



CAC Technology & Innovation Ad Hoc Committee

600 S. Main Street, Orange CA, Room 103/104

February 28, 2017 | 1:00 p.m. – 3:00 p.m.

AGENDA

- 1. Welcome**
- 2. Videos** *(5 minutes)*
- 3. Discussion Items**
 - A. **Mission Statement** *(10 minutes)*
Alice Rogan, Public Outreach Manager
 - B. **Digital Communications for Bus Customers** *(10 minutes)*
Ryan Armstrong, Digital Communications Section Manager
 - C. **Future of Mobility** *(10 minutes)*
Ryan Armstrong, Digital Communications Section Manager
Lloyd Sullivan, Dept. Manager, Enterprise Business Solutions
 - D. **Future Meeting Topics** *(30 minutes)*
Group Discussion
- 4. OCTA Staff Updates** *(10 minutes each)*
 - A. **San Clemente Lyft Program** - Lloyd Sullivan, Dept. Manager, Enterprise Business Solutions
 - B. **Mobile Ticketing & On-Demand Service** - Lloyd Sullivan, Dept. Manager, Enterprise Business Solutions
 - C. **Other**
- 5. Chair / Vice-Chair Remarks**
- 6. Committee Member Comments**
- 7. Public Comments***
- 8. Adjournment**
The next meeting date is TBD

Agenda Descriptions/Public Comments on Agenda Items

The Agenda descriptions are intended to give notice to members of the public of a general summary of items of business to be transacted or discussed. Members from the public wishing to address the Committee will be recognized by the Chair at the time the Agenda item is to be considered. A speaker's comments shall be limited to three (3) minutes.

Any person with a disability who requires a modification or accommodation in order to participate in this meeting should contact the OCTA at (714) 560-5611, no less than two (2) business days prior to this meeting to enable OCTA to make reasonable arrangements to assure accessibility to this meeting.



CAC TECHNOLOGY & INNOVATION AD HOC COMMITTEE MISSION STATEMENT

As an ad hoc committee of the Orange County Transportation Authority (OCTA) Citizens Advisory Committee (CAC), the mission of the CAC Technology and Innovation Ad Hoc Committee is to review new ideas focused on technological advances and innovations that could help improve Orange County's transportation system and provide suggestions to OCTA.

To carry out its mission, the CAC Technology and Innovation Ad Hoc Committee will:

1. Review new technologies and innovations of benefit to transportation
2. Participate in brainstorming and idea-sharing with OCTA staff to identify opportunities for OCTA to incorporate new and emerging technologies and ideas into Orange County's transportation system
3. As appropriate, test and preview OCTA projects in order to provide suggestions and feedback to staff
4. Serve as a liaison between the public and OCTA

News
Articles

CO: Boulder Gondola Idea Could Still Come in for a Landing

ALEX BURNES ON JAN 30, 2017

SOURCE: MCCLATCHY

Jan. 28--A gondola connecting downtown Boulder with University Hill. Sounds crazy, no?

It turns out the ski-slope technology could be a cheaper, greener, traffic-calming economic boon than many might assume.

It might also be too expensive, unreliable and intrusive to work here, but there's growing momentum to at least look into it.

Local business leaders will meet with the city's transportation department next month to discuss the splashy seed of an idea.

The concept has already been implemented in cities around the world, from giant international destinations like Hong Kong and Medellin to smaller spots closer to home, like Telluride and Portland, Ore.

And it's catching on in other American cities, including Chicago, Austin and New York, all of which are considering new gondola systems.

Now, the Downtown Boulder Partnership, the Boulder Chamber and several City Council members are supporting an exploration into how a gondola might work in this city.

"We need to think outside the box," said John Tayer, CEO of the Chamber. "We need to start getting creative with our solutions to traffic issues, and this one has worked in other communities. We've seen that it moves people efficiently, and it's fun."

It's been tried before in Boulder.

In 2009, the University of Colorado's then-Graduate School dean and vice chancellor for research Stein Sture spearheaded an effort to zip people from Williams Village to East Campus to Main Campus.

The administration killed the proposal early on, citing "engineering challenges."

Sean Maher, Downtown Boulder's executive director, said that another concern with the CU project was that gondola systems work best with constant flows of riders. On a college campus, though, ridership would likely go from quiet to chaotic when class periods end. Transit experts aren't convinced that's a tenable set-up for a gondola.

That the concept being revisited now, and along the Hill-downtown corridor specifically, is in large part the result of major construction slated for the northern swath of the Hill neighborhood, where two hotels and a conference center are planned.

"I really got excited about it when we started talking about the conference center on Grandview" Avenue, Maher said.

"That's going to bring hundreds if not thousands of people to Boulder every month. Those people aren't going to necessarily want to spend all their time on the Hill, and a lot of them aren't going to have cars."

Some will walk and some will take the bus, but Maher said he expects a gondola system would be seen as "more exciting and more interesting" to those visiting on business -- not to mention anyone else who might enjoy the experience.

"We have more and more tourists here all the time from out of state," Maher added. "If they could walk a half a block from the (Pearl Street) Mall and get on a gondola that offered them a commanding view of the Flatirons and the foothills, Who's not going to do that for \$5?"

If recent feedback from citizens is any indication, the project might be a hit with locals, too, who are increasingly frustrated with traffic and parking in the city. A 2016 survey commissioned by Boulder government showed the ease of car travel rating 253rd out of 274 comparable communities.

The proposal being only in its infancy, there are many blanks still to be filled in. Perhaps chief among them is cost.

Maher said a consultant he spoke with believes Boulder could build a gondola for between \$10 million and \$15 million. Sture, years ago, said the CU system would have cost between \$4.5 million and \$5 million to build.



The systems can also chug along on wind or solar energy, and are considered one of the greenest ways to move people.

Michael Sweeney, Boulder's transportation director, said he's looking forward to learning more about how a gondola here might function.

The next step, he added, is "to really look at the concept and whether or not it matches up with what the costs are, and to look at it in the critical fashion to figure out if it's really going to work in the situation we're describing."

As of now, the topic is not included on the City Council's 2017 work plan. Their likely first move, were the group inclined to investigate the possibility, would be to commission a feasibility study.

"I think it definitely warrants a study," Maher advocated. "The city spends a lot of money on studies and I think for not a whole lot of money they could have one on this. There's a lot of questions out there, so I'm not saying with absolute certainty this a good idea. But I do think it's worth investing in some research."

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Voice your opinion!

Commuter railroads make progress installing life-saving tech

BY MELANIE ZANONA - 02/21/17 01:53 PM EST

0 COMMENTS

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© Getty

Commuter railroads have made some progress installing a potentially life-saving train technology, though they still have a long way to go, according to new analysis from the American Public Transportation Association (APTA).

A screenshot of a mobile news application interface from the Los Angeles Times. The top bar shows the 'Los Angeles Times' logo and a 'Most Popular' dropdown menu. The main headline reads 'Bob Hope, thanks for the memories. Name change to Hollywood Burbank Airport moves forward' with a 'Read Post' link. Below the headline are several smaller article thumbnails, including 'THE GIRL ON THE TRAIN' and 'MARK GREANEY BACK BLAST'. At the bottom, there is an advertisement for Audible with the text 'ENJOY BOOKS IN A WHOLE NEW WAY.' and 'START FREE TRIAL'.

The improvement comes as the commuter railroad industry has lagged behind the efforts of freight railroads in implementing positive train control (PTC), which automatically slows down a train that is going over the speed limit and will eventually be required by law.

As of the end of last year, 30 percent of passenger rail locomotives and cab cars are equipped with PTC, up from 29 percent in the first half of 2016. Meanwhile, 50 percent of the necessary PTC radio towers have been erected, up from 46 percent.



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Overall, 23 percent of commuter railroad route miles are either in PTC operation or in full demonstration mode, with 19 percent of commuter rail agencies fully equipped with the technology.

The APTA analysis was based on responses from the group's members and quarterly reports from the Federal Railroad Administration (FRA).

"The commuter rail industry continues to make significant progress in implementing positive train control," said Richard A. White, the APTA's acting president and CEO. "The progress on this complex safety technology demonstrates the industry's relentless focus on safety."

Congress had originally given commuter and freight railroads until the end of 2015 to install the technology, which can prevent derailments, collisions, crashes and improper track switching. But as railroads struggled to meet compliance deadlines, lawmakers pushed back the implementation date to at least Dec. 31, 2018.

Recent deadly train crashes — including a speeding New Jersey Transit train that slammed into Hoboken Terminal — have stepped up pressure on railroads.

The APTA data show that commuter railroads across the country still have a long way to go in adopting positive train control, in part because of the steep cost of the technology.

BNSF Railway, a top freight railroad in the U.S., has even called on Congress to help passenger railroads get into compliance.

“As a freight railroad, it may sound out of line, but I actually urge Congress to fund passenger commuter rail funding for positive train control,” Matthew Rose, executive chairman of BNSF, told a Senate panel last week.

“I can’t imagine a more difficult train wreck for us to have to go to where we have the positive train control on the freight rail, and the passenger or commuter train didn’t because of lack of funding.”

PTC implementation is projected to cost the commuter rail industry more than \$3.5 billion in capital expenses and \$100 million annually in additional maintenance costs, the APTA said.

Since 2008, Congress has doled out over \$650 million in federal grants for installing the technology, as well as a nearly \$1 billion loan to the New York Metropolitan Transportation Authority, according to the FRA.

“The installation of PTC is challenging for a number of reasons, including from a technical perspective. PTC was not a mature technology when

Congress mandated it in the Rail Safety Improvement Act of 2008," said White.

"Beyond the technological challenges that have to be addressed, there are significant issues in regard to the costs, scarce qualified resources, and adequate access to track and locomotives for installation and testing."

If I were to imagine taking a spin in a high-tech vehicle of the future, it would be like something out of the 2002 sci-fi movie *Minority Report*: A sleek, driverless transport pod would whip me along elevated expressways unencumbered by traffic jams and stop signs.

I got a chance to visit a city of the future last fall, but it turned out to be different from what I'd pictured. I found myself strapped into a white Saturn Aura being driven the old-fashioned way by Huei Peng, director of the University of Michigan's (UM) Mobility Transformation Center (MTC) in Ann Arbor. Peng's Saturn carried technology that enabled it to communicate wirelessly with other vehicles and with the road infrastructure.

We drove through what looked like a small urban-area movie set: rows of two-story building facades made of glass, wood, aluminum, and vinyl; traffic signs and signals; parking stalls, parking meters, park benches, and pedestrian crossings at intersections. Nothing about the test facility's streets seemed extraordinary—until we drove onto an expressway that terminated after a thousand feet.

The name of this town: Mcity. Opened in 2015, this one-of-a-kind, 32-acre facility with about 16 acres of roads and infrastructure is a closed, controlled environment designed to mimic common driving situations. Here, researchers test innovative technology that could one day enable me to ride in a car sans Peng—or any driver at all.

Researchers and automotive experts believe that connected, automated vehicles (see "Tech Talk" glossary at right) could make traveling by car more efficient, more enjoyable, more accessible, and safer, eliminating most of the 38,000 annual traffic-related deaths (2015), millions of injuries, and billions of dollars in related costs.

A PUBLIC-PRIVATE PARTNERSHIP

Mcity is operated by MTC, part of the university's Office of Research; it works closely with various UM arms, as well as government and industry partners. In 2012, the U.S. Department of Transportation awarded the university a \$30 million grant to research

vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) connectivity.

The funding enabled UM to equip 2,800 local residents' vehicles with V2V and V2I communication technology. This allowed them to transmit their location, speed, and direction to each other and to receivers perched atop 19 Ann Arbor traffic signals. Within a year, the university took the next step and established MTC. In 2014, MTC began building Mcity to test technology that would enable vehicles to "see" their environment and, ultimately, drive themselves.

More than 60 industry partners have invested in MTC and have lined up to test cutting-edge technologies and vehicles on Mcity's circuitous streets. Automakers such as Ford and GM, and suppliers and communications companies such as Delphi, Intel, and Verizon, are seeking to be leaders in the connected and automated car market. The Auto Club, too, has invested in the project because of its interest in automotive safety, improving mobility, and informing members about the latest automotive technology.

Foreign automakers have also found their way to Mcity. "BMW and Toyota have their own test tracks in Germany and Japan," Peng says, "but they have huge operations here in North America. And our infrastructure looks very different from that in Europe and Asia." City planners, public transportation providers, heavy-freight movers, and insurance providers are also paying close attention to the findings.

A LIVING LABORATORY

At first glance, Mcity looks like Anytown, U.S.A. "The design is intentional," says Jim Sayer, director of UM's Transportation Research Institute. "This track is about dealing with complex real-world scenarios that automated and connected vehicles will have to contend with." In Mcity, those real-world elements include brick and gravel roads, fire hydrants, a tunnel, an overpass, roundabouts, and much more.

Peng agrees that the best way to test driverless car technology is to expose it to the real world, warts and all. "We can't say to the state DOTs, 'Hey, we'll need to drill holes and install magnets in all of your streets—and by the way, their location needs to be precise,' "

TECH TALK

Connected.

Connected vehicles can, via wireless communication, exchange information (e.g., location, direction, speed) with other vehicles and with smart technology embedded in streets, traffic signals, or other infrastructure. This is known as vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) capability.

Automated.

Steering, braking, acceleration, and other driving features are activated by technology built into the vehicle. These features rely on such things as sensors, cameras, and radar to operate, and can function independently of human intervention.

Autonomous.

An autonomous vehicle has the hardware and software to "see" the real world as a human driver would—and to carry out driving functions without human involvement. However, an autonomous vehicle is not necessarily a connected vehicle.

TESTING GROUNDS

With more than 16 acres of roads and infrastructure, Mcity simulates real-world scenarios and road conditions that vehicles might encounter in typical cities and suburbs. In this controlled environment, researchers can test the performance and safety of connected, automated, and autonomous vehicles. Pictured are some elements of this outdoor lab. What's not visible are such features as a wireless network that collects data about traffic activity and a real-time positioning system.



Signalized intersections in different configurations, some with pedestrian crossings



Roundabout



Brick paver road

Trunk line road, a rural roadway with temporary and permanent pavement markings

Limited-access freeway with ramps, highway signage, and guardrails

Meandering gravel roadway

AUTOMATION-O-METER

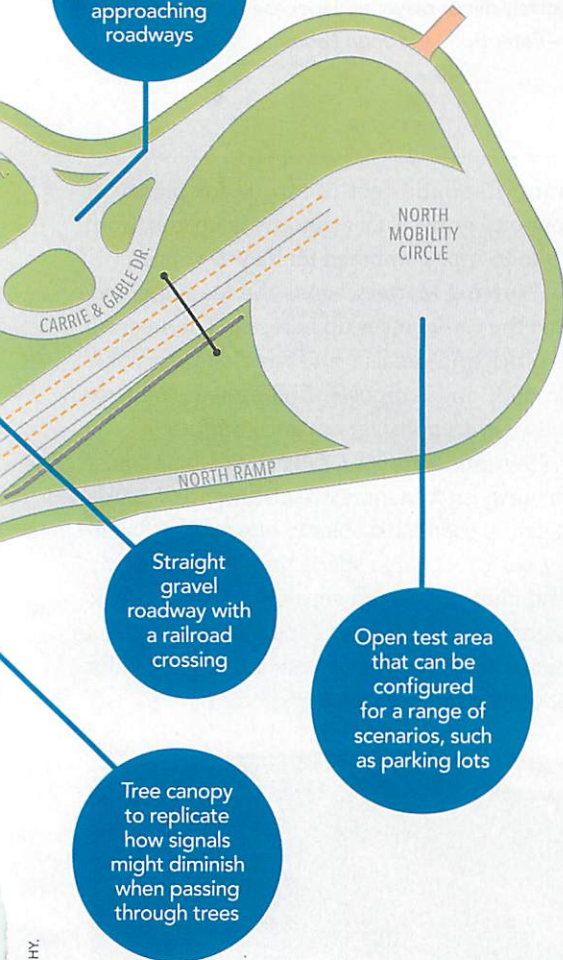
The Society of Automotive Engineers categorizes six levels of driving automation. In all cases, human interaction can override the automated system. Huei Peng of the University of Michigan's Mobility Transformation Center says we're already at Level 3, and many developers believe Level 4 is within reach.

LEVEL 0 NO AUTOMATION	LEVEL 1 DRIVER ASSISTANCE	LEVEL 2 PARTIAL AUTOMATION	LEVEL 3 CONDITIONAL AUTOMATION	LEVEL 4 HIGH AUTOMATION	LEVEL 5 FULL AUTOMATION
Humans perform all driving functions.	A computer executes either steering or accelerating/braking functions, using information from the driving environment; humans perform all remaining driving functions.	A computer executes both steering and accelerating/braking functions, using information from the driving environment; humans perform all remaining driving functions.	A computer handles all aspects of driving and monitors the environment, relying on human intervention only when complex decision-making requires it.	A computer handles all aspects of driving and monitors the environment for most driving conditions, even if a human does not respond appropriately to a request to intervene.	A computer handles all driving functions, under all roadway and environmental conditions that can be managed by a human driver.





Four-way-stop intersection with straight and curved approaching roadways



Straight gravel roadway with a railroad crossing

Open test area that can be configured for a range of scenarios, such as parking lots

Tree canopy to replicate how signals might diminish when passing through trees

Peng says. "It's just too expensive." In this hypercompetitive business, the technology must be able to function on today's streets.

For all of the enthusiasm that Peng and Sayer have for Mcity, they're just as excited about a larger testing ground: the city of Ann Arbor. Its northeast quadrant is already a connected-vehicle test bed. "The vision is to build a city that is truly the connected living laboratory of the world," Peng says.

He envisions a connected and driverless testing ground that reaches beyond Mcity and Ann Arbor's existing communications network, eventually connecting thousands

of vehicles with smart intersections across southeast Michigan. Vehicles would transmit their location to the infrastructure and in return receive updates about imminent traffic jams, pileups, and road construction.

By 2021, MTC plans to introduce an advanced mobility service in Ann Arbor that will include connected and automated vehicles, although its exact form isn't yet known. It's an inevitable development, Peng says, given the ambivalence some millennials have toward car ownership.

"What people need isn't a car," he asserts. "What they need is transportation. You already hear people at GM talking about 'General Mobility' and people at Ford talking about 'Ford Mobility.' The future of Detroit is not as the 'Motor City.' Its future is as the 'Mobility City.' "

ALMOST THERE

How soon *mobility* will replace *motor* in the GM and Ford lexicons is debatable, but Peng says we're closer than most people realize. Although autonomous cars are currently limited by such considerations as nighttime driving, snow, and high speeds, Peng believes the technology is nearly ready.

In fact, with recent announcements of driverless valet parking from BMW and Tesla, Peng says we've already reached Level 3 autonomy (see "Automation-O-Meter"), and for many developers, Level 4 is just over the horizon. For example, Tesla recently began installing the hardware needed for full self-driving capability in its cars and predicted that in two years, all Tesla models will be capable of full Level 5 autonomy—driving themselves without human input.

These developments raise lots of questions, such as: How can autonomous-vehicle developers make passengers comfortable with this new technology? Will future drivers need to pass vision tests or meet age requirements? And who is liable if accidents occur in self-driving cars?

Such questions have yet to be answered. But at a 32-acre test lab in Ann Arbor, the conversation is already under way.

Amy S. Eckert is a freelance writer based in Holland, Michigan. She drove herself to Ann Arbor in a 2012 Volkswagen Passat to research this story.



TRAFFIC JAMS

What continues to stymie autonomous-car developers?

REAL-TIME TRAFFIC

Researchers envision an interactive environment that warns instantaneously of lane closures, suggests traffic-free shortcuts, and even paces automobiles so they never need to stop at a red light. That world requires V2I communication, which is currently being developed.

UNPREDICTABLE DRIVERS

Autonomous cars need to be prepared for the unexpected, potentially dangerous behavior of other vehicles, such as swerving to miss road debris or running a red light. Research in improving V2V communication aims to address these situations.

INTENSE WEATHER

Snow, rain, fog, and the like can make it hard for sensors and cameras on autonomous vehicles to identify obstacles correctly or keep a vehicle in the correct lane if road markings are covered by snow, for instance.

ETHICAL CHOICES

Which is worse, hitting a pedestrian or swerving into traffic to avoid them? Teaching driverless cars to make these split-second value judgments is tricky business.

PUBLIC TRUST

Computers are smart, fast, and accurate. Still, people have misgivings about handing over their keys to a robot. Only time and a lengthy record of successes are likely to change that.

MN: DTA Reaches Out to Bring Transit Future into Focus

BRADY SLATER ON FEB 21, 2017

SOURCE: MCCLATCHY

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Feb. 21--The Duluth Transit Authority turned out more than 3 million rides in 2016, and Tuesday the bus company turns to ask those riders, "What's next?"

The DTA will host an open house at the Duluth Transportation Center on downtown Michigan Street from 4:30-6:30 p.m., when it will unveil its Transit Development Plan survey -- a semi-regular evaluation of ever-changing travel patterns.

To hear the state tell it, the DTA does well at this sort of thing.

"They have a long history of being very thoughtful," said Tom Gottfried, program director for Greater Minnesota Public Transit, a Minnesota Department of Transportation office based in St. Paul. "They don't think in terms of the next two weeks; they think in terms of the next 10 years."

Past surveys have been responsible for the creation of new routes and increased safety and user-friendliness initiatives, said Dennis Jensen, DTA general manager. Visitors to the open house will be able to complete hard-copy surveys or the online version using provided tablets. Additionally, pop-up tables will surface in skywalks and other places in Duluth where people can also take the survey. The final Transit Development Plan and its recommendations is scheduled to be released in August. Jensen said the goal between now and then is to reach as many DTA users as possible, die-hards and infrequent riders alike. Even those who never ride the bus are encouraged to participate.

"They're going to tell us why they don't ride the bus and why they do," Jensen said. "Some of the ideas are very reasonable and some will be impossible to meet the needs."

Data collected will be turned over to a pair of internal committees that plot the DTA's vision for the future in the form of a five-year service recommendation.



The local effort comes at a time when the DTA and the rest of greater Minnesota's transit entities are being asked to increase local service and reach deeper into outlying communities. The state is funding the initiative that seeks to turn demonstration projects into regular offerings by 2020. For the DTA, that could mean greater penetration into Proctor and Hermantown and even commuter service to Cloquet and Two Harbors. Already, the DTA is planning to increase its STRIDE service for people with disabilities by adding the equivalent of another eight hours of service daily. Transit agencies have until March to turn in enhancement proposals to the state.

"We've already approved in 2017 an additional 59,000 hours of service," Gottfried said. "We're committed to delivering these demonstration hours above and beyond those hours."

For Jensen, searching through past Transit Development Program updates offers a glimpse at the evolution of the DTA -- including the trend toward fewer transfers and more one-seat rides, the growth of its service to the University of Minnesota Duluth, the advent of smart-card bus passes and more. All were ideas either proffered or reinforced by rider responses.

"Transfers are a critical factor; people like to get on and get off at their destination and transfers discourage people from riding," Jensen said. "We try to figure out which buses can run from one neighborhood to another. One transfer is not so bad; twice is real negative."

Ridership on the DTA is down from a peak of 3.3 million rides in 2015, Jensen said. He blames the opening of the Duluth Transit Center in 2016, which forced riders to alter their habits. Still, the DTA is by far the busiest transit service in the state outside of the Twin Cities markets and Jensen figures it's only going to get busier and more complex from here on out. He sees a Duluth that is coming into its own as a destination.

"It's a wonderful thing that's happening in Duluth -- something that should have happened 20 years ago," he said. "It's a planned-type of development and expansion with great restaurants, craft breweries. Duluth is becoming a real destination."



To that end, Jensen described the one white whale the DTA has yet to incorporate into the transit system -- a service that would help serve Canal Park during its most congested times.

"The one thing we missed, which is still one of my goals, was bringing a rail trolley around Canal Park," Jensen said. "I need another five years to get that one going."



Open House

The DTA will host an open house Tuesday from 4:30-6:30 p.m. at the Duluth Transportation Center at 228 W. Michigan St. Light refreshments will be provided and there will be activities on hand for children.

People can also take the Transit Development Plan survey online by visiting surveyMonkey.com/r/DTATDp.

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Dubai To Put Autonomous Taxi Drones In The Skies 'This Summer'

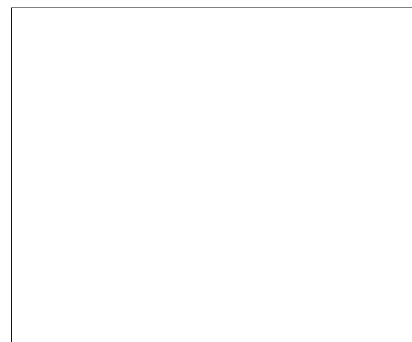


A model of EHang 184 and the next generation of Dubai Drone Taxi is seen during the second day of the World Government Summit in Dubai, United Arab Emirates, Monday, Feb. 13, 2017. (AP Photo/Jon Gambrell)

When the ruling family decrees that a quarter of all journeys in a city state will be autonomous by 2030, someone somewhere is obliged to make that start happening as soon as possible.

In Dubai, that person is Mattar Al Tayer, chairman of the city's Road and Transport Authority. He said Monday that he hopes Dubai will have autonomous taxi drones zipping around its skyline this summer. Actual drones that people can sit inside without fearing for their lives.

The flying taxis are being manufactured by Chinese drone-making firm EHang and can carry a person weighing up to 100 kilograms (about 220 pounds) along with a small suitcase. Passengers don't need to learn how to fly the drones, EHang's co-founder Derrick Xiong [told FORBES staff writer Aaron Tilley in an interview](#) this time last year.



“They just need to press a button and then it vertically takes off, flies from point A to point B, and lands.”

The drones have a range of 30



Shoshana Kedem @B_shosh · 4h

Flying drone taxis introduced later this year will be 'affordable' say @RTA_Dubai @Inc @IncArabia #Dubai #UAE [incarabia.com/video/video-th ...](http://incarabia.com/video/video-th...)



kilometers (19 miles), flying at around 60 miles per hour, and are “on track to take off within months,” Al Tayer said.

“I am glad to inform you that hopefully we will be able to have these drones available, starting July 2017,” he added at the World Government Summit, a gathering of tech and government leaders at Dubai.



That “hopefully” from Al Tayer is an important hedge to make for a product that, it appears, has not yet officially taken flight with paying customers anywhere else in the world.

In fact when EHang unveiled its drone taxi at the Consumer Electronics Show a year ago in January 2016, its “demo video” of the autonomous vehicle soaring over snowcapped mountains and the San Francisco skyline [turned out to be computer generated](#).

FORBES writer Ryan Mac noted then that EHang was one of several drone companies who had overhyped their ability to commercialize a futuristic product.

The latest video of the EHang 184 (above) which was shown in Dubai this week, shows a well-groomed business executive

putting a briefcase into the drone and then folding himself into the sports-car like interior. Notably, the video doesn't show him in the drone when it flies up towards the clouds.

EHang, based in Guangzhou, China and with offices in San Carlos, Calif., has raised some \$53 million to date according to PitchBook data, and its investors include GGV Capital and Golden Partners Capital. It's website, www.ghost-drone.com, did not appear to be accessible on Tuesday.

The EHang 184 is part of a wider initiative that Dubai's ruler, Sheikh Mohammed bin Rashid Al Maktoum, announced in April 2016: that he wanted 25% of all passenger journeys in Dubai to be carried out in autonomous vehicles by 2030.

Since then, the city's officials has struck a deal with Hyperloop One to study the possibility of building a hyperloop line that connects Dubai to Abu Dhabi. In September 2016 a driverless shuttle called the EZ10, made by French company EasyMile, [began running](#) a 700-meter trial route on Mohammed Bin Rashid Boulevard.

RECOMMENDED BY FORBES

[Chinese Drone Maker EHang Announces An Autonomous Flying Vehicle For People](#)

[As Drones Take Flight, Hype And Reality Are Miles Apart](#)

[The Future Of Transportation: The Ehang 184](#)

[Four Reasons Why Drones, Not Driverless Cars, Are The Future Of Autonomous...](#)

[The Richest Person In Every State](#)

[Why I Decided To License Starship's Music To Chick-fil-A](#)

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[Stan Lee Introduces Augmented Reality For His Kids Universe](#)



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BUS



BYD Secures Extra Orders from Sydney Airport Transport

INTERNATIONAL

UK: Autonomous Trains Key to Boosting Capacity, Rail Body Says

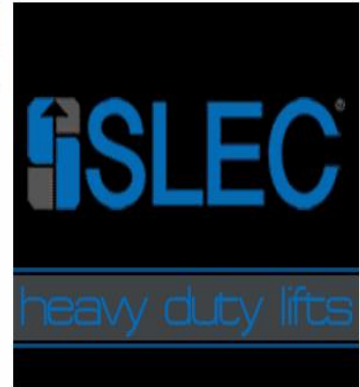
ROBERT WRIGHT ON FEB 7, 2017

SOURCE: FINANCIAL TIMES

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Fully autonomous trains and remote digital networks that allow trains to run closer together have been proposed in a new strategy to ensure Britain's mainline railways can cope with the rapid growth in passenger numbers.

The possibility of dispensing with driver control is raised in a Rail Technical Strategy paper, being published on Tuesday, that sets out 12 key capabilities needed to tackle the challenges of fitting more trains on to constrained tracks.



Read the complete article at <https://www.ft.com/content/36e33914-ec8c-11e6-930f-061b01e23655>

Voice your opinion!

No comments have been added yet. Want to start the conversation?

This site requires you to [login](#) or [register](#) to post a comment.

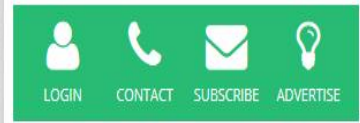
NEWS

UK: Autonomous Trains Key to Boosting Capacity, Rail Body Says

February 7, 2017

Fully autonomous trains and remote digital networks that allow trains to run closer together have been proposed in a new strategy to ensure Britain's mainline railways can cope with the rapid growth in passenger numbers.

INTERNATIONAL



BUS

MN: Gold Line Busway Gets Millions Toward a 2024 Opening

DAVID PETERSON ON FEB 17, 2017

SOURCE: MCCLATCHY

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Feb. 16--Washington County commissioners unanimously approved \$2.5 million Tuesday for the creation of the first rapid busway in the state with its own exclusive lanes.

But not before they indulged in some wistful reflection on how endless seems the gestation before the Gold Line's birth, now slated for 2024 -- and some pointed questions about why they appear to be paying a significant amount for work to be done in Ramsey County.



Ramsey County commissioners last week pitched in their own \$2.5 million share to help move the Gold Line -- to run between Woodbury and Union Depot in downtown St. Paul -- from a start-up effort overseen by hopeful locals to a new phase as a developing state and regional enterprise.

Total cost is close to \$500 million; the next stage for \$25 million is called "project development."

The Counties Transit Improvement Board (CTIB) is expected to approve its \$15 million portion of the latest set of costs as soon as Wednesday. Then a \$3 million funding request will go to the Legislature, which committed \$2 million previously.

CTIB is a metro body to which Washington and Ramsey counties contribute. Each county provides a small match.

If there's a hitch with either CTIB or the state, county officials said, they'll need to figure out how to cover it financially before the Metropolitan Council takes more control of the project.

Ramsey's vote was quick and unanimous. But Washington's vote, while unanimous, turned awkward as Commissioner Gary Kriesel questioned why they seemed to be on the hook for 95 percent of a \$100,000 tab to investigate possible impact of the Gold Line on historic Ramsey County properties nearby. "I am wrestling with the equity of this," said Kriesel, who cast the lone dissenting vote on the \$100,000 item.

George Kuprian, civil division chief for the Washington County attorney's office, said: "Not all contracts seem fair, but if you looked at the totality [of the cost sharing over the years] I'm sure it's fair."

The question may be a harbinger of bigger issues. Jan Lucke, transportation planner for Washington County, cautioned that there are "much bigger discussions later on about the overall project and how costs should be shared between the counties."

While the Gold Line would have several stations in both counties, some argue that the busway would be built more for Washington's benefit than Ramsey's, and at Washington's behest.

Washington County Board Chairwoman Lisa Weik on Tuesday said the Gold Line would "keep us connected to the region," even to the point of "keep[ing] Washington County relevant."

Weik, musing that planning for the Gold Line began in 2009, said she knew that "people feel like we have been doing this for a long time, which is true -- yet we are still in just the first third of the overall process," referring to a graphic showing major decision points.

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GA: Gwinnett Transit Study to Explore County's 'High Capacity' Options

TYLER ESTEP ON FEB 21, 2017

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Feb. 21--Gwinnett County's transit development plan is about to get up-and-running and will explore a plethora of possibilities for Georgia's second most populous county -- including the feasibility of high capacity options like rail or bus rapid transit.

Gwinnett Department of Transportation director Alan Chapman briefed the county's Board of Commissioners on Tuesday morning about the transit plan, which board chair Charlotte Nash announced last week at her state of the county address. The county is expected to award a contract to complete the comprehensive study sometime in the next 90 days or so.

The study, which Nash has vowed will include "ample discussion" with residents, is expected to examine short-, medium- and long-term options for improving Gwinnett County's transit offerings.

The long-term possibilities to be explored include "the development of high capacity dedicated right of way transit solutions," Chapman said -- meaning things like rail or bus rapid transit. The latter would operate in its own dedicated lanes and likely have fewer stops than local bus service.

County officials have not endorsed bus rapid transit, but have said it may be the most economically viable option to expand current services. A financial plan and feasibility study with "estimated cost to construct and operate for a community-supported major investment" will be included in the study.

Nash said last week she wants the county to have a vote on whatever transit options are presented by the study. That referendum would be unlikely to take place in 2017, she said.

As the county prepares to launch its transit study, it's also wrapping up nearly two years of work on its comprehensive transportation plan. That plan touches on transit but also addresses topics like roadways, trails and pedestrian-oriented improvements.

A new round of public meetings on the transportation plan begin next week and will be held at six locations throughout the county. The same information will be presented at each meeting.



Pulling together

Feb. 27, 5:30 to 7:30 p.m.

Lilburn City Hall

340 Main St., Lilburn

March 2, 5:30 to 7:30 p.m.

Snellville City Hall

2343 Oak Road SW, Snellville

March 6, 5:30 to 7:30 p.m.

Gwinnett Justice and Administration Center,

Conference Room C

75 Langley Drive, Lawrenceville

March 16, 5:30 to 7:30 p.m.

Dacula Park Activity Building

2735 Old Auburn Avenue, Dacula

March 18, 10 a.m. to noon

Shorty Howell Activity Building

2750 Pleasant Hill Road, Duluth

March 20, 5:30 to 7:30 p.m.

George Pierce Park Community Room

55 Buford Highway NE, Suwanee

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Elon Musk's hyperloop competition brings new mass-tr technology to life in Southern California



By THE WHITTIER DAILY NEWS |

PUBLISHED: January 31, 2017 at 6:26 am | UPDATED: February 1, 2017 at 11:46 am



Elon Musk, right, talks with engineer Steve Davis (red hat) while watching video boards showing inside the Hyperloop tube. The first Hyperloop pod competition took place along side SpaceX Sunday, January 29, 2017, Hawthorne, CA. The Hyperloop pod is a concept by founder Elon Musk envisioning fast travel through a vacuum-sealed tube and hosted a competition for teams to compete their design. Photo by Steve McCrank, Daily Breeze/SCNG



A new mass transit system that sounded like a crazy futuristic idea a few years ago was brought to three-dimensional life in Hawthorne on Sunday, as young engineering teams from around the world tested prototype pod-vehicles in the first Hyperloop competition.

The technology, introduced to the world in a research paper written by SpaceX and Tesla founder Elon Musk in 2013 that described the basic principles of thrusting a passenger pod through a vacuum-sealed tube at supersonic speeds, was re-imagined by teams who trekked to Hawthorne with their complex homemade vehicles in tow.

[Related Articles](#)

Teams ready to test pods in Southern California for futuristic Hyperloop transit system

The students – mostly from colleges but also including a high school team from Texas – spent more than a year designing and building their contraptions with the help of sponsors and only basic conceptual instructions from Hawthorne-based Space Exploration Technologies Corp.

(Because less instruction means more innovation.)

Musk had a white three-quarter-mile, 6-foot-diameter tube constructed along Jack Northrop Avenue for the event, which drew 27 teams from six countries. The tube will stay put for a second competition this summer.

“This was done to encourage innovation in transport technology,” Musk said in a press conference before the competition. “To really just get people to innovate and think about doing things in a way that’s not just a repeat of the past, but to explore the boundaries of physics and see what is really, really possible.

“I think we’ll find that it’s way more incredible than we ever realized. That’s really the overarching purpose of this Hyperloop competition. I think it’s going to be ultimately something that inspires the world and results in real transportation technology.

“Congrats to everyone. I’m amazed at what the student teams have done. It’s really blown my mind.”

Hawthorne Mayor Alex Vargas attended and said he was thrilled to have the event in his hometown.

“I’m excited not only that we’re hosting them here, but that we’re partners in all this,” he said. “This project is taking us leaps ahead, and it’s all happening here in the city of Hawthorne.”

Three top competitors chosen

Only three teams passed SpaceX’s rigorous 101-point review of their pods’ structural, mechanical, navigational and functional abilities to enter the vacuum chamber Sunday. But thousands of young engineers who have been working long days and long nights in the lead-up to the competition showed off their work at street-fair-style booths.

Delft University of Technology’s 329-pound pod only needed the power of a light bulb to run through the tube. The team, from the Netherlands, got the highest score of the competition.

“We worked very hard,” said team captain Tim Houter. “I feel like we’re pioneers. It’s the way the engineers going to the moon felt doing something no one’s done before.”

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While commercial Hyperloop pods will ideally travel at about 300-700 mph, the prototypes on Sunday only made it to about 50 mph. Technical University of Munich reached 55 mph with its bullet-shaped, striped air-powered pod that levitated through the tube with magnets. An air compressor at the front reduced drag by pulling it through the machine.

“We’re glad we had the opportunity to do the full-competition run,” said team member Bailey Curzadd, a Texan studying in Germany. “You cannot test a vehicle like this without the vacuum tube.”

The team, sponsored by Airbus, had to transport its pod’s batteries and magnets via ship because they weren’t allowed on the plane.

“It’s a very complex technical system,” Curzadd said. “It’s very rewarding to have so many complex pieces of equipment working together. We put an enormous amount of work into it.”

Massachusetts Institute of Technology’s pod was the first to enter the tube and, though it only reached 44 mph instead of its planned 200 mph speed, everything else worked as planned, team members said.

“It’s very satisfying. We’ve been working on this the past year-and-a-half,” said team member Raghav Aggarwal. “We are going to relax and take a break now.”

‘So much innovation’

UC Irvine’s HyperXite vehicle had a few hiccups in the final testing leading up to the

competition and wasn't cleared to enter the tube. But team members said SpaceX officials will let them come back and test it later in preparation for the summer competition. Their pod is one of only a few that used air-based levitation rather than magnets.

"We had a couple problems the first day," said team member David Nguyen. "Projects like this are a lot of time and work. But it's great that we've met so many amazing people and gotten reviewed by people in the industry."

USC's team didn't qualify on Sunday, but members said they plan to come back again to test their pod on the track, which is the only one of its kind in the world. They completely overhauled their design plans about a month ago, deciding to build a mini-electric-car pod with 150 horsepower.

"It's got its own propulsion and drive train," Bryan Byrnes said. "We've learned a ton just by building it. We're superstoked about it. For the next competition, we're going to come back with guns blazing. We're unbelievably proud of what we accomplished."

UC Berkeley's team had a problem with its controls and wasn't able to enter the Hyperloop on Sunday, either. Like most of the pods brought Sunday, their prototype is propelled and braked by magnets.

"Eddy currents from the magnets cause it to levitate one-quarter inch off the ground," said team member Brooks Barrett. "The thing I like most about this competition is there's so much variety in the pods, so much innovation."

Musk started digging

Meanwhile, Musk has been promoting a tunnel-building project on his Twitter account for weeks that began construction Friday next to the Hawthorne airport, at Crenshaw

Boulevard and 120th Street. The tunnel will be 50 feet deep and at least 50 feet wide, according to city permits obtained for the construction.

But Musk said he hasn't decided exactly what he's going to build, other than a walkway for SpaceX employees to easily get to their parking lot across the street.

Mayor Eric Garcetti, who introduced Musk at a Sunday press conference before the competition, said LA Metro will partner with him on the project. The agency previously tweeted Musk, offering to sell him its used tunnel-boring machine.

"We started digging a hole on Crenshaw just in front of SpaceX," Musk said. "There's a giant hole. So, that's going to be the start for the tunnel-boring machine.

"We're going to try to figure out what it takes to improve tunneling speed between 500 and 1,000 percent. So we're just sort of muddling along. We have no idea what we're doing. We're going to get this (tunnel-boring) machine, take it apart, figure out how to make it go faster while still being safe and not affecting people on the surface."

He anticipates using the findings from the tunnel project to improve roadway and train tunnel construction worldwide.

Transit Windsor begins testing Intelligent Transportation System



The Transit Windsor bus station in Windsor, Ont., on Wednesday, April 10, 2013. (Chris Campbell / CTV Windsor)



CTV Windsor

Published Friday, February 17, 2017 10:09AM EST

Transit Windsor has started the testing phase of its new Intelligent Transportation System in an ongoing effort to improve the way they provide service.

Officials say it's the first of several changes to create a more efficient, safer and more user-friendly system.

So far there are 10 Transit Windsor buses equipped with the new system and providing automated stop announcements.

This system provides onboard voice and visual announcements, which include next stop messages. Voice announcements are coordinated with display signs inside the bus.

Pre-boarding external audible announcements are also provided to waiting passengers waiting at bus stop locations.

More buses will be added over the next several weeks as the technology is tested and rolled out.

Visit Transit Windsor's [Intelligent Transportation System](#) web page for details about ITS features that will be available after the fleet is fully integrated and testing is complete.



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Orange County Transportation Authority partners with INIT for mobile ticketing project

INIT Innovations in Transportation Inc. has partnered with the Orange County Transportation Authority (OCTA) for the implementation of electronic fare readers and a back-office revenue management system.

OCTA operates countywide bus and paratransit services, as well as the planning, financing and coordinating of Orange County's freeway, street and rail development and operation of the 91 Express Lanes.

The recent integration of a [moovel](#) mobile ticketing app necessitated the use of fare readers across the agency's 556 fixed-route vehicle fleet. INIT's PROXmobil3 readers are fully capable of accepting open payments – contactless credit cards, debit EMV, and near-field communication devices, a goal that aligns with OCTA's future plans.

In addition, INIT will implement a back-end, multi-client capable revenue management system to process mobile tickets onboard the OCTA fleet, monitor field devices, configuration and reporting. The modular structure of the system will allow OCTA to expand or extend at any time to meet the needs of new technology or new functionalities.

The readers and back-end system will provide an open architecture as well as application programming interfaces (APIs) that support OCTA's core system functions.

The fare system is expected to improve the customer experience by providing a convenient option for riders, simplifying transit use, and allowing for future regional fare integration. The partnership with INIT ensures these goals can become reality.

Rail travellers could pay for train journey by fingerprint or iris scan under new plans

Facial recognition is already used at some UK airports to speed up the border control process

Zlata Rodionova | Tuesday 7 February 2017 19:43 GMT | [4](#) comments

The **rail industry** has come up with a plan that may as well be out of a **science-fiction** movie to cope with growing demand and overcrowding: charging rail passengers for journeys by fingerprint or iris scan.

The Rail Delivery Group (RDG), the organisation representing train operators and Network Rail, claims biometric technology would enable fares to be automatically charged marking the start of an era that could radically accelerate commute times.

The technology represents the next step from travellers being able to use smartphones' Bluetooth signals to open station barriers. That will be trialled on Chiltern Railways' route between London Marylebone and Oxford Parkway over the coming months.

The use of digital signalling technology will also allow trains to operate closer together, cutting delay, according to the RDG.

Paul Plummer, the chief executive of RDG, told the Press Association that the network was "increasingly full" and steps should be taken to consider the "solution of tomorrow".

He said: "This blueprint sets out how we can harness digital technology to make journeys better for passengers and freight customers on a railway that's simpler and easier to use."



Pinellas bus riders can now grab a \$1 Uber or taxi ride from their bus stops

Caitlin JohnstonCaitlin Johnston, Times Staff Writer

Thursday, January 19, 2017 6:33pm

PSTA partners with Uber to help to, from bus stops

ST. PETERSBURG — Riding the bus in Pinellas County just got a whole lot easier.

Transit agencies have always struggled with what's known as the "first-mile, last-mile" problem — how to get riders from the bus stop to their final destination, whether it's their home, the office or even the grocery store.

The Pinellas Suncoast Transit Agency will attempt to meet that challenge with a new county-wide partnership with Uber, United Taxi and Wheelchair Transport that was announced Thursday. The bus agency will help subsidize those services to take people from the bus stop to their final destinations for about a \$1.

PSTA said it is the first transit agency in the country to partner with a ridershare company in this manner.

"This is the future of transit," PSTA CEO Brad Miller said.

The program, known as Direct Connect, is an expansion of a pilot project PSTA rolled out last February in East Lake and Pinellas Park. The pilot was successful enough that PSTA will now subsidize Uber and cab rides for bus patrons throughout the county.

Those who don't want to take an Uber can call United Taxi. Wheelchair Transport is also part of the program, making it accessible for people with disabilities.

Here's how it works: The county is divided into eight zones. Each one has a designated stop that is a transit hub for multiple routes. Trips must be within the zone and start or end at the designated bus stop, which is usually within five miles.

People can access the discounted ride directly in their Uber apps. If they're already at the station, they'll type in their destination, and if it's within the zone, the PSTA discount will be the first option that pops up.

If they're on their way to the station, they'll initially see traditional options on the app such as UberX and UberSelect. But swipe to the right, and the PSTA fare will appear.

Warning: The app will tell riders the fare before the discount, usually around \$5.95. But if they pick the PSTA option, the bus agency covers the first \$5, meaning most people will pay about a dollar for their ride.

"It's been a God-send, really," said Sue Keating, who has been using the program since the pilot started last year. "Not having to muscle groceries and things like that while walking 15-minutes in the summer heat has been so nice."

Her son Kyle Keating, 32, sometimes uses Direct Connect to get home when he works late. Instead of having to walk a couple miles or paying \$8 to 12 for an Uber to get home from work, he can take the bus to Pinellas Park for \$2.25 and then grab a \$1 Uber ride home.

Miller is hoping Direct Connect will entice more people who to use the bus who don't normally do so, but are also looking for a cheaper alternative to Uber or a taxi.

"It's a whole new market of potential bus riders," Miller said. "We want a way to attract people who were just planning to use Uber but want a cheaper way to get there. Can I get a discounted Uber ride combined with the bus to save money?"

The program also allows PSTA to expand its coverage without the additional expense of adding bus routes. PSTA has allocated \$100,000 for the first six months of the county-wide program. By comparison, the old East Lake connector cost \$150,000 to run plus the cost of the bus. But that low-performing route was replaced in February by the pilot program.

Transit agencies are increasingly investing in these kinds of private-public partnerships to help alleviate their constrained budgets and reduced federal funding. This is especially problematic for Tampa Bay's transit agencies, where two transportation sales tax referendums have been defeated since 2010 and a third couldn't even make it onto the ballot last year.

"It just does not make sense to run an \$800,000 bus to every corner of Pinellas County," Miller said. "If we can work out these arrangements with Uber and taxi companies in more suburban, low-density areas ... then we can run the buses we have on the major corridors of Pinellas County."

Across the bay, the Hillsborough Area Regional Transit Authority is also working to provide a first-mile, last-mile solution for its riders, known as HyperLINK.

For a \$3 flat fee, riders can take a van to a designated bus stop within a 3-mile radius. The pilot program currently operates with three stations: the University Area Transit Center near the University of South Florida, a stop at W Fletcher Avenue and N Dale Mabry Highway stop and one at the Westfield Brandon mall.

Six Transportation Trends That Will Change How We Move



Valley Voices, CONTRIBUTOR
Voices on technology and change [FULL BIO](#) ✓
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POST WRITTEN BY

Brook Porter, Michael Linse and Zach Barasz

The authors are investors with the Green Growth Fund at Kleiner Perkins Caufield & Byers.

Since the British pioneered “road locomotives” more than a century ago, people have traveled from point to point in largely the same way. That’s changing.

Six technologies are converging on the transportation industry, and investors have taken note. Venture investors put \$5.7 billion into transportation businesses last year, more than twice the level of investment in the previous two years combined. Uber was the big winner, raising \$3B. But other startups also raised significant funds, like GrabTaxi (\$334 million), Lyft (\$250 million), BlaBlaCar (\$100 million), and INRIX (\$65 million).

So what are these six technologies, and why are they so compelling? Let’s take a look.

Autonomous Vehicles

Hands-free and feet-free driving, with catchy names such as Tesla’s “Autopilot” and GM’s Cadillac “Super Cruise,” will soon be widely available. Experts believe that fully autonomous vehicles are not far behind, and momentum keeps picking up. Three years ago, for example, the specialized LiDAR laser sensors that Google uses on its autonomous vehicles cost more than \$70,000. This year, the manufacturer released a miniaturized version that costs one-tenth the price. And with new technologies in the works that cost only a few hundred dollars, we should expect another huge decrease.

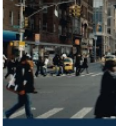
Having ridden in several fully autonomous concept vehicles, we are convinced that they will change the world. The elderly will regain mobility, traffic congestion will decline, safety and fuel efficiency will improve, on-demand services and deliveries will become commonplace, and cities can reclaim public spaces that they currently must devote to parking. And in a time when the median San Francisco resident commutes nearly an hour per day, drivers will save hundreds of hours per year.

Connected Vehicles

In the third quarter of 2014, AT&T added more car data subscribers (500K) than smartphone subscribers (466K) or tablet subscribers (342K). These data plans deliver software updates to the vehicle, traffic data to the navigation system, and Internet connectivity to the passenger. Connections with other vehicles and with infrastructure reduces congestion and vehicle fatalities. They also enable automakers to develop new tools for predictive and preventative maintenance.

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We can already see the benefits of connectivity in commercial vehicle fleets. One of our portfolio companies Telogis uses location and vehicle data to plan fleet purchases and efficiently route, manage, and maintain vehicles. Another one called INRIX delivers traffic data to passenger vehicles to help with shorter and safer commutes. Connectivity will also transform the auto insurance market by enabling insurance firms to differentiate between safe and unsafe drivers. Usage-based auto insurance could become a quarter of the overall auto insurance market in the US by 2020.

Connectivity may also upset the manufacturer-customer relationship. Services like Apple's Car Play and Google's Android Auto are likely to transition the user's attention and primary experience away from the car and onto the screen. Virtual assistant capabilities will provide direct feedback to the driver to improve the in-car experience, from calendar notifications informed by traffic updates to restaurant suggestions based on historical preferences. If iOS or Android becomes the best part of our car, where does that leave the manufacturer?

Collaborative Consumption

Millennials own fewer cars than previous generations. We are already seeing "peak car" in some developed countries. Globally, the auto market is a \$20 trillion asset class with just 4% to 5% utilization. We need to ask ourselves the big question: As two billion more drivers move into the middle class over the next decade, should we be adding another \$20 trillion in assets, or should we strive to reach 10% utilization instead?

Services like Uber and ZipCar enable someone to have what they want (on-demand mobility) without having to purchase what they don't need (a \$30,000 piece of mostly unused metal). This reduces car sales while redefining the meaning of luxury in automobiles. The best seat in your car is no longer behind the wheel. It's now in the back, where you don't need to navigate traffic, worry about speeding tickets, find parking, charge or fuel the vehicle, or pay insurance.

Electric Drivetrain

An electric drivetrain is more powerful, compact, and efficient than the fossil-fueled alternative and produces zero local air emissions. For example, Tesla's dual AC-induction motors on the Model S produce 691 horsepower and 687 lb-ft of torque in a package that weighs less than 200 pounds and fits between the wheels – leaving enough room for both a trunk and jump seats in the back. Electric drive enables a unique combination of performance and efficiency, delivering well-to-wheels efficiency unmatched by internal combustion engines while producing maximum torque at any speed and capturing energy through regenerative braking.

Investments in battery technology, such as the planned Tesla Gigafactory, combined with disruptive innovations from emerging battery companies are dramatically reducing the cost of energy storage. Low-carbon electricity will continue to get more economical, while fossil fuels will get more expensive in the long run. As a result, more segments of the transportation sector will give up market share to electric drive.

Heavy-duty vehicle segments, such as transit buses and local delivery trucks, will lead the way in the electrification of transportation because the economics of electric drivetrains for heavy short-range vehicles are so compelling. Companies such as Proterra (in our portfolio) will provide cheap, quiet, and clean transportation that will help make bus transit more attractive. And companies such as ChargePoint (also in our portfolio) and utilities such as Constellation Energy and Southern California Edison are addressing the chicken-and-egg problem of ensuring that there are a rising number of charging stations to make EVs more viable.

Efficient Multimodal Network

Cars will integrate into an efficient intermodal network. The BMW iSeries is the first attempt by an OEM at incorporating public transit into the driving experience. Multiple companies, such as INRIX and Waze, have sprung up to improve our drive's efficiency. Now, startups are working to improve transparency in public transportation and reduce friction through crowdsourcing transit data, moving ticketing to the smartphone, and calculating prices for multiple trip options.

The Caltrain, which runs from San Francisco to San Jose, is often the fastest way (and lowest cost) to travel between those cities because of traffic. However, long wait times and cumbersome schedules limit broad usage. By incorporating information from users' calendars, locations, and travel preferences, mobile apps can now automatically plan the most efficient trip possible using real-time data. As we integrate this data with car sharing services – and other personal electric modes of transport, such as scooters or e-bikes – we can solve the “last mile” challenge of public transit.

New Materials (and the obligatory 3d printing reference)

In the near term, lightweighting will intensify over the next decade. Fuel efficiency standards mean that manufacturers are motivated to reduce weight: weight is now frequently a more important decision factor than cost in purchasing. Electrification drives lightweighting to the extent it increases range and reduces the battery size required – it's no coincidence that BMW's first production EV (the i3), also is a plastic-reinforced carbon fiber vehicle. The demands for lightweighting come at a time when the cost of carbon fiber parts are coming down dramatically.

In the medium to long term, new automotive manufacturing technologies, including 3d printing, will change the way vehicles are designed and assembled to enable higher performance, lighter weight, and novel design. As these trends collide, transportation is being upended. We can already see that a fleet of autonomous, shared vehicles – connected to the road infrastructure, to the Internet, and to a broader network of public transit options – will create incredible value.

The only open question is who is best positioned to capture it.

CO: Private Company Dreams Big with Cheyenne-to-Pueblo Supersonic Transit Tube

WAYNE HEILMAN ON FEB 13, 2017

SOURCE: MCCLATCHY

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Colorado Springs residents might be able to make the 70-mile trip to Denver in less than 10 minutes in the next decade if a Los Angeles-based company selects a Colorado proposal later this year as one of three locations where it will build a supersonic-speed transportation system.

Privately held Hyperloop One selected the Rocky Mountain Hyperloop, a proposal sponsored by the Colorado Department of Transportation and global engineering giant Aecom, as one of 35 semifinalist projects worldwide from 2,600 proposals to build a transportation system that will use levitation technology to push passenger pods and cargo through low-pressure tubes. The first phase of the Rocky Mountain system would connect Denver International Airport with Greeley, but the system is planned to eventually connect the entire Front Range from Cheyenne, Wyo., to Pueblo.

The Rocky Mountain system would include stops in Colorado Springs, Monument, Castle Rock, Centennial, Denver, Westminster, Boulder, Longmont, Greeley and Fort Collins. No cost estimates have been completed, nor is there a timetable for construction beyond the initial phase, said Alan Eckman, Aecom's vice president of transportation in Denver.

Hyperloop One completed an open-air test in May and is scheduled to complete a full test of the technology on a 500-meter Las Vegas testing track next month. The company plans to narrow the field to about a dozen finalists in May and select two or three projects this summer for construction that would be completed by 2021. The finalists include teams from 17 nations, including 10 other U.S. teams. The first system likely will be built in the United Arab Emirates, funded by \$50 million from port operator DP World Group, to connect Dubai and Abu Dhabi to move cargo 99 miles in 12 minutes.

"As part of this competition, we have to show if we put this technology in place, what value does it provide," Eckman said. "If the hyperloop is a viable technology, it could be used to connect the Front Range and mountain areas. There is a strong link between transportation business competitiveness."

Hyperloop technology was proposed in 2013 by Elon Musk, CEO of SpaceX and Tesla Motors, as a way to carry passengers and cargo at speeds of up to 760 mph to cut the travel time between Los Angeles and San Francisco from 5 1/2 hours to 35 minutes in a system with the capacity to move 7.4 million passengers a year. Musk turned over development of the technology to Silicon Valley venture capital fund investor Shervin Pishevar, who started Hyperloop One to complete the technology development, secure financing and build out the system.



"We'd like to see Colorado host the first Hyperloop network and be a part of the future of travel," Denver Mayor Michael Hancock said last month in a news release about the project. "I am confident that this new and transformative method of transportation will bring substantial benefits to Colorado and the West."

Contact Wayne Heilman: 636-0234

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Transit authority leasing four Tesla vehicles for university area expansion

Feb 15, 2017, 2:58pm EST Updated Feb 15, 2017, 4:33pm EST

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Reporter
Tampa Bay Business Journal



The Hillsborough Area Regional Transit authority is leasing four Tesla (NASDAQ: TSLA) vehicles through a third party leasing agency to expand its HyperLINK program in the [University of South Florida](#) area.

The program currently partners with the company Transdev to provide direct connections from door to bus stop through an on-demand ride-hailing service similar to Uber.

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The program aims to expand using Tesla vehicles equipped with autonomous vehicle technology along Fowler Avenue and connecting roads. The collaboration is a huge leap for transit nationwide because it's the first time the company's vehicles will be used for public transportation.

The vehicles initially will not be capable of fully autonomous operations and will have "drivers" to ensure safety. However, the vehicles will receive software updates as Tesla develops its technology.

Details on the expanded service are limited at this point because HART has not finalized its agreement with Tesla.

Tampa Innovation Alliance Executive Director [Mark Sharpe](#) is heading to San Jose, California to meet Thursday with officials from Tesla Motors to build a relationship with the company. He will head to the Tesla factory with a representative from HART.

"It's something that is cooler and more attractive," said HART CEO [Katharine Eagan](#).

Public transportation in the Tampa Bay region has historically been stigmatized as catering mostly toward the poor. Offering up a hip ride in a Tesla could go a long way in shedding that image.

The Tesla vehicles through HyperLINK will only be available as a first mile/last mile solution to get riders to and from the University Transit Center between Fowler and Fletcher Avenues off Bruce B. Downs Boulevard.

The program is funded through contributions from private companies that are members of the Tampa Innovation Alliance and does not use public dollars.

Janelle Irwin is a reporter for the Tampa Bay Business Journal.