TRANSCEND
engineers + planners

23410 Grand Reserve Dr, Ste 101
Katy, TX 77494
Ph: (832) 992-1582
www.transcendengineers.com

George R. Brown Convention Center Expansion
Traffic Study Summary

Purpose
The purpose of the traffic study was to evaluate the impact of the GRB South building and JRC abandonments on 48 intersections in the immediate vicinity of the new South building and identify any necessary mitigations measures. The study includes Leeland St becoming two-way between Chartres and Austin, although the two-way conversion could very well extend through the remainder of downtown to Louisiana.

Study Area
The study area includes 48 intersections and is bound by Rusk to the north, Chartres to the east, Pease to the south, and LaBranch to the west.

Planned Developments
Two planned projects, GRB South and NHHIP, were considered as part of the traffic analysis.

- GRB South building – Convention center expansion with associated roadway modifications to be opened in 2028. The traffic study considered the first phase to contain to a ~900,000 sf hall, although the current design is only ~700,000 sf.
- North Houston Highway Improvement Program (NHHIP) – TxDOT's planned reconstruction of I-45N between Downtown Houston and Beltway 8 North.

Roadway Modifications
For each of the planned developments, there are proposed roadway modifications which include full closures, conversions from one-way to two-way, and freeway re-configurations.

The GRB South project is proposing the following:

- Polk: closure between Chartres and Avenida
- Jackson: closure between Bell and Polk
- Hamilton: closure between Bell and Polk; convert to two-way between Bell and Leeland
- Clay: closure between Jackson and Hamilton
- Chenevert: closure between Bell and Polk
- Leeland: convert to two-way between Chartres and Austin (potentially extending to Louisiana)
- Bell: convert to two-way between Chenevert and Hamilton

The NHHIP project also has several roadway modifications in the study area:

- Hamilton: closure between Clay and Leeland; conversion to New Hamilton to become southbound frontage road
- St. Emanuel: conversion to northbound frontage road
- Bell: removal of bridge over I-45; southbound freeway exit will tie in directly to Bell
- Leeland: convert bridge to two-way
- Polk: closure between St. Emanuel and Hamilton

Study Methodology

To conduct the traffic study, a standard study methodology was followed. The following are key steps in the study:

- Traffic Data Collection – Collected traffic counts during a non-event day and an event day during the AM and PM peak hours.
- Background Growth – Using H-GAC projections, a 1% annual growth rate was selected for use in the analysis.
- Trip Generation – Based on an attendance-to-floor area ratio and 85th percentile attendance numbers at GRB for a normal event and mega event, the number of trips generated by the GRB South hall expansion was determined.
- Trip Distribution – Using the database, Replica, which houses origin-destination data for the region, travel patterns were identified for people coming to and going from the GRB. A few key points related to origin-destination:
    - Inbound
        - AM peak period: Most inbound trips originated from the highway exit ramp at Chartres, as well as being concentrated at the Rusk/LaBranch and Rusk/Avenida intersections.
        - PM peak period: Inbound trips were concentrated at Rusk/LaBranch and LaBranch/Leeland.
    - Outbound
        - AM and PM peak periods: Outbound trips in both peak hours typically exited via Rusk/Chartres or LaBranch/Leeland.
- Level of Service Analysis – The traffic software, VISTRO, was used to analyze both vehicle and pedestrian operations in the study area. Analysis results for each scenario are presented as a Level of Service (LOS). Generally, LOS is measured on a grading scale of A thru F with A-D grades being an "acceptable" Level of Service. See chart below, sourced from the Highway Capacity Manual 7th edition, published by the Transportation Research Board.

Level of Service	Average Vehicle Delay (Seconds)	
	Signalized	Unsignalized
A	≤ 10	≤ 10
B	>10 - 20	>10 - 15
C	>20 - 35	>15 - 25
D	>35 - 55	>25 - 35
E	>55 - 80	>35 - 50
F	>80	>50
F	V/C >1	

Analysis Scenarios

The study looks at five analysis scenarios to determine potential impacts of the planned developments on the roadway network:

- 2025 Existing Conditions
  - AM and PM peak hour analysis using current traffic counts, intersection control, and roadway conditions

- 2028 No Build Conditions without NHHIP Improvements
  - GRB South is not built; NHHIP Improvements are not in place
  - Streets are not closed due to GRB or NHHIP
  - 2028 traffic volumes were estimated using the annual growth rate identified for the project

- 2028 Build Conditions - GRBCC Expansion – Normal Event Conditions (pre-TxDOT Project)
  - GRB South is built; NHHIP Improvements are not in place
  - Streets are modified due to GRB only
  - 2028 traffic volumes were projected based on convention center expansion and future attendee volumes for a normal event at GRB

- 2028 Build Conditions - GRBCC Expansion – Mega-Event Conditions (pre-TxDOT Project)
  - GRB South is built; NHHIP Improvements are not in place
  - Streets are modified due to GRB only
  - 2028 traffic volumes were projected based on convention center expansion and future attendee volumes for a mega event at GRB

- 2045 Build Conditions with NHHIP Improvement - GRBCC Expansion – Normal Event Conditions (post-TxDOT Project)
  - GRB Houston South is built; NHHIP Improvements are in place
  - Streets are modified due to GRB Houston South and NHHIP
  - 2045 traffic volumes were projected based on convention center expansion and future attendee volumes for a normal event at GRB

Based on the results from this report, the following can be concluded:

1. 2025 Existing Conditions
    a. The roadway network within the study area operates efficiently during AM and PM peak periods, with minimal delays or queuing issues indicating sufficient capacity.
    b. In the AM and PM peak hours, all intersections operate at acceptable LOS D or better.
    c. Most pedestrian crossings operate at LOS D or better, except for five crosswalks where the pedestrian LOS is F. The low pedestrian levels of service can be mitigated with improved signal timing and by increasing sidewalk and crosswalk widths.

2. 2028 No Build Conditions without NHHIP Improvements
    a. Using an assumed 1% annual growth rate, traffic and pedestrian operations remain consistent with existing conditions.
    b. All studied intersections operate at an acceptable LOS D or better in both AM and PM peak hours, except the intersection of Polk St and Chartres St which operates at LOS E and LOS C in AM and PM peak hours respectively.

3. 2028 Build Conditions - GRBCC Expansion – Normal Event Conditions (pre-TxDOT Project)
    a. The GRBCC expansion does not significantly impact the overall operations of the studied intersections.
    b. All studied intersections operate at an acceptable LOS D or better, even with additional trips due to the GRBCC South Hall.
    c. Three crosswalks operate at pedestrian LOS F but can be mitigated with improved signal timing and by increasing sidewalk and crosswalk widths.

4. 2028 Build Conditions - GRBCC Expansion – Mega-Event Conditions (pre-TxDOT Project)
    a. Traffic operations would be based on a detailed traffic management plan that is customized to the type and duration of the event.
    b. During event peak hours with mega event conditions, vehicular traffic operates at LOS E and F for several intersections but is restricted to the duration of the event, similar to current day mega event conditions.
    c. This same approach would be used in 2045 for a mega event.

5. 2045 Build Conditions with NHHIP Improvement - GRBCC Expansion – Normal Event Conditions (post-TxDOT Project)
    a. All studied intersections continue to operate at an acceptable LOS D or better for vehicles during a normal event.
    b. Five crosswalks operate at pedestrian LOS F but can be mitigated with improved signal timing and by increasing sidewalk and crosswalk widths.