

Issues and Considerations for Streetcar in Urban Environments

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Rail Conference



Agenda

- BQX Study
- Planning and Route Challenges
 - Utilities
 - Moveable Bridges
 - Gentrification
 - Major Arterials
 - Narrow Street Design
 - Maintenance and Storage Facility
- Design, Engineering, and Construction Challenges



BQX

A **comfortable, reliable and rapid** north-south transit connection between **waterfront neighborhoods in Queens and Brooklyn** that is cost effective to build. Service reliability, quality, and permanence will increase property value along the route.



Criteria to make BQX work:

- Offer **reliable and regular service**
- **Improve travel times** in the corridor
- A well situated and designed alignment leads to **higher property values** that can be captured to fund construction
- Be **cost effective** to build and maintain
- Comparably short **implementable time frame**

BQX highlights:

- Alignment: **14.1 miles** with **32 stops** between Sunset Park, Brooklyn and Astoria, Queens
- Projected **daily ridership of 58,000** (2024)
- Implementation of dedicated ROW
- Aggressive **transportation engineering** solutions.

Historical Context: Brooklyn and Queens Waterfront

Early 1900s: **Boom in waterway commerce** resulted in development of industrial/manufacturing uses up to Hunters Point, Queens, with a concentration of shipbuilding and oil-refineries.

Public housing projects such as the still-standing, 2,163-unit Ravenswood development (1939) were constructed through 1930s.

1970s brought about **renewed interest in living** in waterfront Brooklyn and Queens neighborhoods.

1900

● **1854:**
Horse-drawn streetcar begins in Brooklyn.

● **1890-1909:**
Electric streetcar operates in Brooklyn

1958

The Brooklyn-Queens Expressway (BQE) created a **physical disconnect** between the waterfront and nearby neighborhoods.

Decline in water reliance through mid-1900s resulted in economic downturn of waterfront commerce.

1990

Rezoning in 1990s permitted larger scale residential development along waterfront.

Today

The area supports the City's expansion with key **economic hubs** and neighborhoods along the waterfront.



PLANNING AND ROUTE CHANGES



Utilities

Challenges

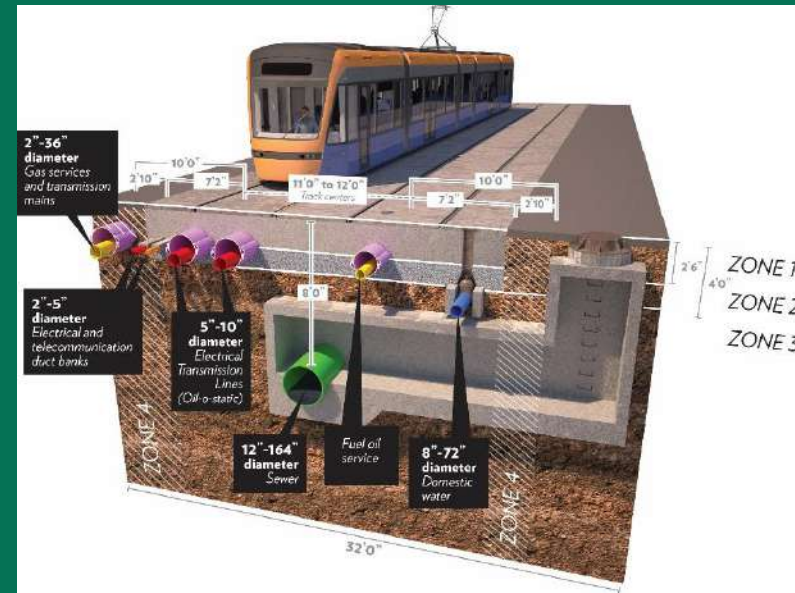
- Dense Network of existing utilities – many electrical lines are buried (oil-o-static)
- Variability in cost and time; unknown until relocation work begins
- Large fuel lines (XX') and sewer mains (17') exist under the roadways which will have unknown impacts to construction duration and cost



Oil-Static line (high voltage power line cooled by oil)

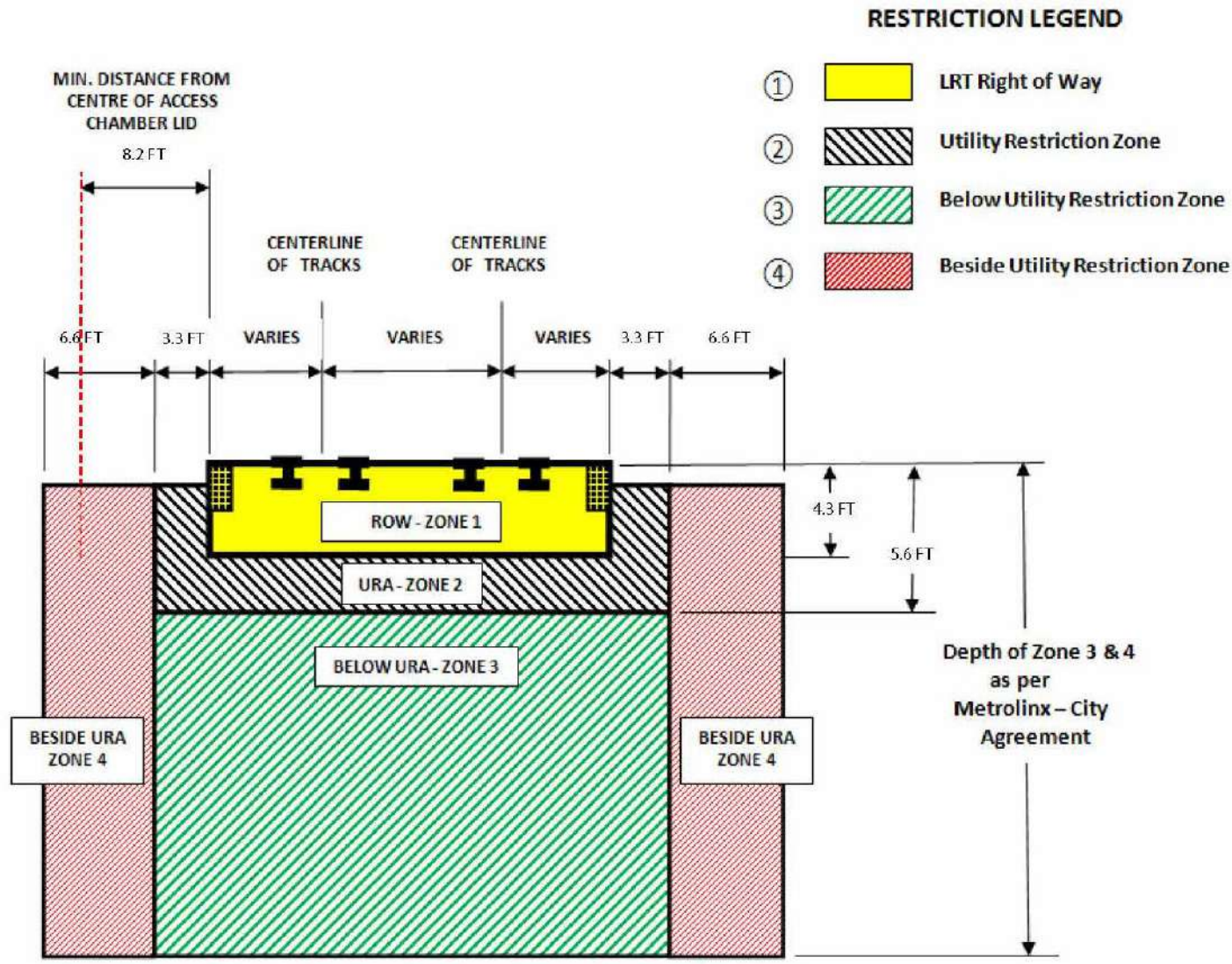
Solutions/Options

- Creative Track Structure
 - Minimize track slab thickness
- Zone approach to rehab and keep in place where possible. Creative Maintenance Access solutions
 - Offset manholes
 - Access agreements



Utility Cross-section

LRT Utility Restriction Zones



Moveable Bridges

Challenges

- Bridges are needed over Gowanus Canal and Newtown Creek
 - Both sites are contaminated Superfund Sites which may complicate construction schedule.
- Required federal approval may impact project schedule
 - Coast Guard, Army Corps of Engineers, 10+ Federal Agencies
- There are limited suitable landing locations within the study area
- Propulsion across movable spans must be addressed (on- vs. off-wire)
- Carrying catenary systems over movable spans is complicated
 - Connection/Reconnection during opening
 - Maintenance issues

Solutions/Options

- Bridge alternatives developed at low-, mid-, and high- spans to address potential conflicts
- Precedent: WAVE Streetcar Bridge in Ft. Lauderdale, Florida will use battery power over the movable span
- Impacts to:
 - Communities
 - Waterborne Traffic
 - Streetcar
 - Budget



17th Street Bridge, Ft. Lauderdale, Florida

Neighborhood Impacts

Challenges

- Concerns that new developments would “price out” current residents within the study area
 - Community concerns around gentrification undercut support for the project
- Implementing BQX would create a reduction of 2,000-3,000 existing parking spots. 64% of Queens households and 44% of Brooklyn households own at least one car
- Resident and business owners concerns over construction duration
- Potential long-term changes to neighborhood character

Solutions/Options

- Maintain regular communication with community leadership
- Explore expansion of mandatory inclusionary housing
- Understand options for parking displacement
- Innovative contracting strategies

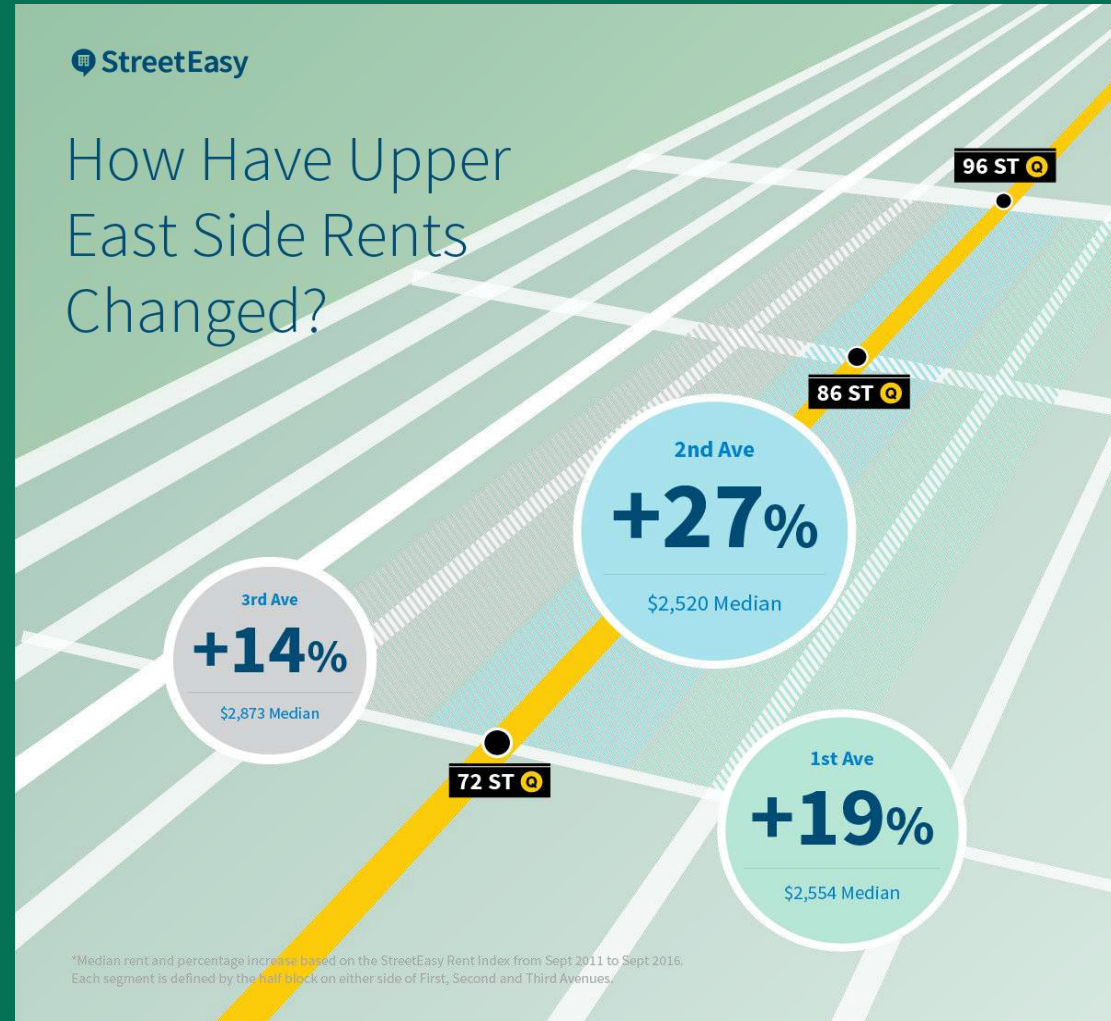


Williamsburg, Brooklyn

Neighborhood Impacts: Case Study

Rental Rates surrounding 2nd Avenue Subway

- StreetEasy study reports:
 - \$462 increase in rent
 - (27%) increase over 5 years along 2nd Avenue, with increases of 19% and 14% along adjacent 1st and 3rd Avenue, respectively.
- The results of the 2016 study found renters will pay \$33 per month more for every minute they save on their commute to 42nd Street, they said.



Reducing Vehicular Capacity on Major Arterials

Challenges

- BQX requires vehicular/lane capacity reduction on major arterials
 - 21st Street in (at 39th Street) currently carries approximately 24,000 vehicles per day
 - Major connector between bridges
 - Atlantic Avenue serves as a major connection to BQE.
- A BQX alignment would impact both parking and vehicle capacity on these roadways

Solutions/Options

- Creative traffic engineering and street design
- Acceptance of new mobility trends



Cross section of existing conditions along 21st Street at 39th Street, Queens

Atlantic Ave Photosimulation

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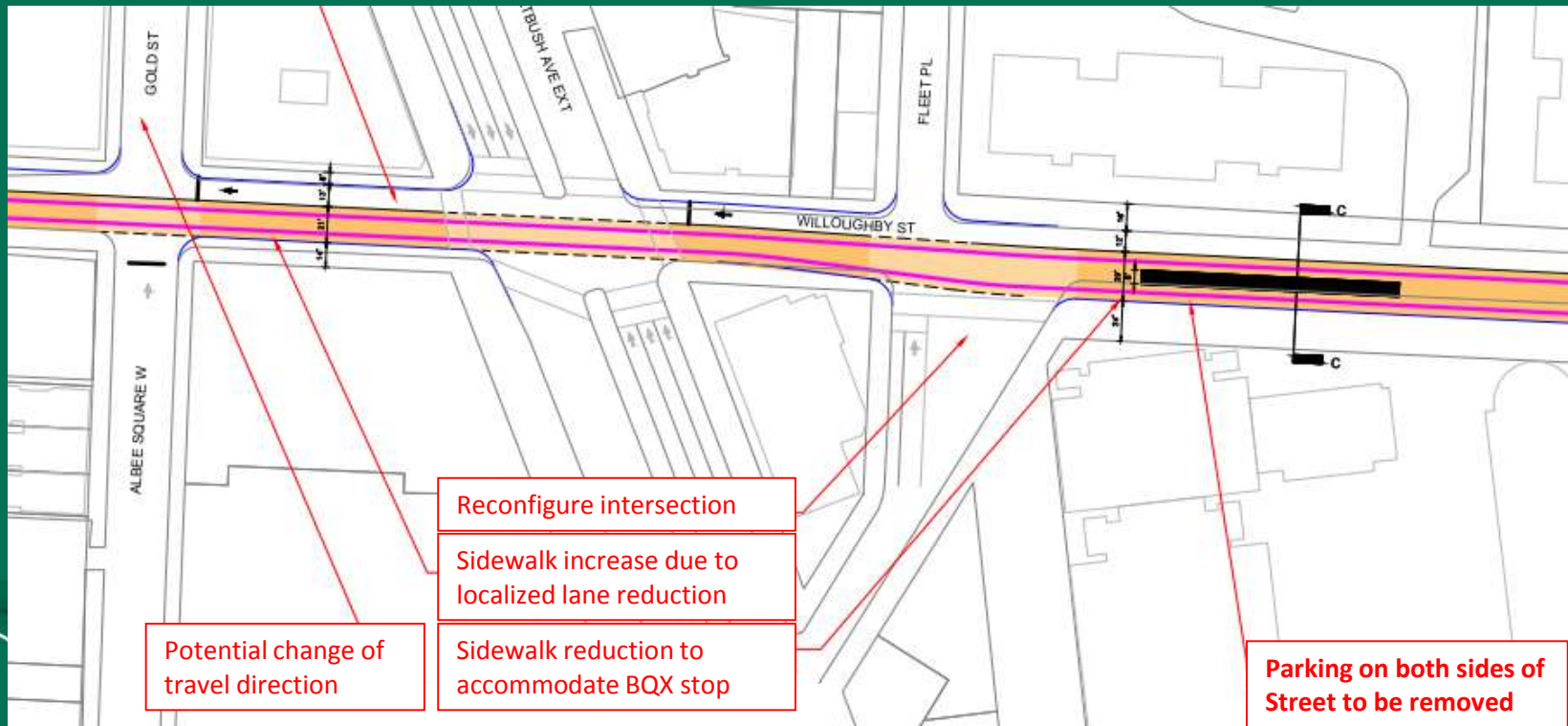
Narrow Roadways

Challenges

- Accommodating streetcar may create major impacts on use of existing local streets
- Removal of parking and/or travel lanes may be required

Solutions/Options

- Acceptance of new mobility trends



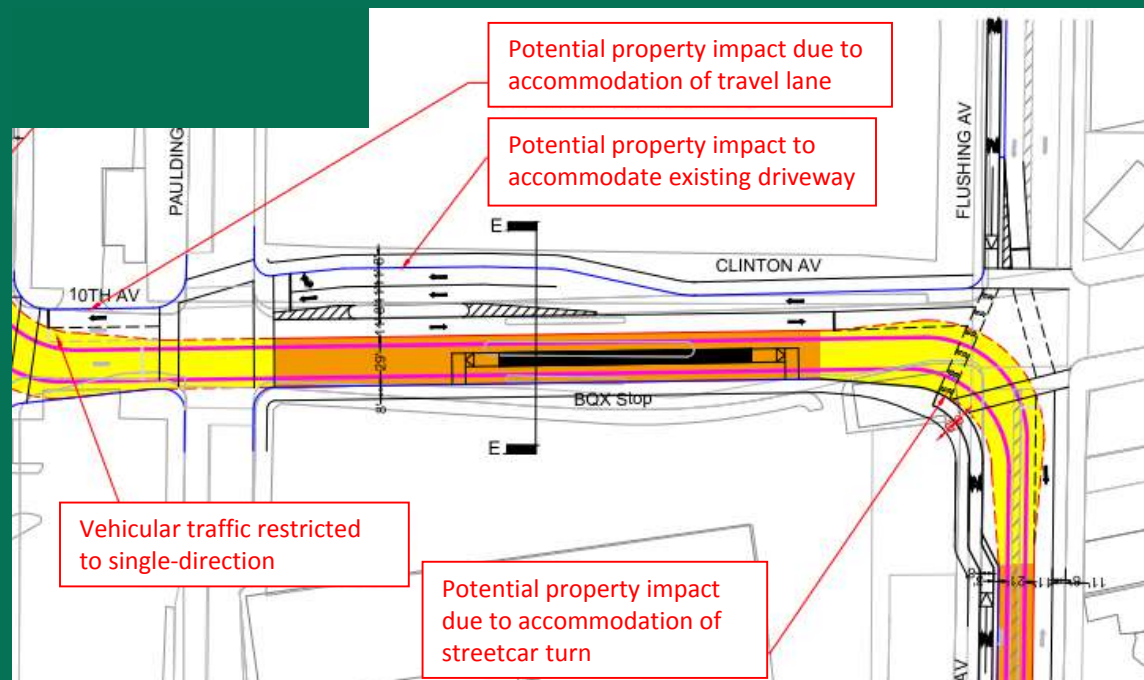
Tight Curves

Challenges

- Existing roadway geometry necessitates tight turning radii
- Turns would reduce travel speed and passenger comfort

Solutions/Options

- Acquisition of adjacent property to accommodate turns
- Specialty vehicles which can navigate tighter curves
- Reduce sidewalk widths (at corners)



Narrow Roadways

Challenges

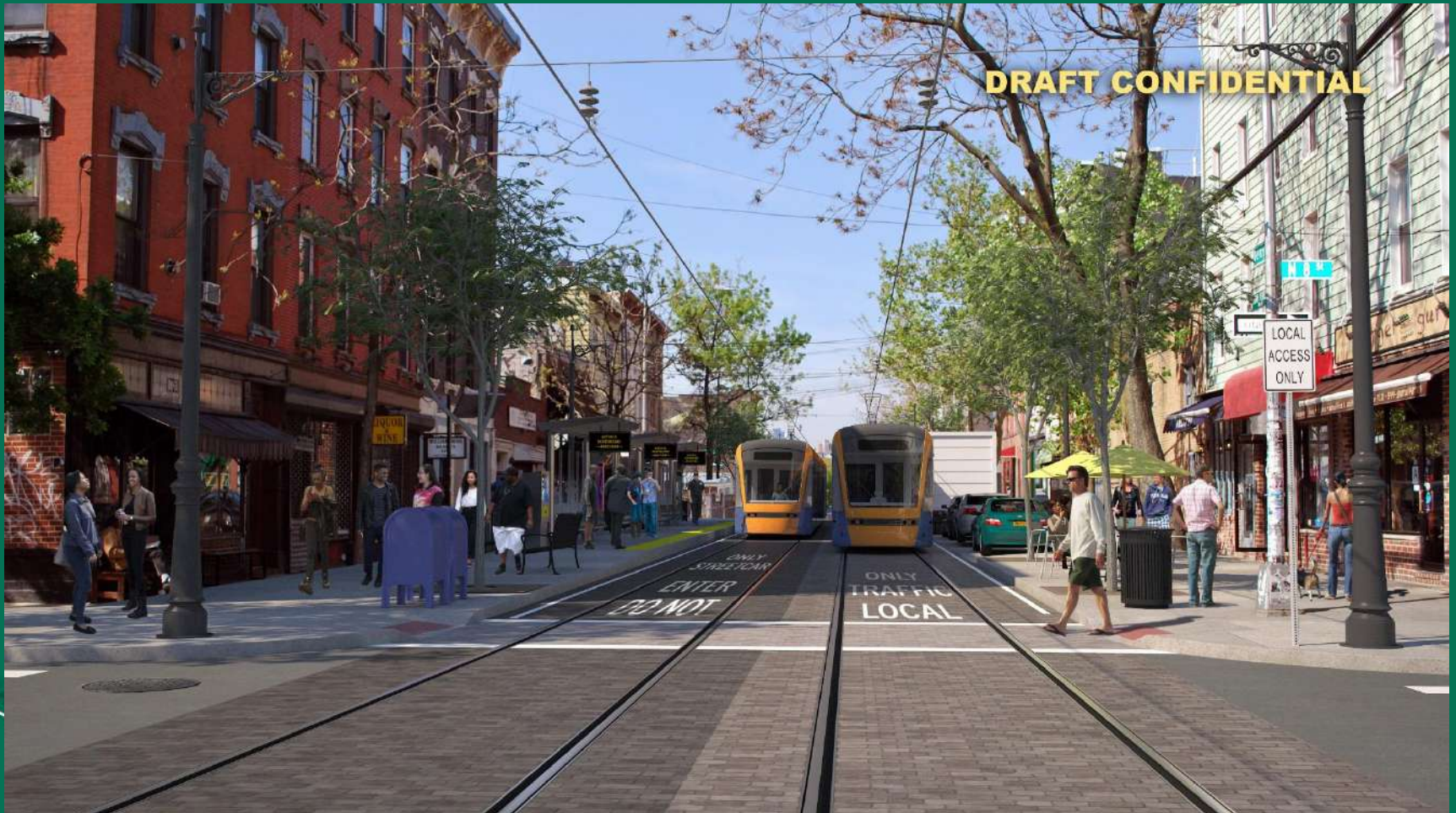
- Existing Roadway may not be able to accommodate bidirectional BQX and vehicular traffic



Narrow Roadways

Solution

- Convert dedicated segments of the alignment to transitways



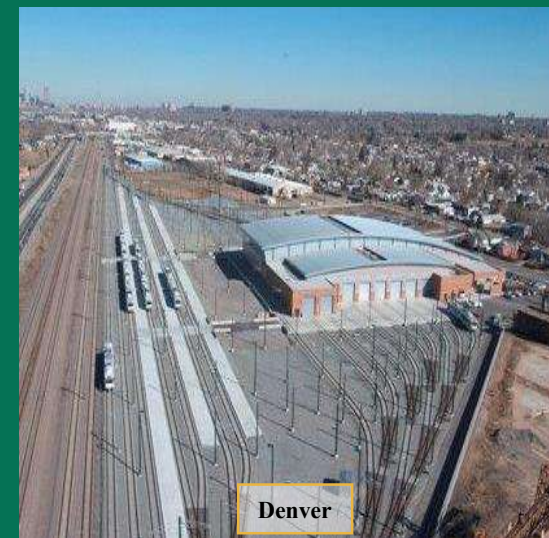
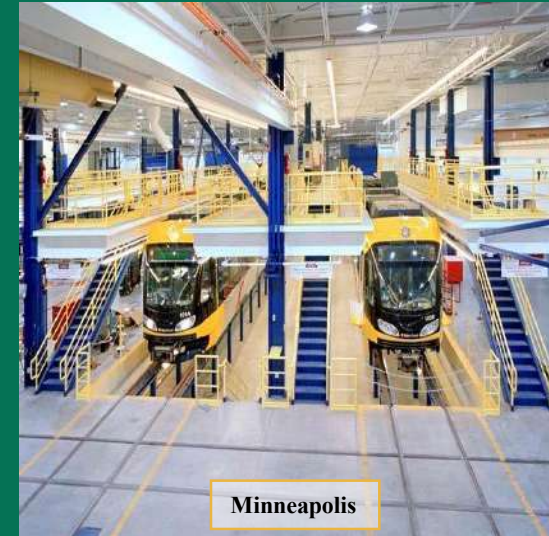
Maintenance + Storage Facility

Challenges

- Need to identify 8-10 acres in size in close proximity to the alignment in a physically-constrained geography and expensive real estate market
- Sites available will have remediation issues (cost + time)
- Need to identify properties which will allow for timely and affordable acquisition (real estate value consideration)
- Need for site which allow for multiply entry tracks
- Concerns around eminent domain

Solutions/Options

- May require separate parcels of land to meet required area for facility
- Prioritize city-owned land for maintenance facility sites
- Creative site design
 - Utilizing multi-story facilities
 - Creative track geometry





DESIGN, ENGINEERING, AND CONSTRUCTION CHALLENGES



Design, Engineering, and Construction Costs

Challenges

- Undefined factors will impact budget and schedule. Items not included in Capital Cost Estimate:
 - Hazardous waste removal
 - Right-of-way acquisition
 - Utility Relocation
 - Railroad force accounts
 - Engineering and inspection
- Challenges associated with building within the New York City context
 - Traffic enforcement agents
- No city-owned transit agency for delivery by NYC
 - Limited in-house streetcar/LRT operational expertise and experience in New York
- Construction includes two bridges
- One of the largest capital projects undertaken by City of New York
- All of the challenges described previously could impact the project budget and schedule
- When completed, BQX will be largest Tax Increment Financing project in US.
 - There are no NYC precedents for TIF implementation
- The first major Public Private Partnership (P3) NYC would undertake
- Deliver a complex project on schedule and within budget
- When completed, BQX will be largest Tax Increment Financing project in US.

Design, Engineering, and Construction Costs

Solutions/Options

- Focus on stakeholder relationships
 - Foster strong relationships with financial partners
 - Building confidence in project with project team
 - Coordinate regularly with the community and project stakeholders
- Create local development corporation
 - Use industry best practices for design/engineering
 - Develop new contracting processes and project management organization
 - Build out in-house streetcar/LRT expertise

