The 2055 Freight Transportation System

Mexican INDUSTRY PERSPECTIVES

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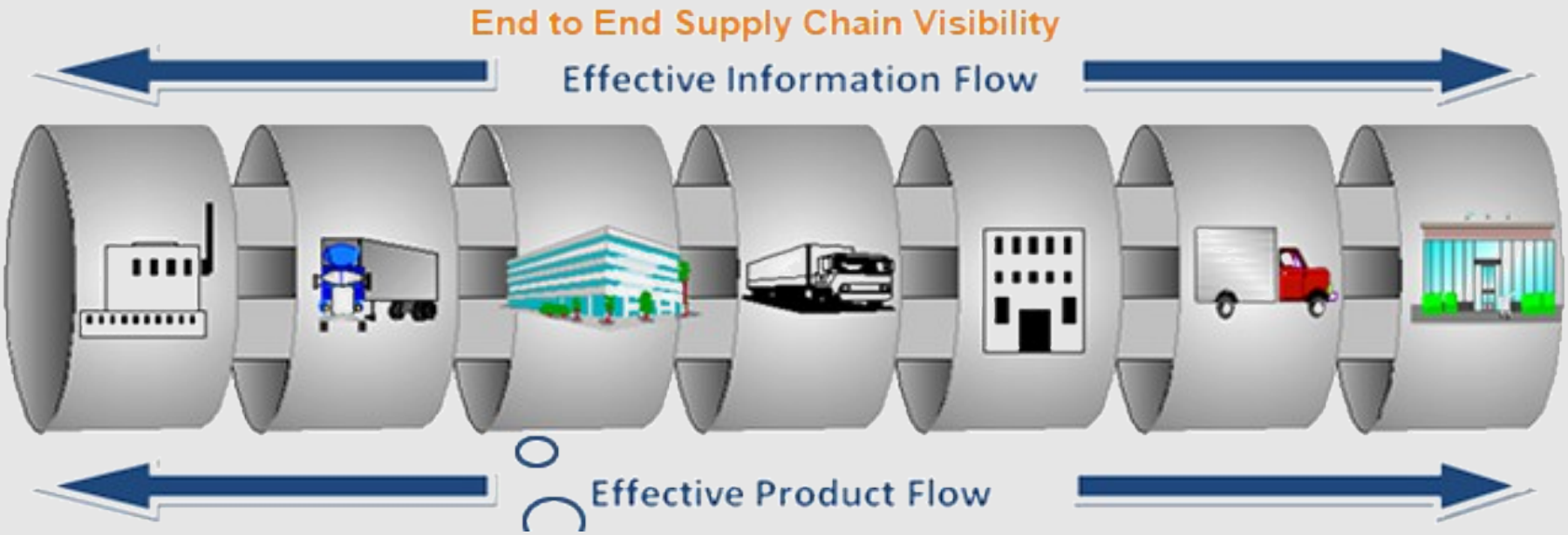
The 2055 Freight Transportation System—Interviews

- In-person and phone interviews with Fortune 500 and maquiladora executives in Mexico:
  - Food and beverages
  - Automotive
  - Steel and mining
  - Construction materials
  - Transportation
  - Manufacturing

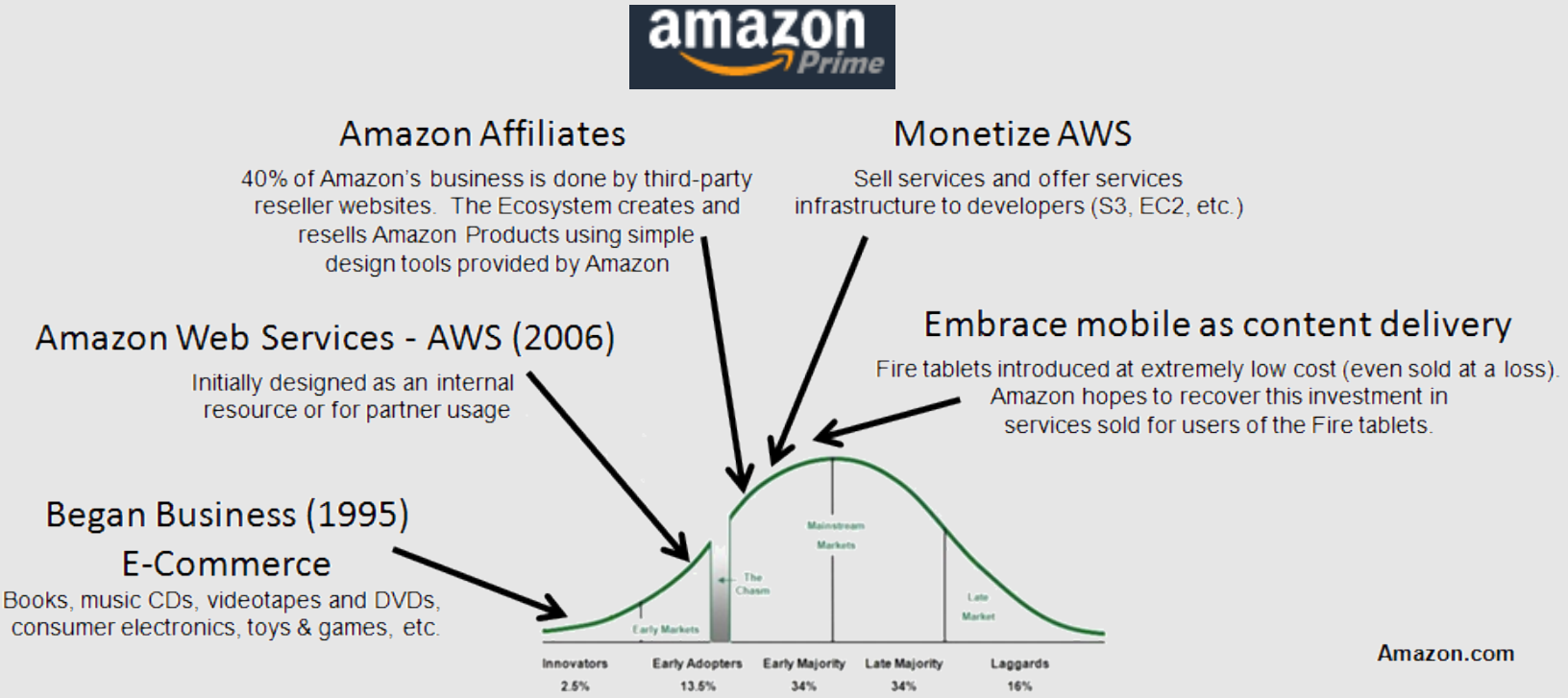
Food and Beverages

- The internet has the potential to increase visibility throughout the supply chain
- There is a lack of communication/coordination between supply chains and the transportation system/infrastructure



Food and Beverages

- The transportation system needs to be connected to shippers and receivers to anticipate travel demand



- Transportation sector needs to use green fuels and renewable energy

Automotive

- The manufacturing base in Mexico exports finished products to the U.S.
- Storage and cross-docking operations are conducted at the U.S. side of the border
- Customs agencies/procedures add unnecessary delays, increasing supply chain costs
- Bullwhip effects are caused by adding safety buffers for production inventory levels at each stage of the supply

Higher costs for consumers

Automotive

- Ideal vision is to implement direct pull orders, in real time, from the point of sale, at each segment of the supply chain
  - (e.g. production plants, suppliers, and transportation)

Automotive

- **Suppliers** need inventories closer to the **manufacturing base**

- Production plants

Steel and Mining

- Rail volumes have increased substantially and expected to continue growing—250% increase in the last 10 years
- Steel and metallic products will not be replaced as a construction material in the next 50 years

- **Repairing the deteriorated infrastructure will be one of main demand drivers in next decades**

Steel and Mining

- Rail industry challenges in this industry sector
  - Long travel-times (e.g. from Texas to California, a high demand routes, travel time is around 7-14 days)
  - Do not serve enough origin-destinations
- Trucking industry facing challenges
  - Driver shortage
  - Weight and sizerestrctions in some states (e.g. California)

Construction Materials

- Construction industry will continue growing
- Major changes in business and operational models will come from product and technology evolution
- Standard modular systems (similar to auto industry) allow for increased speed of building construction and remodeling

- Construction is evolving to a sophisticated supply chain with special transportation needs

Construction Materials

- Driverless, autonomous trucks and trains are being used at several large construction and mining sites.

Transportation

- **Re-shoring** of various large manufacturing companies into Mexico is expected to increase demand for cross-border freight transportation
- **Sustainability —**key advantage for rail; also higher level of safety, and by diverting freight to rail, highway maintenance costs and congestion are reduced
- **However**, current rail business model could not be sustainable with increased demand
- **Public Private Partnerships** would be required to develop additional infrastructure needed to serve future demand
- Some Class I railroads could need **federal funding** to help finance additional infrastructure needs

Transportation

- Several small Texas ports have rail service which are currently under utilized. Shippers are looking at them as potential alternatives.

- Infrastructure providers should plan for improved landside access to “smaller” ports

Manufacturing

- Border crossing infrastructure and advanced technologies need to be implemted at both sides of the border to improve border crossing procesess.
- Pointless to have innovative public and private border project delopment if there is no coordination among U.S. and Mexican counterparts

Manufacturing

- Several trusted-traveler security programs were implemted after 9/11, which has led to imprived border crossing operations.
- Mexico's New Certification Scheme Certified Companies (NEEC) can become as efficient as C-TPAT
- Inadequate border crossing infrastructure remains an issue
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NEEC
Nuevo Esquema de Empresas Certificadas

C-TPAT
Customs-Trade Partnership Against Terrorism

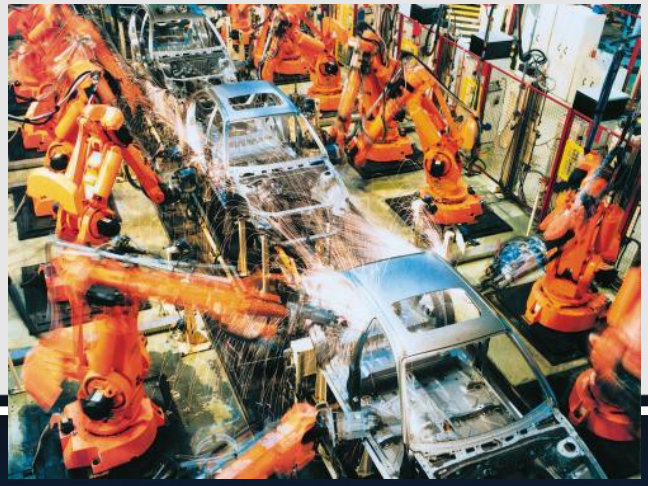
Manufacturing

- New manufacturing centers are starting operations in central Mexico (e.g., Guanajuato, Queretaro, San Luis Potosi)
- Will impact Mexico's transportation system and U.S.-Mexico border (e.g., rail exports of automobiles and air exports of aeros

Aerospace Industry Location

Manufacturing

- **Robotic process automation** is dramatically changing the way of doing business at each stage of supply chain
- E**ducational attainmen**t and **advanced skills** become more critical for robotics and automation technologies (e.g. Queretaro)
- Adoption of **3D printing technologies** expected to revolutionize business models and plant operations



To Think About?

- How will the identified trends impact Texas's transportation system?
- What is the role of TxDOT? (How should the agency prepare?)