Today’s Meeting

1. 30-40 minute presentation
2. Questions and answers

• Meeting will be recorded
• Camera optional
• We encourage you to put your name and affiliation (optional) in the chat
• To ask a question/make a comment
  – Enter your questions into the chat during or after the presentation
  – Use hand raise function to be recognized to speak
• Spanish translation is available
Reminders

• Please be respectful of other in the chat

• Please mute yourselves unless speaking

• We want to ensure everyone has a chance to provide their input
  – We may come back to you if you have multiple questions
  – We may move on once you have made your point
How to Enable Live Interpretation

- Step 1: Select ‘Interpretation’ in the bottom of the Zoom panel

- Step 2: Select your language
Outline

• Introduction
• Public Engagement
• Preliminary Options
• Conceptual Corridor Proposal
• Other Improvements
• Next Steps
Introduction
Introduction

Study Corridor

- Queens Plaza North to Hoyt Ave North
- “Bridge to Bridge”
- 1.95 miles
- Consistent street width and geometry – 60’ wide
- Vision Zero Priority Corridor
- Identified as bus priority corridor in MTA’s Queens Bus Network Redesign Draft Plan
Introduction

Study Process

NYC DOT & MTA
- Document traffic, bus and safety conditions
- Share potential design approaches to improve bus operations and safety
- Develop and refine conceptual corridor plan

CAB
- Provide local knowledge. Communicate issues, concerns, and desires
- Provide input on design approaches
- Provide input on conceptual corridor plan

Study

Implementation
- Community Board presentation
- Final corridor plan
- Implementation

Additional Public Engagement throughout study
Introduction

21st Street Bus Routes

Q66
• Queens Plaza to Flushing
• Leaves 21st St at 35th Ave
• Local Service

Q69
• Queens Plaza to Jackson Heights
• Leaves 21st St at Ditmars Blvd
• Local Service

Q100
• Long Island City to Rikers Island
• Leaves 21st St at 20th Ave
• Limited Stop Service

Note: Q102 & Q103 travel on short segments of 21st St; multiple bus lines cross over 21st St
Introduction

Study Corridor Bus Speeds - 2019

- Northbound buses generally faster than Southbound buses
- Northbound speeds decrease in PM
- Q69 is slower than other routes (runs as local through full corridor)
- Bus Speeds impacted by congestion and vehicles double parking
Introduction

Pedestrian Volumes

Weekday AM peak hour intersection pedestrian volumes
May/June 2019

- 1,467
- 887
- 904
- 357
Injuries 2015-2019

• All of 21st Street designated as a Vision Zero corridor in 2019
• All study corridor injury types increased after 2015
• Most common pedestrian injury is left turn vehicles striking pedestrian crossing with the signal.
• Three fatalities – all were pedestrians
Study Context

Pedestrians Killed and Seriously Injured (KSI) – 2015-19

- Pedestrian severe injury location
- Pedestrian fatality location
- Pedestrian severe injury & fatality location
### Introduction

**Traffic Volumes – 2019 vs 2021**

### Southbound

**Peak Hour:**
- 2019 – 871 veh 5:45-6:45 AM
- 2021 – 1,080 veh 6:15-7:15 AM

**24-Hour Total:**
- 2019 – 12,261 veh
- 2021 – 11,762 veh

### Northbound

**Peak Hour:**
- 2019 – 725 veh 4:15-5:15 PM
- 2021 – 829 veh 5:00-6:00 PM

**24-Hour Total:**
- 2019 – 10,231 veh
- 2021 – 8,643 veh
Public Engagement
Public Engagement

Elements

Community Advisory Board
• Over 50 Community stakeholders representing Community Board, Electeds, Neighborhood Associations, Advocacy Groups, and many others
• Provided input onto study during four meetings

Online Feedback Map
• Allows anyone to identify issues in the corridor
• Over 200 individual comments received

On-street Pop-ups
• Shared potential corridor approaches with pedestrian and bus riders
• Completed 144 in-person surveys

Public Meetings
• December 20th 2021 and January 12th 2022
Public Engagement

Community Advisory Board (CAB)

- Used successfully by DOT for multiple projects
- Opportunity for DOT and community stakeholders to engage from inception of project planning process
- CAB members suggested by local elected officials - intended to be broad and inclusive
- Only one part of an engagement strategy - does not replace Community Board consultation or other engagement elements.
### Public Engagement

#### Feedback Map

![Map showing feedback locations](https://nycdotprojects.info/project-feedback-map/21st-street-bus-priority-and-safety-study)

<table>
<thead>
<tr>
<th>Category</th>
<th>Number of Comments</th>
<th>Specific Concerns</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Crosswalk</td>
<td>27</td>
<td>Astoria Blvd/Newtown Ave, 25&lt;sup&gt;th&lt;/sup&gt; Rd, 33&lt;sup&gt;rd&lt;/sup&gt; Rd, 33&lt;sup&gt;rd&lt;/sup&gt; Ave, 39&lt;sup&gt;th&lt;/sup&gt; Ave</td>
</tr>
<tr>
<td>Aggressive Drivers</td>
<td>19</td>
<td>Unsafe for bikes and peds, double parking and wide roadway encourages aggression, high speeds, Astoria Blvd complex intersection cited</td>
</tr>
<tr>
<td>Double Parking</td>
<td>15</td>
<td>Double parking cited at locations along 21&lt;sup&gt;st&lt;/sup&gt; St and side streets</td>
</tr>
<tr>
<td>Areas of Opportunity</td>
<td>13</td>
<td>Citi Bike station at F Subway Station, bike lanes, trees/planters/benches, wayfinding signs</td>
</tr>
<tr>
<td>Speeding</td>
<td>12</td>
<td>Speeding on long blocks, vehicles trying to make lights</td>
</tr>
<tr>
<td>Bus Stuck in Traffic</td>
<td>10</td>
<td>Double parking, difficult for buses to merge into traffic after stops, bus bunching, signal delays</td>
</tr>
</tbody>
</table>

Public Engagement Feedback

Pop-Ups – Results

Three-in-five people (63%) cited pedestrian safety as a primary concern along 21st Street. Another half (51%) experience slow or unreliable bus service and that traffic congestion (50%) is a problem in the area.

In a select-all-that-reply question among participants, % who say the following issues are transportation concerns along 21st Street...

<table>
<thead>
<tr>
<th>Transportation Issues</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedestrian safety</td>
<td>63%</td>
</tr>
<tr>
<td>Slow or unreliable buses</td>
<td>51%</td>
</tr>
<tr>
<td>Traffic congestion</td>
<td>50%</td>
</tr>
<tr>
<td>Double parking/parking on sidewalks</td>
<td>39%</td>
</tr>
<tr>
<td>Bus stop conditions</td>
<td>29%</td>
</tr>
<tr>
<td>Parking availability</td>
<td>22%</td>
</tr>
<tr>
<td>No issues</td>
<td>6%</td>
</tr>
</tbody>
</table>

...and more than three-quarters of respondents who identify as bus riders said they would take the bus more often if buses were faster and more reliable; Additionally, nearly three quarters (67%) of non-bus rider respondents said they would consider taking the bus instead of other modes if buses were faster and more reliable as well.

In a agree/disagree question among participants who self identify as bus riders, % who agree or disagree on whether they would take the bus more often in 21st St if buses were faster and more reliable.

<table>
<thead>
<tr>
<th></th>
<th>Strongly disagree</th>
<th>Somewhat disagree</th>
<th>Somewhat agree</th>
<th>Neutral</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus Riders</td>
<td>10%</td>
<td>10%</td>
<td>79%</td>
<td></td>
</tr>
<tr>
<td>Non-Bus Riders</td>
<td>23%</td>
<td>10%</td>
<td>19%</td>
<td>48%</td>
</tr>
</tbody>
</table>
Preliminary Options
21st Street Today

Existing Conditions

Pedestrians have a long crossing of 21st Street

Buses use same lane as other traffic and can get caught in congestion or behind double parked cars

Buses must pull in and out of bus stops which slows them down
Preliminary Options

Three options were considered...

Option #1 – Queue Jump Lanes and Signals

Option #2 – Offset Bus Lanes with Bus Bulbs

Option #3 – Center Running Bus Lane
Option #1 - Queue Jump Lanes and Signals

Benefits
- After picking up passengers, buses can get a “green light” before other traffic
- Buses have their own short lane to pass traffic and reach bus stops
- Same number of travel lanes for cars and trucks as today
- Curb extensions shorten distance for pedestrians to cross 21st Street

Limitations/Challenges
- Buses subject to congestion delay excepting intersection approaches
- Curbside queue jump lanes could experience illegal standing/parking
- Pedestrian curb extensions would be paint prior to a capital buildout
- Some parking loss
Option #2 – Offset Bus Lanes with Bus Bulbs

Benefits
- Bus bulbs provide extra space for people waiting for bus
- Bus bulbs and curb extensions shorten distance for pedestrians to cross 21st Street
- Buses have their own lane so can move faster
- Less speeding with a single lane for cars and trucks
- Amount of car parking about the same as today

Limitations/Challenges
- Offset bus lanes may experience double parking without other measures in place
- Build out of bus bulbs requires capital project. Plastic “bus boarders” may be implemented sooner in some locations
- Reduction of traffic capacity – further traffic analysis required
- Left turn restrictions required unless bus lane is shifted to curb at intersections
Option #3 – Center Running Bus Lane w/ Bus Stop Islands

Benefits
- Bus stop islands provide extra space for people waiting for bus
- Islands extend into crosswalk – makes it safer for pedestrians to cross 21st Street
- Buses have their own lane so can move faster
- Center running bus lane avoids double parked vehicles
- Less speeding with a single lane for cars and trucks

Limitations/Challenges
- Reduction of traffic capacity – further traffic analysis required
- Left turn restrictions required
- Buses will need to transition to/from center-running lanes on either side of treatment
- Some parking loss
Preliminary Options

On-street Pop-ups – Results

Design option 1 – short bus lanes with bus only signals

Design option 2 – “offset” bus lanes with bus bulbs

Design option 3 – center running bus lanes with bus stop islands

None - these options will neither improve pedestrian safety nor improve bus speeds and reliability in this area

I don’t know

I do not drive in this neighborhood
Preliminary Options

Option #1 – Queue Jump Lanes & Signals
- Least popular option among CAB and pop-up survey
- Fewest pedestrian safety and bus benefits

Option #2 – Offset Bus Lanes
- Buses benefit from continuous bus only lane
- Potential to adapt to provide additional pedestrian safety benefits

Our proposal uses option #2 as a starting point but adds in pedestrian islands and dedicated left turn bays at key locations.
Preliminary Options

Option #3 – Center Running Bus Lanes

- Preferred by many CAB members
- Slight preference of option #3 (34%) over option #2 (30%) of pop-up bus rider survey respondents

Though center running bus lanes have proven effective in some locations, it is not the optimal approach in this corridor. **Why?**

1) **Impact on limited buses (Q100)**
   - Will experience delay passing local buses (must wait behind stopped buses or use general traffic lane to bypass bus stop island)

2) **Impact on trucks**
   - Several Intersecting truck routes in the corridor are also locations of key bus stops
   - Design would limit ability for trucks to turn right or left

3) **Impact on traffic circulation**
   - Left turns not possible without slowing down buses
Conceptual Corridor Design
Conceptual Corridor Design

Key Considerations

- Design should significantly enhance both pedestrian safety and bus speed and reliability
- Design needs to accommodate truck and emergency vehicles turns
- Left turns should be restricted where possible, and safely accommodated where needed
Conceptual Corridor Design

Precedent – Utica Ave, Brooklyn

• Major north-south arterial in Southern Brooklyn
• Offset bus lanes move to curb to accommodate left turns
• Pedestrian islands included in some locations
Conceptual Corridor Design

21st St @ 34th Ave - Existing
Conceptual Corridor Design

21st St @ 34th Ave - Proposed

Curbside bus stop

Offset bus lanes
Conceptual Corridor Design

21st St @ 34th Ave - Proposed
Conceptual Corridor Design

21st St @ 41st Ave - Existing
Conceptual Corridor Design

21st St @ 41st Ave - Proposed

Bus Boarder

New pedestrian refuge

Bus lane moves to curb at bus stop

New left turn lane
Conceptual Corridor Design

21st St @ 41st Ave - Proposed
Conceptual Corridor Design

21st St @ Broadway - Existing
Conceptual Corridor Design

21st St @ Broadway - Proposed
Conceptual Corridor Design

21st St @ Astoria Blvd - Existing
Conceptual Corridor Design

21st St @ Astoria Blvd - Proposed
Conceptual Corridor Design

Design Elements

Offset Bus Lane

**Proposed Locations**
- Throughout corridor

Bus Boarder

**Proposed Locations**
- 21st St @ 41st Ave (northbound)
- 21st St @ 35th Ave (northbound and southbound)
- 21st Ave @ 30th Ave (southbound)
Conceptual Corridor Design

Design Elements

Left Turn Lane

- 21st St @ Queens Plaza North (northbound)
- 21st St @ 41st Ave (southbound)
- 21st St @ 40th Ave (northbound)
- 21st Ave @ 30th Ave (northbound)
- 21st St @ Astoria Blvd (northbound)

All other intersections have NB/SB left turn restrictions except Hoyt Ave South SB.

Pedestrian Island

- 21st St @ 41st Ave (south side)
- 21st St @ 40th Ave (north side)
- 21st Ave @ Broadway (south and north sides)
- 21st St @ 30th Ave (north side)
- 21st St @ Astoria Blvd (west and north sides)
Conceptual Corridor Design

Design Elements

Painted Curb Extension

Proposed Additional Locations

- 41st Ave (NE corner)
- 40th Ave (NW corner)
- 38th Ave (All four corners)
- 14th St (NW corner)
- 35th Ave (SE, SW, and NW corners)
- 34th Ave (SE and NW corners)
- 31st Ave (SE and NW corners)
- 30th Ave (SW and NW corners)
Conceptual Corridor Design

Bus Stop Balancing

- Bus stops on 21st Street often closer than MTA Guidelines (750’)
- Very closely spaced stops reduce bus speed and reliability
- MTA and DOT proposing removal or move of nine stops
  - NB 30th Dr, SB 36th Ave, and SB 33rd Ave all had less than 100 daily passenger ons and offs
  - 28th Ave, 36th Ave, and 38th Ave stops less than 500’ from adjacent stops
  - SB 25th Rd moved to locations with better bus stop conditions
- No changes to stops south of 38th Avenue
Conceptual Corridor Design

Bus Route Change

• Roosevelt Island-bound Q102 bus currently turns left at 41st Avenue
• Proposed design provides dedicated northbound left turn lane at 40th Ave
• New routing uses 40th Ave instead of 41st Ave
• No changes proposed to Q102 in Astoria-bound direction
• No other bus route changes proposed

KEY:
- Q102 Routing unchanged
- Q102 Routing new
- Q102 Routing eliminated
Traffic Considerations

- To improve bus travel and pedestrian safety project reduces through travel lanes from two to one in each direction
- However, left turn bans, left turn lanes, and right turns made from bus lanes take turning traffic out of the through lane
Conceptual Corridor Design

Signal Timing

• DOT will adjust signal timing to optimize for new design
• In some cases, green time will be re-allocated to 21st Street from side streets
Conceptual Corridor Design

Traffic – What to Expect

- Initial congestion likely as drivers get used to new design of 21st Street
- Conditions will improve over time due to Triple Divergence

**Triple Divergence** – When overall capacity decreases, drivers will seek out other modes, travel during other times of day or use alternative routes.

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<table>
<thead>
<tr>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Mode</td>
<td>Some drivers will shift to other means of travel. Increases in bus speed and reliability will make that mode more attractive</td>
</tr>
<tr>
<td>2.</td>
<td>Time</td>
<td>Some drivers will choose to travel at off-peak times.</td>
</tr>
<tr>
<td>3.</td>
<td>Route</td>
<td>Some drivers will use parallel streets to reach their destination.</td>
</tr>
</tbody>
</table>
Conceptual Corridor Design

Traffic Diversions

- The majority of current traffic volumes can be accommodated on 21st St
- Regional through traffic may use BQE
- Some traffic may divert to Vernon Blvd or 31st St
- Many local north-south alternatives for local trips
Other Improvements

Ongoing Investigations

1) Vehicle Loading Zones
   - Goal = reduce double parking
   - Time lapse camera observations planned
   - Curbside management plan to be developed

2) Sidewalk Tree Plantings
   - DOT has requested survey by Department of Parks and Recreation
   - Expected to be complete by end of year

3) Bus Lane Enforcement
   - Will investigate for 2022 installation of road side cameras
   - MTA piloting cameras on buses – will eventually be citywide

4) Transit Signal Priority
   - Have requested study
   - If feasible would be implemented in 2022
Next Steps

• Second Virtual Public Meeting – January 12th – 6-8 PM
• Community Board Presentation – Early 2022
• Please provide any additional thoughts and comments to DOT
  – John O’Neill - joneill@dot.nyc.gov
• For more information – nyc.gov/busprojects
Questions and Comments?
Thank You!