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

Additional Public Engagement throughout study

Study

Implementation

- Community Board presentation
- Final corridor plan
- Implementation
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
Study Context

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

<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, 25rd Rd, 33rd Ave, 39th 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 21st 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:

- Strongly disagree
- Somewhat disagree
- Neutral
- Somewhat agree
- Strongly agree

**Bus Riders**

- 10%
- 10%
- 79%

**Non-Bus Riders**

- 23%
- 10%
- 19%
- 48%
Preliminary Options
21st Street Today

Existing Conditions

- Pedestrians have a long crossing of 21st Street
- Buses use the 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
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

**Proposed Locations**
- 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.*

Left Turn Lane

Pedestrian Island

**Proposed Locations**
- 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

KEY:
- Existing bus stop
- Bus stop removed
- Bus stop moved
- New bus stop
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
Conceptual Corridor Design

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.

<table>
<thead>
<tr>
<th></th>
<th>Mode</th>
<th>Description</th>
</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

- 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!