The Infrastructure Investment and Jobs (IIJA) Act.

- On Tuesday, August 10th, the U.S. Senate passed the Infrastructure Investment and Jobs (IIJA) Act by a vote of 69 – 30.

- The IIJA includes $550 billion in new federal spending over a range of infrastructure categories, including broadband, the electric grid, drinking water, wastewater, and transportation.

- Transportation receives the largest amount of money at $274 billion, in part because the bill includes a five-year reauthorization of highway, transit, and rail programs. The $274 billion includes:
  - $110 billion for roads, bridges and major projects.
  - $66 billion for passenger and freight rail.
  - $65 billion for broadband.
  - $39 billion for transit.
  - $11 billion for highway and rail safety programs.
Title I – Federal-Aid Highways:

- **Rural Surface Transportation Grant Program:** Eligible tech projects include those that:
  - Establish, or maintain integrated mobility management systems;
  - Develop transportation demand management systems; or,
  - On-demand mobility services.
  - Funded at $400 million per year (or $2 billion over five years).

- **Cybersecurity:**
  - Funds from the National Highway Performance Program and the Surface Transportation Block Grant Program can now be used to address cybersecurity threats on the national highway system and other roadways.
  - Requires FHWA to develop a tool to assist transportation authorities in identifying and combating cyber incidents. Requires FHWA to designate a “cyber coordinator.”
Title I – Federal-Aid Highways:

- **Carbon Reduction Program:** Establishes a formula program to reduce transportation emissions, including:
  - Advanced transportation and congestion management technologies;
  - The installation of Vehicle to Infrastructure (V2I) communications equipment; and,
  - Funds to owners of Dedicated Short-Range Communications (DSRC) to retrofit assets to Cellular Vehicle to Everything (C-V2X) technology.
  - Funded at $1.3 billion per year (or $6.42 billion over five years).

- **Promoting Resilient Operations for Transformative, Efficient, and Cost-saving Transportation (PROTECT) Program:** New grant program for projects that include technology components, the installation of communications, and ITS equipment and infrastructure.
  - Funded from two different sources at $1.46 billion and $280 million, over five years, respectively.
Sections of Interest – Infrastructure Investment and Jobs (IIJA) Act (cont.)

- **Title I – Federal-Aid Highways:**
  - **Geomatic Data:** Requires USDOT to develop and issue guidance for the acceptance and use of data obtained from a non-Federal entity through geomatic means, such as remote sensing, land surveying, cartography, and global navigation satellite systems.
  
  - **Emerging Technology Research Pilot Program:** Establishes a program to conduct emerging technology research as well as research into activities to reduce the impact of automated driving systems and advanced driver automation systems technologies on pavement and infrastructure performance.
    
    • Appropriations are authorized from the General Fund of the Treasury at $5 million for each of FY 2022 – 2026.
Sections of Interest – Infrastructure Investment and Jobs (IIJA) Act (cont.)

- **Title I – Federal-Aid Highways:**
  - **Travel Demand Data and Modeling:** Requires USDOT to conduct a study of forecasted travel demand data compared to observed travel:
    - Findings will inform states and MPOs’ use of travel forecasting to evaluate the impacts of transportation investments on travel demand.
  - **Research & Technology Development and Deployment:** Expands the Technology and Innovation Deployment Program by adding a focus on accelerated market readiness efforts, including new and innovative construction technologies for smarter, accelerated project delivery.
- **Title III – Research, Tech, and Education:**
  - **Data Integration Pilot Program:** Requires USDOT to establish a program to research and develop models that integrate multi-source data, including geolocated weather conditions, roadway conditions, incidents, and work zones related to emergency planning.
    - Funded at $2.5 million per year (or $12.5 million over five years).
  - **Advanced Transportation Technologies and Innovative Mobility Deployment grant program (replaces current ATCMTD program):**
    - Makes Vehicle-to-Pedestrian (V2P) technology eligible.
    - Makes retrofitting stranded DSRC assets to C-V2X technology eligible.
    - Flat funding of $60 million per year, with an increased federal cost-share from 50% to 80%.
Sections of Interest – Infrastructure Investment and Jobs (IIJA) Act (cont.)

- **Title IV – Highway & Motor Vehicle Safety:**
  - **Research on Connected Vehicle (CV) Technology:** Requires USDOT to conduct research on how CV systems can accommodate bicyclists and vulnerable road users. Expands V2P research to ensure these users are incorporated into the safe deployment of CAVs.

- **Title V – Research and Innovation:**
  - **Smart Community Resource Center:** Requires USDOT to create a website with resources on ITS and smart community transportation projects (projects that use innovative technologies, data, and other means to address local challenges) including technical assistance and training.

  - **Strengthening Mobility and Revolutionizing Transportation Grant (SMART) Program:** Provides grants for projects that:
    - Incorporate innovative transportation technologies or uses of data; or,
    - Demonstrate the integration of intelligent transportation systems.
    - Funded at $100 million per year (or $500 million over five years).
Sections of Interest – Infrastructure Investment and Jobs (IIJA) Act (cont.)

- **Title V – Research and Innovation**
  - **Advanced Transportation Research:** Establishes the Advanced Research Projects Agency-Infrastructure (ARPA-I) to support early-stage research and advance conceptual research into testing and development of emerging technologies by:
    - Developing innovative science and technology solutions that lower the long-term costs of infrastructure development; and,
    - Reduce the lifecycle impacts of transportation infrastructure on the environment, including through the reduction of greenhouse gas emissions.
  - Provides for a Director to lead ARPA-I and requires them to ensure that the activities of ARPA-I do not duplicate other USDOT research activities and programs.
About Nuro

Company founded in 2016
~1000 employees in TX, CA, AZ

Fully autonomous, on-road vehicle
Specifically designed for goods delivery

Delivering groceries, medicine, and pizza with leading retailers
We spend a lot of time running errands

% of daily trips taken by Americans

- 11% Other
- 22% Recreational
- 24% Commuting
- 43% Shopping & Errands

Commuting is only 24% of total trips vs 43% for shopping/errands

75 million hours wasted every day on just traveling to/from stores & errands

Source: Federal Highway Administration 2017 National Household Travel Survey
WHERE ARE WE NOW?

Houston Survey - Key Results

Women use delivery most frequently & are most unfamiliar w/ AVs

![Chart showing frequency of delivery usage by age and gender]

The value in AV delivery - what people care about the most
- People see AV delivery has a positive impact primarily in:
  - **Expanding access to fresh food** (63% Nuro zips and 46% in non-Nuro zips); 82% see this as most important, and
  - **Environmental Impact** (47% and 36%) with 59% as most important.

The more people experience autonomous delivery vehicles, like Nuro, the more favorable they are. People still largely unfamiliar.
What Nuro looks for in deciding on new deployment areas

Can the current or near future state of technology handle the environment?
- Weather
- Road quality
- Traffic complexity
- Street speed

Is the state/city open to AV deployments?
- State AV regulations
- Municipal support for innovation (history with transportation tech)

Is there a strong potential for commercialization?
- Density of customers
- Existing partner locations
WHERE ARE WE NOW?

Helpful to advancing safe deployment of AV delivery vehicles based on what we’ve learned to date in Houston

“Boring” Infrastructure Needs Are Important
- Clear paint lines on streets & signage
- Potholes
- Slow speed streets

Traffic Notifications Allow Us to Easily Program Workarounds
- Advanced notification of street closures/improvements

Importance of Electrification Infrastructure & Incentives
- DC; Decentralized to reduce VMT
- Off-peak charging
- Special needs for a zero-occupant fleet
Appendix
Improved road safety

Human drivers had the highest fatal crash tally since 2007 last year. Zero-occupant AVs can help reduce road injuries

- Avoid human error
- Autonomy decisions focus on safety, not comfort
- Travel at lower speeds, on safer routes
- A vehicle designed to keep what’s on the outside safer than what’s inside

Port Infrastructure in a Pandemic

9/8/2021 | Rich Byrnes, Chief Infrastructure Officer  rbyrnes@porthouston.com
Port Houston and “greater port of Houston”

Port Houston
- Public Docks including Container Terminals and Project Cargo
- 3 MM TEU on 6000 Trucks / Day
- 52 Mile Houston Ship Channel

Greater Port
- 200 Private Facilities
- World Scale Industrial Complex

Together
- 3.2MM Related Jobs Nationwide
- $802 Billion Economic Value
Port Houston Container Cargo
trends by region and changes over time
### Pandemic Shifts

#### Demand Changes
- Consumers “to go” and “at home”
- Raw Materials Domestic vs Export
- Growing populations

#### Supply Changes
- Overseas manufacturers production
- Shipping Availability & Costs
- Local Trucking and Warehousing Labor

#### Together
- Import/Export Balance ➔ Diversion
- Supply Chain “spring” effect
- Continuing strong growth ahead

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**Container Totals By Type**

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**Operational Coordination**

**Intermodal Execution**

**Prepare for More:**
Invest in Freight Networks and Technology