Brooklyn Streetcar Feasibility Study

Presentation to Community Advisory Committee
April 14, 2011 – CAC Meeting #3
Outline

• Study Overview
• Recap of Interim Reports
• Feasibility Analysis
• Short-Term Non-Streetcar Transit Improvements
• Next Steps
Study Overview
Study Purpose

- Determine the feasibility of a streetcar linking Red Hook with surrounding areas

Goals:

- Identify potential alignments
- Identify unit costs, and potential impacts (e.g. construction, utilities, traffic)
- Determine the feasibility of a streetcar in the Focus Area with connections to the larger Study Area
## Study Overview

### Schedule

<table>
<thead>
<tr>
<th>October</th>
<th>November</th>
<th>December</th>
<th>January</th>
<th>February</th>
<th>March</th>
<th>April</th>
<th>May</th>
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<tbody>
<tr>
<td><strong>Existing Conditions &amp; Case Study Report</strong></td>
<td><strong>Identify Potential Routes</strong></td>
<td><strong>Cost Estimating, Construction Issues and Alignment Evaluation</strong></td>
<td><strong>Work Completed To Date</strong></td>
<td><strong>Feasibility Evaluation</strong></td>
<td><strong>Final Report</strong></td>
<td><strong>CAC Meeting</strong></td>
<td><strong>Public Meeting</strong></td>
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**CAC Meeting**

**Public Meeting**
Recap of Interim Reports
Existing Conditions - Focus Area Transit Service

- High percentage of households with no vehicle (81.5%)

- Transit Service
  - B61 bus
    - 11,013 Average Weekday Riders
    - 8 Minute AM Peak Headway
  - Nearby Subway station at Smith/9th Street (F, G)

- Transit Issues
  - No subway service within Focus Area
  - Long travel time to Downtown Brooklyn
  - Perceived lack of bus reliability
Recap of Interim Reports
Transit Demand Analysis

Existing Study Area
Transit Ridership
14,809/day

% Increase Ridership
Due to Streetcar
12.3%

New Riders with Streetcar
1,822/day

Transit Ridership With Streetcar
16,631/day

Additional Trips from Committed Development
1,592/day

Ridership with Future Development
18,223/day
(23% increase)
Recap of Interim Reports
Case Studies

SELECTED SYSTEMS

Portland, OR
Seattle, WA
Philadelphia, PA
Recap of Interim Reports
Case Studies–Key Findings

- Early utility coordination with public/private entities is a key factor

- Integration with existing bus and subway network is critical

- Increased development can occur with complementary incentives (Portland and Seattle); Streetcar alone will not result in additional development (Philadelphia)

- Streetcar ridership can build from first year (Portland and Seattle); Not all streetcar systems yield ridership increases (Philadelphia)

- Streetcar tracks can pose bicycle safety concerns; Design should minimize impacts on bicycle lane network
Feasibility Analysis

What would be the issues and constraints?

What would be the benefits?

What would the optimal route be?

Decision on Pursuing Streetcar in the Study Area

What would it cost?
Feasibility Analysis
Alignment Options

Red Hook Inset

Meets major Downtown Brooklyn transit hub at Borough Hall, via loop or terminus, or continues to Atlantic Terminal.

Travels mixed-use Van Brunt corridor, but width may require pair with Richards.

Various possible connections to Columbia Street and portions of Carroll Gardens not served by subway.

Connects Smith/9th subway, Red Hook Houses, IKEA, Fairway, and other waterfront destinations.

Legend
Potential Alignment Options
- Bead Street
- Focus Area East
- Centre Street
- Focus Area West
- Van Brunt Street 1
- Van Brunt Street 2
- Middle Section
- Columbia Street
- Columbia Street 1
- Columbia Street 2
- Northern Section
- Atlantic Avenue
- Borough Hall 1
- Borough Hall 2

NYCDOT - BROOKLYN STREETCAR FEASIBILITY STUDY
## Feasibility Analysis
### Selected Goals, Objectives, and Evaluation Criteria

<table>
<thead>
<tr>
<th>Goal/Objective</th>
<th>Evaluation Criteria</th>
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<tbody>
<tr>
<td><strong>Improve Transportation Mobility</strong></td>
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<tr>
<td>Provide transit accessibility</td>
<td>Population within 1/3-mile of alignment</td>
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<tr>
<td><strong>Provide Economic Opportunity and Enhance the Community Character</strong></td>
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<tr>
<td>Serve propose/projected development</td>
<td>Future development within 1/3-mile</td>
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<td><strong>Maintain Traffic and Delivery Access</strong></td>
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<td>Maintain Curb Access</td>
<td>Minimize changes in linear-feet of access</td>
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<tr>
<td><strong>Minimize Impacts on Built/Natural Environment</strong></td>
<td></td>
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<tr>
<td>Minimize traffic impacts</td>
<td>Minimizes negative impact on traffic flow</td>
</tr>
<tr>
<td><strong>Minimize Streetcar Capital and Operating Costs</strong></td>
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<tr>
<td>Avoid or minimize utility relocation</td>
<td>Maintain access to utilities</td>
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Feasibility Analysis
Optimal Route
Feasibility Analysis
Optimal Route: Centre Mall and Lorraine Street

- Centre Mall – fewer obstacles than narrow Lorraine Street

- Red Hook Housing Tenant’s Associations - concerns about Centre Mall alignment
• Two-way Van Brunt Street route reduces total curb conflicts
• Utility and right-of-way width concerns remain
Feasibility Analysis
Optimal Route: Borough Hall

- Borough Hall terminal station provides most streamlined connection to Downtown Brooklyn
Feasibility Analysis

Key Issues

- Roadway constraints
- Utilities
- Land use and economic development
- Bicycle interaction
Feasibility Analysis
Roadway Constraints

- Streets as narrow as 38 feet present challenges for streetcars
  - As in Philadelphia, double-parked or improperly parked cars can cause service delays
  - Lack of space for bicycle travel between track and parking lanes

- Roadway changes may be required
  - Parking bans or sidewalk reductions on Columbia and Van Brunt Streets
  - Reconfiguration of intersections to accommodate streetcar turns

**Typical Cross Section:** Van Brunt Street at Hamilton Avenue
Feasibility Analysis
Roadway Constraints

- 82 foot turning radius is streetcar standard; 50 foot radius possible with some vehicles
- Even smallest radius would require parking removal and/or sidewalk reductions at certain constrained intersections
- Streetcar turns may also result in property impacts at certain locations
Feasibility Analysis

Utilities

- Known utility obstacles include 48-inch water mains and various private utilities under Atlantic Avenue and Van Brunt Street.

- Potential obstacles include sidewalk vaults and Hamilton Avenue subsurface conditions.

- Significant utility relocation required along portions of route.
• A successful Red Hook streetcar project would require changes in City development policy

• Philadelphia: No comprehensive development plan = No streetcar-induced development

• DCP: No planned changes to industrial zones in Red Hook or up-zoning of residential areas
Feasibility Issues
Street Operations

- Several intersections would require an additional phase to accommodate exclusive streetcar movements.

- Accommodating existing bicycle routes would require parking removal (e.g., Columbia Street).

- Potential bicycle safety concerns:
  - Narrow tires can get caught in track gap.
  - Station bulb-outs present obstacles.
• A 12% increase in Red Hook transit ridership under current conditions; greater increase expected if paired with future development

• While Streetcar speeds would be similar to bus, higher capacity and smoother ride could increase passenger comfort

• Economic development benefits could be realized if City policy were to change in the future
Total Capital Cost:
$176 million ($26 million x 6.8 miles)

- Vehicles: $36.1
- Stations: $3
- ROW/Land: $10
- Facilities: $13.3
- Track/Guideway: $19.2
- Road/Sidewalks: $16.4
- Utilities: $16.8
- Signals/Power: $17.4
- Design-Engineering: $21.1
- 15% Contingency: $22.7
### Feasibility Analysis
Costs: Operating Costs

- **Annual Streetcar Operating and Maintenance (O&M) Costs**
  - $6.2 Million - $7.2 Million

<table>
<thead>
<tr>
<th>City</th>
<th>O&amp;M Costs per Vehicle Revenue Mile</th>
<th>Annual O&amp;M Costs</th>
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<tbody>
<tr>
<td>Tampa</td>
<td>$31.95</td>
<td>$2.4 Million</td>
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<tr>
<td>New Orleans</td>
<td>$24.00</td>
<td>$10 Million</td>
</tr>
<tr>
<td>Seattle</td>
<td>$39.35</td>
<td>$2.4 Million</td>
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<tr>
<td>New York (projected)</td>
<td>$41.66</td>
<td>$6.2 Million - $7.2 Million</td>
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Source: National Transit Database (2009)
Feasibility Analysis

Summary of Findings

• Streetcar could be engineered along chosen alignment

• Chosen alignment still provides formidable implementation and operational challenges

• Estimated $176 million in capital costs would result in 12% increase in transit ridership

• Current City development/land use policy in Red Hook is not complementary to streetcar as an economic development driver
Feasibility Analysis

What would be the issues and constraints?

What would be the benefits?

What would the optimal route be?

Decision on Pursuing Streetcar in the Study Area

What would it cost?
### Feasibility Analysis

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<thead>
<tr>
<th>Task</th>
<th>Result</th>
<th>Implication</th>
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<tr>
<td>Routing Options</td>
<td>Optimal route identified</td>
<td>Streetcar could be engineered in Study Area</td>
</tr>
<tr>
<td>Issue Identification</td>
<td>Significant issues include roadway constraints, utility relocations, compatibility with development approach, and bicycle safety</td>
<td>Even optimal route raises community impact, safety, and operational concerns</td>
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# Feasibility Analysis

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<td>Benefits</td>
<td>12% projected gain in transit utilization, higher capacity vehicles, more comfortable ride</td>
<td>Streetcar will attract some new riders, but travel time and reliability gains over existing bus service not expected</td>
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<tr>
<td>Cost Calculation</td>
<td>Capital: $176 million; Operation: $6.2-$7.2 million per year</td>
<td>Will be difficult to fund in constrained fiscal environment; Cost effectiveness questionable</td>
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Based on these considerations, NYCDOT is not supportive of a streetcar within the Study Area at this time.
The following neighborhood factors would improve attractiveness of streetcar in New York City:

- Wider streets that better accommodate streetcar side by side with other street users

- Zoning and development policies (higher density, mixed-use) that can work in concert with streetcar to facilitate growth and create new riders
DOT staff, in coordination with MTA-NYCT, has begun to investigate short-term alternatives to Streetcar that could provide enhanced transit access to Red Hook:

- New intersection at Mill Street and Hamilton Avenue
- Changes to NYCT B61 Bus Route
- Enhanced pedestrian environment connecting Red Hook to Smith/9th Street subway station
A traffic evaluation of the full intersection and vehicular-pedestrian crossing at Mill Street and Hamilton Avenue will study the following:

- Mill/Garnet Streets become Eastbound connection (between Clinton Street / Smith Street) to subway station
- Reverse Mill Street between Hamilton Avenue and Court Street
- Signalize where necessary/warranted
BENEFITS:

- Creates additional pedestrian connection to Red Hook
- Provides eastbound egress from neighborhood paired with westbound W. 9th Street
- Allows more direct bus connection between Red Hook Houses and Smith/9th Streets Subway
- Simplifies bike lane network
Short-Term Improvements
Mill Street Intersection

- Re-route EB via Mill/Garnet Streets to provide more direct connection to subway station
- Discontinue Circuitous EB routing through non-residential areas
- Serve Red Hook Houses East in both directions via Clinton Street

Red Hook Houses (8,000 residents)
Smith/9th Subway Station (F,G)
Short-Term Improvements
B61 Bus Changes

• Potential service adjustments

• Additional stop shelters at Van Brunt Street / Hamilton Avenue and Columbia Street / Warren Street

• Upgrade existing shelters at Lorraine Street / Hicks Street and Lorraine Street / Henry Street
Short-Term Improvements
Enhanced Pedestrian Environment

• Install pedestrian refuge on Clinton Street and Centre Mall
• Urban Art Project under Gowanus Expressway at W. 9\textsuperscript{th} Street crossing
Short-Term Improvements
Urban Art Project

Lower East Side, Manhattan

West Farms Square, Bronx
Questions?

Comments?
Next Steps

• Post Operations Memo and Feasibility Report on study website

• Receive public comments

• Hold public meeting in early May

• Produce Final Report