Finance and Capital Committee

Information Item III-B

October 27, 2022

Potential Future Service and Fares Concepts

Washington Metropolitan Area Transit Authority

Board Action/Information Summary

○ Action ◉ Information	MEAD Number: 203399	Resolution: ○ Yes ◉ No

TITLE:

Potential Fare and Service Optimization Concepts

PRESENTATION SUMMARY:

Staff will provide details on opportunities to optimize Metro's service and fares to better adapt to customer needs and maximize Metro's value to the region. These potential future concepts are intended to be customer-centric and equitable, efficient and effective, optimize the use of existing assets, and align with Metro's fare policy principles.

PURPOSE:

To present to the Board several fare and service optimization concepts for consideration and seek guidance on priorities for further concept development and implementation.

DESCRIPTION:

Potential future fare optimization concepts for consideration include:

- Adopting a fare-free, flat fare, or zone-based fare structure
- Simplifying the existing distanced-based rail fare structure and the customer interface
- Pricing changes, including modifying the minimum/maximum fare, changing or eliminating peak/off-peak fares, creating a low-income fare product, modifying parking fees, and lowering bus fares to $1

Potential future service optimization concepts for consideration include:

- Increasing service on the Green and Yellow Lines with Yellow Line short turns
- Improving Red Line transfers with additional service between Grosvenor and Silver Spring
- Optimizing Blue, Orange, and Silver Line service, including improving Orange Line service and potential Silver Line express trains
- Improving maintenance efficiency and effectiveness to ensure system safety and potentially allow for later closings and earlier openings on weekends

Key Highlights:

- Metro has the opportunity to optimize its service and fares to better meet customer needs and expectations.
- Potential fare optimization concepts are intended to improve simplicity and convenience for customers, ensure equitable access, and maintain financial stability.
- Potential service optimization concepts may be viewed through several lenses, including improving customer access to destinations and growing ridership, improving regional equity and access to opportunities, and better utilizing Metro's existing assets to maximize capacity and throughput.

Background and History:

In October 2021, the Metro Board of Directors adopted updated Fare Policy Principles, which provide a framework for the development and evaluation of potential fare policy changes. The adopted Fare Policy Principles are outlined below:

1. Customer Focused – Adopt customer-focused fare policies and systems to position Metro as an attractive choice in a competitive travel market
2. Simple and Convenient – Make it simple, intuitive, and convenient for customers to purchase fares and take transit
3. Equitable – Maintain equitable fares and practices that promote broad access to regional destinations
4. Seamless – Create a seamless customer experience across modes and operators to promote regional mobility
5. Built to Drive Ridership – Maximize ridership to support service and regional mobility
6. Generate Revenue to Maintain Financial and Service Stability – Ensure sustainable revenue and cost efficiency to maintain financial health and sufficient service

Simplifying the buying of fares is one way that Metro can improve the customer experience. Recent customer-friendly fare changes include instituting free rail-bus transfers, $2 weekend and late-night flat fares on Metrorail, and lower 7-day regional bus and monthly unlimited pass prices.

Efforts to improve bus service for customers and the region are also underway as a part of Metro's Better Bus: Network Redesign project. The Network Redesign builds on recommendations from the Bus Transformation Project strategy, including the adopted Metrobus Service Guidelines, the recently adopted full transfer discount between Metrorail and bus, and the creation of Metro's bus priority program, as well as partnerships with jurisdictions to prioritize buses and improve their reliability. Public and stakeholder engagement activities are underway, and the next update to the Board is expected in December 2022.

As Metro looks ahead to fiscal year 2024, ridership data from the first nine months of calendar year 2022 show rail and bus ridership continuing to recover from the worst impacts of the pandemic. Total ridership is expected to reach approximately 53 percent of pre-Covid levels in FY2023 and forecast to reach 70 percent in FY2024.

Metro continues to monitor changes in ridership patterns since the pandemic began. While approximately 37 percent of pre-pandemic Metrorail trips occurred during the peak period, peak trips make up 28 percent of Metrorail trips as of September 2022. The profile of rail trip lengths has also changed; the share of rail trips traveling five miles or less has increased from 39 percent to 47 percent, while very long Metrorail trips (over 10 miles) have dropped from 23 percent to 19 percent of trips.

Discussion:

Fare Optimization

Metrorail customers currently pay fares based on distance between the origin and destination stations during peak and off-peak periods, providing a direct link between price and service used. However, the fare structure is complex and can be complicated. Optimizing Metro's fare structure, fare policy, and the overall fare experience can make traveling more simple and convenient for customers, more equitable, and help ensure financial stability.

Staff are analyzing multiple fare structure concepts, including fare-free, flat fare, zone-based fare, and improved distance-based fares. Staff are also analyzing fare pricing changes.

Fare-free and flat-fare structures would both increase simplicity for customers and grow ridership. However, substantial additional subsidy would be required if Metro no longer charged fares or if Metro charged a flat $2 fare. A higher flat fare would decrease ridership and have additional equity impacts and considerations.

Another option is a zone-based fare structure that would replace mileage-based rail fares with fares determined based on the number of zones customers cross. Fare zones may be created based on station typologies, political boundaries, or distance from the core. While zone-based fares are easier for customers to calculate, short trips that cross a zone boundary would result in a fare increase compared to current structure.

Concepts for consideration in improving the existing distance-based fare structure include changing or eliminating the peak/off-peak difference, rounding fares to $0.25 increments, and simplifying the mileage tiers and distance calculation.

Simplifying the use of the existing distance-based fare structure could include allowing negative SmarTrip balances, investing in custom fare maps for each station, mobile web fare calculators, and tourist- and visitor-oriented pass products.

All concepts could be complemented with the introduction of a low-income fare product to make transit more affordable for the most price sensitive customers. It is estimated that approximately 15 percent of Metrorail and 50 percent of Metrobus riders are low-income. An example concept program could offer qualified low-income customers a 50 percent fare discount. Customers could be eligible based on enrollment in a designated means-tested program.

Fare capping and regional fare integration are potential improvements that could be further analyzed and developed for implementation beyond FY2024.

Service Optimization

Frequent Metro service benefits customers, the community, regional safety, the environment, economic development, and the entire transportation system. Metro has an opportunity to consider service changes that will bring further benefits to the region by deploying more trains in service than the FY2023 budget baseline (assuming full 7000-series fleet availability). Because most of Metrorail's operating costs are maintenance of fixed assets or otherwise do not vary with service levels (fixed), the marginal costs of running additional service are comparatively low.

Metrorail was intentionally designed as a hybrid system with regional rail characteristics in suburban areas and urban rapid transit characteristics in the central part of the system. Passenger loads are highest in the central part of the system and there are opportunities to further align service with where most customers are traveling. Increasing frequent central service offers benefits for customers across the entire network, enabling efficient and predictable transfers and providing access to more destinations.

Staff developed multiple service concepts for each of Metro's three trunk lines (Green/Yellow, Red, and Blue/Orange/Silver). Concepts include different scales of investment in service, from increases in overall service to reallocations of existing service in new patterns.

Green/Yellow Line Concepts

Increasing Green and Yellow Line Service with a Yellow Line turnback at Mt. Vernon Sq. would reduce transfer times at Gallery Place and L'Enfant Plaza, serve rapidly growing areas, and provide equity benefits.

Red Line Concepts

Adding more service in the busiest segment of the Red Line by turning some trains at Grosvenor and Silver Spring would reduce transfer times to other lines.

Blue/Orange/Silver Line Concepts

Providing more Orange Line service while maintaining baseline service on the Blue and Silver Lines would result in more balanced service between Downtown Largo and New Carrollton. Metro could also operate Silver Line Express trains out to Ashburn that would skip stops to save up to six minutes on trips.

The Green and Yellow Line frequency investment, the Red Line Core frequency realignment, and the Orange Line service increase could be implemented together, with other concepts added in the future as resources allow. Constraints on expanding Metrorail service include trunk line capacity, railcar availability and reliability, staffing, operational complexity, infrastructure, and overnight maintenance.

FUNDING IMPACT:

Information only - no impact on funding

TIMELINE:

Previous Actions	October 2021 – Metro Board of Directors approves updated Fare Policy Principles September 2022 – Board discussion of FY2024 fare and service optimization concepts
Anticipated actions after presentation	December 2022 - GM/CEO Proposed FY2024 Budget

Potential Future Service and Fare Optimization Concepts

Finance and Capital Committee
October 27, 2022

Purpose of Service and Fare Optimization

- Bring fresh perspective and adapt service and fares to best serve customers and maximize Metro's value to the region
- Opportunity to consider changes that align with values and priorities: customer-centric, equitable and inclusive, efficient and effective, optimizing use of assets, fare policy principles
- Build on recent service and fare changes by developing concepts for consideration as part of FY2024 budget and beyond
  - Launch Better Bus network redesign effort
  - Metrorail service optimization and fare concept development

Transit Benefits the Entire Region

Customers and Communities

- Increases access to opportunity
- Serves vulnerable communities
- Reduces the need to own a car
- Provides access to large venues and special events

Safety

- Safer way to travel
- Reduces auto crashes and road deaths

Environment

- Reduces greenhouse gas emissions
- Improves air quality

Economic Development

- Increases employee access to jobs
- Transit-oriented development is shaping the region

Transportation System

- Reduces traffic congestion
- Reduces need for highway construction and parking infrastructure

Potential Future Fare Optimization

Board-adopted Fare Policy Principles (October 2021)

Customer Focused
Adopt customer-focused fare policies and systems to position Metro as an attractive choice in a competitive travel market

Simple and Convenient
Make it simple, intuitive, and convenient for customers to purchase fares and take transit

Equitable
Maintain equitable fares and practices that promote broad access to regional destinations

Seamless
Create a seamless customer experience across modes and operators to promote regional mobility

Built to Drive Ridership
Maximize ridership to support service and regional mobility

Generate Revenue to Maintain Financial and Service Stability
Ensure sustainable revenue and cost efficiency to maintain financial health and sufficient service

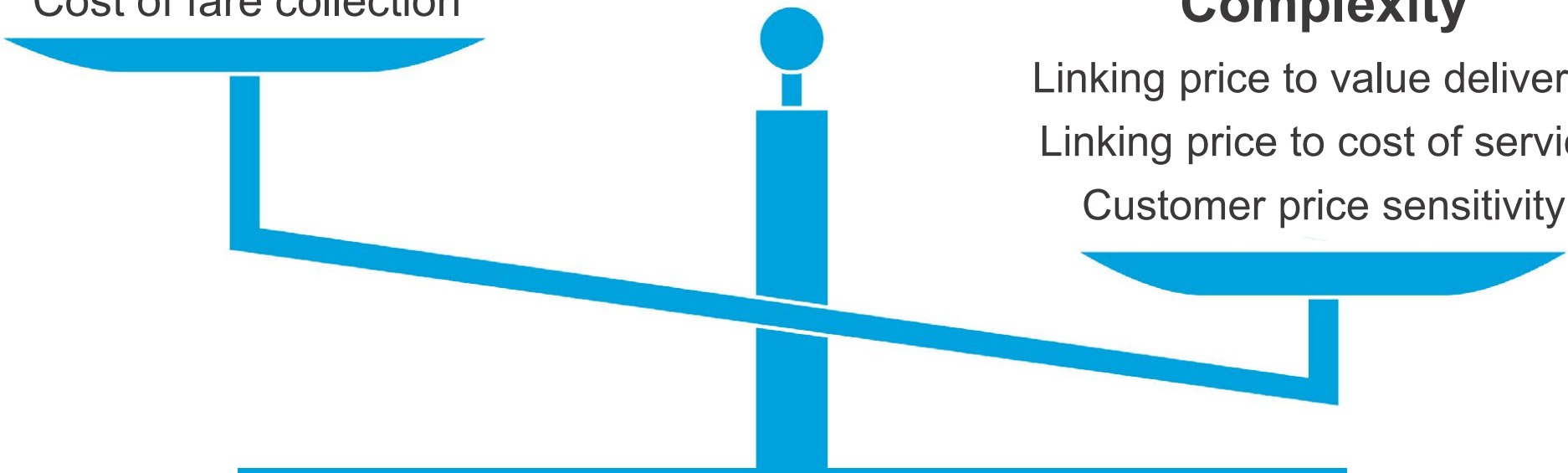
Fare policy principles guide development and evaluation of potential fare policy changes

Balancing Considerations in Fare Policy

Simplicity

Ease of use / understanding

Cost of fare collection



Complexity

Linking price to value delivered

Linking price to cost of service

Customer price sensitivity

Equity

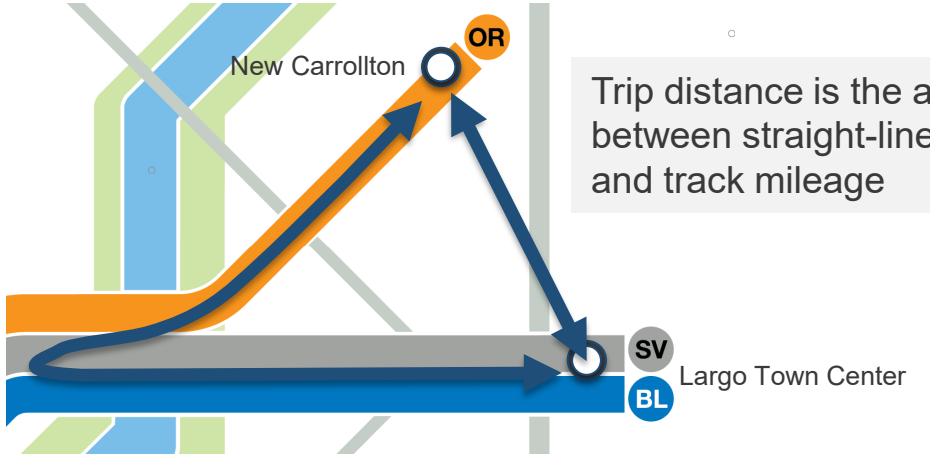
Metro will provide safe, equitable, reliable, and cost-effective public transportation

Current Fare Structure

Rail Fares

- Fares are based on the distance between origin and destination stations
- Mileage rates are applied to that composite distance
- Rates higher during peak periods
- $2 weekend, late night flat fare

Determining trip distance between stations



Trip distance is the average between straight-line distance and track mileage

Mileage rates

Trip starts	Base Fare Peak: $2.25 Off-Peak: $2.00	**3 miles**	Peak: $0.33/mile Off-Peak: $0.24/mile	**6 miles**	Peak: $0.29/mile Off-Peak: $0.22/mile	**Trip ends**	Max Fare Peak: $6.00 Off-Peak: $3.85

Bus Fares

- $2 flat fare across system
- Higher prices for express and airport services

Bus Service Type	Fare
Metrobus, MetroExtra, MetroWay, REX	$2.00
Commuter Bus Routes (17B/G/K/M, 18G/J/P)	$4.25
Airport Routes (5A)	$7.50

Recent customer-friendly fare changes

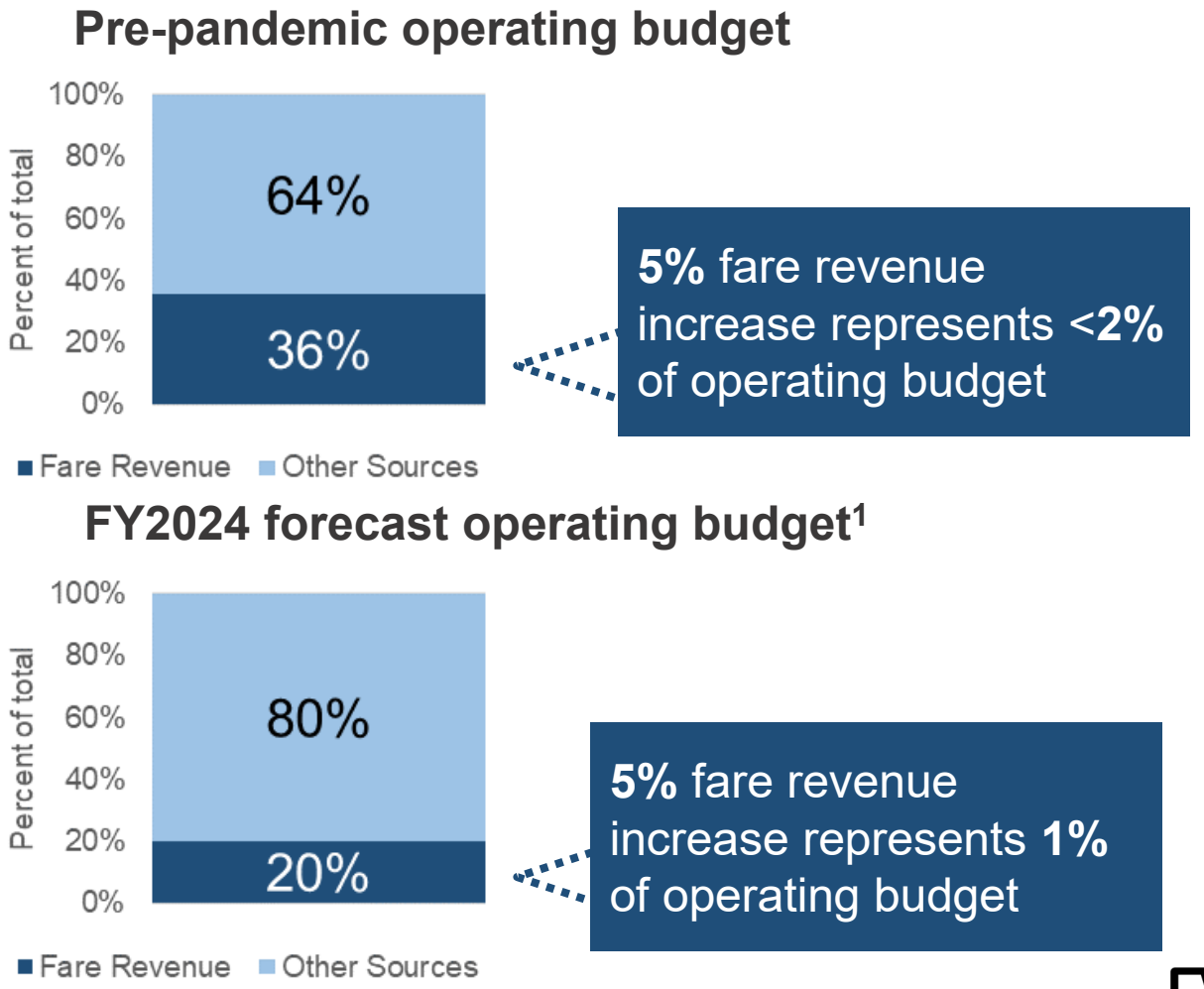
Promote ridership, equity, seamless experience

	FY2022 Improvements	FY2023 Improvements
Permanent	▪ Free rail-bus transfers ($2 transfer discount) ▪ Rail weekend $2 flat fares ▪ Lower 7-Day Regional Bus Pass Price • Pass price of $12, previously $15 ▪ Regional providers included in rail-bus combo passes	▪ Late-night $2 Metrorail fares ▪ Lower monthly unlimited pass price • Price of 32 trips, previously 36
Promo	▪ 50 percent off rail-bus combo passes (1, 3, 7 day) for a month	• 50 percent off 7-day unlimited passes for six months

Ridership impacts from fare or service changes build over time

Lower Ridership Reduces Financial Impacts of Fare Changes

- Fare revenue reduced compared to pre-pandemic, contributes less to overall operating budget
- General fare increases would be expected to result in less revenue now than compared to pre-pandemic



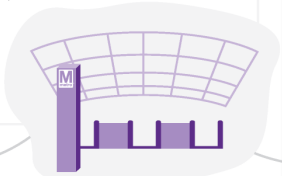
1. FY2024 Operating Budget Outlook, September 2022: $377M fare revenue

There Are Many Opportunities to Improve Customer Experience

Buying fares is one part of the customer experience

1 Plan transit trip
- WMATA trip planner
- Access
- Schedules

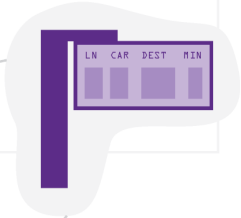
2 Access station
- Convenience
- Appearance
- Wayfinding
- Security



3 Buy fare
- Ease
- Value
- Legibility

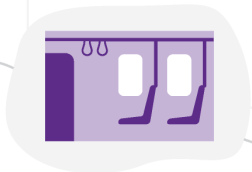
4 Pay fare
- Ease

5 Wait for train
- Wait time
- Comfort
- Security



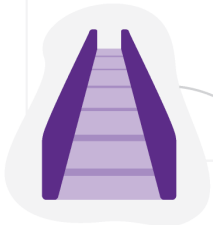
6 Enter train
- Appearance
- Customer engagement
- Cleanliness

7 Sit/stand on train
- Travel time
- Personal space
- Comfort
- Security



8 Exit train
- Appearance
- Cleanliness
- Wayfinding
- Security

9 Exit station
- Convenience
- Appearance
- Wayfinding
- Cleanliness
- Security



Fare Optimization Goals

Simple and Convenient

- Customers can figure out fare in seconds
- Fares are easy to understand and communicate

Equitable

- Ability to pay does not determine ability to ride
- Ensure people of color and low-income customers equal access to quality service
- Roughly aligns price to value received

Financial Stability

- Ensure sustainable revenue and cost efficiency to maintain financial health and sufficient service

Fare Optimization Concepts

Evaluate through multiple lenses:

- Customer Focused
- Equitable
- Simple and Convenient
- Drives Ridership
- Seamless
- Generates Revenue

FY2024 Concepts

- **Fare increase/decrease:** Consider fare level changes
- **Peak/off-peak**: Change or eliminate time of day price difference
- **Zone fare**: Establish zone fares to replace mileage charges
- **Low-income fare**: Offer discounts for low-income customers
- **Parking fees:** Reduce fees to increase utilization and ridership
- **$1 Bus fare**: Reduce standard bus fare to $1 from $2
- **MetroAccess Fare**: Consider options to increase predictability

Post-FY2024 Concepts

- **Fare capping**
- **Fare integration**

Fare Optimization Concepts

Evaluate through these lenses: Simplicity, Equity, Financial Stability

1 Fare Structure

A Fare Free

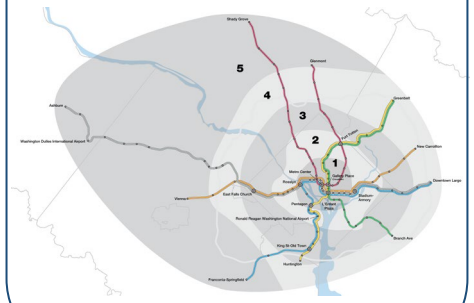
- Do not charge fares

B Flat Fare

- Set one fare for all rail trips
- Can set price lower to grow ridership or higher to grow revenue

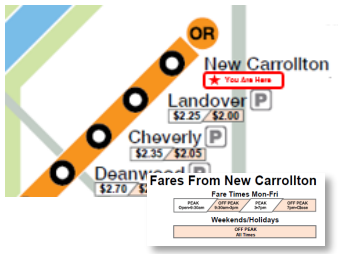
C Zone-Based Fares

- Charge by zones traveled rather than mileage



D Improved Distance-Based Fares

- Simplify the fare structure
- Use technology and other tactics to simplify customer experience



2 Fare Pricing

- Change minimum/ maximum fares
- Changing or eliminating peak/ off-peak fares
- Low-income fare products
- Parking fees
- $1 bus fare

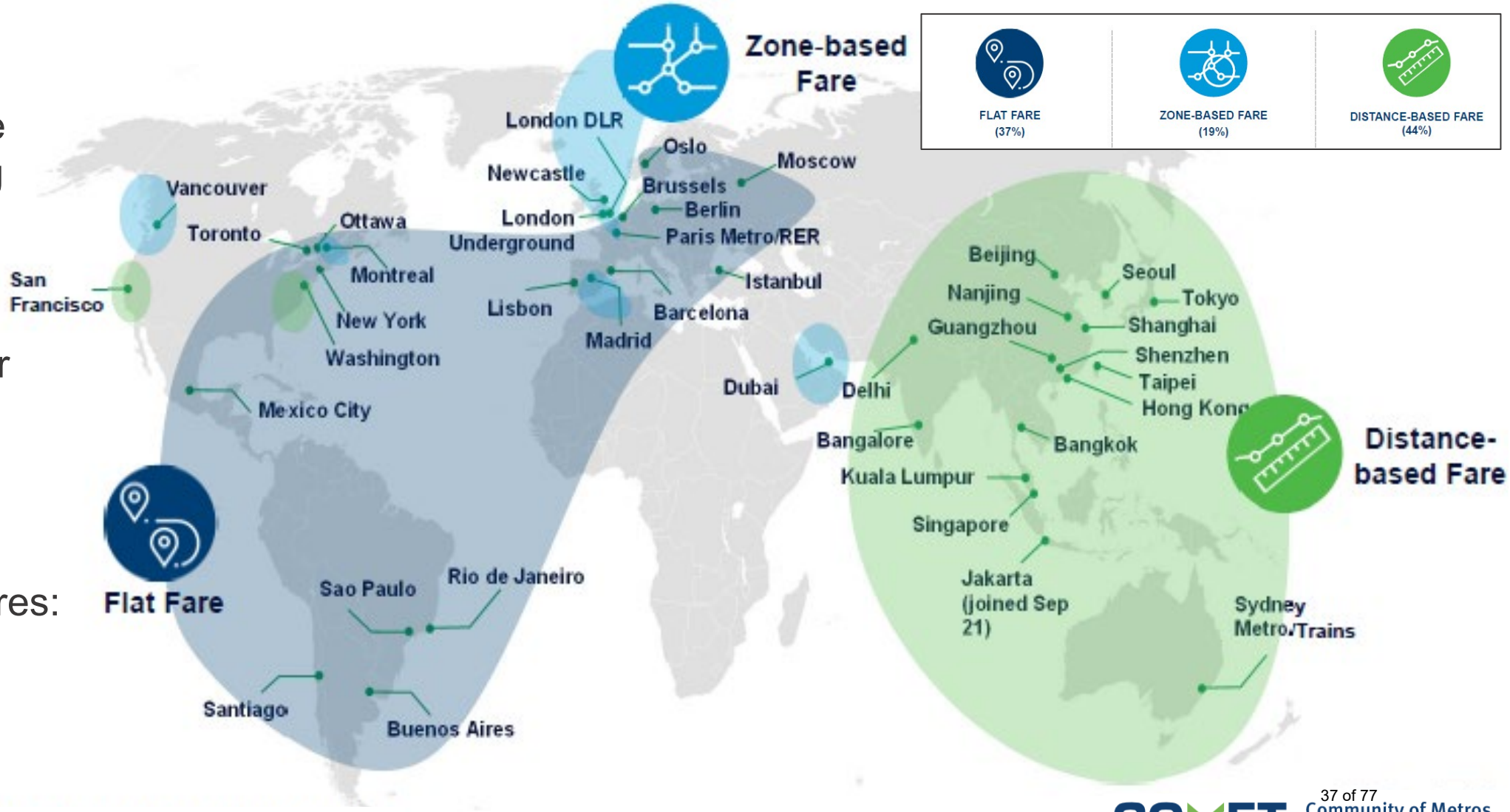
International Benchmarking of Metro Fare Structures

Metro fare systems vary globally with some regional clustering

Distance-based fares are more common on longer networks and in Asia

U.S. examples of distance-based fares:

- WMATA
- BART
- PATCO
- Sound Transit



Source: Community of Metros/Transport Strategy Centre at Imperial College London

Concept A: Fare-Free System

No charge for customers

- No charge for any trip (bus or rail)
- Requires full subsidy, $465m (FY24)[1]
- Lowers income barriers to transit
- Grows ridership
- Long-term considerations:
  - Potential crowding and security issues
  - Subsidy growth over time
  - Costs of fare collection

Concept B: Flat-Fare System

All customers pay one flat rate

- Initial concepts:
  - $2 all trips, all times
  - $3 all trips, all times
  - $4 all trips, all times
- $2 flat fare would grow ridership but require more subsidy
- $3 or $4 flat fare would lose ridership and increase subsidy
- All have equity impacts and considerations

Flat Fare Concept			
Measures	**$2 Flat Fare**	**$3 Flat Fare**	**$4 Flat Fare**
Est. Ridership Impacts	+5M to +6M	-8M to -13M	-23M to -30M
Est. Revenue Impacts	-$61M to -64M	-$10M to -$24M	-$18M to +$12M

(Impact estimates based on preliminary conceptual analysis)

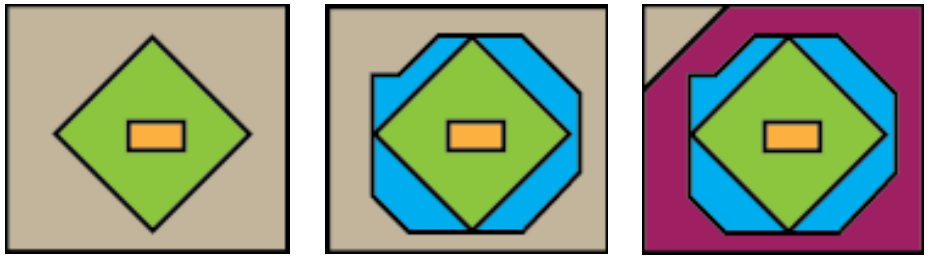
1. FY24 Budget Outlook forecast, September 2022

Concept C: Zone-Based Fares

Replace mileage-based rail fares with zone-based fares

Multiple Options for Creating Zones

Station Typologies



Political Boundaries

Distance from a Center Point

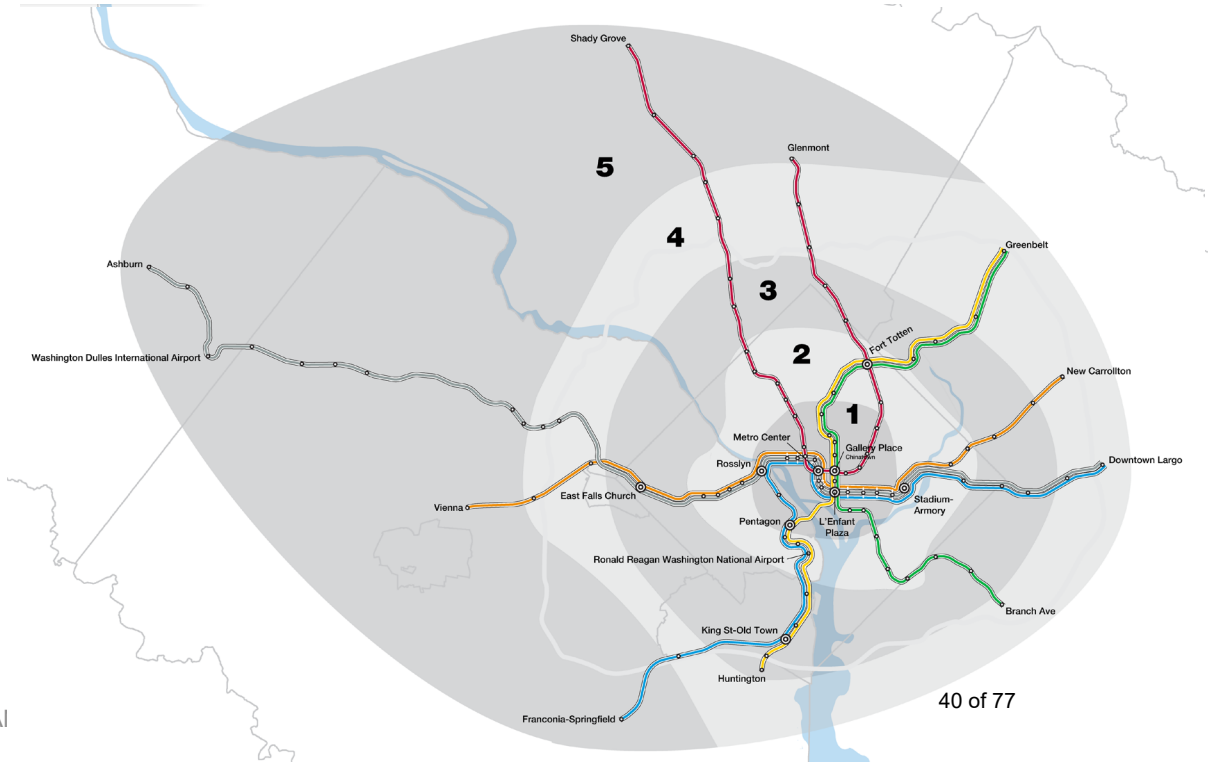
Other Policy Levers

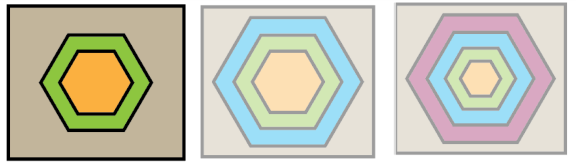
- Options for charging fares:
  - Zone pairs?
  - Number of zones crossed?
- Options for setting prices:
  - Change minimum/maximum fares?
  - Keep regular and discounted fares?
  - Target revenue growth?

The zone-fare concept is flexible and can be shaped to desired policy outcomes. Its complexity and impacts on ridership, revenue, and equity would depend on those policy decisions.

Zone Fare Concept: Zones by Distance

- Fares based on distance from Metro Center
  - Maintain current base, maximum, and discounted fares
  - Maintain $2 late night and weekend fares
- 3, 4, or 5 fare zones
- Fares based on the number of zone boundaries a trip crosses, capped at fare to the core
- Tradeoffs between simplicity and granularity
  - Fewer zones vs. linking price and value vs. avoiding large price jumps between zones
- Basing zones on distance vs. other options:
  - Better links price to service used
  - Boundaries set by geometry rather than geography
  - Lower potential equity risks than other zone options

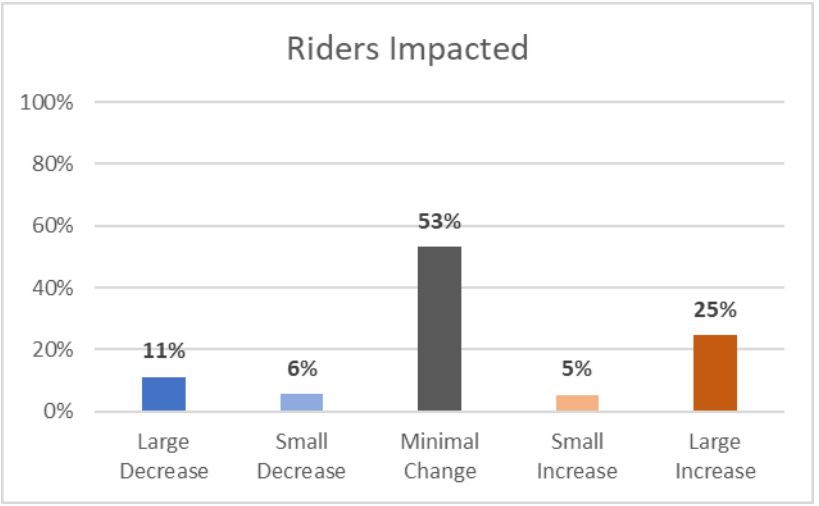




3 Zones Concept

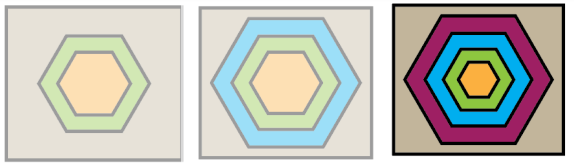
- Boundaries: 3 & 6 miles from Metro Center
- Fare basis: boundaries crossed
- Max fare set to $4.50

Fare Basis	Regular Fare	Discount Fare
0	$2.25	$2.00
1	$3.00	$2.65
2	$4.50	$3.85
Max	$4.50	$3.85



Title VI Equity Scan: ✓

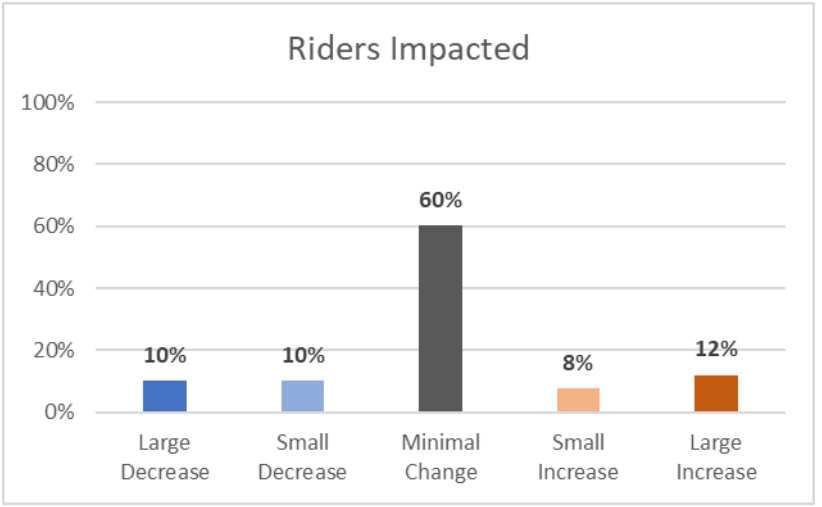
Current Fare Range	Concept Fare Range	Potential Ridership Impact (Trips)	Potential Revenue Impact
$2.25-6.00 *Peak* $2.00-3.85 *Off-Peak*	$2.25-4.50 *Regular* $2.00-3.85 *Discount*	-1M to -2M	+$0.2M to +$1M



5 Zones Concept

- Boundaries: 3,6,9,12 miles from Metro Center
- Fare basis: boundaries crossed
- Retains current minimum and maximum fares

Fare Basis	Regular Fare	Discount Fare
0	$2.25	$2.00
1	$2.50	$2.20
2	$3.50	$3.10
3	$4.50	$3.85
4	$6.00	$3.85
Max	$6.00	$3.85



Title VI Equity Scan: ✓

Current Fare Range	Concept Fare Range	Potential Ridership Impact (Trips)
$2.25-6.00 *Peak*	$2.25-6.00 *Regular*	+0.1M to +0.2M
$2.00-3.85 *Off-Peak*	$2.00-3.85 *Discount*	-$0.5M to -$1M
		Potential Revenue Impact

5-Zone System: Sample Trips

Tenleytown-AU to Union Station

- 2 > 1 = One Boundary

	Current	Proposed	% Change
Regular	$3.15	$2.50	-21%
Discount	$2.60	$2.20	-15%

College Park-U of Md to Columbia Heights

- 4 > 3 > 2 > 1 = Three Boundaries

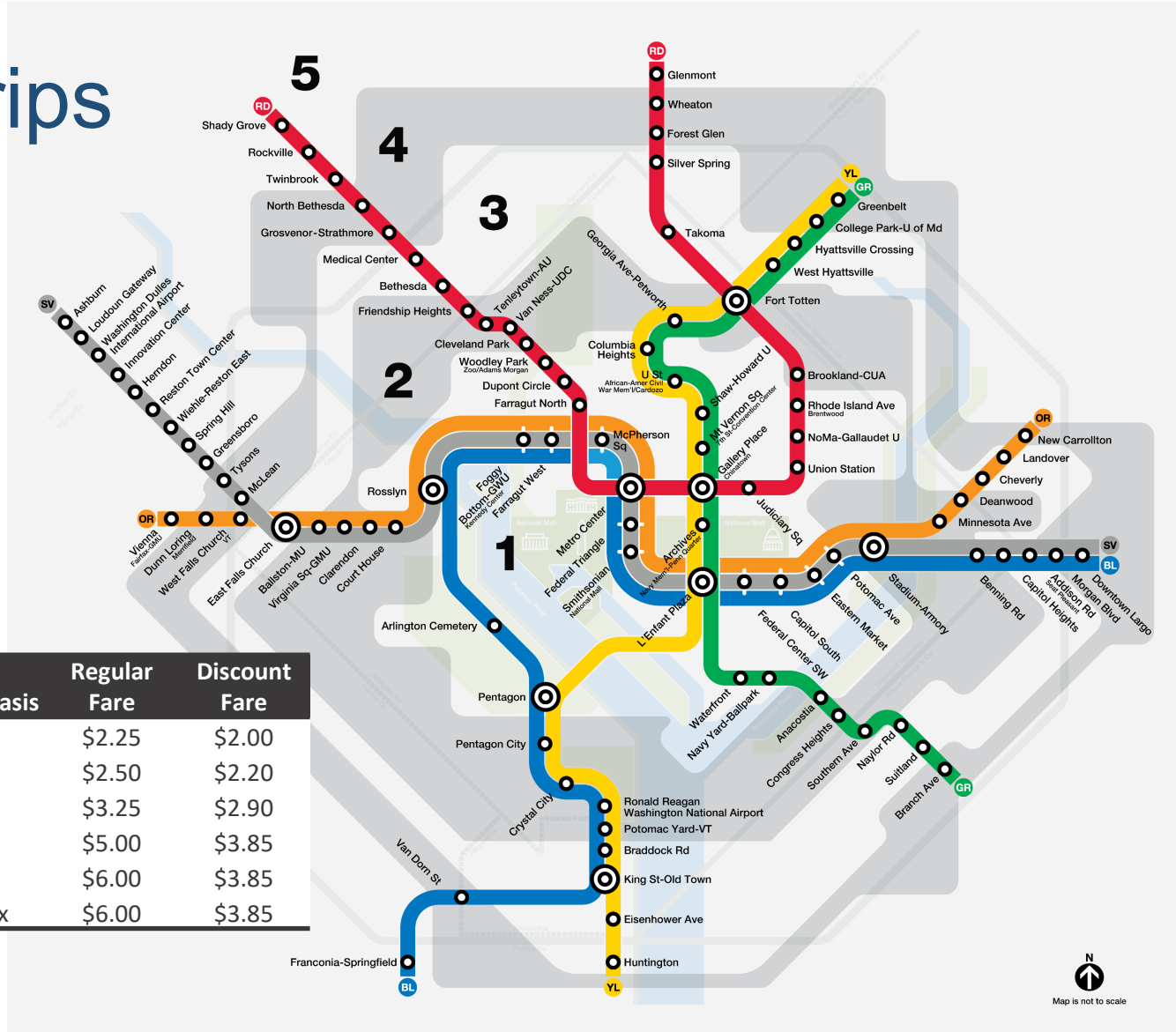
	Current	Proposed	% Change
Regular	$3.55	$4.50	27%
Discount	$3.00	$3.85	28%

Franconia-Springfield to Pentagon

- 5 > 4 > 3 > 2 > 1 = Four Boundaries

	Current	Proposed	% Change
Regular	$4.70	$6.00	28%
Discount	$3.85	$3.85	0%

Fare Basis	Regular Fare	Discount Fare
0	$2.25	$2.00
1	$2.50	$2.20
2	$3.25	$2.90
3	$5.00	$3.85
4	$6.00	$3.85
Max	$6.00	$3.85



Zone-Based Fares

Opportunities

- Greatly reduces the number of fare combinations
- Simplifies fare tables
- Should be easy to communicate and understand
- Retains rough link between price and value received

Concerns

- Major change for customers to learn
- Would require intensive customer engagement and training
- Some customers would face large fare increases (higher costs for short trips between zones)
- May lose price-sensitive customers

Concept D: Improving Distance-Based Fares

Simplifying the Structure of Distance Fares

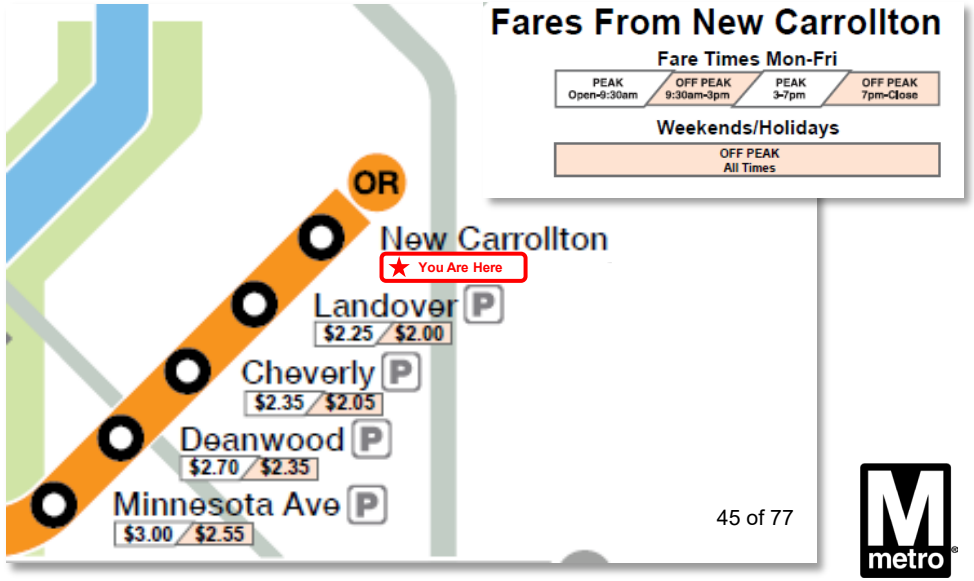
- Change or eliminate peak/off-peak difference
- Round fares to $0.25 increments
- Consolidate mileage tiers:

Time	Current Mileage Rate	Potential Mileage Rate
Peak	$0.29 - $0.33	$0.33
Off-Peak	$0.22 - $0.24	$0.22

- Simplify distance calculation (e.g., straight-line distance)

Simplifying the Use of Distance Fares

- Allow negative SmarTrip balances
- Custom fare maps for each station, mobile web fare calculators
- Tourist/visitor pass products



Improving Distance-Based Fares

Opportunities

- Minor changes for customers to learn
- Simplifies fare tables and reduces number of fare combinations
- Tools could automatically show customers their fare
- Price well aligned to value received

Concerns

- Still results in a complex fare table and many fare combinations
- Can be difficult to explain and communicate

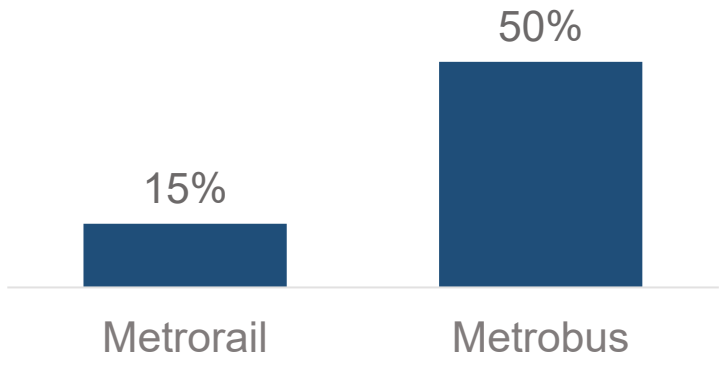
A Low-Income Fare Product Would Promote Equity and Access

- Low-income customers are more likely to avoid riding Metro due to cost
  - Fares represent a higher percentage of income compared to wealthier riders
  - Less likely to receive tax or employer subsidies through SmartBenefits
  - May be enrolled in assistance programs such as Medicaid, SNAP, or TANF
- A discounted fare program would make transit more affordable, lower barriers, promote ridership
- 17 of the 50 largest transit agencies currently have low-income fare programs

Equitable

Maintain equitable fares and practices that promote broad access to regional destinations

Low Income Share of Ridership, %



Source: Rail and Bus Passenger Surveys

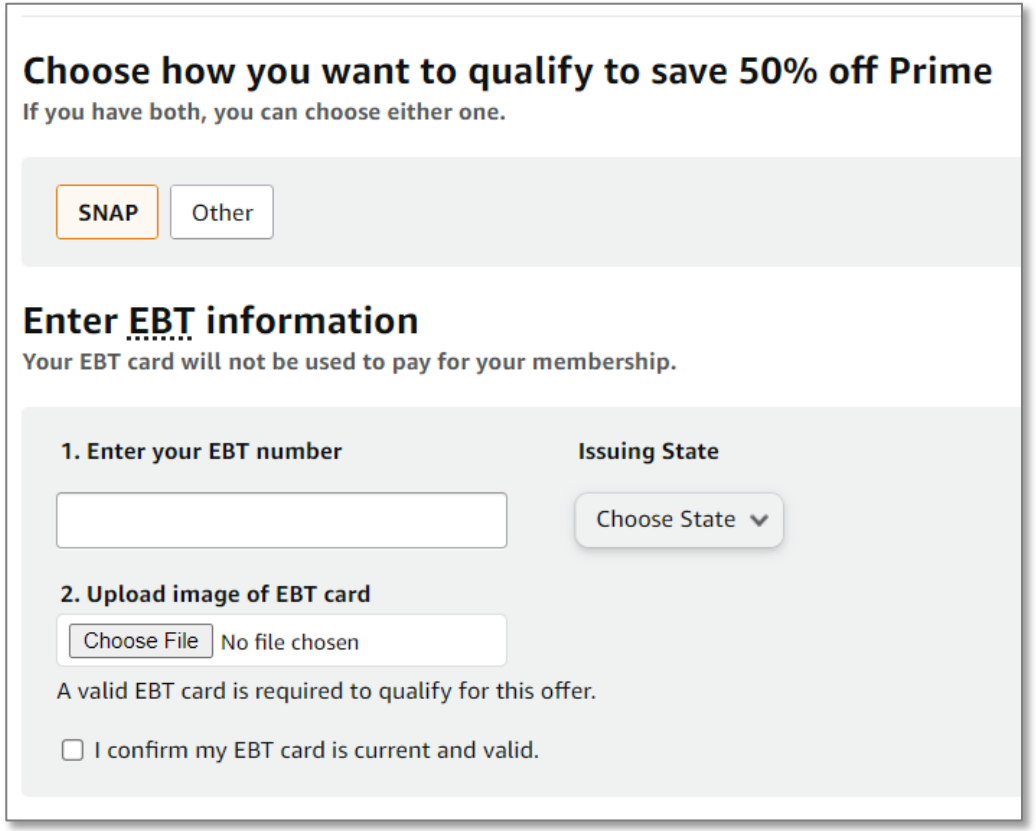
Low-Income Fare Program

Example Concept

- Offer low-income customers 50% fare discount*
- Low-income customers could qualify based on enrollment in designated means-tested programs (e.g., Medicaid or SNAP/EBT)
- Potential to fund through subsidy allocation formula that allocates to jurisdictions based on percentage of customers benefitting (e.g., Maximum Fare Subsidy)
    - Alternatively, fund through either jurisdictional reimbursement (e.g., student discount programs) or general subsidy (e.g., senior discount)

Randomized controlled trial underway with Lab@DC – providing participants 50% discount or free fare and comparing with control group

* Potential opportunity for integration with existing Senior and Disabled rider fare programs; currently half the peak fare



Example: Amazon offers discounted Prime memberships to customers participating in qualifying programs.

Low-Income Fare Program Design Considerations

Primary considerations: Create a unified regional program managed by Metro, or coordinate with local/jurisdictional programs?

Program design considerations

Eligibility

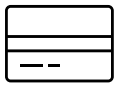
What criteria should be used to determine eligibility?

Verification

Where and how should applicants be verified for the program?

Discount

What discount should participants receive?



Pass Distribution and Upkeep

How should discounted passes be distributed?

What reloading or deactivation methods are needed, if any?

Other considerations

Cost and Funding

What is the anticipated program cost and how should it be funded?

Outreach and Partners

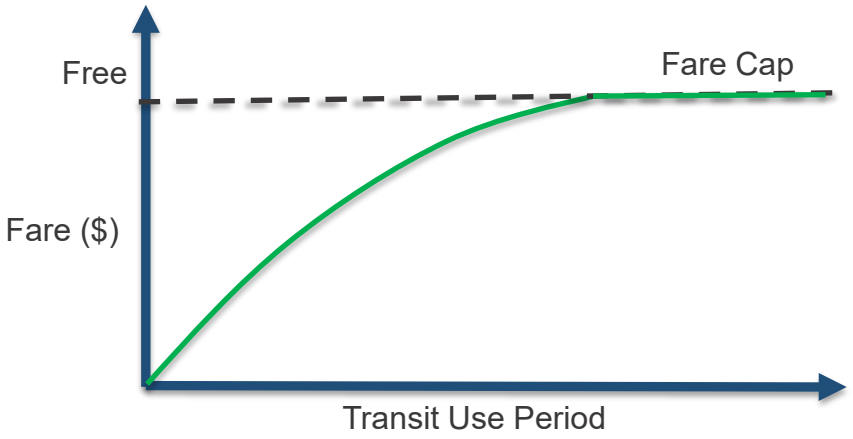
What outreach should be done to raise awareness?

What partners does Metro need to make the program successful?

Potential Improvements Beyond FY2024

Fare Capping

- Caps the maximum total fares customers pay per day
- Encourages ridership
- Promotes equity



Regional Fare Integration

- Create common fare media and linked payments between Metro, regional rail, commuter bus, and bikeshare operators
- Allows customers to pay for all multimodal trips with one fare medium
- Creates the possibility for future regional fare policies (i.e., transfers and passes)

Potential Future Metrorail Service Optimization

What Service Optimization Could Accomplish

Customer Focus / Drives Ridership

- Improve customers' access to destinations and grow system ridership
  - Increase service frequency in areas with high ridership potential
  - Minimize transfer wait times

Equitable

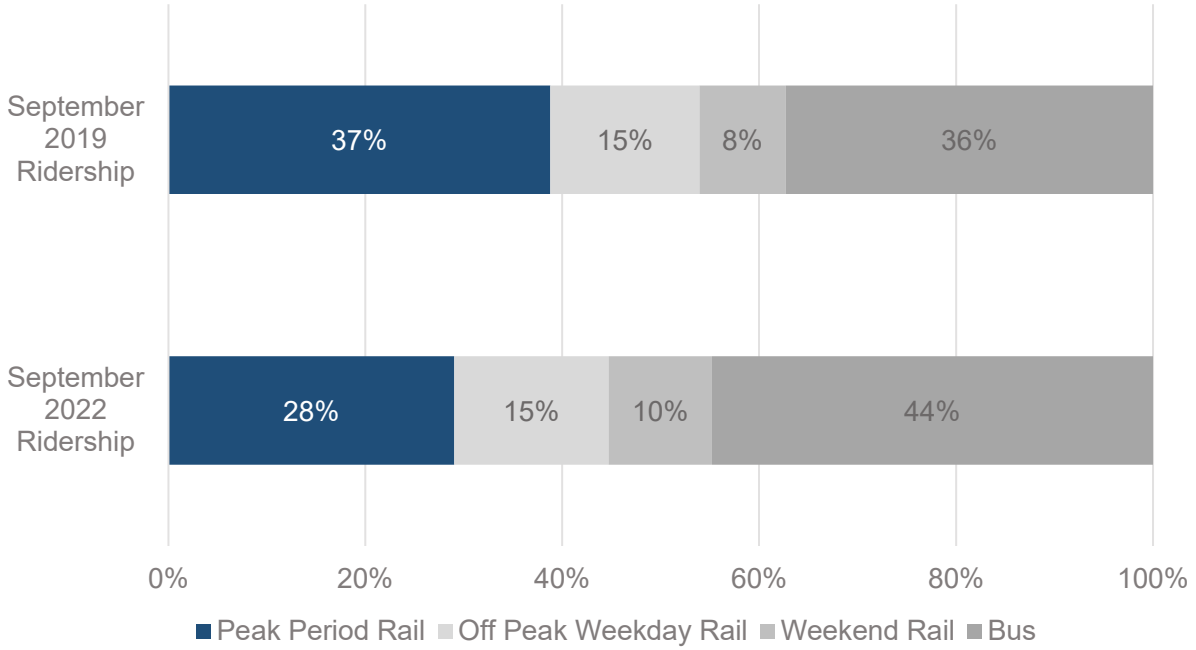
- Increase access to opportunity
  - Focus on currently under-served areas
  - Especially benefit people of color and low-income customers

Asset Optimization

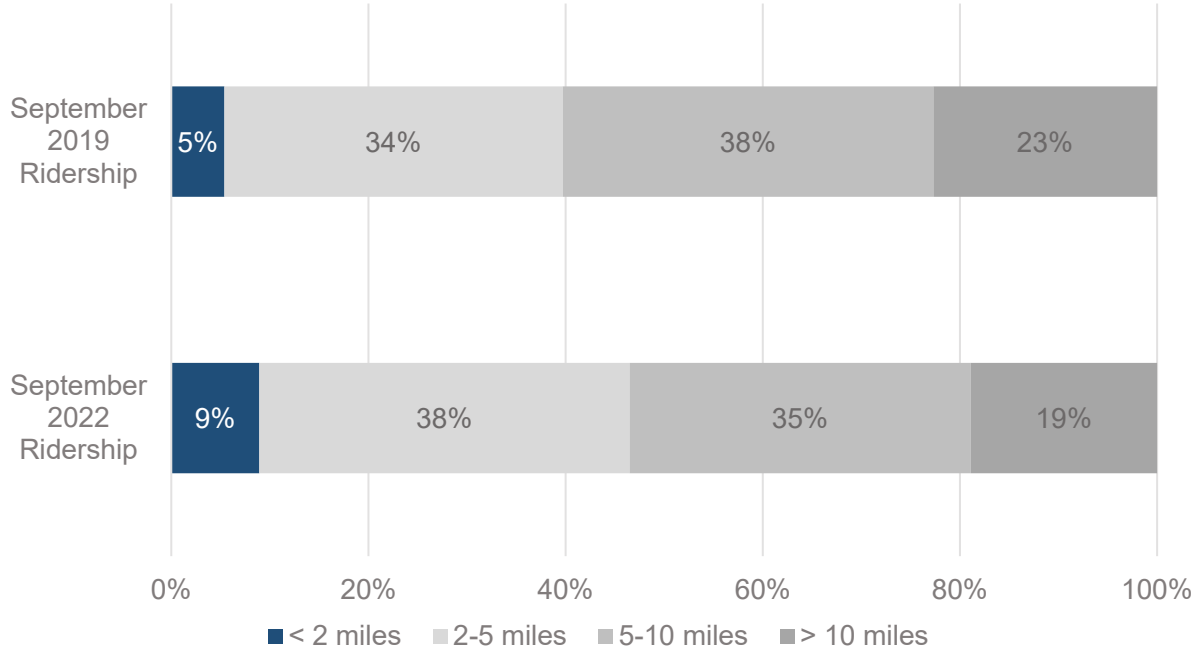
- Optimize use of assets and value delivered from system investments
  - Use available railcar fleet
  - Maximize system design capacity and train throughput

Changing Rail Ridership Profile

Peak period rail trips dropped from 37 to 28 percent

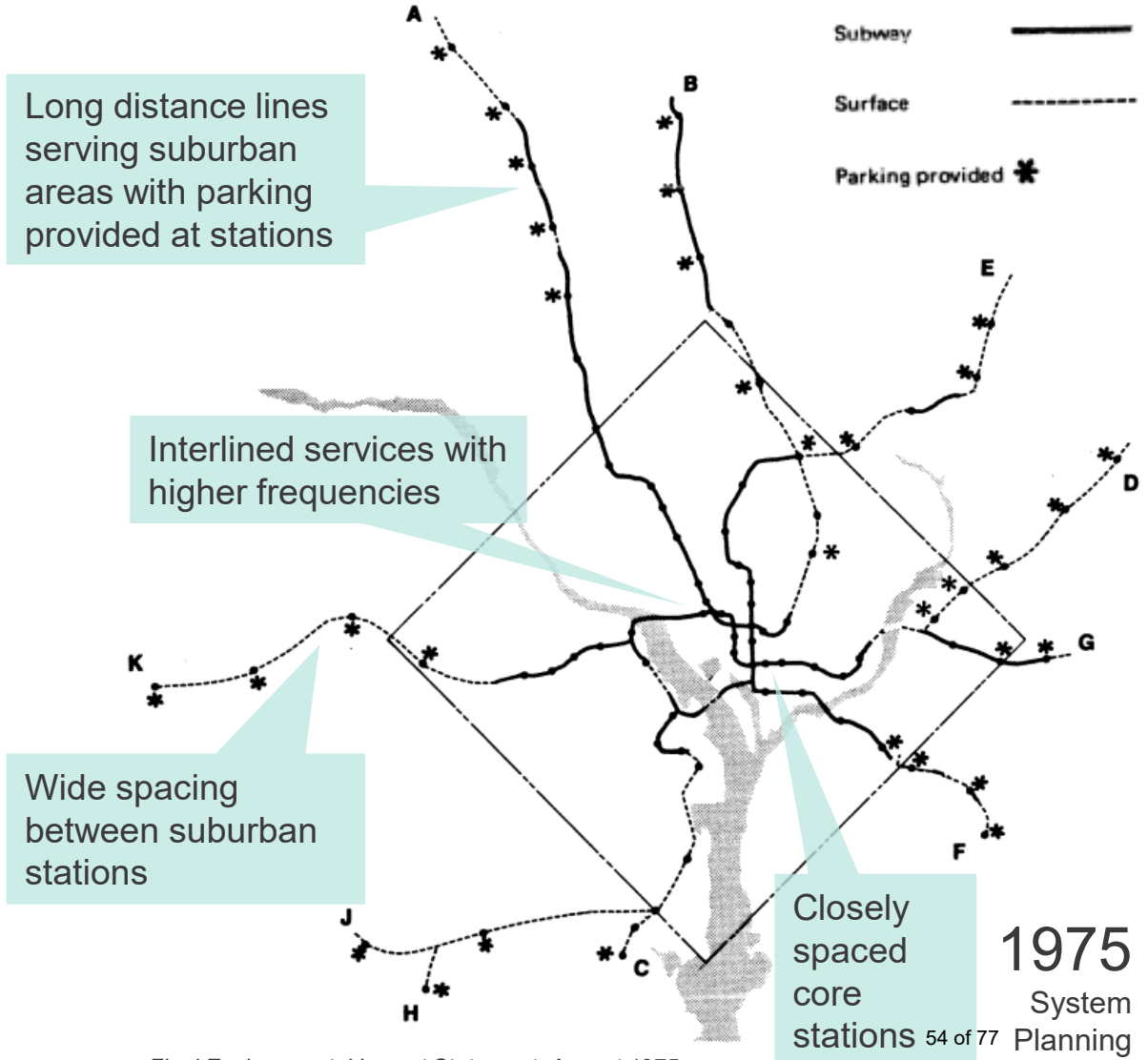


Rail trips of 5 miles or less increased from 39 percent to 47 percent



Metro was designed as a hybrid system

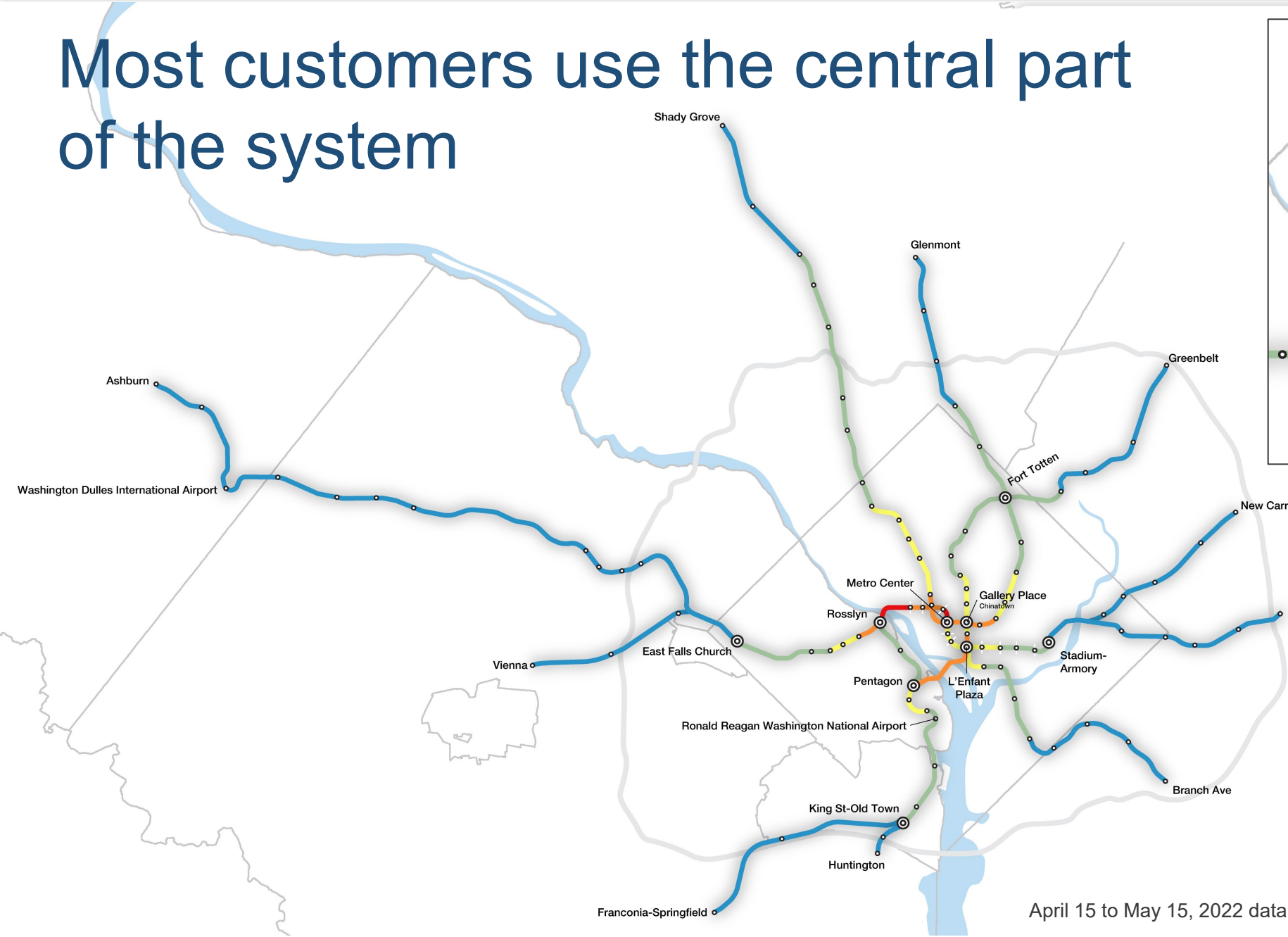
- **Regional rail:**
  - Customers travel farther with longer total journey times
- **Urban rapid transit:**
  - Customers travel shorter distances with less total journey time

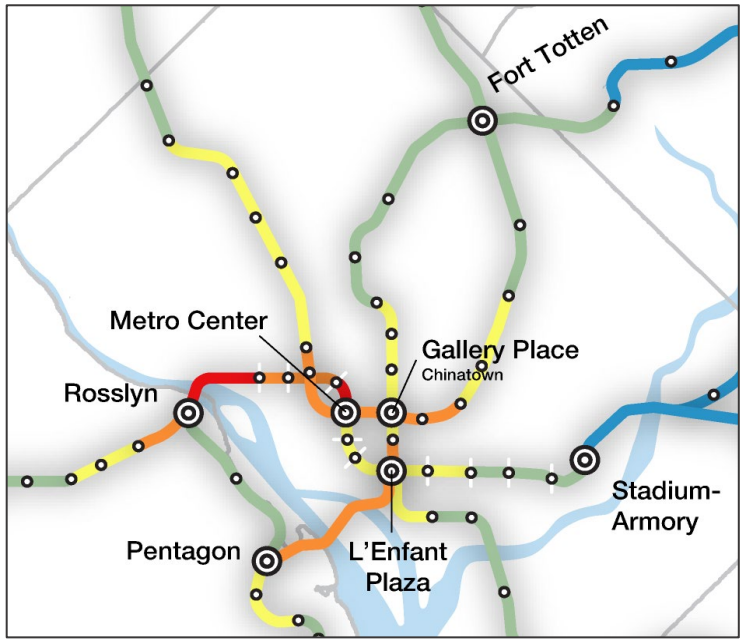


1975 System Planning Map

Final Environmental Impact Statement, August 1975
Metropolitan Washington Regional Rapid Rail Transit System

Most customers use the central part of the system





Passengers per Segment

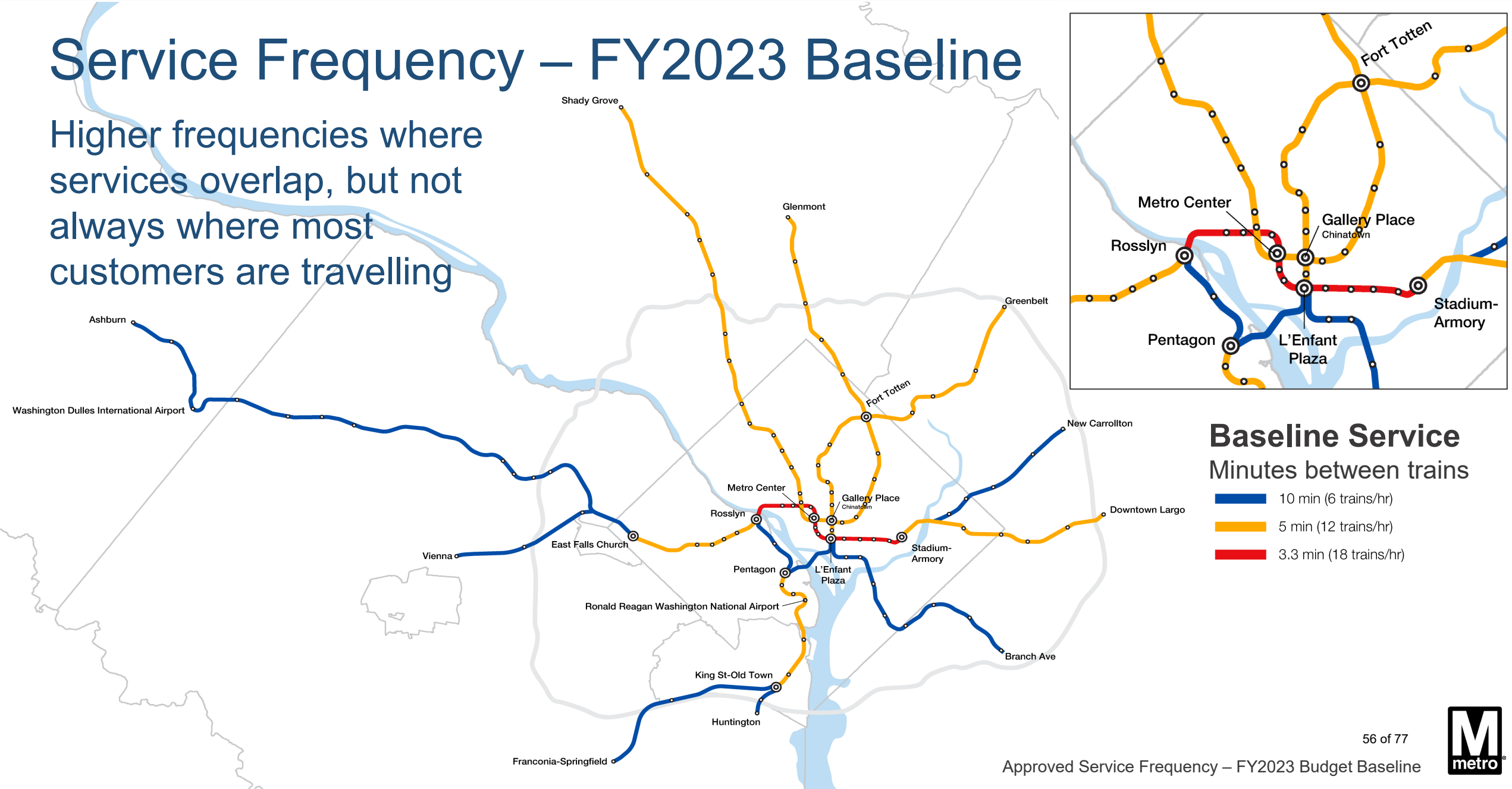
Monthly Total Throughput

- 0-200,000
- 200,000–500,000
- 500,000–750,000
- 750,000–1,000,000
- 1,000,000–1,300,000

April 15 to May 15, 2022 data; Silver Line Phase 2 included in visualization

Service Frequency – FY2023 Baseline

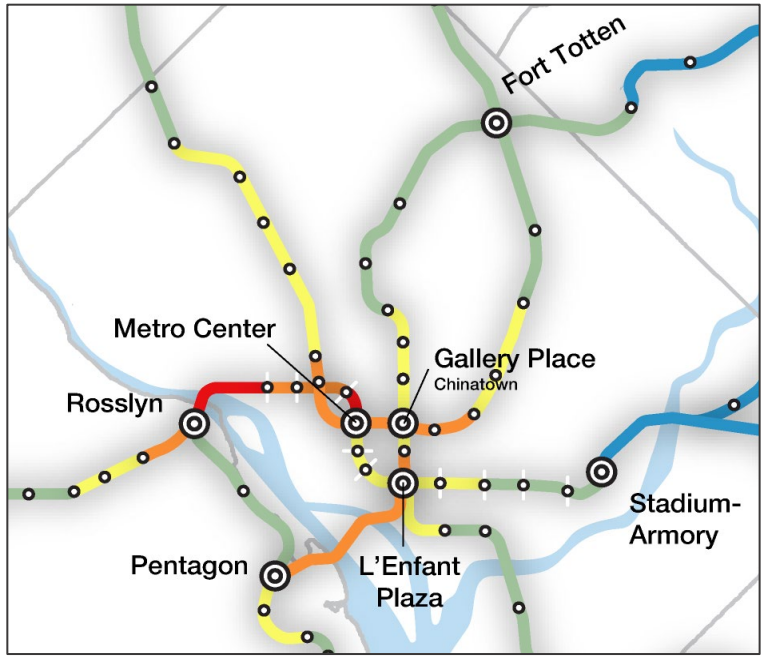
Higher frequencies where services overlap, but not always where most customers are travelling



Strengthening the Network with Frequency and Efficient Transfers

Frequent service:

- Focuses service where the network is carrying the most customers
- Offers benefits for customers across the entire network, enabling efficient and predictable transfers and providing access to more destinations



Customer use of the Network
Passengers per Segment per Month

April 15 to May 15, 2022 data

Efficient & Predictable Transfers
L'Enfant Plaza Station

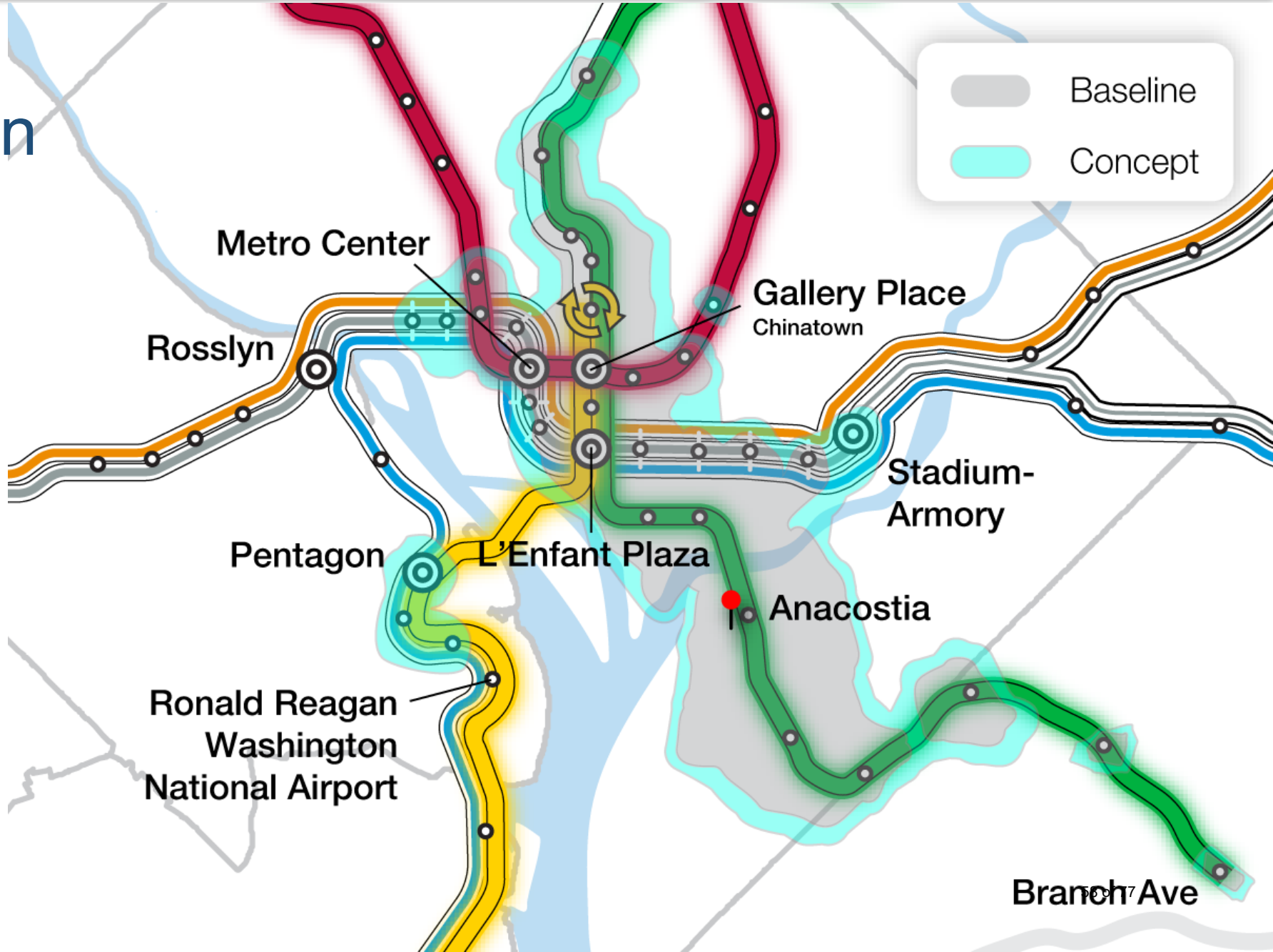
Destination Access Example:

Anacostia Station

For a customer starting a short walk from Anacostia Metro Station…

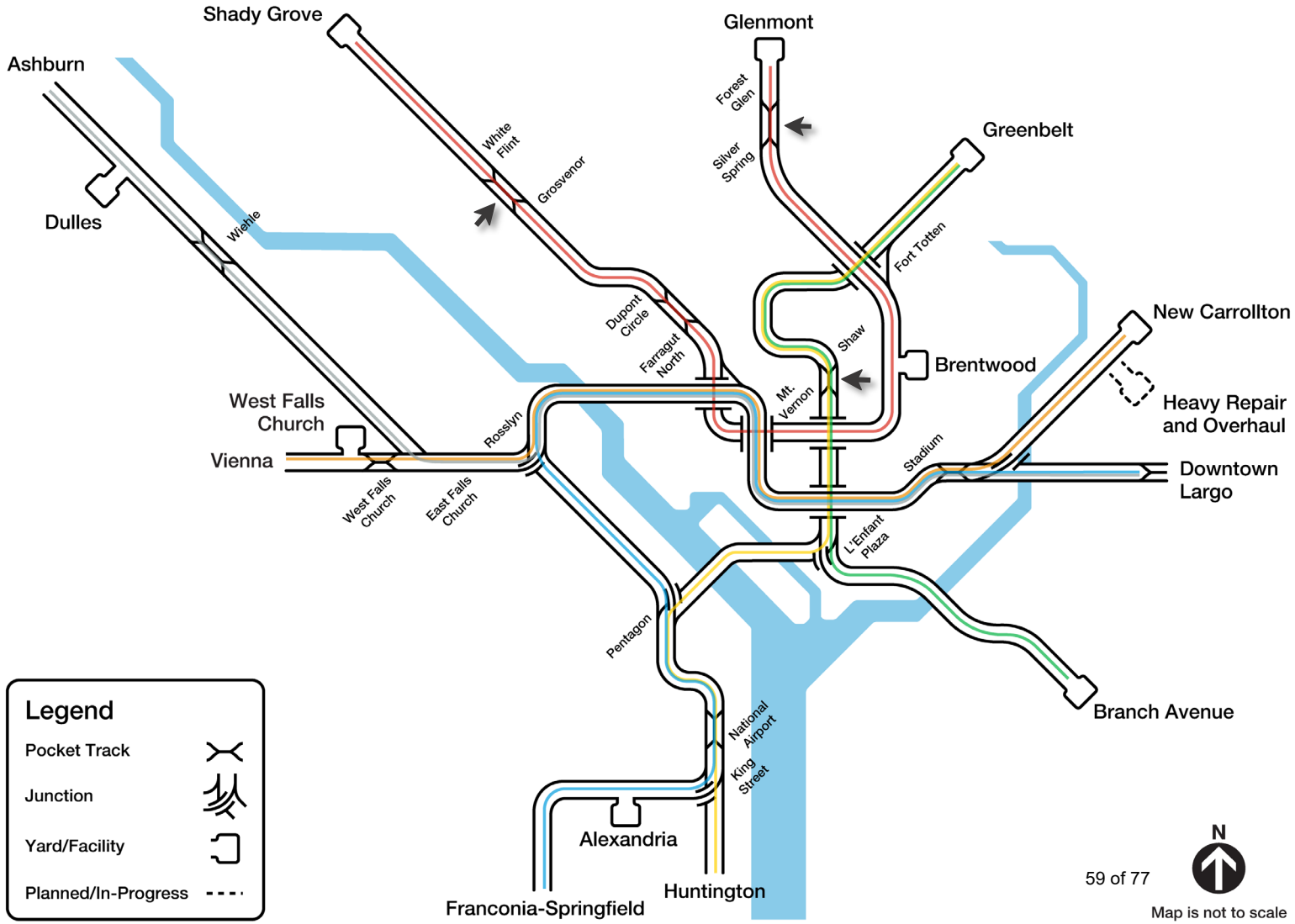
By reducing average **wait times for Green Line trains and enabling** further time savings with quicker **transfers to Yellow or Red Line:**

Jobs accessible within 30 minutes increase approximately 25%



Infrastructure & Railcars

- Limited locations to reliably turn trains in service
  - New infrastructure investment could enable more service flexibility beyond FY2024
- With railcar fleet (including 7000 series) fully available, can deploy more trains in service than FY2023 budget baseline

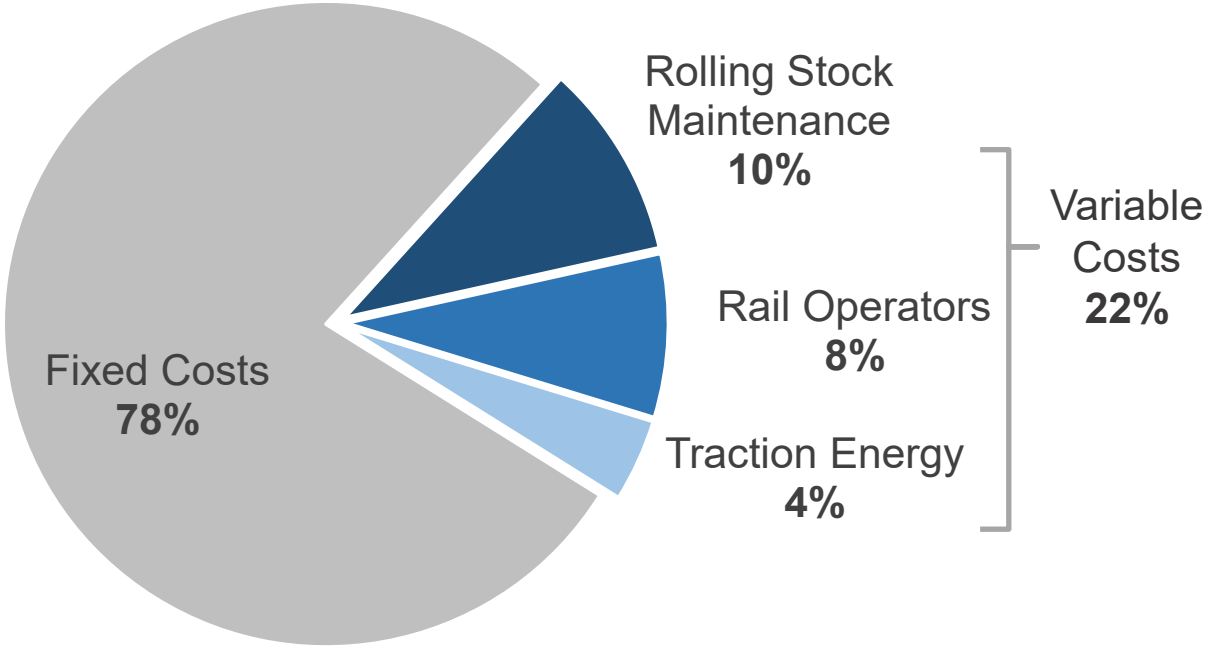


Most Metrorail costs are operations and maintenance of fixed assets or otherwise do not vary with service levels

- Metrorail is a $100 billion regional system supported by ongoing annual operating and capital expenditures maintaining and renewing assets
- The investment provides potential capacity to deliver service at relatively low marginal cost
  - Both fixed and variable costs are potentially changeable independent of service levels, but only variable costs necessarily scale with the amount of service delivered
  - Some types of service level changes affect fixed costs, including changes to operating hours (affecting the cost of operating stations) or changes above certain thresholds affecting fleet and facility footprint (long-term capacity)

FY2023 Metrorail Costs

Share of $1.3B Operating Budget



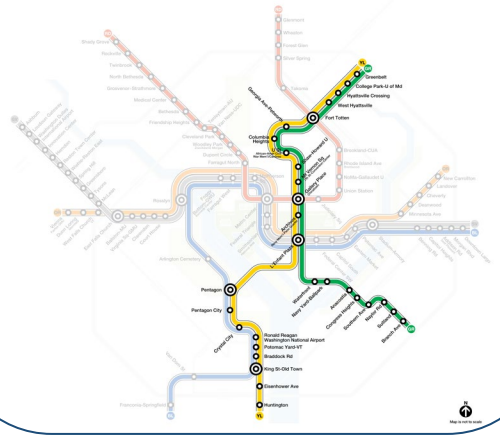
Fixed costs include operation and maintenance of railyards, track, structures, stations, signals, elevators/escalators, fare collection, maintenance equipment and vehicles, police and security, and administrative support.

Service Optimization Concepts

Evaluate through multiple lenses: Drives Ridership; Equitable; Asset Optimization

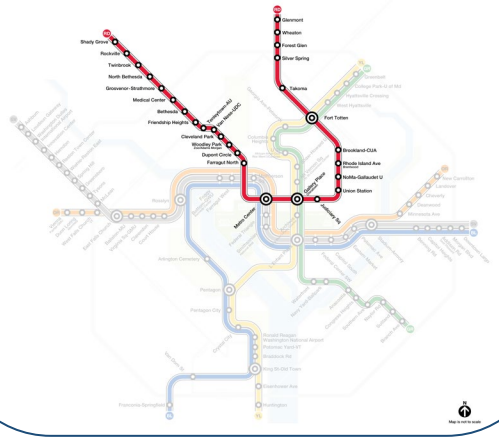
Green/Yellow

- Increase service on core and southern segments Green and Yellow Lines
- Serve fast-growing parts of the region, including major sports venues and airport



Red

- Optimize Red Line service, concentrating frequency in high ridership segments (post-pandemic ridership patterns)

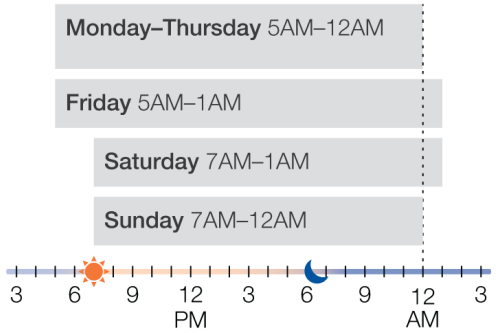


Blue/Orange/Silver

- Improve Orange Line service
- Consider first and last train times, airport service, and balance of BL/OR/SV frequency in core and to terminals

Operating Hours

- Consider options including opening earlier on Saturday and Sunday and closing later on Friday and Saturday
- Consider pre-scheduled maintenance outages
- Night-time options



Metrorail Service Optimization

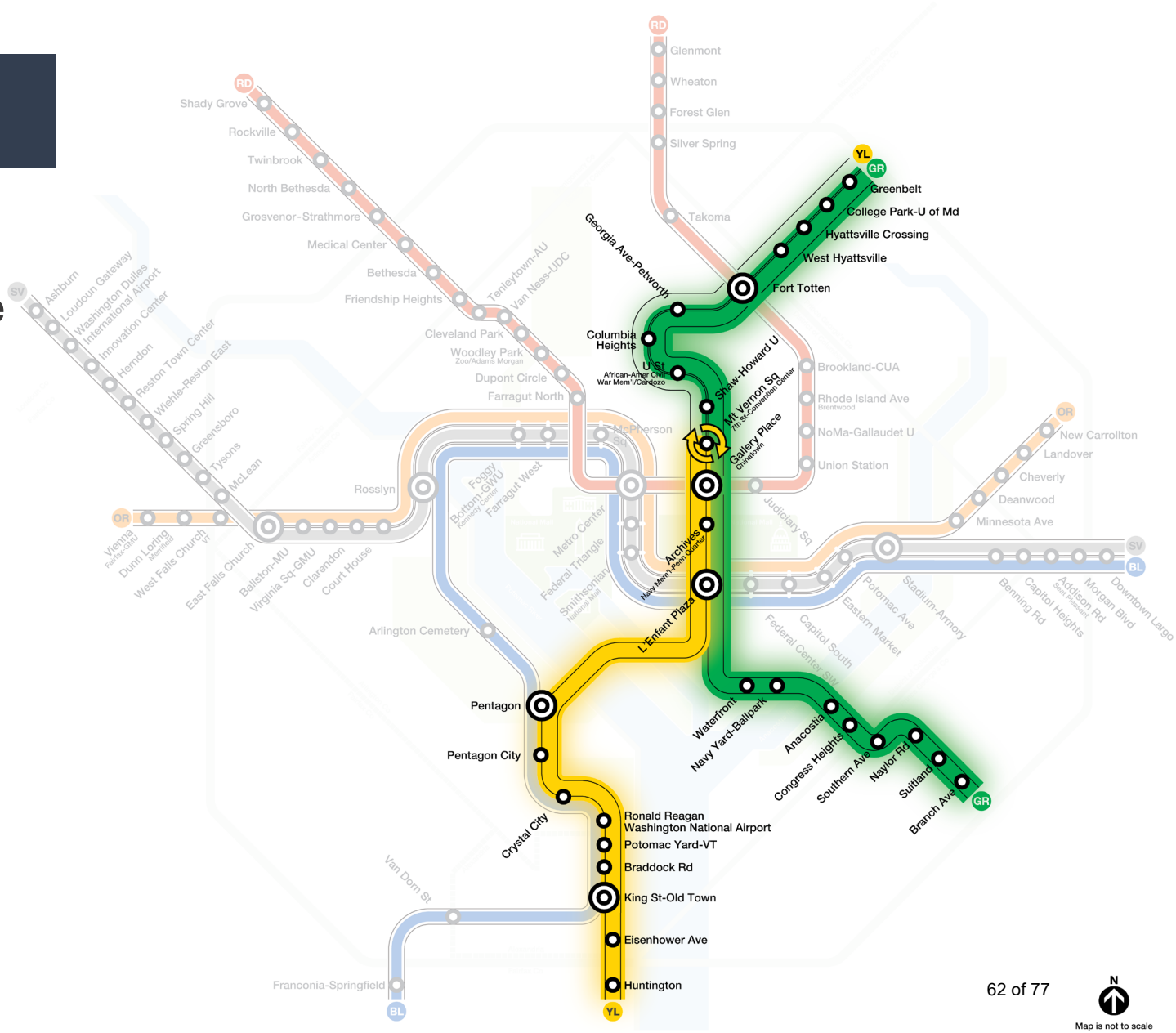
Green/Yellow Line Concepts

Increased Green and Yellow Service with Yellow Line Short Turns

Increase frequency of Green and Yellow Line south of Mt. Vernon Sq. to match effective frequency of Northern Green Line

Opportunity to grow ridership with enhanced service for fast growing parts of system, games and other events at four major sports venues, airport travelers (DCA), and a new station (Potomac Yard)

Reduces transfer times at Gallery Place and L'Enfant Plaza, provides equity benefits on Southern Green Line, increases utilization of key assets (e.g., Yellow Line bridge)



Map is not to scale

Metrorail Service Optimization

Green/Yellow Line Concepts

Increased Green and Yellow Service with Yellow Line Short Turns

Preliminary Cost and Revenue Estimates

Estimated Ridership (Millions, Annual)	**Incremental Revenue** ($, Millions, Annual)	**Incremental Operating Cost** ($, Millions, Annual)	**Incremental Net Operating Budget Impact** ($, Millions, Annual)
3	$ 7	$ 20	$ 13

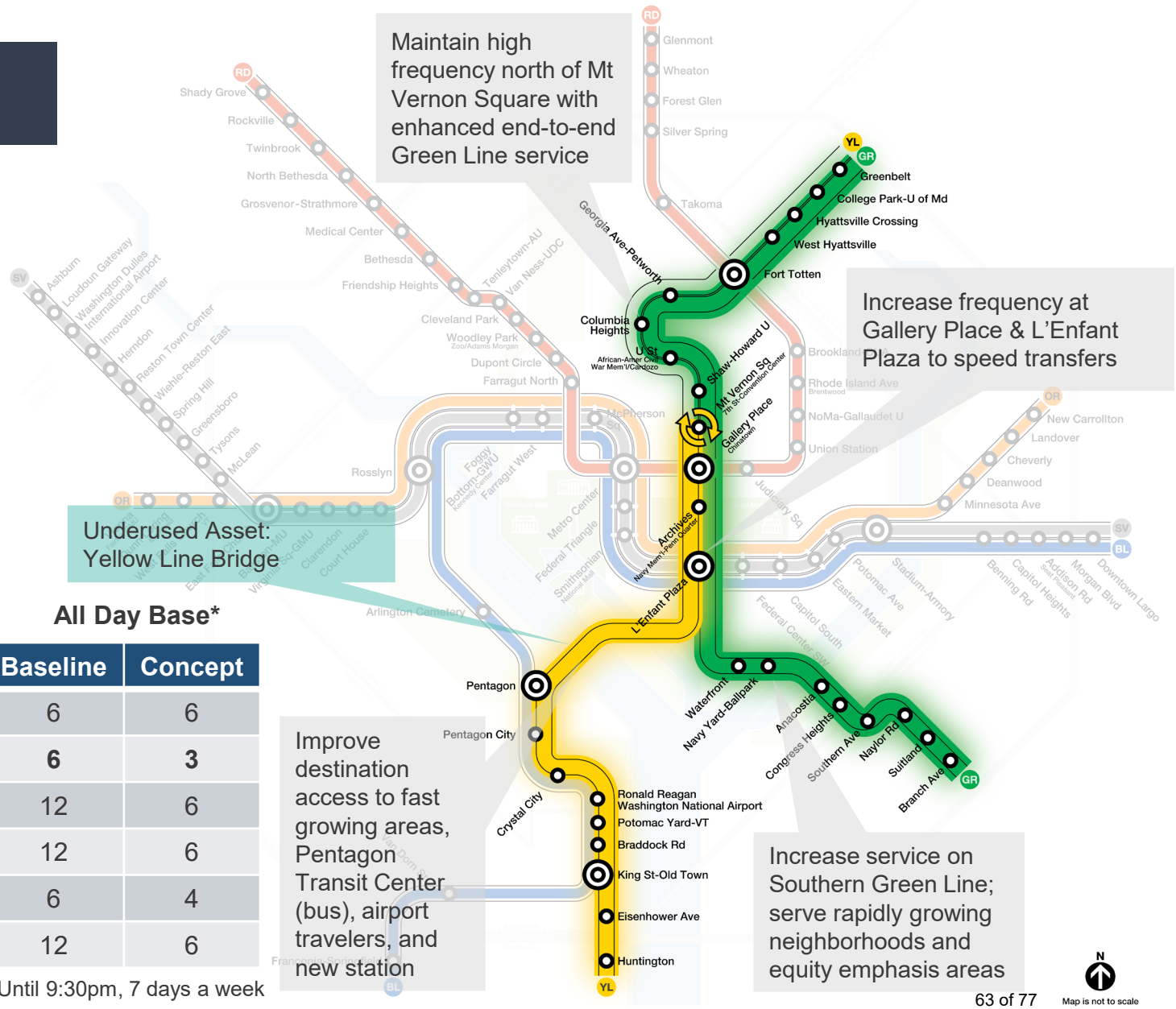
Preliminary Service Frequency by Segment

Minutes between trains

		Peak		All Day Base*	
Line	**Segment**	**Baseline**	**Concept**	**Baseline**	**Concept**
GR YL	Greenbelt to Mt. Vernon Square	5	5 to 6	6	6
GR YL	**Mt. Vernon Sq to L'Enfant Plaza**	**5**	**2.5 to 3**	**6**	**3**
GR	L'Enfant Plaza to Branch Ave	10	5 to 6	12	6
YL	L'Enfant Plaza to Pentagon	10	5 to 6	12	6
BL YL	Pentagon to King St	5	3 to 4	6	4
YL	King St to Huntington	10	5 to 6	12	6

Mt. Vernon Sq. previously used to turn back YL trains every 6 minutes, potential constraints to reliable delivery of service beyond that level (e.g., every 5 minutes).

*Until 9:30pm, 7 days a week



Metrorail Service Optimization

Red Line Concepts

Improve Red Line Transfers with Additional Service between Grosvenor and Silver Spring

Provide more service in the busiest segments of the Red Line by making use of short turns between Grosvenor and Silver Spring, reducing transfer times to other lines

Realignment to improve core frequency and serve growing areas with an approximately similar level of total service

Increased frequency benefits four customer trips for every trip with longer waits (4 to 1 ratio)

Map is not to scale

Metrorail Service Optimization

Red Line Concepts

Improve Red Line Transfers with Additional Service between Grosvenor and Silver Spring

Preliminary Cost and Revenue Estimates:

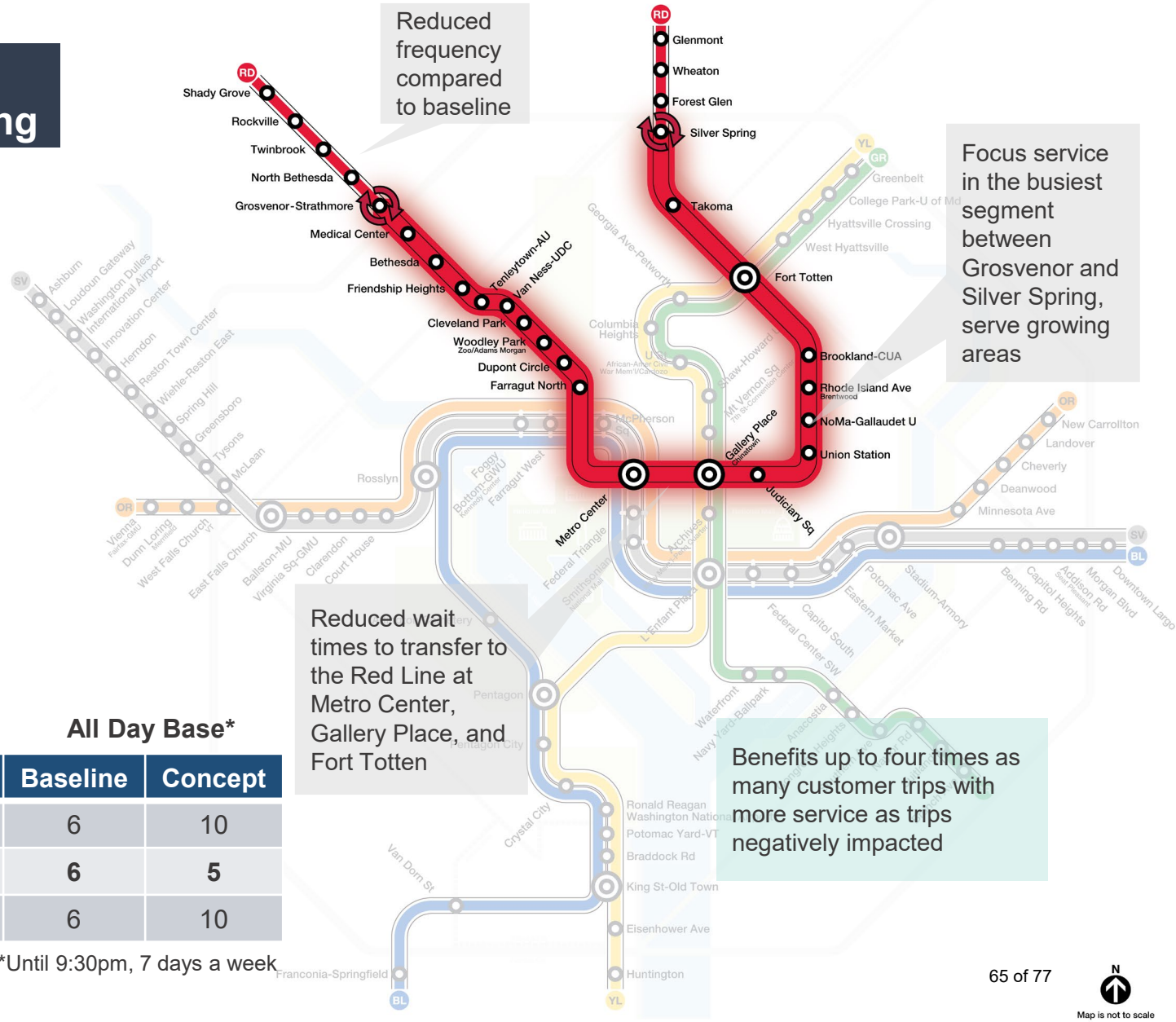
Estimated Ridership (Millions, Annual)	**Incremental Revenue** ($, Millions, Annual)	**Incremental Operating Cost** ($, Millions, Annual)	**Incremental Net Operating Budget Impact** ($, Millions, Annual)
0.4	$ 0.2	$ 0.3	$ (0.5)

Preliminary Service Frequency by Segment

Minutes between trains

		Peak		All Day Base*	
Line	**Segment**	**Baseline**	**Concept**	**Baseline**	**Concept**
RD	Shady Grove to Grosvenor	5	8	6	10
RD	**Grosvenor to Silver Spring**	**5**	**4**	**6**	**5**
RD	Silver Spring to Glenmont	5	8	6	10

*Until 9:30pm, 7 days a week



Blue/Orange/Silver Line Concepts

Improve Orange Line Service

Provide more service on the Orange Line while maintaining baseline service on the Blue and Silver Lines

Current ridership on the eastern Orange and Blue/Silver branches is roughly even, and the New Carrollton branch historically had 10-25% more riders

Improves potential connections at New Carrollton to Amtrak, MARC, and the future Purple Line

Map is not to scale

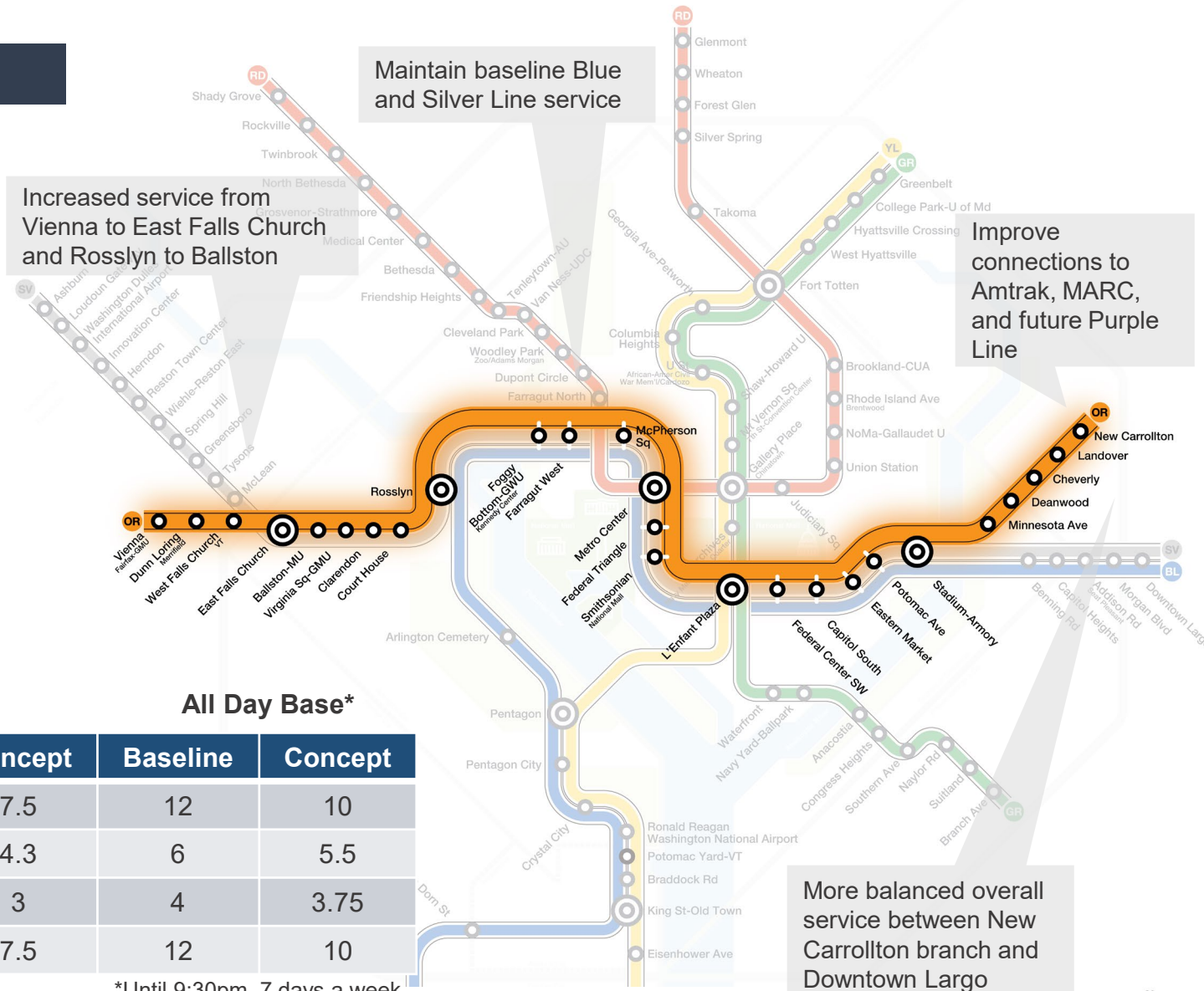
Metrorail Service Optimization

Blue/Orange/Silver Line Concepts

Improve Orange Line Service

Preliminary Cost and Revenue Estimates:

Estimated Ridership (Millions, Annual)	Incremental Revenue ($, Millions, Annual)	Incremental Operating Cost ($, Millions, Annual)	Incremental Net Operating Budget Impact ($, Millions, Annual)
0.6	$ 1.7	$ 7.7	$ 6



Preliminary Service Frequency by Segment

Minutes between trains

Line	Segment	Peak		All Day Base*	
		Baseline	Concept	Baseline	Concept
OR	Vienna to East Falls Church	10	7.5	12	10
OR SV	East Falls Church to Rosslyn	5	4.3	6	5.5
BL OR SV	Rosslyn to Stadium-Armory	3.33	3	4	3.75
OR	Stadium-Armory to New Carrollton	10	7.5	12	10

*Until 9:30pm, 7 days a week

Blue/Orange/Silver Line Concepts

Silver Line Express Services

Mitigate the long travel time to and from Ashburn with a new express service

Potential to reduce travel time to and from Dulles and Ashburn by 4 to 6 minutes by adding some trains that skip approximately seven stops between Rosslyn and Wiehle

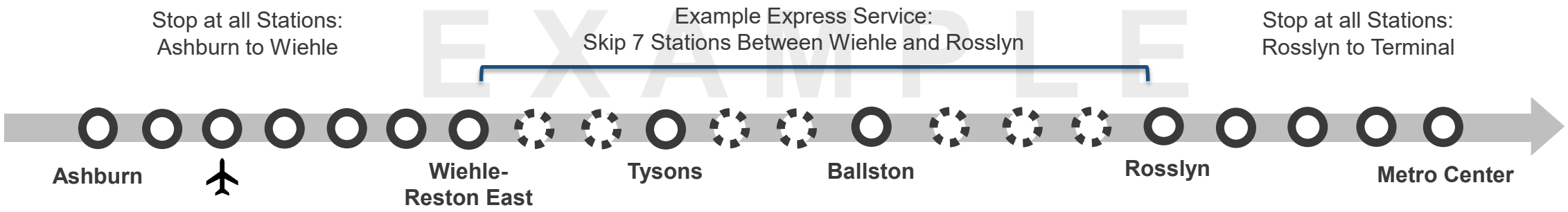
Options include:

- A **few express trains per day**
- Add a new **all-day express service** pattern

Metro is designed as a two-track system with no passing tracks. Without passing:

- An express train can only 'catch up' to the train in front of it
- Travel time savings can be no greater than the local service headway

Estimated Ridership (Millions, Annual)	**Incremental Revenue** ($, Millions, Annual)	**Incremental Operating Cost** ($, Millions, Annual)	**Incremental Net Operating Budget Impact** ($, Millions, Annual)
0 to 1.5	$ 0 to 4	$ 0.5 to 22	$ 0.1 to 17



Planning and Analysis Underway to Improve Maintenance Efficiency and Effectiveness

- Maintenance optimization that ensures system safety could also allow for future changes in weekend late night and early morning service hours (close later, open earlier)
- Also exploring concepts for improved overnight and early morning bus service as part of the Better Bus Initiative

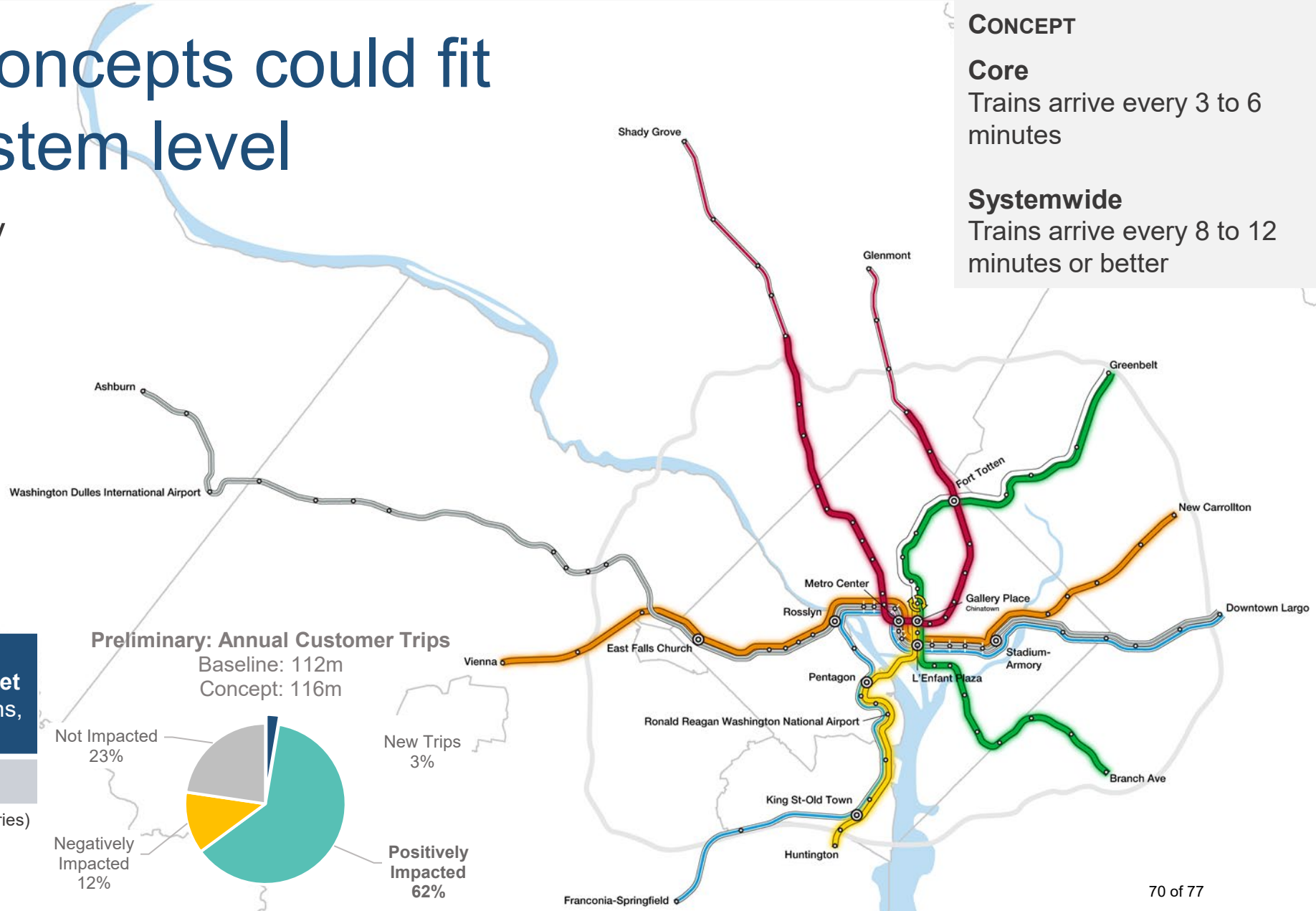
How service concepts could fit together at system level

- Increase core frequency on Green, Yellow, and Red Lines, reducing transfer times and concentrating service in fast growing areas with high ridership potential

CONCEPT

Core
Trains arrive every 3 to 6 minutes

Systemwide
Trains arrive every 8 to 12 minutes or better



Preliminary: Annual Customer Trips
Baseline: 112m
Concept: 116m

Estimated Ridership Change (Annual)	**Incremental Net Operating Budget Impact** ($, Millions, Annual)
4 million (+3.5%)	$ 18.5

Assumes railcar fleet fully available (including 7000 series)

Potential Future Service Optimization Concepts

Priority	Concepts	Trips Positively Impacted (Millions, Annual)	Trips Negatively Impacted (Millions, Annual)	Estimated Ridership Change (Millions, Annual)	Incremental Net Op. Budget Impact ($M, Annual)	Equity Impact (Prelim.)
1	Green/Yellow Line investment	23.3	8.9	2.8	$ 13.0	✓
2	Red Line service realignment	35.9	9.8	0.45	$ (0.5)	✓
3	Orange Line Increase	34.1	0	0.5	$ 6.0	✓
Total		93.3*	18.7*	4	$ 18.5	✓
	Future: Blue/Orange/Silver Optimization, Silver Line Express**					
	Future: Red Line Frequency Investment**					
	Optimizing maintenance could allow opening earlier or closing later on weekends**					

*Some customers could be impacted by more than one concept
**Additional analysis underway

Assumes railcar fleet fully available (including 7000 series)

Considerations and Constraints

Considerations

- Ridership
- Equity
- Customer, community, region-wide impacts
- Cost
- Implementation timeline

Constraints

- Trunk line capacity
- Railcar availability & reliability
- Staffing
- Operational complexity
- Infrastructure
- Overnight maintenance

Next Steps

- Community, customer, stakeholder engagement
- Further analysis and refinement of service and fare optimization concepts
- Board consideration of updated concepts

Appendix

Metrorail Service Optimization

Service Frequency Details

Line	Segment	Peak Headway Minutes between trains			All Day Base Headway* Minutes between trains		
		August**	FY23 Budget	Concept***	August**	FY23 Budget	Concept***
RD	**Grosvenor to Silver Spring**	**10**	**5**	**4**	**10**	**6**	**5**
RD	Shady Grove, Glenmont Terminals	10	5	8	10	6	10
GR YL	**Mt. Vernon Sq to L'Enfant Plaza**	**7.5**	**5**	**2.5 to 3**	**7.5**	**6**	**3**
GR	Greenbelt Terminal	15	5	5 to 6	15	6	6
GR	Branch Avenue Terminal	15	10	5 to 6	15	12	6
YL	Huntington Terminal	15	10	5 to 6	15	12	6
BL YL	Pentagon to Reagan National Airport	7.5	5	3 to 4	7.5	6	4
BL OR SV	**Rosslyn to Stadium-Armory**	**5**	**3.3**	**3**	**5**	**4**	**3.75**
OR SV	East Falls Church to Rosslyn	7.5	5	4.3	7.5	6	5.5
OR	New Carrollton Terminal	15	10	7.5	15	12	10
BL SV	Downtown Largo Terminal	7.5	5	5	7.5	6	6
BL	Franconia Terminal	15	10	10	15	12	12
OR	Vienna Terminal	15	10	7.5	15	12	10
SV	Wiehle (Future Ashburn) Terminal	15	10	10	15	12	12

**Typical Service in August 2022 (before Yellow Line construction shutdown) with reduced service due to limited availability of 7000 series

*Until 9:30pm, 7 days a week

***Assumes railcar fleet fully available (including 7000 series)