CE-UY 4833 & TR GY 6403 TRANSPORTATION CAPSTONE
Week 1
Key Elements of the Class

• Travel Demand Forecast for Future Developments

• Street Network Design and Capacity Analysis

• Traffic Signal Design

• Subway Station Planning and Design

• Parking Planning and Design
Three Projects for the Semester

• Roadway Street Design
  • Examine Existing Field Conditions
  • Develop Two Potential Future Design Conditions

• Travel Demand Forecast and Design for a Subway Station
  • Forecast Existing Demand and Future demand for the Station
  • Analyze Future Demand on Potential Station Elements
  • Design Station Elements to Accommodate Future Demand

• Parking Design
  • Parking Demand Forecast
  • Design of a Variety Parking Facilities
<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Project 1 – 12th Avenue Street Planning and Design. Overview of Hudson Yards development and several deliverables. Held visit requirements, 11th Avenue and baseline conditions. Deliverables given for Project 1. Design materials provided.</td>
</tr>
<tr>
<td>2</td>
<td>Field visit observations discussion of 11th Avenue. Existing condition of 11th Avenue from W 34th Street to W 30th Street. Design of a two-way arterial with lane configurations, intersection geometry, signal plans, bike, transit, and pedestrian elements. NYC Street Design Manual.</td>
</tr>
<tr>
<td>3</td>
<td>Level of Service. Elements of intersection level of service - geometry, traffic volumes, signal timing etc. Signal design plans. NYC Vision Zero.</td>
</tr>
<tr>
<td></td>
<td><strong>Fall Break</strong></td>
</tr>
<tr>
<td>5</td>
<td>Project 1 workshop.</td>
</tr>
<tr>
<td>6</td>
<td>Project 1 Presentation. All deliverables and materials due before class.</td>
</tr>
<tr>
<td>7</td>
<td>Subway Station Planning and Design. Station elements: Stairways, Passageways, Escalators, and Fare Area. Level of Service analysis.</td>
</tr>
<tr>
<td>8</td>
<td>Ferry Presentation.</td>
</tr>
<tr>
<td>10</td>
<td>Project 2 Presentation. All deliverables and materials due before class. Project 3 – Parking Planning and Design. Introduction and deliverables.</td>
</tr>
<tr>
<td>12</td>
<td>Parking Design Garage.</td>
</tr>
<tr>
<td>14</td>
<td>Project 3 Presentation. All deliverables and materials due be for Class.</td>
</tr>
</tbody>
</table>

[Last Day of Class: December 14th 2022]
Hudson Yards Master Plan
Eastern Railyard Master Plan
Hudson Yards Plaza (Looking South)
Hudson Yards Plaza (Looking South)
11th Avenue at W.28th Street (Looking North)
11th Avenue at W.29th Street (Looking North)
11th Avenue at W.30th Street (Looking North)
Hudson Yards Plaza with 11th Avenue (Looking South)
11th Avenue at W.33th Street (Looking South)
11th Avenue at W.34th Street (Looking North)
Hudson Yards Subway Station with Elevator
Eastern Railyards Master Plan - Density

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office</td>
<td>8.2 million sf</td>
</tr>
<tr>
<td>Retail</td>
<td>700,000 sf</td>
</tr>
<tr>
<td>Residential</td>
<td>534 DUs</td>
</tr>
<tr>
<td>Hotel</td>
<td>200 Rooms</td>
</tr>
<tr>
<td>Performing Arts</td>
<td>1,500 Seats</td>
</tr>
</tbody>
</table>
11th Avenue Existing Conditions
11th Avenue Base Drawing
11th Avenue – Sample Signal Plan

NOTES:
1. USE EXISTING A50-6 TYPE NON-ACTUATED CONTROLLER (CASTING ASHMORE G160).
2. USE EXISTING Fix).
3. ALL VISUAL AND PERIMETERIAL SIGNALS TO BE LED.
4. 4A = PEDESTRIAN COUNTERFLOW SIGNAL.

11th Avenue – Sample Signal Plan

NOTES:
1. USE EXISTING A50-6 TYPE NON-ACTUATED CONTROLLER (CASTING ASHMORE G160).
2. USE EXISTING Fix).
3. ALL VISUAL AND PERIMETERIAL SIGNALS TO BE LED.
4. 4A = PEDESTRIAN COUNTERFLOW SIGNAL.
Existing PM Peak Hour Volumes
### Existing Traffic Levels of Service

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Lane Group</th>
<th>AM Peak Hour</th>
<th>PM Peak Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>V/C Ratio</td>
<td>Delay (sec/veh)</td>
</tr>
<tr>
<td>7. 11th Avenue &amp; West 42nd Street</td>
<td>EB-T</td>
<td>0.36</td>
<td>21.9</td>
</tr>
<tr>
<td></td>
<td>EB-R</td>
<td>0.68</td>
<td>33.9</td>
</tr>
<tr>
<td></td>
<td>WB-L</td>
<td>0.46</td>
<td>18.7</td>
</tr>
<tr>
<td></td>
<td>WB-LT</td>
<td>0.39</td>
<td>15.0</td>
</tr>
<tr>
<td>10. 11th Avenue &amp; West 39th Street</td>
<td>WB-L</td>
<td>0.51</td>
<td>27.3</td>
</tr>
<tr>
<td></td>
<td>WB-R</td>
<td>0.41</td>
<td>25.7</td>
</tr>
<tr>
<td></td>
<td>NB-T</td>
<td>0.05</td>
<td>9.6</td>
</tr>
<tr>
<td></td>
<td>SB-T</td>
<td>0.67</td>
<td>16.3</td>
</tr>
<tr>
<td>11. 11th Avenue &amp; West 38th Street</td>
<td>NB-TR</td>
<td>0.12</td>
<td>7.9</td>
</tr>
<tr>
<td></td>
<td>SB-LT</td>
<td>0.86</td>
<td>20.2</td>
</tr>
</tbody>
</table>

**Note:**
- EB-Eastbound, WB-Westbound, NB-Northbound, SB-Southbound
- L-Left, T-Through, R-Right, Dfl-Analysis considers a defacto left lane on this approach
- V/C Ratio - Volume to Capacity Ratio, sec/veh - Seconds per Vehicle
- LOS - Level of Service
- * Denotes a congested movement (LOS E or F, or V/C ratio greater than or equal to 0.9)
- Analysis is based on the 2010 Highway Capacity Manual methodology (HCS+, version 5.5)
34th Street-Hudson Yards Subway Station
Subway Station Design
Parking Design
Hudson Yards Field Trip
Any Questions?
Project #1
Due 10/17 (Week 6) at the beginning of class

Overview:
Project 1 requires group presentations and write-ups for the analysis and design of 11th Avenue for both existing conditions and future two-way conditions. Both geometric design and traffic signal design drawings will also be required to be presented and included in the write-up.

11th Avenue Intersection Scope:
- 11th Avenue & West 28th Street
- 11th Avenue & West 29th Street
- 11th Avenue & West 30th Street
- 11th Avenue & West 33rd Street
- 11th Avenue & West 34th Street

Deliverables:
- 11th Avenue geometric design drawings. Drawings need to show 11th Avenue existing conditions and two design options for two-way 11th Avenue from West 28th Street to West 34th Street.

- Geometric Design Drawings (PDF):
  - 11th Avenue Two-Way – Option A
  - 11th Avenue Two-Way – Option B

- Traffic LOS analysis AM and PM (HCS PDF Reports and LOS tables):
  - 11th Avenue One-Way
  - 11th Avenue Two-Way – Option A
  - 11th Avenue Two-Way – Option B

- Traffic Signal Design Drawings (PDF) for future 11th Avenue Two-Way operation.
  - Option A
  - Option B

- Power Point Presentation of 11th Avenue design, level of service analysis and signal design.

- Write-up of 11th Avenue design, level of service analysis and signal design.

Materials provided:
- One-Way Traffic Volumes
- Traffic Diversion
- Existing Intersection NYC DOT Signal Drawings
- HCS Factors & Sample LOS Table
- CAD Base Drawing for geometric design of 11th Avenue
- NYC DOT Street Design Manual
- NYC DOT Pedestrian Ramp Design
- MUTCD Signal Design guidelines
- NYC DOT Striping Design