Westchester County

- Population est: 980,244 (2018)
- Service area: 450 square miles

Bee-Line Bus System

- 59 fixed routes
- Fleet size: 325 buses
- 3,300 bus stops
- 323 shelters
- Annual passengers: 27.2 million (2018)
- Average weekday ridership about 100,000
Study Corridor:

Selected for in-depth analysis due to:

- One of the most heavily used transit corridors
  - Serves 3 Bee-Line routes including multiple branches, for a total of 287 trips per day
  - A total of ~17,000 riders on all routes; ~11,000 along the corridor

- Connects to long-range Regional Transportation Plan
  - Yonkers identified as sustainable development center
  - RT 9 identified as sustainable development corridor

- Regional connection ‡ High transfer point with NYCT subway
# Bee-Line System Ridership Patterns

<table>
<thead>
<tr>
<th>Between:</th>
<th>And:</th>
<th>% of Bee-Line Ridership</th>
</tr>
</thead>
<tbody>
<tr>
<td>NYCT Bus</td>
<td>Bee-Line</td>
<td>5%</td>
</tr>
<tr>
<td>NYCT Subway</td>
<td>Bee-Line</td>
<td>~20%</td>
</tr>
</tbody>
</table>

Source: Oct 2015 NYCT Transfer Data

### Trip Origin

- **Bronx**: 24%
- **White Plains**: 12%
- **Mt. Vernon**: 11%
- **New Rochelle**: 6%
- **All other origins**: 13%

Source: 2016 Bee-Line Passenger Survey Results

### Trip Destination

- **Yonkers**: 36%
- **Bronx**: 21%
- **White Plains**: 16%
- **New Rochelle**: 6%
- **Other**: 12%

Source: 2016 Bee-Line Passenger Survey Results
Existing Routes

- Route 1 to Hastings
- Route 1C to Westchester Community College, Medical Center
- Route 1T to Tarrytown
- Route 1W to White Plains
- Route 1X Express to WCC and WMC
Existing Routes

- Route 2 to Tudor Woods/Executive Park

- Route 3 Express to White Plains and Purchase (only NB AM and SB PM)
-15 routes converge
-No consistency with route paths
-Many one way streets so routes travel on different streets for each direction
-Minimal wayfinding
Initial Observations

Bronx:
- Long lines waiting for NB in PM
- Over-crowded SB buses in AM
- Passengers unclear where to stand
- Passengers confused about routes
- Bus bunching
- Inconsistent headways
- Slow to board

Getty Square:
- Multiple routes available to go to 242nd St, but all have different stops
- Traffic congestion
- Confusing signage
- Inconsistent headways
Public Outreach: Survey

Q1: What Bus Are You Waiting For? # of Responses: 142

- 1st Bus That Comes 59%
- Specific Route 41%

Q2: Where Are You Getting Off? # of Responses: 141

- Before Getty Sq 23%
- In Getty Sq 37%
- After Getty Sq 40%

At 242nd St

At Getty Sq

Getty Square Stops Combined (SB)

Q: Where are you getting off? Total # of Responses: 111

- Getting off before 242nd: 40%
- Getting off at @ 242nd: 60%

Q: Reason for not waiting at next stop that has more frequency? Total # of Responses: 111

a. I was not aware that the #2 stops there or at the same locations as the #1
b. I was not aware the stops were so close
c. I am aware, but the next bus stops here
d. I am aware, but this stop is closer, and I prefer to walk less
e. I prefer this stop/route for another reason: ____________________________
Project Goals:

• Improve the rider experience by:
  – Reducing waiting time at stop
  – Improve on-time performance
  – Reducing travel time on bus
  – Clarifying route service
Route Service Span, Frequency

<table>
<thead>
<tr>
<th>NB</th>
<th>Total # trips per Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>35</td>
</tr>
<tr>
<td>1C</td>
<td>12</td>
</tr>
<tr>
<td>1T</td>
<td>14</td>
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<tr>
<td>1W</td>
<td>12</td>
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<tr>
<td>1X</td>
<td>3</td>
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<tr>
<td>Total</td>
<td>146</td>
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<table>
<thead>
<tr>
<th>SB</th>
<th>Total # trips per Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>20</td>
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<tr>
<td>1C</td>
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<tr>
<td>1X</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>141</td>
</tr>
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Source: Fall 2017 Pick Book and Timetable
### Preliminary Findings: Activity at 242\textsuperscript{nd} St by Hour

#### NB: Total Ons at 242nd St by Hour

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<thead>
<tr>
<th>Hour</th>
<th>5:00 AM</th>
<th>6:00 AM</th>
<th>7:00 AM</th>
<th>8:00 AM</th>
<th>9:00 AM</th>
<th>10:00 AM</th>
<th>11:00 AM</th>
<th>12:00 PM</th>
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<td><strong>ALL</strong></td>
<td><strong>43</strong></td>
<td><strong>117</strong></td>
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<td><strong>63</strong></td>
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<td><strong>79</strong></td>
<td><strong>84</strong></td>
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#### SB: Total Offs at 242nd St by Hour

<table>
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<tr>
<th>Hour</th>
<th>5:00 AM</th>
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<th>7:00 AM</th>
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<th>10:00 PM</th>
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<tbody>
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<td>1</td>
<td>17</td>
<td>297</td>
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<td>0</td>
</tr>
<tr>
<td><strong>ALL</strong></td>
<td><strong>19</strong></td>
<td><strong>329</strong></td>
<td><strong>435</strong></td>
<td><strong>273</strong></td>
<td><strong>126</strong></td>
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</tbody>
</table>

**Source:** October 2017 APC data
**Preliminary Findings: Activity at 242nd St by Hour**

**NB: Average Ons** per Trip at 242nd St by Hour

**SB: Average Offs** per Trip at 242nd St by Hour

Source: October 2017 APC data
X - Articulated buses that are under seating capacity
A - Non-articulated buses that are at or over seating capacity

Source: October 2017 APC data
## Preliminary Findings: Stop Activity

### Average Daily Ridership

<table>
<thead>
<tr>
<th>Route</th>
<th>Average Ridership Weekdays</th>
<th>Average Ridership Saturdays</th>
<th>Average Ridership Sundays</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>3,061</td>
<td>2,015</td>
<td>1,475</td>
</tr>
<tr>
<td>1C</td>
<td>1,707</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1T</td>
<td>1,579</td>
<td>-</td>
<td>-</td>
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<tr>
<td>1W</td>
<td>1,761</td>
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<td>1X</td>
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<td>-</td>
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<tr>
<td>1</td>
<td>8,315</td>
<td>3,361</td>
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<td>8,359</td>
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<td>2,610</td>
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<tr>
<td>3</td>
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<td>-</td>
</tr>
<tr>
<td>All:</td>
<td>17,519</td>
<td>7,471</td>
<td>4,085</td>
</tr>
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</table>

Source: October 2017 APC data
Preliminary Findings: On-time Performance

**NB: Avg Min Late Departing**

<table>
<thead>
<tr>
<th></th>
<th>At 242nd St</th>
<th>At Mclean</th>
<th>At Getty Sq</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-1.09</td>
<td>-2.57</td>
<td>-0.34</td>
</tr>
<tr>
<td>1C</td>
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<td>1W</td>
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<td>-2.50</td>
<td>-0.83</td>
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<td><strong>-1.01</strong></td>
<td><strong>-2.76</strong></td>
<td><strong>-1.84</strong></td>
</tr>
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</table>

**SB: Avg Min Late Departing**

<table>
<thead>
<tr>
<th></th>
<th>At Getty Sq</th>
<th>At Mclean</th>
<th>At 242nd St</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-4.50</td>
<td>-2.85</td>
<td>-2.85</td>
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<tr>
<td><strong>ALL:</strong></td>
<td><strong>-7.79</strong></td>
<td><strong>-5.82</strong></td>
<td><strong>-7.23</strong></td>
</tr>
</tbody>
</table>

**NB: Avg Daily % of Trips 5+ Min Late**

- 242 Sub: 5.5%
- Bway & McLn: 12.3%
- Getty Sq Stops: SBwyNMain(1X,2,3)/Pros&Riv(1,1C,1T,1W): 9.6%

**SB: Avg Daily % of Trips 5+ Min Late**

- Getty Sq: Prospect & S Broadway: 37.1%
- BwayMcLn: 21.7%
- 242 Sub: 23.8%

Source: Weekday Oct 2017 AVL data
Public Outreach: Meetings

- Meetings were held with stakeholders and elected officials (including staff from NYC DOT, NYC Transit, NYC DCP and Yonkers)
- 1st public outreach meeting in March 2018
- Feedback via meeting and online survey:
  - More frequent service, especially during late evening and weekend hours.
  - More articulated buses for crowded trips
  - Improved timing for connecting transfers
  - More analysis for corridor further along branch lines
  - Better customer communication
- 2nd public meeting in November 2018 to summarize findings and recommended improvements
Project Goals: Improvements

• Improve the rider experience by:
  – Reducing waiting time at stops  
  – Reducing travel time on bus  
  – Improving reliability and on-time performance  
  – Improving public information

How?

Add more service
Provide faster trips with fewer stops
Adjust scheduled times to better reflect real conditions
Reduce causes of delay
Clarify signage, add wayfinding and customer communication
UPWP Project Timeline

- **Study Begins**: APR 2017
- **Analyze Existing Conditions**: MAR 2018
- **1st Public Meeting - Present existing conditions and obtain feedback**: NOV 2018
- **Develop Alternatives**
- **Implement Short-Term Improvements**:
  - Add more service
  - Adjust scheduled times
- **2nd Public Meeting - Summarize Recommendations**: JUN 2018
- **Implement Medium-Term Improvements**:
  - Faster trips
  - Better wayfinding
- **Final Report Due**: SEP 2018
- **Implement Long-Term Improvements**:
  - Reduce causes of delay
- **Continuous monitoring and modifications as needed**: APR 2020
- **Final Report Due**: APR 2022
Short-term Improvements:

• Early Wins- Implemented in Summer 2018:
  • Added **three new trips** on Route #1 Weekday NB between 5:20 PM and 7:00 PM
  • Reduces headways from 6 min to 5 min
Short-term Improvements:

- **Early Wins:**
  - **Implemented Fall 2018:**
    - *Extended trip* on Route #2 Weekday SB 6:56AM trip continues from Getty Square to 242nd St.
  - **Implemented Spring 2019:**
    - *Added trip* on Route #2 Weekday SB early morning 4:48 trip from Getty Square to 242nd St.
Short-term Improvements:

- Early Wins:
  - Implemented Summer 2018:
    - Added **two** new trips on Route #1T Saturday NB 7:00PM, 7:55PM
    - Added **one** new trip on Route #2, Saturday NB 8:55PM
  - Implemented Fall 2018:
    - Added **two** new trips on Route #1 Saturday 8:35PM, 11:15PM
Short-term Improvements:

- Early Wins:
  - Implemented Spring 2019:
    - Extended **two trips** on Route #1 Sunday SB and NB morning to 242nd St
    - Added **one new trip** on Route #1, Sunday SB morning
    - Extended **one trip** on Route #2 Sunday NB morning to 242nd St
Short-term Improvements:

- Early Wins:
  - Adjusted scheduled arrival times to better match actual trip times and reduce variability
Medium-term Improvements:

**Non-Stop Shuttle Alternative:**
- Add trips between 7:00 - 8:00 AM and 5:00 - 6:00 PM

**Pros:**
- Shorter running time with no stops
- Potential to save about 5 minutes per trip
- Some existing branch trips may be able to begin at Getty Square instead
- Not subject to potential delays from longer branch patterns
- Can by-pass local buses en-route

**Cons:**
- Does not serve intermediate stops
- May increase need to transfer
Medium-term Improvements:

• Re-assign vehicle fleet to better match current loads
Medium-term Improvements:

**Wayfinding:**
- Install system maps/schedules in 242nd St subway station
- Re-install destination sign at 242nd St bus stop post
- Install signs that identify which routes stop at that location
- Install maps/schedules at stops with shelters
- Neighborhood wayfinding signs in downtown Getty Square
- Advertise availability of real-time info
Medium-term Improvements:

**Wayfinding:**
- Curbside management of buses and passenger queues at 242\textsuperscript{nd} St NB stop
  - Separate queues for the different routes
  - Coordinate with NYC Transit and NYC DOT
Long-term Improvements:

**Off-board fare collection:**
- Reduces dwell time
- Speeds up trip times
- Coordination with municipality and NYC MTA

**All-door boarding**
- Adoption of OMNY in 2021-2022
- Coordination with NYC MTA
Long-term Improvements:

**Transit Signal Priority/Queue Jump Lane:**
- Reduces bus delay by allowing buses to pass through an intersection ahead of general traffic
- Consider in Getty Square
Next Steps:

- Monitoring of short-term improvements, modify as necessary
- Further refinement and implementation of medium and long-term improvements
- Coordination with municipalities and MTA

Final Report can be found here:

https://transportation.westchestergov.com/planning-division/projects

Questions?

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Westchester County – Department of Public Works & Transportation
irw3@westchestergov.com