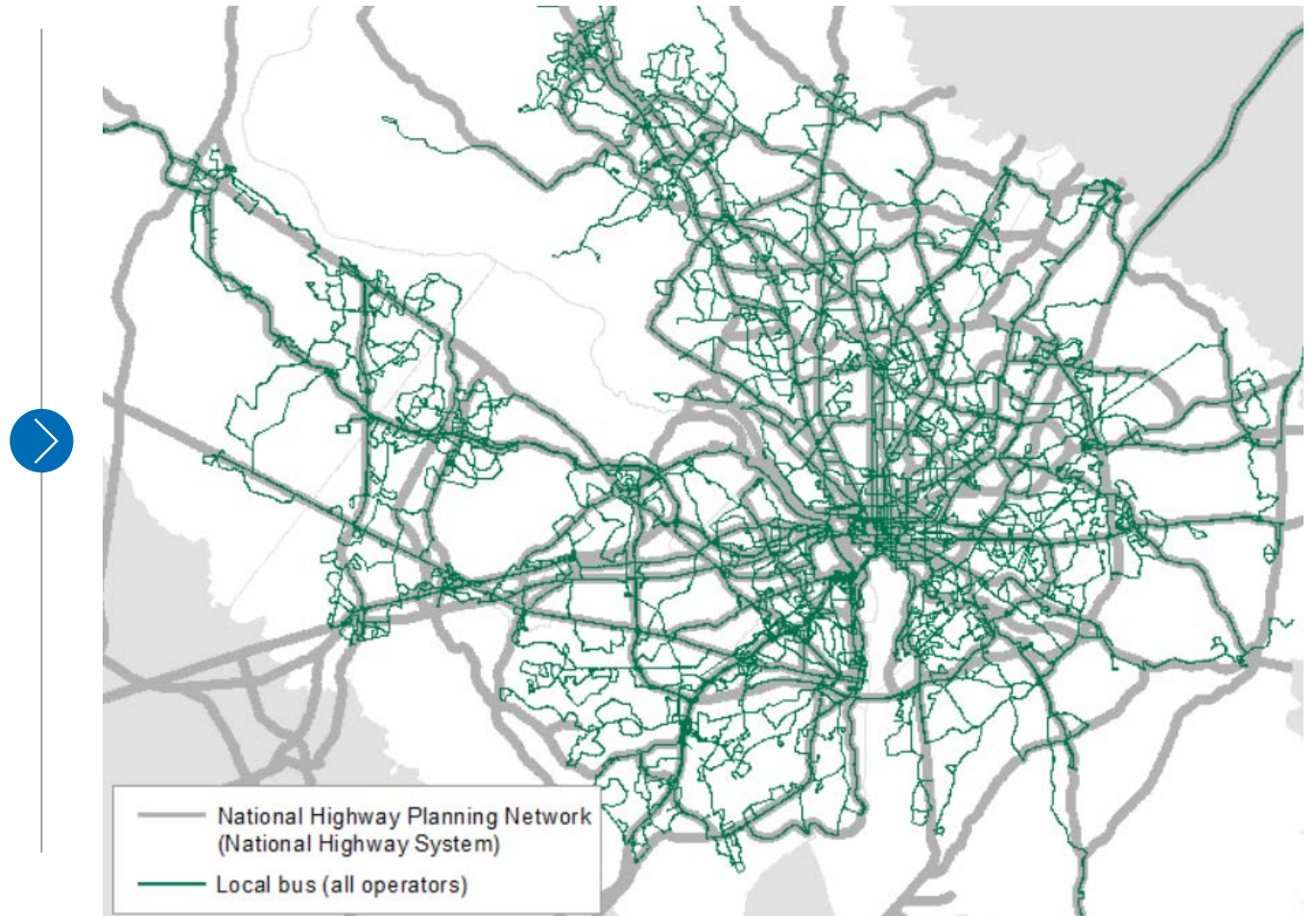
A large number of routes in the region travel on arterial roads

Criteria: "Travels "considerable distance" on arterial roads"

Undefined terms make this difficult to apply consistently:

- Considerable distance
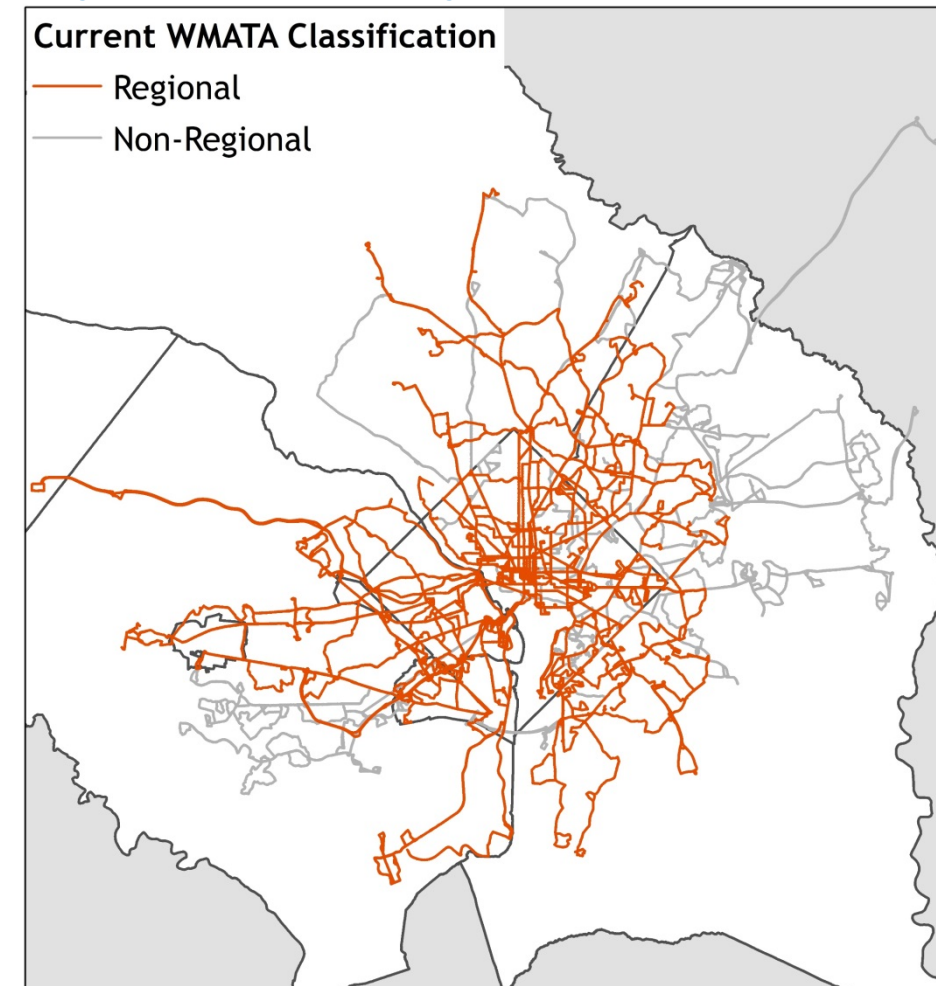
- Arterial road

Bus routes and arterial roadways

National Highway Planning Network (National Highway System)

Local bus (all operators)

Source: WMATA 2017

Context: Today, 63% of WMATA routes are funded regionally

Regional vs. non-Regional routes

Many of these routes may not meet the original purpose envisioned for Metrobus as the regional provider

Regional routes must be planned and coordinated regionally, causing inefficiencies in the network, and increasing the cost of Metrobus's operations

The Regional designation has expanded beyond what is truly regional, creating conflict among jurisdictions

Current WMATA Classification
— Regional
— Non-Regional

Source: WMATA 2017

www.BusTransformationProject.com

4

Context: Ambiguity and lack of clarity on Metrobus' core responsibilities as a regional provider results in WMATA operating routes that it may not be in the best position to operate

Metrobus operates single-jurisdiction routes today that may not be in the best interests of the region:

Responsiveness to rider needs: Local operators better understand local rider needs and can be more responsive to those needs than a regional operator
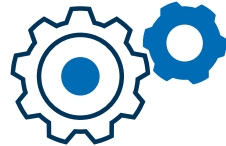
Operational efficiency: Currently, the region does not consider garage location and labor rules in deciding whether Metrobus or local operator should operate a certain route (missed opportunity to reduce costs)

Financial sustainability: Given lack of full cost allocation for non-regional routes, it may not be financially sustainable for Metrobus to continue serving some non-regional routes
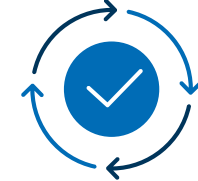
Alignment on Responsibilities: WMATA operates many specialized services that are not regional in nature and serve a purely local need

Recommendation: Position the regional bus system to provide the services that meet regional needs

As the regional provider, Metrobus will focus on the backbone bus network that provides benefits to the region as a whole, which:

- Serves as a comprehensive network of routes that support regional mobility as the "rubber-tire-rail" network akin to Metrorail, that the region agrees to fund jointly
- Provides access to jobs
- Ensures a resilient transit system
- Supports regional quality of life

Metrobus is best positioned to operate these services:

- Best positioned to provide inter-jurisdictional services, which are essential in the region
- Invested in facilities across the region and a large vehicle fleet, to meet regional needs
- Regional cost-sharing arrangements and allocation formulas already exist

Benefits of a Regional bus system:

- Decreasing congestion on roads regionwide
- Lower levels of emissions
- Improving mobility options for residents and visitors without a car
- Lowering costs for travel in the region
- Providing access to public transportation to areas not served by rail

123

www.BusTransformationProject.com

A B C 4

Recommendation: Position the regional bus system to provide the services that meet regional needs

Three criteria for Metrobus service: **Must provide at least one**
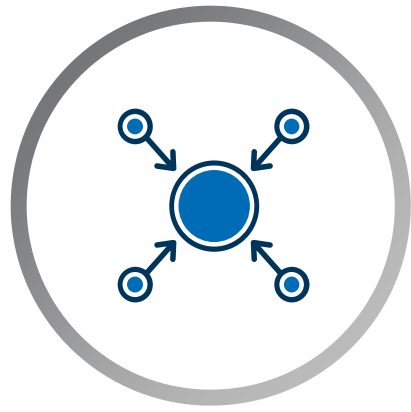
OR

OR

Direct Interjurisdictional Connections

Transfer Value to Network

High Transit Potential

www.BusTransformationProject.com

Supporting Information: Route Eligibility and Transition Plan

- Criteria determine route eligibility for Metrobus Regional operation and cost sharing

- Local routes that meet eligibility can be operated by WMATA as Regional service at jurisdiction's request to take advantage of cost-sharing

- Routes that are not eligible for Regional operation but are currently WMATA-operated should transition to local operators over a 10-year period (see Recommendation 4C)

- During the transition period, local operators can contract with WMATA to operate local routes at the new cost for non-regional service, similar as to how non-regional service is operated today

- Capital assets (vehicles and/or facilities) may be transitioned in order to facilitate route transition

Based on current arrangements for MetroAccess, none of the recommendations in Element 4 are planned to have any impact on how MetroAccess service is provided or paid for.

Supporting information: Criteria for Direct Interjurisdictional Connections

Criteria

In order for a route to meet the Direct Interjurisdictional Connections criteria, it must fulfill both the Interjurisdictional Connections and Directness elements:

Interjurisdictional Connections: Route serves at least four Regional Activity Centers and it must serve Regional Activity Centers in multiple jurisdictions*

Directness: More than 75% of the route miles are on the National Highway Planning Network (National Highway System) OR route circuity measure is less than 1.25 (a measure of how directly the route travels between endpoints)

Note: For analysis purposes, the City of Falls Church and the City of Fairfax were included in Fairfax County.

Why Metrobus?

Providing transit between concentrations of housing and jobs across jurisdictions limits the impacts of jurisdictional boundaries on the provision of bus service and allows customers to conveniently travel where and when they want

Service which is direct, operating on arterial roads for large portions of the route, serves as the backbone of the bus system in the region. These services contribute more to regional benefits, and are attractive to a broader base of users because travel time is better or perceived to be better

Metrobus is the only agency uniquely positioned to deliver this service

*Six Activity Centers straddle jurisdictional borders. Routes which connect to these Activity Centers are counted for connecting to two jurisdictions in these locations. If these routes meet the other qualifications for the total number of Activity Centers and directness, they qualify under this criteria even if they do not technically cross a jurisdictional boundary.

126

Supporting information: Criteria for Transfer Value to Network

Criteria

In order for a route to meet the Transfer Value to Network criteria, it must fulfill one of the elements below:

Connections to Many Other Bus Options: Route provides extensive opportunities to connect to at least 45 other bus routes, by serving Metrorail stations or transit centers along the entire route which provide high-volume connections

Connections Between Non-Adjacent Metrorail Stations: Route provides connection(s) between at least three different branches of the Metrorail network, effectively creating the "rubber-tire rail" portion of the WMATA network

Why Metrobus?

The benefits of a regional transit system are amplified by the network effect of transfers between routes. Transfer opportunities greatly expands access to opportunities (jobs, recreation, education, etc.) by expanding how far a user can get in a reasonable amount of time

These services improve the reach of the Metrorail system and shorten transit trips by allowing for circumferential transit trips (instead of radially along the Metrorail lines). Providing these connections may help to maintain or boost Metrorail ridership and expands the reach of the WMATA network

Metrobus is the only agency uniquely positioned to deliver this service

127

Supporting information: Criteria for High Transit Potential

Criteria

In order for a route to meet the High Transit Potential criteria, it must fulfill the element below:

Route has **average density of more than 25 population + jobs per acre** today or in 2030 along the route
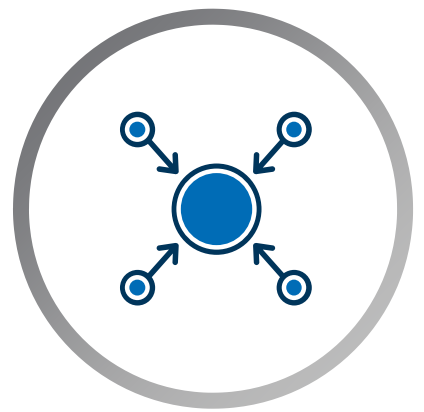
Why Metrobus?

Service connecting dense areas requires large capital and operating investments to meet demand, which WMATA is best positioned to make. Serving these areas with frequent service supports overarching regional goals.

Supporting Information: Application of criteria

<u>**For illustration purposes**</u>, the criteria for Metrobus service were applied to the existing bus network. In actual application, this recommendation would likely be implemented in coordination with the recommended service guidelines and the regional bus network plan (see Element 3). The following pages depict the results of applying these criteria to the existing bus network.
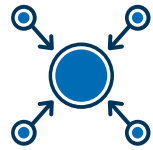
Three criteria for Metrobus service

Direct Interjurisdictional Connections

OR

Transfer Value to Network

OR

High Transit Potential

129

Supporting information: Map of current* routes that meet criteria for Metrobus Regional operation

For illustration purposes

132 current* routes meet at least one of the three criteria for Metrobus Regional operation

- 114 of these are currently* WMATA routes

- The other 18 are currently* operated by other jurisdictional operators

*Note: Maps and lists of routes qualifying based on criteria are current as of 2017, which was when the latest and most consistent data were available across providers

Note: For analysis purposes, the City of Falls Church and the City of Fairfax were included in Fairfax County.

List of routes on next page

Current Routes Meeting Criteria for Metrobus Operation
— Currently Operated by Jurisdictional Operators
— Currently Operated by WMATA

130
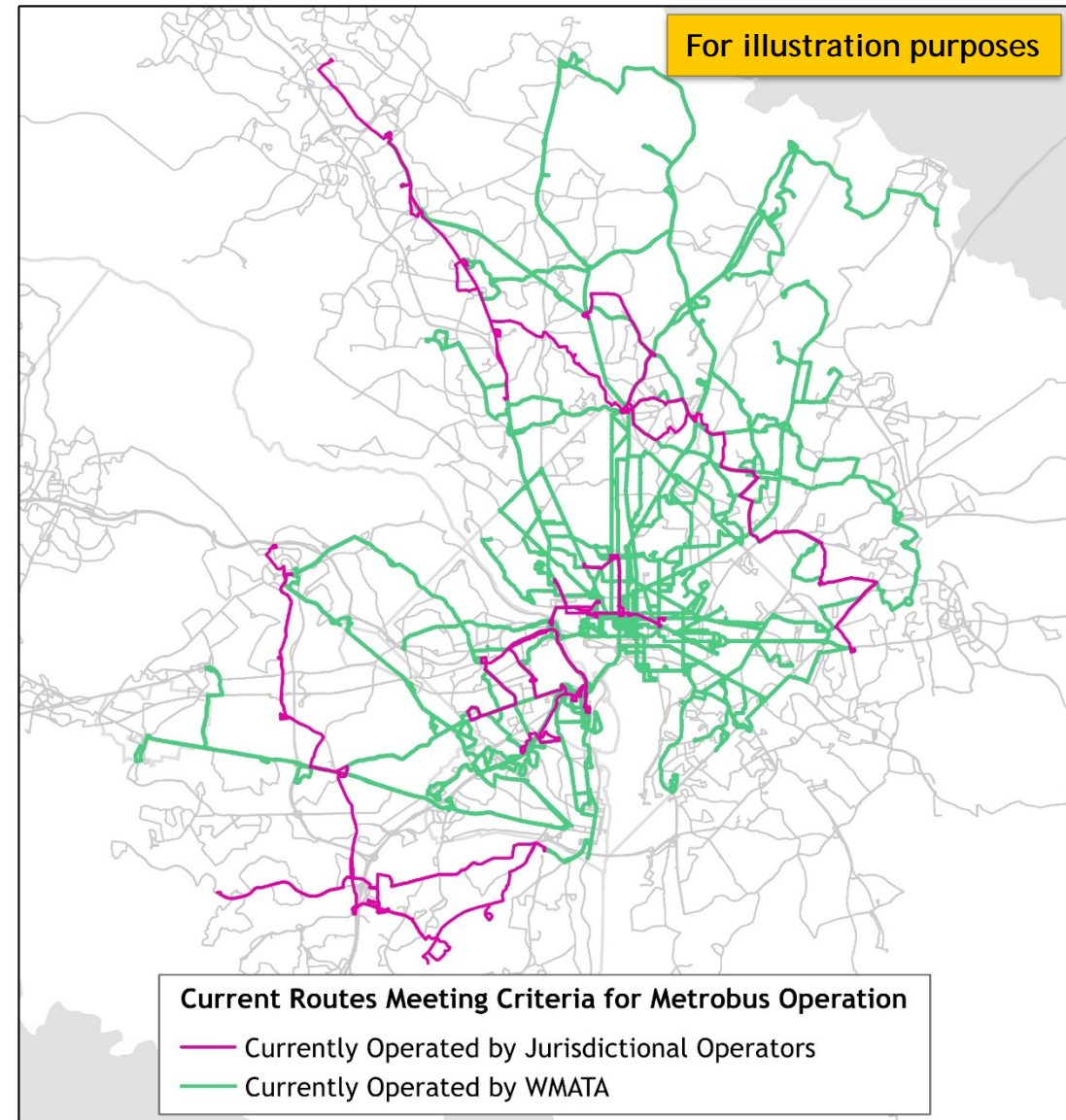
Supporting information: List of current* routes that meet criteria for Metrobus Regional operation

For illustration purposes

Currently* Operated by WMATA

10A, 10E, 10N	62, 63	F6	X1, X3
16A, 16B, 16E, 16J, 16P	70	G8	X2
16G, 16H, 16K	74	G9	X8
16X	79	H1	X9
16Y	7A, 7F, 7W, 7Y	H2, H3, H4	Y2, Y7, Y8
22A, 22B, 22C, 22F	80	J1, J2, J3	Z2
23A, 23B, 23T	83, 86	J4	Z6
28A	90, 92	K6	Z7, Z8, Z11
29K, 29N	96, 97	K9	
30N, 30S	A9	L1, L2	
31, 33	C2, C4	Metroway	
32, 34, 36	C8	N2, N4, N6	
37	D1	P6	
38B	D4	Q1, Q2, Q4, Q5, Q6	
39	D6	S1	
3Y	D8	S2, S4	
42, 43	F1, F2	S9	
52, 53, 54	F14	V1	
60, 64	F4	V2, V4	

Currently* Operated by Other Jurisdictional Operators

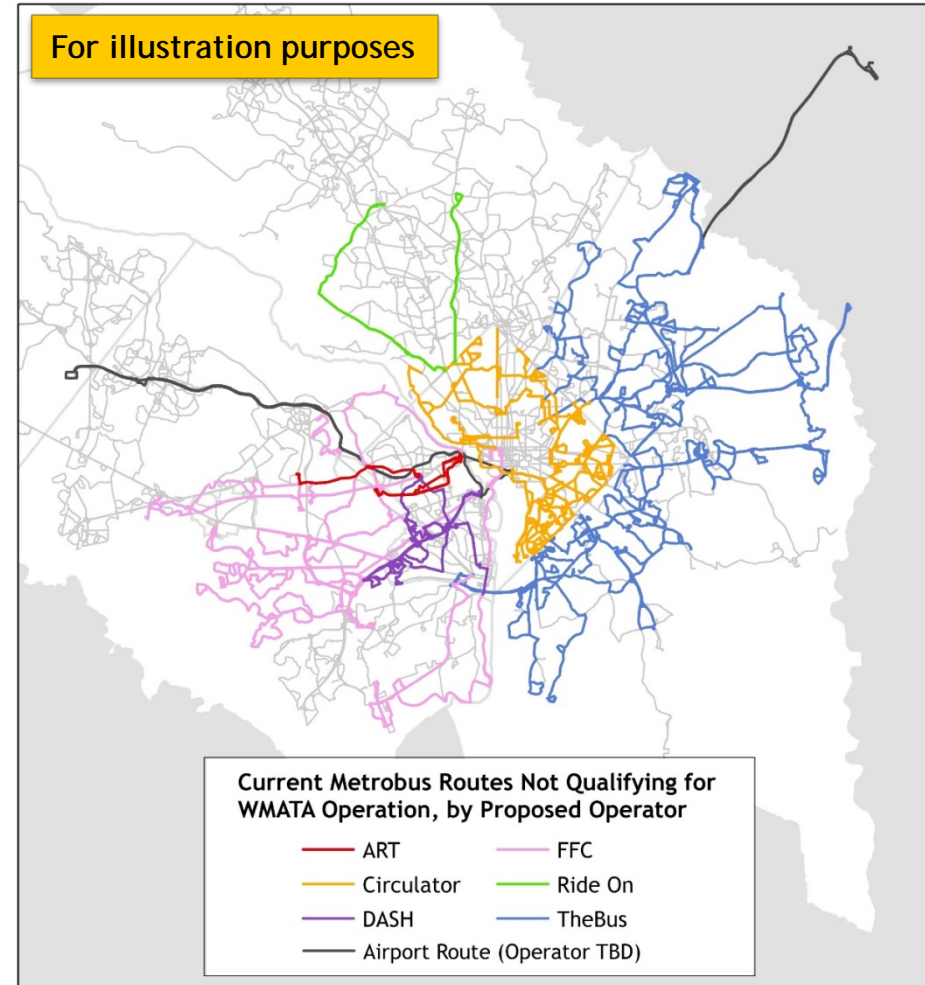| |
|---|
| ART 41 |
| ART 42 |
| ART 43 |
| ART 87 |
| Circulator GT-US |
| Circulator RS-DP |
| Circulator WP-AM |
| FFC 301 |
| FFC 310 |
| FFC 401 |
| FFC 402 |
| Ride On 101 |
| Ride On 15 |
| Ride On 17 |
| Ride On 46 |
| Ride On 5 |
| Ride On 9 |
| TheBus 18 |

Note: Local jurisdictions can ask Metrobus to operate these regional services to take advantage of cost sharing

*Note: For illustration purposes, maps and lists of routes meeting regional criteria are current as of 2017, for which latest and most consistent data were available across providers

Map of routes on previous page

www.BusTransformationProject.com

Supporting information: Current* WMATA Regional routes that would become local routes over a 10-year transition period

- Under the proposed criteria, assuming the route system as it exists today without implementing the regional bus plan (Recommendation 3.A), WMATA could add 18 routes currently operated by other operators which are eligible for Regional status and cost-sharing.
- 140 current Metrobus routes are recommended for transition to local service (shown on this map).
- As part of a 10-year transition plan (Recommendation 4.C) these routes could continue to be operated by WMATA as non-Regional routes for a time.
- Under the proposed criteria, Metrobus would operate 122 fewer routes than it does today.

Operator	Proposed Number of Metrobus Routes Transitioned to Local Provider
ART	3
Circulator	49
DASH	12
FFC	26
Ride On	2
TheBus	48
Total	140

Note: Proposed provider for formerly-WMATA routes were identified by identifying jurisdiction where at least 50% of a route's stops fall. If no jurisdiction held 50% of stops, the route went to the jurisdiction with the largest share of stops.

For illustration purposes

Current Metrobus Routes Not Qualifying for WMATA Operation, by Proposed Operator

- ART
- FFC
- Circulator
- Ride On
- DASH
- TheBus
- Airport Route (Operator TBD)

*Note: For illustration purposes, maps and lists of routes meeting regional criteria are current as of 2017, for which latest and most consistent data were available across providers

132

www.BusTransformationProject.com

Supporting information: Current* WMATA routes not qualifying for WMATA Regional operation under criteria (I)

These routes could continue to be operated by WMATA during 10-year transition period

For illustration purposes

Proposed transition to ART (3 routes):

2A
4A, 4B

Proposed transition to DC Circulator (49 routes):

A2, A6, A7, A8	H6	W4
A31, A32, A33	H8, H9	W45, W47
A4	K2	W5
B2	M4	W6, W8
B8, B9	M6	W9
D2	S35	5A
D31, D32, D33, D34	S41	94
D5	U4	
D51	U5, U6	
E2	U7	
E32	U8	
E4	V5	
E6	W1	
G2	W2, W3	

Proposed transition to DASH (12 routes):

10B
21A, 21D
25B
28F, 28G
7C, 7P
7M
8S, 8W, 8Z

Proposed transition to FFC (26 routes):

11Y	26A
15K	29C, 29G
16L	29W
17B, 17M	2B
17G, 17H, 17K, 17L	3A
18G, 18H, 18J	3T
18P	REX
1A, 1B	S80, S91
1C	

Proposed transition to Ride On and TheBus on next page

*Note: For illustration purposes, maps and lists of routes meeting regional criteria are current as of 2017, for which latest and most consistent data were available across providers

Supporting information: Current* WMATA routes not qualifying for WMATA Regional operation under criteria (II)

These routes could continue to be operated by WMATA during 10-year transition period

For illustration purposes

Proposed transition to ART, DC Circulator, DASH, and FFC on previous page

Proposed transition to Ride On (2 routes):

L8

T2

Proposed transition to TheBus (48 routes):

87	F12	T14
89, 89M	F13	T18
A12	F8	V12
B21, B22	G12, G14	V14
B24	H11, H12, H13	W14
B27	J12	
B29	K12, K13	
B30	NH1	
C11, C13	NH2	
C12, C14	P12	
C21, C22, C26, C29	P18, P19	
C27	R1, R2	
C28	R12	
D12, D13, D14	R4	

*Note: For illustration purposes, maps and lists of routes meeting regional criteria are current as of 2017, for which latest and most consistent data were available across providers

134

Recommendation: Revise the cost local jurisdictions pay WMATA for local service to better match the actual cost to provide service

Costs to operate an hour of Regional service will be the same as the cost to operate an hour of non-regional service during the transition period

One Hour of Regional service ($149.35)

> One Hour of Non-Regional service ($104.74)

> Cost One Hour of Regional service ($~140.30)

= Cost One Hour of Non-Regional service ($~140.30)
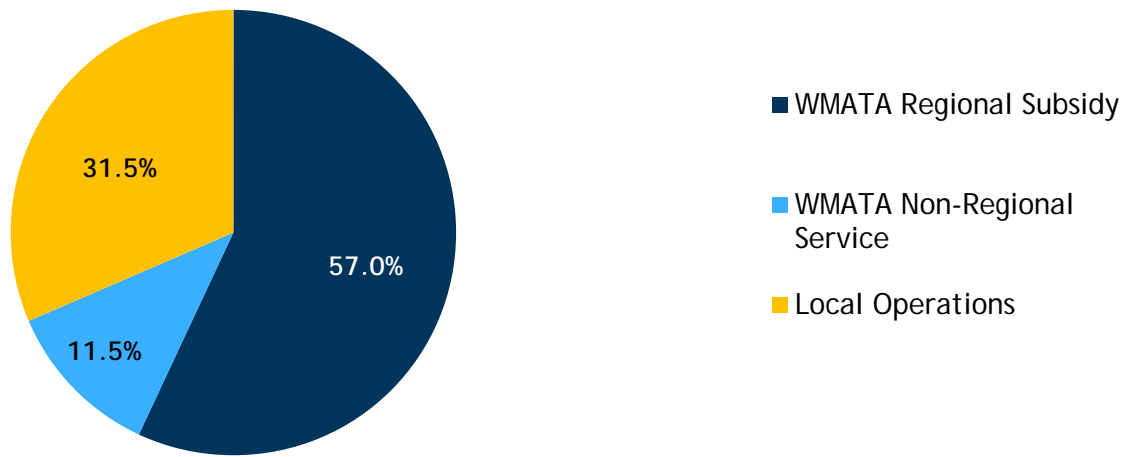
Today

Recommendation
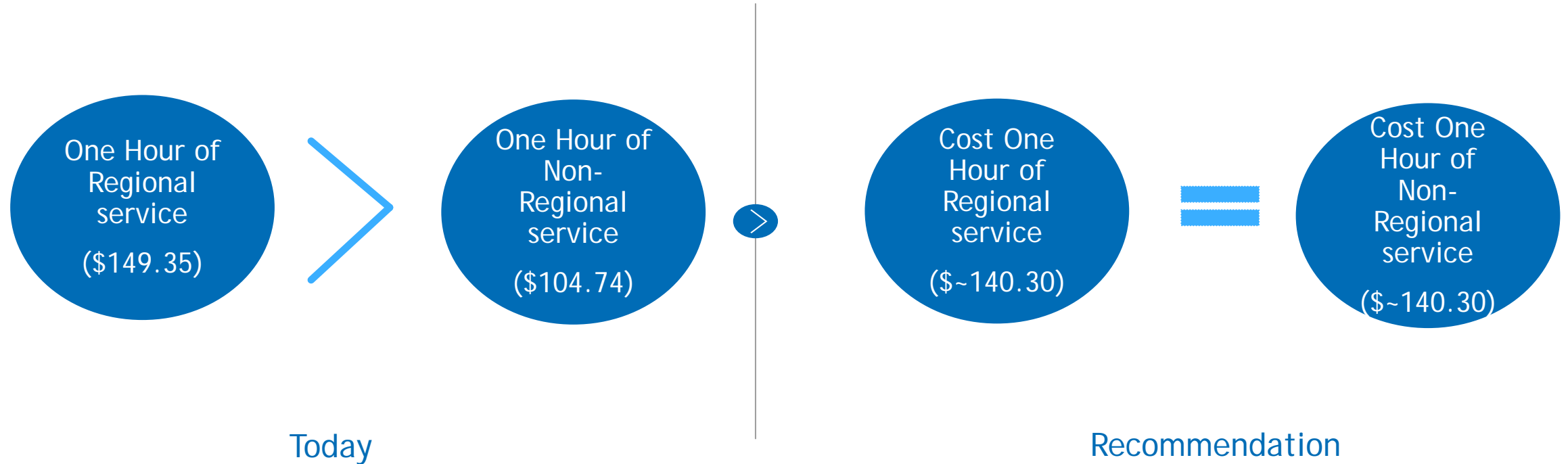
Non-Regional service is contracted out based on actual cost and should not be considered as part of the regional subsidy and therefore should not be considered as part of the current 3% subsidy growth cap.
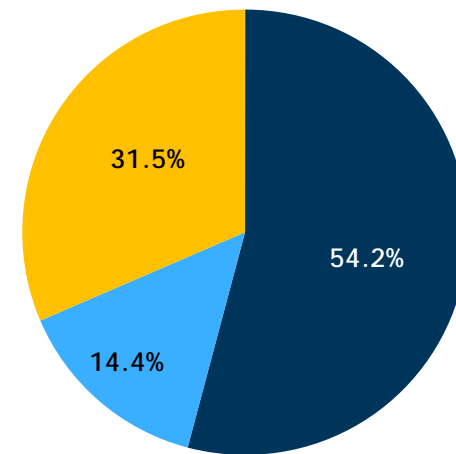
135

Source: WMATA FY2017 Operating Budget, Estimate of proposed hourly cost based on 2017 NTD data.

www.BusTransformationProject.com

Supporting information: Approximately $738M is spent annually on bus service in the region, including WMATA Regional Subsidy payments, costs for WMATA to operate non-Regional services, and jurisdictional costs to operate local services.

Redefining the routes eligible for Regional funding and changing the jurisdictional cost of non-Regional service operation will not impact how much the region spends on bus service…

But it would change **where** that money was paid.

WMATA Regional Subsidy

WMATA Non-Regional Service

Local Operations

Today pie chart:
- 57.0% WMATA Regional Subsidy
- 11.5% WMATA Non-Regional Service
- 31.5% Local Operations

Today

New Definition pie chart:
- 54.2% WMATA Regional Subsidy
- 14.4% WMATA Non-Regional Service
- 31.5% Local Operations

New Definition of Regional Service AND Revised Regional and non-Regional cost allocations

Cost analysis assumes no changes to the Regional Subsidy Allocation formula.

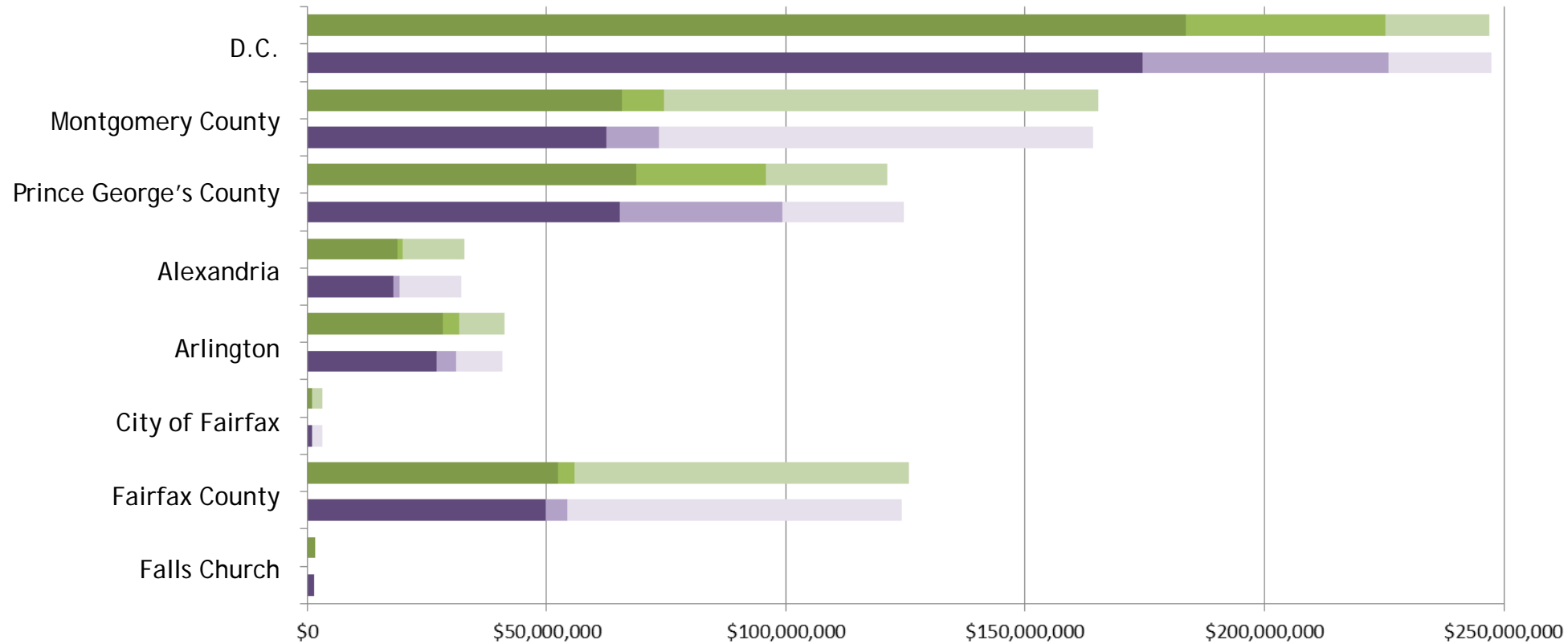Source: FY2017 WMATA and Local Operating Data

136

Supporting information: Some jurisdictions would pay more and some would pay less by implementing a new definition of Regional service and revising Regional and non-Regional cost allocations

Jurisdiction	Change in Regional Subsidy	Change in non-Regional operating costs	Change in Local Operating Costs	Total Change in Bus Operating Cost	
				Dollars	Percent of Total Spent on Bus
Alexandria	-$932,300	$691,200	--	-$241,100	-0.7%
Arlington County	-$1,444,000	$561,500	--	-$882,500	-2.1%
City of Fairfax	-$48,500	--	--	-$48,500	-1.5%
DC	-$8,939,700	$9,386,100	--	$446,400	0.2%
Fairfax County	-$2,749,100	$1,177,400	--	-$1,571,700	-1.2%
Falls Church	-$75,800	--	--	-$75,800	-4.9%
Montgomery County	-$3,008,600	$2,152,300	--	-$856,300	-0.5%
Prince George's County	-$3,538,000	$6,767,300	--	$3,229,300	2.6%
Regional Total	**-$20,735,800**	**$20,735,800**	**--**	**--**	**--**

Cost analysis assumes no changes to the Regional Subsidy Allocation formula.

* All costs are operating costs only, excluding capital costs.
Regional subsidy for Montgomery and Prince George's County are paid by the State.

Recommendation: Develop a 10-year plan to optimally allocate services between bus systems for applicable routes

Re-focusing of Metrobus service on Regional services would transition slowly over 10-years to ensure necessary capacities are developed region-wide.

An illustrative potential timeline:

1 year   **3** years   **10** years

- **Revise non-regional service costs (4.B):** Changes how WMATA overhead costs are paid for
- **Begin regional development of bus service guidelines (3.B):** to be developed and agreed upon by all regional stakeholders

- **Finalize and implement new definition of Regional (4.A):** Identifies which routes would be eligible for regional cost-sharing
- **Development of regional bus plan (3.A):** Re-alignment of bus service regionally

- **Identify local needs:** WMATA and jurisdictions work together to identify needs and achieve service goals, e.g.,
  - Legislation
  - Vehicles
  - Facilities
  - Staff capacity

- Respecting WMATA's role as the regional provider, within 10 years, **Metrobus will only operate those services that meet the criteria defined in this Strategy**
- Implementation may necessitate some exceptions

More detailed timeline will be developed as part of the next phase of the Bus Transformation project – developing a Roadmap.

139

Supporting Information: Transition plans will consider all elements necessary for jurisdictions to take on local services

Supported by WMATA and other stakeholders, transition plans will be developed that support each jurisdiction's unique needs:
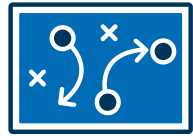
Facilities: transfer, sale, or sharing arrangements for facilities including garages or other infrastructure

Rolling stock: potential transfer of assets, including buses and/or other vehicles

New legislation: state and/or local legislative needs

Funding sources: revisions to local and regional funding agreements (e.g., Maryland contribution to the WMATA regional subsidy may need to be shifted to the jurisdictions)

Contracting arrangements: new or revised contracting mechanisms may be required

Staffing: Growth of internal agency staff levels and expanding capabilities

Supporting information: Resulting Metrics – Net Change by Operator

Operator based on new WMATA Criteria	Number of Routes	Revenue Miles	Revenue Hours	Ridership	Peak Vehicle Needs	Average Passengers per Revenue Mile	Average Passengers per Revenue Hour
ART	22	1,658,137	152,463	2,959,300	55	1.8	19.4
Circulator	52	6,489,950	663,444	24,610,343	215	3.8	37.1
CUE	2	448,925	33,412	325,921	8	0.7	9.8
Dash	25	3,002,419	309,314	6,354,828	119	2.1	20.5
FFC	109	11,455,224	837,205	11,176,563	305	1.0	13.3
Loudoun Co. Transit	142	1,754,143	96,281	1,664,405	65	0.9	17.3
Ride On	76	11,892,049	909,390	21,057,456	269	1.8	23.2
TheBus	75	10,101,402	740,273	17,414,007	275	1.7	23.5
WMATA Total	**132**	**26,552,829**	**2,934,193**	**93,187,258**	**835**	**3.5**	**31.8**
Jurisdictional Total	**503**	**46,802,249**	**3,741,782**	**85,562,823**	**1,311**	**1.8**	**22.9**
Regional Total	**635**	**73,355,078**	**6,675,974**	**178,750,080**	**2,146**	**2.4**	**26.8**

Net Change							
	Number of Routes	Revenue Miles	Revenue Hours	Ridership	Peak Vehicle Needs	Average Passengers per Revenue Mile	Average Passengers per Revenue Hour
ART	-1	-190,600	-22,390	-343,466	5	0.00	0.52
Circulator	46	4,914,023	447,334	20,918,147	168	1.45	20.01
CUE	0	-	-	-	-	0.00	0.00
DASH	12	1,064,483	86,632	2,436,374	38	0.09	2.95
FFC	22	1,806,665	101,287	2,582,181	67	0.08	1.67
Loudoun Co. Transit	0	-	-	-	-	0.00	0.00
Ride On	-4	-925,170	-107,622	-2,308,443	-23	-0.05	0.18
TheBus	47	7,038,084	509,588	14,455,027	192	0.76	10.70
WMATA	**-122**	**-13,707,485**	**-1,014,828**	**-37,739,820**	**-447**	**0.26**	**-1.40**
Jurisdictions	**122**	**13,707,485**	**1,014,828**	**37,739,820**	**447**	**0.38**	**5.33**

For illustration purposes

These estimates assume that the local jurisdictions would request that eligible routes be operated as Regional service by WMATA to take advantage of regional cost sharing, as noted on page 131.
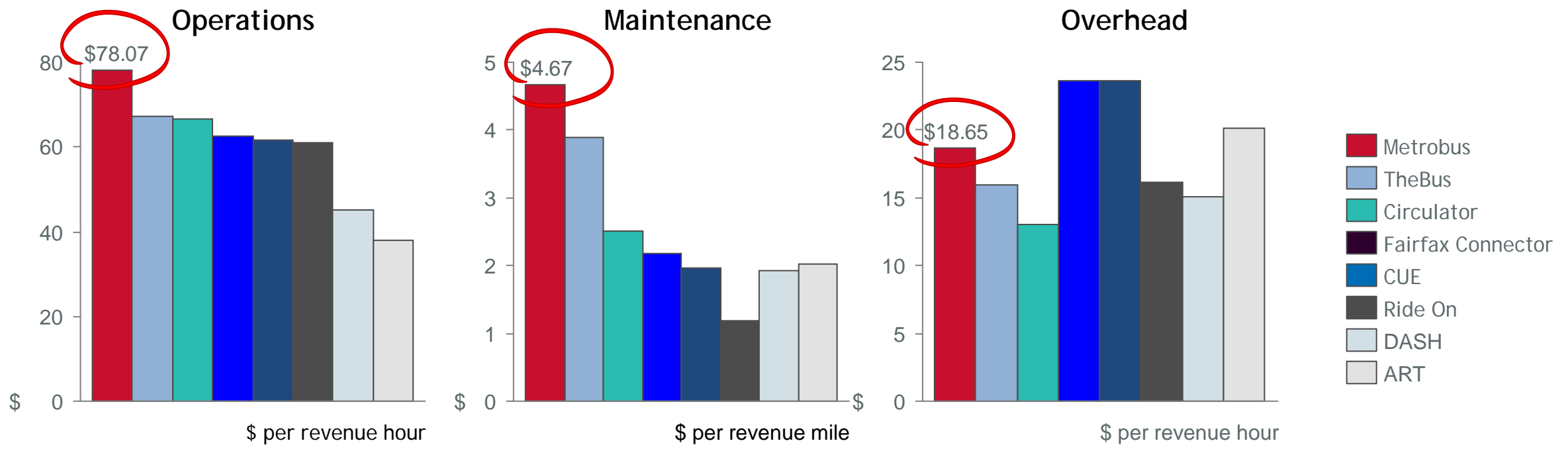
Note: Based on current arrangements for MetroAccess, none of the recommendations in Element 4 are planned to have any impact on how MetroAccess service is provided or paid for.

141

www.BusTransformationProject.com

Supporting information: Resulting Metrics – Percent Change by Operator

Operator based on new WMATA Criteria	Number of Routes	Revenue Miles	Revenue Hours	Ridership	Peak Vehicle Needs	Average Passengers per Revenue Mile	Average Passengers per Revenue Hour
ART	22	1,658,137	152,463	2,959,300	55	1.8	19.4
Circulator	52	6,489,950	663,444	24,610,343	215	3.8	37.1
CUE	2	448,925	33,412	325,921	8	0.7	9.8
Dash	25	3,002,419	309,314	6,354,828	119	2.1	20.5
FFC	109	11,455,224	837,205	11,176,563	305	1.0	13.3
Loudoun Co. Transit	142	1,754,143	96,281	1,664,405	65	0.9	17.3
Ride On	76	11,892,049	909,390	21,057,456	269	1.8	23.2
TheBus	75	10,101,402	740,273	17,414,007	275	1.7	23.5
WMATA Total	132	26,552,829	2,934,193	93,187,258	835	3.5	31.8
Jurisdictional Total	503	46,802,249	3,741,782	85,562,823	1,311	1.8	22.9
Regional Total	635	73,355,078	6,675,974	178,750,080	2,146	2.4	26.8

Percent Change							
	Number of Routes	Revenue Miles	Revenue Hours	Ridership	Peak Vehicle Needs	Average Passengers per Revenue Mile	Average Passengers per Revenue Hour
ART	-1	-10%	-13%	-10%	10%	-0%	3%
Circulator	46	312%	207%	567%	357%	62%	117%
CUE	0	0%	0%	0%	0%	0%	0%
DASH	12	55%	39%	62%	47%	5%	17%
FFC	22	19%	14%	30%	28%	10%	14%
Loudoun Co. Transit	0	0%	0%	0%	0%	0%	0%
Ride On	-4	-7%	-11%	-10%	-8%	-3%	0%
TheBus	47	230%	221%	489%	231%	79%	83%
WMATA	-122	-34%	-26%	-29%	-35%	8%	-4%
Jurisdictions	122	41%	37%	79%	52%	27%	30%

For illustration purposes

These estimates assume that the local jurisdictions would request that eligible routes be operated as Regional service by WMATA to take advantage of regional cost sharing, as noted on page 131.

Note: Based on current arrangements for MetroAccess, none of the recommendations in Element 4 are planned to have any impact on how MetroAccess service is provided or paid for.

142

Supporting Information: Local bus systems generally have lower unit operating costs than Metrobus…

Current Bus Operating Unit Costs (2017)

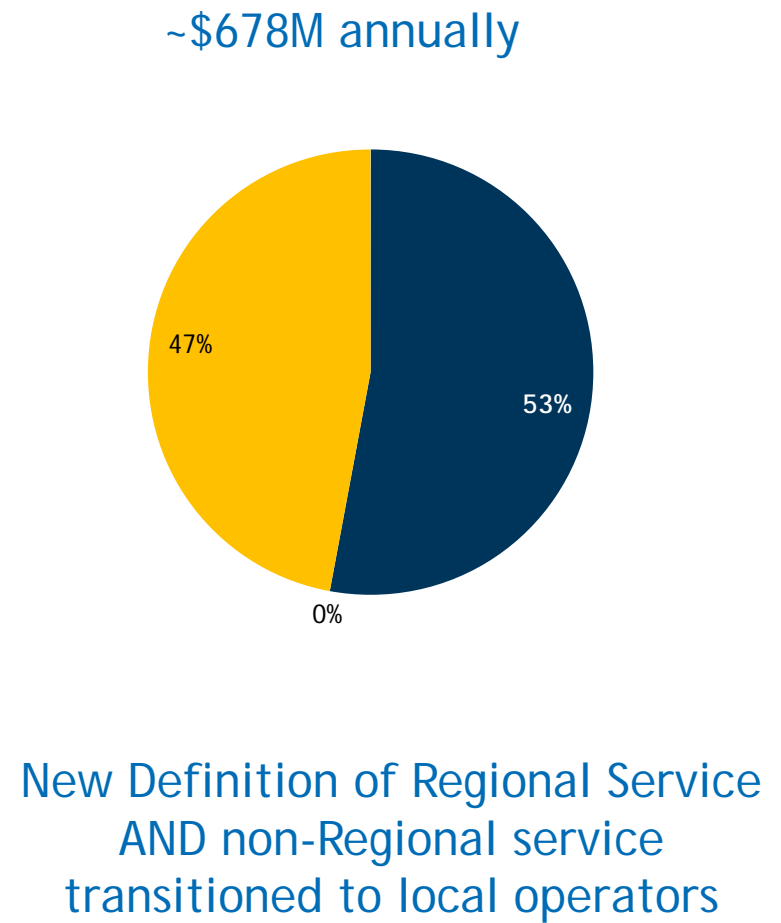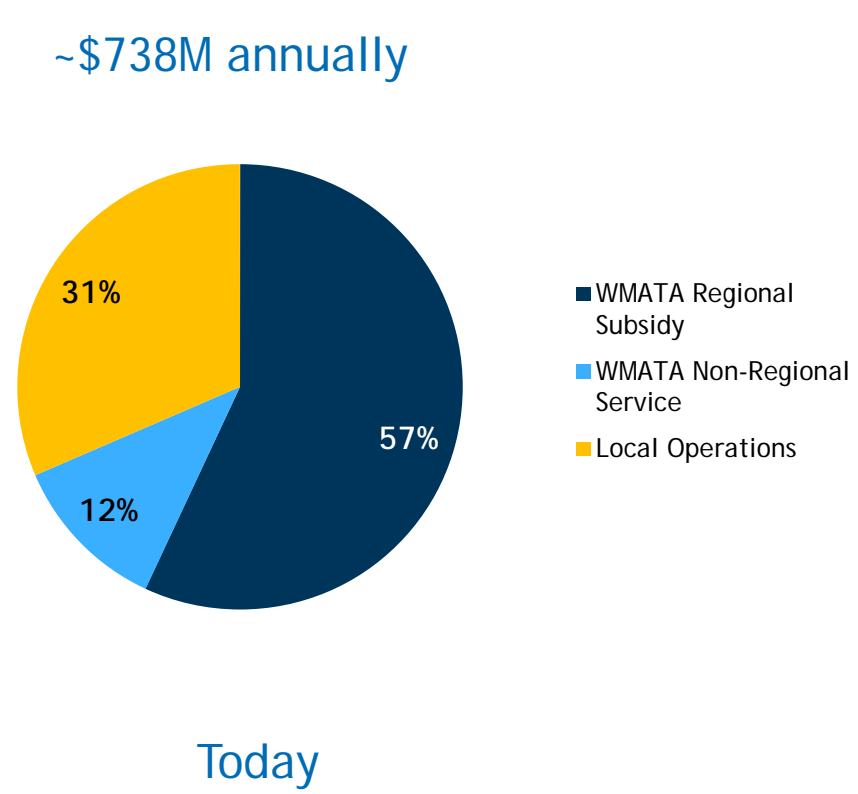Operations — $ per revenue hour — $78.07

Maintenance — $ per revenue mile — $4.67

Overhead — $ per revenue hour — $18.65

Legend:
- Metrobus
- TheBus
- Circulator
- Fairfax Connector
- CUE
- Ride On
- DASH
- ART

Differences in scope, scale, and operating environment affects agency performance across these metrics.

Note: Figures are for Calendar Year 2017. Peer group includes Ride On (Montgomery), Fairfax Connector (Fairfax County), TheBus (Prince George's), DC Circulator, ART (Arlington), DASH (Alexandria), and CUE (City of Fairfax). Source: MWCOG 2018 Regional Bus Service Provision Study

www.BusTransformationProject.com

Supporting information: Balancing local and regional bus service responsibilities would save the region money by decreasing the total amount spent on bus operations in the region by $60M per year (8% decrease)

For illustration purposes

~$738M annually

~$678M annually

- WMATA Regional Subsidy
- WMATA Non-Regional Service
- Local Operations

31%

57%

12%

47%

53%

0%

Today

New Definition of Regional Service
AND non-Regional service
transitioned to local operators

Cost analysis assumes no changes to the Regional Subsidy Allocation formula, and that system unit costs remain the same.
Source: FY2017 WMATA and Local Operating Data, 2016 NTD Data

Supporting information: All jurisdictions would decrease the amount spent on bus annually by implementing a new definition of Regional service and rebalancing local and regional bus service responsibilities

If jurisdictional operating costs remain as low as they are, the region could save almost $60M on bus operations each year by making the recommended changes
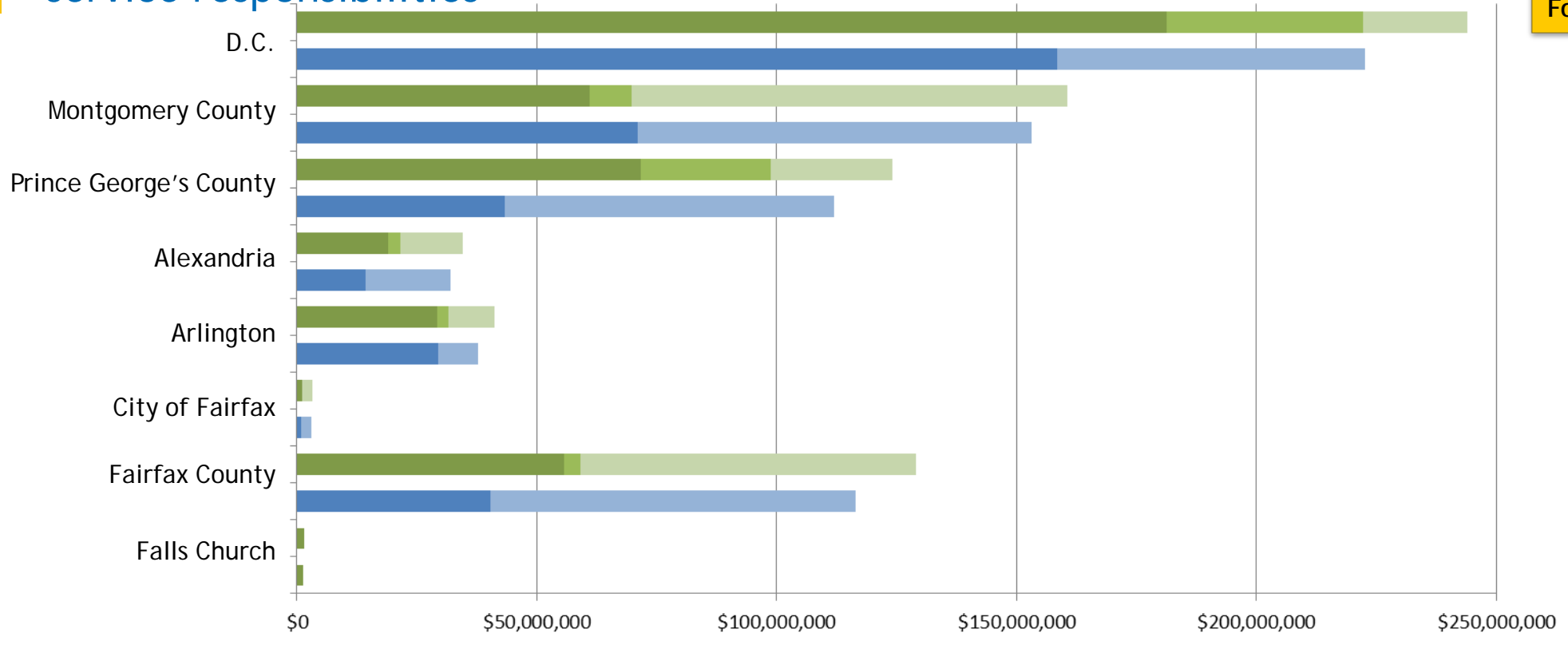
For illustration purposes

Jurisdiction	Current Total Spent on Bus Operations	Proposed Total Spent on Bus Operations	Total Change in Bus Operating Cost	
			Dollars	Percent of Total Spent on Bus
Alexandria	$34,613,000	$31,981,300	-$2,631,700	-7.6%
Arlington County	$41,088,000	$37,804,300	-$3,283,700	-8.0%
City of Fairfax	$3,165,200	$3,068,600	-$96,600	-3.1%
DC	$243,848,300	$222,684,900	-$21,163,400	-8.7%
Fairfax County	$129,036,500	$116,496,600	-$12,539,800	-9.7%
Falls Church	$1,535,900	$1,294,100	-$241,900	-15.7%
Montgomery County	$160,576,000	$153,048,900	-$7,527,100	-4.7%
Prince George's County	$124,147,600	$111,937,400	-$12,210,200	-9.8%
Regional Total	$738,010,500	$678,316,000	-$59,694,500	-8.1%

Cost analysis assumes no changes to the Regional Subsidy Allocation formula.

* All costs are operating costs only, excluding capital costs.
Cost analysis assumes that system unit costs remain the same.

www.BusTransformationProject.com

Supporting information: All jurisdictions would decrease the amount spent on bus annually by implementing a new definition of Regional service and rebalancing local and regional bus service responsibilities

For illustration purposes

Chart axis (x-axis): $0, $50,000,000, $100,000,000, $150,000,000, $200,000,000, $250,000,000

Jurisdictions (y-axis): D.C., Montgomery County, Prince George's County, Alexandria, Arlington, City of Fairfax, Fairfax County, Falls Church

Current Jurisdictional Bus Costs

- Metrobus Regional Routes
- Metrobus Non-Regional Routes
- Local Operation

Jurisdictional Subsidy with new Regional definition AND service transition to local operators

- Metrobus Routes
- Local Operation

All costs are operating costs only, excluding capital costs.
Analysis assumes no changes to the Regional Subsidy Allocation formula, and that unit costs remain the same.

146

5

Optimize back-office functions through sharing, streamlining, and shared innovation by consolidating regional resources and devoting more resources to operating bus service

Element: Streamline back-office functions and share innovation by consolidating regional resources and devoting more resources to operating bus service

Recommendations to drive strategy:

(A) Consolidate **back-office support functions** to realize shared benefits of scale for bus systems that choose to participate

(B) Establish a Regional Mobility **Innovation Lab** to drive continuous improvement in customer experience

(C) Develop **regional standards for bus data** collection, formatting, sharing, and analysis

What the strategy will achieve:

If the region pursues centralization of select business functions and shared innovation across bus operators, it will experience:

- Annual **Cost saving** potential of ~$11.7 million due to economies of scale, which can be redirected into improving service

- Greater **consistency in service** for customers

- Greater understanding of bus system usage, which will enable additional **cost savings** and efficiencies

- Improved customer experience, leading to **ridership growth**

www.BusTransformationProject.com

Context: 12% of bus operating costs in the region are devoted to back-office and administrative functions

Many key back-office activities are duplicated at agencies across the region
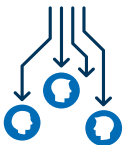
Customer service

Business development

Procurement & contract admin

Marketing & communications

Payment systems mgmt.

Human resources

Risk mgmt. & security

Vehicle maintenance

Sign & stop maintenance

Use of centralized resources across bus operators only occurs intermittently, e.g.,

Procurement: MTA and ART have piggybacked previously on WMATA's bus procurement

Payment systems: SmarTrip card accepted by all local transit providers, except for the VRE, Loudoun County local bus system, and MARC commuter rail systems

Signage: WMATA developed standard regional bus stop signage used by all bus operators

Technology integration: The TIGER Transit Service Priority Project allows buses to run along the same corridors, across jurisdictions, using the same TSP technology

149

Source: MWCOG Regional Bus Service Provision Study

Context: De-centralized regional bus operating model duplicates support functions, meaning that less money is available to provide better bus service

Missed opportunities for efficiencies from de-centralized support function model

Integrated systems and consistent rider experience: Standardized processes, contracts, systems, data collection across bus operators to drive more consistent customer experience
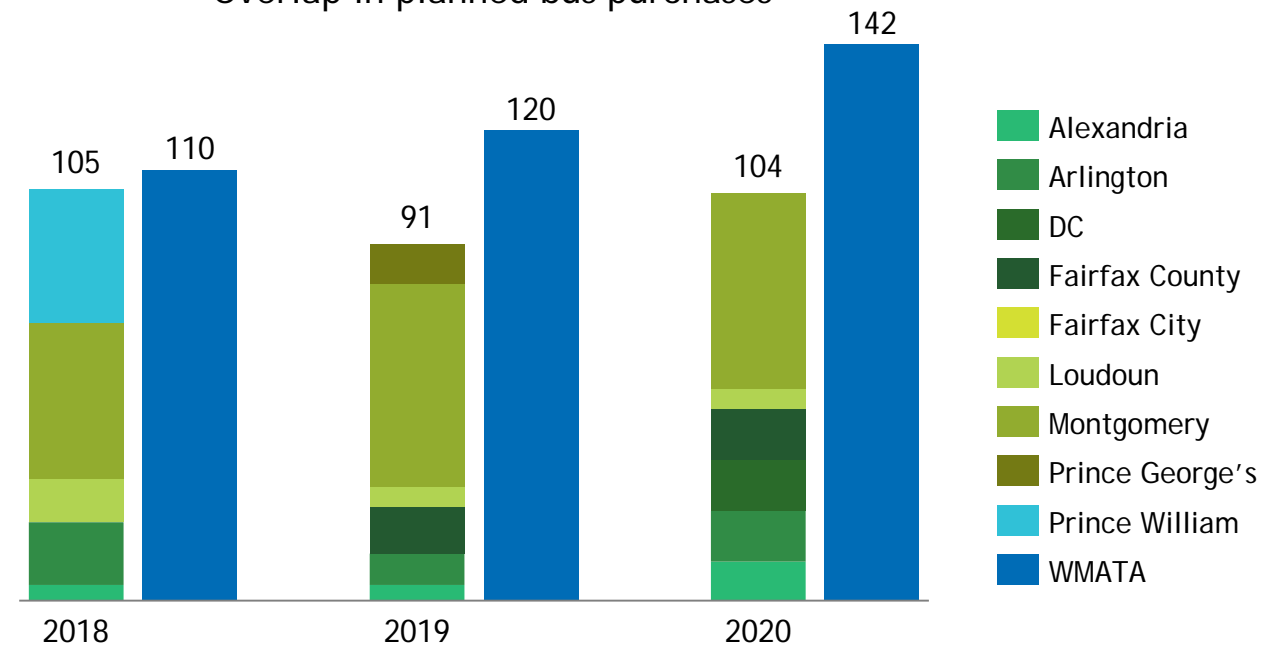
Functional excellence: Ability to bring together best practices across operators to ensure highest quality support

General administration cost reduction: Fewer resources and time needed to achieve the same outcomes in a centralized support model due to economies of scale

Example: De-centralized procurement means operators lose opportunity to maximize purchasing power when buying buses

Overlap in planned bus purchases

Legend:
- Alexandria
- Arlington
- DC
- Fairfax County
- Fairfax City
- Loudoun
- Montgomery
- Prince George's
- Prince William
- WMATA

2018: 105, 110
2019: 91, 120
2020: 104, 142

Bus providers could augment purchasing power with joint procurement, and give the region access to preferred pricing

150

Source: MWCOG Regional Bus Service Provision Study

www.BusTransformationProject.com

Recommendation: Consolidate back-office support functions to realize shared benefits of scale for bus systems that choose to participate

Current state: Bus systems run all support functions at the local level

Decentralized support functions
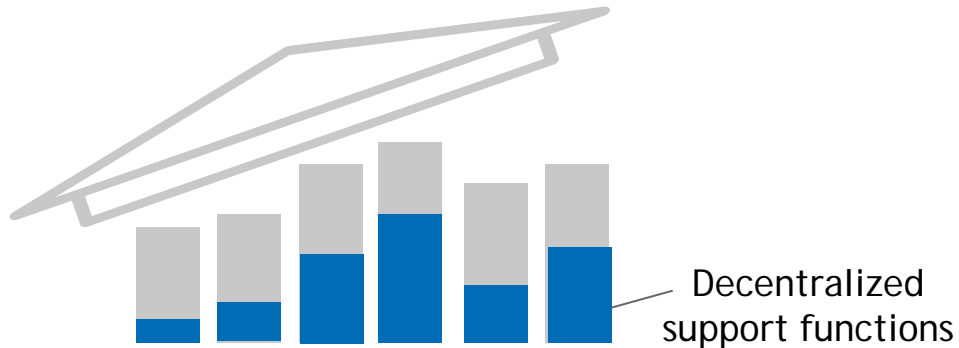
- Highly fragmented workforce in support functions across bus operators
- Duplication of efforts and expertise
- No common steering of services
- Lack of standardization
- Total annual cost of $100-$120 million for general administration across all bus operators in the region (11%-13% of total region-wide bus operating costs)

Future state: Key support functions run at the regional level for participating bus systems

Shared services

- Bundling of shared services across the region
- Standardization of processes "end-to-end"
- Implementation of consistent quality standards
- Less duplication of efforts across the region
- Adoption of best practices through connections to regional Innovation Lab (see recommendation 5.B)
- Annual cost saving potential of ~$11.7 million

151

Supporting analysis: Key success factors for creating successful shared services organization
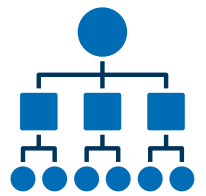
Long term, structured effort

Unwavering support from leadership at all participating bus systems

High caliber leadership team

Strong and clearly articulated vision

### Processes re-engineering important driver

Eliminate unnecessary activities and duplicative efforts

Simplify those remaining

Standardize work processes across the agencies…

… with variation for legal or tax reasons, or where it creates competitive advantage

Standardized regional data architecture

Single common data warehouse – the single source of truth

Common reference databases and standardized architecture (See Recommendation 5.C)
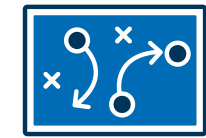
"Run it like a business"

Customer care, innovation, investment, service strategy

Balance cost and service

www.BusTransformationProject.com

Supporting information: Other regions have successfully implemented shared services to drive efficiencies

Case study

Chicago Regional Transit Authority

The Chicago Regional Transit Authority (RTA) oversees three transit agencies in Northeastern Illinois:
- Chicago Transit Authority (CTA)
- Metra Commuter Rail
- Pace Suburban Bus & Pace ADA Paratransit

In addition to panning responsibilities, the RTA provides a range of shared services to bus operators in the area, including:
- Integrated travel information to public, e.g.,
    - RTA Travel Information hotline
    - Automated Trip Planner
- Shared "Try Transit" advertising
- Procurement of equipment, professional services, construction
- Payment systems management
- Signage / information design

Hamburg HVV

Hamburger Verkehrsverbund (HVV – The Hamburg Public Transportation Association) formed in 1965 as a regional transit association with the goals of:
- One ticket – passengers would need only one fare pass to reach their destination, regardless of provider
- One fare structure – passengers would always pay the same fare regardless of provider or mode
- One schedule – schedules were coordinated so that transfers between different modes and different providers were possible

Today, the HVV coordinates shared services across all transit providers, e.g.,
- Marketing and appearance
- Customer service and information
- Planning and coordination of schedules
- Electronic payment and ticketing

Source: Regional Transportation Authority: Interagency Transit Passenger Information Design Standards Manual (2016); TransitCenter: The role of Governance in Regional Transit (2014); Regional Transportation Authority: Interagency Transit Passenger Information Design Standards Manual (2016); Chicago Tribune, : Boschalumni: German Transit, Innovations and lessons for US transit agencies

www.BusTransformationProject.com

Supporting analysis: Initial survey of bus systems across the Washington region indicates potential benefits for centralizing several functions

Key Benefits based on bus operator survey

Preliminary identification of functions that may benefit from centralization across bus operators in the region	Consistent systems/rider experience	Functional excellence	G&A cost reduction
Customer Information (Printed & Digital Materials)	✓	✓	✓
Vehicle Overhaul		✓	✓
Sign and Stop Maintenance	✓		✓
Driver & Mechanic Recruitment (Applicant Solicitation, Screening, Testing)		✓	✓
Revenue Vehicle Procurement		✓	✓
Customer Call Center	✓	✓	✓
Promotion and Advertisement	✓		✓

Key questions follow-up study will answer:

- Who should provide the shared service?
- What resources are needed to set up shared service?
- How long will it take to set up shared service?
- What processes / systems should the service use?
- How will each function interact with bus agencies in the region?
- What other functions could potentially benefit from centralization?

Source: Survey of six operators (Metrobus, ART, DASH, Ride On, The Bus, DC Circulator), who provided comments on feasibility of sharing certain functions and estimates of current costs for providing the functions.

154

Supporting analysis: Potential for ~$11.7M annual savings from implementing shared services across bus systems in the region

Function	Region-Wide Annual Cost	Source of Cost Saving	Est. Annual Saving % ($)
Customer Information	Approx. $3M	• Consolidation of print shops and vendors • Consolidation of service data management • Consolidation of printed and digital material design	10% ($0.3M)
Vehicle Overhaul	Approx. $20M	• Greater bargaining power in market, if contracting out • No private contractor profit, if Metrobus takes over	10% ($2.0M)
Sign and Stop Maintenance	Approx. $2M	• Reduction of redundant capacity and increased productivity from consolidated responsibility by area • Standardization of bus stops and signs	20% ($0.4M)
Driver & Mechanic Recruitment	Approx. $6M	• Reduction of repetitive screening and testing processes	30% ($1.8M)
Revenue Vehicle Procurement	Approx. $2M (Staff labor) Approx. $40M (2020 local operators' planned bus purchases)	• Reduction of procurement administrative costs • Reduction of per vehicle purchase price for local operators • Joint effort in testing new technologies (e.g. electric vehicle)	15% ($6.3M)
Customer Call Center	Approx. $6M	• Reduction of contractor cost • Reduction of contract administration cost	15% ($0.9M)
Promotion and Advertisement	Approx. $3M	• Potential increase in spending as some operators currently have less or limited ongoing promotion and advertisement for bus and consolidated function may increase promotion effort	N.A.

Source: Survey of six operators (Metrobus, ART, DASH, Ride On, The Bus, DC Circulator), who provided comments on feasibility of sharing certain functions and estimates of current costs for providing the functions.

155

A B C 5

Key considerations: Expect net cost savings in near term; key risk is maintaining right service levels

Benefits

Enhanced productivity in providing selected functions (Links to Goal 3b)

Improved customer experience for bus riders which should lead to higher ridership (Links to Goals 2a, 2c)

Operating cost savings through streamlined processes, allowing for improved bus service (Links to Goal 1a, 3a, 3b)

Costs

Key costs include one-time capital investment or asset transfer costs – in long run, expect net savings from centralization

Risks

Potential that centralized functions may be slow to respond to unforeseen local needs that may emerge

Mitigating factors

Establish communication protocols to ensure consistent coordination between shared service and each local agency

156

Context: Evolving customer needs require constant innovation to keep pace

Customer expectations today

Ubiquity

Interested in on-demand consumption –available anytime, anywhere

Personalization

Looking for customized experience tailored to individual needs

Transparency

Interested in comparing various options for goods & services using unlimited data online

Value focus

Seeking best value for money and excellence in delivery (smart shopping)
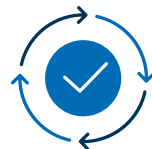
Simplicity

Attracted to straightforward, seamless user interfaces and experiences

Proactive support

Expect proactive support from companies, and anticipation of customer needs

157

Context: Transportation innovation occurs today, but no concerted effort to drive continuous bus innovation at the regional level (I)

Sample innovations occurring in local areas

Trace program

WMATA's Trace Program syncs anonymized SmarTrip card "tap" data (information from the Metro fare gates and buses) with vehicle locations

Allows WMATA's planners to understand which trains or buses riders boarded and how crowded those vehicles were, and then use data to inform service improvements

Micro-transit pilot

Ride On is developing a micro-transit pilot, to be launched in June 2019 in Glenmont, Rockville, and Wheaton

Ride On is working with Via to create an on-demand tech platform, but it will use its own operators and ~24-foot vehicles, which can seat 11 passengers

Automated vehicles

In 2018, Mayor Bowser launched the Interagency Autonomous Vehicle Working Group to proactively prepare the District for AV technologies

The administration also partnered with the Southwest Business Improvement District to solicit input on policies and procedures to support AV pilot on 10th Street SW

Dynamic tolling

In 2017, Virginia Department of Transportation (VDOT) began using technology to institute dynamic tolling on the I-66 Express Lanes (inside the Beltway between I-495 and Rosslyn, VA)

Goal of toll is to decrease congestion and improve traffic flow on busy roadway

Context: Transportation innovation occurs today, but no concerted effort to drive continuous bus innovation at the regional level (II)

Sample innovation labs in local areas

Mobility Lab™

Local example: Arlington's Mobility Lab

Arlington's Mobility Lab measures the impact of transportation demand management, and is funded by Arlington County Commuter Services, USDOT, VDOT, and Virginia Department of Rail and Transportation

Lab focus areas:
- Conducting research about how Arlington's transit-oriented development works
- Convening top minds in transportation for events like Hack Days, Transportation Camp, and educational symposiums on topics ranging from sustainability to real-estate development
- Building online database of readable, entertaining, and usable best practices in transportation

UNIVERSITY OF MARYLAND

Local example: University of Maryland's CATT Lab

The Center for Advanced Transportation Technology Laboratory (CATT) at the University of Maryland was established as an academic applied research and development lab to support efforts to solve important transportation, safety, and security problems

Lab focus areas:
- Creating web-based training systems that are highly effective at teaching people a variety of skills, including traffic control
- Building data and technology solutions for transportation management centers, including sensors and CCTV cameras
- Developing visual analytics that lead users to insights that would usually be difficult, if not impossible, to discover through traditional data analysis techniques.

Source: Mobility Lab, CATT Lab

www.BusTransformationProject.com

Recommendation: Establish a Regional Mobility Innovation Lab to drive continuous improvement in customer experience

Innovation Lab can wear many different hats
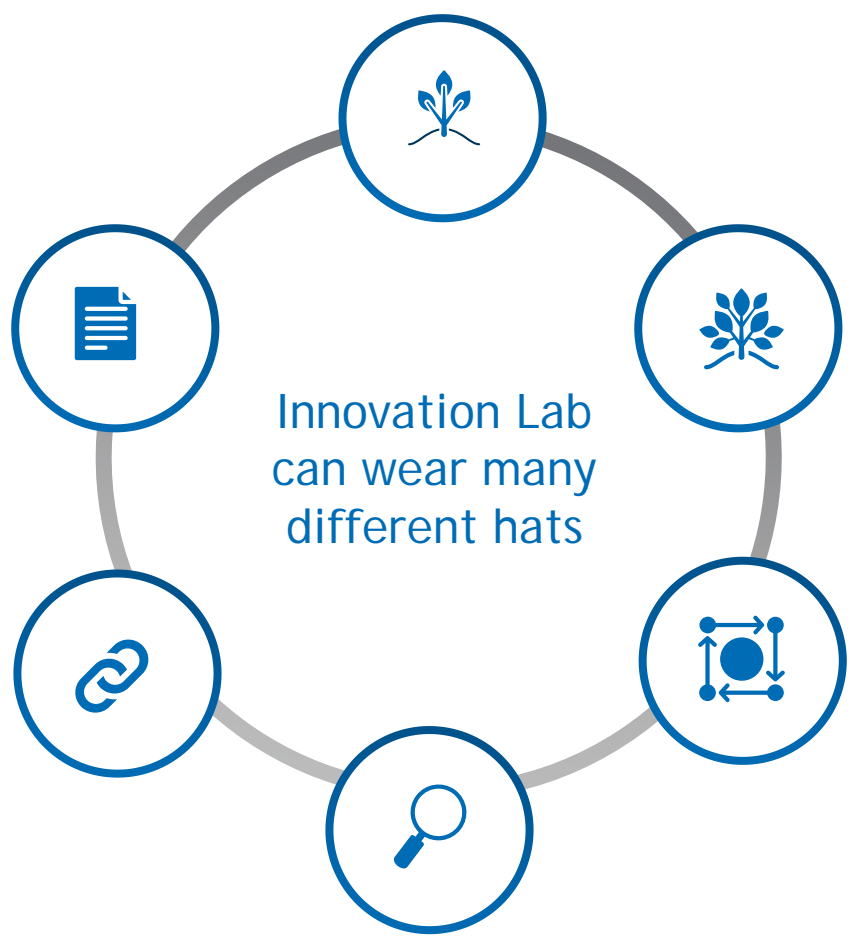
Incubator
- Generates new ideas with help of iterative design process and fast testing
- Forms new interdisciplinary teams for each new topic consisting of designers, researchers, developers

Accelerator
- Scales existing ideas in different stages of development from inside the organization
- Gives access to resources, especially relevant experts

Knowledge Broker
- Pools knowledge and translates it for the relevant context
- Creates visibility for new ideas and helps to establish them across the region

Impact evaluator
- Evaluates and measures the impact of its projects
- Sets up system for performance measurement through Key-Performance-Indicators

Networker
- Establishes a network between all regional stakeholders
- Offers public events and workshops in which participants can exchange best practices

Think tank
- Publishes major findings from projects and makes them available to the public
- Provides information to the public on the work inside the lab

160

Supporting information: Key success factors for establishing an Regional Mobility Innovation Lab
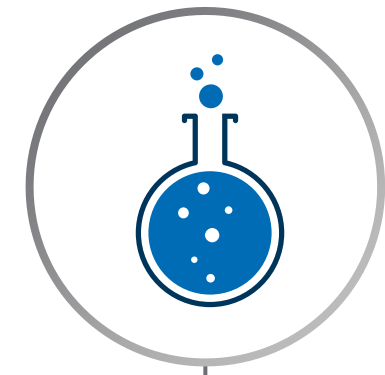
Strong leadership, funding, and support of political sponsors
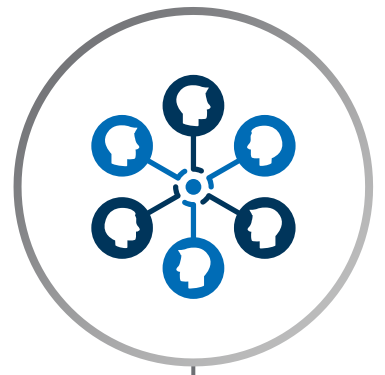
High-performing, interdisciplinary team to drive and enable innovation

Innovative methods that allow for iteration, such as design thinking

A physical place that encourages creativity and collaborative work

Inclusion and capacity-building of bus agencies in order to test new ideas

www.BusTransformationProject.com

Supporting information: Emerging innovation labs incubating cutting edge transportation ideas in major metropolitan areas

Transport for London's RoadLab

In 2018, Transport for London (TfL) partnered with Plexal to deliver London RoadLab, a program aimed at making London's streets smarter and safer.

Innovators joining the London RoadLab will receive funds and expert advice to scale solutions at pilot sites during a 10-week program in early 2019. At the end of the program, members will pitch their ideas to TfL and its partners, and be considered for contracts.

The initiative is in line with the Mayor's Transport Strategy, which aims to tackle pollution and congestion while encouraging more active travel as London's population expands from 8.7 million to 10.5 million over the next 25 years.

New York MTA's Transit Tech Lab

In 2018, New York City's Metropolitan Transportation Authority (MTA) partnered with the business group Partnership for New York City on the nation's first Transit Tech Lab, testing new technologies to modernize the city's public transportation.

The lab will evaluate new products, with the most promising companies selected by an expert panel to participate in an eight-week accelerator program, beginning February 2019.

The most successful companies will then be selected to carry out 12-month pilot programs. Companies will be tasked with two challenges to solve: to better predict subway incident impacts, and to make buses faster and more efficient.

Source: Smart Cities (2018), Business Cloud (2018).

162

Key considerations: Setting up a Mobility Innovation Lab would allow the region to become and remain "future ready"

Benefits

Ensures bus system is always "future ready" and able to meet evolving customer needs (Links to Goals 2a,b,c) which should result in higher ridership

Channels insights from broad group of stakeholders (beyond bus agency employees) to drive innovation (Links to Goals 2a,b,c and 3a)

Costs

Key cost is personnel needed to set up and run the lab

Benchmarks:
- MTA Transit Tech Lab: 1 FTE (Executive Director) with 30 advisors
- Mobility Lab: 5 FTEs
- CATT Lab: ~30 FTEs plus 80-100 student volunteers

Risks

May be difficult to keep Regional Innovation Lab afloat if jurisdictions are already spending on local innovation projects

Mitigating factors

Identify dedicated funding stream and resources to be allocated to Regional Mobility Innovation Lab on an annual basis

Context: Coordinated regional data will help bus move successfully into the future

Value of Data

Data is a valuable resource in the transportation ecosystem, which is not always fully leveraged by bus systems

Value of data will continue to increase into the future

Growth in Data

The amount of data available about bus and bus users has grown dramatically with the proliferation of systems such as Automatic Vehicle Location (AVL) and Automated Passenger Counters (APC)

Data availability will continue to grow with introduction of mobile apps, automation, and connected technologies
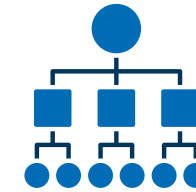
Unused Data

Bus systems in the region collect and maintain different types of data, in different formats, making it difficult to understand regional bus passengers or ridership patterns

Data may be collected but never analyzed, either within individual bus systems, or regionally
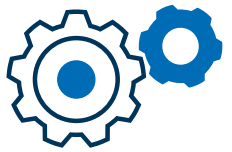
Recommendation: Develop regional standards for bus data collection, formatting, sharing, and analysis

Data Standards

Data Standards outline what data should be collected by each bus system at a minimum

Specify consistent data formats so that regional data can be easy compiled

Data Sharing Agreement

Develop regional agreement to share specific types of data across bus systems to limit effects of jurisdictional boundaries on regional understanding of bus usage and needs

Wherever possible, bus data should be consolidated with data from other modes (e.g. roads, TNCs, rail, etc.)

Consolidated Data Analysis

Dedicated staff with data analytics expertise will provide the best opportunity to understand large quantities of data produced at a regional level

Data analysis specialists can focus on both regional issues and specific local needs

Better Understanding of Market and Customers

Bus systems will be better positioned to:
- Provide the services that customers want
- Improve operating efficiencies
- Understand and address issues

165

Key considerations: Standardizing data collection, sharing, and analysis would allow bus systems to provide a better experience for customers

Benefits

Bus systems could better tailor services to meet customer needs and desires (Links to Goals 1a and 2c) which should result in higher ridership

Efficiency and effectiveness of service could be improved where issues are identified, potentially decreasing operating costs (Links to Goals 3a and b)

Better integration of bus service with other modes (Links to Goal 1c)

Costs

Set-up costs to define and implement data standards

Dedicated analysis staff may require additional costs, but it is possible that existing resources could be leveraged (e.g. WMATA has dedicated data analysts)

Risks

Not all bus systems currently have the same type of data collection efforts, sensors, etc.

Mitigating factors

Phased implementation of standards to allow for different levels of resource availability

Illustrate benefits of data collection, analysis, and sharing early to stakeholders and decision makers

166

6

Customers in a region with multiple bus providers need a **regional steward to transform the bus system**

Element: Customers in a region with multiple bus providers need a regional steward to transform the bus system

Action recommendations to drive strategy:

A Form a **task force** responsible for Bus Transformation Project execution; after a three-year period, transfer responsibilities to a formal **Coalition of jurisdictional representatives** with authority for implementation

B Hold transportation and transit agencies accountable for prioritizing bus as a **primary mode of transportation** within their organizations

C Publish an annual Bus Transformation and **bus performance scorecard** to drive accountability for results
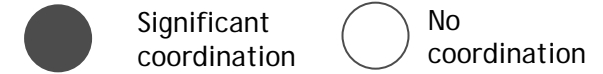
What the strategy will achieve:

If the region commits to strengthening coordination and governance, it will experience:

- Increased **customer focused** decision making
- More **cost efficient** use of resources
- Improved **coordination** among bus operators and across mobility modes

Context: There is some coordination on bus today, but we are not where we need to be as a region

● Significant coordination   ○ No coordination

Players	Level of coordination	Example of coordination today (if any)
Bus only	◐	Shared facilities, infrastructure, administration in limited instances, e.g., • WMATA and Fairfax County co-occupy the West Ox bus maintenance facilities • Multiple bus operators share passenger facilities at Metrorail Stations; Takoma/Langley Transit Center; Mark Center Transit Center; Pentagon Transit Center; Silver Spring Transit Center • Two bus operators to use certain parts of Metroway in Arlington / Alexandria
Bus + rail	◐	Coordination on fare payment mode and structure, e.g., • SmarTrip card used across bus and rail • $0.50 discount on transfers between multiple bus operators (Metrobus, CUE, ART) and rail
Bus + bike share	◐	Bikeshare stations are frequently co-located with major bus stations, Metrorail stations, and other transit hubs
Bus + roadway officials	◕	Some coordination on planned bus lanes and Transit Signal Priority, e.g., • 229 intersections outfitted with TSP throughout the District as identified by the District Department of Transportation (DDOT) • DDOT working closely with WMATA on implementing the 16th Street Bus Lane
Bus + TNCs (Uber, Lyft)	○	No formal collaboration to date

169

Sources: WMATA Strategic Energy Study (2018), MWCOG Regional Bus Service Provision Study

Context: Coordination is complicated by the number of responsible parties...

Local, state, and regional agencies responsible for decisions and funding that affect bus

① Washington Metropolitan Area Transit Authority	⑩ DC Department of Transportation
② Fairfax County Department of Transportation	⑪ Virginia Department of Transportation
③ City of Alexandria Transit Services Division	⑫ Maryland Department of Transportation
④ Prince George's County Department of Public Works & Transportation	⑬ Northern Virginia Transportation Commission
⑤ Arlington County Department of Environmental Services	⑭ Northern Virginia Transportation Authority
⑥ City of Fairfax Transportation Division	⑮ Virginia Department of Rail & Public Transportation
⑦ Montgomery County Department of Transportation	
⑧ Loudoun County Transit and Commuter Services	
⑨ City of Falls Church	

Source: ART, NVTC, PG County, City of Fairfax, Fairfax County, City of Alexandria, Loudoun County, City of Falls Church

www.BusTransformationProject.com

Recommendation: Form a regional task force responsible for Bus Transformation Project execution…(I)

Leverage existing local governance entities to create a regional task force…

Broad representation: Task Force would consist of executive leadership from all local decision-making / funding bodies, to ensure all jurisdictions are represented

Monthly cadence: Full group would meet at least once a month to discuss Project progress and next steps, with additional smaller working group meetings as needed

Rotating leadership: Task Force leadership would rotate regularly; leadership responsible for setting meeting agendas and facilitating execution of strategy

Bus focus: Task Force would ensure that the region has dedicated time for conversations focused on Bus

….that would own the Strategy to ensure the right players implement Project recommendations, e.g.,

- Develop regional service guidelines to match bus offerings to demand
- Liaise with TNCs about on-demand services

- Align on bus priority guidelines
- Create capital program to fund bus priority

- Agree on region-wide route naming conventions
- Introduce low-income fare product

- Align on functions to be centralized across operators
- Monitor performance of shared services

Approach would ensure that there is **coordinated leadership to drive Bus Transformation Strategy on Day One**, without having to set up an entirely new governance body
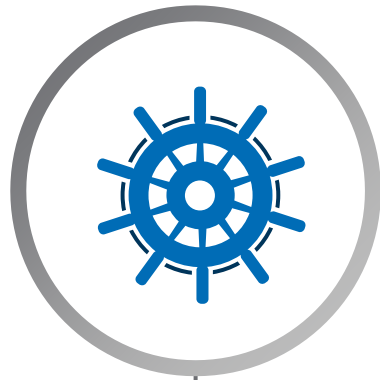
Recommendation: Form a regional task force responsible for Bus Transformation Project execution…(II)

Key attributes of regional task force representatives
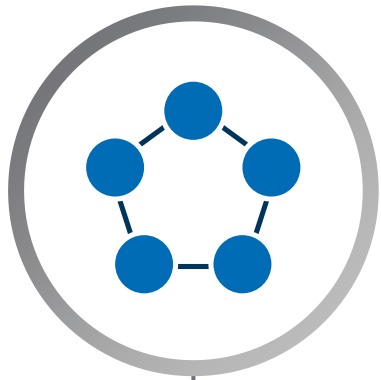
Regional orientation
Prioritize building a better bus system for the region

Decision-making authority
Able to make decisions on behalf of the organizations they are representing

Funding authority
Able to commit funding to regional bus projects required to execute strategy (e.g., bus priority capital program)

Technical expertise
Has some relevant technical expertise that can be leveraged as part of the task force

Public influencer
Willing to engage with organizations whose decisions affect bus (e.g., roadway officials, TNCs) to facilitate implementation of strategy

172

Recommendation: …after a three-year period, transfer responsibilities to a formal Coalition of jurisdictional representatives with authority for implementation

Immediate: Regional task force of local decision-making & funding bodies

+ Task force representatives already have local governing authority

+ Task force begins to meet on Day 1 of implementation; establishes clear goals for first 6 and 12 months of activity

+ Meeting structure supports participation by all affected jurisdictions and agencies

− Task force does not have formal regional oversight authority - does not have "teeth" – could make it difficult to consistently bring stakeholders to the table

Year 3: Formal regional Coalition with authority to facilitate bus coordination

+ Fully-dedicated staff committed to the effort

+ Single accountable entity for bus sits under "one roof"

+ Would have regional authority to drive changes across bus system

− Time-intensive to set up structure and obtain relevant oversight authority; would not be ready to go right away, which is why task force serves as a "bridge"

Recommendation: Hold transportation and transit agencies accountable for prioritizing bus as a primary mode of transportation within their organizations

Current state   *Future state: Greater focus on bus*

Limited focus on bus

Across the region today, transportation agencies tend to de-prioritize discussion of bus in executive dialogue (compared to rail and/or roadways), and organizational structures do not always adequately support prioritization of bus

Deeper discussions on bus

Push for increased engagement on bus during transit discussions (e.g., WMATA Board meetings) to ensure realization of vision to make bus the "roadway mode of choice"

Enabled bus organizations

Hold agencies responsible for exploring and establishing organizational structures that elevate bus as a mode of transportation (e.g., give bus leaders within agencies same seniority as rail leaders)

174

Recommendation: Publish an annual Bus Transformation and bus performance scorecard to drive accountability for results (I)

Number of benefits associated with publishing Project progress, e.g.,

Ensures accountability
- Enables public to understand how much progress is being made on each recommendation
- Tracks true regional progress on strategy
- Tracks Coalition's effectiveness at managing transformation of bus system

Provides insight into lagging milestones
- Facilitates diagnosis of major roadblocks and risks
- Supports identification of mitigation tactics to keep Strategy execution on-track

Enables prioritization of key actions
- Supports efforts to continuously turn high-level recommendations into concrete, prioritized actions

Enhances visibility into regional bus performance
- Provides insight into how regional bus is performing on key success metrics (today, bus performance metrics are typically shared at local level only)

Sample: Key elements of Project scorecard to be shared with the public

Progress tracker

| Strategy point	Recommendation	Completion	Key leads	Status	Notes
Align bus service to demand	Develop regional service guidelines	[Date]	[Name]	Complete ✓	
Prioritize bus on roadways	Obtain commitment from elected officials to prioritize bus on roadways			On-track	
	Align on bus priority guidelines			Progressing but facing obstacles	
Create a system people want to ride	Develop route-naming proposal for the region			Behind schedule	

Regional bus performance

Ridership change:
On-time performance:

Customer satisfaction:
Financials:

Looking Ahead: Risks & Mitigation
- xx

175

Recommendation: Publish an annual Bus Transformation and bus performance scorecard to drive accountability for results (II)
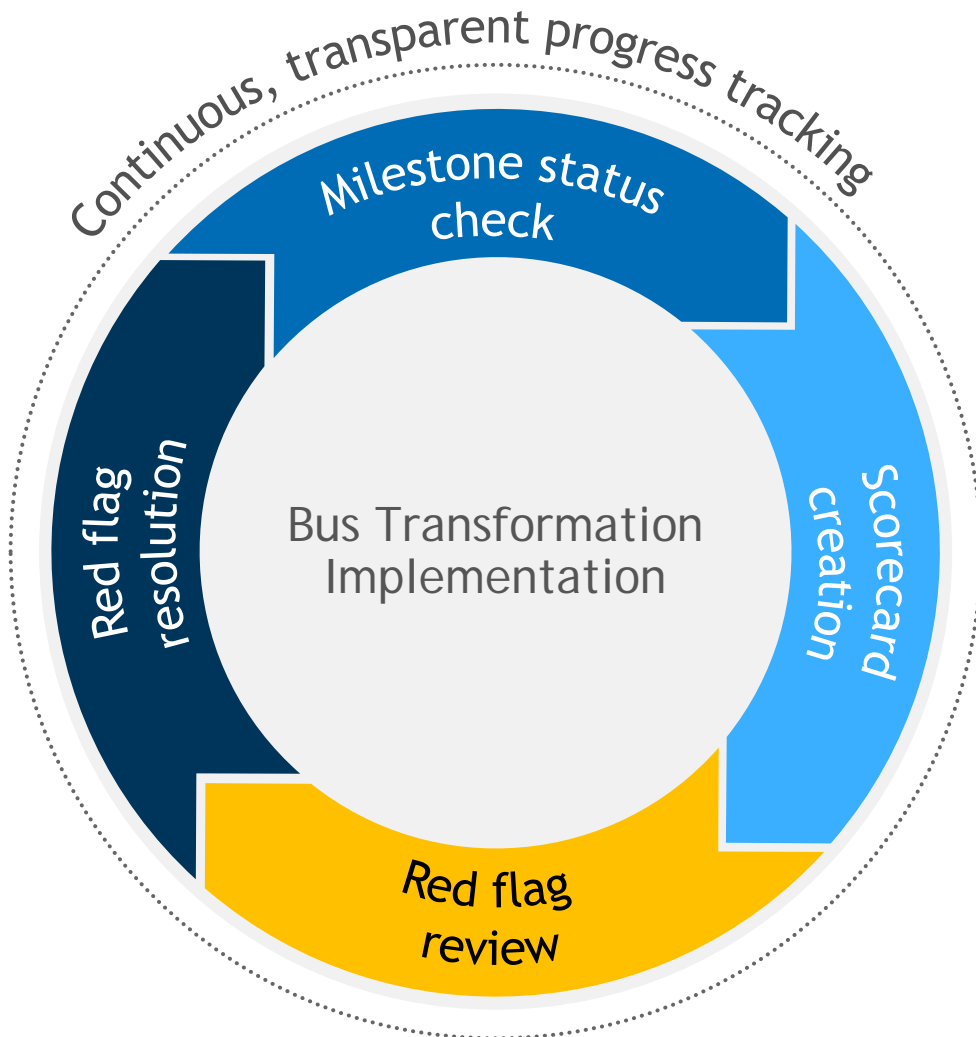
Milestone status check
Independent organization gathers information on latest status of upcoming Project milestones

Scorecard creation
Organization creates and publishes scorecard highlighting Project milestones that are on-track ("green"), progressing but facing obstacle(s) ("yellow"), and behind schedule ("red")

Red flag review
Regional coalition reviews scorecard to identify areas for intervention and next steps to resolve any roadblocks

Red flag resolution
Key leads for each "red" or "yellow" milestone implement recovery plans, engaging relevant stakeholders as needed

Supporting information: Boston-based organizations release annual scorecard to track MBTA progress on 2017 strategic plan

Case study

Three entities developed scorecard to pressure MBTA to deliver on promises of strategic plan

In 2018, three entities – The Greater Boston Chamber of Commerce, Conservation Law Foundation, and MBTA Advisory Board – announced their decision to release annual scorecards to track MBTA progress on their 2017 strategic plan

MBTA welcomed the scrutiny: "Stakeholder feedback and transparent data sharing is imperative to any strategic plan, and particularly for the MBTA as we make the MBTA the world class public transit system our state needs and deserves"
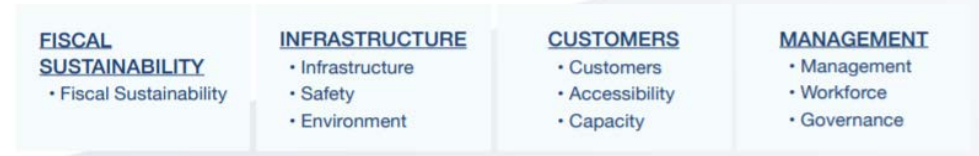
First report was released in March 2019, and found:
- 🟢 31 of 44 strategic goals are on-track
- 🟡 3 of 44 strategic goals are progressing but face obstacles
- 🔴 10 of 44 strategic goals are behind schedule

The three entities will publish the next scorecard in the first quarter of 2020

MBTA scorecard tracks status of each element of the strategic plan, and provides notes on progress to date

STRATEGIC PLAN CATEGORIES
CONDENSED INTO FOUR PRIORITY AREAS

FISCAL SUSTAINABILITY	INFRASTRUCTURE	CUSTOMERS	MANAGEMENT
• Fiscal Sustainability	• Infrastructure • Safety • Environment	• Customers • Accessibility • Capacity	• Management • Workforce • Governance

STATUS KEY

COMPLETE	ON TRACK	PROGRESSING	BEHIND SCHEDULE
✓	🟢	🟡	🔴

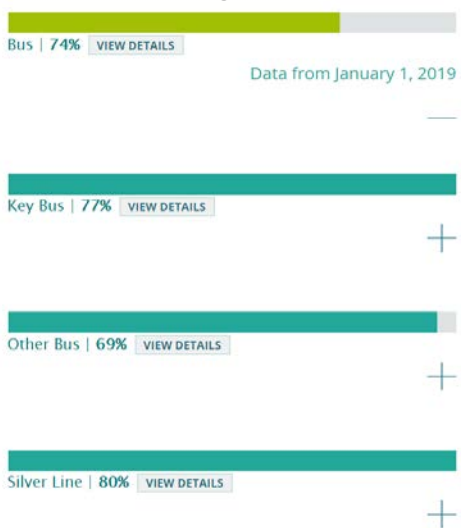| GOAL/SUBGOAL	GOAL DATE	STATUS	PROGRESS NOTES
FISCAL SUSTAINABILITY			
Generate $100 million in non-fare, own-source revenue	FY21	🟢	The MBTA set its non-fare, own-source revenue budget at $101.6 million in fiscal year 2019. If it can generate the budgeted revenue, then it will be two years ahead of its Strategic Plan goal of $100 million by fiscal year 2021.
Eliminate reliance on annual appropriation for operating support	Ongoing	🟡	In fiscal year 2018, the MBTA balanced its budget for the first time in 10 years. However, the MBTA is projecting a $36.5 million deficit for fiscal year 2019, which will be funded by Additional State Assistance. Furthermore, the MBTA continues to face fiscal challenges – most notably a growing pension liability – that it will need to address in future years to avoid returning to large structural deficits on an annual basis.

www.BusTransformationProject.com

Supporting information: MBTA developed publicly-available scorecard to track bus, rail, and ferry performance along four key dimensions

Case study

Sample views

Reliability
On-time performance by bus line
Refreshed daily

Bus | 74% VIEW DETAILS
Data from January 1, 2019

Key Bus | 77% VIEW DETAILS

Other Bus | 69% VIEW DETAILS

Silver Line | 80% VIEW DETAILS

Ridership
Month-to-month bus ridership
Refreshed first of the month

440K
420K
400K
380K
360K
340K

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
month

● 2017   ● 2016

Financials
Budget vs. actual financials
Refreshed first of the month

$985.53M
$991.66M

● Revenue Year to Date   — Budgeted Year to Date

$999.83M
$1.01B

● Spending Year to Date   — Budgeted Year to Date
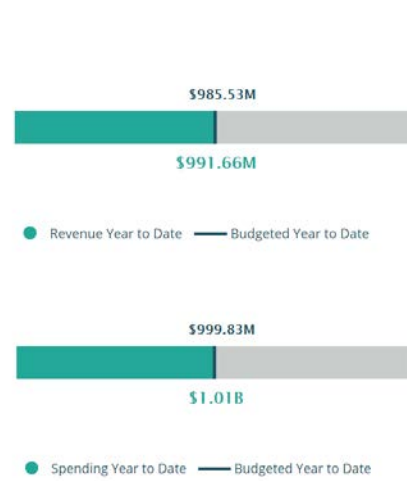
Customer satisfaction
Customer ratings of MBTA performance
Refreshed first of the month

How would you rate the mbta overall?
9% 13% 9% 21% 34% 8%

How would you rate your most recent trip?
8% 9% 9% 10% 14% 37% 13%

The mbta provides reliable public transportation services.
15% 10% 16% 10% 24% 19% 6%

How satisfied are you with the MBTA's communication overall?
9% 13% 13% 22% 31% 6%

Extremely dissatisfied / strongly disagree

Extremely satisfied / strongly agree
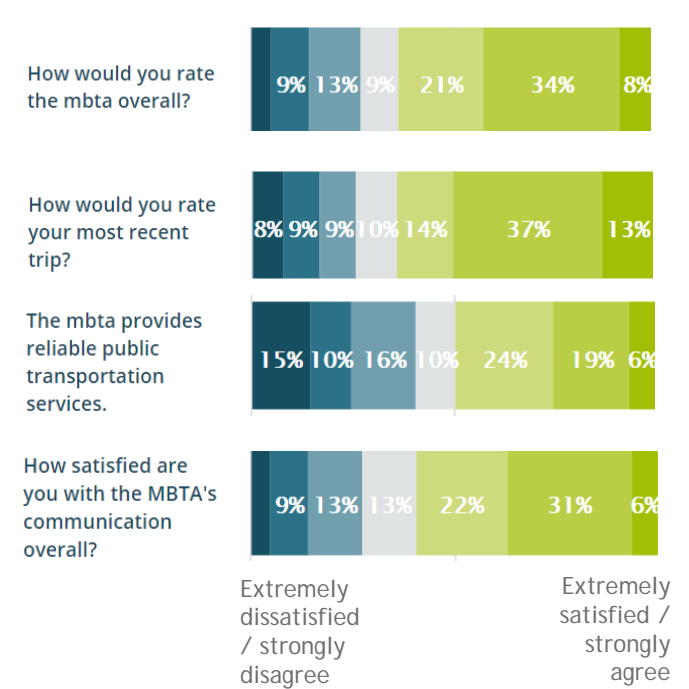
Similar **tracking across all operators** regionally would help develop cooperation between jurisdictions and highlight the success of **bus as an integrated mode**

178

Source: MBTA Back on Track

www.BusTransformationProject.com

Key considerations: Creating a coordinating body and scorecard, and increasing focus on bus is critical to making bus the roadway mode of choice by 2030

Benefits

No immediate need to set up a new authority with convening power (Links to Goal 3e)

Increased coordination across bus and other mobility modes to deliver best-in-class service (Links to Goal 1c, 2a)

Establishes lead entity for execution of Bus Transformation Strategy, and holds the group accountable for results (Links to all Goals)

Costs

TBD - Dependent on incremental resources needed to stand up regional coalition, new coordinating body (after three-year period) and scorecard

Risks

Existence of a regional coalition could make it difficult for jurisdictions to quickly react to local needs
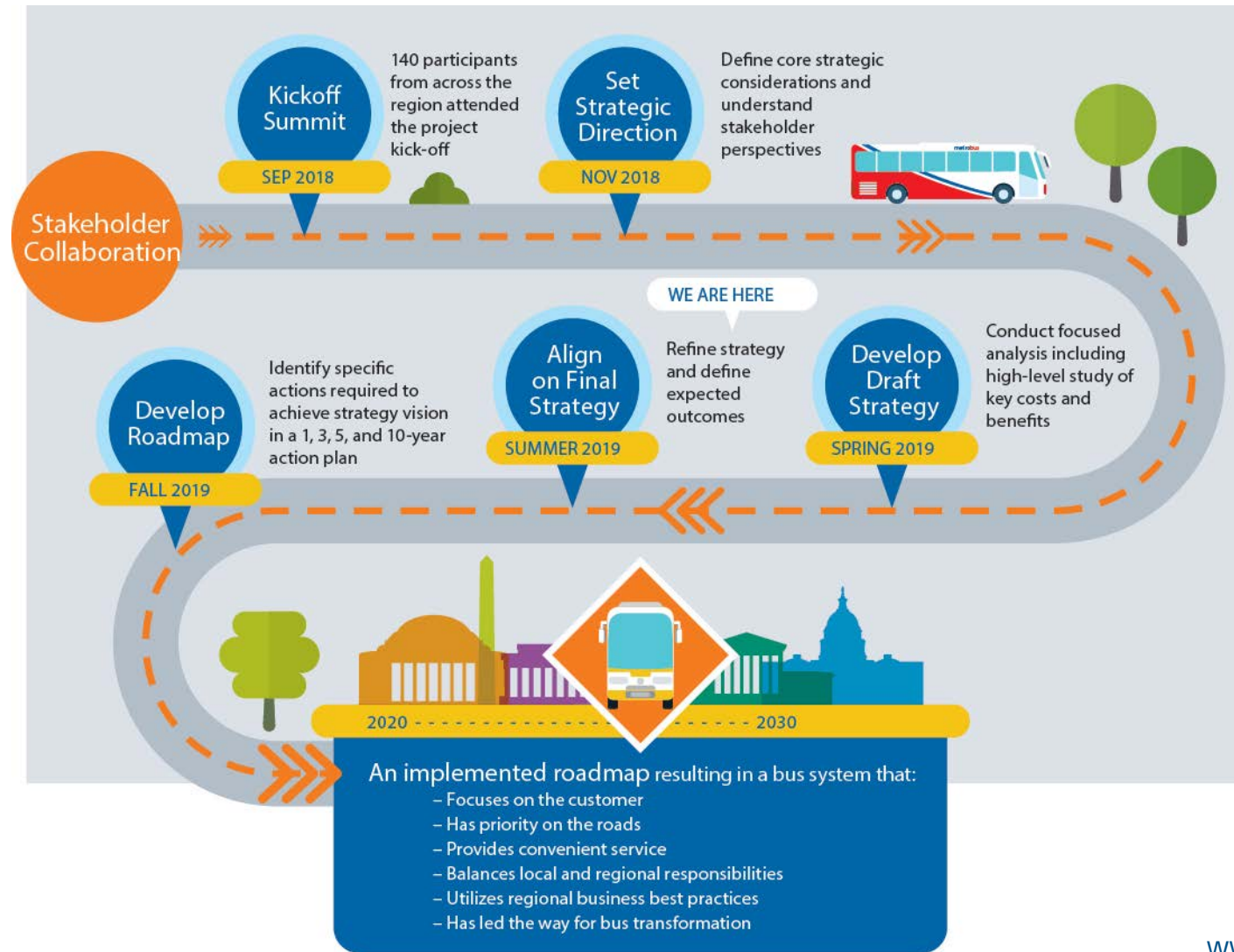
Mitigating factors

Ensure jurisdictions have an "emergency action" channel that enables them to get immediate attention and/or assistance from regional coalition in exceptional circumstances

179

V. Next Steps

The Transformation starts immediately, but will take time to implement fully

VI. Appendix: Background Information

Table of Contents

www.BusTransformationProject.com

Appendix A: Background of the Bus System Today

Context and additional information

The Bus System Today

- A comprehensive assessment of the region's bus system concluded in November 2018
- The following pages are an excerpt of key pieces of information from that report

Other resources:

- Additional Information on potential improvements and international Best Practices can be found in the project's White Paper #2
- The findings from the regional public survey are summarized in the Public Input Survey Report

All of these documents can be found on the Bus Transformation Project website under Resources/Project Documents

1

Overview of the Regional Bus System

Overview of the Regional System

The current regional system includes **nine bus service providers**:

- WMATA
- Loudoun County Transit
- The Bus
- Fairfax County Connector

- Ride On
- ART
- DASH
- CUE
- DC Circulator

Bus carries almost as many people everyday as Metrorail. There are over 164 million annual bus trips across the region. However, ridership fell by 12 percent across the region since 2012.

Together, the jurisdictional services (all except WMATA) have decreased in passengers per hour by 32 percent, from 25 to 17 passengers per hour, since 2012.

www.BusTransformationProject.com

Region's Bus Service Providers: Local Jurisdictions

Eight local jurisdictions provide bus service within the WMATA Compact area:

- ART
- CUE
- DASH
- DC Circulator
- Fairfax County Connector
- Loudoun County Transit
- Ride On
- The Bus

Non-Metrobus Routes

Legend — Non-Metrobus Routes:
- LCT
- CUE
- ART
- Circulator
- Dash
- FFC
- RideOn
- TheBus

Non-Metrobus Routes

www.BusTransformationProject.com
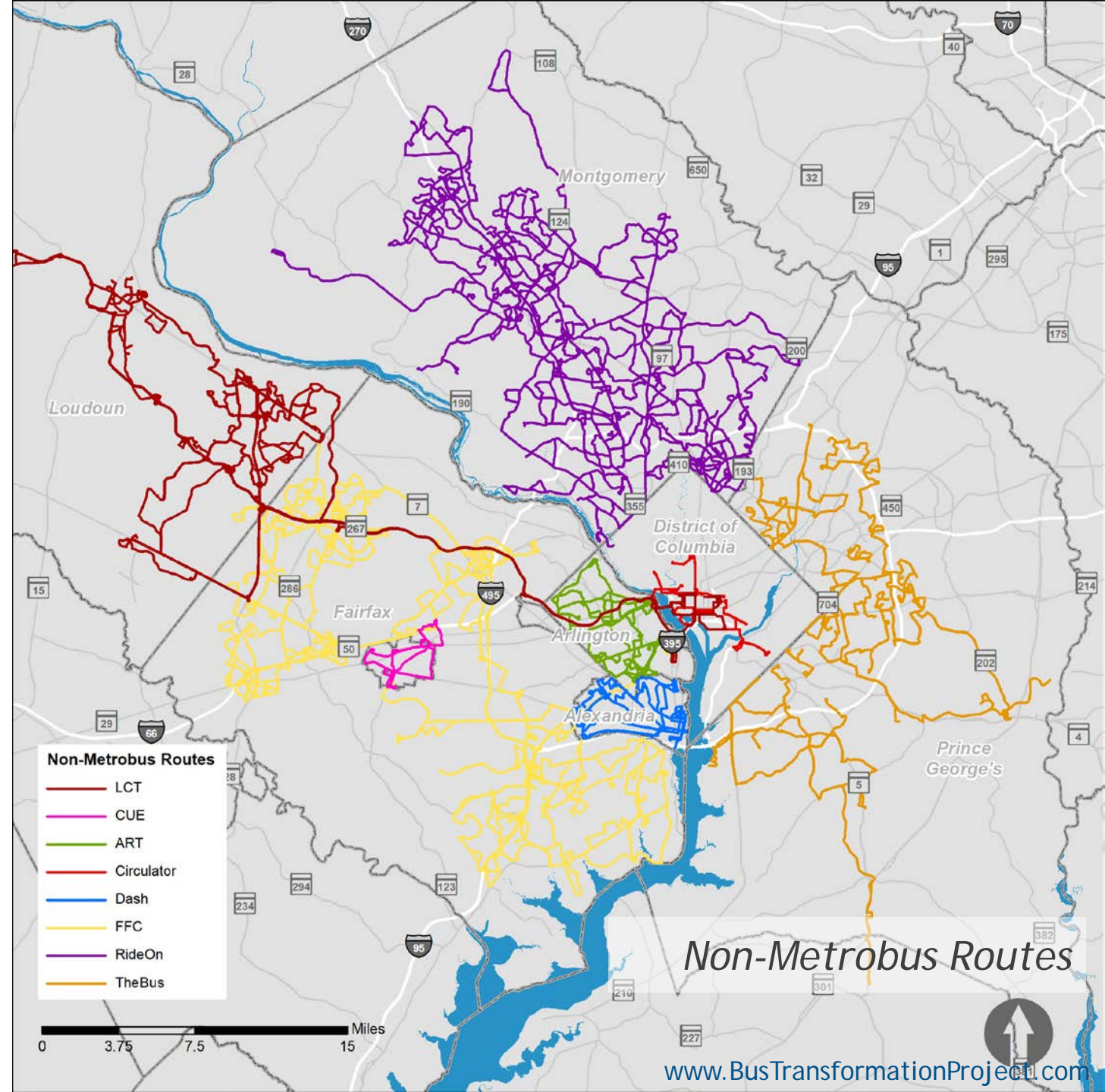
Region's Bus Service Providers: Metrobus

Metrobus provides service across and within every jurisdiction within the Compact Area.

—— Metrobus routes

0   2.5   5   10
              Miles

N

Bus is a major part of the region's transportation system, carrying almost as many people everyday as Metrorail

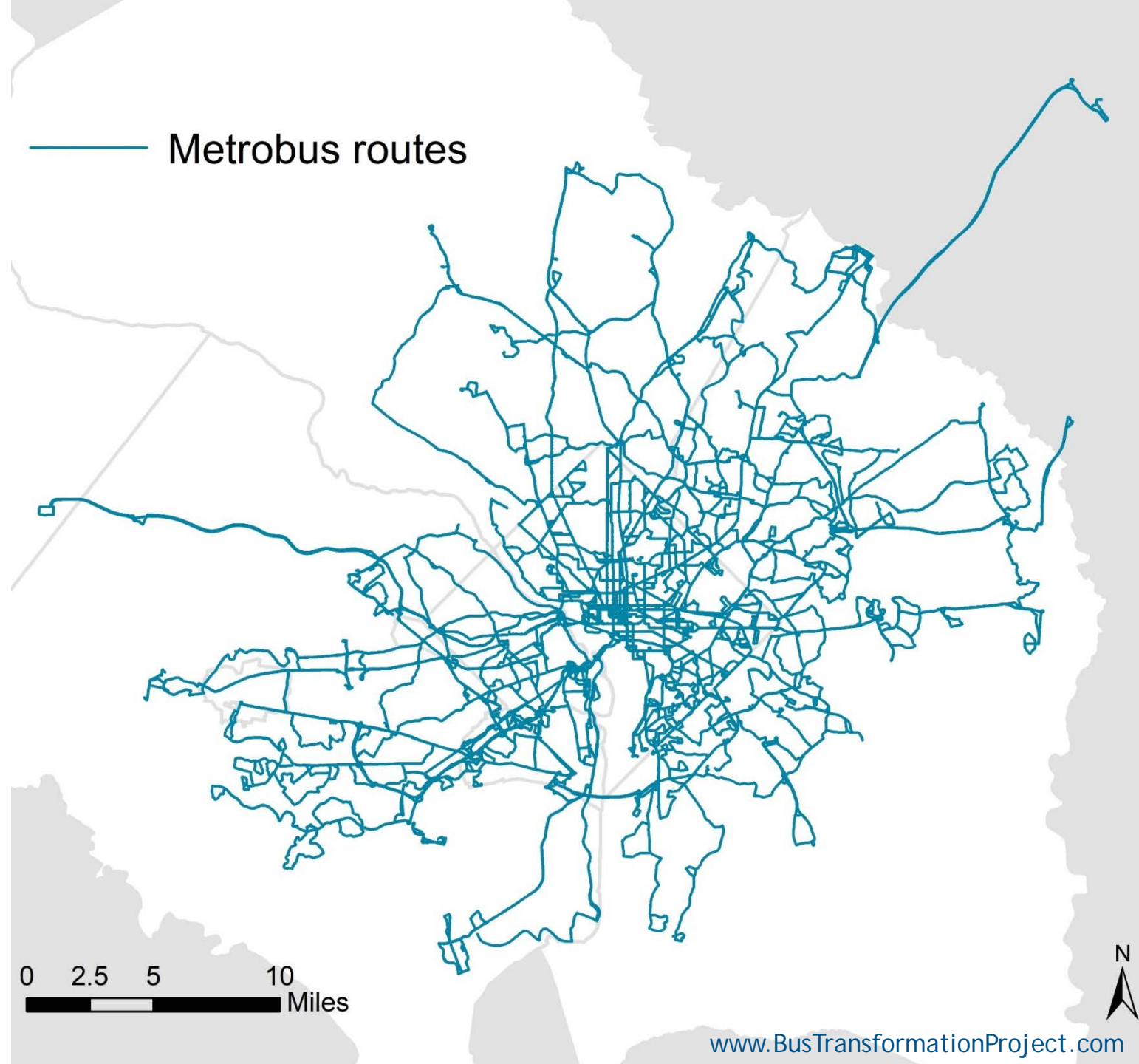| Agency	Average Daily Ridership	Number of Routes	Fleet Size	Annual Operating Cost * (millions)	Average Age of Fleet
ART	10,000	23	65	$12.1	5
CUE	3,000	2	12	$3.3	4
DASH	14,000	13	85	$16.1	7
DC Circulator	16,000	6	67	$19.0	8
Fairfax County Connector	33,000	87	303	$81.4	6
Loudoun County Transit	2,000	30**	112	$7.6	6
Metrobus	443,000	254	1,503	$590.1	8
Ride On	85,000	80	338	$109.0	6
The Bus	15,000	28	93	$27.1	6
Total	621,000	523	2,578	$865.7	--

Source: National Transit Database (2016 and 2017)
* As noted in the 2018 Regional Bus Service Provision Study by the Transportation Planning Board, there is a significant variation in how agencies attribute costs for operations, maintenance, and capital expenses of bus service. https://www.mwcog.org/documents/2018/12/27/regional-bus-service-provision-study/
**Does not include commuter bus routes

191

www.BusTransformationProject.com

2

Customer Expectations and Demands

Customer Expectations and Demands
Key Highlights

- **Throughout the region, 81 percent of people live within a quarter-mile of a bus stop and can access transit (irrespective of the level of service at the stop).**

- **A majority of transit dependent and transit supportive populations live within D.C., Arlington, and Alexandria, areas which receive high levels of bus service.**

  - There are concentrations of jobs and people in Fairfax County, Montgomery County, and Prince George's County that are also transit supportive, but lack adequate bus service.

- **There are 18,000 daily transfers between other local bus providers and Metrobus. There are an additional 49,200 daily transfers among Metrobus routes.**

- **Bus riders surveyed throughout the region in 2016 were substantially less satisfied than those surveyed in 2013.**

- **Bus service levels vary significantly across the region**

  - In suburban areas, a higher percentage of weekday services are focused on peak only commuting service than in more urban areas.

  - Overall, service declines across the region on weekends.

www.BusTransformationProject.com

Today's customers expect system to adapt to their needs

Customer expectations today

Ubiquity
Interested in on-demand consumption – available anytime, anywhere

Personalization
Looking for customized experience tailored to individual needs

Transparency
Interested in comparing various options for goods & services using unlimited data online

Value focus
Seeking best value for money and excellence in delivery (smart shopping)

Simplicity
Attracted to straightforward, seamless user interfaces

Proactive support
Expecting proactive support from companies, and anticipation of customer needs

Where Bus Customers Live in the Region

- Most bus customers in the region reside in DC, whose residents account for over one third of the region's bus trips.

- Montgomery County has the second highest amount of bus trips, with its residents accounting for nearly one quarter of all bus trips.

23%

<1%

37%

7%

12%

1%

5%

10%
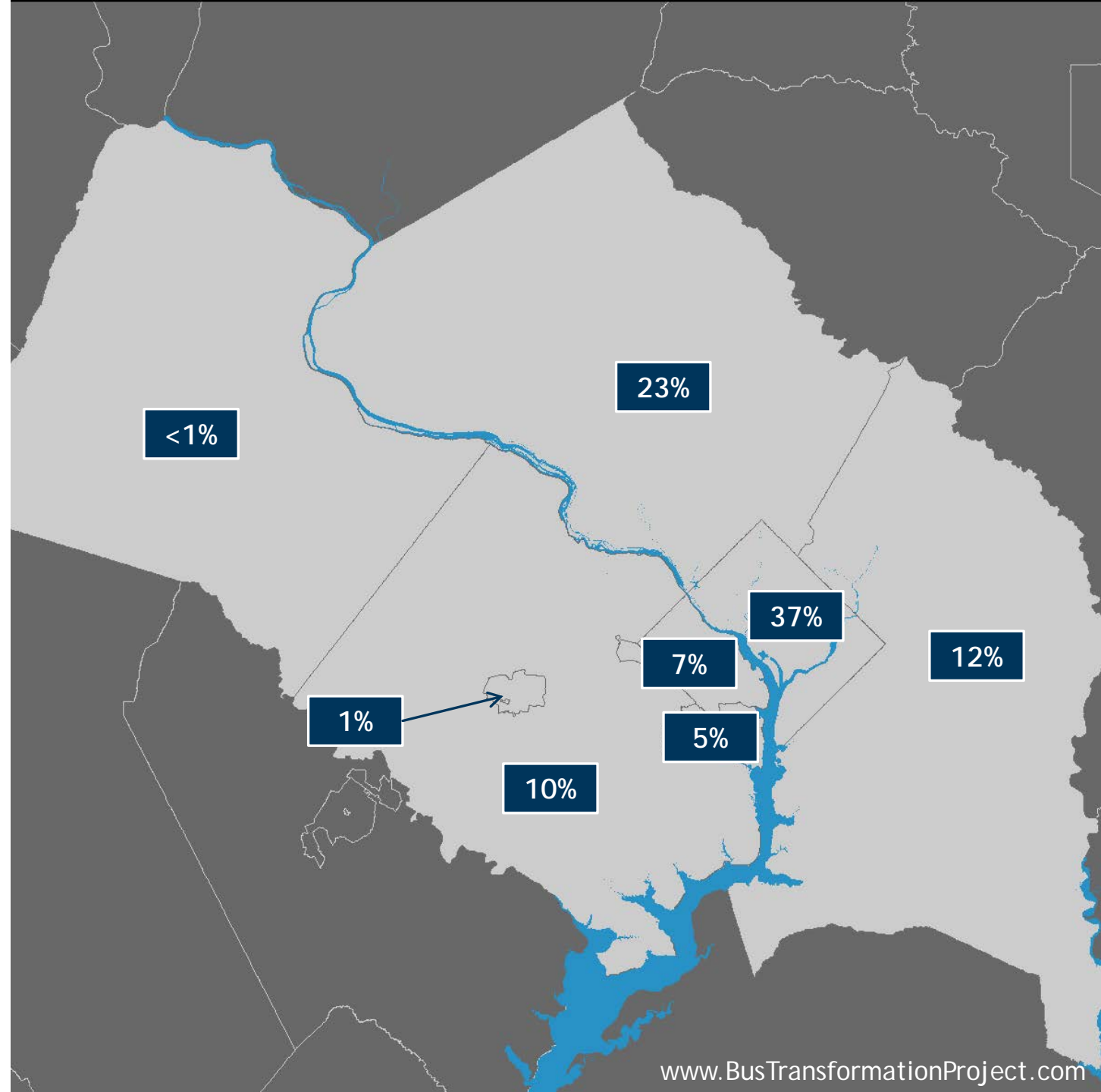
Buses service a diverse population across the region
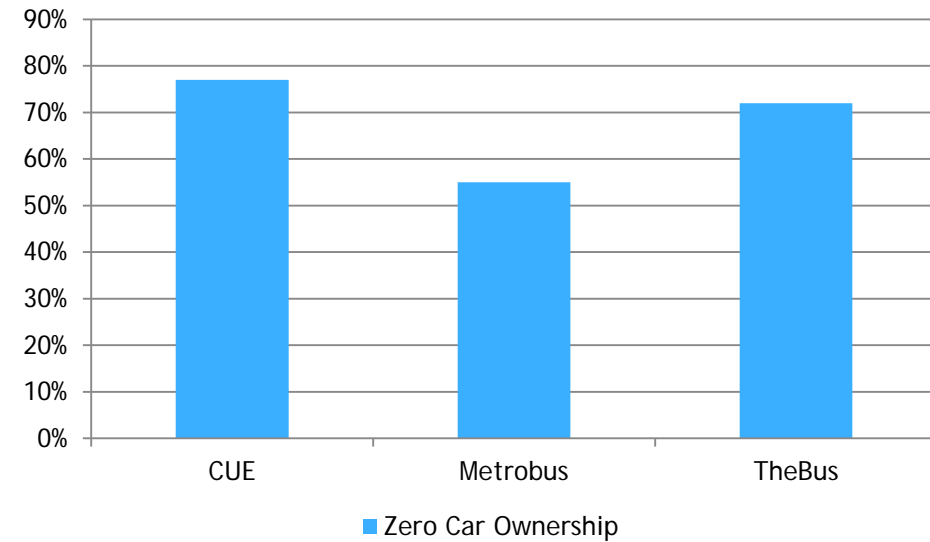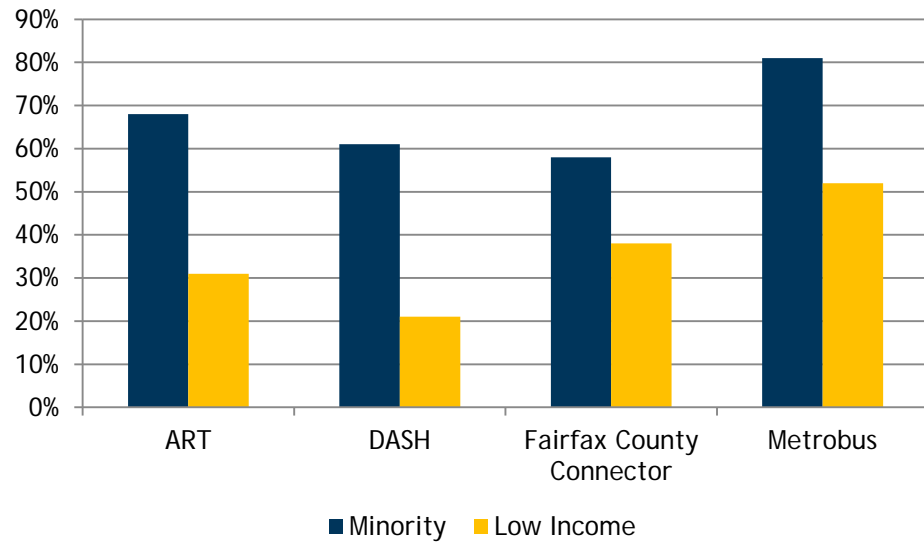
Bus riders are more likely to be from low income households, to have no access to a car, and to be minority than average in the region

Note: Not all data is available from every survey.
Source: Arlington Transit Ridership Study (2013), DASH 2012 Onboard Survey, Fairfax Connector Ridership Survey (2015), Prince George's County, Transit Vision Plan, 2018 – 2022, Onboard Survey - CUE and Mason Shuttles (2014), WMATA 2014 Passenger Survey

www.BusTransformationProject.com

Bus Transformation Project Survey (Fall 2018)

Survey Respondents Summary

- 5,679 responses
- At least once per week
  - 78% ride public transit
  - 68% ride local bus
  - 20% use Uber, Lyft or other ride-hailing service
- 16% low-income
- 45% non-white

Top 3 reasons for riding local bus:

1. It is the closest transit option to my home or work.
2. It is the most affordable option.
3. It is easy to use.

Top 3 barriers to riding local bus:

1. The bus comes to infrequently.
2. The bus is too slow.
3. Buses don't go where I need to go.

Survey **Investment Priorities**

Respondents divided 20 coins between the eight categories, giving higher amounts to their highest priorities for investment.

23%	More Frequent Service
20%	More Reliable and Faster Service
16%	More Direct Buses and Fewer Transfers
10%	Longer Hours of Operation
10%	Affordable Fares
8%	Safer, More Secure Buses and Stops
7%	Better App for Information or Payment
5%	Less Confusing system
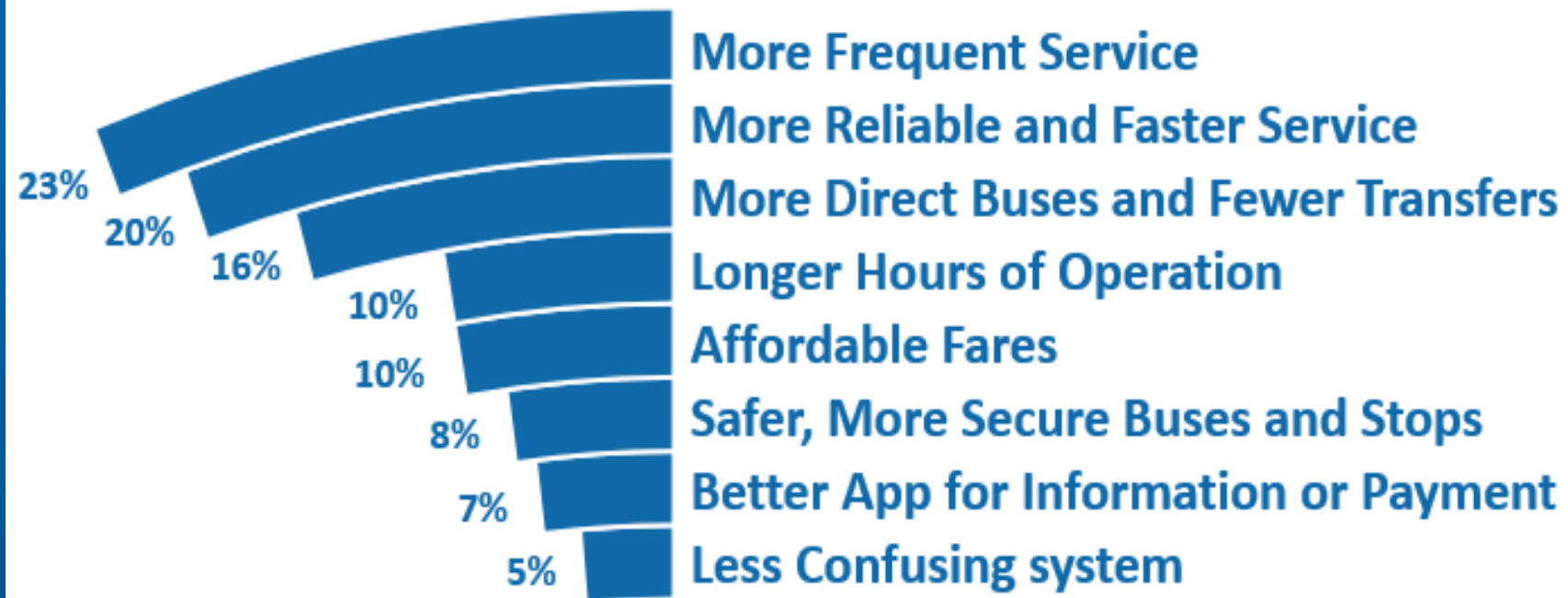
- Top three choices for investment (receiving 60 percent of all coins) were **consistent across the region and demographic groups**.

- Frequent, occasional, and non-riders **had the same top three investment choices**.

- **Affordable fares** were a higher priority among low-income and non-white respondents, and frequent riders.

DRAFT

3

Regional Coordination

Regional Coordination
Key Highlights

- **In 1967, the Compact created the Washington Area Metropolitan Transit Authority (WMATA) as an "instrumentality and agency" of each of the signatory parties: District of Columbia, Maryland, Virginia.**

- **All existing bus routes in the region are divided into Regional and Non-regional routes.**
  - WMATA has overall responsibilities for the regional routes, including: Governance, Planning, Fare policy, Operation
  - Each jurisdiction is responsible for its non-regional routes and decide their service delivery method : in-house operation, WMATA operated, or third-party contractor operated

- **Subjectivity of regional and non-regional definitions introduces uncertainty in decision-making authority and planning scope between WMATA and the jurisdictions.**

- **Lack of clarity in planning scope and responsibilities undermines WMATA's ability to be effective in its Compact-defined role of regional bus planner.**

www.BusTransformationProject.com

Complex set of stakeholders driving decisions about mobility and transit
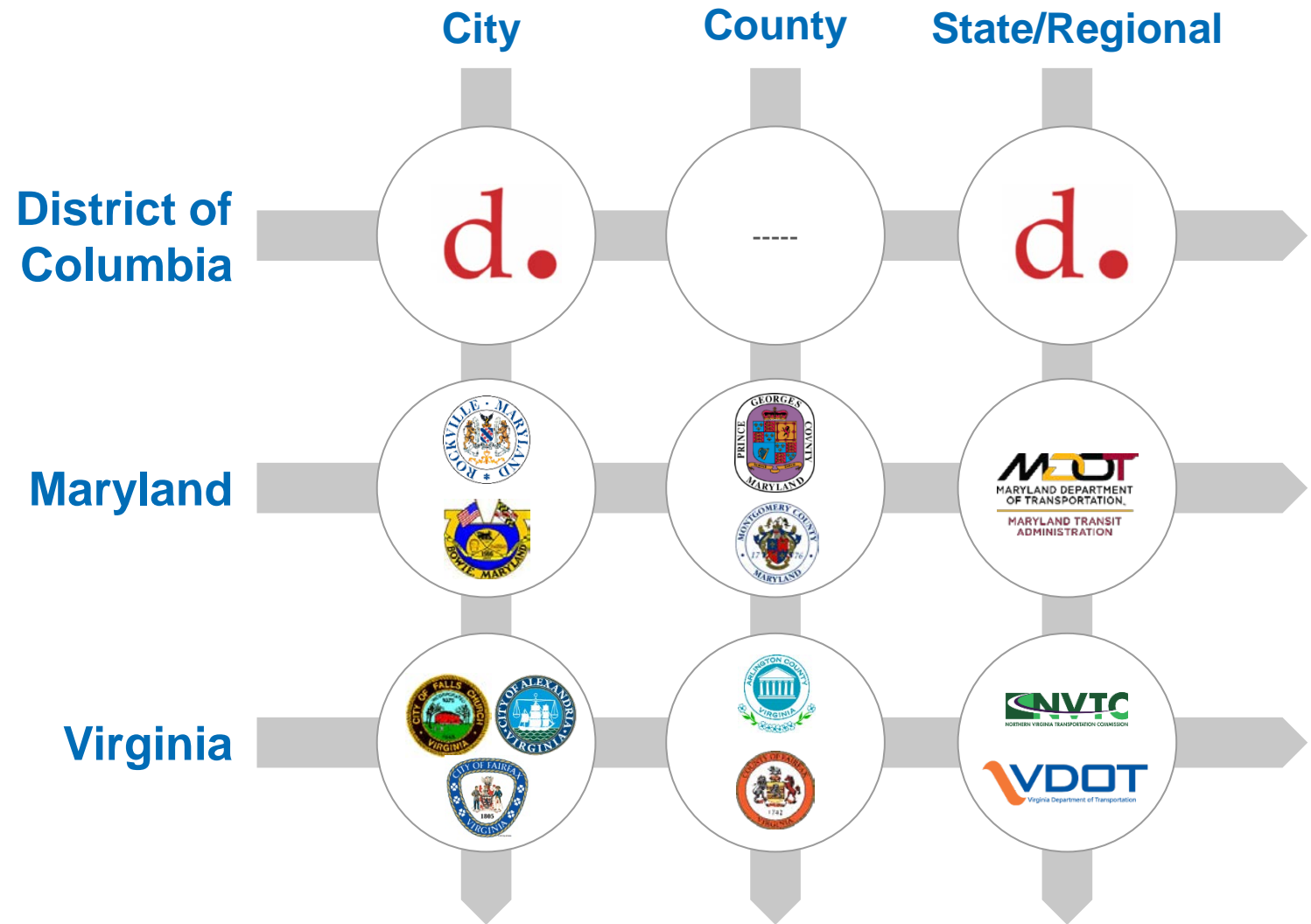
WMATA Compact

The 1967 interstate Compact created the Washington Area Metropolitan Transit Authority (WMATA) as an "instrumentality and agency" of each of the signatory parties: District of Columbia, Maryland, Virginia

The Compact defines the organization, responsibilities, and authority of WMATA:

- Broad independent authority to own and operate public transit facilities and services

- Develop and adopt a Mass Transit Plan - substantial changes to bus network and service would fall under developing a Mass Transit Plan

- Coordinate operation of transit into a unified system without unnecessarily duplicating service

- Serve other regional purposes and perform other regional functions as the jurisdictions authorize

Sources of Funding for Bus vary across the region

- **State and local funding, used for both capital and operating**

  - District of Columbia, Maryland, and Virginia use different combinations of state and local funding and adopt different funding mechanisms for Metrobus

  - Local jurisdictions directly fund their own bus operations, and states provide funding to the jurisdiction transit operators

- **Federal funding, mostly used for bus capital projects by some agencies**

Bus Operating Funding Contribution by Jurisdiction

Bus Operating Subsidy – Contribution by Jurisdiction (FY2016)

Legend: ■ Local Operator ■ WMATA Regional ■ WMATA Non-Regional
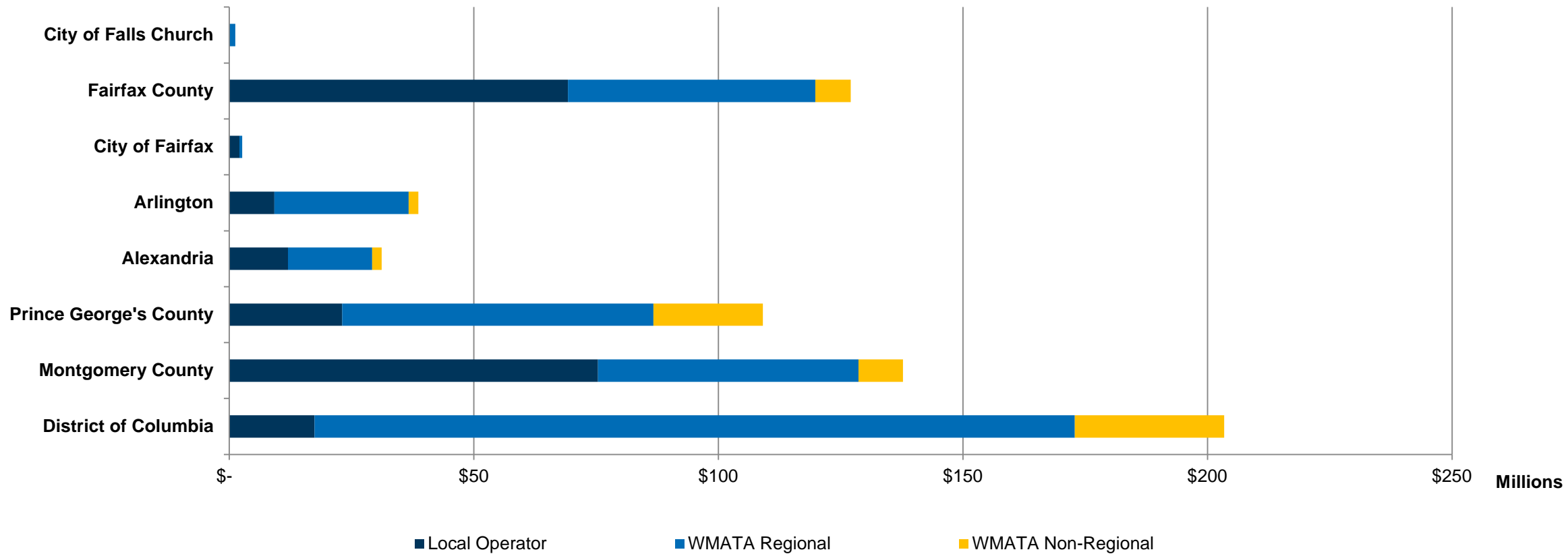
Source: FY2016 National Transit Database

*Metrobus funding for Maryland counties is provided by the State

204

www.BusTransformationProject.com

4

Technology Trends

Technology Trends
Key Highlights

Five emerging global technology trends are rapidly changing the transit market…

1. **Shared mobility platforms**: Allowing riders to connect with transport options when it is most convenient
2. **Connectivity-enabled traffic management**: Leveraging big data and the Internet of Things to reduce congestion and improve travel time
3. **User-centric design**: Increasing customers' expectations that systems will adapt to their individual needs and habits
4. **Automated mobility**: Allowing vehicles to navigate roadways without human intervention
5. **New propulsion opportunities:** Enabling vehicles to reduce CO2 emissions and ongoing operating cost of vehicles

…and they will play an increasingly important role in shaping the future of mobility:

- **Shared mobility platforms**: TNC ridership in US has grown to 4B+ over past five years, and offerings are increasingly price-competitive with transit
- **Automated mobility**: 100+ automated vehicle pilots underway across the world today; new AV-ready ecosystems emerging in select cities
- **New propulsion opportunities:** Increasing proportion of transit buses in the US powered by electric propulsion, and electric vehicle (EV) usage will continue to rise—plug-in EVs and hybrids forecasted to make up ~50% of new car sales by 2030

Going forward, there are a number of challenges and opportunities along each dimension that region must contend with to be "future ready"

www.BusTransformationProject.com

Today, riders in the Washington region demonstrate significant interest in TNCs as an alternative to transit

Survey of riders in agency service areas on reason for most recent TNC trip (2018)

Region has lower proportion of TNC trips connecting to transit…

…and higher proportion of respondents who opted for TNC instead of transit option

Have used TNCs

Have not used TNCs

WMATA (Washington area)
BART (Bay Area)
MARTA (Atlanta)
NJ Transit (New Jersey)

% respondents

TNC connecting to transit

TNC instead of transit

TNC as only option (no transit available)

Haven't used TNC in region

Source: TCRP Research Report 195 - Broadening Understanding of the Interplay Among Public Transit, Shared Mobility, and Personal Automobiles. Four Agency Survey. Transportation Research Board. 2018. http://nap.edu/24996.

www.BusTransformationProject.com

Technology trends offer opportunities and challenges

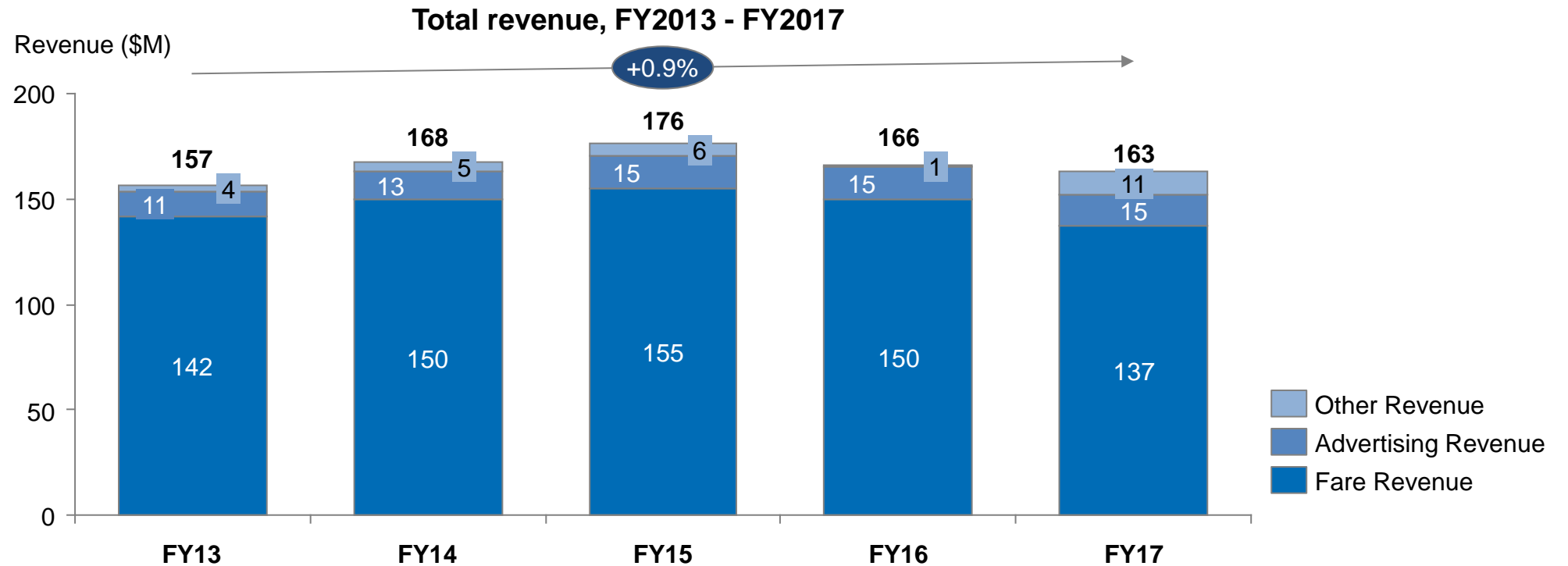| Trend / Technology	⚠️ Future challenges for bus	👟 Future opportunities for bus
Shared mobility Allowing riders to connect with transport options when it is most convenient	• Evolution of TNC model suggests it will continue to erode bus market share • TNCs increase congestion which could slow down bus	• Exploration of shared mobility solutions for bus (e.g. microtransit, multi-modal platforms)
Connectivity-enabled traffic management Leveraging big data and IoT to reduce congestion and improve travel time	• Elements needed to set up and maintain traffic management system aren't necessarily within control of transit; while transit owns vehicles, other stakeholders may control traffic lights, roadways, and related infrastructure / data	• Improved bus performance using IoT-enabled infrastructure, e.g, Transit Signal Priority • Dynamic bus scheduling using predictive analytics and real-time data collection
User-centric design Increasing customers' expectations that systems will adapt to their individual needs and habits	• Increased user expectations • Private companies developing user-focused tools at a faster rate than bus • Diverse rider population increases complexity of creating personalized interfaces for each user	• More intuitive and comprehensive transit application interfaces • Introduction of supply and demand management tools • Seamless payment for transit services
Automated mobility Allowing vehicles to navigate roadways without human intervention	• Automated cars could displace mass transit • Switch to automated buses would have employment impacts, significant infrastructure investment	• Reduced operating costs from switching to automated buses • Potential for automated buses to improve passenger safety, trip time • Labor cost savings makes running smaller vehicles more financially viable
New propulsion opportunities Enabling vehicles to reduce CO2 emissions and ongoing operating cost of vehicles	• Reduced environmental competitive advantage • Charging needs must be considered in operations planning, garage locations	• Reduction in carbon emissions by switching to electric or full-cell propulsion vehicles

208

5

Metrobus Financial Sustainability
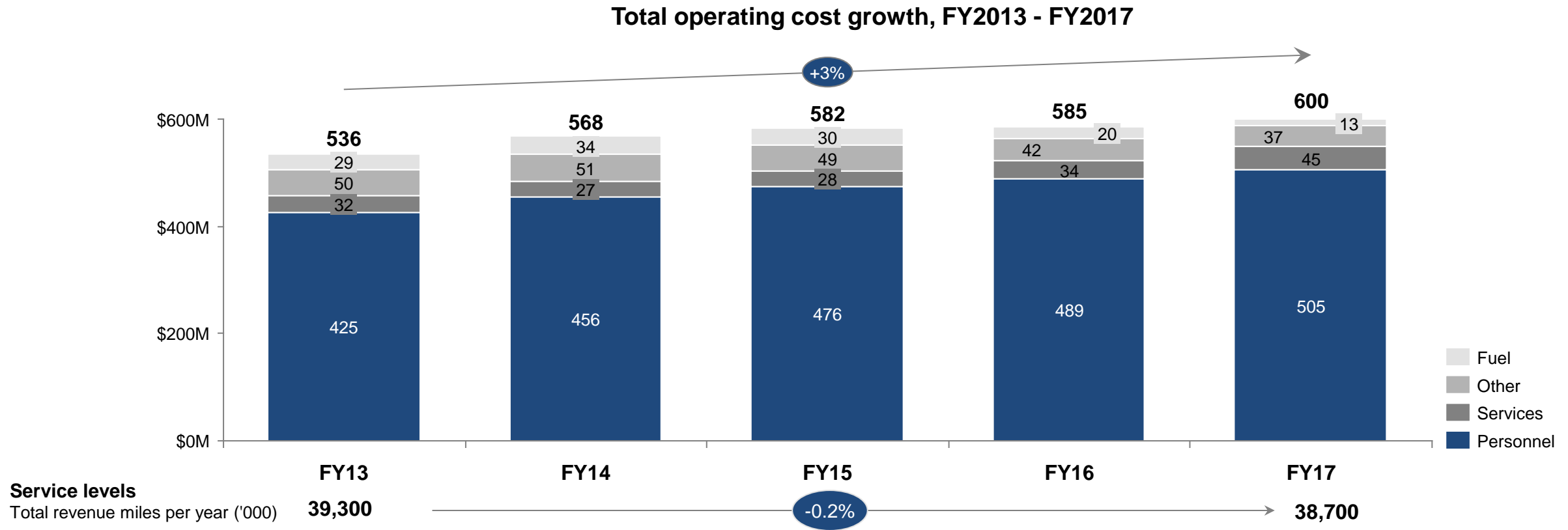
Metrobus Financial Sustainability
Key Highlights

- **Since 2013, Metrobus' farebox recovery has declined by 4 percentage points, resulting in an operating loss growth of 3.6% p.a.**

- **The operating loss is the result of both flat revenue and rising operating costs**

- **Flat revenue growth has been caused by:**
  - Despite fare increases, declining bus ridership (2% p.a.) has driven a 1% p.a. decline in fare revenue since 2013
  - Declines in fare revenue have only been partially offset by increases in non-fare revenue (e.g. advertising)

- **Operating costs have increased by 3% p.a. since 2013, without an increase in service levels. The main drivers include:**
  - Increase in personnel costs, representing 84% of costs in 2017 compared to 79% in 2013
  - Relatively high percentage of time and miles spent on deadhead versus national peers
  - Declining bus speeds, which have decreased by 9% or 1mph over the past 10 years

- **With current revenue and cost trends, meeting the 3% operating subsidy growth cap will be challenging**
  - Based on current revenue and cost structure, meeting the operating subsidy cap will require a 4% per year growth in ridership
  - Alternative paths to meet the 3% operating subsidy growth cap require a slow down in cost growth, fare increases, and/or a reduction in service

Revenue growth has remained flat due to declining revenues from ridership, even with a small increase in non-fare revenues

DRAFT

Total revenue, FY2013 - FY2017

Revenue ($M)

+0.9%

Other Revenue
Advertising Revenue
Fare Revenue

Source: WMATA Bus Modal FY12-17 P&L Expense by Category

www.BusTransformationProject.com

Metrobus operating costs rose by 3% per year over past 5 years though service levels remained flat…

Total operating cost growth, FY2013 - FY2017

+3%

	FY13	FY14	FY15	FY16	FY17
Total	536	568	582	585	600
Fuel	29	34	30	20	13
Other	50	51	49	42	37
Services	32	27	28	34	45
Personnel	425	456	476	489	505

Service levels
Total revenue miles per year ('000)   39,300   -0.2%   38,700

Source: WMATA Bus Modal FY12-17 P&L Expense by Category; Urban Integrated National Transit Database

www.BusTransformationProject.com

Three major factors driving Metrobus cost growth – personnel costs, deadhead and slow bus speeds

1

Increased personnel costs

Accounts for 80% or $80M of cost increase from 2013 to 2017, includes salaries & wages, fringe benefits and overtime expenses

Commuter nature of service (peaked) requires a larger labor force

2

High percentage of time and miles spend on deadhead

Metrobus could save, e.g., $16M per year by reducing deadhead hours from 14% to 9% of total platform hours

3

Declining bus speeds

Average Metrobus speeds declined ~1mph since 2007

1mph increase in average bus speeds would unlock savings equal to 4% of operating costs

Other local operators are also experiencing many of these challenges (e.g., road congestion impacting bus speeds)

213

Appendix B: Detailed Goals and Objectives

www.BusTransformationProject.com

Regional Connectivity

GOAL: Provide reliable on-street transit options that efficiently connect people to places and improve mobility

Objectives

a) Align routes and resources with travel demand

b) Mitigate congestion by increasing transit usage

c) Enhance integration of bus systems and integration of bus with other transportation modes

d) Invest in transit facilities and assets that support transit speed, frequency, reliability and efficiency

www.BusTransformationProject.com

Rider Experience

GOAL: Ensure a convenient, easy-to-use, user-centered travel choice

Objectives

a) Provide clear, accurate, integrated customer information across all regional operators

b) Make it easy to plan, pay, and ride all modes

c) Provide a safe, comfortable experience for passengers while waiting, riding, and transferring

www.BusTransformationProject.com

Financial Stewardship

GOAL: Maintain a transit mode that is financially sustainable in the long-term

Objectives

a) Maximize the value delivered by the bus system to the public and taxpayers

b) Use available funding efficiently by lowering costs where possible

c) Align agency funding allocations with consensus role for bus

d) Provide transparent and understandable reporting on financial performance to the public

e) Optimize operating costs related to capital investments

Sustainable Economic Health and Access to Opportunity

GOAL: Encourage vibrant, economically thriving and sustainable communities

Objectives

a) Leverage bus investment to catalyze new economic development

b) Link bus service with land use decisions to support housing affordability and reduced automobile usage

c) Realize the positive environmental potential of bus

d) Nurture a high-performing transportation workforce

www.BusTransformationProject.com

Equity

GOAL: Create a bus system that is affordable and equitable

Objectives

a) Ensure equitable transit service for those who most depend on it (e.g., low-income, seniors, youth, individuals with no vehicle)

b) Provide riders with affordable end-to-end transportation

c) Enhance mobility options for people with disabilities

www.BusTransformationProject.com