How this virtual meeting works:

If you would like to provide input during the meeting either:

- Wait for the discussion portions and participate online.
- Raise your hand, wait to be called upon and state your name, organization, and question.
- Use the chat option to submit your question or comment, and the moderator will call upon you.

Ground Rules

- Mute your line if you are not speaking
- Respect opinions of others
- This meeting is being recorded
- Conserve bandwidth by turning off your camera
Agenda

Welcome and Introductions

Meeting and Texas Delivers 2050 Overview

Current and Future Freight Demand and Challenges

Break-out Groups – Freight Transportation Needs and Strategies

Discussion, Next Steps and Closing Remarks
Meeting Overview
**Purpose:** To develop a statewide multimodal freight plan that reflects freight transportation needs and economic competitiveness throughout the state by incorporating stakeholder input

**Objectives:** Solicit stakeholder input on freight demand, needs and strategies

**Outcome:** Finalize needs assessment and develop strategies to ensure safe, efficient freight mobility in Texas
Seven Workshops

In Person
- Brownsville, May 16
- Houston, May 17
- Midland, May 18

Virtual
- Urban areas, June 14
- Rural areas, June 15
- Border region, June 16
- Statewide, June 17
How Today's Input Will Be Used

Today's Meeting

FREIGHT DEMAND
Identify current and future freight demand in Texas

Inform forecasts and scenarios

LAY GROUNDWORK FOR RECOMMENDATIONS

FREIGHT NEEDS AND STRATEGIES
Input on infrastructure, technology, operations, policy and program needs

Refine freight transportation needs assessment and strategies
Plan Overview
Motivation for Texas Freight Mobility Plan (TFMP)

Federal requirement to use National Freight Program Funds (FAST Act)

How does transportation maintain/grow/support our economy?

How do we leverage our assets for economic growth and quality of life?

How do we make the business case for freight investment?

How do we accommodate growth across the state?

What is going to happen in the future and how do we plan for it?

How do we balance freight and passenger needs?
Approach Overview

1. Collect Data, Review Materials, Identify Supply Chains
2. Develop and Vet Supply Chains
3. TFMP Goals and Objectives
4. Supply Chain Network, Needs, Trends, and Strategies
5. Technical Analysis
6. Supply Chain Working Groups
7. Documentation
8. Draft Final Report
10. Fact Sheets, Executive Summary
Supply Chain Focus

- Role of Texas Multimodal Freight Network (TMFN) for key industries
- Identification of critical supply chain trends and challenges
- Analysis of supply chain opportunities and risks
- Identification of freight transportation operations, policies, and program investments to support continued economic growth
Stakeholder Informed Plan

- Stakeholder interviews
- Texas Freight Advisory Committee
- Supply Chain Working Group (SCWG)
- Industry forums and workshops
Texas Delivers 2050 Schedule

ASSESSING CURRENT & FUTURE FREIGHT NEEDS
Commodity Flow Forecasts and Scenarios; Needs Assessment

ACCESSING CRITICAL SUPPLY CHAINS, UNDERSTANDING THE TEXAS MULTIMODAL FREIGHT NETWORK
Freight and Economic Profiles; Supply Chain Analysis, Network Designation; Trends, Disruptors & Opportunities

DEVELOPING STRATEGIES
Policy, Program, and Project Strategies

STAKEHOLDER OUTREACH

STAKEHOLDER WORKSHOPS #1
Goals, Freight Profiles, Freight System

STAKEHOLDER WORKSHOPS #2
Forecasts, Needs, Strategies

TxFAC Meetings
SCWG Meeting
Current and Future Freight Demand

Facilitated Discussion
How have freight flows changed in urban areas over the last 5 years?

- It has increased
- Significantly
- increased. More short-haul/last-mile routes.

- Dramatically increased, freight now uses toll roads, moving all times of days
- More emphasis on last mile direct-to-consumer delivery.
- Greater volume overall; many more more local deliveries

- More truck TEU containers
- E-bikes and sidewalk robots are making deliveries
- More trucks on the road - delivering last mile.
How have freight flows changed in urban areas over the last 5 years?

- Increased
- Increased significantly
- Increased due to COVID-19 in our area.
- We've gone from past group rate to more local delivery.
- Community members report a lot of trains blocking their neighborhoods.
- Increased steadily but picked up specifically in the last 5 years.
- Increased dramatically
- Increased. More frequent and diversified
- Seemingly doubled in many areas.
How have freight flows changed in urban areas over the last 5 years?

- Higher rates of freight in areas where pedestrian and active transportation users frequent.
- UAVs starting last mile deliveries too.
- Electronics.
- Expectation for just-in-time delivery without warehousing.
- Produce - moving out.
- Consumer Goods & Electronics - moving in.
What are the most important commodities moving in your region?

- Food
- Electronics
- Petrochemicals, refined fuels (aviation and otherwise), consumer goods
- Consumer goods
- Consumer goods
- LNG, Chemicals, consumer goods
- Agriculture products
- Increase population has increased the need for more food deliveries

not sure but guessing lots more food and household items
What are the most important commodities moving in your region?

- Auto Parts, Auto Wire Harness, Produce
- Home deliveries, Deliveries.
- Medications
- Consumer Goods, consumer goods, chemicals, agriculture products, and other natural resources to extract fuel.
- Crude oil, Consumer Goods & Electronics - importing, Produce - exporting
- Textiles, Machinery, Chemicals, Auto Parts, produce, resins
Commodity Flow Data

- Developed by IHS Markit, a unit of S&P Global
- Obtained 2019 and 2020 base year and 2050 forecast
  - County-level commodity flow
  - 4-digit Standard Transportation Commodity Classification (STCC) code
- Supplemented to address critical gaps
  - Energy sector goods - water, brine, sand
  - Cross-border flows
- Used 2019 as base year
  - Avoid disruptions caused by pandemic in 2020
  - Use 2020 to examine impact of disruption
Total Freight Volumes Moving in Texas, 2014-2050

Tonnage (thousands)

- 2014: 1,500,000
- 2015: 2,000,000
- 2016: 2,500,000
- 2017: 3,000,000
- 2018: 3,500,000
- 2019: 4,000,000
- 2050: 7,500,000

Texas Delivers 2050
Freight Tonnage in Texas by Mode, 2014-2050

Tonnage (Thousands)

- Highway
- Rail
- Water
- Air

Year:
- 2014
- 2015
- 2016
- 2017
- 2018
- 2019
- 2050

Texas Delivers 2050
Freight Volumes Moving via Truck on Texas Roadways, 2014-2050

Truck Tonnage (Thousands)

- 2014
- 2015
- 2016
- 2017
- 2018
- 2019
- 2050

Texas Delivers 2050
Freight Volumes in Texas by Direction, 2014-2050

Tonnage (Thousands)

- Inbound
- Outbound
- Through
- Intrastate

### Top Commodities Moving in Texas by Tonnage, 2019-2050

<table>
<thead>
<tr>
<th>Year</th>
<th>Commodity</th>
<th>Tonnage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>Petroleum Refining Products</td>
<td>238,858,881</td>
</tr>
<tr>
<td></td>
<td>Broken Stone or Riprap</td>
<td>236,313,620</td>
</tr>
<tr>
<td></td>
<td>Gravel or Sand</td>
<td>185,168,774</td>
</tr>
<tr>
<td></td>
<td><strong>Crude Petroleum</strong></td>
<td>97,296,009</td>
</tr>
<tr>
<td></td>
<td>Warehouse &amp; Distribution Center</td>
<td>76,938,146</td>
</tr>
<tr>
<td></td>
<td>Grain</td>
<td>71,463,596</td>
</tr>
<tr>
<td></td>
<td><strong>Liquefied Gases, Coal or Petroleum</strong></td>
<td>66,536,789</td>
</tr>
<tr>
<td></td>
<td>Misc. Waste or Scrap</td>
<td>56,496,654</td>
</tr>
<tr>
<td></td>
<td>Ready-mix Concrete, Wet</td>
<td>54,138,651</td>
</tr>
<tr>
<td></td>
<td>Bituminous Coal</td>
<td>52,754,822</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Commodity</th>
<th>Tonnage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2050</td>
<td>Broken Stone or Riprap</td>
<td>392,153,387</td>
</tr>
<tr>
<td></td>
<td>Warehouse &amp; Distribution Center</td>
<td>360,397,005</td>
</tr>
<tr>
<td></td>
<td>Gravel or Sand</td>
<td>337,330,071</td>
</tr>
<tr>
<td></td>
<td>Misc Waste or Scrap</td>
<td>272,661,463</td>
</tr>
<tr>
<td></td>
<td>Petroleum Refining Products</td>
<td>172,402,610</td>
</tr>
<tr>
<td></td>
<td><strong>Misc Industrial Organic Chemicals</strong></td>
<td>157,493,797</td>
</tr>
<tr>
<td></td>
<td>Grain</td>
<td>147,376,506</td>
</tr>
<tr>
<td></td>
<td><strong>Plastic Material or Synth Fibers</strong></td>
<td>128,945,995</td>
</tr>
<tr>
<td></td>
<td>Ready-mix Concrete, Wet</td>
<td>115,487,012</td>
</tr>
<tr>
<td></td>
<td><strong>Freight-all-kinds shipments</strong></td>
<td>113,481,345</td>
</tr>
</tbody>
</table>
# Top Commodities Moving in Texas by Value, 2019-2050

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freight-all-kinds shipments</td>
<td>$264,166,380,882</td>
</tr>
<tr>
<td>Motor Vehicles</td>
<td>$210,342,339,829</td>
</tr>
<tr>
<td><strong>Petroleum Refining Products</strong></td>
<td><strong>$155,055,452,913</strong></td>
</tr>
<tr>
<td>Motor Vehicle Parts or Accessories</td>
<td>$106,647,942,592</td>
</tr>
<tr>
<td>Plastic Matter or Synth Fibers</td>
<td>$101,611,069,284</td>
</tr>
<tr>
<td>Warehouse &amp; Distribution Center</td>
<td>$94,852,505,167</td>
</tr>
<tr>
<td>Rail Intermodal Drayage from Ramp</td>
<td>$68,684,834,589</td>
</tr>
<tr>
<td>Electrical Equipment</td>
<td>$68,544,912,178</td>
</tr>
<tr>
<td>Rail Intermodal Drayage to Ramp</td>
<td>$60,550,970,113</td>
</tr>
<tr>
<td>Small Packaged Freight Shipments</td>
<td>$55,463,797,491</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor Vehicles</td>
<td>$631,864,083,731</td>
</tr>
<tr>
<td>Freight-all-kinds shipments</td>
<td>$595,353,626,792</td>
</tr>
<tr>
<td>Warehouse &amp; Distribution Center</td>
<td>$444,312,227,658</td>
</tr>
<tr>
<td>Plastic Matter or Synth Fibers</td>
<td>$300,133,796,412</td>
</tr>
<tr>
<td>Motor Vehicle Parts or Accessories</td>
<td>$263,983,777,060</td>
</tr>
<tr>
<td>Electrical Equipment</td>
<td>$200,125,779,062</td>
</tr>
<tr>
<td><strong>Drugs</strong></td>
<td><strong>$160,802,797,196</strong></td>
</tr>
<tr>
<td>Rail Intermodal Drayage from Ramp</td>
<td>$128,564,111,465</td>
</tr>
<tr>
<td>Small Packaged Freight Shipments</td>
<td>$117,196,664,680</td>
</tr>
<tr>
<td>Rail Intermodal Drayage to Ramp</td>
<td>$113,339,169,188</td>
</tr>
</tbody>
</table>

*Texas Delivers 2050*
Texas Freight Flows by Direction by Tonnage, 2019 and 2050

2019
- Inbound: 64%
- Outbound: 15%
- Through: 11%
- Intrastate: 10%

2050
- Inbound: 63%
- Outbound: 15%
- Through: 11%
- Intrastate: 11%
Texas Freight Flows by Direction by Value, 2019 and 2050

2019:
- Inbound: 22%
- Intrastate: 26%
- Outbound: 24%
- Through: 28%

2050:
- Inbound: 28%
- Intrastate: 22%
- Outbound: 26%
- Through: 24%
Do you think these commodity flow numbers are:

- Too high: 6
- Too low: 3
- About right: 6
- Not sure: 7
Break-Out Group - Freight Needs and Challenges
Freight Network Needs and Challenges

- SAFETY
- TRUCK PARKING
- TECHNOLOGY
- MOBILITY & RELIABILITY
- ASSET PRESERVATION
- CONNECTIVITY
- FUNDING
- RESILIENCY
Needs Assessment Categories and Metrics

**MOBILITY AND RELIABILITY**
- Congestion
- Truck travel time reliability
- At-grade highway-rail crossings

**SAFETY**
- Truck involved crash rate
- Truck crash severity
- At-grade highway-rail crossings

**FREIGHT ASSET UTILIZATION AND PRESERVATION**
- Pavement conditions
- Bridge load restrictions and conditions
- Vertical bridge clearance
- Oversize/Overweight permitted loads

**FREIGHT NETWORK DESIGN**
- Frontage roads
- Number of lanes
- Shoulder widths
- Lane width

Overlay factors on Freight System Designation score

Combined score of factors and relative freight importance to get high, medium, and low needs score
### Mobility and Reliability Needs

<table>
<thead>
<tr>
<th>Mobility Needs</th>
<th>High</th>
<th>Medium</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>THFN Mileage</td>
<td>3,016</td>
<td>7,502</td>
<td>12,548</td>
</tr>
<tr>
<td>% of Miles</td>
<td>13%</td>
<td>33%</td>
<td>54%</td>
</tr>
</tbody>
</table>

- West Texas and border regions experienced most significant increase in mobility needs since 2018
Truck Parking Needs

<table>
<thead>
<tr>
<th>Truck Parking Needs</th>
<th>High</th>
<th>Medium</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>THFN Mileage</td>
<td>4,455</td>
<td>5,031</td>
<td>13,580</td>
</tr>
<tr>
<td>% of Miles</td>
<td>19%</td>
<td>22%</td>
<td>59%</td>
</tr>
</tbody>
</table>

- High needs throughout state
  - Large metro areas
  - Permian Basin
  - Panhandle
  - Eastern border region
Asset Preservation Needs - Pavement Conditions

International Roughness Index (IRI)

Pavement Condition Rating (PCR)

Needs Assessment - Pavement Condition
- Texas Highway Freight Network (THFN)
- Rough (IRI 171 - 220)
- Very Rough (IRI >220)

THFN Pavement Condition
- Poor
- Fair
- Good

Texas Delivers 2050
Asset Preservation – Bridge Conditions

Functionally Deficient and/or Structurally Obsolete

Bridge Constraints

Deck Condition Rating
- Poor Deck Condition
- Fair Deck Condition
- Good Deck Condition

THFN Bridge Constraints
- Load Constraint
- Clearance Constraint
- Load and Clearance Constraint
<table>
<thead>
<tr>
<th>THFN Mileage</th>
<th>Pavement Needs</th>
<th>Bridge Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>THFN Mileage</td>
<td>8,317</td>
<td>6,664</td>
</tr>
<tr>
<td>% of Miles</td>
<td>36%</td>
<td>29%</td>
</tr>
</tbody>
</table>
**Freight Design Needs**

<table>
<thead>
<tr>
<th>Freight Design Needs</th>
<th>High</th>
<th>Medium</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>THFN Mileage</td>
<td>396</td>
<td>4,599</td>
<td>18,071</td>
</tr>
<tr>
<td>% of Miles</td>
<td>2%</td>
<td>20%</td>
<td>78%</td>
</tr>
</tbody>
</table>

- High needs are isolated
  - Southeast Texas
  - Rural roads on urban fringes
- Medium needs more widespread and longer segments
Additional Needs Assessment Categories and Metrics

**TECHNOLOGY**
- Weigh-in-Motion needs
- Traffic management center coverage
- Traveler information systems
- Incident management systems

**CONNECTIVITY**
- Strategic industries
- Intermodal terminals
- Gateways

**EQUITY**
- Vulnerable communities index
- Poverty, Minority, English proficiency, Education, Age, Disability, Unemployment

**RESILIENCY**
- Exposure to disruptors
- Extreme weather events, Labor disputes, Cyber attacks
- Infrastructure failures, Other man-made disruptions

Overlay factors on Freight System Designation score

Combined score of factors and relative freight importance to get high, medium, and low needs score
Breakout Group Discussion Topics

1. What are your most critical freight transportation challenges?

2. What can TxDOT do to mitigate these challenges?

3. How can TxDOT partner with local governments and private industry to ensure a safe, resilient freight network?
Next Steps and Wrap-up
Developing the Texas Delivers 2050 Recommendations

1. Develop comprehensive list of strategies
2. Screen strategies based on selected criteria to develop recommendations
3. Prioritize recommendations and develop implementation framework
Types of Strategies and Recommendations

- **Infrastructure**
  - Expansion projects
  - Modernization projects
  - Safety projects

- **Operations**
  - Technology
    - Transportation system management and operations (TSM&O)

- **Programs**
  - TxDOT led
  - TxDOT supported

- **Policies/Outreach/Coordination**
  - TxDOT led
  - TxDOT supported
Next Steps for Recommendations and Strategies

Stakeholder Meetings, TxFAC, SCWG

1. Compile list of draft recommendations
2. Steering Committee review recommendations and provide feedback
3. Update recommendations based on input
4. Develop freight investment plan
5. Screen and prioritize
6. Finalize recommendations
Upcoming Meetings

- Virtual workshops
  - Urban areas, June 14
  - Rural areas, June 15
  - Border region, June 16
  - Statewide, June 17

- Texas Freight Advisory Committee – July 20 (Austin)
Thank you!

Contact info the TFMP

Sherry Pifer
TxDOT
sherry.pifer@txdot.gov
(512) 460-1727