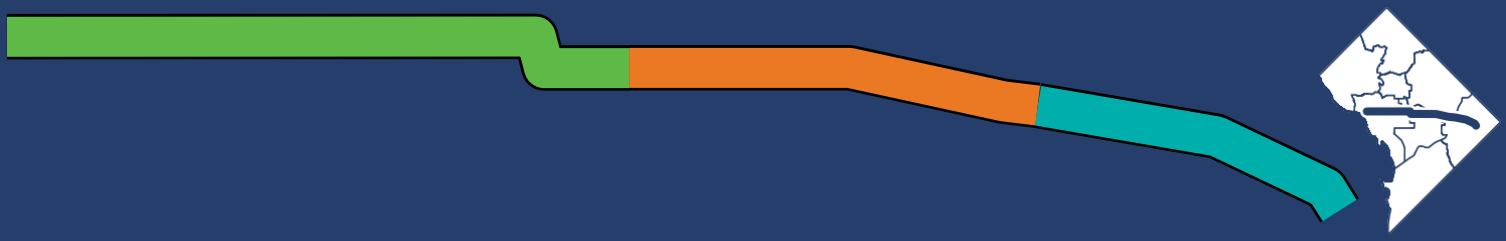


Union Station to Georgetown
Environmental Assessment
Under Development

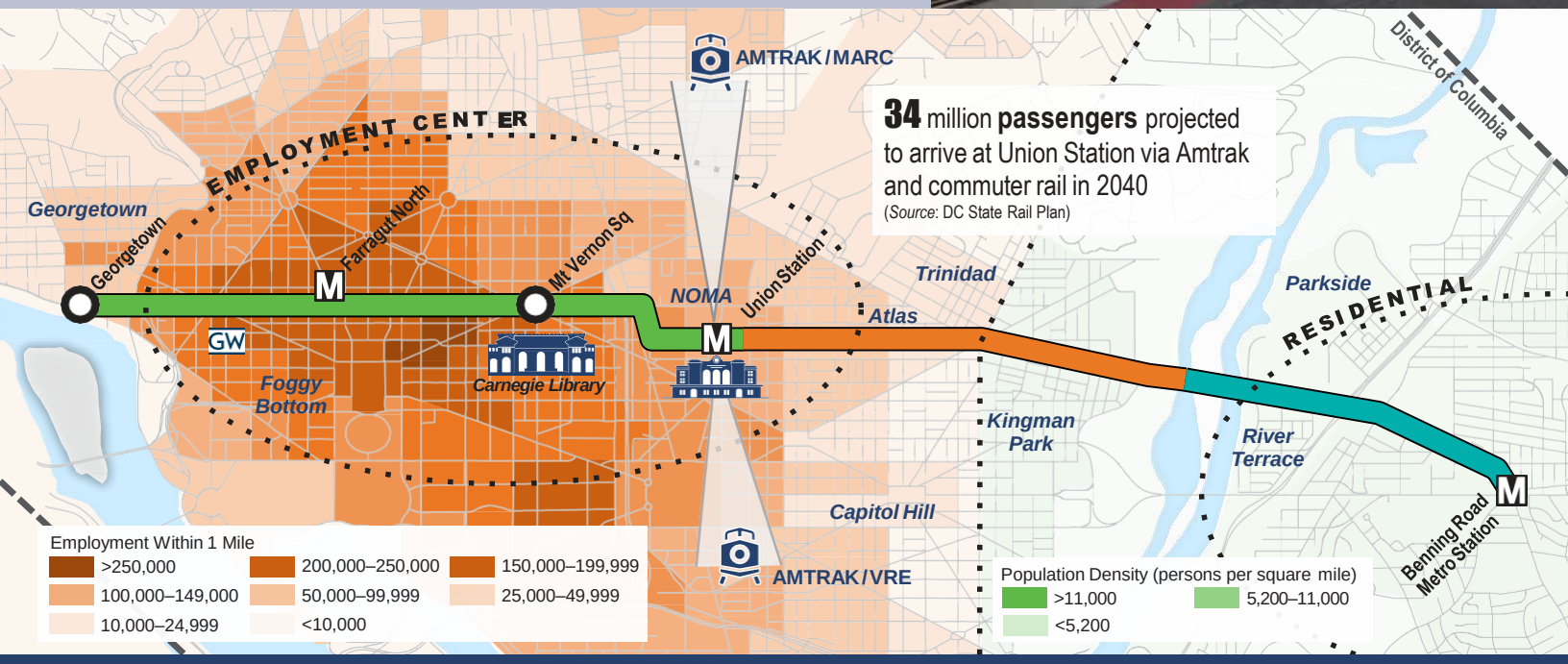
H Street/Benning Line
OPENED FEB. 2016

Benning Road Extension
Environmental Assessment
Under Federal Review

dc streetcar

Streetcar Connects People

- Links people to jobs, shopping, and activity centers
- Provides direct access to H Street, Union Station, and downtown
- Capitalizes on existing streetcar investment by connecting markets east and west of Washington Union Station (WUS)
- Improves operations by providing more reliable, higher speed, and greater capacity transit



The DC Streetcar is Exceeding Expectations

The DC Streetcar exceeds ridership projections, with ridership continuing to grow well into the second year of service. DC Streetcar has also increased service levels since opening to the public in February 2016.

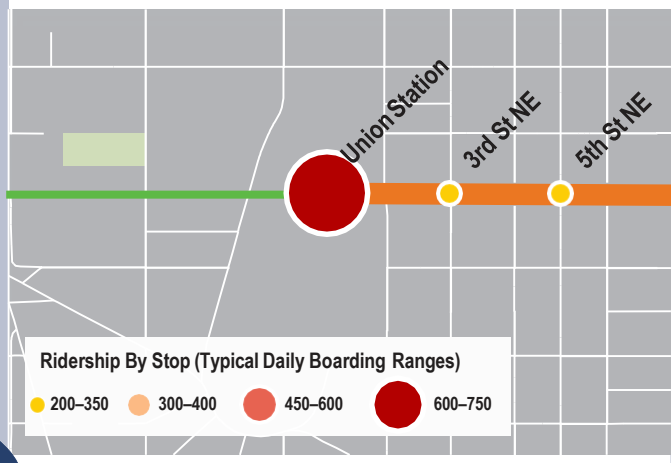
Streetcar Operates More Frequently

In September 2016, DDOT increased streetcar service levels to reduce wait times and serve more passengers.

Service increased **36%**

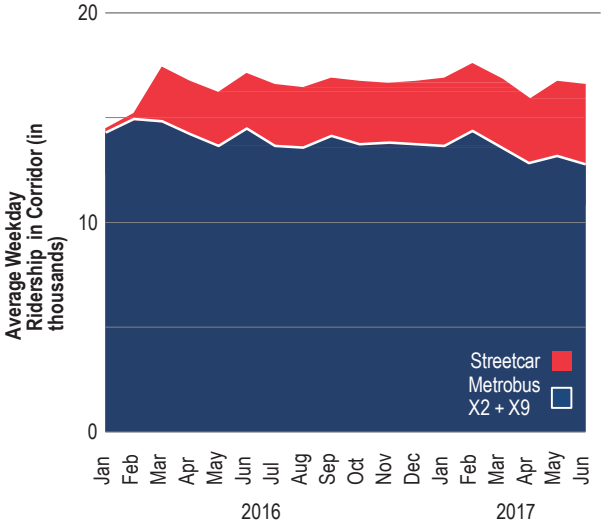
2016	15 min. headway	6 days a week
2017	12 min. headway	7 days a week

Weekday Ridership By Stop



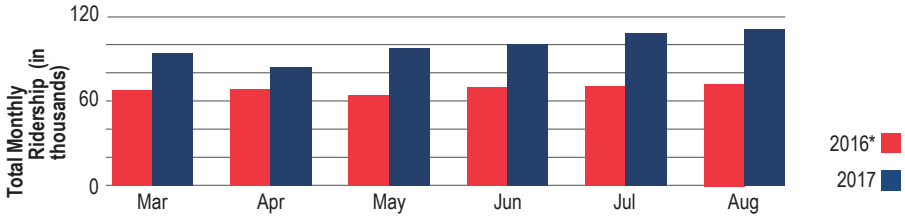
Streetcar Attracts New Transit Riders

Ridership on the X2/X9 Metrobus routes has remained relatively constant as streetcar service started operations. However, the total number of transit riders in the corridor has grown demonstrating that streetcar has attracted new transit riders and is accommodating ridership growth driven by development on the corridor.



Streetcar Ridership is Growing

Overall, streetcar has experienced a 44% increase in ridership month-over-month from 2016 to 2017.



* In 2016, service operated six days per week with 15 minutes headways; since 2016, streetcars have been operating seven days per week with 12 minute headways.

Streetcar Performance

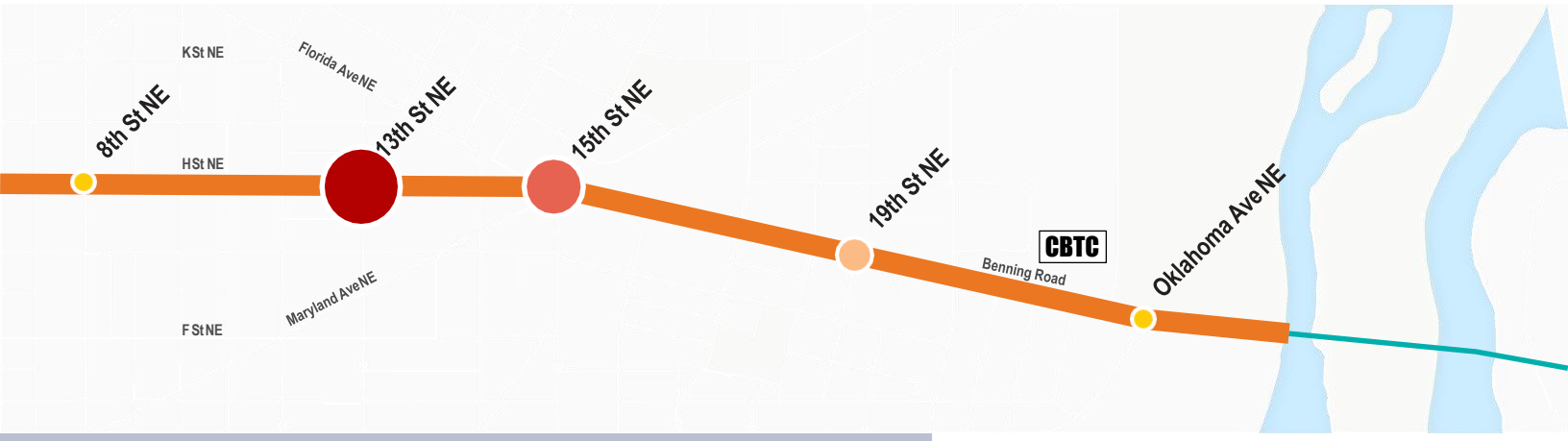
111,000 total **monthly passengers** (August 2017)

3,700 average **weekday** ridership (August 2017)

20 minutes average end-to-end **travel time**

12 minutes average **headway** (time between streetcars)

H STREET/BENNING



The Car Barn and Training Center is Operating

The Car Barn and Training Center (CBTC) opened in 2017. All maintenance for the fleet of six streetcar vehicles is conducted here.

- LEED certification in process
- Operations center completed in March 2017
- Final construction was completed in July 2017
- 48 employees based at the CBTC

Streetcar Serves Events

In January 2017, DC Streetcar had its **highest** ridership day since launch day.

7,350 passengers rode on January 21, 2017.


Car Barn and Training Center

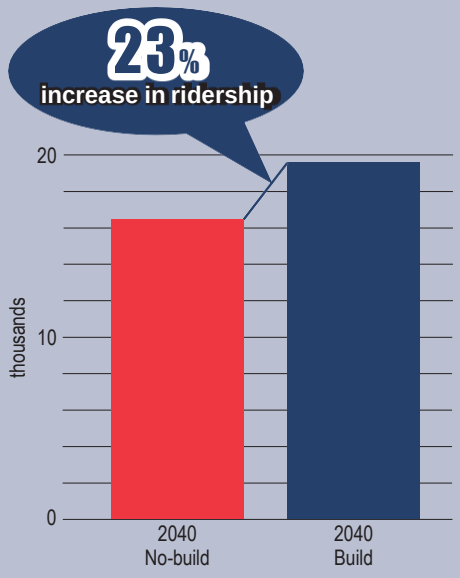

Control Center

dcstreetcar

A Final Environmental Assessment Is Anticipated In Early 2019

DDOT has been completing an Environmental Assessment (EA) as required by the National Environmental Policy Act (NEPA). In 2016, DDOT released a draft EA to the public and agencies. The final EA will be released in early 2018.

Total Daily Transit Riders in Benning Extension Corridor



The Benning Road Extension Improves East/West Connectivity

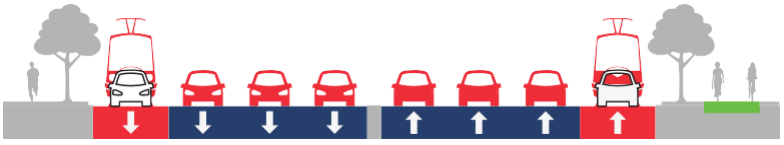
The nearly 2-mile extension will:

- Provide **additional all-day transit service**, including early morning and evening service
- Increase **access to jobs and activity centers** in the District
- **Improve mobility and accessibility** between Oklahoma Avenue NE and the Benning Road Metrorail station
- Provide a **one-seat ride** to Union Station and eventually downtown

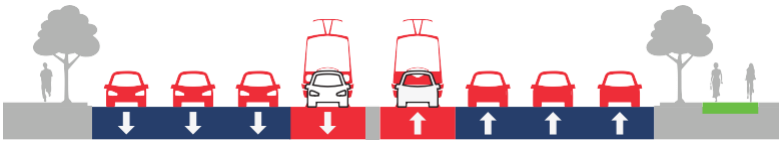
What Will It Look Like?

The Benning Extension EA examines three alternatives:

- **No Build Alternative** – includes the existing roadway, [illegible] sidewalks, and transit service
- **Build Alternative 1** – Curbside Alignment Streetcar



- **Build Alternative 2** – Median Alignment S[illegible]



Projected Performance on Benning Road Extension

3,700
new transit riders in corridor
by 2040 (compared to 2016)

2,400
daily streetcar riders
on opening day

5,000
daily streetcar riders
by 2040

BENNING EXTENSION

Extend Streetcar Service East To Ward 7

The Benning Extension provides a new, direct connection from Ward 7 to H Street and Union Station. Eventually, the Benning Extension will provide an additional one-seat ride from Ward 7 to jobs and activity centers downtown.

Improve Conditions of Roads, Bridges, and Sidewalks

Roads, bridges, and sidewalks along Benning Road are in need of improvement and may present safety hazards. The Benning Extension project will also improve these conditions.

Improve Transit Service Along Benning Road

Currently, buses in this corridor are crowded and can be unreliable. Many destinations along the corridor require transfers. Streetcar will increase transit capacity and operate 18 to 20 hours most days.

Timeline

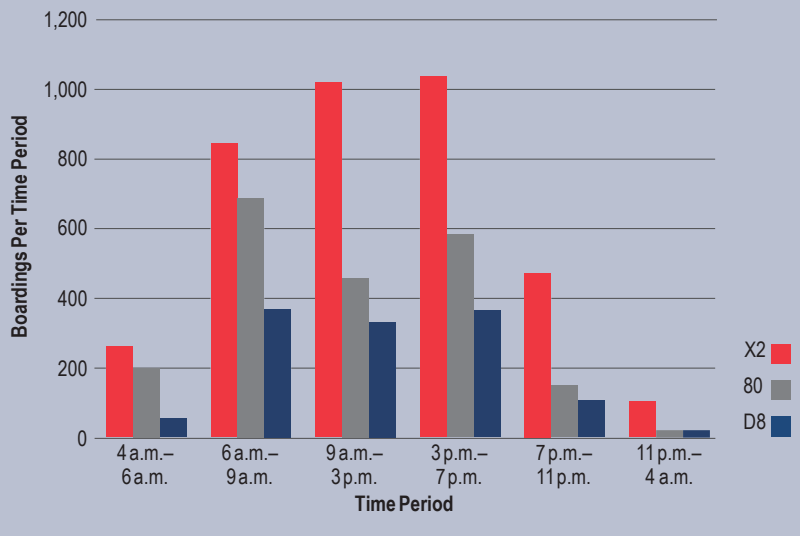
- 2017 — Environmental Assessment Document
- 2018
- 2019 — Design
- 2020
- 2021
- 2022 — Construction
- 2023
- 2024 — Testing and Begin Revenue Service
- 2025

High Demand and Slow Surface Transit

Today there are numerous bus routes operating along or parallel to the Union Station to Georgetown (USGT) corridor to serve the high demand for east-west transit service. Ridership on these bus routes is high; on an average weekday over 80,000 passengers board and alight buses in the future USGT streetcar corridor.

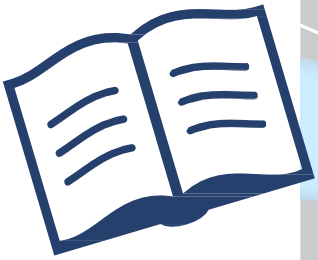
Further, there is high ridership throughout the day. Several routes also have high ridership during early morning and evening hours, as illustrated by the time of day demand for bus routes X2, 80, and D8. (Ridership figures are across the entire bus route, not only within the USGT corridor).

High Ridership Throughout the Day on East/West Bus Routes (2016)

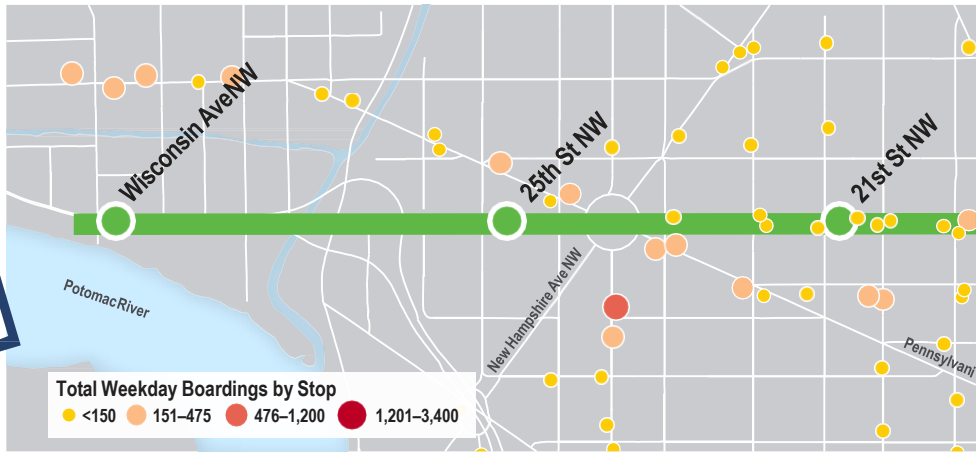


An Environmental Assessment expected in 2018

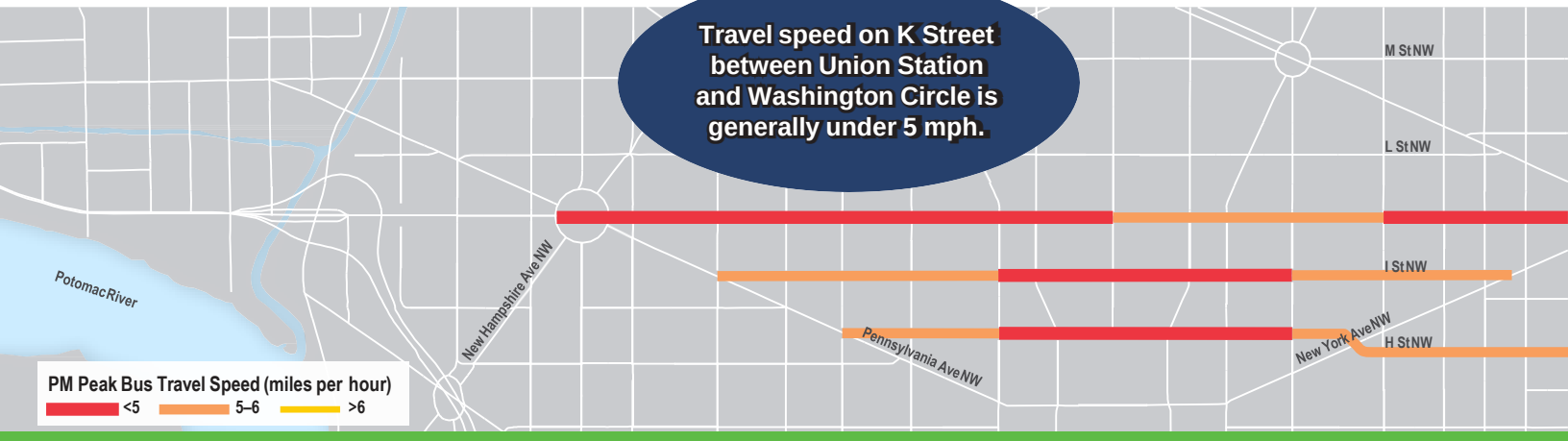
DDOT is conducting an Environmental Assessment (EA) for Union Station to Georgetown to evaluate existing transit service. DDOT expects to publish the EA in 2018.



High Transit Ridership Across USGT Corridor



PM Peak Bus Speeds



UNION STATION TO GEORGETOWN EXTENSION ON

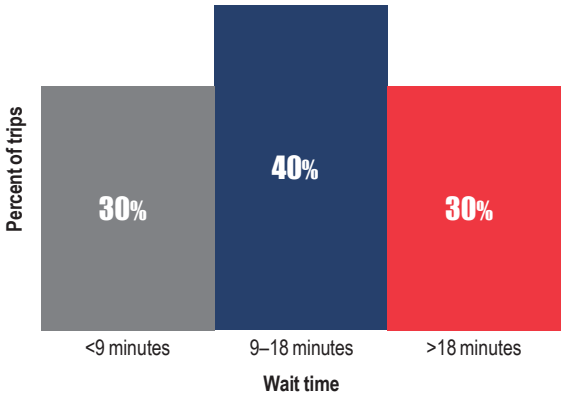
Low Speeds and Variable Headways Result In Poor Reliability

Average headways (time between buses) for the Georgetown to Union Station (GTUS) DC Circulator bus routes are 13–14 minutes.

Headways along the route vary significantly. Approximately 40% of bus runs have headways of 9 to 18 minutes which means they arrive within four minutes of the average headway. The majority of runs (60%) are either early or late. Thirty percent of runs have headways of more than 18 minutes and another 30% have headways of less than 9 minutes.

Variable headways mean that passengers cannot rely on the bus coming within an acceptable time period.

DC Circulator Frequency and Reliability (GTUS Route)



Lots of People and Traffic Congestion = Slow Speeds

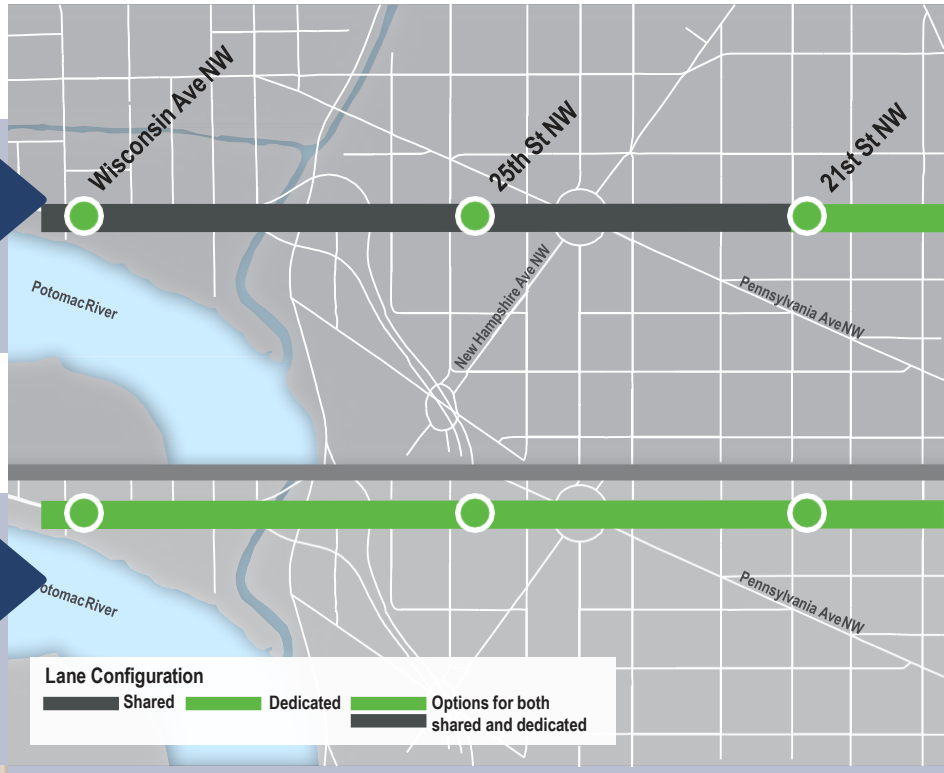
Bus speeds through the downtown core are slower due to passengers boarding (and alighting) and near constant traffic congestion. Traffic congestion is a result of many types of vehicles and passengers using this constrained corridor, as well as roadway layouts that lead to persistent lane blockages.

Typically, bus speeds are less than 5 mph for most segments of the corridor throughout the day.

USGT Will Operate Off-Wire in Dedicated or Shared Transit Lanes

The USGT EA examines two build alternatives (and one no-build alternative). The build alternatives combine sections of shared and dedicated lanes for transit:

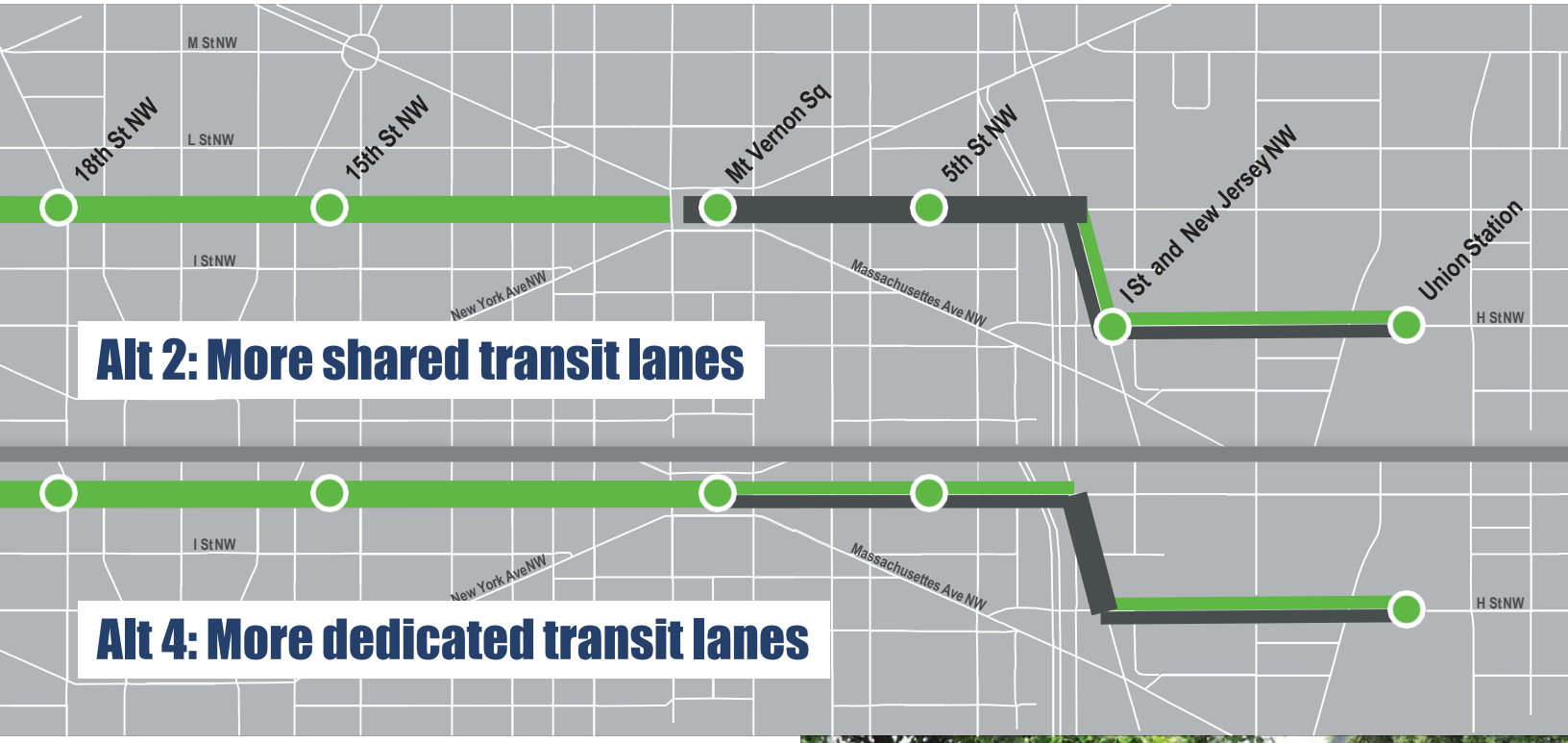
- **Alternative 1:** No Build
- **Alternative 2:** Mostly curb-running with dedicated lanes along K Street Transitway for Streetcar and WMATA buses
  - **2A/2B:** Options for dedicated lanes east of New Jersey Avenue
- **Alternative 3 Dropped from Consideration:**
  Side-running in service lanes on K Street
  - *Dropped from consideration because it did not meet project goals*
- **Alternative 4:** Mostly center-running with dedicated lanes from Georgetown to Mt. Vernon Square, WMATA buses do not operate in K Street Transitway
  - **4A/4B:** Options for dedicated lanes east of Mt. Vernon Square



Operating Smoothly in a Busy Corridor (Mt. Vernon Square)

Several points along the corridor present challenges for streetcar operation. DDOT is designing streetcar to operate in complicated areas like Mt. Vernon Square that have multiple turns, traffic signals, and heavy traffic and pedestrian activity. In Alternative 4, illustrated below, streetcar operates in a mix of dedicated and shared lanes to optimize both vehicle and streetcar travel speeds, streamline signal cycles, and maximize pedestrian safety.

UNION STATION TO GEORGETOWN EXTENSION



Wireless Operations

Most of the USGT alignment will operate off-wire meaning there will be no overhead wires along the majority of the corridor; minimizing visual impacts. The design would feature:

- Overhead charging at each stop
- On-board energy storage (battery and super capacitor) to provide consistent power for acceleration and operations, as well as rapid recharging
- Off-wire operations except on steep grades, under and in tunnels

Wireless Systems in Operation

Simulations with maximum load and maximum delay show that wireless technology is viable on the USGT corridor. Off-wire operations will become even more feasible in the future as technology improves and as a growing number of cities, including Dallas, Detroit, and Seattle, employ wireless operations.

PHOTO COURTESY OF BROOKVILLE EQUIPMENT CORPORATION

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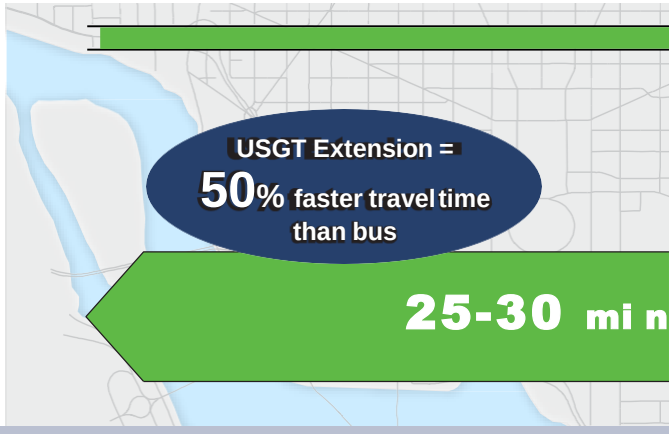
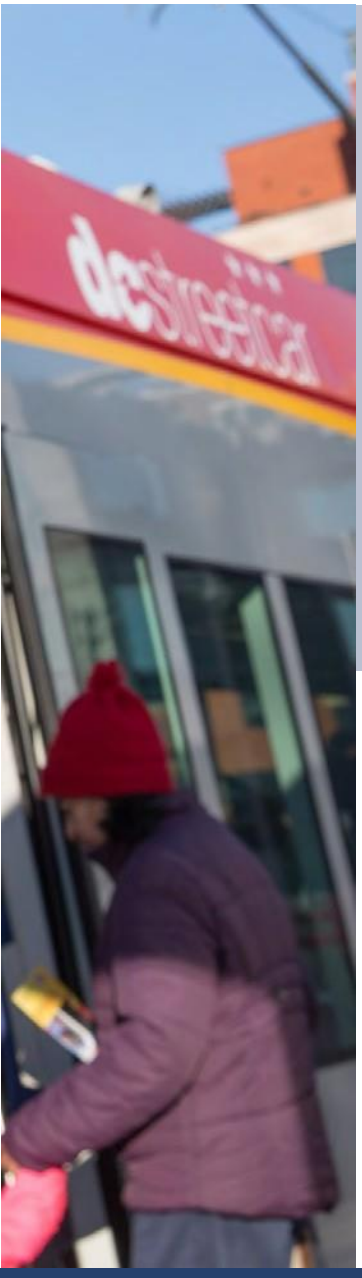
Planning for High-Performance Streetcar System

DDOT is planning for improved transit service by considering alternatives that operate streetcars in lanes dedicated to transit or in the center lane where conflicts with parked and turning vehicles are minimized.

Moving Streetcar Faster





Expecting High Ridership

24,000 riders (system-wide) on opening day

30,000 daily riders (system-wide) in 2040

3,000 system-wide riders per corridor mile

5,700 USGT-only riders per corridor mile

Storage and Maintenance Facility

With 15 new streetcar vehicles anticipated to extend service from Union Station to Georgetown a second storage and maintenance facility is needed to house the expanded fleet.

DDOT is preparing for this need by:

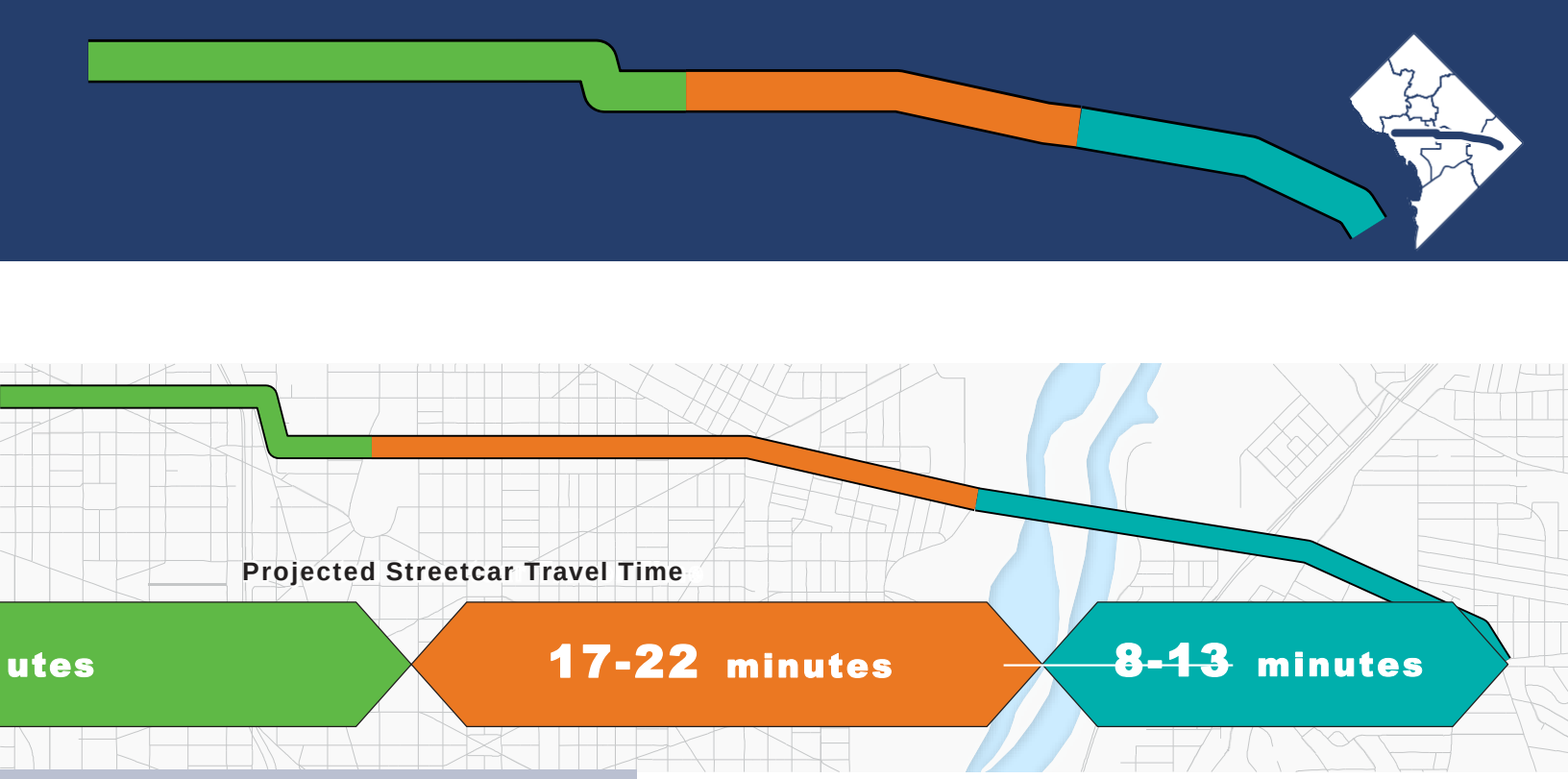
- Studying feasible sites for storage and maintenance

Making Connections

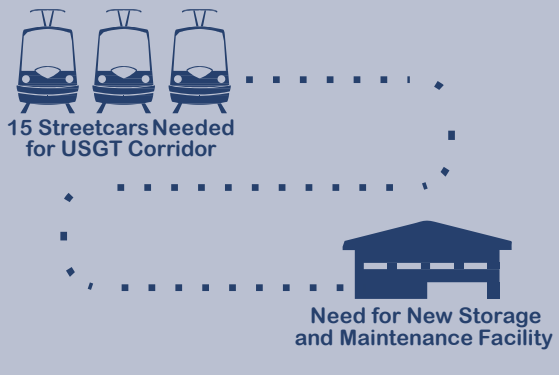
Fill network gaps: Many growing and underserved markets lack a simple transit connection, which streetcar can provide. These connections include:

- Ward 7/H Street to Mt. Vernon Square
- H Street to Georgetown
- NoMa/Union Station to Foggy Bottom/West End

Serve Washington Union Station Expansion: Union Station's planned expansion will bring 60,000 additional Amtrak and commuter rail passengers by 2040. Streetcar will help these passengers travel east and west across the District.



along the entire east-west streetcar corridor
- Identifying criteria for operational and environmental feasibility
- Including up to three sites in the USGT EA

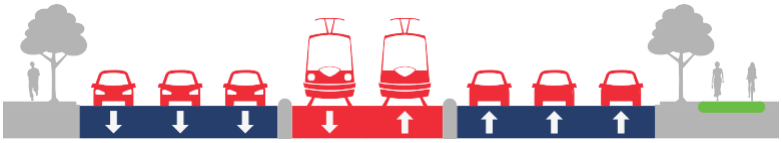


Designing for Reliability

Dedicated Transit Lanes

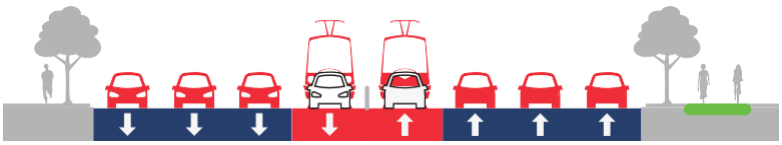
Dedicated transit lanes are reserved for the exclusive use of transit vehicles. These lanes have several advantages. These include:

- Increasing reliability and speeds, helping with consistent headways, and generally improving efficient operations
- Reducing delays and service interruptions caused by parked freight deliveries, and drop off and pick ups



Center-Running Lanes

Center-running lanes allow streetcars to operate in the left lane, closest to the median. Unlike curb-running lanes, streetcars operating in center-running lanes face fewer delays or service interruptions from double-parked vehicles, buses, and opening car doors. Center-running lanes offer greater transit reliability than curb-running lanes.



Provide new rail connection to Georgetown: Georgetown is a major activity center with limited connectivity to the east due to the natural barrier of Rock Creek. Georgetown is not currently served by a Metrorail station, and streetcar would offer the first rail service to this vibrant neighborhood.

Schedule and Costs

SEP 2013
DDOT Publishes Alternatives Analysis Report and Propulsion Study

FEB 2016
H St./Benning Streetcar Begins Service

MAY 2016
Agency and Public Meetings

Draft Environmental Assessment (EA) Benning Road Extension

Benning Extension Public Hearing

NOV 2016
Agency and Public Meetings

JAN 2017
Propulsion Report Update for the DC Council

FALL 2017
Agency and Public Meetings

2018
Publication of USGT EA

USGT Public Meetings

2019
Publication of Benning Extension EA

Benning Extension NEPA decision documents

Public Hearing for USGT EA

USGT NEPA decision documents

2021-2024
Benning Extension Construction

2025
Benning Extension Testing and Begin Revenue Service

Costs

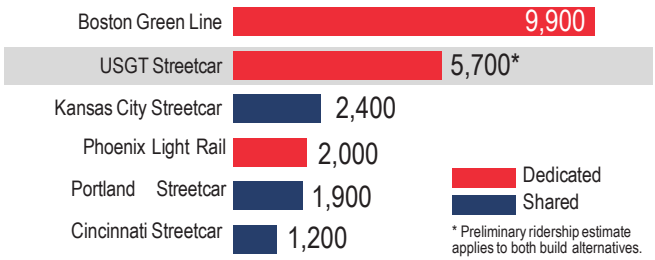
Cost Category	Benning Extension	USGT (includes streetcar, roadway improvements, and maintenance facility)
Design and Engineering	$22 million	$45 million
Construction	$180 million	$330 million
Vehicles	$20 million (4 vehicles)	$75 million (15 vehicles)
Earliest feasible completion year	2025	2028

Projected Ridership Show USGT is Competitive for Federal Funding

Predicted daily ridership on the USGT Streetcar is expected to be higher than most other streetcar or light rail lines in the United States.

This makes USGT a strong candidate for federal grant funding which the District plans to pursue.

Boardings Per Corridor Mile



District Department of Transportation

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MURIEL BOWSER, MAYOR