Cruise

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NCSL Panel

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What is Cruise?

Zero-emission.
Cruise AVs are all-electric, and our entire fleet in California is powered by 100% renewable energy.

Self-driving.
Our mission is to build the world’s most advanced self-driving vehicles to safely connect people with the places, things, and experiences they care about.

Shared.
Cruise will own and operate our fleet, with the goal of providing shared transportation services.
What is Cruise doing today?

Research, Development, & Testing

Cruise is still in the development stage - to date we have not offered any kind of self-driving ride-hail service to the public.

We continue to test in fully autonomous Chevy Bolts in San Francisco and Scottsdale, Arizona.

CPUC & DMV Permits

In June 2021, Cruise became the first - and to date, only - company approved by California Public Utility Commission to provide driverless passenger service to members of the public, without charging a fare.

In September 2021, Cruise received a driverless deployment permit from the California DMV, which allows us to transport goods, for a fare, in our AVs.
What is Cruise doing today?

Testing and a Delivery Pilot Arizona

In addition to Cruise’s main hub of activity in San Francisco, we also actively do on-road research and development in Scottsdale, Arizona, which has been underway since 2017, giving us valuable data from a different driving landscape.

In late 2020, Cruise and Walmart announced a partnership to begin a pilot program delivering groceries from a Walmart store in Scottsdale to customers’ homes utilizing our autonomous vehicles.

Walmart strengthened this partnership with a major investment in Cruise in April 2021.
Decarbonizing Transportation

**Improving Public Access to Green Miles Traveled**

- All Cruise vehicles are 100% electric.
- **Investing in charging infrastructure**, including in communities of concern
- Centrally-managed: efficient routing from charger to passenger to destination
- Sourcing our renewable solar energy credits directly from family farms in California’s Central Valley - our initiative known as **Farm to Fleet**

**Investing in EV charging infrastructure**

- To support our operations, Cruise is working to build one of the largest EV charging stations in North America.
- Continued growth into new markets for Cruise’s all-electric fleet will include significant investments into EV charging stations in each of our markets.

The ‘Farm to Fleet’ initiative allows Cruise — which owns and operates its own EV charging infrastructure — to directly purchase renewable energy credits to power its fleet in San Francisco. In 2019, the company pledged to power its fleet with 100% renewable energy.
Impact of Farm to Fleet at Scale

REC revenue from electrifying ridehailing in California via Farm to Fleet could exceed $100M per year by 2035 for companies that own the electrical panels we source to.

By 2040, all-renewable ridehailing in California could offset 13.5M MT CO2 per year - the same impact as removing 2.9M gas-powered cars from our streets.

More programs like the Low Carbon Fuel Standard - state or federally - can incentivize transport decarbonization while bridging urban and rural communities through sustainable financial partnerships.
Cruise is Focused on Safety
Driver Assist Systems vs Autonomous Driving

There is a lot of confusion about what really qualifies as ‘autonomous’ or not, particularly as many personal vehicles now have advanced driver assistance systems (ADAS) - including lane assist and automatic emergency braking - which are vastly different than autonomous vehicles that utilize autonomous driving systems (ADS) where vehicle occupants do not operate the vehicle.

| Level 0 | The human driver does all the driving. |
| Level 1 | ADAS can sometimes assist the human driver with either steering or braking/accelerating, but not both simultaneously. |
| Level 2 | ADAS can itself actually control both steering and braking/accelerating simultaneously under some circumstances. The human driver must continue to pay full attention at all times and perform the rest of the driving task. |

| Level 3 | An semi-autonomous driving system can itself perform all aspects of the driving task under some circumstances, but the human driver must be ready to take back control at any time. In all other circumstances, the human driver performs the driving task. |

| Level 4 | ADS can perform all driving tasks and monitor the driving environment – essentially, do all the driving – in certain circumstances (examples: limited geography or specified weather conditions). The human occupants do not need to pay attention and are just passengers. |
| Level 5 | ADS can do all the driving in all circumstances, routes, and weather conditions. The human occupants are just passengers and are never involved in driving. |
A Broken Status Quo on US Roads

As new data from NHTSA showed last week, roadway deaths are increasing, and the status quo -- where tens of thousands die on our streets every year -- is entirely unacceptable.

Safety at Our Core

● Safety is the top priority at Cruise, instilled at every level of the company and essential to our ability to serve our eventual customers. We must win both the technology race as well as the trust race.

● Cruise utilizes a number of safety metrics that guide our assessments of safety rigorously and holistically.

High-Powered Machines

● Cruise AVs utilize redundant systems that take in the full, 360-degree view around the vehicle, synthesize it, and react up to 10 times per second, never getting distracted, drowsy, or drunk.
Our Product: Seamless Integration

- AV from the ground-up
- Dedicated Manufacturing
- Critical System Redundancy
- Auto-Grade
Sensor Technology

Sensor diversity provides confidence that the self-driving system can detect, track, and classify objects around it in various driving conditions.

Cameras

Cameras help classify and track objects so the Cruise AV can make confident real-time decisions.

Cruise AVs use multiple cameras to create a 360° field of view with no blind spots. Cameras help the Cruise AV identify pedestrians, vehicle types, construction zones, and traffic light states.

LiDAR sensors

LiDAR sensors use an array of lasers to measure the distance between objects, down to the centimeter, and create a 3D visualization of the world.

LiDAR helps the Cruise AV determine where it is in the world and reliably know where all nearby pedestrians, vehicles, and other objects are located.

Radar sensors

Radar sensors use radio waves to quickly measure the speed and trajectory of moving objects.

Each Cruise AV is equipped with multiple radar sensors, which measure the direction of travel and speed of moving objects like cars on the road.
**Safely Navigating Communities**

**Testing**
Complex SF ecosystem 24 hours per day, 7 days per week (Real World, Closed Course, and Simulation)

Testing in Arizona, where we see higher speed limits and lower density compared to SF

**Partnering with First Responders**
Provide law enforcement and first responders with the information they need to safely identify and interact with our Cruise Autonomous Vehicles (AVs)

**Partnering with Road Safety Experts**
Joining the Vision Zero Network and Mothers Against Drunk Driving

**Data Replay and Regression Testing**
Constant data-driven improvement
Our Future
The Cruise Origin

**Purpose Built.**

Our goal is an inclusive, shared, accessible, zero-emission, purpose-built vehicle - known as Origin - that gives us the opportunity to have more flexibility to offer a self-driving service that can serve more people with the most positive community benefit.

**American Made.**

Origin will be manufactured at the Detroit-Hamtramck Assembly, GM’s first fully dedicated EV plant.
A Shared Experience

By removing the driver and all associated equipment, the Origin will seat up to six passengers in a campfire seating arrangement and is designed to be a comfortable, affordable, and scalable shared solution.

Delivery Potential

Being purpose built by an OEM manufacturing partner like GM, the Origin offers a number of advantages, including potential for delivery-specific versions that may even be utilized as either delivery or passenger ride hail vehicles depending on demand and time of day.

Serving More Users

Cruise is also working with accessibility groups for research, design, and development of a wheelchair-accessible version of the Origin, as we work to make transportation more accessible for more people.
The Need for Federal Engagement

In order to manufacture Origin vehicles, made in America by union workers and incorporating hundreds of unique components supplied by American companies, Congress needs to raise the existing cap that limits AV manufacturing and deployment.

- **Existing Cap on AV Manufacturing**
  - Under current law, companies are limited to producing 2,500 AVs per year, for a maximum of two years, creating a significant barrier to investment, technological development, and critical data needed to underpin new regulations.

- **Global Competition**
  - Competitor nations are not waiting for the U.S. to step up, instead they are moving ahead with R&D and regulatory frameworks that will determine the rules of the road.
The States

Cruise works with states and cities to develop the regulatory frameworks necessary for widespread deployment of AVs.

- **Enabling legislation**
  - In order to launch AVs, states must enact the regulatory frameworks authorizing their operation.
  - Self-certification
  - Common sense insurance requirements
  - Incentives for fleet EV charging infrastructure
Thank you!

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