D5.2 The study and report on innovative AV design solutions

Status	…
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Work Package	WP 5 – Developing green transport- and spatial planning strategies incorporating autonomous vehicles
Task	T5.2 The study and report on innovative AV design solutions
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Content

On-demand Ride Hailing

On-demand ride-hailing, such as Uber and Didi, which allow passengers with smart phones to submit trip requests and match them to vehicle based on their locations and vehicle’s availability.

Project Name: Cruise
Project Location: San Francisco, CA
Mobility Type: Autonomous Passenger Car
Stakeholders: Cruise LLC
General Motors LLC
Operating Site: Public Road
Project Status: Testing (2016 – Present)

Cruise LLC is an American self-driving car company headquartered in San Francisco, California. Founded in 2013 by Kyle Vogt and Dan Kan. Cruise received a permit to test self-driving vehicle technology from the California Department of Motor Vehicles in June 2015, nine months before it was acquired by GM. As of September 2016, Cruise was conducting testing with a fleet of approximately 30 self-driving vehicles. By June 2017, after GM announced the mass production of 130 new Chevy Bolts used for testing, the total number of self-driving vehicles owned by GM was estimated to be 180.

As of July 2017, Cruise was conducting testing on public roads in San Francisco, Scottsdale, Arizona, and the metropolitan Detroit area. In early 2017, Cruise released a series of videos showing its self-driving vehicles navigating the streets of San Francisco.

Official Website:
https://www.getcruise.com/

Wikipedia:
https://en.wikipedia.org/wiki/Cruise_(autonomous_vehicle)

Project Name: DiDi Robottaxi
Project Location: Shanghai, China
Mobility Type: Autonomous Passenger Car
Stakeholders: DiDi, Volvo Cars, NVIDIA Drive
Operating Site: Public Road
Project Status: Testing（2020 – Present）

Robotaxis are autonomous vehicles that can operate on their own in geofenced areas, such as cities or residential communities. With a set of high-resolution sensors and a supercomputing platform in place of a driver, they can safely operate 24 hours a day, seven days a week. And as a safer alternative to current modes of transit, robotaxis are expected to draw quick adoption once deployed at scale, making up more than 5 percent of vehicle miles traveled worldwide by 2030.

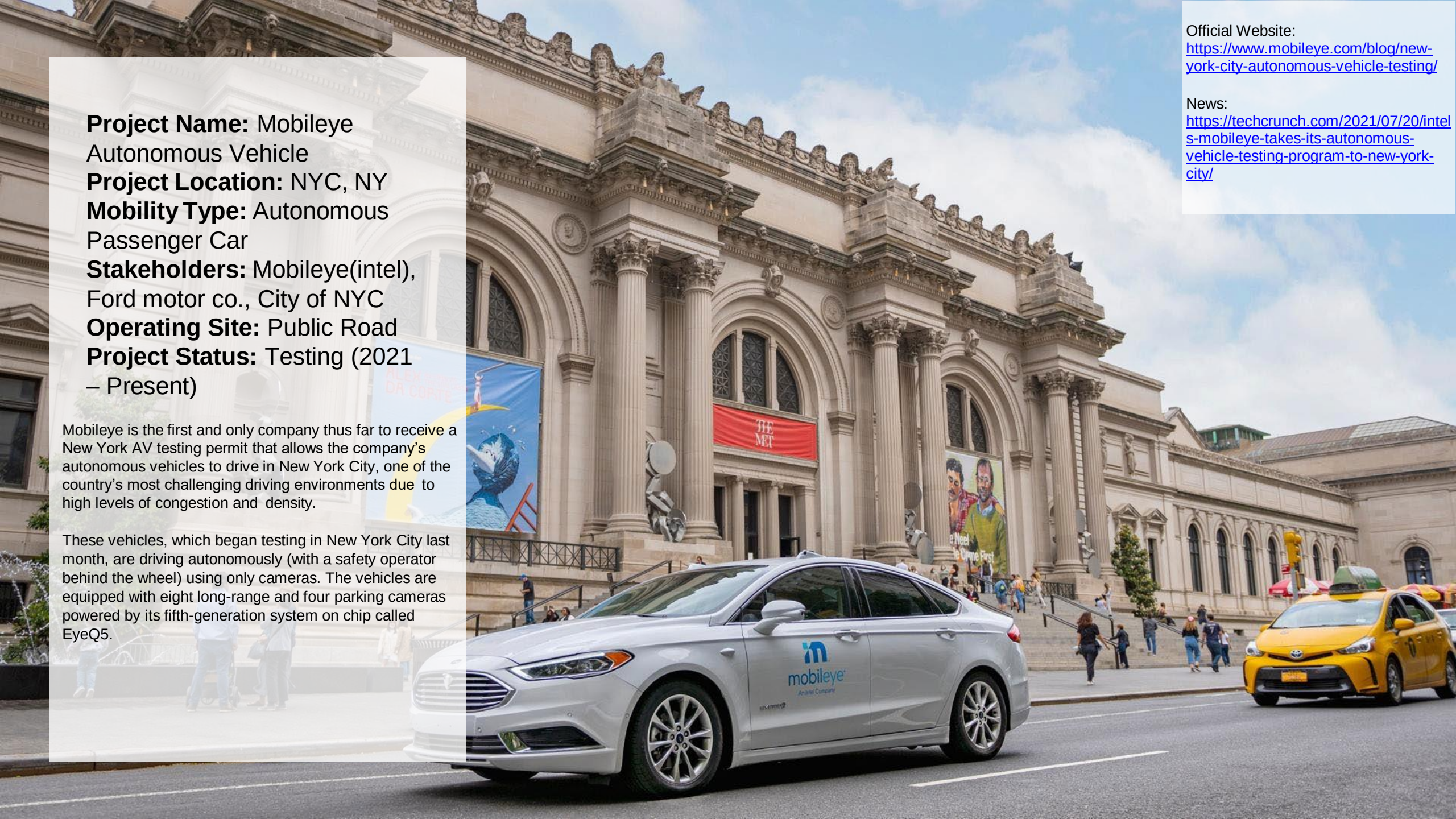
DiDi launched its self-driving development team in 2016 and firstly tested its Robotaxi at shanghai in 2020. Until now, there are more than 50000 people have taken a ride of DiDi's robotaxi in China.

Official Website:
https://www.didiglobal.com/science/intelligent-driving

News:
https://blogs.nvidia.com/blog/2021/05/17/didi-nvidia-drive-self-driving-robotaxis/

https://www.jiemian.com/article/5628463.html

https://finance.sina.com.cn/tech/2020-10-16/doc-iiznctkc5954991.shtml



Project Name: Mobileye Autonomous Vehicle
Project Location: NYC, NY
Mobility Type: Autonomous Passenger Car
Stakeholders: Mobileye(intel), Ford motor co., City of NYC
Operating Site: Public Road
Project Status: Testing (2021 – Present)

Mobileye is the first and only company thus far to receive a New York AV testing permit that allows the company's autonomous vehicles to drive in New York City, one of the country's most challenging driving environments due to high levels of congestion and density.

These vehicles, which began testing in New York City last month, are driving autonomously (with a safety operator behind the wheel) using only cameras. The vehicles are equipped with eight long-range and four parking cameras powered by its fifth-generation system on chip called EyeQ5.

Official Website:
https://www.mobileye.com/blog/new-york-city-autonomous-vehicle-testing/

News:
https://techcrunch.com/2021/07/20/intels-mobileye-takes-its-autonomous-vehicle-testing-program-to-new-york-city/

Project Name: Uber ATG
Project Location: Pittsburgh, PA; Washington DC, San Francisco, CA
Mobility Type: Autonomous SUV
Stakeholders: Uber ATG, Volve Cars
Operating Site: Public Road
Project Status: Testing (2017 – Present)

Uber's self-driving car division, the Advanced Technologies Group (ATG), has taken a new approach to autonomous driving since a fatal crash involving one of its vehicles. Uber plans to launch its self-driving cars in pockets of cities where weather, demand and other conditions are most favorable.

Ultimately, the new strategy is designed to help Uber drive down costs as it seeks to show investors it has a clear path to profitability.

Official Website:
https://www.uber.com/us/en/atg/research-and-development/

News:
https://www.cnbc.com/2020/01/28/ubers-self-driving-cars-are-a-key-to-its-path-to-profitability.html

https://www.theverge.com/2020/3/10/21172213/uber-self-driving-car-resume-testing-san-francisco-crash

Project Name: WAYMO ONE
Project Location: Phoenix, AZ
Mobility Type: Autonomous SUV
Stakeholders: Waymo, FCA US LLC
Operating Site: Public Road
Project Status: Fully Operation （2020 – Present）

Waymo LLC is an American autonomous driving technology development company. It is a subsidiary of Alphabet Inc, the parent company of Google. Waymo operates a commercial self-driving taxi service in the greater Phoenix, AZ area called "Waymo One", with Chandler, AZ fully mapped. In October 2020, the company expanded the service to the public, and it is the only self-driving commercial service that operates without safety backup drivers in the vehicle.

Official Website:
https://waymo.com/waymo-one/

Wikipedia:
https://en.wikipedia.org/wiki/Waymo

Project Name: Motional AD
Project Location: Boston, MA; Pittsburgh, PA; Las Vegas, NV
Mobility Type: Autonomous Van
Stakeholders: Motional, Lyft, Via, Cox Automotive
Operating Site: Public Road
Project Status: Testing (2021 – Present)

Motional is an American autonomous vehicle company founded in March 2020 as a joint venture between automaker Hyundai Motor Group and auto supplier Aptiv. Headquartered in Boston, Massachusetts, Motional also maintains operations in Pittsburgh and Singapore. Motional began testing its newest generation of vehicles in Las Vegas Nevada, in February 2021.

Official Website:
https://motional.com/

Wikipedia:
https://en.wikipedia.org/wiki/Motional

Fixed Route Stop-Based Ride Sharing

Ride-sharing is a way for multiple riders to get to where they're going by sharing a single vehicle, usually a bus or shuttle. This mobility makes multiple stops along a fixed route to pick up and drop off passengers, reducing the need for multiple cars on the road.

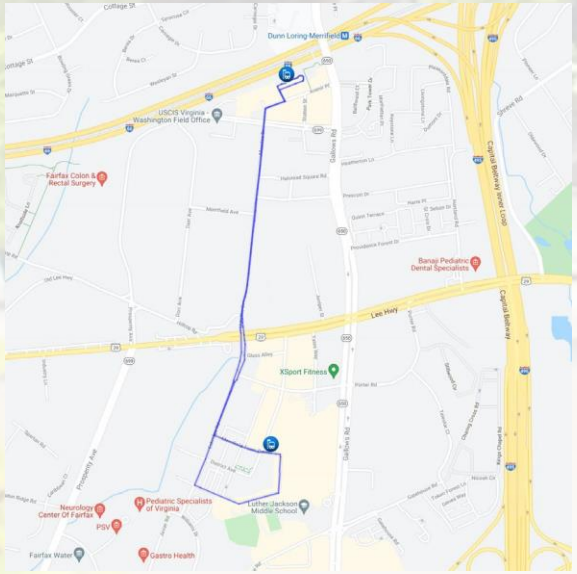
Project Name: Move Nona
Project Location: Lake Nona, FL
Mobility Type: Autonomous Shuttle
Operating Site: Neighborhood Development
Stakeholders: Beep/local motors/navya, Lake Nona community, Bestmile, Verizon
Project Status: Fully Operation (2019 – Present)

Within a 17-square-mile development, Move Nona has created a highly efficient mobility network within a planned community that connects residential, commercial, retail, recreational, and medical services. The autonomous vehicle service is currently the largest and longest autonomous vehicle network at one location in North America. The alternative mobility network consists of five routes and eight shuttles connecting nearly ten key destinations within the community.

Official Website:
https://ridebeep.com/location/move-nona/

Case Study Booklet:
https://ridebeep.com/wp-content/uploads/2021/05/Case-Study-FINAL-Lake-Nona-1.pdf

Project Name: Relay
Project Location: Fairfax, VA
Mobility Type: Autonomous Shuttle
Stakeholders: Fairfax County, Dominion Energy, EDENS (Mosaic), DRPT and so forth
Operating Site: Neighborhood Development
Project Status: Fully Operation (2019 – Present)



The pilot project team will test this driverless, public transportation option to evaluate its effectiveness and safety and see how it can be used as a “first and last-mile” transit option to “relay” riders and help connect the community, activate neighborhoods and attract businesses.

This pilot project is a partnership between Fairfax County, Dominion Energy, EDENS (Mosaic), The Virginia Department of Rail and Public Transportation (DRPT) Virginia Department of Transportation (VDOT), Virginia Tech Transportation Institute (VTTI) and George Mason University (GMU).

Official Website:
https://www.fairfaxcounty.gov/transportation/autonomous-shuttle-pilot

Realtime Route Map:
https://www.transitoms.com/shadow/Predictions_Mobile_GPSDisplay.aspx?ccid=656&rid=1044&rcolor=3333ff

Project Name: SMRT
Project Location: Columbus, OH
Mobility Type: Autonomous Shuttle
Stakeholders: Easymile, Inc., Smart Columbus, DriveOhio
Operating Site: Neighborhood Development
Project Status: Testing(2018-2019)

Smart Columbus partnered with DriveOhio, a division of the Ohio Department of Transportation, to learn more about what autonomous vehicle technology is capable of today.

Smart Circuit, Ohio's first self-driving shuttle, was launched in December 2018. Smart Circuit circled the Scioto Mile in downtown Columbus, providing free rides to the Center of Science and Industry (COSI), the National Veterans Memorial and Museum, Bicentennial Park and the Smart Columbus Experience Center.

Smart Circuit offered residents and visitors a hands-on educational experience with self-driving technology. The shuttle operated daily on its 1.5-mile route providing over 16,000 rides until September 2019, when the pilot concluded.

Official Website:
https://smart.columbus.gov/projects/self-driving-shuttles

Project Name: Union Point Development
Project Location: Weymouth, MA
Mobility Type: Autonomous Shuttle
Stakeholders: Optimus ride, Lstar Ventures(developer)
Operating Site: Neighborhood Development
Project Status: Testing (2018 - Present)

Self-driving car startup Optimus Ride Inc. is partnering with the developer behind Weymouth's Union Point to launch what it's calling the "first revenue generating autonomous vehicle pilot program."

Visitors and residents of Union Point will have the chance to ride in one of the Boston startup's autonomous vehicles starting in early 2018, according to the company. During the pilot program, which was first reported by the Boston Globe, passengers will be ferried to and from the South Weymouth commuter rail station.

Union Point is a 1,550-acre former naval air station in the midst of a $1 billion redevelopment under North Carolina-based LStar Ventures. The site, which touches parts of Abington, Rockland and South Weymouth, will be turned into a mixed-use development with more than 4,000 residences and 8 million square feet of commercial space.

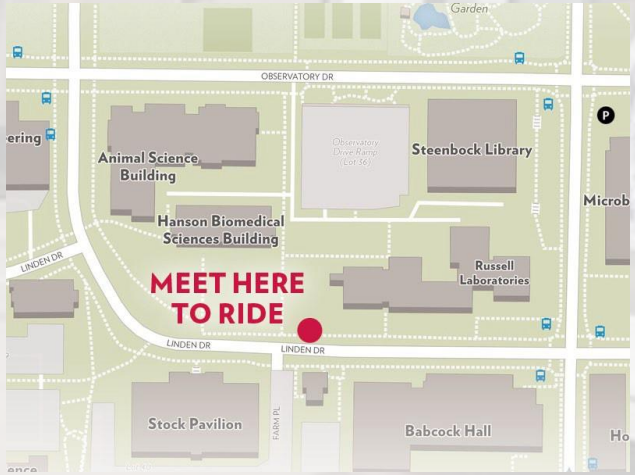
Optimus Ride Website:
https://www.optimusride.com/solution

News:
https://www.bizjournals.com/boston/news/2017/11/28/self-driving-startup-to-offer-rides-in-weymouths.html

https://www.technologyreview.com/2019/02/27/239503/wont-you-be-my-neighborhood-autonomous-vehicle/

https://www.patriotledger.com/news/20180606/union-point-testing-ground-for-self-driving-cars

Project Name: Autonomous Shuttle
Project Location: UW-Madison
Mobility Type: Autonomous Shuttle
Stakeholders: UW-Madison, Navya, City of Madison
Operating Site: UW-Madison University Campus
Project Status: Testing (April 2018)



The college, which is leading the federally designated Wisconsin Automated Vehicle Proving Grounds collaboration (WiscAV), will host one such autonomous vehicle on campus April 24 and 25. Members of the public can ride in an Autonomous Shuttle, made by the French company Navya, from 9 a.m. to 3 p.m. both days. Rides will start outside the west side of Russell Laboratories, 1630 Linden Drive, and follow a loop covering parts of Linden, Elm, Observatory and Babcock drives.

Researchers from the College of Engineering will be on hand to discuss their work and the latest developments in an evolving industry.

“A big part of our work as the proving grounds — especially as a more public-based, university-based proving grounds compared to the private test tracks — is getting people comfortable with this new technology that’s coming very, very fast, whether agencies or regulators are ready for it or not,” says Peter Rafferty, a program manager in the Traffic Operations and Safety Laboratory and one of the leaders of WiscAV..

Official Website: https://news.wisc.edu/driverless-shuttle-to-deliver-rides-at-uw-madison-april-24-25/

Project Name: Autonomous Shuttle
Project Location: Reston, VA
Mobility Type: Autonomous Shuttle
Stakeholders: Optimus Ride, Brookfield Properties
Operating Site: Employment Campus
Project Status: Fully Operation (2019 –Present)

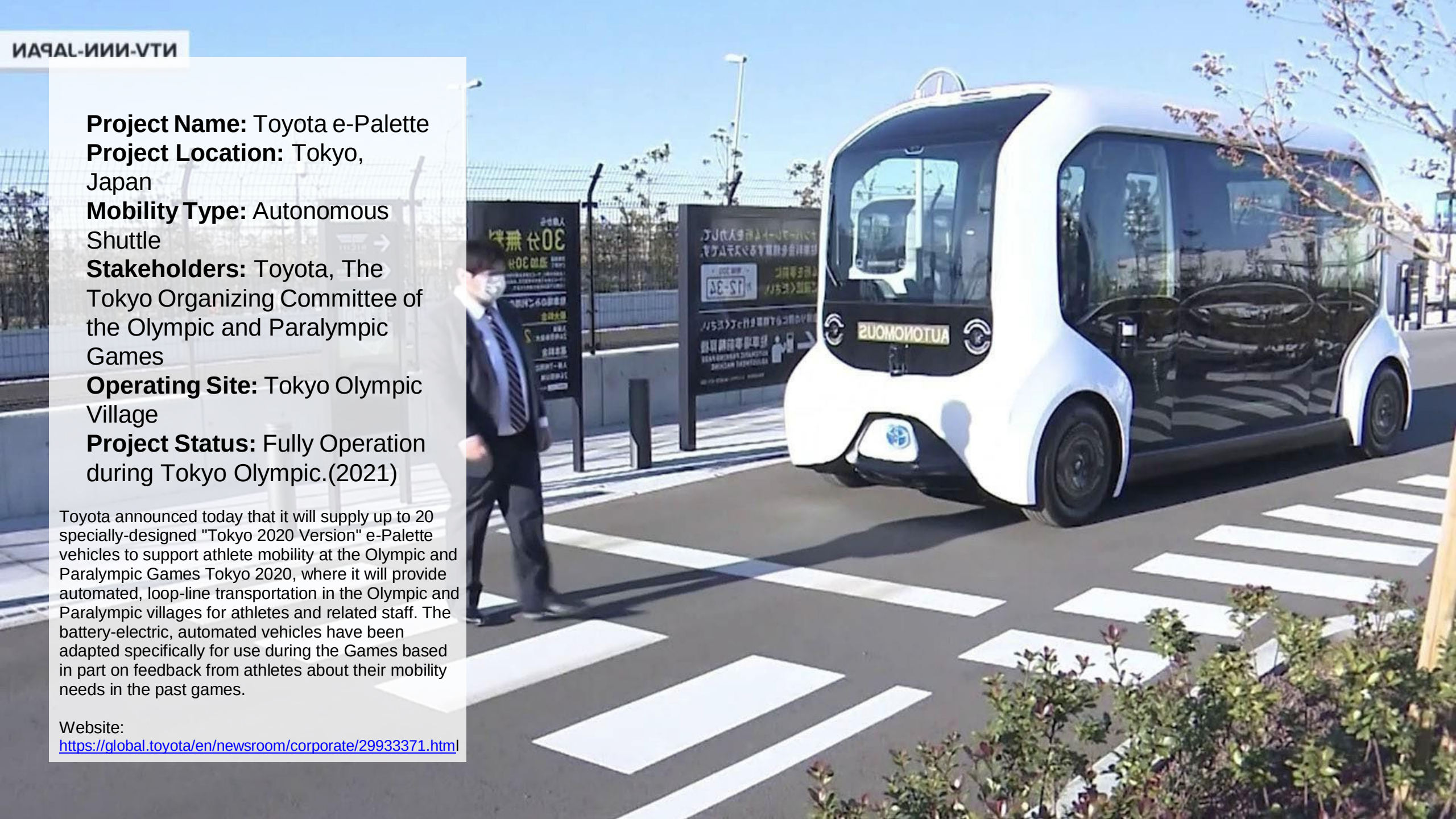
A Boston-based startup called Optimus Ride has launched a new self-driving vehicle service in the Washington, DC suburb of Reston, Virginia.

Since August, the company has been ferrying passengers between a Fannie Mae office building at the site and an overflow parking lot a few minutes' walk away. But Optimus Ride has much larger ambitions for the site.

The 36-acre property is directly adjacent to a new stop ("Reston Town Center") on the DC Metro system's Silver Line. The site's owner, Brookfield Properties, is planning a massive mixed-use development here it has dubbed Halley Rise. There will be new homes, office space, and retail stores —including a Wegmans grocery store.

News:
https://arstechnica.com/cars/2019/10/how-self-driving-shuttles-could-enable-car-free-living-in-the-suburbs/

https://www.auvsi.org/industry-news/optimus-ride-showcases-self-driving-shuttles-reston-virginias-halley-rise

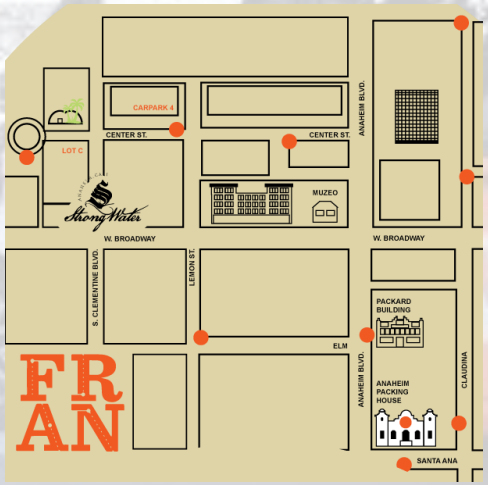


Project Name: Toyota e-Palette
Project Location: Tokyo, Japan
Mobility Type: Autonomous Shuttle
Stakeholders: Toyota, The Tokyo Organizing Committee of the Olympic and Paralympic Games
Operating Site: Tokyo Olympic Village
Project Status: Fully Operation during Tokyo Olympic.(2021)

Toyota announced today that it will supply up to 20 specially-designed "Tokyo 2020 Version" e-Palette vehicles to support athlete mobility at the Olympic and Paralympic Games Tokyo 2020, where it will provide automated, loop-line transportation in the Olympic and Paralympic villages for athletes and related staff. The battery-electric, automated vehicles have been adapted specifically for use during the Games based in part on feedback from athletes about their mobility needs in the past games.

Website:
https://global.toyota/en/newsroom/corporate/29933371.html

Project Name: FARN(Free Rides Around the Neighborhood)
Project Location: Anaheim, CA
Mobility Type: Electric Shuttle
Stakeholders: City of Anaheim, Anaheim Transportation Network
Operating Site: Mixed-use Commercial/Historical Neighborhood
Project Status: Fully Operation (2019 – Present)



The City of Anaheim, in partnership with Anaheim Transportation Network (ATN), now offers Free Rides Around the Neighborhood– FRAN, where convenience and unique experiences meet.

FRAN is a micro-transit system of sustainable electric vehicles currently serving Anaheim's downtown area known as "Center City".

Official Website:
https://rideart.org/fran/
http://www.ctrcityanaheim.com/fran

Project Name: AAA Autonomous Shuttle
Project Location: Las Vegas, NV
Mobility Type: Autonomous Shuttle
Stakeholders: AAA, Keolis, City of Las Vegas, RTC, Zappos, Navya
Operating Site: Commercial District
Project Status: Testing (2017 - 2018)

The American Automobile Association, NCNU launched the AAA Free Self-Driving Shuttle ("shuttle") in Las Vegas in November 2017, and successfully concluded the program on October 2018. The city of Las Vegas offered a great diversity of visitors, residents and local businesses to engage with, and a collaborative regulatory environment. The shuttle operated for 1,515 hours, with 32,827 riders.

The AAA shuttle was the first in the country to operate in live traffic and open to the public. Over the course of a year, the AAA shuttle provided the opportunity of free rides to residents and visitors of Las Vegas, and exposed most riders to the technology for the first time.

Official Website:
http://www.aaahoponlasvegas.com/

Project Name: Heathrow ULTRA PRT
Project Location: Heathrow Airport, London
Mobility Type: Autonomous Shuttle
Stakeholders: Ultra Global, Heathrow Airpot
Operating Site: Airport
Project Status: Fully Operation (2011 – Present)

Ultra's first commercially operational pod system provides 800 passengers per day with a vital link between the T5 Business Car Park and the terminal itself.

A powerful example of the system's benefits, the small footprint of the Heathrow pods system enables it to fit within the tight constraints imposed by the airport infrastructure.

Commissioned by Heathrow Airport operator BAA, the system consists of 21 vehicles, a total of 3.8 kilometers of one-way guideway, and three stations – two in the T5 Business Car Park and one at Terminal 5.

To date the system has carried over 700,000 passengers and in May 2013 celebrated reaching its 1 millionth autonomously driven mile.

Ultra Website:
https://www.ultraglobalprt.com/wheres-it-used/heathrow-t5/

Arup Website:
https://www.arup.com/projects/heathrow-personal-rapid-transit-prt

Wikipedia:
https://en.wikipedia.org/wiki/ULTra_(rapid_transit)

Project Name: Airport Shuttle
Project Location: Austin-Bergstrom International Airport
Mobility Type: Autonomous Shuttle
Stakeholders: Easymile, Inc., City of Austin, Austin-Bergstrom International Airport
Operating Site: Airport
Project Status: Testing (2019)

Travelers can now experience the latest in autonomous technology as part of a new pilot programe at Austin-Bergstrom International Airport (AUS).

Now in a public testing phase, the airport's Easy Mile EZ10 driverless shuttle is available to transport passengers going between the Barbara Jordan Terminal and the Rental Car Facility/Ground Transportation.

Operating on the upper level of Garage 1, the electric, driverless and ADA-compliant vehicle represents another mobility alternative for transporting travelers on the airport's campus.

Official Website:
https://www.austintexas.gov/news/austin-bergstrom-begins-autonomous-vehicle-testing

Project Name: Autonomous Bus
Project Location: Singapore
Mobility Type: Autonomous Full-Size Bus
Stakeholders: NTU**,** Volvo
Operating Site: Public Road
Project Status: Testing (2019)

NTU and Swedish firm Volvo have launched a 12m-long autonomous electric bus, which they say is the world's first.

The bus, which can fit about 80 people, has gone through multiple tests at the Centre of Excellence for Testing and Research of Autonomous Vehicles - NTU (Cetran), and is now ready for tests in actual traffic Conditions.

News:
https://landtransportguru.net/ntu-lta-volvo-autonomous-bus-trial/

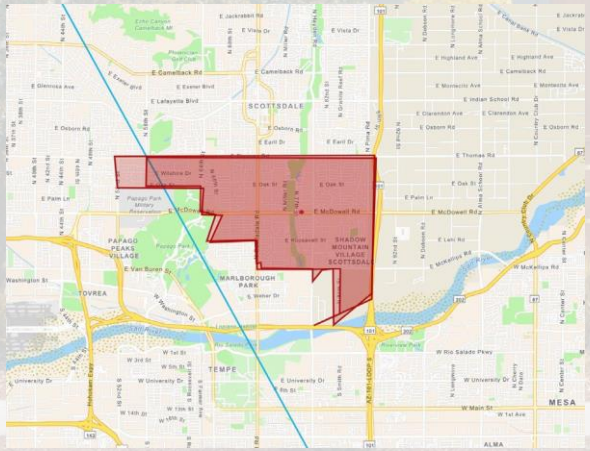
https://www.straitstimes.com/singapore/transport/ntu-and-volvo-launch-worlds-first-full-sized-autonomous-electric-bus-for-trial

Video:
https://www.youtube.com/watch?v=usRhtNTuS_g

Autonomous Logistic Mobility

Autonomous logistics mobility describes mobility that provides unmanned, autonomous transfer of goods, baggage, and container ranging from last-mile delivery to long-haul transport.

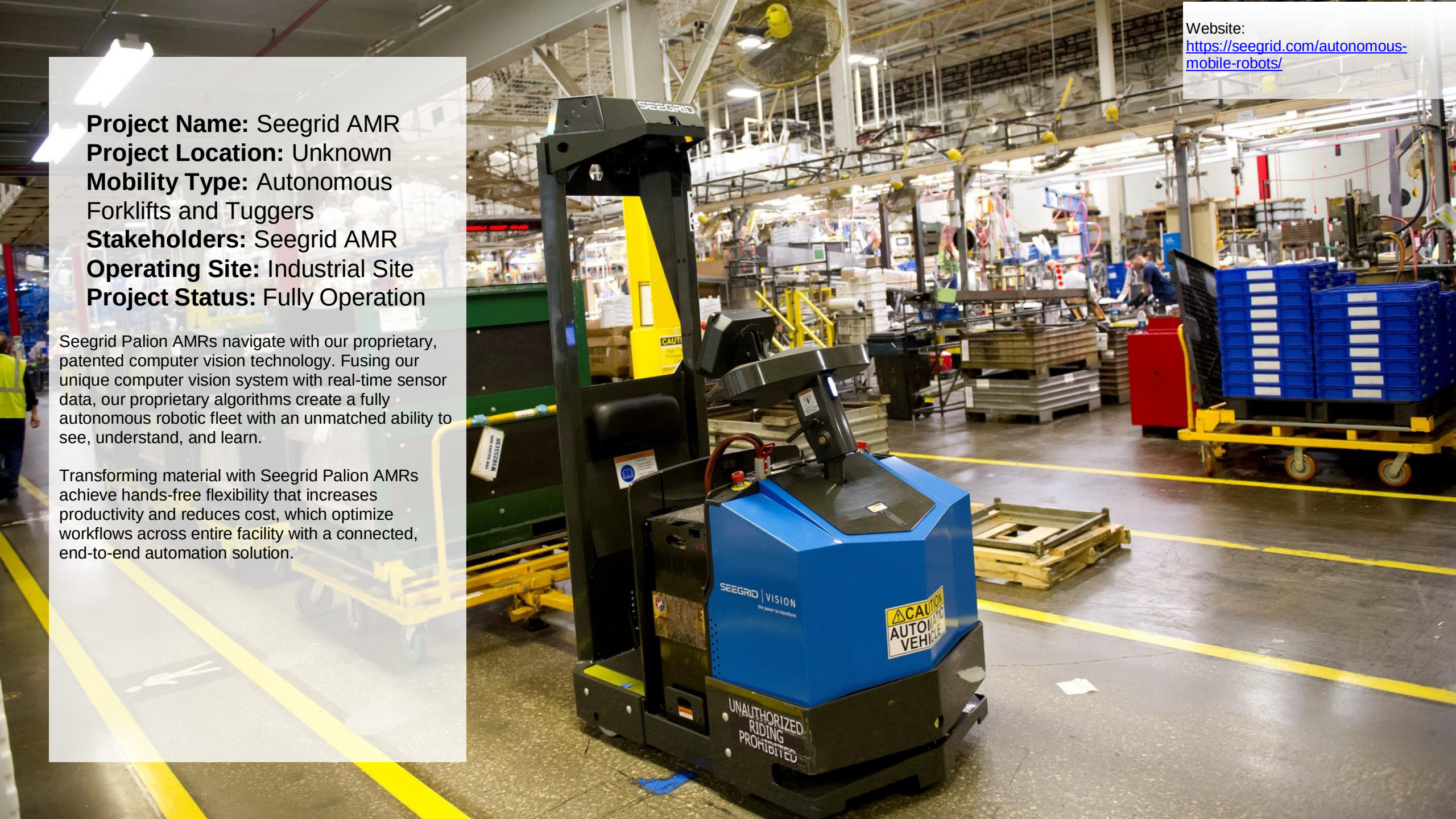
Project Name: Nuro Delivery Deployment
Project Location: Huston, TX; Silicon Valley, CA; Greater Phoenix, AZ
Mobility Type: Autonomous Delivery Robot
Stakeholders: Nuro, Domino's Kroger, Walmart
Operating Site: Residential Neighborhood
Project Status: Testing (2018 – Present)



About as large as an ATV, the four-wheeled "R1" Nuro vehicles have no space for a driver or passengers. For now, they'll roam only about a square mile of one small section of Scottsdale, delivering groceries from neighborhood stores for a small fee.

Nuro Website:
https://www.nuro.ai/service

News:
https://www.phoenixnewtimes.com/news/nuro-beats-waymo-unmanned-food-delivery-service-in-arizona-11074874



Project Name: Seegrid AMR
Project Location: Unknown
Mobility Type: Autonomous Forklifts and Tuggers
Stakeholders: Seegrid AMR
Operating Site: Industrial Site
Project Status: Fully Operation

Seegrid Palion AMRs navigate with our proprietary, patented computer vision technology. Fusing our unique computer vision system with real-time sensor data, our proprietary algorithms create a fully autonomous robotic fleet with an unmatched ability to see, understand, and learn.

Transforming material with Seegrid Palion AMRs achieve hands-free flexibility that increases productivity and reduces cost, which optimize workflows across entire facility with a connected, end-to-end automation solution.

Website:
https://seegrid.com/autonomous-mobile-robots/

Project Name: Navya Autonomous Tractor
Project Location: Toulouse-Blagnac
Mobility Type: Autonomous Baggage Tractor
Stakeholders: Air France, Charlatte Autonom and Toulouse-Blaganac Airport
Operating Site: Airport
Project Status: Testing(2019)

The experimentations of Autonom® Tract allow for the introduction of technological innovation into the heart of goods transport today and into the future. During these experimentations of several months, all the players of the logistics flow participate in the implementation of the autonomous tractor, located at the heart of their eco-system.

Website：
https://navya.tech/en/solutions/moving-goods/self-driving-tow-tractor-for-logistics/

Case:
https://navya.tech/en/usecases/autonomous-baggage-tractor/

Project Name: Walmart Autonomous Freight
Project Location: New Orleans, LA; Bentonville, AK
Mobility Type: Autonomous Light Truck
Stakeholders: NTU**,** Volvo
Operating Site: B2B short-haul
Project Status: Testing (2017 – Present)

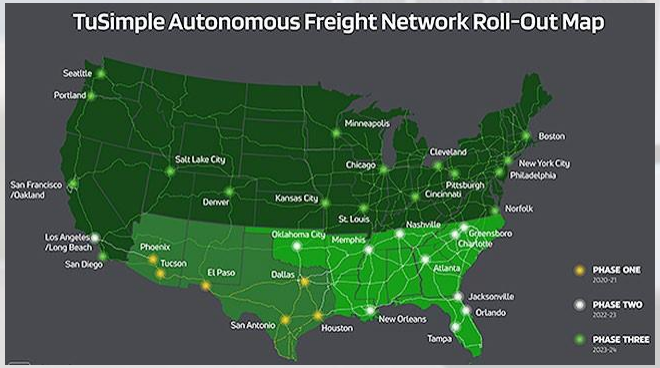
Walmart will use fully autonomous box trucks to make deliveries in Arkansas starting in 2021. The big-box retailer has been working with a startup called Gatik on a delivery pilot for 18 months. The two companies plan on taking their partnership to the next level by removing the safety driver from their autonomous box trucks.

News:
https://www.forbes.com/sites/richardbishop1/2020/12/20/walmart-says-game-on-for-driverless-freight/?sh=416dcc79706c

https://www.theverge.com/2020/12/15/22176179/walmart-fully-driverless-box-truck-delivery-gatik

https://cleantechnica.com/2021/08/31/walmart-offers-new-delivery-systems-autonomous-evs/

Project Name: TuSimple Autonomous Freight
Project Location: Tucson, AZ
Mobility Type: Autonomous Heavy Truck
Stakeholders: Tusimple, Ryder System Inc
Operating Site: B2B long-haul
Project Status: Testing (2015 – Present)



Self-driving truck technology company TuSimple Holdings Inc said on Thursday its trucks will use truck leasing and rental company Ryder System Inc's maintenance sites as terminals to help it expand its U.S. autonomous freight network.

Under the partnership, Ryder will provide maintenance and data downloading services for TuSimple's fleet of more than 50 self-driving trucks, which are currently operating in Arizona, New Mexico and Texas. TuSimple plans to roll out a national U.S. autonomous freight network by 2024.

TuSimple:
https://www.tusimple.com/

News:
https://www.reuters.com/business/autos-transportation/tusimples-self-driving-trucks-use-ryder-sites-terminals-2021-07-29/

https://www.ttnews.com/articles/tusimple-partners-major-fleets-launch-autonomous-freight-network

Autonomous Parking

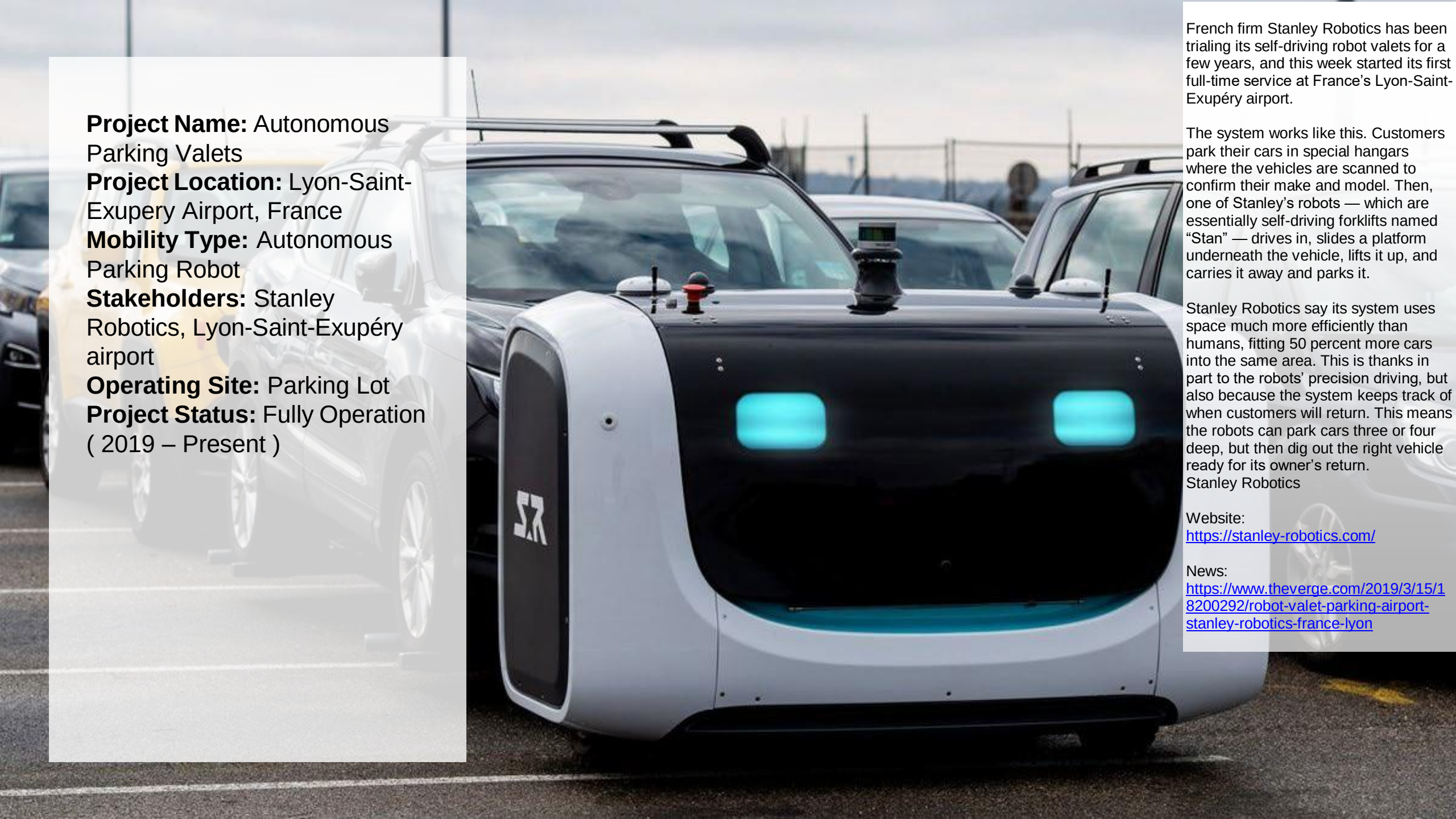
Autonomous Parking is an unmanned car-maneuvering system either by on-board plug-in or parking robot. It will largely enhance the efficiency of overall parking system.

Project Name: Merriweather District Development
Project Location: Columbia, OH
Mobility Type: Autonomous Parking Plug-in
Stakeholders: Steer, Howard Hughes Corporation
Operating Site: Parking Lot and Parking Garage
Project Status: Testing

The Howard Hughes Corporation and Maryland Governor Larry Hogan broke ground today on the first urban, walkable neighborhood to be created within the Merriweather District, celebrating The Howard Hughes Corporation's continued transformation of the district and the revitalization of Downtown Columbia.

Plans were announced for a neighborhood amenity to harness the emerging technology of autonomous parking. The Merriweather District buildings will be powered by STEER technology, the first fully-autonomous parking solution transforming everyday cars into driverless vehicles that self-park. This integration will transform the Merriweather District into the first city in the country to be built for automated self-parking cars.

Website:
https://hocomd.cc/2018/06/03/autonomous-vehicle-technology-coming-to-merriweather-district/



Project Name: Autonomous Parking Valets
Project Location: Lyon-Saint-Exupery Airport, France
Mobility Type: Autonomous Parking Robot
Stakeholders: Stanley Robotics, Lyon-Saint-Exupéry airport
Operating Site: Parking Lot
Project Status: Fully Operation (2019 – Present)

French firm Stanley Robotics has been trialing its self-driving robot valets for a few years, and this week started its first full-time service at France's Lyon-Saint-Exupéry airport.

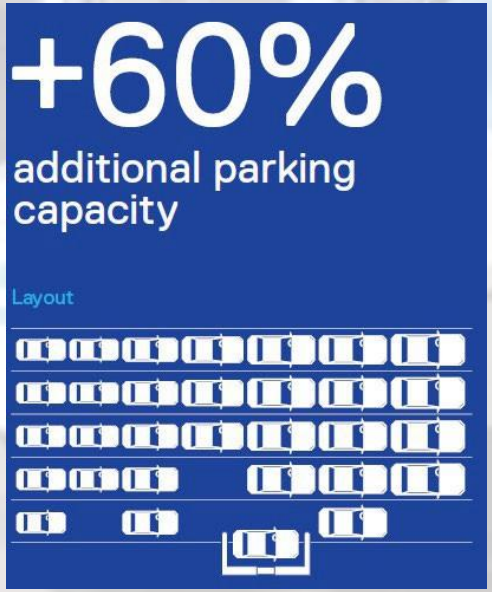
The system works like this. Customers park their cars in special hangars where the vehicles are scanned to confirm their make and model. Then, one of Stanley's robots — which are essentially self-driving forklifts named "Stan" — drives in, slides a platform underneath the vehicle, lifts it up, and carries it away and parks it.

Stanley Robotics say its system uses space much more efficiently than humans, fitting 50 percent more cars into the same area. This is thanks in part to the robots' precision driving, but also because the system keeps track of when customers will return. This means the robots can park cars three or four deep, but then dig out the right vehicle ready for its owner's return.
Stanley Robotics

Website:
https://stanley-robotics.com/

News:
https://www.theverge.com/2019/3/15/18200292/robot-valet-parking-airport-stanley-robotics-france-lyon

Project Name: RAY Autonomous Parking
Project Location: DUS Airport
Mobility Type: Autonomous Parking Robot
Stakeholders: Serva, DUS Airport
Operating Site: Parking Lot
Project Status: Fully Operation (2014 – Present)



RAY™ uses principles from material logistics and deposits vehicles with maximum efficiency. RAY™ sorts vehicles by size and expected retrieval time and parks them in a multi-depth, lateral arrangement (stacks). As vehicles can be parked in closer proximity with no need for door opening space, up to 60% more vehicles can be accommodated as compared to conventional parking configurations.

In contrast with other automated parking systems, RAY™ recognizes the size (length and width) of the vehicle to be parked and selects the corresponding most economical parking space to eliminate idle spaces.

Website:
https://serva-ts.com/en/parking/

News:
https://www.designboom.com/technology/dusseldorf-airport-ray-robotic-parking-system-serva-07-02-2014/

Drone Technology

Drone related technologies use unmanned drone as main carrier to provide multiple services including last-mile package delivery, agriculture seeding and protection, and inspecting.

Project Name: Amazon Prime Air
Project Location: Multiple，USA
Mobility Type: Semi-Autonomous Drone
Operating Site: Multiple
Project Status: Testing (2016 – Present)

A future delivery system from Amazon designed to safely get packages to customers in 30 minutes or less using autonomous aerial vehicles, also called drones. Prime Air has great potential to enhance the services we already provide to millions of customers by providing rapid parcel delivery that will also increase the overall safety and efficiency of the transportation system.

Website: https://www.amazon.com/Amazon-Prime-Air/b?ie=UTF8&node=8037720011

Project Name: Shun Feng Full-size Drone Delivery
Project Location: Multiple，China
Mobility Type: Semi-Autonomous Full-size Drone
Operating Site: Multiple
Project Status: Testing (2020 – Present)

Shun Feng, a Chinese express company and also the first company got commercial drone delivery operation permit from Chinese government, has started to test its full-size delivery drone by 2020.

Website:
http://uav.xinhuanet.com/2018-03/28/c_129839510.htm

http://www.xinhuanet.com/mil/2018-02/06/c_129806300.htm

Project Name: DJI Agriculture
Project Location: Agriculture Site, China
Mobility Type: Autonomous Agricultural Drone
Operating Site: Agriculture
Project Status: Fully Operation and Industrialization

DJI, an advanced drone development company, has developed a mature system to help agricultural operations. With DJI, users can create area mapping and obtain data analysis for farms, orchards, and forests, prescribing solutions for variable rates of fertilizer spreading. DJI also supports mission planning, significantly improving operational efficiency with its ability to generate automatic flight paths.

Website:
https://ag.dji.com/