Metro Rail Expansion Project
Project No. 34LZ1725

Traffic Analysis Methodology

November 2018

1. Traffic Analysis

This task will evaluate the existing and future traffic operations along the corridor for vehicular, transit, and non-motorized modes of travel. The results of this task will identify the safety and operational impacts that a potential transit alternative may have on the corridor. The subtasks are broken down into existing and future conditions along the corridor.

1.1 2018 EXISTING CONDITIONS ANALYSIS

The first task will be to analyze the existing transportation conditions along the corridor.

Field Review and Data Collection

- A field review will be conducted of the corridor noting laneage, on-street parking, signage, speed limits, non-motorized facilities, signal locations, other traffic control, and transit stops and routing will be documented.
- Review of other and relevant studies; identify any recent developments that could create significant trip generators and change traffic volumes.
- Signal timing permits will be requested of the maintaining agencies for all signalized intersections along the corridor.
- Traffic turning-movement counts will be collected for 19 intersections (see attached maps for locations) for AM and PM peak hours of a typical weekday (Tuesday, Wednesday, or Thursday) on a non-holiday work week while area schools are in session. Counts will also be obtained for the peak hour on a Saturday as well. All counts will include vehicles, pedestrians, and bicycles with heavy vehicle classification.
    - John James Audubon Parkway and Town Complex entrance
    - John James Audubon Parkway and North Forest Road
    - John James Audubon Parkway and Lee Road (roundabout)
    - Rensch Road and John James Audubon Parkway
    - Sweet Home Road and Rensch Road
    - Maple Road and Sweet Home Road
    - Maple Road and Hillcrest Drive

- Maple Road and Bailey Avenue
- Maple Road and Alberta Drive
- Niagara Falls Boulevard and Maple Road
- Niagara Falls Boulevard/Large Parking Lot Driveway just north of Treadwell Road
- Niagara Falls Boulevard and Mall Entrance aligned with Treadwell Road
- Niagara Falls Boulevard and Almeda Avenue
- Niagara Falls Boulevard and Sheridan Drive
- Niagara Falls Boulevard and Eggert Road
- Niagara Falls Boulevard and Highland Avenue (if early portal on NF Blvd)
- Niagara Falls Boulevard and Longmeadow Road (if early portal on NF Blvd)
- Eggert Road and Alberta Drive (near portal)
- Eggert Road and Sheridan Drive

- Existing models (VISSIM, Synchro, VISTRO) will be requested and utilized within the corridor, if available.

Develop 2018 AM, PM, and Saturday Peak Hour VISSIM Models

- Based on the data collected, the Consultant will create a 2018 VISSIM model of the portion of the corridor from where a portal near Alberta Drive/Eggert Road would be located to Niagara Falls Boulevard, along Niagara Falls Boulevard to Maple Road, Maple Road from Niagara Falls Boulevard to Sweet Home Road, Sweet Home Road from Maple Road to Rensch Entrance, and along Audubon Parkway from Lee Road (UB North Campus) to the Town Complex entrance for the weekday AM, PM, and Saturday peak hour.

- Existing transit information will be incorporated into the VISSIM network, including routes, bus stop locations, average dwell time at stops, and headways between routes.

- Model calibration will be conducted such that the models validate to within +/-15% of existing traffic counts or within 20 vehicles of the existing counts, whichever is greater. Observed queuing during field reviews will also be noted and used as a secondary validation measure of the models.

- Intersection queues and levels of service for up to 19 intersections will be determined for the weekday AM, PM, and Saturday peak hours for the existing base year and documented in the EIS. All signalized intersections will be included along the study corridor as part of the 19 locations. Corridor travel time for passenger vehicles will also be summarized.

- Simulation animation files will be prepared to convey key information in a visual format to project stakeholders. Up to five animations will be created.

1.2 TRAVEL DEMAND FORECASTING

The consulting team will coordinate with the GBNRTC to determine future traffic growth along the corridor using the regional travel demand model for the following scenarios:

- Future year 2040 No Build (single horizon year)
- Future year LRT 2040 Build Alternative LPA (single horizon year)
- Future year LRT 2040 Build Alternative – Alternative to LPA (single horizon year)

Future traffic growth will be estimated for the weekday AM peak hour, PM peak hour, Saturday peak hour, and average daily traffic. As the regional forecasting model does not include a time frame for Saturday, the daily percent growth for the weekday will be considered and applied to the Saturday traffic counts collected in the field. If the Saturday traffic counts reveal a significant directionality to traffic along the corridor, the AM and PM peak period forecasts will be reviewed to see if the percent growths from either one of these peak periods may be more appropriate than the daily percent growths. Whichever of the three time periods (daily, AM peak, or PM peak) are more appropriate upon review of the field collected Saturday traffic counts will be used to create the future year Saturday traffic forecast. GBNRTC will summarize the AM peak period, PM peak period, Saturday peak period, and daily regional and corridor travel characteristics including: vehicle miles of travel (VMT), vehicle hours of travel (VHT), congested VMT and VHT.

1.3 FUTURE HORIZON YEAR ANALYSIS

The purpose of this task is to determine the transportation operations in a single future horizon year for No-Build and the LRT Build scenarios (2040). Two Build scenarios will be analyzed; the LPA (utilizing Bailey Ave), and an alternative to the LPA where the LRT alignment utilizes more of Niagara Falls Boulevard between Kenmore Avenue and Eggert Road per direction from the NFTA Technical Advisory Committee.

<u>Develop Future Horizon Year 2040 No-Build Weekday AM, PM Peak, and Saturday VISSIM models</u>

A No-Build scenario represents no alternatives being constructed and the existing roadway network remaining as it is today. This will provide a base for comparison against the Build Alternatives.

- The 2018 weekday AM, PM, and Saturday peak hour VISSIM models will be used to develop the future horizon year No-Build weekday AM, PM, and Saturday peak hour models.
- Traffic growth estimates from the travel demand forecasting task will be applied to the 2018 existing conditions models to develop the future horizon year No-Build traffic conditions.

- Synchro will be utilized to determine future-year optimized signal timings for all signalized intersections. These timings will then be entered into the VISSIM models.

- Roadway network improvements along the study corridor that are currently approved in the GBNRTC Transportation Improvement Program (TIP) and anticipated to be in place by the future horizon year will be incorporated as part of the No-Build conditions.

- Changes to transit services along the corridor planned to be in place by the future horizon year and part of the current transit master plan will be incorporated as part of the No-Build conditions.

- Intersection queues and levels of service for up to 19 intersections will be determined for the weekday AM, PM, and Saturday peak hours for the future horizon year No-Build conditions and documented. Corridor travel time for passenger vehicles will also be summarized.

- All signalized intersections with failing levels of service (LOS) along the corridor and will mitigate to an acceptable LOS (where feasible) based on criteria defined by NYSDOT and other jurisdictional agencies. Mitigation may include updating signal timing/phasing, turn restrictions, or other geometric enhancements to improve traffic flow. All recommended mitigation along the corridor will be documented.

- Simulation animation files will be prepared to convey key information in a visual format to project stakeholders. Up to five animations will be created.

Develop Future Horizon Year 2040 LRT Build Weekday AM, PM, and Saturday Peak VISSIM models

The purpose of this task is to document transportation impacts within the study area for the LRT Build Alternative.

- The future horizon year No-Build weekday AM, PM, and Saturday peak hour VISSIM models will be used to develop the future horizon year Build AM, PM, and Saturday peak hour models.

- Traffic growth estimates from the travel demand forecasting task will be applied to the future horizon year No-Build conditions models to develop the future horizon year Build traffic conditions.

- Synchro will be utilized to determine future-year optimized signal timings for all signalized intersections. These timings will then be entered into the VISSIM models.

- Models will be developed for the LPA alignment identified in the Alternatives Analysis, as well as an alternative to the LPA where the LRT alignment utilizes more of Niagara Falls Boulevard between Main Street and Eggert Road. AM, PM, and Saturday peak hour models will be prepared for these two Build alternatives.

- Transit signal priority and/or transit signal preemption will be incorporated into the VISSIM models along the LRT route with operational assumptions of the priority/preemption approved by the Technical Advisory Committee.

- Preliminary drawings of the LRT alignment will be utilized to determine permissible turning-movements at all intersections.

- Intersection queues and levels of service for up to 19 intersections will be determined for the weekday AM, PM, and Saturday peak hours for the future horizon year Build conditions and documented. Corridor travel time for passenger vehicles will be summarized as well.

- Modeled LRT travel time from station to station will be provided for the weekday AM, PM, and Saturday peak hours.

- All signalized intersections with failing levels of service (LOS) along the corridor and will mitigate to an acceptable LOS (where feasible) based on criteria defined by NYSDOT and other jurisdictional agencies. Mitigation may include updating signal timing/phasing, turn restrictions, or other geometric enhancements to improve traffic flow. All mitigation along the corridor will be documented.

- Simulation animation files will be prepared to convey key information in a visual format to project stakeholders. Up to six animations will be created.

2. Non-Auto Traffic Analysis

2.1 NON-MOTORIZED IMPACT ANALYSIS

This task will document any impacts to non-motorized transportation the preferred LRT alignment may have. Specific subtasks are as follows:

- The Consultant will review any Non-Motorized Plans (i.e., bicycle, pedestrian, trail, etc.) developed by the local jurisdictions pertinent to this project.
- Using field observations and socio-economic information from the GBNRTC travel demand forecasting model, areas of high pedestrian activity will be determined along the study corridor.
- Identify pedestrian access requirements at station locations for local residents and commuters from parking facilities and adjoining neighborhoods.
- Identify bicycle access requirements at proposed station locations.
- How the LRT alternative would impact areas of non-motorized transportation, including the impact to any Non-Motorized Plans and the locations of the stops in regards to the projected areas of high pedestrian activity.

2.2 PARKING IMPACTS

This task will document any impacts to the existing parking environment the preferred LRT alignment may have. Specific subtasks are as follows:

- Document existing parking in the LRT corridor (on-street and off-street)
- Identify projected parking demand for the LPA and alternative alignment
- Identify potential impacts on park-and-ride facilities
- Identify parking demand impacts on adjacent neighborhoods
- Summarize impacts in order to identify mitigation measures that would be addressed in the EIS

2.3 TRANSIT IMPACT ANALYSIS

This task will document any impacts to transit the preferred LRT alignment may have. Specific subtasks are as follows:

- Impacts from transit access mode at each station will be evaluated during this task. The purpose of this task will be to identify how transit will be providing feeder service to the alternative. The analysis will include an assessment of how transit will access each station, where the transit stops would be located and the potential peak hour transit vehicles likely to stop and/or layover near each station.
- The impacts to existing and proposed park and ride locations along the alignment will be reviewed.
- Recommendations will be developed to mitigate any physical impacts to the station area and identify needed improvements to mitigate those impacts due to feeder transit activity

3. Deliverables

- Transportation Technical Report
    - The Consultant will complete a Transportation Technical Report which will document in detail the project methodology and analysis results.
    - The report will contain chapters on existing conditions, future No-Build conditions, and analysis results from the Build alternatives.
    - The Consultant will provide an electronic version of the Draft Transportation Technical Report to the client for review prior to sending to appropriate agencies for review.
    - All VISSIM models as well as simulation animations will be provided to the NFTA in electronic format

4. Assumptions

- It is assumed that the GBNRTC regional travel demand model is calibrated and validated and no work would need to be completed to receive NYSDOT approval of the model.
- It is assumed that the GBNRTC regional travel demand model will be able to provide VMT and VHT outputs.
- It is assumed that the alignment of the LRT (median-running, curb-running, and/or outside the median) will be a known input to the modeling effort, i.e., the microsimulation modeling effort will not be comparing the impacts of median-running vs. curb-running.