



Developed for the  
ITS Joint Program Office

# **Intelligent Transportation Systems: Is it the Right Career Choice for You?**

ITE Student Chapter Series

# How Did We Get Here?!

---

The Century of the Traffic Jam?



Is this our destiny?

# A Fast Forward Trip Through Time

- Pre-history through 1781 (Watt's Steam Engine)

- Animal (including our two legs)
- Wind



- 1800's – The Century of the Railroad

- 1830 – 40 miles of track in the US
- 1880 – 163,560 miles of track in the US



- 1900's – The Century of the Automobile

- Enabled by the invention of the internal combustion engine (and cheap oil)
- US Primary System (Built 1925 – 1956) 157,724 miles
- Interstate System (Built 1956 – 1991) 47,856 miles



- Where we are today is neither –

- Sustainable nor
- Livable



# The Challenges are Flesh and Blood Real



## Safety

32,719 highway deaths in 2012  
5.7 million crashes in 2012  
Leading cause of death for ages 4, 11-27



## Mobility

5.5 billion hours of travel delay  
\$121 billion cost of urban congestion



## Environment

2.9 billion gallons of wasted fuel  
56 billion lbs of additional CO<sub>2</sub>



Data Sources:  
Traffic Safety Facts 2013, National Highway Traffic Safety Administration (June 2014)  
2012 Urban Mobility Report, Texas Transportation Institute (Dec 2012)  
Image Source: ThinkStock/USDOT

# Can We Answer These Challenges?



- If we could . . .
  - “See” what is going on
  - Communicate what we see in real time
  - Apply cutting-edge analytics and modeling
- We could . . .
  - Create smarter management and control actions
  - Give travelers timely and valuable information to help them make smarter travel decisions
  - Allow everyone to travel more safely, smoothly, and sustainably

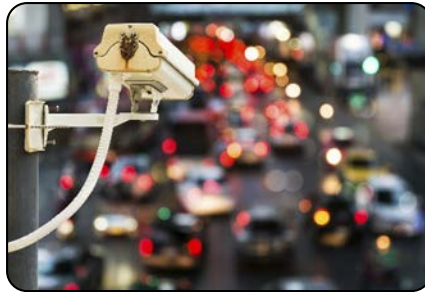
Can We Do This?

- Thanks to ***Intelligent Transportation Systems*** . . . We can!

# What are *Intelligent Transportation Systems*?

- Think of the human body as the ultimate system, i.e. Many complex subsystems working together as a whole
- **Intelligent Transportation Systems** combine –

**Sensing**



**Communications**



**Information Processing**



**to make smarter transportation a reality**

# Sensors – The Eyes and Ears of ITS

- We can't respond to what we can't see or *hear*
- Sensors are now everywhere . . . in vehicles and throughout our roadway, transit, and parking systems . . . and in our hands
- The data provided by these sensors enables –
  - Better traveler information
  - Better traffic control and management
- Without the data from advanced sensors . . .  
we are literally in the dark



Image Source: USDOT



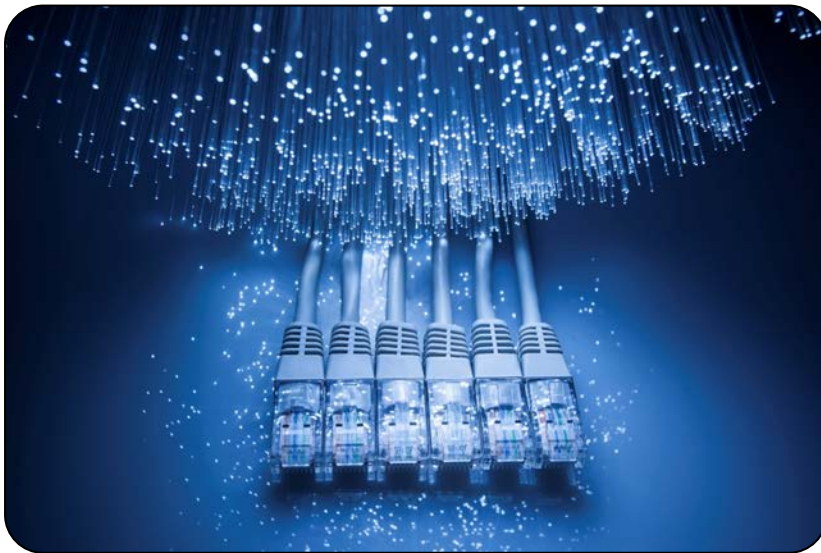
Image Source: ThinkStock/USDOT



Image Source: USDOT

# Communications – The Nervous System of ITS

- The sensor data is of no value if we can't get it from the *field*
- Our control and management decisions and enhanced traveler information are of no value unless we can get them back to the *field*
- Wired and wireless communications systems tie everything together



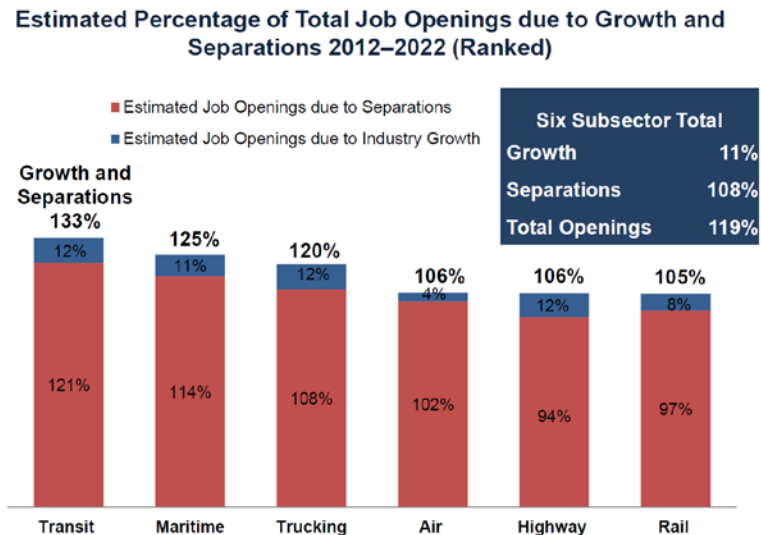






# Positive Outlook for ITS Job Market

- Job growth is forecast to continue to be very strong
- Employment levels have been robust through economic cycles
- Salaries are above national average from technician through management levels
- The ITS work force will provide key technical leadership for a transportation sector that is projected to need 4.6 million new hires between 2012 and 2022



Source: Subsector job openings due to growth based on TLC and JFF analysis of EMSI Industry Report. Data retrieved from EMSI June 2014. Subsector job openings due to separations based on TLC and JFF analysis of EMSI Industry Report and Separation Rates from BLS Employment Projections program. *Projected occupational separation rates, 2012-22 experimental data set.* [http://www.bls.gov/emp/ep\\_separations\\_data.xlsx](http://www.bls.gov/emp/ep_separations_data.xlsx). Released May 9, 2014.

# It's Not Just About Cars and Highways



Image Source: City of Raleigh (Used by Permission)



Image Source: ThinkStock/USDOT

# We Are on the Cusp of an Explosion in ITS

- All the necessary pieces are in place --

- The technologies are ready



- The traveling public expects services and solutions



- The private sector is primed for action

**Cisco's**  
**The Last**  
**Traffic Jam**

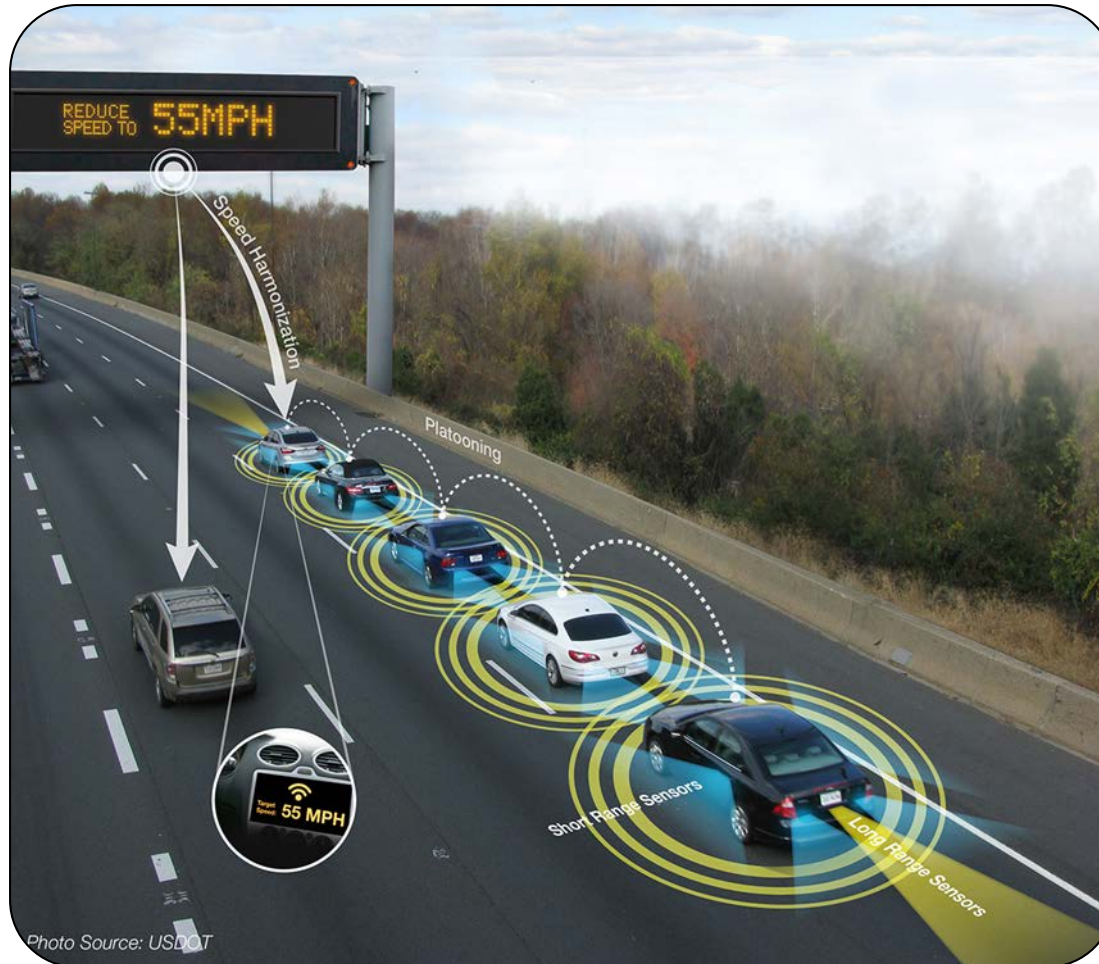
- The federal government is beginning to push . . . Hard



Transportation Sec. Foxx announces steps to accelerate road safety innovation

- State and local governments are gearing up

# It's Happening Now – Vehicle Safety Technologies



# Personalized Travel – Crowd Sourcing



Image Source: Waze Inc. 2013

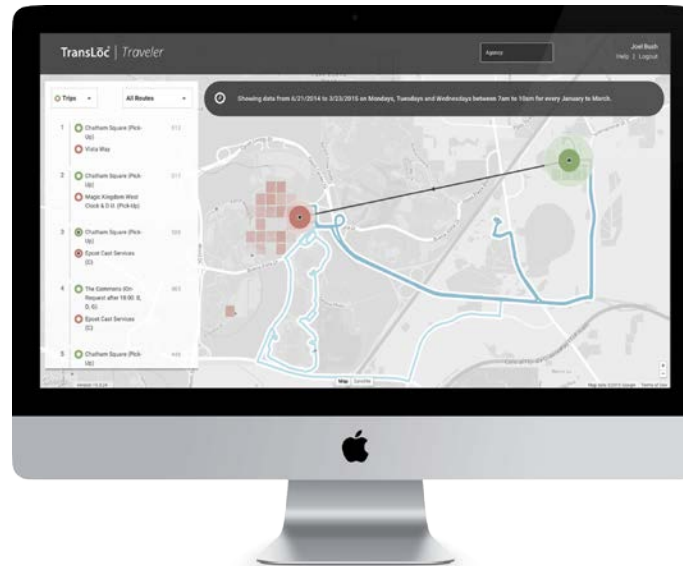


Image Source: Provided by TransLōc  
Used by Permission





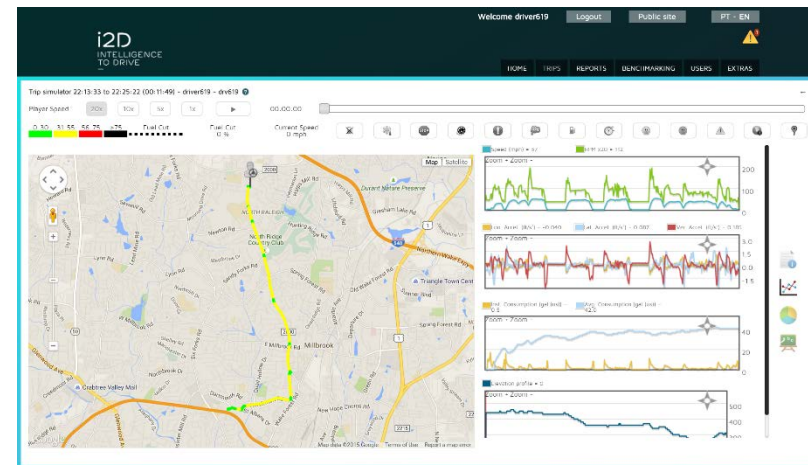
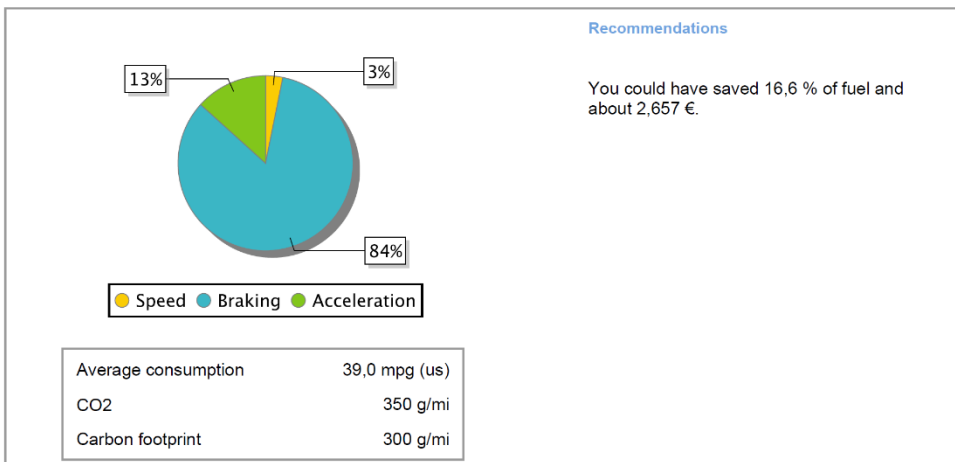
# i2D – Connected Vehicles in Europe



SOON ALL VEHICLES  
WILL BE CONNECTED



## Eco-driving



- <https://www.i2d.co/i2dpubportal/home.xvw>

# Dash – A US Example





# dash

## Social

Are you the best driver?

Capture the fun behind the wheel, by sharing your road trip stories!

Compare how you drive to your friends – and the better you drive, the more bumper stickers and promotions you unlock!

	<b>01. Alicia Yoon</b> New York - BMW 325i	<b>93</b>
	<b>02. Dennis Crowley</b> New York - Audi A6	<b>90</b>
	<b>03. Chamara Paul</b> Chesapeake - Toyota Rav4	<b>87</b>
	<b>04. Patrick Lewis</b> New York - BMW 528i	<b>75</b>
		<b>84</b>



■ <https://dash.by/>

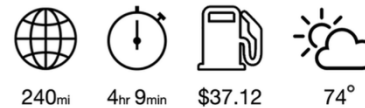


## Savings

Save while driving.

We give you real time feedback, so you can improve your driving and maximize fuel efficiency. And by connecting you with great deals, you can save hundreds of dollars per year on gas, repairs and maintenance!

We also show you where the cheapest gas is nearby and provide you accurate estimates for the most common repairs, so you get the fairest price from your mechanic.



# What's Coming – Will You Be in the Game?

- Epochal changes will occur . . .  
in your lifetimes



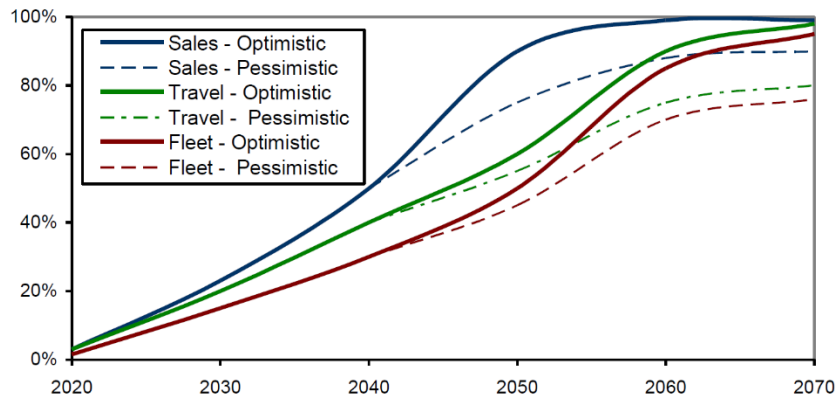
- You **can** play a role . . .  
in shaping the next 20-30 years



- Crystal Ball – Two of the Many  
Future Developments
  - Autonomous Vehicles
  - Unmanned Aerial Vehicles

# Autonomous Vehicles

- Transition to full automation will –
  - Likely take several decades
  - Will be filled with difficult yet exciting challenges
- Will require a monumental cooperative effort between private and public sectors



Source: ThinkStock/USDOT

## Autonomous Vehicle Sales, Fleet and Travel Projections

Source: *Autonomous Vehicle Implementation Predictions: Implications for Transport Planning*, Todd Litman, Victoria Transport Policy Institute, February 2015

[Google Self-Driving Car Project Video](#)

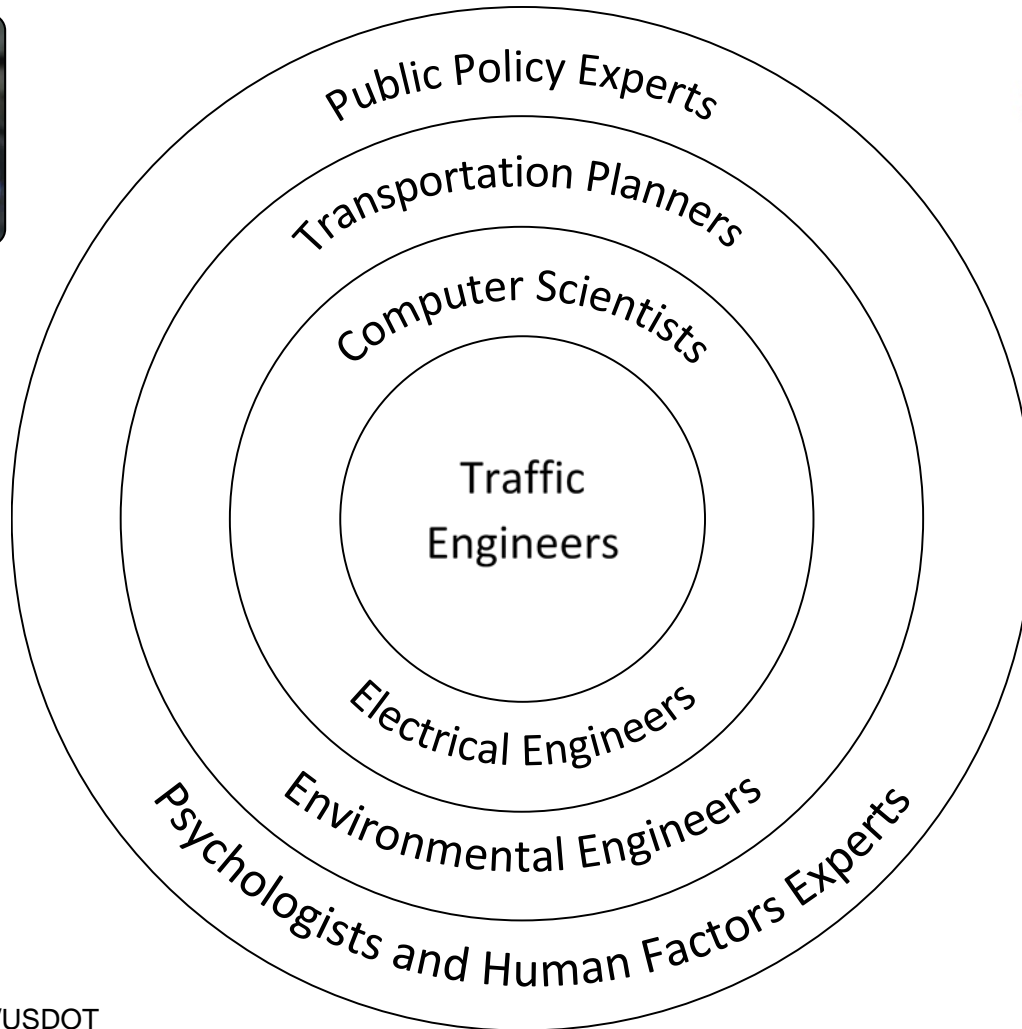
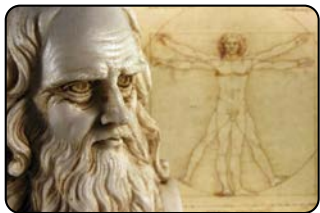
# Unmanned Aerial Vehicles

---



# We Need All Hands on Deck

- The winning team will need players from many fields



# The Mission – Will You Choose to Accept It?

- In the 19<sup>th</sup> and 20<sup>th</sup> centuries we let technology lead
- The unintended consequences have been piling up



- ***Intelligent Transportation Systems*** will be an important part of turning this around and using technology to build a sustainable and livable world
- **You** can help lead this effort . . .
  - It will take all of us working together
- **You** can make a real and significant difference
- It's up to **you** to seize the opportunity

