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AV Developer
Call to Action
Acknowledge children are not small adults and require
special developmental consideration:
Support safety standards that protect children
Inclusive design
Conduct research on appropriate supervision
Best safety practices in marketing
Recommendations
for Traffic Safety
Community
Blue Ribbon Panel Report
Regulation, Legislation, Enforcement \& Policy
Education \& Outreach
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| Additional Resources |  |  |
| :---: | :---: | :---: |
| 2021 <br> The Automated Vehicles Consortium is creating, publishing and adding resources | $\underset{\& \text { Enforcement }}{\text { Policy, Legislation }}$ | - Guidance and best practices for ensuring policies and legislation include children |
|  | Public Information $\&$ Education | - Educational information certified CPS techs, 1st responders, and law enforcement officers |

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## Driver Assistance \& Autonomy



## On the Way to Automated Driving

Advanced Safety Features

- Electronic stability control
- Blind spot detection
- Forward collision warning
- Lane departure warning

Advanced Driver-Assistance Features

- Rearview video systems

Partially Automated Safety Features

- Lane keeping assist
- Adaptive cruise control
- Traffic jam assist
- Self-park

Fully Automated Safety Features

- Driverless vehicles
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- Automatic emergency braking
- Pedestrian automatic emergency
braking
- Rear automatic emergency braking
- Rear cross traffic alert
- Lane centering assist

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## Level 1 - Driver Assistance

Vehicle assists the driver with a single task such as:

- braking
- lane-keeping
- adaptive cruise control of vehicle models for over a decade
(Many vehicles have had these features for the past several years.)

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Level 2 - Partial Automation

| Level 2 - Partial Automation |  |
| :---: | :---: |
| Vehicle assists the driver with two or more Level 1 tasks <br> - braking <br> - lane-keeping <br> - acceleration <br> - steering <br> - adaptive cruise control | Not considered self-driving; Human driver still required |
| (Examples: Tesla Autopilot, Mercedes-Benz Drive Pilot, Volvo Pilot Assist) |  |
|  |  |

(Examples: Tesla Autopilot, Mercedes-Benz Drive Pilot, Volvo Pilot Assist)

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## Level 3 - Conditional Automation

- Vehicle can self-drive from point $A$ to point $B$ under certain conditions
- Driver must take control in a moment's notice in an emergency or when conditions change.

Driver must be
$\qquad$ present and attentive at all times and ready to take control (No current examples exist on the consumer market.)
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## Level 4 - High Automation

Vehicle operates autonomously, but in limited situations, such as:

Within a set geographical area

- Up to a maximum speed In favorable weather conditions Driver or remote operator may be required for some models and situations

Envisioned for fixed route vehicles, like shuttles or commercial deliveries (No current examples exist on the consumer market.) Chidren in Automated veitides

## Level 5 - Full Automation

- Vehicle can self-drive from point A to point B regardless of weather condition or speed
- No driver required
- All humans are passengers

Passengers free to shift focus (to reading, working, watching TV, etc.)

- Some vehicles could be occupantless
(No current examples exist on the consumer market.)

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## AV: Safety Advantages

- Single-year crash toll in the U.S. (2019):
- 119,095 children ages 0-14 visited an ER
- 7,908 children ages $0-14$ were hospitalized
- 280 children ages $0-14$ died
- $94 \%$ of serious crashes are due to human error
- AV technologies remove human error from crashes
- Fewer crashes mean fewer deaths \& injuries
- Reductions in pedestrian and other non-occupant injuries and deaths are also expected.

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Children in Automated Vehicles
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## AV: Economic Advantages

- Societal costs of child passenger traffic fatality and injury include medical, work loss, and quality of life loss costs:
- \$4.1 Billion - Emergency Department Visits $\qquad$
- \$4.8 Billion - Child Hospitalizations
- \$2.5 Billion-Child Deaths
\$11.38 Billion TOTAL per year in the United States
- Economic costs are accompanied by devastating social impacts for road users, their families, and the broader community
- Elimination of crash-related deaths and serious injuries is an urgent priority.
children in Automated Vehicles


## AV: Additional Possibilities

- AV Rideshare and other options for families
- More accessible mobility for unlicensed individuals
- More accessible mobility for people with disabilities
- Independent possibilities for older children
- Cost Savings
- Likely shift in family insurance costs $\qquad$
- Reduced product costs due to improved delivery efficiency
- Further Potential
- Less need for parking space if vehicles are share/active
- Further technological advances and robotics

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## Are AVs Safe?

Current regulations, vehicles and laws make the driver or
attending parent responsible for child safety.
Regulations, laws and education must adapt to the changing
technology and continue to assure child safety.
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## Currently in Use for Real-World Testing

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Identifying the Waymo Fully Self-Driving Vehicle $\qquad$ The Waymo fully self-diving Chrysler Pacifica Hybrid minivans can be easily identified by the white
color with Waymo logos, roof assembly, front fender additions, or rear roof additions below. During driverless testing and operation, Waymo's vehicles are fully self-driving at all times, and $\qquad$ will not have any person in the driver's seat either steering or otherwise controlling the vehicle.


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Appropriate Restraints for All Occupants
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## What Guidance Is Needed by Families?

Clear Laws
(Current laws
focus on drivers)
Best Practice Guidance
(Using clear, consistent terminology)

Vehicle
Design \&
Regulations

## Children Must Be Supervised for Safety

- Current vehicles and laws make the driver or attending parent responsible for child safety
- Who is responsible when the potential exists for no $\qquad$ parent/caregiver to be present or alert?
- children may unbuckle themselves or others
- bored children may play unsafely with unused seat belts
- What is the appropriate age when a child can ride alone?

Children under 13 must not be transported without appropriate adult supervision. $\qquad$

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## AV: Time Efficiency Discussion

- What are some potential benefits to families being
"driven" compared with an adult needing to drive?
- What are some of the related safety considerations?


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Law Enforcement and AV

## Fewer crashes and significant injury reduction

- Human error crashes
- Distracted driver crashes
- Impaired driver crashes
- Officers multitask in patrol vehicles


Did the driver assume emergency control in a Level 2 or 3 vehicle? Who is responsible for crashes in vehicles with no driver? Have laws been updated to include autonomous vehicles?

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Laws Must Guide Safe Practices

| Model Law for Child Transport in AV |
| :--- |
| - Responsible party duties |
| - Restraision requirements requirements |
| - Vehicle requirements |
| - Definitions |

are a crucial part of educating road users.

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## Child Safety at the Forefront

> AV Developers, Vehicle Manufacturers, Car Seat Manufacturers, Regulators and Safety Experts...

MUST COMMUNICATE THROUGHOUT PROCESS!

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CPS Techs Need Updated Info

## 2017 survey: 1300 certified CPS Technicians

- 131 actively following and 811 "know a little" about AV
- 975 have never started a conversation about AV
- Child supervision (1005) is the biggest AV concern
- Believe AV is in distant future

AV design \& development have been progressing for decades, but widespread visibility is now increasing

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## Safety Is Important for All Uses

## Multiple User Vehicles Becoming More Common

Rideshare, rentals, shared vehicles
Certain car seats are becoming more portable, lightweight
Easy use, accessible instructions and dexterity are needed
Labels-pictorial
Standardized, harmonized terms for a new field
10 years ago, no one talked about GOOGLING, for example
Vehicle Differences - Cars, trucks, shuttles
Interior designs
Swivel seats
Number of rows and configurations

Children in Automated Venicles

## Will Common Crash Types Shift?

Will frontal crashes continue to be the most common type?


Regulatory and Testing Consideration in the United States:

- FMVSS 213 requires frontal crash protection for car seats $\qquad$
- Near-side lateral testing is anticipated
- No rear or rollover testing is required

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