

**MISSOURI'S
TRANSPORTATION**



LONG RANGE PLAN UPDATE

Impacts of emerging trends and technologies

March 8, 2018

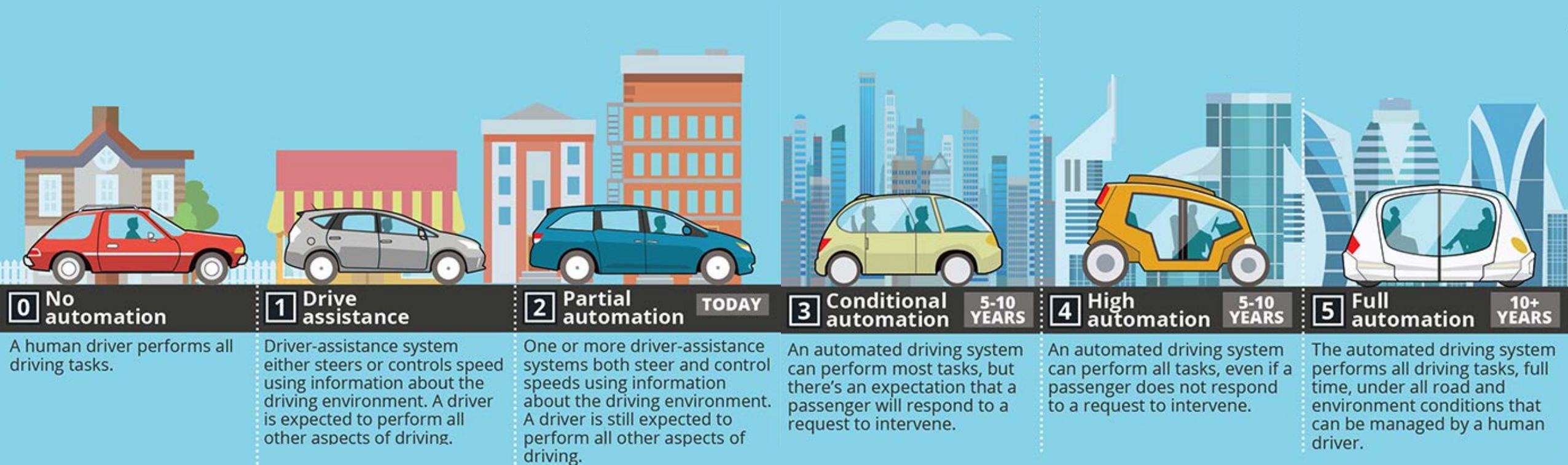




**Autonomous vehicles
are coming.**

The evolution of self-driving cars

National Highway Safety Administration classification system



When will they get here?

Basics of AV/CV

12/7/2017



Tesla	By 2018
Ford	2020
Toyota	2020
Renault-Nissan	2020
Hyundai	Highway by 2020; Urban by 2030
GM	2021
Volvo	2021
Daimler	Early 2020s
Fiat-Chrysler	2021
BMW	2021
Kia	2030

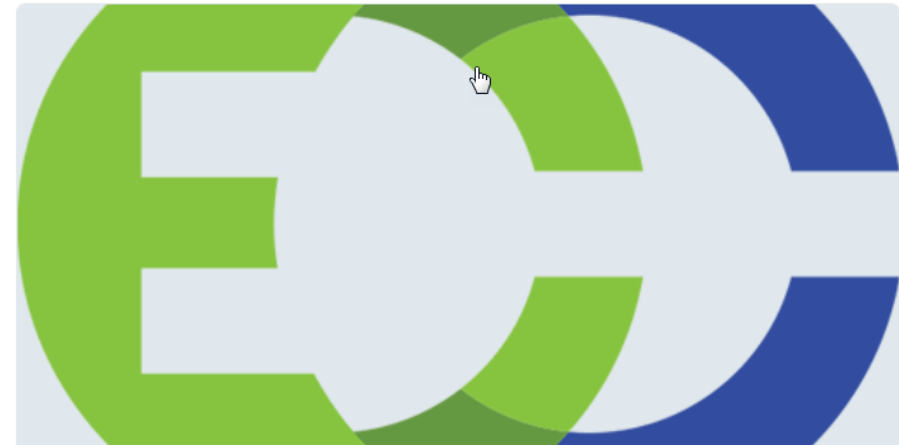
Will AV/CV follow electric vehicle adoption trends?



U.S. Engineering
@USEngineering

Follow

#KC named #1 in electric vehicle growth!
Since 2015, the metro has increased electric vehicle adoption by 95%.



KC Ahead for EV Growth » The Clean Charge Network

Since the deployment of the KCP&L Clean Charge Network began in 2015, Kansas City has experienced a 95 percent increase in electric vehicle adoption.

cleanchargenetwork.com

Impacts of AV/CV

More cars, less capacity required?



+273%



Short Range Sensors

Long Range Sensors

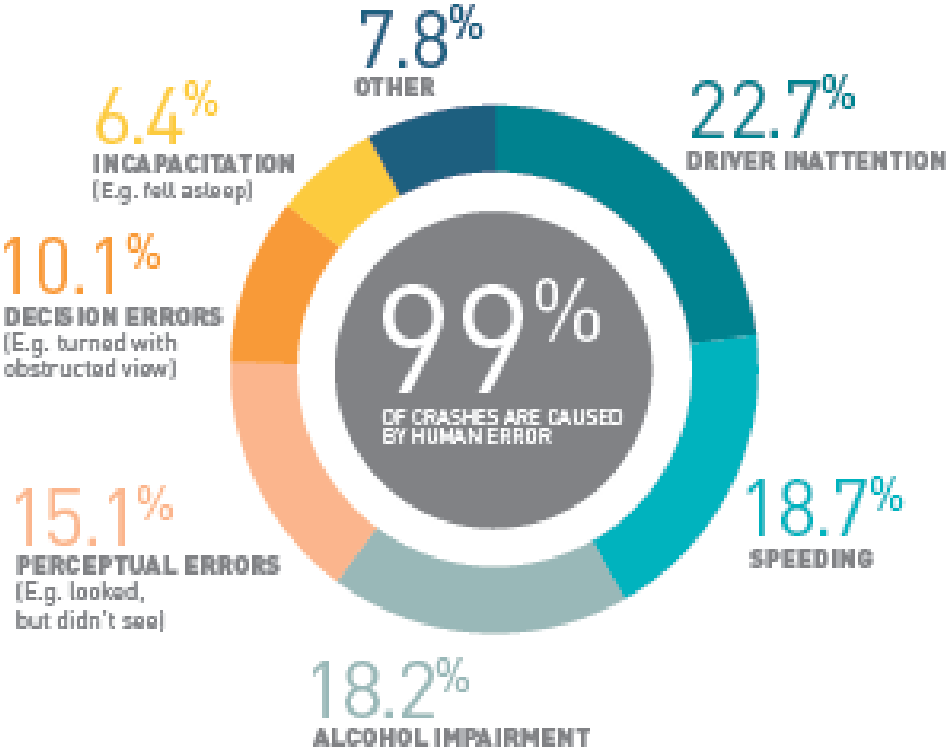
Impacts on land use of AV/CV

12/7/2017



REDUCING HUMAN ERROR

Fully automated vehicles will significantly reduce driving incidents caused by human error. In a study of 723 crashes, driver error caused or contributed to 717*



*Relative frequency of unsafe driving acts in serious traffic crashes, summary technical Report, USDOT NHTSA Traffic Safety Programs, January 2001

Impacts on safety of AV/CV

12/7/2017



Public shuttles/circulators



Impacts on mobility of AV/CV

12/7/2017



Car ownership? Shared vehicles?



Impacts on household costs / commutes

12/7/2017



Safer, more efficient trucks?

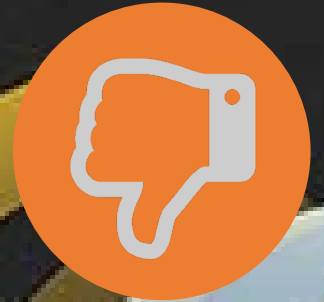


Impacts on freight

12/7/2017



Zero Occupant Vehicles (ZOVs)



COULD result in
more VMT-up to:
35 percent more for personal AVs
90 percent more for shared AVs

Impacts on environment

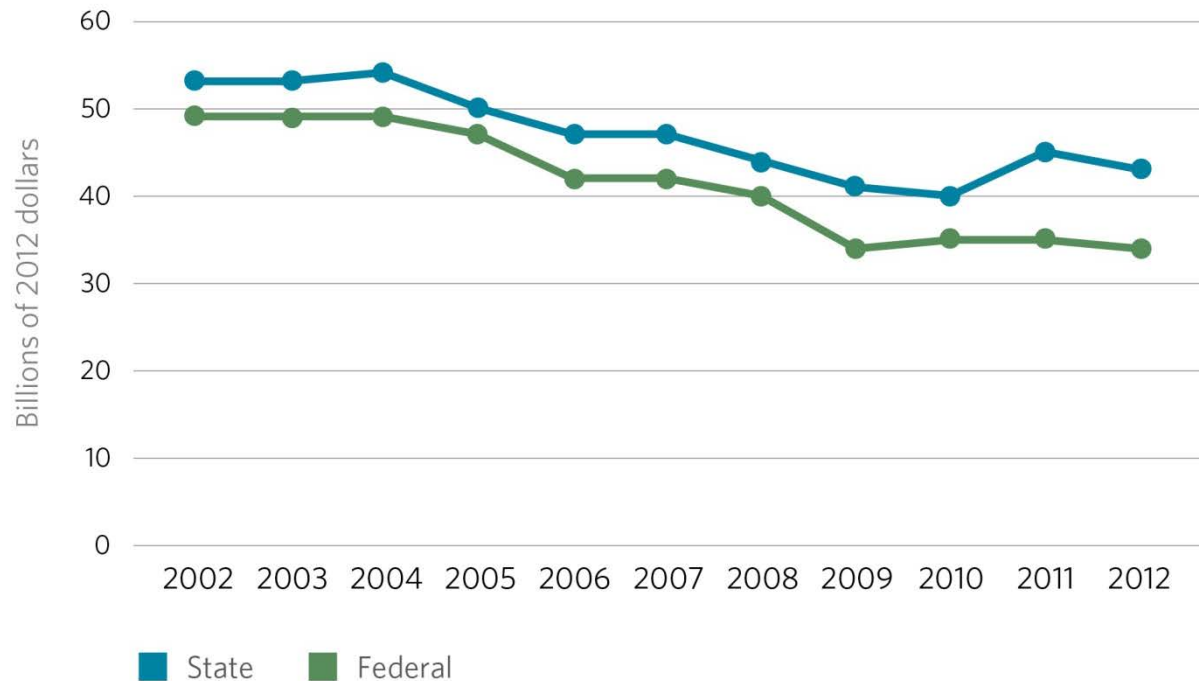
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Declining fuel tax revenue



Gas Tax Revenue Has Fallen Over the Past Decade
Federal and state fuel tax revenue, adjusted for inflation, 2002-12



Impacts on Revenue

12/7/2017





In 2025 autonomous technology will add \$7,000-\$10,000 to a car's price.

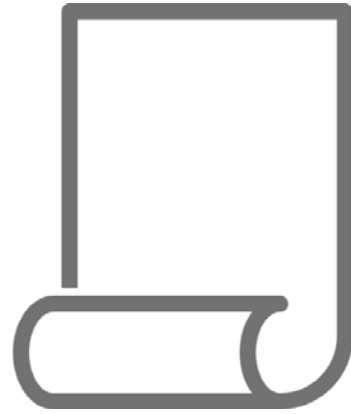
2030: \$5,000 more

2035: \$3,000 more

Impacts on equity

12/7/2017



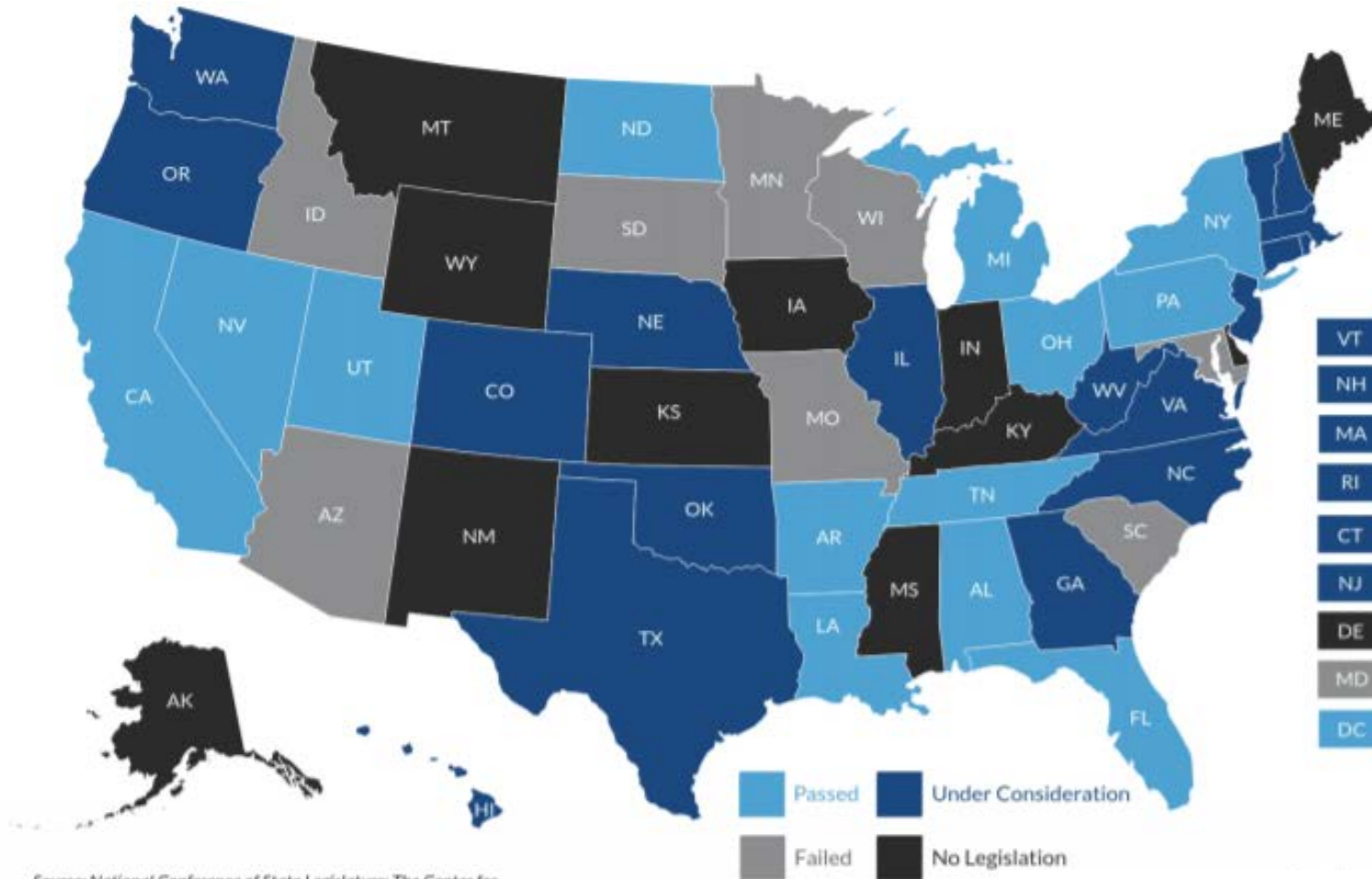


Potential Missouri policy implications

Why we plan



Status of automated driving legislation



Source: National Conference of State Legislature; The Center for Internet and Society; and individual state-legislatures ³¹

Cybersecurity



"Self-driving cars will prove an irresistible target for hackers,"
warns 12/7/2017 cyber security expert Eddie Schwartz



Privacy



Insurance



- The car insurance sector could shrink to 40% of its current size by 2040
- Self-driving cars could cut 90% of all car accidents in the United States
- Tesla is already putting pressure on insurers

Insurance

What people like about driverless cars:

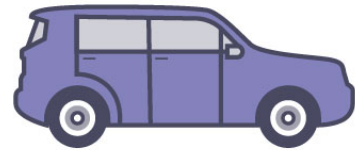
(Respondents could select more than one choice)

nerdwallet



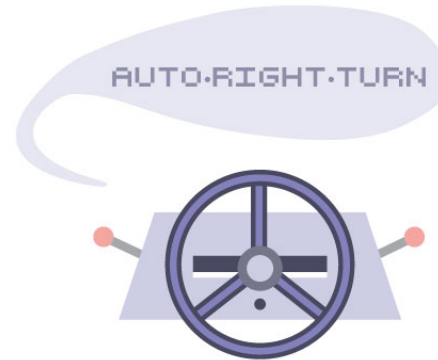
28%

Could be more productive on commute



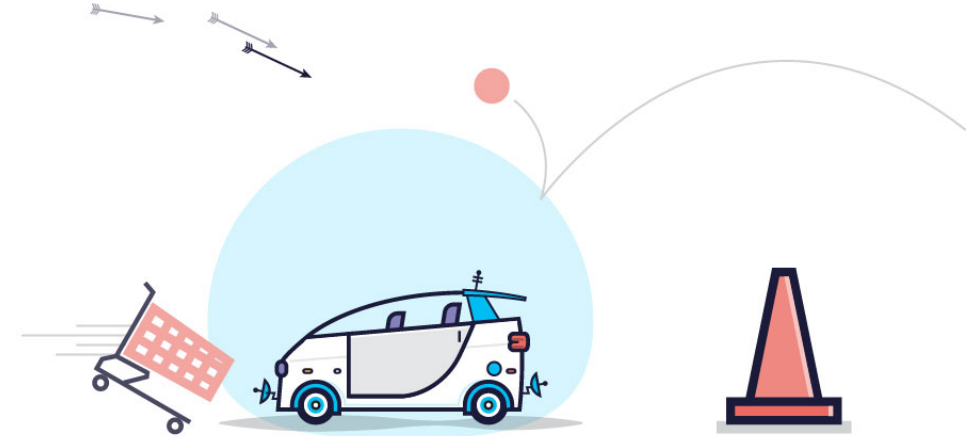
29%

Would be safer than today's cars



33%

Would handle routine tasks such as steering and speed control



35%

Could reduce cost of auto insurance



36%

None of the above





Feature

When Autonomous Cars Crash, Who's at Fault?

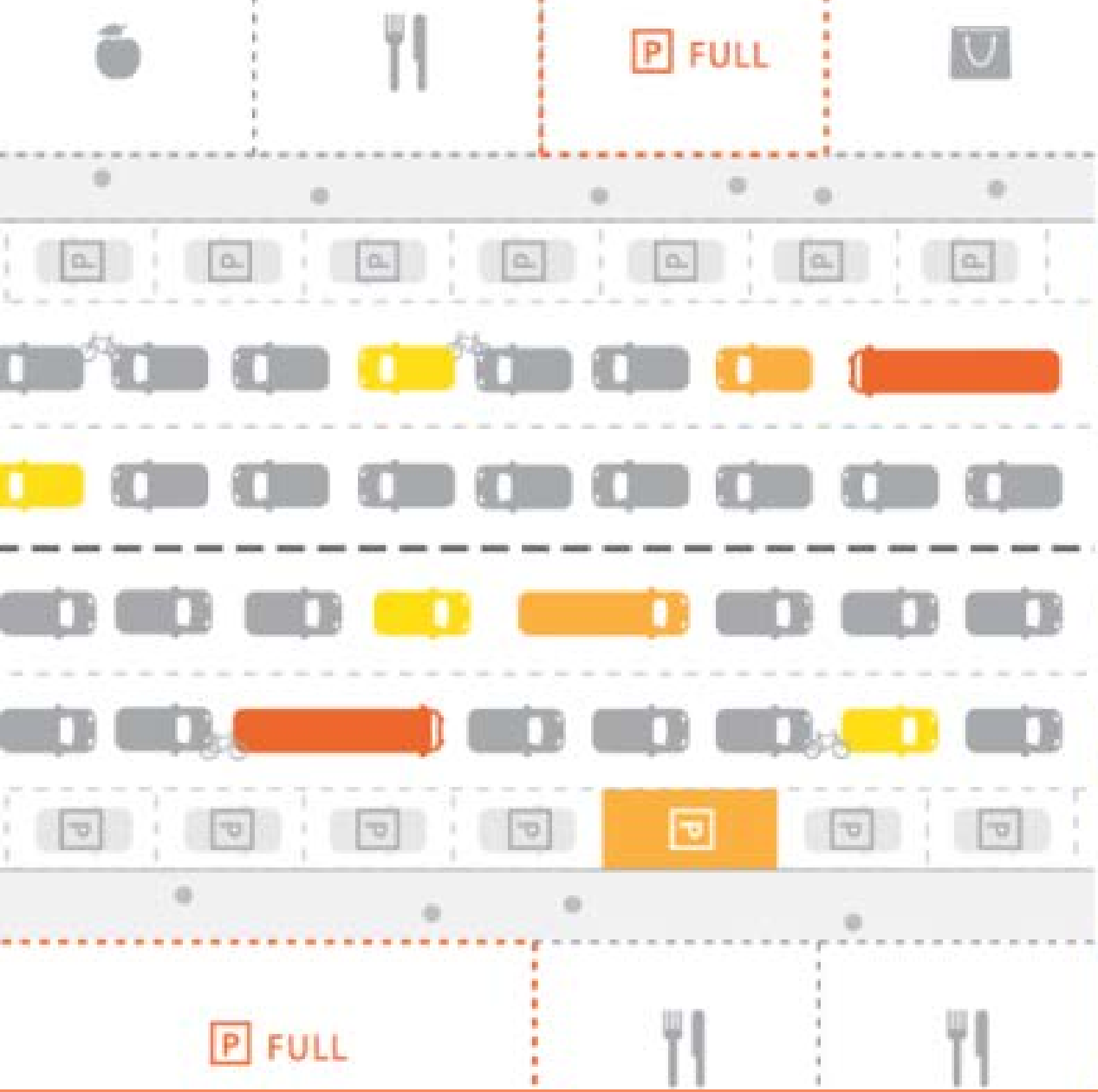
The road to full automation will bring several lifetimes' worth of work for lawyers.



Enforcement

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Land use

12/7/2017





Autonomous Vehicle Development

Workforce issues

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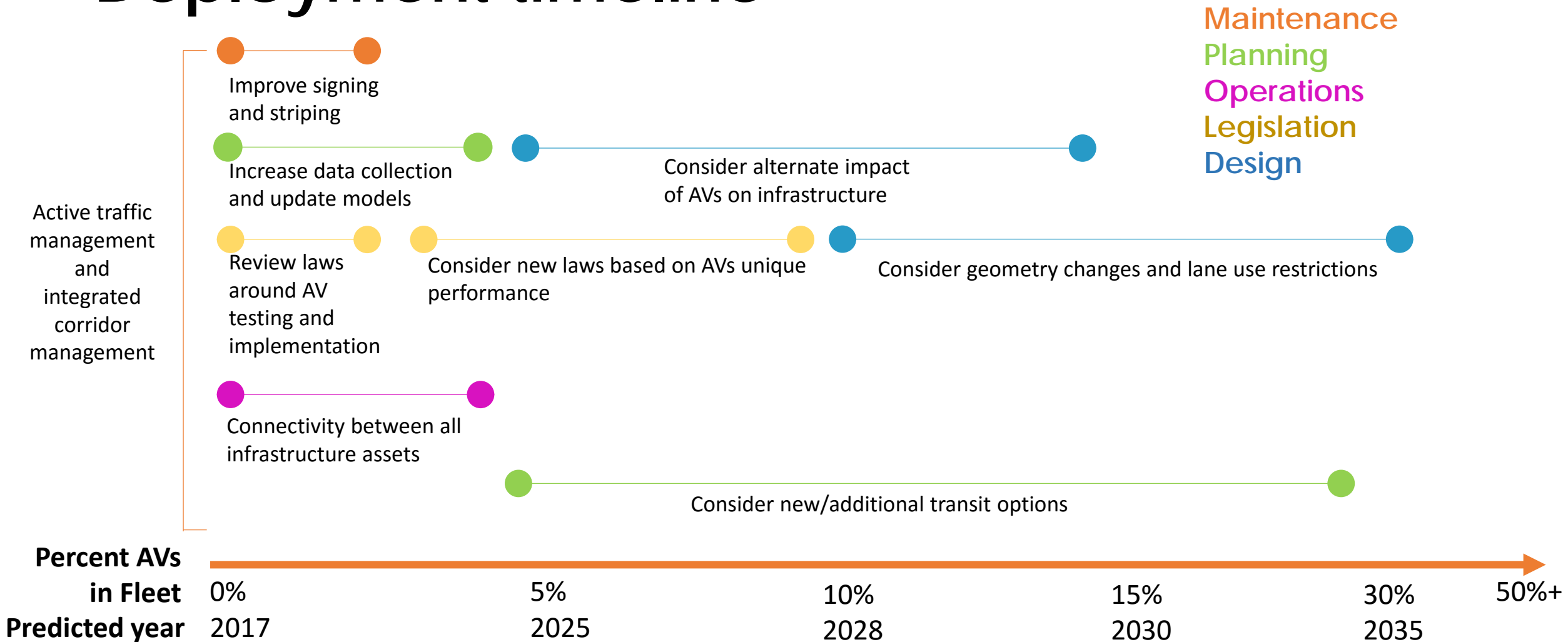


Environment

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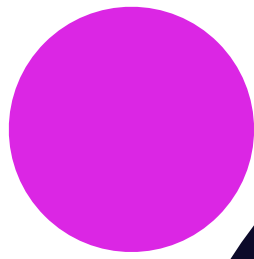
Deployment timeline



MoDOT Workshop

- Brought together many stakeholders
- AV/CV will have wide impact on transportation and society
- Participants see MoDOT as a leader in facilitating future conversations





**See you in the
FUTURE!**