
ITE Joint Western & Texas District Meeting
June 25, 2018
Introduction

Sumeet Kishnani, PE, PTOE, LEED AP
Principal, Transportation
League-Wide Ingress and Egress Operations Study

National Football League

Tasks:
- Observe ingress and egress at several events for each club
- Develop an evaluation framework that allows objective rankings of each club’s operation against standard criteria
- Identify best practices across the League
- Identify specific opportunity areas for each club
- Develop a “toolkit” of best practices in several operational areas
- Identify emerging trends from other sports leagues around the world
- Determine how new technologies can be integrated into the fan experience
- Conduct observations of special events to identify methods to improve the guest ingress and egress experience
### Analysis Areas

![Diagram showing analysis areas with various benefits and complexities]

- **Greatest Benefit**
  - Improved Pre-Event Communication
  - Improved Signage and Wayfinding
  - Improved Pedestrian Management
  - Improved Rideshare Coordination
  - Better Roadway Utilization (Counter-Flow)
  - More Engaged Staff with Defined Roles
  - Improved Stakeholder Coordination
  - Improved Transit Access / Connectivity
  - Better Lot Ingress / Egress / Circulation
  - Better Tailgate Policies, Enforcement

- **Increasing Complexity**

**Operational Benefit**

**Implementation Complexity**

---

**Image of a map showing analysis areas and symbols representing different locations and areas.**

---

**Image of a busy street scene with traffic congestion, indicating the need for improved traffic management and planning.**

---

**Sidebar with icons representing various aspects such as pre-event communication, roadway operations, signage & wayfinding, parking lots, tailgating, pedestrian experience, transit, and rideshare.**
1) Club Questionnaire Surveys to Identify:
   • Strengths
   • Opportunities
   • New Strategies for this Season
   • Travel Patterns
   • Desired Focus Areas

2) In-field observations at two events for each club

3) Evaluate operations against a rubric

4) Identify opportunity areas for the Club and best practices for the League

<table>
<thead>
<tr>
<th>CHARACTERISTIC: ROADWAYS • VEHICLE FLOW</th>
<th>Opportunity</th>
<th>Strength</th>
<th>Checklist</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criteria: Are attendants and/or officers effectively controlling intersections where needed to prevent confusion? Or were intersections uncontrolled that appeared to need supervision?</td>
<td>There is noticeable confusion at this location, and staff are either not present, or not observed to be engaged.</td>
<td>Staff are at this location, and they are directing motorists and pedestrians in an orderly manner.</td>
<td>Sufficient staff for amount of congestion, no confusion</td>
<td>1 2 3</td>
</tr>
<tr>
<td>Criteria: Vehicle flow seems organized and logical, even if slow. Describe conditions and pace of traffic</td>
<td>Multiple queues in different directions, no traffic management, general sense of confusion.</td>
<td>Traffic is moving freely, no queues, adequate traffic management.</td>
<td>Traffic moves freely or continuously (if slow, not stopped)</td>
<td>1 2 3</td>
</tr>
<tr>
<td>Criteria: Minimal instances of wrong-way vehicle traffic, or turn-around events (e.g. vehicles being prompted by a Traffic Officer to turn-around and not proceed), or general confusion are observed</td>
<td>Motorists stopping and asking for questions, many U-turns at a location (more than 2 per minute)</td>
<td>No U-turn events or isolated events (less than 1 per 5 minutes), any confusion seems to be caused by driver error.</td>
<td>No U-Turns in a 5 minute period</td>
<td>1 2 3</td>
</tr>
<tr>
<td>Criteria: Clear signage exists to effectively direct fans to specific areas and lots; may include permanent, temporary and VMS signage</td>
<td>No signage, confusing signage, or signage is not visible from a distance.</td>
<td>Good signage provided to multiple destinations. it is visible from a distance, easy to understand, and consistent with previous signage messages.</td>
<td>Signage visible from a distance (high, large text)</td>
<td>1 2 3</td>
</tr>
</tbody>
</table>
Pro Football Facts

- 15 million attendees per year
- High transit ridership
- “Time to clear” varies between 45-150 minutes

Pedestrian Flow Rates from Stadium

- Close Game Estimate 1
- Super Bowl LI
- Close Game Average
- Normal Estimate 2
- Normal Game Average
- Super Bowl 50
- Vikings (Observed Close Games)
- Normal Estimate 1
- Vikings (Observed Normal Games)
Sample Best Practices / Recommendations
Deliverables

Operations Summary

League-Wide Toolkit

Special Event Reports

- Specific recommendations for areas of improvement for each club
- Considerations for better integration technology / alternate modes of travel
- Toolkit of best practices across the League in each evaluation area
- Special event reports to improve the fan experience at annual events
What Now / Challenges

- Fan experience varies based on:
  - Game time
  - Opponent
  - Attendance
  - Score
  - Weather
  - Club performance
Real-Time Traffic Data

- Explored options for real-time traffic analytics

Factors considered:

- Current practices
- Is the data reliable and updated regularly?
- What is the cost?
- Is it proprietary or open-source / easily shared?
How it has been done

1) Qualitative observation of time to clear
2) Fan surveys
3) Agency reports
4) Online traffic reports
A New Method
Sample Input:

https://maps.googleapis.com/maps/api/directions/json?origin=Chicago,IL&destination=Los+Angeles,CA&waypoints=Joplin,MO|Oklahoma+City,OK&key=YOUR_API_KEY

Sample Output:

```json
[{
  "bounds": {
    "northeast": {"lat": 36.191742, "lng": -83.9207782},
    "southwest": {"lat": 33.103073, "lng": -96.67495509999999},
  },
  "copyrights": "Map data ©2018 Google",
  "legs": [{
    "distance": {"text": '833 mi', 'value': 1339991},
    "duration": {"text": '12 hours 27 mins', 'value': 44792},
    "duration_in_traffic": {"text": '12 hours 21 mins', 'value': 44463},
    "end_address": 'Knoxville, TN, USA',
    "end_location": {"lat": 35.9606228, "lng": -83.9207782},
    "start_address": 'Allen, TX, USA',
    "start_location": {"lat": 33.103073, "lng": -96.67495509999999},
    "steps": [{
      "distance": {"text": '0.4 mi', 'value': 599},
      "duration": {"text": '1 min', 'value': 67},
      "end_location": {"lat": 33.1033231, "lng": -96.6769669},
      "html_instructions": 'Head <b>west</b> on <b>W Main St</b> toward <b>Butler Dr</b>',
      "maneuver": 'turn-right',
    },
    {
      "distance": {"text": '1.7 mi', 'value': 2709},
      "duration": {"text": '3 mins', 'value': 164},
      "end_location": {"lat": 33.1249275, "lng": -96.66387089999999},
      "html_instructions": 'Turn <b>right</b> onto <b>N Central Expwy</b>',
      "maneuver": 'turn-right',
    },
  }]
}
```
Typical (Projection) vs Actual

Projected speeds are based on historical averages, while actual speeds are based on current reports, updated every few minutes (fluctuations).
Comparison to Real-World Data

Good correlation between reported speeds and actual speeds

Variation is typical of daily fluctuations, or even speeds within the same link
Sensitivity on Adjacent Links

Frontage Road vs Mainline

- Free Flow Speed
- Actual Speed

Frontage Road

Mainline
Next Steps

• Develop a Traffic Database, Congestion Index

• Differentiate between event and non-event days

• Identify trends based on start time, weather, opponent, attendance, day of week, etc.