Top use cases for regional bus data sharing

Bus Transformation Project – Rec B

Last updated April 26, 2020

Purpose

Identify top use cases for sharing regional bus data.

Use cases will inform what data to share, and how frequently and in what format it should be shared.

Agenda

1. What is Recommendation B of the Bus Transformation Project?

2. What are some use cases for data sharing?

3. What sharing is already taking place?

4. Next steps

Bus Transformation Project

Recommendation B

WASHINGTON AREA
BUS TRANSFORMATION
PROJECT

B	*Recommendation:* Collect and share standardized bus operations and performance data across agencies to improve transparency and better plan bus service.	Primary	Support

Benefits	Better and more complete data will enable the creation of a better, more efficient regional bus system.
Outcome	Data standards and sharing agreements are reached so that there is consistency in data reporting to make planning and analysis easier and more efficient, which has benefits for other recommendations. Implementation of this recommendation will also include a way to share the operations and performance data easily between agencies and reporting partners.
Schedule	Starts: 2020 Complete: 2023

Bus Transformation Project

Recommendation B

Action steps

1. Convene a regional data sharing working group to develop data needs for ongoing planning and reporting, including the types of data, tools to collect data, and level of detail, while considering what is already being collected

2. Identify responsible party to house, own, and maintain the data on an ongoing basis and identify and develop a common tool and formats for collecting and storing the data

3. Identify what data will be shared with whom and develop an inventory of data types, level of detail, uses, and frequency of updates

4. Develop and sign a data sharing agreement between all transit agencies and the data repository owner

5. Collect and consolidate the first phase of data from each agency; develop and implement plans for collecting remaining data needed

6. Perform ongoing analysis of consolidated data

Use Cases for Data Sharing

1. Regional long-range planning

2. Bus network redesign

3. Bus service planning

4. Facility assessments

5. Performance reporting

What else?

What is most important?

Sharing already occurring

1. Regional long-range planning

   - TPB Ridership

2. Bus service planning

   - Annual Line Report

   - RITIS tool

3. Facility assessments

4. Performance reporting

   - MetroHero Aries tool

TPB collects and visualizes average weekday ridership by route

National Capital Region Transportation Planning Board

Transit Ridership

Last updated last year
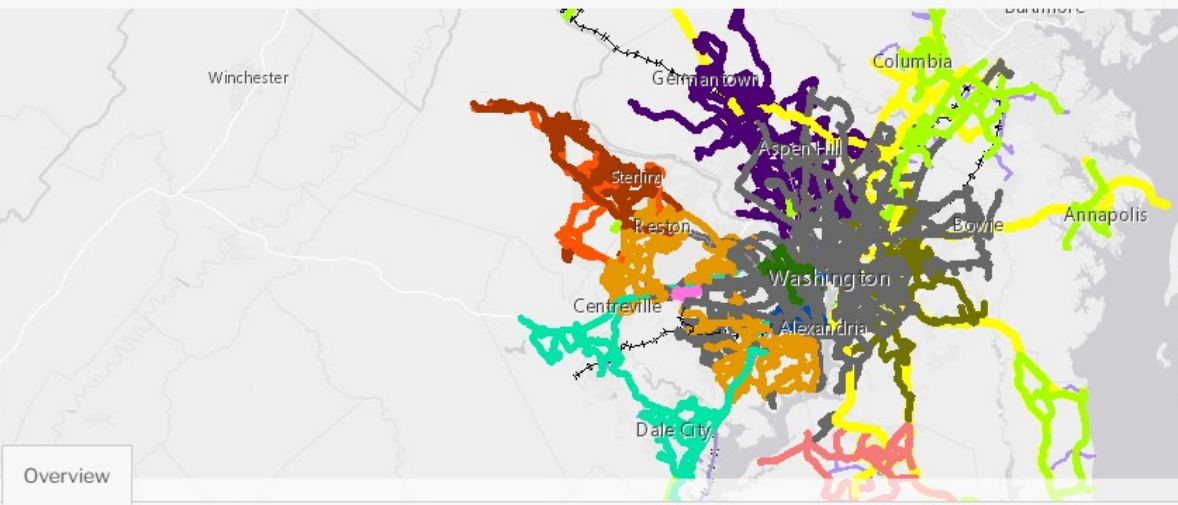
Overview

📅 11/7/2019   📄 Map Service   🔒 Custom License

The **Average Weekday Transit Ridership** layers show transit routes in the TPB/MWCOG modeled region. This layer provides average weekday ridership data for each month from July to June in the reported Fiscal Year (FY), as reported to TPB/MWCOG by transit operators.   Route features extracted from the TPB travel demand model network and joined with ridership data.   The monthly average weekday transit ridership is the total ridership of each route instead of individual variation of that route.   Ridership d   ata received from TPB Regional Public Transportation Subcommittee members and other partners.

Included providers:

DC Circulator

ART Bus - Arlington

DASH - Alexandria

CUE - Fairfax City Bus

Fairfax Connector - Fairfax County

Loudoun County Commuter Bus

TransIT - Frederick County

Loudoun County Local Bus

MTA Maryland Commuter Bus

Omni Ride

TheBus - Prince George's County

Ride On - Montgomery County

WMATA - Metro Bus

MARC - Maryland Commuter Rail

VRE - Virginia Commuter Rail

VanGO - Charles County (starting with 2019 dataset)

Metro's annual Line Report evaluates performance vs. service guidelines

Table 1: Metrics by Level

Level	Availability	Route Design	Productivity	Reliability	Cost Effectiveness
Line	Span of Service, Frequency of Service	Branch Productivity, Parallel Corridors	Passengers per Revenue Hour, Passengers per Revenue Mile	On-Time Performance, Crowding, Load Factor	Operating Cost per Passenger Trip, Cost Recovery
Route	Number of Stops per Mile	Circuity	Passengers per Revenue Hour, Passengers per Revenue Mile, Unique Segment Ridership	On-Time Performance, Crowding, Load Factor	Operating Cost per Passenger Trip, Cost Recovery

5. Network Guidelines

As Metrobus is not the only bus provider in the region, it is important to identify systemwide and operator neutral performance measures for the entirety of the network. These include possible targets for availability, comfort and safety, and passenger amenities across the WMATA Transit Zone. The purpose of these metrics is to evaluate the network as a whole, rather than focusing on specific lines/routes or operators. As such, they are not evaluated for Metrobus, but are included in the event that data sharing across operators or a bus network redesign is realized in the years ahead.

5.1. Availability Guidelines

Availability in this context refers to the ability for residents, workers, and visitors to access transit with varying levels of service regardless of operator. One important aspect of access is availability of higher frequency services in locations with higher activity densities (population plus jobs per acre). Certainly, serving areas with high concentrations of low income and/or high minority populations is an important priority. Transit providers may also consider how much of their resources should go to high ridership routes as opposed to routes that may not have as many riders but cover a larger service area. This section will lay out network-wide targets for availability. For the purposes of these analyses and based on industry evidence, one quarter mile is the maximum acceptable distance a passenger will travel to access to a local or coverage route, while one half mile is the assumed distance a passenger will travel to access a higher frequency routes, such as a BRT Route, Priority Corridor, or Metrorail.

Service Availability: Frequent Service

High-frequency transit service, equivalent to the BRT/Framework Routes service classifications, should be provided to at least 80 percent of dense census blocks (jobs[4] + people[5] of at least 25 per acre) within the WMATA Transit Zone on both weekdays and weekends.

How to Calculate: Identify census blocks with at least 25 jobs + people per acre (**Figure 2**). Assess the percentage of these census blocks within a half mile of a BRT/Framework Route bus stop or a Metrorail station.

Service Availability: Base Coverage

Combined, transit providers in the WMATA Transit Zone should serve 90 percent of census blocks with three or more households per acre and/or four or more jobs per acre.

How to Calculate: Identify census blocks with three or more households per acre and/or four or more jobs per acre. Assess the percentage of these census blocks within one quarter mile from a bus stop, rail station or access point to public transportation.

Equity Emphasis Areas Availability

The Metropolitan Washington Council of Governments developed Equity Emphasis Areas (**Figure 3**) to identify small geographic areas that have significant concentrations of low-income, minority populations, or both.[6] Combined, transit providers in the WMATA Transit Zone should provide some level of transit service within one quarter mile of 95 percent of the Equity Emphasis Areas.

How to Calculate: Assess the percentage of Equity Emphasis Area census blocks within one quarter mile from a bus stop, rail station or access point to public transportation.

Funding Allocation Goal

Transit providers should also consider how much funding resources should go to higher levels of service routes that are more focused on corridor services (such as BRT), as opposed to routes that may have lower levels of service but cover a large area (other route types). Because different transit providers serve areas with different densities, this guideline differs by geography. This metric should be used as a goal and should not limit the ultimate design of a network utilizing the service guidelines detailed above.

How to Calculate: Operating funds for BRT and Framework Routes divided by total operating funds for fixed-route bus service.

Table 15 | Funding Breakdown Goal

Zone	BRT/Framework Routes	Other Bus Routes
Tier 1	85%	15%
Tier 2	80%	20%
Tier 3	75%	25%

Line: Fair Oaks-Jermantown Road | **Route(s):** 2B

Route 2B

	Measure | Standard	Route Average	Class Tier Average	Grade
Availability	Number of Stops per Mile | 4–5	3.8	6.1	E
Route Design	Circuity | N/A	1.57	2.00	-

	Measure | Standard	Weekday			Saturday			Sunday		
		Route Avg.	Class/Tier Avg.	Grade	Route Avg.	Class/Tier Avg.	Grade	Route Avg.	Class/Tier Avg.	Grade
Productivity	Passengers per Revenue Hour | 15.0	13.6	29.7	C	11.4	29.3	E	9.7	27.9	E
Productivity	Passengers per Revenue Mile | 2.0	1.0	3.0	E	0.9	2.9	E	0.8	2.7	E
Productivity	Unique Segment Ridership | 10%	87%	31%	A	87%	33%	A	87%	32%	A
Reliability	On-Time Performance | 79%	84%	82%	A	90%	82%	A	87%	84%	A
Reliability	Crowding | 5.0%	0.0%	0.4%	A	0.0%	0.2%	A	0.0%	0.1%	A
Reliability	Load Factor | Peak: 1.00 / Off-Peak: 1.00	Peak: 0.30 Off-Peak: 0.20	Peak: 0.39 Off-Peak: 0.29	A	0.20	0.31	A	0.20	0.27	A
Cost Effectiveness	Operating Cost per Passenger Trip | $5.00	$8.62	$4.77	E	$10.25	$4.83	E	$12.06	$4.94	E
Cost Effectiveness	Cost Recovery | 20%	Data Unavailable for FY2020								

Legend ■ Exceeds ■ Meets ■ Approaches ■ Below ■ Significantly Below

RITIS shares transit alerts, AVL, & schedule data, as well as travel time, speed and OD info.
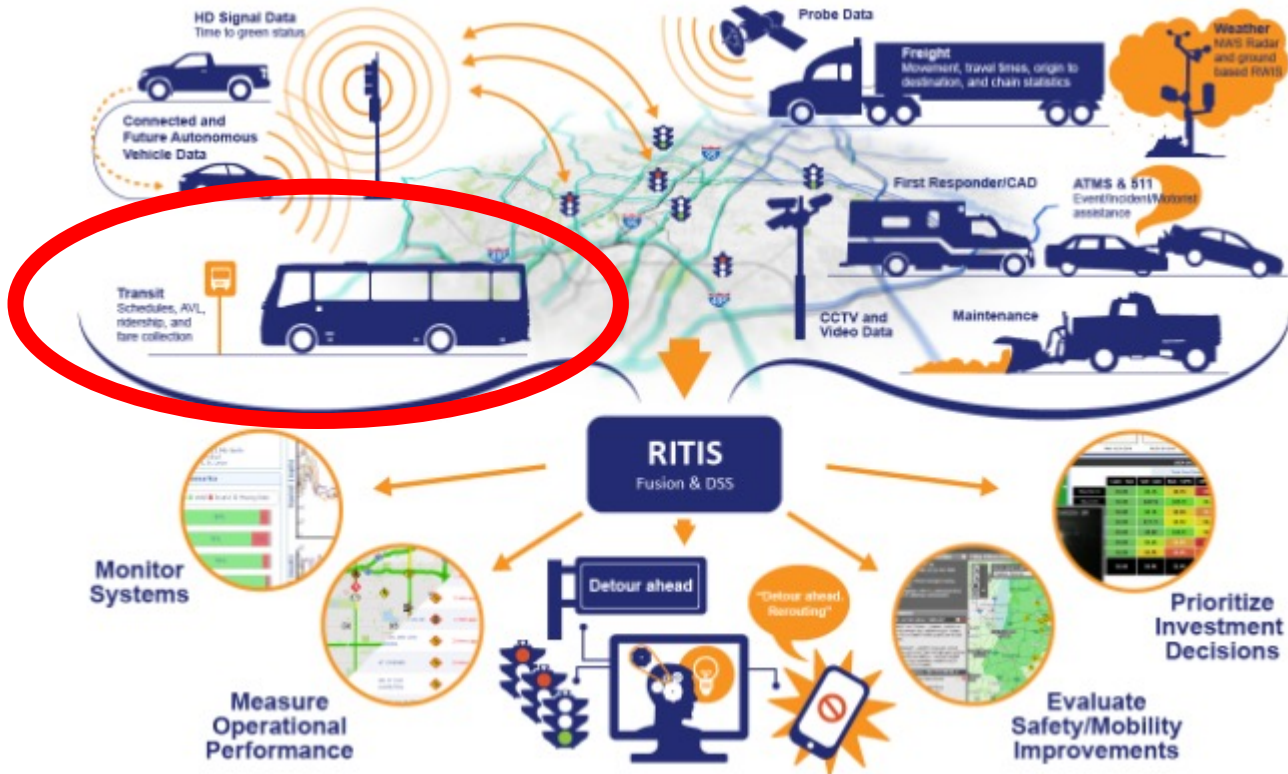
Why do so many transportation professionals use RITIS?

Because of its ability to support the core functions of their agencies or organizations. These people may need to:

- Plan, monitor, execute, review and report on operations activities
- Maintain situational awareness beyond local coverage areas
- Understand how transportation impacts law enforcement activities and vice-versa
- Collaborate with and share information among peer agencies
- Measure progress toward achieving goals or hitting performance targets
- Perform credible benefit-cost analyses for proposed investments
- Build consensus for and confirm projects for long range plans
- Maintain credibility with the public and provide timely information
- Collect evidence and make the case for more program funding
- Demonstrate competent stewardship of public funds
- Drill deeply to discover insights hidden inside today's 'big' databases
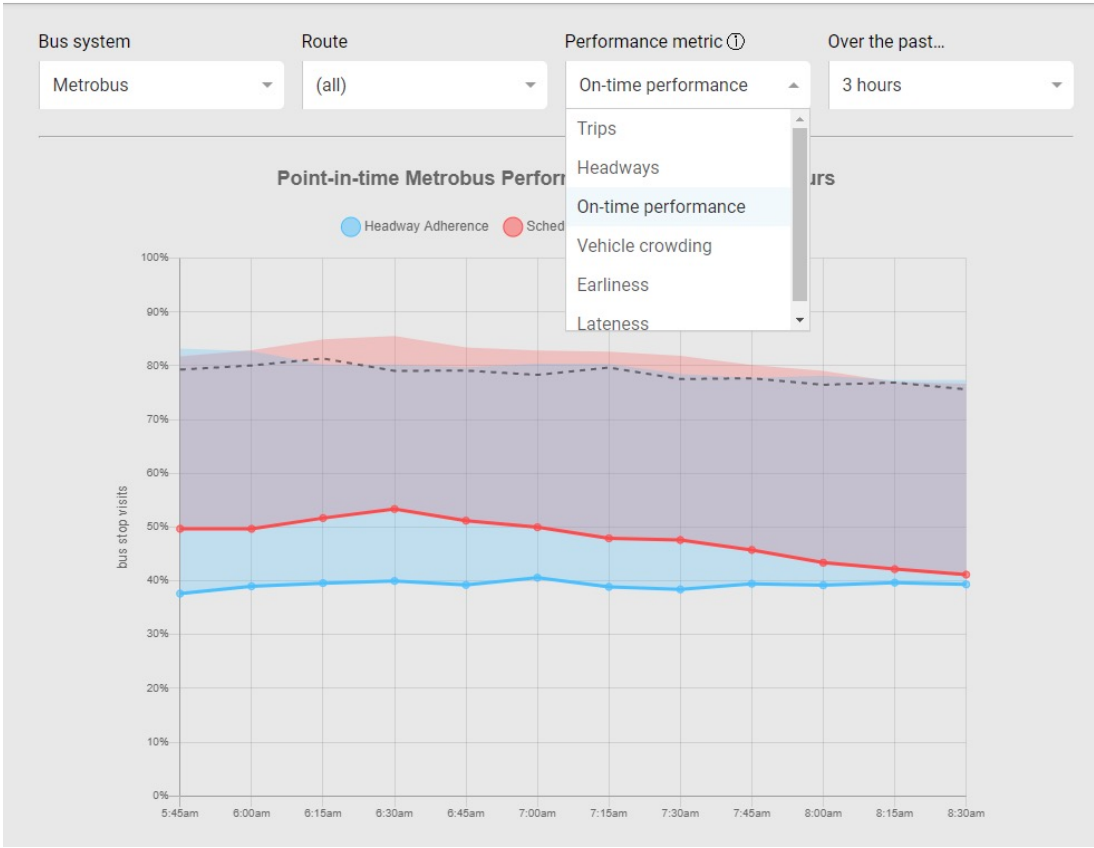- Test new data, decision support concepts, or other

MetroHero Aries leverages public schedule and AVL data to evaluate OTP

Proposed principles for data sharing

Key objective: minimize reporting burden and keep it simple

– What to measure: use **service guidelines** as a starting point

– How to measure: leverage **NTD definitions** whenever possible

– Data format: use **GTFS**, **GTFS-RT** and **NTD**

– Frequency: **annual** for most data points

– Collection method: scrape APIs already produced by providers, accept NTD forms

Next steps

✓Catalog data available in NTD, GTFS and GTFS-RT [complete]

✓Develop list of potential measures/data points [complete]

✓Compile NTD definitions of relevant measures [complete]

- Archive GTFS and GTFS-RT (schedule and AVL) data

- Incorporate data on regional bus network in Metro's FY2021 annual line report