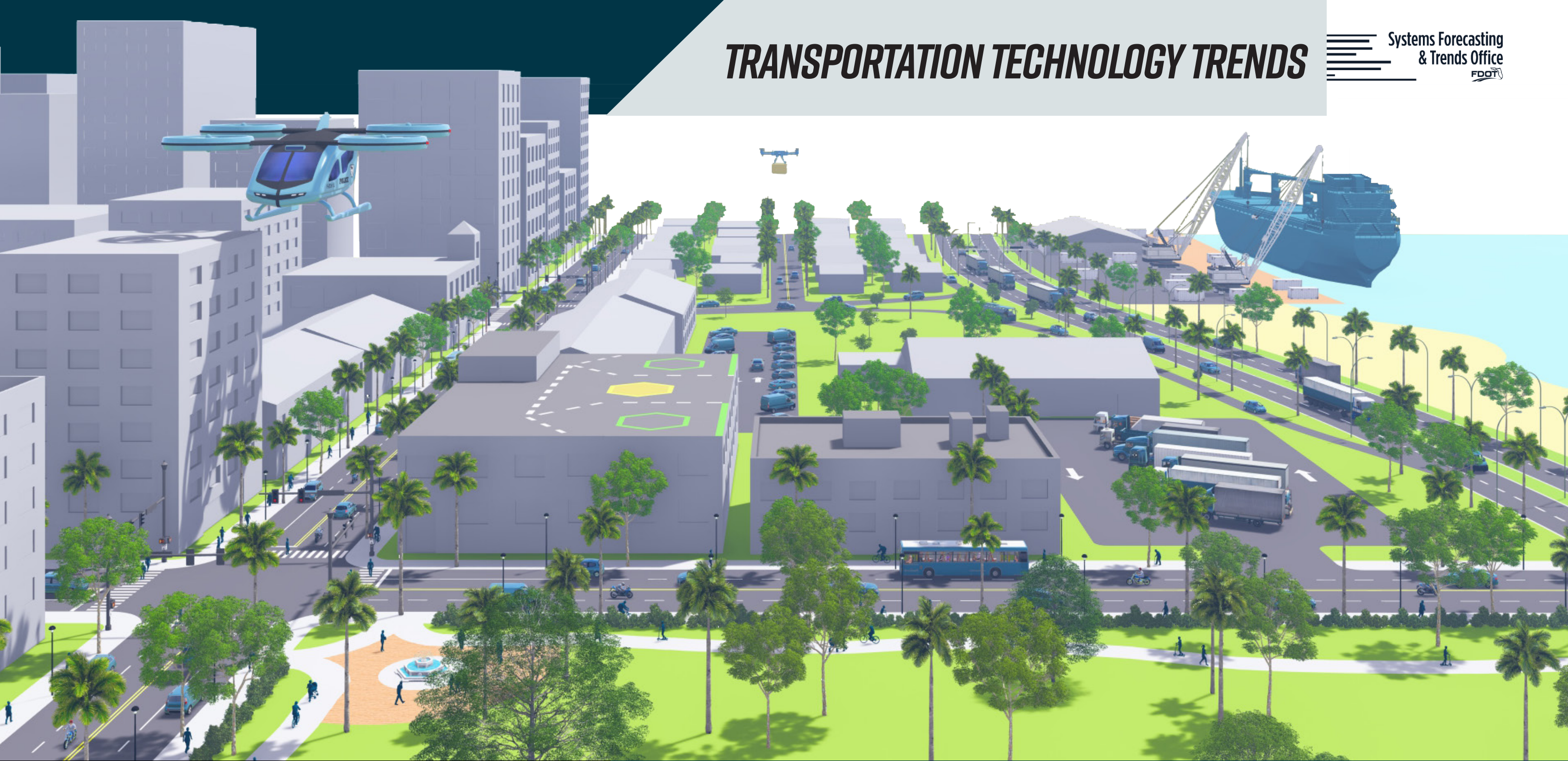


# TRANSPORTATION TECHNOLOGY TRENDS



**R**apid growth in Florida is putting new demands on our transportation network. As travel and freight volumes grow and safety concerns persist, smarter, more adaptive solutions are needed. To improve how people and goods move across the state, FDOT is introducing advanced technologies like connected systems, automation, and data-driven tools. This document highlights the integral role technology plays in Florida's transportation network.

April 2026



Advanced air mobility is a new way to move people and freight.



Automated vehicles minimize congestion, cut transportation costs, and expand travel choices.



Truck platoons boost safety, cut fuel costs, and reduce driver hours.



Connected vehicles warn drivers of roadway risks—and help make travel safer for all.

[Sources]

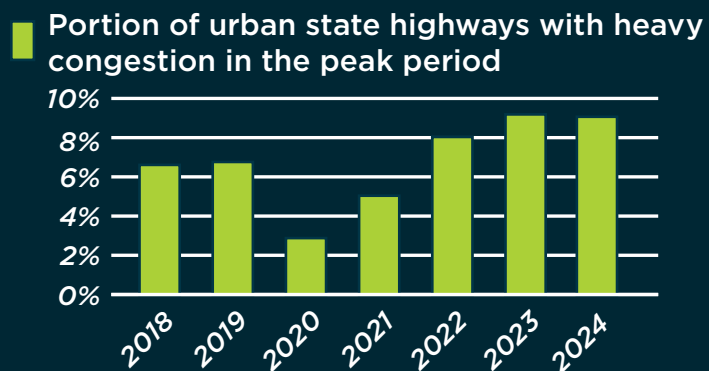
# MOVING PEOPLE

FDOT is using technology to optimize the existing transportation system, minimizing congestion while moving more people. New transportation modes offer individuals more options and balance demand across the network.

## TRANSPORTATION TECHNOLOGY TRENDS

### Tech solutions boost capacity and ease congestion across Florida's transportation system.

**1.9% MORE URBAN STATE HIGHWAYS ARE HEAVILY CONGESTED IN 2024 THAN IN 2018.**



Connected vehicles (CVs) and automated vehicles (AVs) ease congestion by smoothing and adapting to traffic flow.

AVs are coming to Florida in different types of vehicles.

Waymo launched AV rideshare in Miami in 2026.

Holon to construct Jacksonville AV shuttle production facility in 2026.

Tensor to launch AV in US in 2027.

**50+** CV initiatives in Florida.  
**8+** AV initiatives in Florida.



Ride-sharing AV costs projected to **drop from \$8.20 to \$1.30** per mile by 2035, making them more accessible.

Dynamic tolling varies pricing to manage traffic flow.

Blockchain keeps tolling data in a shared digital record that helps protect driver privacy while keeping information accurate and secure.



Dynamic tolling is in place along I-4 and I-95.

Smart infrastructure manages congestion with dynamic messaging and optimized signals.

Now: SunGuide and INRIX process **500K - 1 million** alerts annually.



I-4 Florida's Regional Advanced Mobility Elements (FRAME) delivers information to CVs and improves signal operations on routes parallel to I-4 when traffic is diverted from I-4.

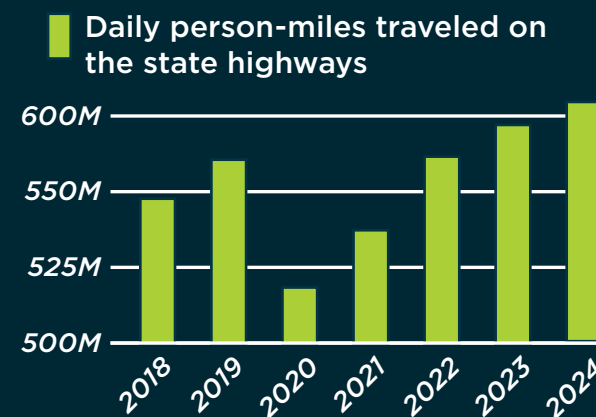
**23%** reduction in stops along parallel routes to I-4 after signals were coordinated.

**10%** corridor travel time reduction with adaptive signal control.

Up to **25%** corridor travel time reduction after signal retiming.

### Emerging transportation modes address growing travel needs in Florida.

**13% RISE IN PERSON MILES TRAVELED ON STATE HIGHWAYS IN 2024 VS 2018.**



**10%** more trips projected due to AV technologies.

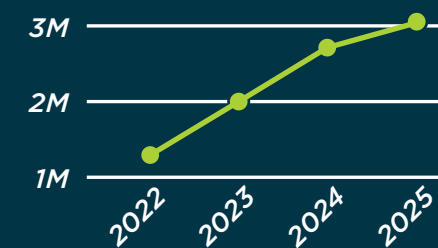


**19%** increase in airline passenger boardings from 2018 to 2024.



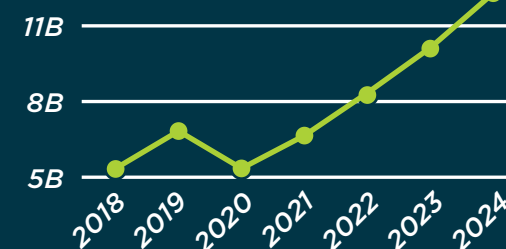
Brightline, which links south and central Florida continues to see ridership growth.

● Annual Brightline Ridership



Ride-hailing continues to grow, and is a popular option for Florida visitors.

● Annual Trips



Micromobility use has boomed, offering users more options to access destinations.



**24,000** trips on 200 shared bikes in Orlando in 2016.

**540,000** trips on 1,600 shared bikes and scooters in Orlando in 2025.

Advanced Air Mobility (AAM) is poised to transform how Floridians travel.

2026: Air taxi companies are set to launch first operations.

**0.2-1.4** million expected trips during the first year of AAM.

**11-19** million expected annual AAM trips by 2050.



# MOVING FREIGHT

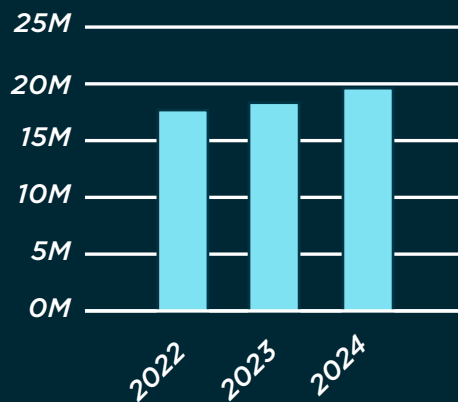
Technology offers opportunities to reduce freight costs and delay by optimizing existing systems and introducing innovative ways to move freight, including aerial transport and autonomous vehicles.

## TRANSPORTATION TECHNOLOGY TRENDS

### Surging freight activity contributes to challenges.

#### 9% INCREASE IN TRUCK VEHICLE MILES TRAVELED (VMT) IN 2024 VS 2022.

Annual combination truck VMT on state highways



70% of manufacturing shipments are from e-commerce.



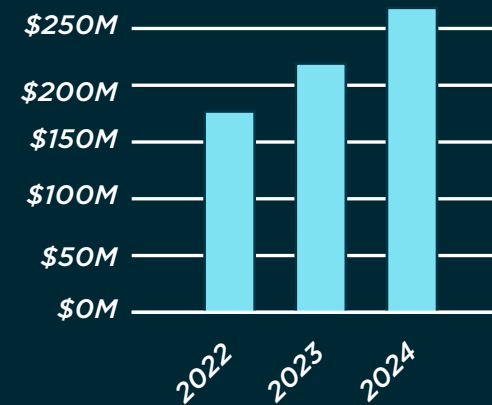
3x as much money spent on construction for manufacturing from 2018 to 2024. More domestic manufacturing translates to more shipments and more freight traffic.



### Technology can be used to drive down costs.

#### THE COST OF DELAY INCREASED 41% FROM 2022 TO 2024.

Annual cost of delay for combination trucks



1.4x freight cost increase from 2018 to 2024.

\$2.20 freight trucking cost per mile in the southeast in 2024.



Higher truck and trailer payment costs drove the increase in operational costs from 2023 to 2024.



Using drones to deliver goods can reduce truck VMT.



100+ southeast U.S. Walmart stores will have drone delivery by 2026, including Orlando, Lakeland, and Tampa.

Amazon launched drone delivery service in the Tampa Bay Area in early 2026.

Connected and autonomous trucking offers cost saving opportunities.

\$125B estimated annual savings with autonomous technology.

2016: FDOT autonomous freight pilot between Miami Airport and warehouse district.

2025: Autonomous freight transportation started between Dallas and Houston.

13% of heavy duty trucks are predicted to be autonomous in 2035.

A digital twin is a virtual replica of real-world systems using real-time data. Digital twins can support freight logistics:

Digital Twin models optimize processes.

Tracking the status, location, and condition of containers and trucks.

Evaluating outcomes from 'what if' scenarios before resources are invested.

Now: Jacksonville leaders use JaxTwin to explore hazard scenarios like flooding.

Future: 10 anticipated digital twin models statewide by 2035.

Sensors on vehicles and along roadways support autonomous operations.



- Roadside sensors support highway merging.
- LiDAR and radar monitor debris and weather conditions.
- Edge computing enables on-board data processing instead of relying on distant data servers.
- Reliable networks enable communication with infrastructure.
- Real-time tracking of vehicles and cargo helps manage operations.

Smart parking technologies predict and manage demand.



FDOT's Truck Parking Availability System has 2,564 truck parking spaces across 69 rest stops, helping drivers locate available places to rest.

Curb management can include automated enforcement, dynamic signs to communicate allowable use, and mobile based payment.

Truck platooning links trucks into a convoy using connected and autonomous vehicle technologies. Benefits include:

5-10% reduction in fuel usage.

5x faster reaction time for braking, increasing safety.

10% reduction in emissions.

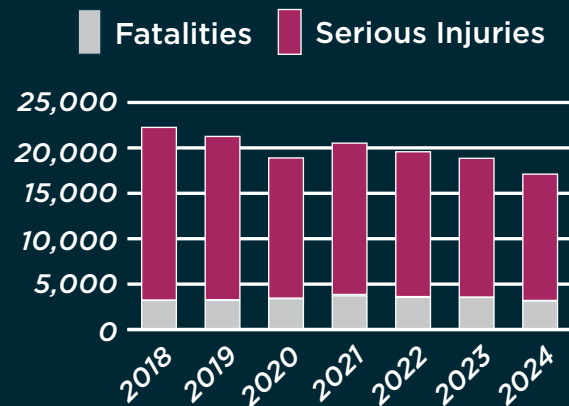


# ENHANCING SAFETY

Technology helps achieve safety goals through the adoption of vehicle technologies that reduce driver errors and the development of roadway infrastructure designed to reduce the risk of a crash occurring.

## TRANSPORTATION TECHNOLOGY TRENDS

Florida is targeting **ZERO** fatal or serious injury crashes.



Fatalities and serious injuries on Florida roads have decreased since 2018.

**FDOT'S SAFETY EMPHASIS AREAS INCLUDE INTERSECTIONS, LANE DEPARTURES, AGING ROAD USERS, PEDESTRIANS AND BICYCLISTS, AND IMPAIRED DRIVING.**

### SYSTEMS AND VEHICLE TECHNOLOGIES PROMOTE SAFER CONDITIONS

AVs are designed to make fewer mistakes than human drivers.

Autonomous driving systems are projected to result in **90% fewer crashes**.

**4x** faster hazard detection for AVs with new hardware "reflex" system compared to current practices.



CVs give warnings to drivers.

The Tampa Hillsborough Expressway Authority CV Pilot includes:

- Emergency electronic brake light warning
- End of ramp deceleration warning
- Pedestrian collision warning

**33%** of ramps on Florida's State Highway System have Wrong-Way Vehicle Detection Systems.

**97%** of detected wrong-way driving events do not result in a crash.

Technology offers more options for enforcement.

**64%** decrease in speeding when intelligent speed assistance is installed in a fleet.

**21%** fewer fatal red-light-running crashes in cities with cameras.



Enhancements to planning and traffic management.

Crash risk is assessed using deep learning to combine historic crashes, aerial imagery, and vehicle paths.

Video analytics identify near misses.

Crowdsourced data reduced average incident response time by **10 minutes**.

### INTERSECTIONS



**96%** projected reduction in intersection injury crashes after the adoption of AVs.

**15%** reduction in intersection crashes with **smart signals**. Smart signals collect real-time traffic data and broadcast signal phase timing and intersection geometry messages to CVs.

### LANE DEPARTURES

**11%** reduction in lane departure crashes with adoption of **lane departure warning**.

**100%** reduction in crashes resulting from tire blowouts with the adoption of **airless tires**.



### PEDESTRIAN AND BICYCLISTS

**92%** accurate detection of pedestrians at midblock locations with **passive detection**.



**Pedestrian automatic emergency braking** is proposed to be mandatory in new vehicles by 2029.

### IMPAIRED DRIVING



**24%** reduction in weekend night crash injuries after rideshare was introduced.

2019: Orlando piloted rideshare hubs downtown to support nightlife patrons getting home safely.

**90%** potential reduction in impaired driving deaths from **in-vehicle impairment detection technology**.