Purpose

No public transportation system in the United States turns a profit. Few routes or services even sustain operations based solely on fare revenue. Every system relies on additional support from public sources, generally direct tax revenue or appropriations from partner counties and cities, which recognize the inherent value of transit in both direct service to their citizens and indirect, positive externalities such as economic development, lifestyle and travel choice, and environmental benefits. Considering the interplay of those benefits with the politics and costs involved, transit agencies and public officials have a vested interest in expanding access and improving service while reducing operating costs and lowering the tax burden on constituents. With careful planning and strategic targeting, some investments can simultaneously lower the costs of doing business while growing revenue by attracting new riders. If the nexus between cost savings and increased revenue is great enough, the improvement may actually pay off the up-front capital investment in a relatively short period of time. Monetization of service efficiencies may be great enough to encourage private investment partners to assume the risk of up-front investments in an era of intense competition for ever-shrinking capital budgets.

Metro is interested in pursuing public-private partnerships (P3s) for projects that appear to offer a win-win scenario for all parties. Metro has engaged in discussions about P3 opportunities with the Federal City Council (FC2), an organization which has been a leader in advocating a smarter approach to regional infrastructure planning and development, as well as creation of a P3 Infrastructure Bank for the Federal District. Working on potential P3s with FC2 would provide Metro access to a wide array of possible investors and the benefit of FC2's financial expertise; over time, it may even provide Metro and potential investors access to a variety of funding mechanisms through an Infrastructure Bank.

Metro and FC2 may decide to explore the potential of P3 arrangements through a pilot project for off-board fare payment (OBFP) on select Metrobus routes. Metro has long expressed a need to improve service and travel times on its identified Priority Corridor Network, a network of over twenty routes that carries over 50 percent of Metrobus riders. However, Metro's capital improvement program is severely constrained and has many needs competing for very limited funds; the same is true for its partner jurisdictions. Metro's Office of Planning and Office of Bus Planning have thoroughly analyzed the likely performance and impacts of off-board fare payment on the most heavily-utilized bus corridors in the District, and believe the resultant service efficiencies would translate into annual operating cost savings that would pay off the initial cost of implementation within a handful of years.

Metrobus off-board fare payment is an exceptionally promising value proposition. It would allow Metro to action system improvements it cannot currently afford; improve the customer experience; and guarantee a solid return on investment for private-sector partners, with potential for additional profit through revenue-sharing.

Metrobus Off-Board Fare Payment
Potential Performance and Cost Savings, Scenario 1

Corridor	Avg. Daily Ridership	Avg. Daily Cash Loads	Cash Load Share	Minutes Saved/Day	Bus Hours Saved/Day	Weekday Cost Savings	Annual Cost Savings
14th Street	15,635	1,886	12.1%	44	4	$1,070	$355,700
16th Street	19,938	1,298	6.5%	20	1	$526	$174,909
H Street/Benning Rd	14,764	3,284	22.2%	78	8	$1,964	$653,138
Georgia Ave/7th St	21,880	3,517	16.1%	56	13	$2,665	$886,040
Wisconsin/Pennsylvania Aves	20,306	2,744	13.5%	43	7	$1,687	$561,059
All 5 Corridors	*92,523*	*12,729*	*13.8%*	*241*	*33*	*$7,912*	*$2,630,846*

Leveraging Value: The Benefits of Transit Prioritization

In high-density, urbanized areas like the National Capital Region, transit systems generally deploy a range of service types and strategies in order to serve varied needs and travel markets. Heavy rail systems like Metrorail excel at quickly moving masses of people between major concentrations of people, jobs, and services, such as the defined Regional Activity Centers. MetroAccess provides demand-responsive, door-to-door service for the elderly and disabled. Metrobus provides high-capacity and high-frequency service on major corridors that do not currently have rail service, as well as local circulation within neighborhoods and connections to Metrorail stations. Metrobus provides the regional transit system's geographic reach and broadens market penetration; however, buses are frequently caught in heavy traffic, which increases travel times, degrades reliability, and increases operating costs. Labor costs are by far the largest component of every transit agency's expenses, so every minute spent in traffic or waiting at a bus stop adds to the overall hourly cost of doing business.

One possible response to slow-downs would be to cut service on routes as they become too expensive, but doing so usually results in ridership and revenue losses, resulting in a downward spiral of service degradation. Metro and its partner jurisdictions continue to explore opportunities to cut costs ***and*** grow ridership and revenue by increasing vehicle speeds, limiting stops, and reducing passenger boarding times. Agencies can pursue a number of strategies to speed overall transit travel time, including:

- Limiting stops (half- to one-mile)
- Dedicated or semi-dedicated lanes
- Low-floor and multi-door vehicles
- Bus bump-outs
- Traffic signal prioritization
- Fast boarding and fare payment

Most on-street transit services would benefit from at least one of these strategies, and the most effective systems utilize all of them.

The Metrobus network includes numerous routes that carry tens of thousands of riders every day. However, because Metro runs the bus system but local and state governments own the streets and sidewalks, it is challenging to put forth a comprehensive, corridor-wide transit prioritization strategy. As the region continues to grow and areas away from Metrorail densify, it is likely that Metrobus ridership on major corridors will continue to grow rapidly. With limited resources, Metro must find a way to retain current customers while attracting and accommodating new ones by running existing services more efficiently. Most on-street transit prioritization strategies will require partnership, approval, and investment from county and city governments. But Metro does have control over where and how often vehicles stop, as well as when, where, and how customers pay fares. Relocating all cash transactions from buses to SmarTrip® kiosks at bus stops is the most effective fare-based strategy for reducing travel time on congested streets.

Rationale for Off-Board Fare Payment

Off-board fare payment has a proven track record in substantially reducing bus dwell times. At minor stops serving only a few riders, dwell time may be as little as 10 to 20 seconds. At major urban stops and transfer points, buses may be delayed for minutes. These delays do not include additional time for bus deceleration, acceleration, negotiating traffic signals, and merging with traffic. As evidenced by the Transportation Research Board's *Transit Cooperative Research Program Report 165: Transit Capacity and Quality of Service Manual*, allowing off-board fare payment and utilization of smart cards vastly improves boarding time per passenger, particularly at busy stops:

Situation	Average Passenger Service Time (seconds per passenger)
Level-floor boarding	
No fare payment	1.75
Visual inspection (passes, mobile phones)	2.00
Smart card taps	2.75
Ticket or token into farebox	3.00
Mechanical ticket validation	4.00
Exact change into farebox	4.50
Magnetic stripe card	5.00
Alighting	
Front door	2.50
Rear door	1.75
Rear door with smart card tap	3.50

*Add 0.5 s/p when standees present and/or for high-floor buses

*TCRP Report 165: Transit Capacity and Quality of Service Manual, 3rd edition

#X2 bus at Gallery Place, 5/18/2015: Dwell time nearly two minutes.

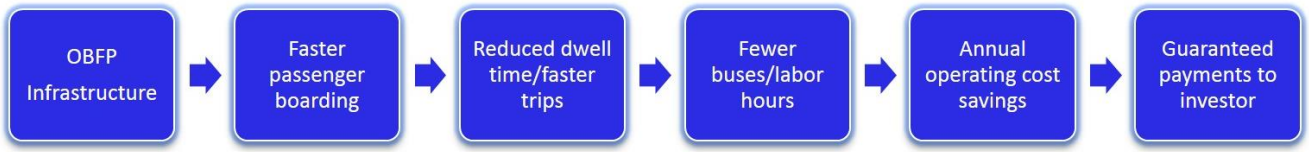
This national research is corroborated by field surveys on the Metrobus System undertaken by both Metro and the District Department of Transportation (DDOT). Those surveys found that the average SmarTrip® rider takes approximately 2.5 seconds to tap and board; cash fares take about 6 seconds; and card value loading takes around 20 seconds per customer. When those transactions are multiplied across stops and hours on busy routes like the S-lines on 16th Street, bus dwell times can consume 20% or more of total in-service time. Limiting all boardings and farebox transactions to SmarTrip® taps would reduce all passenger boardings to around 2.5 seconds, greatly reducing dwell times and speeding up the overall trip-time for each bus on the route. These time savings would in turn allow Metro to schedule less total time for each trip, allowing Metro to provide the same levels of service (frequencies) on each corridor with fewer buses and operator hours, resulting in operating cost savings for the agency and partner jurisdictions.

Components of Off-Board Fare Payment

Off-board fare payment on Metrobus would function similarly to the Metrorail system. Customers would use kiosks at designated bus stops to purchase SmarTrip® cards and load value on cards. A typical stop may have one or two kiosks, while a high-demand stop could have two or more. Kiosks would be located as close as possible to the passenger waiting area without encroaching on Americans with Disabilities Act (ADA)-mandated clear pathways. The kiosks would require sidewalk space as well as the purchase, installation, and management of software to connect to Metro's current fare collection and revenue management system. This software must allow seamless interface with Metro's existing database, though it should be designed to accommodate new fare payment approaches from universal media types; e.g. smart phones, credit cards, etc. Metro is currently studying the feasibility of allowing universal fare payment, and will work with contractors to incorporate that capacity.

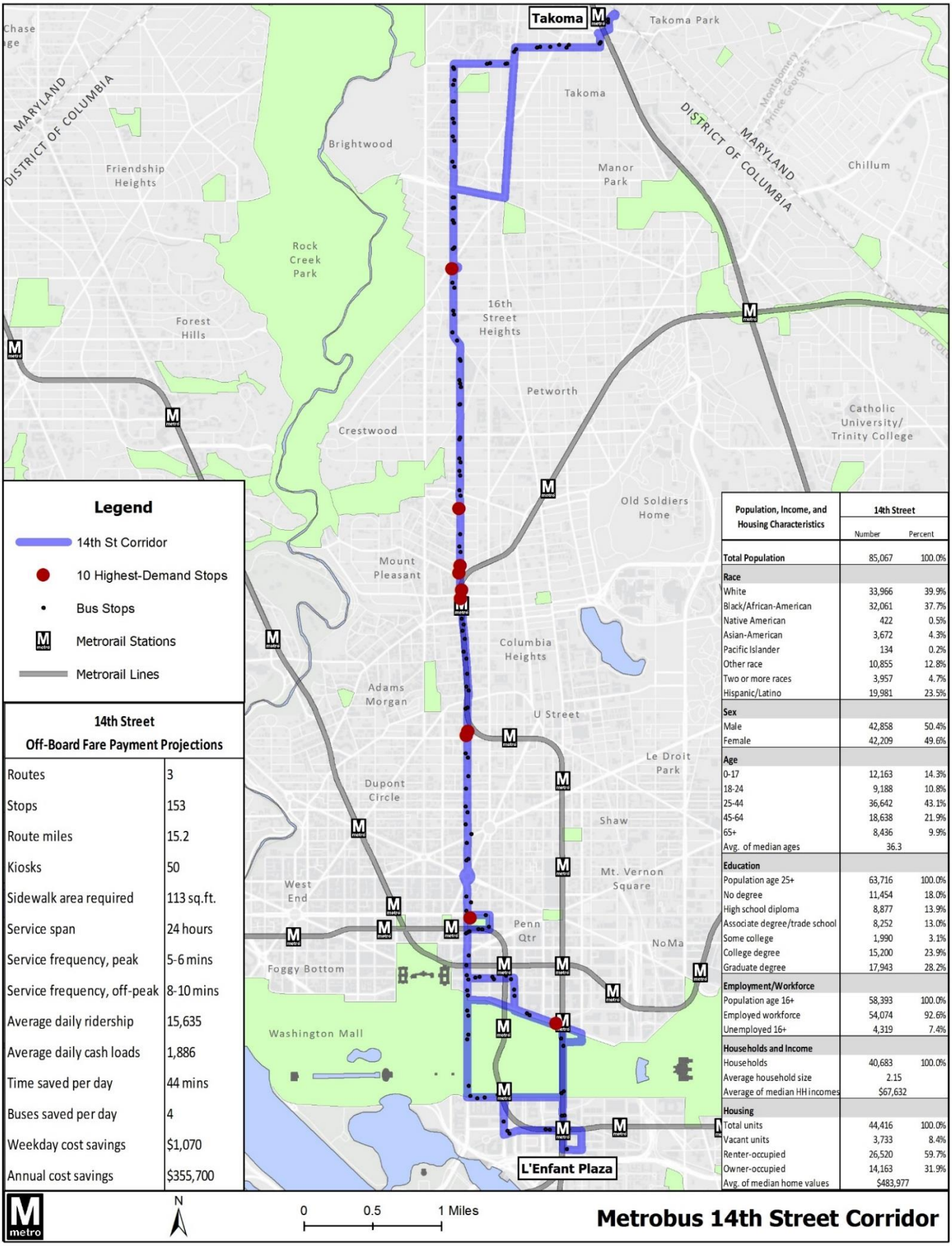
Once customers load fare products, they would proceed to the passenger waiting area. When the bus arrives, passengers will board and tap their SmarTrip® card as expeditiously as possible. No fare purchases or loading will be allowed at the farebox on any corridors designated for off-board fare payment. Unlike Metrorail, customers do not tap off to exit the bus, though this policy may change over time. Off-board fare payment could enable all-door boarding, though this would likely require uniformed fare enforcement officers, which will add operating costs. Metro will work with its contractor and any potential investor to determine equipment needs, facility design, and fare management policy assumptions. The graphic below illustrates the typical components of a bus-based off-board fare payment system.

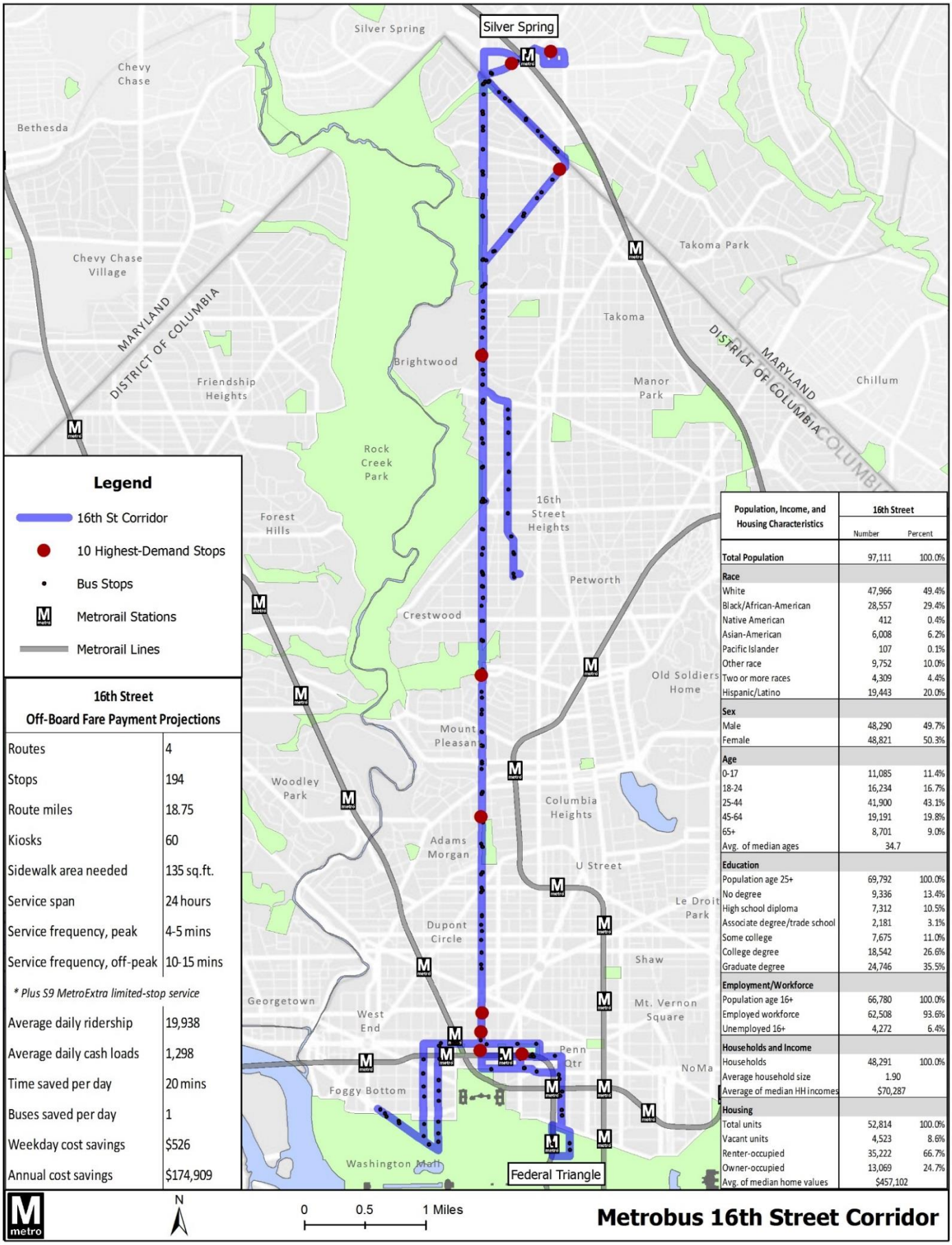
Metrobus Off-Board Fare Payment: P3 Investment Logic Model

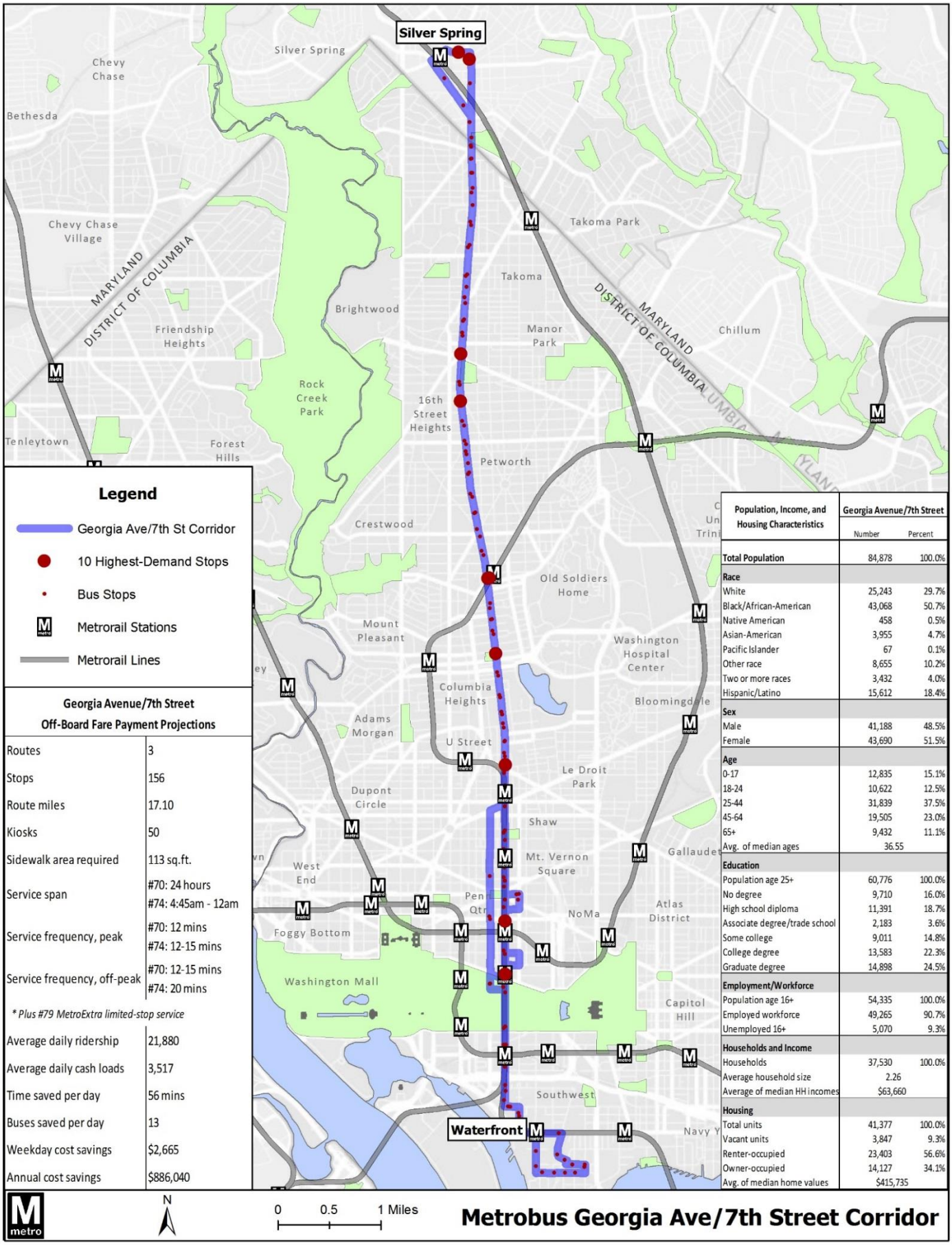


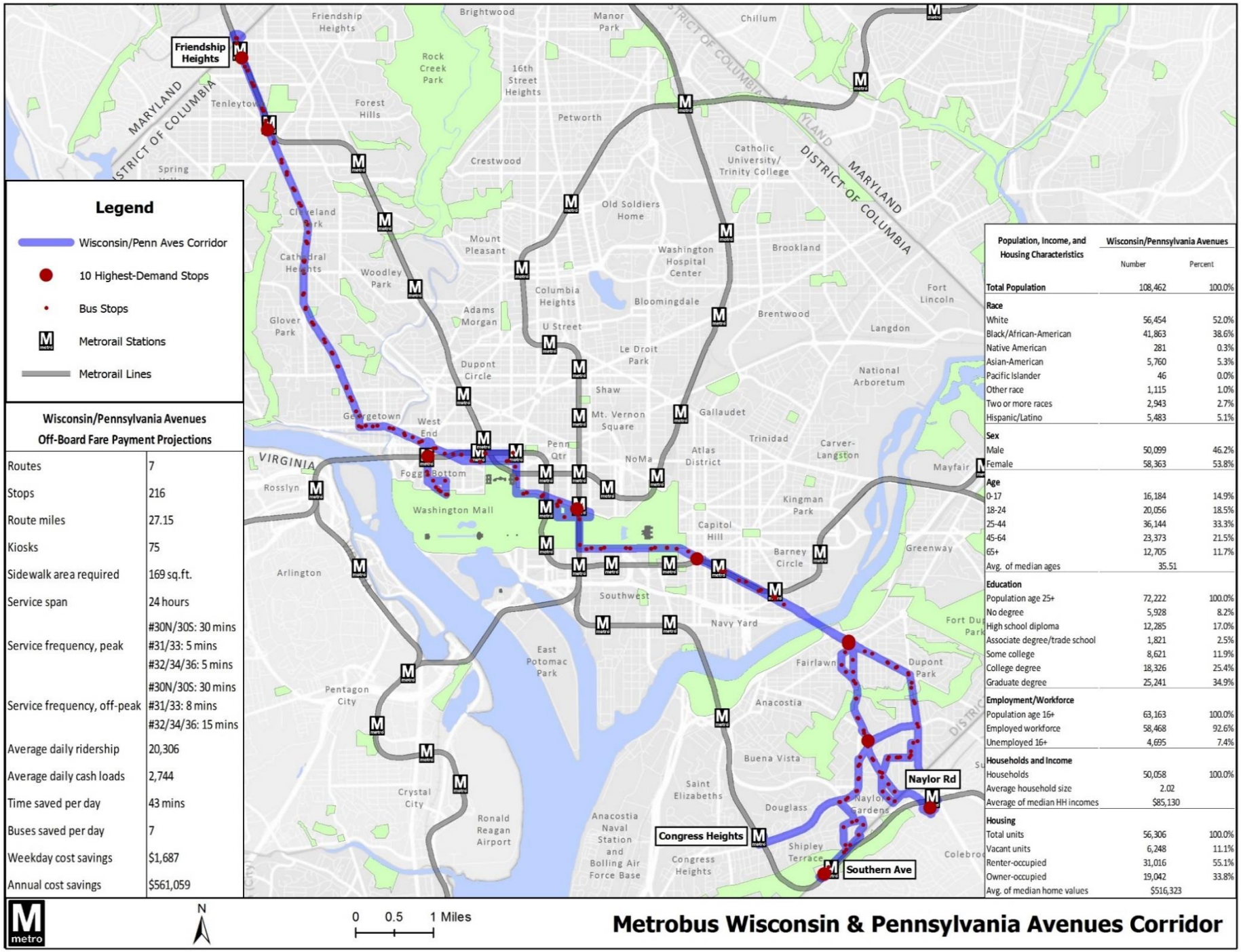
Corridor Summaries

Metro recommends phasing the implementation of off-board fare payment, focusing first on our most utilized routes. These carry nearly 100,000 riders per day, providing a solid test of off-board fare payment feasibility. They also promise to deliver the biggest return on investment in terms of cost savings. The following maps provide demographic and service summaries for each corridor, as well as initial infrastructure assumptions and performance projections. The "top ten" bus stops identified on each corridor map are those with the highest number of boardings. They are included as *illustrative examples* of the types of stops that might host SmarTrip® kiosks.


Takoma
Takoma Park
Takoma
MARYLAND
DISTRICT OF COLUMBIA
Brightwood
Friendship Heights
Manor Park
Chillum
Rock Creek Park
16th Street Heights
Forest Hills
Petworth
Crestwood
Catholic University/ Trinity College
Old Soldiers Home
Mount Pleasant
Columbia Heights
Adams Morgan
U Street
Le Droit Park
Dupont Circle
Shaw
Mt. Vernon Square
West End
Penn Qtr
NoMa
Foggy Bottom
Washington Mall
L'Enfant Plaza
Legend
14th St Corridor
10 Highest-Demand Stops
Bus Stops
Metrorail Stations
Metrorail Lines
14th Street
Off-Board Fare Payment Projections
Routes 3
Stops 153
Route miles 15.2
Kiosks 50
Sidewalk area required 113 sq.ft.
Service span 24 hours
Service frequency, peak 5-6 mins
Service frequency, off-peak 8-10 mins
Average daily ridership 15,635
Average daily cash loads 1,886
Time saved per day 44 mins
Buses saved per day 4
Weekday cost savings $1,070
Annual cost savings $355,700
Population, Income, and Housing Characteristics | 14th Street | Number | Percent
Total Population 85,067 100.0%
Race
White 33,966 39.9%
Black/African-American 32,061 37.7%
Native American 422 0.5%
Asian-American 3,672 4.3%
Pacific Islander 134 0.2%
Other race 10,855 12.8%
Two or more races 3,957 4.7%
Hispanic/Latino 19,981 23.5%
Sex
Male 42,858 50.4%
Female 42,209 49.6%
Age
0-17 12,163 14.3%
18-24 9,188 10.8%
25-44 36,642 43.1%
45-64 18,638 21.9%
65+ 8,436 9.9%
Avg. of median ages 36.3
Education
Population age 25+ 63,716 100.0%
No degree 11,454 18.0%
High school diploma 8,877 13.9%
Associate degree/trade school 8,252 13.0%
Some college 1,990 3.1%
College degree 15,200 23.9%
Graduate degree 17,943 28.2%
Employment/Workforce
Population age 16+ 58,393 100.0%
Employed workforce 54,074 92.6%
Unemployed 16+ 4,319 7.4%
Households and Income
Households 40,683 100.0%
Average household size 2.15
Average of median HH incomes $67,632
Housing
Total units 44,416 100.0%
Vacant units 3,733 8.4%
Renter-occupied 26,520 59.7%
Owner-occupied 14,163 31.9%
Avg. of median home values $483,977
N
0 0.5 1 Miles
Metrobus 14th Street Corridor


Silver Spring
Chevy Chase
Bethesda
Chevy Chase Village
MARYLAND
DISTRICT OF COLUMBIA
Friendship Heights
Brightwood
Takoma Park
Takoma
Manor Park
Chillum
Rock Creek Park
Forest Hills
16th Street Heights
Petworth
Crestwood
Old Soldiers Home
Mount Pleasant
Woodley Park
Columbia Heights
Adams Morgan
U Street
Le Droit Park
Dupont Circle
Shaw
Georgetown
West End
Mt. Vernon Square
Penn Qtr
NoMa
Foggy Bottom
Washington Math
Federal Triangle
Legend
16th St Corridor
10 Highest-Demand Stops
Bus Stops
Metrorail Stations
Metrorail Lines
16th Street
Off-Board Fare Payment Projections
Routes 4
Stops 194
Route miles 18.75
Kiosks 60
Sidewalk area needed 135 sq.ft.
Service span 24 hours
Service frequency, peak 4-5 mins
Service frequency, off-peak 10-15 mins
* Plus S9 MetroExtra limited-stop service
Average daily ridership 19,938
Average daily cash loads 1,298
Time saved per day 20 mins
Buses saved per day 1
Weekday cost savings $526
Annual cost savings $174,909
Population, Income, and Housing Characteristics
16th Street
Number Percent
Total Population 97,111 100.0%
Race
White 47,966 49.4%
Black/African-American 28,557 29.4%
Native American 412 0.4%
Asian-American 6,008 6.2%
Pacific Islander 107 0.1%
Other race 9,752 10.0%
Two or more races 4,309 4.4%
Hispanic/Latino 19,443 20.0%
Sex
Male 48,290 49.7%
Female 48,821 50.3%
Age
0-17 11,085 11.4%
18-24 16,234 16.7%
25-44 41,900 43.1%
45-64 19,191 19.8%
65+ 8,701 9.0%
Avg. of median ages 34.7
Education
Population age 25+ 69,792 100.0%
No degree 9,336 13.4%
High school diploma 7,312 10.5%
Associate degree/trade school 2,181 3.1%
Some college 7,675 11.0%
College degree 18,542 26.6%
Graduate degree 24,746 35.5%
Employment/Workforce
Population age 16+ 66,780 100.0%
Employed workforce 62,508 93.6%
Unemployed 16+ 4,272 6.4%
Households and Income
Households 48,291 100.0%
Average household size 1.90
Average of median HH incomes $70,287
Housing
Total units 52,814 100.0%
Vacant units 4,523 8.6%
Renter-occupied 35,222 66.7%
Owner-occupied 13,069 24.7%
Avg. of median home values $457,102
N
0 0.5 1 Miles
Metrobus 16th Street Corridor

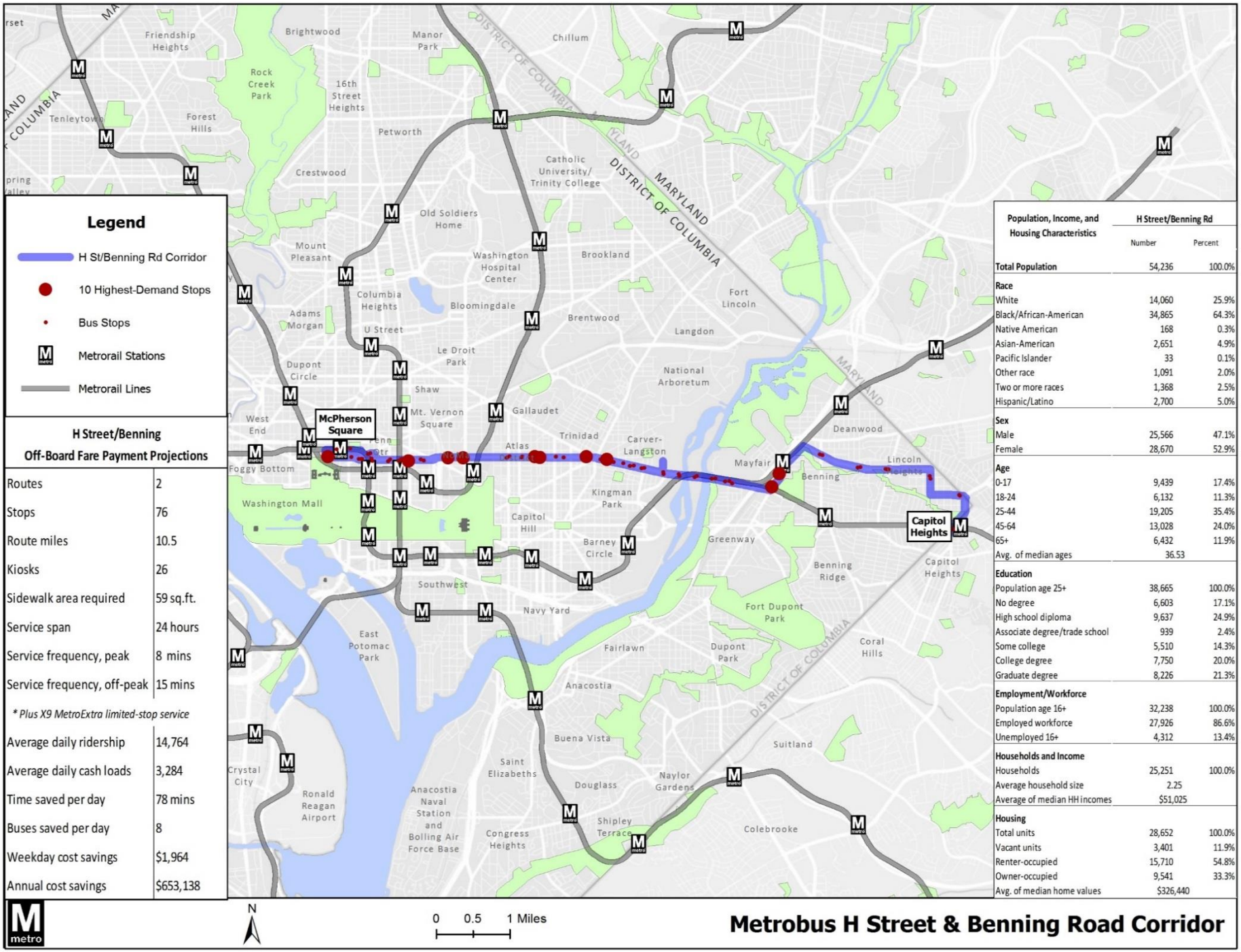

Silver Spring
Chevy Chase
Bethesda
Chevy Chase Village
MARYLAND
DISTRICT OF COLUMBIA
Friendship Heights
Tenleytown
Forest Hills
Rock Creek Park
Brightwood
16th Street Heights
Takoma Park
Takoma
Manor Park
Chillum
Petworth
Crestwood
Old Soldiers Home
Mount Pleasant
Washington Hospital Center
Columbia Heights
Bloomingdale
Adams Morgan
U Street
Le Droit Park
Dupont Circle
Shaw
West End
Mt. Vernon Square
Gallaudet
Foggy Bottom
NoMa
Atlas District
Washington Mall
Capitol Hill
Southwest
Waterfront
Navy Y
Legend
Georgia Ave/7th St Corridor
10 Highest-Demand Stops
Bus Stops
Metrorail Stations
Metrorail Lines
Georgia Avenue/7th Street
Off-Board Fare Payment Projections
Routes 3
Stops 156
Route miles 17.10
Kiosks 50
Sidewalk area required 113 sq.ft.
Service span #70: 24 hours #74: 4:45am - 12am
Service frequency, peak #70: 12 mins #74: 12-15 mins
Service frequency, off-peak #70: 12-15 mins #74: 20 mins
* Plus #79 MetroExtra limited-stop service
Average daily ridership 21,880
Average daily cash loads 3,517
Time saved per day 56 mins
Buses saved per day 13
Weekday cost savings $2,665
Annual cost savings $886,040
Population, Income, and Housing Characteristics | Georgia Avenue/7th Street | Number | Percent
Total Population 84,878 100.0%
Race
White 25,243 29.7%
Black/African-American 43,068 50.7%
Native American 458 0.5%
Asian-American 3,955 4.7%
Pacific Islander 67 0.1%
Other race 8,655 10.2%
Two or more races 3,432 4.0%
Hispanic/Latino 15,612 18.4%
Sex
Male 41,188 48.5%
Female 43,690 51.5%
Age
0-17 12,835 15.1%
18-24 10,622 12.5%
25-44 31,839 37.5%
45-64 19,505 23.0%
65+ 9,432 11.1%
Avg. of median ages 36.55
Education
Population age 25+ 60,776 100.0%
No degree 9,710 16.0%
High school diploma 11,391 18.7%
Associate degree/trade school 2,183 3.6%
Some college 9,011 14.8%
College degree 13,583 22.3%
Graduate degree 14,898 24.5%
Employment/Workforce
Population age 16+ 54,335 100.0%
Employed workforce 49,265 90.7%
Unemployed 16+ 5,070 9.3%
Households and Income
Households 37,530 100.0%
Average household size 2.26
Average of median HH incomes $63,660
Housing
Total units 41,377 100.0%
Vacant units 3,847 9.3%
Renter-occupied 23,403 56.6%
Owner-occupied 14,127 34.1%
Avg. of median home values $415,735
N
0 0.5 1 Miles
Metrobus Georgia Ave/7th Street Corridor



Wisconsin/Pennsylvania Avenues Off-Board Fare Payment Projections

Routes	7
Stops	216
Route miles	27.15
Kiosks	75
Sidewalk area required	169 sq.ft.
Service span	24 hours
Service frequency, peak	#30N/30S: 30 mins #31/33: 5 mins #32/34/36: 5 mins
Service frequency, off-peak	#30N/30S: 30 mins #31/33: 8 mins #32/34/36: 15 mins
Average daily ridership	20,306
Average daily cash loads	2,744
Time saved per day	43 mins
Buses saved per day	7
Weekday cost savings	$1,687
Annual cost savings	$561,059

Population, Income, and Housing Characteristics	Wisconsin/Pennsylvania Avenues	
	Number	Percent
Total Population	108,462	100.0%
Race		
White	56,454	52.0%
Black/African-American	41,863	38.6%
Native American	281	0.3%
Asian-American	5,760	5.3%
Pacific Islander	46	0.0%
Other race	1,115	1.0%
Two or more races	2,943	2.7%
Hispanic/Latino	5,483	5.1%
Sex		
Male	50,099	46.2%
Female	58,363	53.8%
Age		
0-17	16,184	14.9%
18-24	20,056	18.5%
25-44	36,144	33.3%
45-64	23,373	21.5%
65+	12,705	11.7%
Avg. of median ages	35.51	
Education		
Population age 25+	72,222	100.0%
No degree	5,928	8.2%
High school diploma	12,285	17.0%
Associate degree/trade school	1,821	2.5%
Some college	8,621	11.9%
College degree	18,326	25.4%
Graduate degree	25,241	34.9%
Employment/Workforce		
Population age 16+	63,163	100.0%
Employed workforce	58,468	92.6%
Unemployed 16+	4,695	7.4%
Households and Income		
Households	50,058	100.0%
Average household size	2.02	
Average of median HH incomes	$85,130	
Housing		
Total units	56,306	100.0%
Vacant units	6,248	11.1%
Renter-occupied	31,016	55.1%
Owner-occupied	19,042	33.8%
Avg. of median home values	$516,323	



H Street/Benning Off-Board Fare Payment Projections

Routes	2
Stops	76
Route miles	10.5
Kiosks	26
Sidewalk area required	59 sq.ft.
Service span	24 hours
Service frequency, peak	8 mins
Service frequency, off-peak	15 mins

** Plus X9 MetroExtra limited-stop service*

Average daily ridership	14,764
Average daily cash loads	3,284
Time saved per day	78 mins
Buses saved per day	8
Weekday cost savings	$1,964
Annual cost savings	$653,138

Population, Income, and Housing Characteristics	H Street/Benning Rd	
	Number	Percent
Total Population	54,236	100.0%
Race		
White	14,060	25.9%
Black/African-American	34,865	64.3%
Native American	168	0.3%
Asian-American	2,651	4.9%
Pacific Islander	33	0.1%
Other race	1,091	2.0%
Two or more races	1,368	2.5%
Hispanic/Latino	2,700	5.0%
Sex		
Male	25,566	47.1%
Female	28,670	52.9%
Age		
0-17	9,439	17.4%
18-24	6,132	11.3%
25-44	19,205	35.4%
45-64	13,028	24.0%
65+	6,432	11.9%
Avg. of median ages	36.53	
Education		
Population age 25+	38,665	100.0%
No degree	6,603	17.1%
High school diploma	9,637	24.9%
Associate degree/trade school	939	2.4%
Some college	5,510	14.3%
College degree	7,750	20.0%
Graduate degree	8,226	21.3%
Employment/Workforce		
Population age 16+	32,238	100.0%
Employed workforce	27,926	86.6%
Unemployed 16+	4,312	13.4%
Households and Income		
Households	25,251	100.0%
Average household size	2.25	
Average of median HH incomes	$51,025	
Housing		
Total units	28,652	100.0%
Vacant units	3,401	11.9%
Renter-occupied	15,710	54.8%
Owner-occupied	9,541	33.3%
Avg. of median home values	$326,440	

Metrobus H Street & Benning Road Corridor

Potential Application and Performance: Scenario 1

Metro staff formulated an initial set of scenarios to test the feasibility and potential outcomes of implementing off-board fare payment on the 19 routes serving the five corridors described above. These routes carry nearly 100,000 riders per day, but routinely experience delays, crowding, and bus-bunching due to the high level of demand. Metro planners researched typical equipment specifications, requirements, and operational needs, then analyzed each route and bus stop in terms of ridership, consistency of activity, and accessibility to identify where off-board fare payment is most likely to prove cost-effective. The table below illustrates Scenario 1, including initial assumptions for project phasing; potential cost savings; the time it would take those savings to break even with the cost of implementation; and a target date for reversion of ownership and maintenance to Metro under a P3 agreement. These assumptions and findings provide a basis for an investment pro forma.

Metrobus Off-Board Fare Payment
Projected Costs, Savings, and Performance - Scenario 1

Scenario Inputs/Assumptions	14th Street	16th Street	Georgia Ave/ 7th St	H Street/ Benning	Wisconsin/ Pennsylvania	All 5 Corridors
Project Timing						
Contract Year	1	1	1	1	1	1
Groundbreaking Year	1	1	1	1	1	1
Construction Year 1	40%	40%	40%	40%	40%	40%
Construction Year 2	60%	60%	60%	60%	60%	60%
Delivery/Opening Year	3	3	3	3	3	3
Operations Year 1	65%	40%	65%	40%	65%	40-65%
Operations Year 2	90%	65%	90%	65%	90%	65-90%
Operations Year 3+	100%	70%	100%	70%	100%	70-100%
Stabilized Year	5	5	5	5	5	5
Reversion Year	10	10	10	10	10	10
Equipment & Installation						
Number of Kiosks	50	60	50	26	75	261
Kiosk Unit Cost	$27,500	$27,500	$27,500	$27,500	$27,500	$27,500
Kiosk Footprint, sq.ft.	2.5	2.5	2.5	2.5	2.5	2.5
Sidewalk Area Needed, sq.ft.	113	135	113	59	169	589
Sidewalk Cost per sq.ft.	$50	$50	$50	$50	$50	$50
Total Land Costs	$5,625	$6,750	$5,625	$2,925	$8,438	$29,363
Soft Costs (% of Hard Costs)	20%	20%	20%	20%	20%	20%
Overall Contingency	5.0%	1.0%	5.0%	5.0%	5.0%	5.0%
Cost Escalation, Construction	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Total Hard Costs	***$1,777,555***	***$2,064,808***	***$1,777,555***	***$924,329***	***$2,666,333***	***$9,210,580***
Software Costs	→	→	→	→	→	$2,000,000
Total Capital Outlay	***$3,777,555***	***$4,064,808***	***$3,777,555***	***$2,924,329***	***$4,666,333***	***$11,210,580***
Operations & Performance						
Operating Cost per Kiosk	$600/yr	$600/yr	$600/yr	$600/yr	$600/yr	$600/yr
Annual Operating Costs	***$53,120.50***	***$40,372.73***	***$87,592.60***	***$58,053.97***	***$81,468.84***	***$320,608.64***
Marketing (% of Revenues)	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Expenses Escalation	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Average Daily Ridership	15,635	19,938	21,880	14,764	20,306	92,523
Average Daily Cash Loads	1,886	1,298	3,517	3,284	2,744	12,729
Cash Load Share	12.1%	6.5%	16.1%	22.2%	13.5%	13.8%
Base Revenue per Load	$1.75	$1.75	$1.75	$1.75	$1.75	$1.75
Annual Revenue	$4,478,580	$6,589,538	$5,267,450	$3,365,403	$6,222,168	$25,923,139
Projected Revenue Growth Rate	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Minutes Saved	44	20	56	78	43	241
Bus Hours Saved	4	1	13	8	7	33
Average Weekday Cost Savings	$1,070	$526	$2,665	$1,964	$1,687	$7,912
Annual Cost Savings	***$355,700***	***$174,909***	***$886,040***	***$653,138***	***$561,059***	***$2,630,846***

Alternative Scenarios

The scenario described above is only one possible approach, and Metro will work with potential investors to assess the costs and benefits of changing the routes, number and location of kiosks, or other inputs. Other possibilities that may be explored include allowing multi-door boarding and concentrating kiosks only at stops designated for Metro's limited-stop service, MetroExtra.

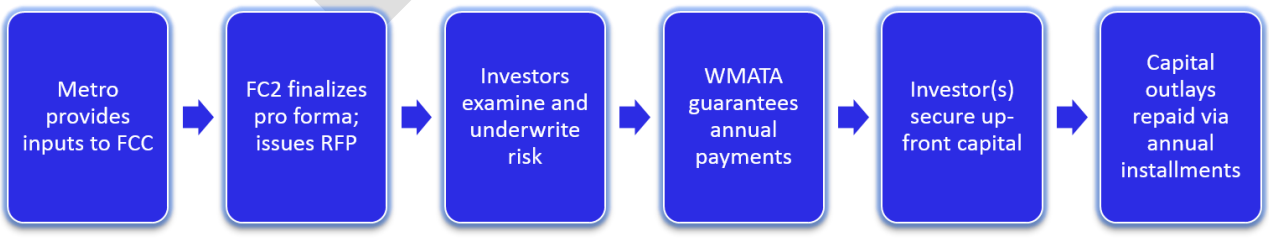
Multi-door boarding: The baseline scenario assumes implementation of off-board fare payment and loading, but would still require customers to board buses at the front door and tap SmarTrip® cards at the farebox. This approach would require little change to current procedure and minimal education for operators and customers. It would also help suppress fare evasion. An alternative approach would allow passengers to board and "tap on" at both the front and rear doors. Doing so would multiply the time-savings benefits per passenger and operator labor cost savings, but it would require the up-front purchase and installation of rear-door validators, as well as the presence of uniformed Metro Transit Police Department fare enforcement officers. Metro would work with any investor interested in this scenario to determine the most effective strategy for deploying fare enforcement officers, and adjust the pro forma accordingly.

MetroExtra bus stops: MetroExtra routes are specially-branded express overlay services that operate only during peak travel hours and make limited stops at high-ridership nodes and major transfer points. MetroExtra stops tend to be the highest-ridership stops for all routes along these corridors, and they serve approximately 70% of the combined ridership in the five pilot corridors. Metro may find that limiting off-board fare payment infrastructure to these stops is more efficient than spreading them out along each corridor, though the corresponding savings may also be lower.

Proposal: P3 Arrangement and Performance

Metro hopes to coordinate this effort with FC2, and will provide all necessary inputs and finalized assumptions for an investment pro forma covering multiple scenarios for potential P3s. Once finalized, the pro forma and this business plan will help shape a Request for Proposals. Assuming positive reactions from the business community, Metro and FC2 will work with potential investors to examine and assess the actual costs per stop and kiosk, and provide any additional information and analyses the investor may request. Once all parties have crafted an agreement to move forward, the investor(s) will be responsible for securing all the up-front costs for buying and installing equipment and software, as well as the annual costs for operating and maintaining kiosks. The involvement of FC2 would provide expert financial guidance and open this opportunity to a wider array of potential investors; it may also offer the opportunity to take advantage of financing through a shared Infrastructure Bank. The graphic below illustrates a potential P3 agreement coordinated through FC2.

Potential OBFP P3 Agreement Structure



As part of the final partnership agreement, Metro would commit to guaranteed annual payments to the investor or investment group, in order to help them recoup the up-front costs of implementing the off-board fare payment infrastructure. Those annual payments would be based on reasonable, conservative projections of ridership performance, revenue generation, and operating cost savings. There may even be some potential for profit and revenue sharing from higher fares charged for future premium services, such as bus rapid transit or enhanced express routes. The final business arrangement and implementation strategy could take many forms, but performance estimates for Scenario 1 indicate the projected cost savings would help recoup the initial investment within five years of opening and full operations. The table and chart below summarize the projected intersection of capital outlays and annual payouts based on cost savings.

Metrobus Off-Board Fare Payment Investment Performance - Scenario 1										
Project Operating Years	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Infrastructure + Kiosk Operations	$5,684,231	$11,210,579	$11,531,188	$11,861,415	$12,191,643	$12,521,870	$12,852,097	$13,182,324	$13,512,552	$13,842,779
Cumulative Cost Savings/Payouts	$0	$0	$2,630,846	$5,340,617	$8,050,389	$10,760,160	**$13,469,932**	$16,179,703	$18,889,474	$21,599,246