

# Issue 6

## Contemporary Conversation: Transportation Infrastructure Development





# Contemporary Conversation: Transportation Infrastructure Development

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# Introduction

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## About These Series

The Contemporary Conversation (CCs) Series is a compilation of voices from experts in the transportation sector, focusing on specific topics and divided into their relevant subtopics. These pieces are taken from the Regional Mobility Dialogue Series, a series of conversations made from Dialogues organized by the Leonard Transportation Center (LTC). These dialogues include a diverse panel of experts, from researchers and PhD professors, to key players/stakeholders in the transportation sector.

The purpose of the CCs is to provide the reader with an overview of the transportation issues faced in the Inland Empire and California. It is to do so by including a wide variety of perspectives which bring about a further understanding of the issues faced and their respective solutions proposed. The topics discussed can vary from housing, sustainability, fiscal policy, among others.

## About This Issue

This Contemporary Conversation will provide an overview of various topics related to infrastructure and its current developments. The three dialogues will focus on the main areas of transportation development: one will address commuters who use cars, another will discuss connecting counties through public transit, and the third will cover aviation. By the end of this CC, you will have learned about congestion pricing, airport logistics, and intercounty buses.

## This Contemporary Conversation is organized into three topics:

- **Infrastructure for Car Commuters:** This section is about developments on freeways and streets that might change travel patterns and times into more convenient and controlled ones, congestion pricing is set to be the solution to stop building more and start using our buildings smarter.
- **A Vision for new Urbanism:** Congestion pricing accompanied by a proper public transportation system will help us reimagine the way we commute. This section is meant to show what kind of projects are being done to connect cities through public transit in a faster manner than how it's being done in 2024.
- **Aviation Infrastructure Development:** Finally, this section is all about aviation. After covid many of the local airports turned their mainstreams of revenue to be the logistics sector, accompanied by the growing acres of warehouse space in the county makes the perfect scenario for this switch, this will be about that transition being done by the airports in the IE.

# Infrastructure for Automobile Users

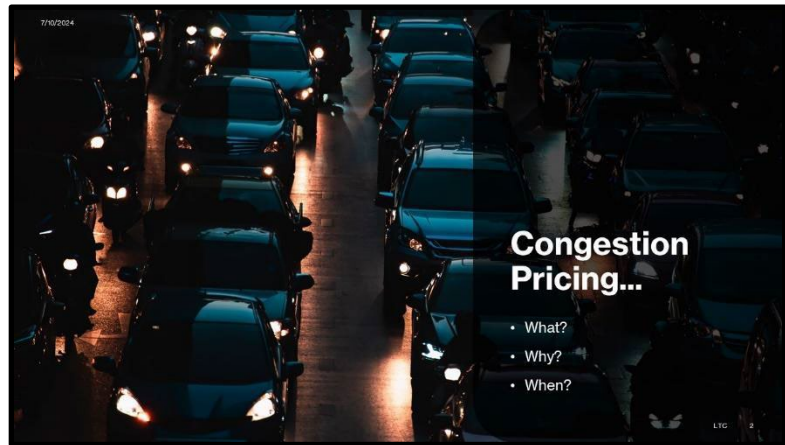
One potential solution to reduce traffic on the freeway is congestion pricing, this section will focus primarily on the issue of congestion pricing. Speakers will delve into what congestion pricing is defined as and how it is used. Different speakers will go over the pros and cons of using congestion pricing, and finally a speaker will give an overview of future projects regarding Congestion Pricing on the I-15 and I-10 corridor.

## Is the Solution to Build More? – Perhaps Not

**Baruch Feigenbaum**, Assistant Director of Transportation Policy, Reason Foundation

Mr. Feigenbaum has a diverse background researching and implementing transportation issues including revenue and finance, public-private partnerships, highways, transit, high-speed rail, ports, intelligent transportation systems, land use, and local policymaking. Mr. Feigenbaum is a member of the Transportation Research Board Bus Transit Systems and Intelligent Transportation Systems Committees, and chairs the Bus Rapid Transit Conference Committee. He has appeared on NBC Nightly News and CNBC, and some of his work has been featured in the Washington Post and Wall Street Journal.

Mr. Feigenbaum discussed what congestion pricing is and what it means for our region. “What is congestion pricing? Congestion pricing uses variable pricing to change and help manage the demand on a roadway. Why? Why would we want to variably change pricing? What is the point of this? So, the majority of drivers on the roads during rush hours are not commuters. And if you think about



it, it always blows my mind, because why would someone be driving around rush hour if they do not have to? But the reality is that a lot of folks make trips that they could be making outside of rush hour. And so, we found that pricing, more than vehicle restrictions, more than urban road boundaries, more than anything like that is the best way to manage behavior.”

According to Mr. Feigenbaum, there are four types of congestion pricing, which are:

1. Variable Priced Lanes, as seen in SR 91.
2. Variable tolls on Roadways, SR 133.
3. Cordon Charges, found in Singapore.

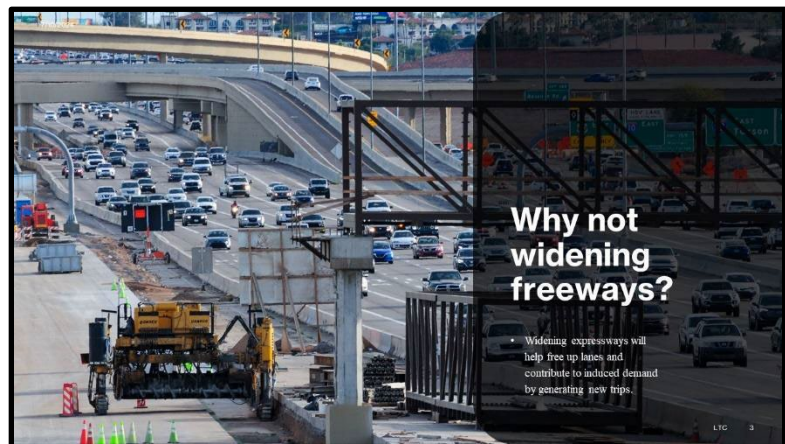
4. Area-wide charges, found in Stockholm, which are similar to Cordon Charges but just a little different geography.

There are various residential and commercial destinations in our region, and this adds to the challenges of operating transit. “Free lanes suffer from the ‘Goldilocks Scenario’, also carpool lanes, HOV lanes with restrictions. Either, those lanes and GP lanes are too hot, meaning that they got too many vehicles, or they are too cold, meaning there is not enough vehicles. So, the problem is, how then, do you create a lane that has a consistent travel time in a consistent quality experience. And we found that using pricing does that.”

Some of us may not be aware of how tolling now works in the 21st century. There used to be toll booths on the toll roads that one could stop at and pay a fee to use that toll road. This is no longer the case. Mr. Feigenbaum elaborated on this common misconception.

“21st Century Tolling has something called, toll gantry, which is an overhead device that basically is able to know when a vehicle goes under the device and it notes by communication with the toll transponder, which is basically just a window sticker. So, I like to say that the transponders speak with the toll gantries. The customers are then sent a bill in the mail or funds are withdrawn from the account.” Individuals open an account and deposit monies to maintain a balance and the tolls are automatically deducted. The account is automatically refunded with a credit card when the balance falls below a certain amount. There are options to also pay with cash. This system is much more efficient than maintaining tollbooths and toll collectors. It is safer than the old system and there is a lower administrative cost. 5 Southern California has severe congestion and the economic, social and environmental costs are

considerable. These congested areas experience induced demand, in other words, cars traveling by car in economic terms, is a normal good. Widening expressways will help free up lanes and contribute to induced demand by generating new trips. Those who are reluctant to make trips due to the congestion, will make those trips. Nonetheless, if the freeways become congested as soon as they are widened, it does not solve the problem.



Tolling is used as a means of reducing congestion, but some believe that congestion pricing is regressive because everyone is charged the same. Research studies show that toll lanes are used an average of once a week, not for every trip. 6 The buildout of toll roads has experienced a few bumps along the way but these have been addressed and for the most part resolved. Mr. Feigenbaum's presentation provided a reasoning for the need for tolling as a tool in the transportation infrastructure system. In order to keep people and the economy moving forward, tolling is an important component of the transportation infrastructure.

Now that we know what congestion pricing is and how it can potentially affect the infrastructure planning in the streets, it's time for the next speaker to argue whether it can work or not.

## Can Congestion Pricing Work?

**Patrick DeCorla-Souza**, U.S. Department of Transportation, Build America Bureau and FHWA, P3 Project manager

In this presentation Patrick DeCorla-Souza will go over why he believes congestion pricing could be the potential solution to extreme congestion on Southern California's freeway. The thing is that while there is an increasing demand for space in the freeway, there is no dedicated supply line. Congestion pricing, Souza points out, is the way to give a pricing to the supply and demand which will balance out things in the roads of SoCal. Unfortunately, though, there are no pricing standards on the roads or highways, which leads to traffic when demand is high.

In 1995, priced lanes in Southern California were put on the SR-91 and I-15. These were the first freeways to use variable tolls to manage congestion. Today, there are 53 operating projects across the U.S. There have also been variable tolls implemented on existing bridges, showing that operationally it can be done. Recently, New York City made history by implementing

cordon pricing on existing roads to enter the central business district, and the funds raised will pay to enhance the transit network. Southern California may not be a prime place to implement congestion pricing because congestion is throughout the freeway system, leading us to ask can congestive pricing work on the freeway system?

The main obstacle to congestion pricing is the lack of convenient transportation alternatives. For example, if people do not have options besides driving a vehicle or carpooling with a coworker to get to work, implementing congestion pricing can have adverse impacts on commuters. Especially



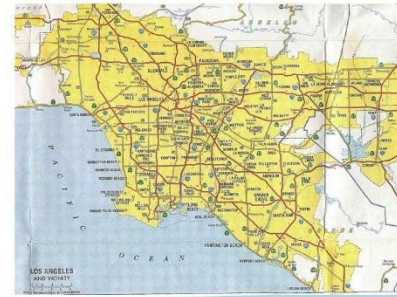
for lower income drivers as they will pay a larger percentage of their income for tolls, creating inequities in the system.

DeCorla-Souza provided a proposal to make congestion pricing a more viable option for the Southern California region using the current infrastructure. A new mode and alternative, called incentivized ridesharing. We have heard of Uber and Lyft, where we use our mobile phones to hail a ride. Without spending billions of dollars, we can empty car seats, decreasing congestion, practically overnight. The biggest hurdle is providing the necessary cash incentives for drivers and passengers. Northern California has already attempted to implement this system. In 2017, San Mateo County received 68% of new members of this carpool cash incentive system. The standard amount is around \$2 per person, per trip. In 2020, South Bend Indiana implemented incentivized ridesharing. The system was used mainly to transport employees to worksites. The cost was 50 cents per mile. As the price point was so low, it increased accessibility to residents of Indiana.

## Southern California

### Freeway congestion

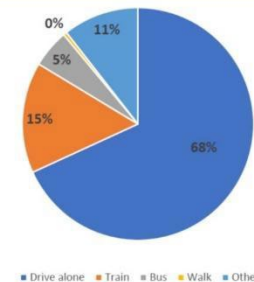
- Can pricing solve it?



## Carpool cash incentives

### San Mateo County, CA (2017):

- Mobile app
- \$2 per person per trip



Source: Presentation at C/CAG Board of Directors Meeting, March 8, 2018

## Incentive needed to pick up a passenger

Source: Mineta Transportation Institute

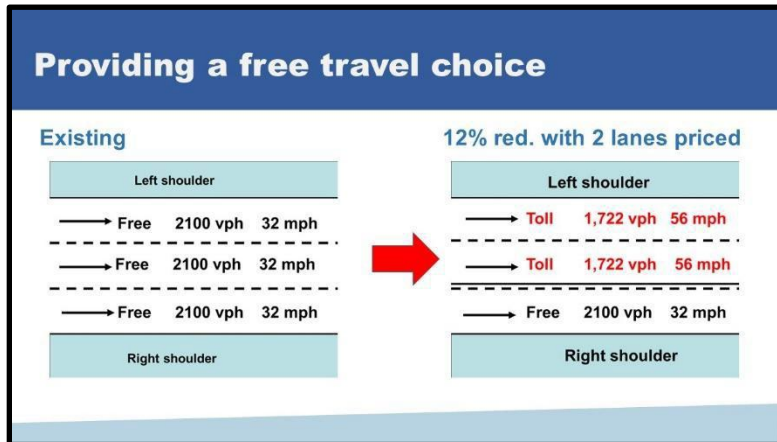


A recent study by the Mineta Transportation Institute found that a \$5 incentive would encourage drivers to pick up passengers. That is a reasonable amount of money to reduce traffic. The passengers would need a subsidy as well. Otherwise, they would continue driving their cars over long distances to work and school. The passenger incentive will be \$1 per day, making it 50 cents per trip. The total incentive needed to fill up one car would be only \$5.50. This will cut traffic congestion by 15%! We must remember that cash incentives provide the solution to kick starting this program off. The goal is to reduce traffic and provide alternatives.

Congestion pricing has the potential to solve these problems. The money obtained from the toll can be used to fund rideshares. It would ward off the induced travelers inadvertently increasing more traffic. Patrick conducted his own study to understand what a 12% reduction may imply. On the left, which resembles California highways, freeways received 2,100 vehicles per hour (VPH).

Once we see a 12% decrease in traffic, 32 mph increases to 49mph on the freeway.

What about those who are low-income drivers? Traffic diversion will also be an issue if drivers refuse to increase their trips in rideshare systems. If we toll only two lanes, we get more reduction per lane, producing higher speeds. That results in a 24-mph increase. We would need to increase the toll rate to ward off induced travelers. The goal here is to improve the fluidity of traffic. Mr. DeCorla-Souza estimated goals needed to ward off induced travelers, those who only drive during rush hours. The DOT will see a net revenue of 17% for one lane and 25% for two lanes. The cash incentive remains the same regardless of number of lanes. If we combine congestion pricing with on demand ridesharing, we can solve the ongoing congestion issue in the Inland Empire and all of California. The biggest challenge is the initial source of funding for the tolls and ridesharing.



### Financial Viability

	All Lanes Priced	Two Lanes Priced
Toll (paid by all vehicles)	\$1.50	\$2.50
Cash incentive (carpoolers)	\$5.50	\$5.50
<b>Net revenue after operations (% of gross)</b>	<b>17%</b>	<b>25%</b>

Charging a base price for the toll is the beginning of the process. Different HOV lanes will produce different credits. The diagram to the left shows a savings of \$3 for the drivers who hold more passengers. That savings would be the incentive to fill up cars using rideshare and decrease the total number of cars on the road. First, the plan is to solve the HOV lanes. Once this system proves to be tried and true through adaptation from the public, we must solve congestion in the regular lanes. We would charge a nominal toll to ward off those induced drivers. We provide more credits to higher occupancy vehicles.

Mr. Souza just gave an argument to prove that congestion pricing does in fact work, and might be the solution for our congestion problems, following now, the next two speakers in this dialogue will speak on how it can be implemented both in our streets as well as in our freeways.

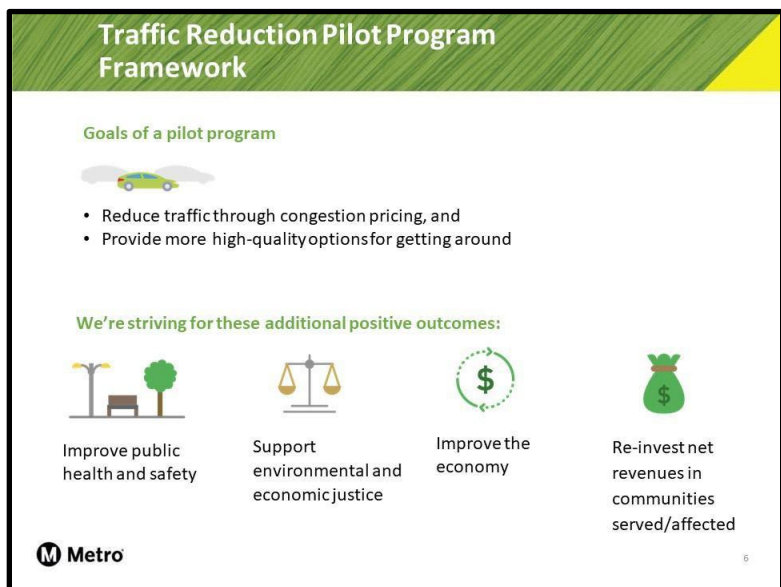
## Traffic Reduction Study: Congestion Pricing by LA Metro

Tham Nguyen, LA Metro's Office of Extraordinary Innovation

Since the beginning of 2019, Nguyen embarked on a research journey regarding to congestion pricing and other alternative methods of traffic control. "Offering additional high-quality options for people is our goal" – she said as she developed about LA Metro and its ambitions for the future; This initiative was created by vision 2028, Metro's 10-year strategic plan which began in 2018. Metro can deliver a mobility system that makes Californians' transit trips more enjoyable, regardless of destination. Mobility as a Service (MaaS) entails adopting congestion pricing, one of many strategies. Reducing the number of cars on the road will be the only way to create less traffic.

This is an image that all Californians who have driven on the freeway are familiar with. In the beginning of COVID, traffic was noticeably reduced. However, now that the economy has been partially revamped, traffic has worsened. Metro recognizes that inequity in the transportation system is prevalent and must be addressed. Those who take buses may be stuck in traffic, which is why most people do not use them. Metro has tried to improve it but cannot keep up with the pace of demand. Consequently, there are unwanted results that affect low-income populations disproportionately. Carbon emissions induce air pollution, which affects communities closer to freeways.

During the study, a pilot program that views congestion pricing as a means to manage traffic was analyzed for the LA region. A couple of the conclusions that were made were that having city partners was going to be critical for the process to be implemented as they hold the jurisdiction over roadway networks. Stakeholders play an integral role, and that is proven by the fact that the delay in the implementation is not the lack of technology or innovations, it is rather a political



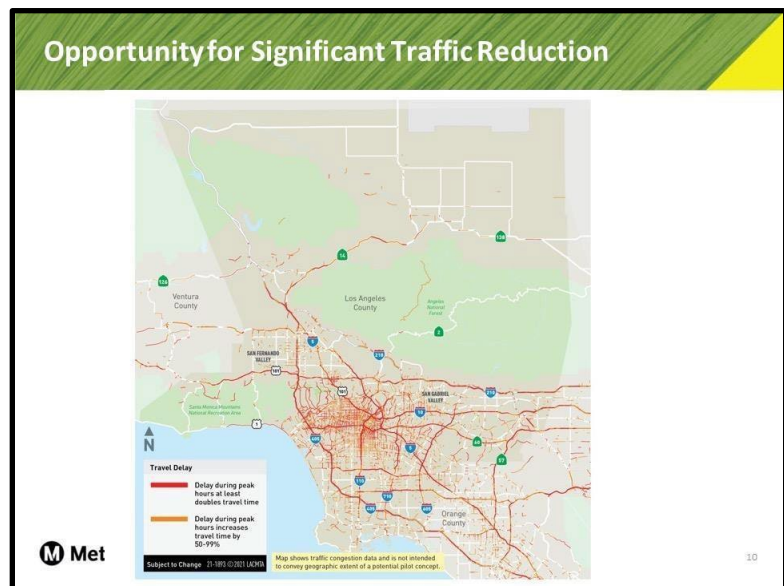
problem. The goal of the pilot program reviewed is to reduce traffic congestion by implementing congestion pricing in the county of LA. In addition, it is meant to improve public health and safety, which will simultaneously improve the environment and the economy. “We are tasked with circulating the money received from pilot programs and investing it back into the communities that participate in them”.

Identifying the who and how is key to the program’s success. It is also critical that measurements in the early phases are accurately documented. Having the ability to detect the failures is just as important as reviewing the positive benefits. LA Metro puts emphasis on development through collaboration of not just their own employees, but outside, private agencies as well. The job is not done once the pilot is launched. Constant refinement is key to higher levels of success. Increased bus and rail services and telecommuting are some of the end goals. We want to focus on safety while integrating carpool incentives. Public safety must always remain the top priority.

LA County is a huge county, which brought about some questions regarding placement of congestion pricing. LA Metro asked some very good questions. Where in the county would congestion reduction be best for a trial? We are learning from our European and Asian neighbors’ take on congestion pricing. Using natural or human made structures as boundaries is key. People should be aware of where congestion pricing is located. At the same time, avoiding neighborhoods is important.

The red you see is where the most traffic occurs. During peak hours, drivers’ trips take twice as long. There are four concepts LA Metro will be exploring. Placing appropriate pricing is another big question that needs an answer. Just as Patrick mentioned earlier, should we price all lanes or a select few (otherwise known as corridor pricing)? Cordon pricing involves charging drivers who cross a designated boundary.

Hybrid systems are an option as well. Just as Dr. Evgeny mentioned previously, London and Stockholm have implemented pricing to decrease cars on the highways. London saw a 15% to 20%



reduction in vehicle trips, Stockholm saw a 22% reduction, and the SR-520 in Seattle saw a 25% decrease in morning hours.

What does success look like and how can we measure it? The importance of answering questions like, are we improving mobility, equity, and quality with a new pilot program? We have to integrate affordability, a component of equity. We also need to evaluate if the program is cost effective. We want to create a future where people have alternatives and can avoid gridlock. Swift travel options through driving, taking transit rides, or truckers delivering goods are our main priority. Having more time to live a fulfilling life, while creating a cleaner future is our vision.

The last speaker spoke about congestion pricing in the LA area. Now the only question left to answer is, can it really work on the freeways? Interstate freeways? Gary Cohoe will speak about the I-10 and I-15 project which will be the evidence that we need to answer those questions.

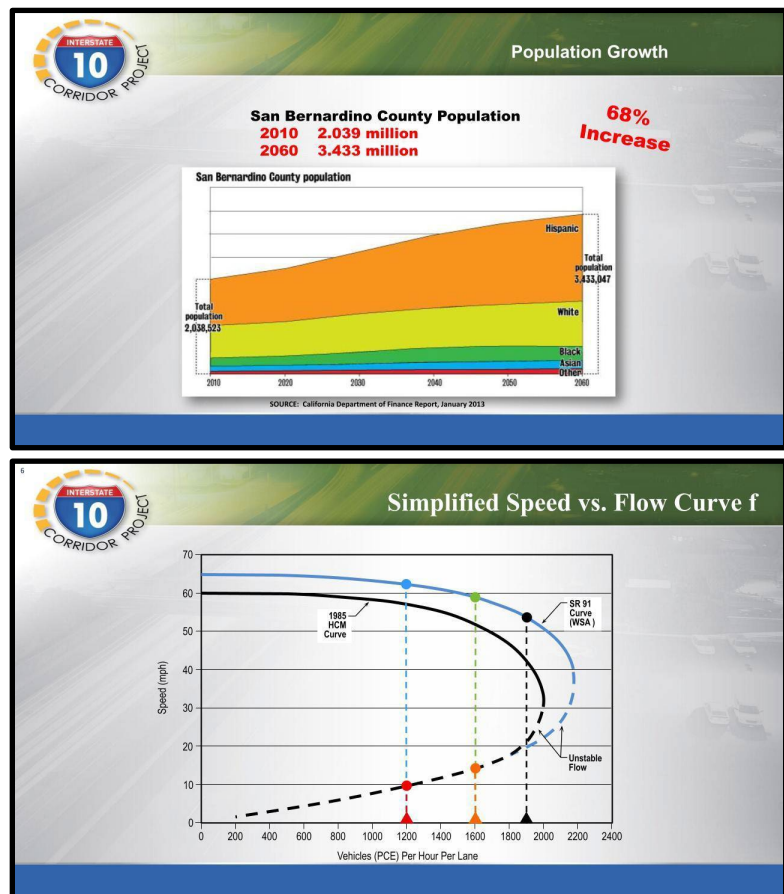
## I-10 & I-15 Corridor Congestion Projects

Gary Cohoe, Senior Vice President of Advanced Civil Technologies

San Bernardino County has an unprecedented population growth increase, 68%, by 2060. With an overwhelming number of people in the region, how can the corridor projects maximize their alternatives?

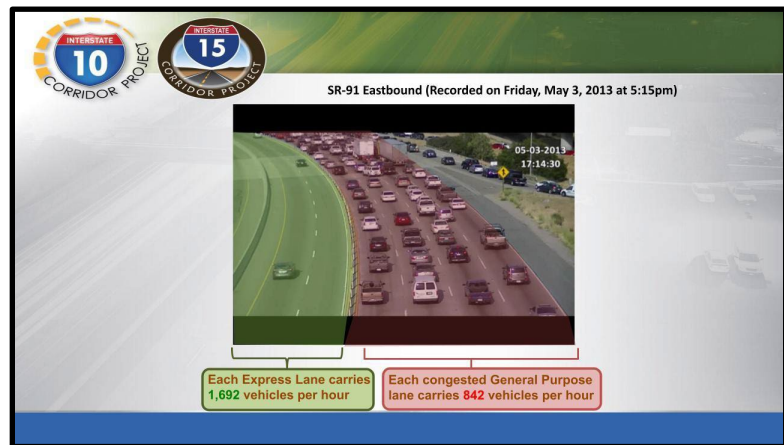
On the I-10 and I-15, we can only add two more lanes, due to the constraint of right away. The surrounding areas are commercial or residential, which minimizes available construction space. The vehicle's miles traveled is increasing faster than transportation revenues. "We can't build our way out of congestion."

We evaluated and analyzed the speed vs. flow curves in the express lanes. Once capacity is hit, which is the red line, the number of vehicles per lane starts to decline. When we showed people these graphs, most did not know how to interpret it. We would ask people to give us their thoughts on a video from the SR-91 Eastbound. The lanes to the right are overwhelmed with vehicles and the lanes on the left are underutilized. After analyzing both lanes, we found that both lanes hold approximately the same number of vehicles.



Express lanes have two main purposes. One is to manage traffic and the other is to generate revenue. It also promotes carpooling. On the I-10 Corridor, with three or more passengers, you may travel for free. We are speaking with Omnitrans, as they are considering using the express lanes for their buses, allowing them to stay on schedule through the surge of traffic. A concern about express lanes is their Lexus Lanes.” However, there are benefits to the low-income users who cannot afford the express lanes. Some studies have shown that general purpose lanes become opened up because the express lane users free up the general-purpose lanes. As Dr. Evgeny mentioned earlier, people do not want to pay twice for driving their personal vehicles.

On the left, you can see the Fast-Trak customer approval, 88%, of using and building more express lanes. On the right, approval of general-purpose lane drivers, 66%, is still very high. Even the general-purpose drivers see the benefits of higher express lane usage.

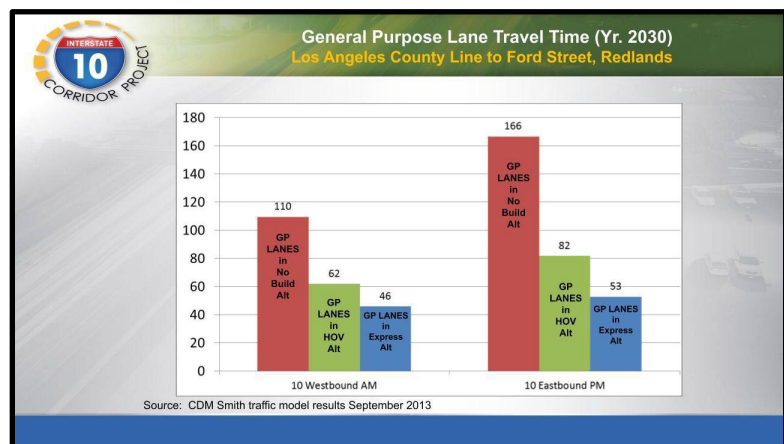


These two express lane routes in San Bernardino County have been approved through an environmental process. The I-10, which starts at the LA County line, through 4th street in Redlands, is 33 miles. That stretch of roadway costs about \$2.2 billion. The I-15 starts from the SR-60, up into Victorville, and stretches about 35 miles. This stretch of roadway costs about \$2.6 billion. There will be access every three to four miles. The express lane alternative is a focus area. Two express lanes and four general purpose lanes, or auxiliary lanes, are available on the I-10 and I-15.

This chart represents duration of travel based on direction of travel (10 Westbound and 10 Eastbound). The red bar is the general-purpose lanes. There is a significant increase between the AM (on the left) and PM (on the right). More people commute to the West during the AM, which means there are more drivers commuting during peak hours.

This is a similar study, but for Route 60 to Route 395.

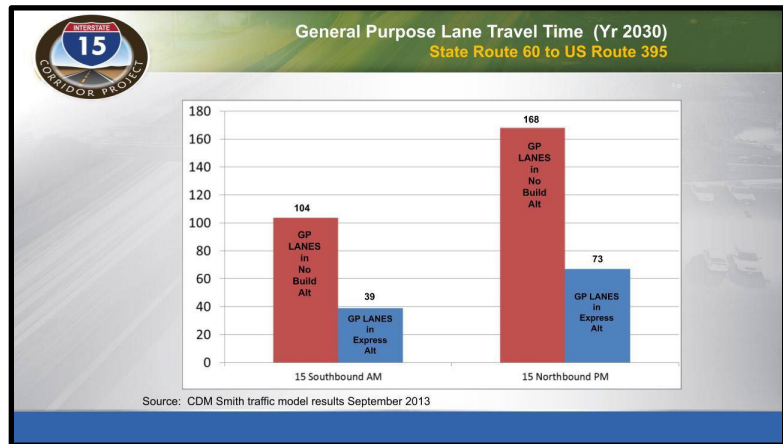
Unfortunately, there is no HOV alternative for the I-15. The average duration of commute on the



I-15 in the AM is just over an hour, while the commute in the PM is about two and a half hours, depending on the destination.

The I-10 and I-15 Corridor Projects are operated under the SCAG Regional Transportation Plan. The red lines show where the express lanes are within the region. The SR-91, I-10, and I-110 in LA County, were the first freeways to implement the express lanes in the Southern California Association of Governments.

We have now covered a section in which we spoke about infrastructure development as it relates to normal carpoolers, which essentially becomes congestion pricing. Now, in the next section we will focus on how new urban development is seen in the LA and the Inland Empire area. Some things will include how Air Mobility may be a new way to get around traffic congestion, how the Olympic Games will be handled, and the Bus Rapid Transport (BRT) project line in the Inland Empire.



# New Urbanism

Along with advancements in the aviation industry we will also see advancements taking place across urban environments with Advanced Air Mobility being of the new innovations being prototyped as a solution for extreme congestion on the roads and highways in Los Angeles and as 2028 approaches we must consider how the Olympic games will be handled in the city of LA. Finally, this section will look at how the Inland Empire aims to introduce and use Bus Rapid Transit, introducing a long-range bus travel and cutting travel time down.

## Urban Movement Labs, Advanced Air Mobility

**Clint Harper**, Advanced Air Mobility Program Manager of Urban Movement Labs.

The transportation challenge that started in 2016 was especially noticeable in the city of LA where new innovation in terms of transportation like ridesharing or electric scooters was first introduced into the market, this was a problem because now city planners had to think about transportation planning from a reactive point of view rather than a proactive one.

In response to this challenge, in 2018 the city started utilizing the mobility data specification, which is a way for the city to push and enforce digital policies around these new technologies, then, in 2019 the Urban Movement Lab was initially formed in the major's office, initially planned to become an incubator that would reach out and work with the industry, to understand how it is evolving and to work together so they can understand what are the needs and where they are struggling to keep up. In 2020 the lab separated from the major's office and became its own nonprofit organization while still keeping a partnership with the city, the reason why they did this is because they wanted to be a nexus between the industry, the government, and the community which would allow them to hear what the needs are from the government, work with businesses to meet those needs, and finally get to benefit the people.

### Why Los Angeles? - Transportation Challenges



Must Reads: Fed-up locals are setting electric scooters on fire and burying them at sea

Sorry, Single Passenger Ridesharing Trips Are Worse For the Environment: Research Paper

Carmageddon: Helicopters ease stress for LAX travelers

July 16, 2011 | 3:28 pm

### Urban Movement Labs

→ Urban Movement Labs

→ Los Angeles County.

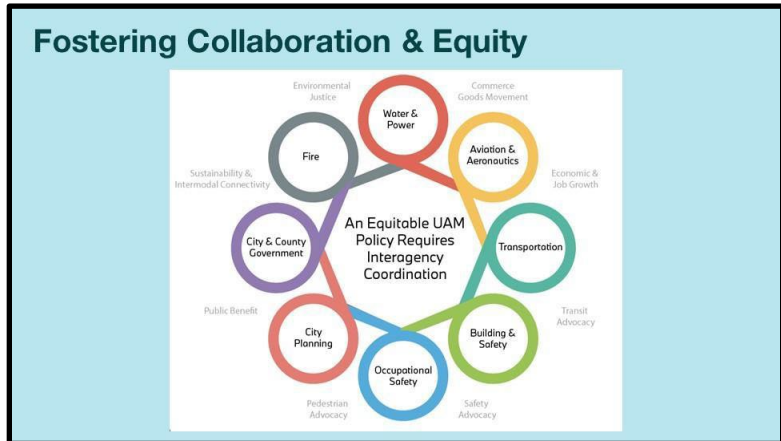
→ Community Stakeholders

→ Industry Partners



The lab currently has some major aircraft OEM partners who are manufacturing electric vertical takeoffs and landing aircraft (or technically called EV Talls for short), as well as some existing urban air mobility operators who work with helicopters too. Ultimately, these relationships allow the office lab to help people understand how the transportation industry is moving and evolving and in which ways it's likely to interact with the communities early on; the idea is to help people understand what's going on today and not get lost into the future that the media sells.

Now the goal of the partnership between the lab and LA city is really to engage and educate the community members, all by working with community groups or local transportation research institutions to create a common understanding of where mobility actually is, where the technology has taken us and where it can take us. The goal is to really engage with the communities in the region, to help them understand better the transportation industry and trends, to connect with the local government to figure out what the needs are and how to supply them, and to help industry partners supply those needs according to the demand, however, Harper acknowledged, "this can only be done through collaboration".



Harper's presentation moved on by making a comparison of different levels in which entities see transportation. Both at the federal and state level see aviation as just part of transportation but they fail to ignore really what's going to happen and how the logistics of it are going to be connected with the people. The question then becomes, "how can we best reach across all the different actors within a city to help them understand how this technology is going to intercept them and how we can provide the information that they are going to need to make informed decisions to guide the implementation of new strategies moving forward?".

Well, the answer to this question proposed by Harper's team at the lab was to develop different projects that would aim at informing the community correctly from reliable sources:

The first product that they developed was a collaboration between the World Economic Forum and the city of LA with a number of other industry partners, this lead to the creation of The Seven Principles of the Urban Sky, which was essentially a way to communicate with the related businesses as for what they should have at the top of their mind when working with the communities, so it is aimed to help them understand the issues better so they don't say "we are here to solve congestion" because they are supposed to understand that the transportation issues are much more dynamic than just all the congestion with a singular model solution. The seven principles exposed in their work to help businesses get that multi-dynamic perspective that reaches multi-dynamic solutions.

The second product released was the 2021 Urban Mobility Policy Framework of Considerations document. This document was aiming to dictate a high-level vision of transportation where the transportation planning should be done as a complement of the current infrastructure rather than a different kind of infrastructure, this one is meant not to say that the current infrastructure is perfect, however, to include the current transportation as the nexus to a more holistic solution that can be integrated in the city of Los Angeles, so, it shows how we can leverage the new aviation technology and the new vision as a part of the current transportation system. Mr. Harper spoke about the third product also made in 2021. The document Shaping Urban Air Mobility in Los Angeles through Community Engagement, which is a compilation of all the conversations had with the research institutions and the community group of the area, it talks about the community priorities and really works as a way to inform about the industry stakeholders and city planners about what the community thinks.

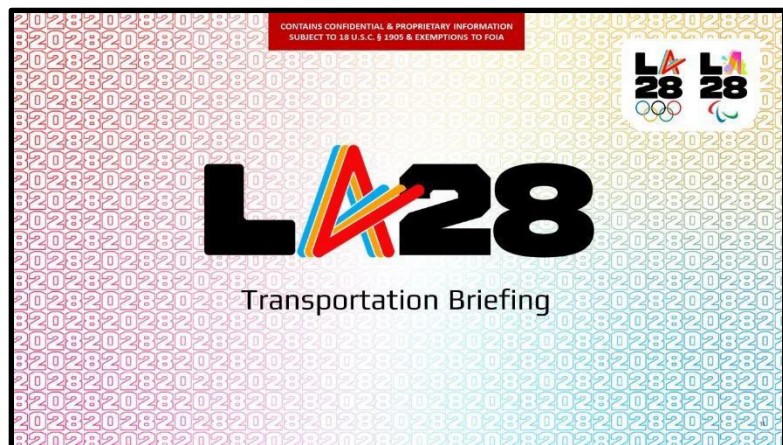


The last speaker focused on a community-centric approach to overcome the challenges faced in Urban Air Mobility (UAM) in Los Angeles. The next speaker, Sam Morrissey will focus on how the Olympic Games 2028 will be handled and how it will affect day-to-day life for the 13 days the games are present in Los Angeles.

## LA28: Transportation Briefing

Sam Morrissey, Vice President, LA28

Morrissey starts off the conversation by going over the strategy overview for the upcoming 2028 Olympics, with the mission emphasis placed on seamless transportation. A seamless transportation gives the athletes, spectators, and local people in the area less traffic congestion, less air pollution and still ensures people get to their destination at a reasonable time. The vision for seamless transportation is not only for the short-term goal of ensuring people arrive to the games on time but for the long-term goal of benefiting the region, through reducing the traffic congestion, bettering air quality and the promotion of public transformation. The guiding principles Morrissey advocates



and follows is: sustainability, legacy, equity, and innovation. There is a big gap since the last Olympics in 1984, Los Angeles port dealt with 900,000 containers, the same port in 2022 dealt with 9 million containers, this is a 100-fold increase. This 40-year difference has given new ways to approach and understand public transportation, ensuring this Olympics will not be plagued by the same congestion from the 1984 Olympics.

With something as complex as the Olympics it is no surprise that the LA28 must work with many different private and public companies to ensure the travel to and from the games is seamless and as efficient as possible. Some of these entities are the city of Los Angeles, Metrolink, Metro, Caltrans, LADOT, SCAG (Southern California Association of Governments) just to name a few. All of these organizations play a pivotal role in society, especially regarding public transportation. Morrissey explains that unlike every other country in the world when hosting the Olympics, their respective organization has the government's full backing and a blank check. In the United States it's a different story, LA28 is an independent privately funded nonprofit organization, because a nonprofit can own nothing and make nothing, they must rely on other organizations. LA28 is also working with community working groups, they are three groups with the primary goal of hiring local small business opportunity and sustainability



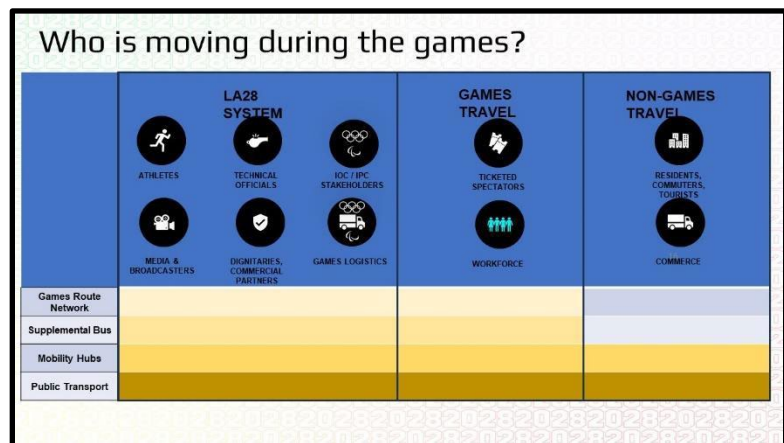
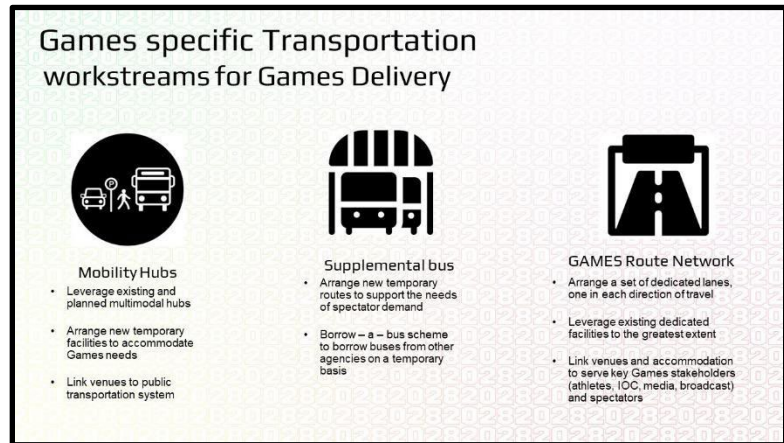
There are three major transportation goals that LA28 aims to achieve: efficient transportation, existing and enhanced public transportation, and movement. effective transportation is key and essential to moving not only spectators and fans, but the athletes, stakeholders, technical officials and organizing committees as well. Without these key personnel there to film, organize and play; there are no Olympic games. Approximately 100,000 people just need to be moved around the region for the Olympic games and about 60,000 people moved around the region for the Paralympic games. The method to move these key personnel will be a combination of buses and vehicles to move them through the different venues, training facilities, anti-doping facilities, different national Olympic organization committee homes, and supporting their friends and family through letting them move around using this system. It's estimated that of the

In the 16 days that the Olympics will occur, it's expected that transportation will need to move 500,000 people between the various venues in the region. It is estimated that there will be approximately one million boardings over the course of the games. Unlike in 1984 games, there will be no promotion of parking at the venue because of the space needed for the tents and other facilities needed and the security risk it would pose; being that there will be a large amount of people it could run the risk someone could drive into the crowd. With this in mind, there is a push

for the use of public transportation to be used over personal vehicles. The current Los Angeles County metro sees about 900,000 of boardings a day so effectively we would be doubling the amount of people on the busiest day of the Olympics, in order to mitigate the influx of people using the LA metro, more regional rails will be leveraged such as Metrolink and Amtrak. Along with taking the train and using the buses to get around, there will also be emphasis on getting people to walk and biking as well, adding another way people will be able to attend the event. The final transportation goal aimed to be achieved by LA28 is keeping freight and goods moving along with allowing LA residents to be able to move as well; in other words, ensuring the region, its residents and workers are still able to go to work and continue their day to day lives. This is aimed to be achieved by heavily relying on the public transportation sector to move commuters, tourists for the Olympic games and everyone else.

Delving into the specific transportation options that will be used by LA28 for the Olympic games, there will be three main options: Games Route Network, Supplemental Buses, and Mobility Hubs. The Games Route Network would set aside dedicated lanes, any managed or specialized lane is considered a facility and whether it is a HOV (High-Occupancy Vehicle) Lane or a carpool lane will be used as needed. This in turn will be free of traffic going to and from the games and venues. Having these lanes just specific for transportation will also provide the chance to expand the lanes.

With a major emphasis placed on the usage and the critical use of transportation the number of buses currently owned by Los Angeles will not meet that high expectation. The current number of buses operated by the LA Metro is 2500 with an additional 2500 to 3000 of buses being added to supplement the current fleet. This will be done by a borrowed bus program, this program has seen success before in the past, and would enable the large quantity of buses to be used and ready to go by the time of the Olympic games. How this system would work is different agencies from around the country lend one agency their buses, in this case the one agency is the LA Metro.



It is imperative to use any and all multimodal transportation hubs to the fullest of their abilities, with the goal of trying to move as many people in the region around to and from the games and or commuters heading to work. The benefit of having all of the transportation needs in one place cannot be understated, and to ensure that this strategy is working to its max potential, temporary facilities will be constructed to accommodate the Olympic games.

Because of the great emphasis placed on public transportation and how it will be revamped and used for the Olympics and a bigger emphasis on using mobility hubs for all transit needs in one place, it not only is a short-term impact but rather a long-term impact that will be seen far after the games are over. However not all efforts will result in a long-term impact such as the game route and supplemental buses, this is for more or less obvious reasons. Once the games are over, all dedicated lanes repurposed for the games will go back to their original purpose and intent. For the supplemental buses, they are borrowed so they would have to be given back to their respective agencies. Despite the long-term legacy of the public transit revamped and mobility hubs they still have more room to grow and expand.

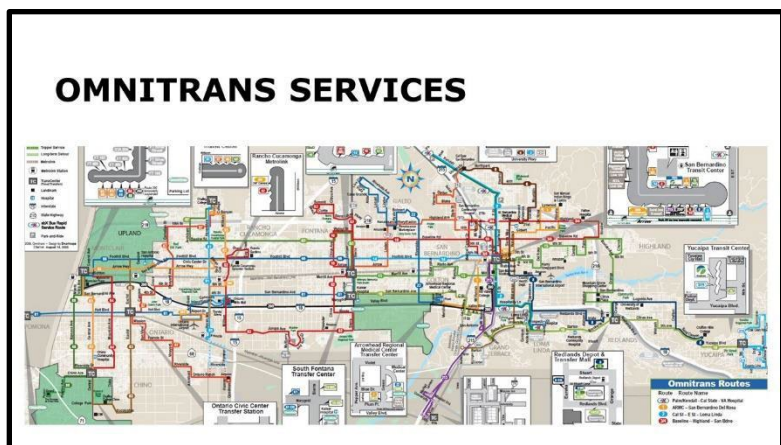
Our last speaker focused on the coming Olympic Games in 2028, giving an overview of how it will be handled and what the transportation to the games should look like, as well as providing details of what should be expected for the 13 days. The next speaker, Anna Jaiswal, will talk about the future prospects of multiple Bus Rapid Transport (BRT) and one line that will be up and running soon.

## West Valley Connector: sbX Purple Line Transit Project

**Anna Jaiswal**, Development Planning Manager, Omnitrans

Jaiswal starts off the conversation by going over what Omnitrans offers as a company. Oftentimes Omnitrans is known for their buses around San Bernardino, however they are not just limited to regular buses but instead offer a wide range of transportation options such as the BRT (Bus Rapid Transit), microtransit options, mobility services, shuttles, and paratransit that is complement with the ADA (American Disability Act).

Spanning 15 cities and the Southwest portion of San Bernardino County Omnitrans has 29 fixed routes throughout the area, with some even being express that go on the freeway. Before the pandemic Due the widespread of vehicles and unique missions each faces getting around the Inland Empire becomes easier especially with the added bonuses of stops to key essential areas, such as the airport and Metrolink station just to name a few. Across the vast stretch of area, a majority of people who ride with Omnitrans, do so for work and school reasons.



Looking closer at the ONT (Ontario International Airport), currently there are only two ways of getting to the airport with public transportation Route 61 and ONT Connect, both of these routes connect directly to terminals 2 and 4 respectively. The current average of people who ride and go to either terminal is averaged out to 91 riders on a weekday. Despite the two different public transportation options, there are plans for the near future to introduce the BRT as a quicker option for public transportation to get to and from the ONT.

### OMNITRANS SERVICES AT ONT

- Today:
  - Route 61
  - ONT Connect
  - 91 total average weekday riders at ONT terminals 2 and 4
- Future:
  - Bus Rapid Transit



Delving deeper into what makes BRT distinct compared to a traditional bus. We must understand that a traditional bus operates by stopping every quarter mile, this means it stops frequently. With more stops and people leaving or boarding it leads to longer times spent on the bus if you are traveling too somewhere far. BRT on the other hand is the opposite, it has fewer stations but because of the lack of stations with each station being half a mile to a mile away, this means the bus can rapidly move to its farther destinations without being burdened by stopping every quarter mile; on top of that it has dedicated bus lanes and traffic signal priority which add to the speed of getting to the location with being able to maneuver around traffic much easier. The time spent on the road is typically 10 to 15 minutes. With additional dedicated traffic lanes, there are also custom amenities and custom stations built for supporting and boarding.

### BUS RAPID TRANSIT SYSTEM

- 2010 System-Wide Transit Corridors Plan
  - 10-15-minute frequency service
  - Fewer stations (1/2 mi – 1 mi)
  - Dedicated bus lanes
  - Transit signal priority
  - Level boarding at stations
  - Custom amenities at stations
  - Branding

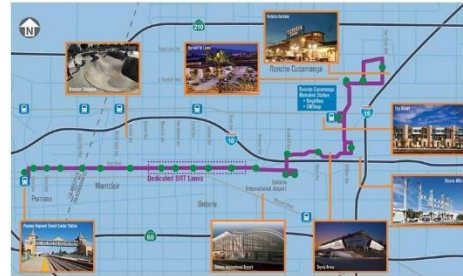


Taking a closer look into the Bus Rapid System Project, we witness the 10 planned routes that would cover a significant portion of the Inland Empire. With SBX Green Line being open since 2014 it provides access to travel by BRT from CSUSB (California State University San Bernardino) to Loma Linda. Currently the next BRT transit line is being planned with SBCTA (San Bernardino County Transportation Authority) and it is being called the West Valley Connector as it will be connecting Montclair, Ontario, Pomona, and Rancho Cucamonga. It is planned to run from Pomona Transit Center to ONT, Cucamonga multimodal HART district, Ontario Mills, Victoria Gardens, and Toyota Arena.

The West Valley Connector will run 3.5 miles with a dedicated lane throughout the whole trip. This line will have 33 stations at 22 intersections across the line it travels and 5 center median bidirectional stations. The buses themselves that will be running on this line will be a 3 door all electric bus. With this being an all-electric vehicle there is work that will need to be done to add infrastructure to support the all-electric vehicle, adding charging stations at the maintenance facility and at the end of the line in Pomona. With all being said it won't be until 2026 when this line will be fully finished, built, and open to the public

### WEST VALLEY CONNECTOR

- 19-mile corridor
- Cities of Montclair, Ontario, Pomona, Rancho Cucamonga
- OIAA, Cucamonga Station/HART District and Downtown Pomona Metrolink Station
- Ontario Mills, Victoria Gardens, Toyota Arena



Some benefits from this project are projected to be overall reduced travel time by 28% instead of using various buses to get to your location. It is expected that this new lane alone will increase ridership in the corridor by 30% and it is expected it will increase the ridership at the ONT terminals 45% in just its opening year. Some further predictions place the ridership at 79% by 2040. This BRT project is not an alone for revamping public transportation in the Inland Empire but it is in fact a part of an overall city effort to improve transit in the Inland Empire, the BRT project goes hand in hand with the HART District project which seeks to put all your transportation needs in one place and in Ontario there is efforts being made to improve housing affordability and making sure there is appropriate transit there to support the community. In summation, the overall city efforts will make transit more efficient and attractive to old and new customers all the while economically aiding the Inland Empire by providing people with a faster new way of traveling and affordability in housing.

The last section primary focused on the new Urban developments in and around airports that will affect the surrounding areas of Los Angeles and the Inland Empire areas including the introduction of BRT in the Inland Empire with several more projects being pushed to the future, the future prospects of UAM used in Los Angeles as a bypass to traffic congestion, and how the Olympic Games will affect the Los Angeles area and how it will be handled and how preparations started as early as today. The next section will focus on airports in the Inland Empire SBD and ONT, their current status in a post-pandemic world, economic developments, and embracing interesting technologies that will ease traffic in and around airports while investing in new technologies such as AV's, VTOL Aircraft and UAS Center.

# Aviation Ecosystem

The aviation industry has always played a key role in our society, not just in the city of San Bernardino but in our county as a whole, from commercial flights across the country or globe to visit or cargo flights that bring your packages from wherever to your home town. This section will explore the histories of Ontario International Airport and San Bernardino Airport, how its modern states compare, and what their respective plans of innovation are. We will also go over the up-and-coming AV market that will aid transportation at these Airports.

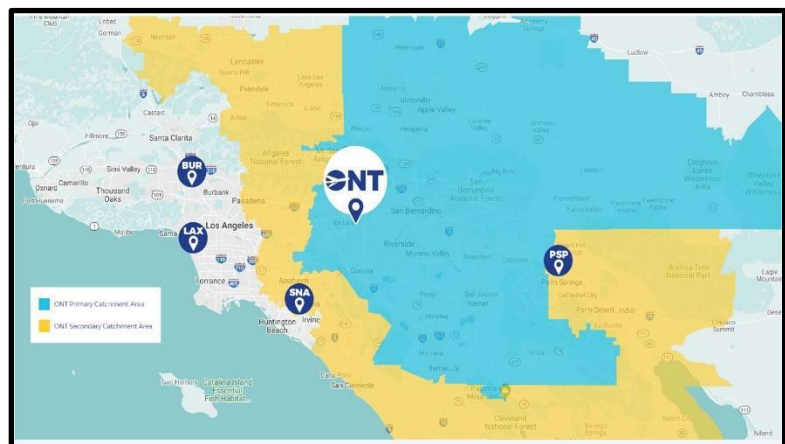
## Ontario International Airport: Post-Pandemic Overview

**Michelle Brantley**, Chief Capital Development Officer, Ontario International Airport

Brantley starts by going over the history of the OIA (Ontario International Airport), starting in 1923 when it began as an airstrip being used for military purposes at the time it was called Latimer Field. By 1949 the military strip was given to the local government and commercial flights soon took off and landed in Ontario. By 1971 1 million passengers had entered and left the OIA, an astonishing achievement however by the time of 1985, the city of Los Angeles had acquired OIA as part of incorporating other airports in the LAWA (Los Angeles World of Airports). From 1985 to 2016 Los Angeles managed OIA, however by 2007 they faced major issues brought on by the recession, and by 2016 ownership, management, and operation were transferred back to the city of Ontario, and with that was the creation of the OIAA who currently oversees and manages the airport (Ontario International Airport Authority)

ONT is primarily used by people in the San Bernardino area, the blue area represents this and it is also called Catchment Area. Cities nearest to ONT are Ontario, Riverside, and San Bernardino the three major cities located the closest. The yellow represents the secondary Catchment Area, these are second because people in the regions either have a closer and more convenient option.

ONT Is in a unique spot in downtown Los Angeles where it is in the middle of multiple major attractions and important highways. Some notable attractions are Angels Stadium, Universal Studios, Legoland, Disneyland, and various beaches just to name a few. The several major highways are Interstate 10, 15 North, 15 South, and the 57. Each of these highway lead to recreational locations such as the aforementioned locations and some lead you out of California such as the 57 which takes you directly to Las Vegas.



Switching focus onto some of the statistics ONT and how far it has grown since the pandemic, during the pandemic had lost a significant number of customers, however recently ONT has fully recovered its passengers in 2022 with there being approximately 5.7 million passengers, for reference in 2019 there was only 3% 171,000 of passengers, furthermore, in 2023 it was found that there are up 12% more passengers than 2022 with projections showing it will be well over 6 million. In 2022 ONT launched open terminals, restaurants and shops to non-travelers as well. On September 12th, 2023 Ontario won a prestigious designation as a 'great place to work' and would later on win two global marketing awards, on June 27th, 2023. ONT was also ranked high in customer satisfaction in the ranking of North American Airports. ONT is also now ranked the 7th highest growth in seat capacity in 2023. In July 2023 ONT saw the largest number of international passengers with an astonishing 43,551 people, that's about 1,405 people a day every day for the whole month of July. In October 2023, ONT saw the largest number of total passengers since the ONT was transferred from Los Angeles to the city and OIAA, with 606,497 people; that's about 19,564 people per day every day in October. A new airline started operations at ONT in November 2023, New Pacific Airways, connecting Ontario with Las Vegas, Nashville, and Reno. Some other Airline updates include Southwest Airlines launching a daily service to Houston and nonstop service to Nashville, Volar is increased service levels to 11 times a week to Guadalajara.

### ONT Stats

- ONT has fully recovered from the pandemic, with 5.7 million total passengers in 2022, 3% compared to 2019.
- Year-to-date in 2023, we are up an additional 12% compared to last year.
- Among all medium and large hub airports in the US, ONT is seeing the 7th highest growth in seat capacity in 2023, compared to 2019.
- In July 2023, we saw our largest number of international passengers in a single month in the airport's history (43,551).
- In October 2023, we saw the largest number of total passengers since the airport returned to local control (606,497).
- Recent air service updates:
  - Start-up carrier New Pacific Airways (ZH) launched its first commercial flight in July 2023, with service from ONT to Las Vegas (LAS) – additional flights to Nashville (BNA) and Reno (RNO) start in November 2023.
  - Southwest Airlines (WN) launched daily service to Houston/Hobby (HOU) in October.
  - Volaris (Y4) will increase service levels to Guadalajara (GDL) from 8-times weekly to 11-times weekly, starting in December 2023.
  - Southwest Airlines (WN) announced daily nonstop service to Nashville (BNA) effective June 2024.

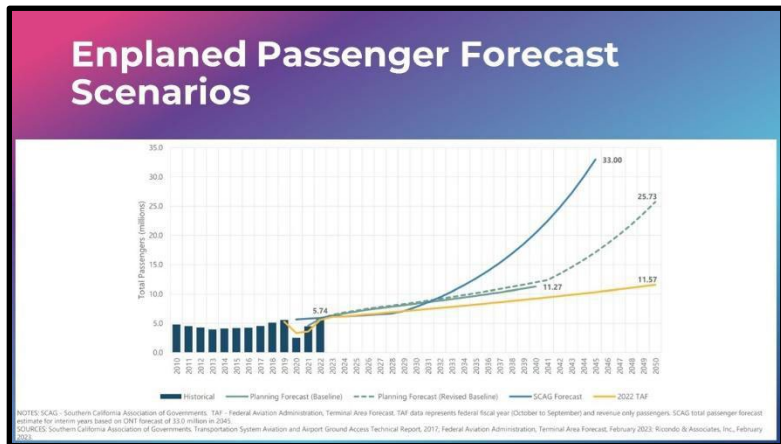
**ONTARIO**  
INTERNATIONAL AIRPORT  
Do Get. So Easy.

This slide showcases how far other airports are on a more realistic map, ONT covers a vast area where there is no other option, this gives it the bigger emphasis placed on its importance to the Inland Empire and its surrounding communities.

Prior to covid ONT saw well over 2 million people and was on track to steadily surpass that amount, in the early 2019 year saw a 6.4% in increased passengers but would soon nose dive because of the pandemic and lockdowns to 17.4% and to its lowest 32%. However out of the darkness came light and after the lowest point ONT started to grow and gain its passengers just as fast as they left. This coincided with the removal of the lockdowns, and they even gained more passengers afterwards. In 2022 they saw 91.3% increase in passengers and in 2023 an estimated 11.6% increase.



Moving onto passenger forecasts and projections, there are several because of a variety of different sources they use. One of the best projections is 35 million annual passengers in 2050 and some more conservative projections showcasing a little more than 10 or 11 million annual passengers. Currently ONT is working with partners to prepare for the increase in volume of passengers whether the future is as big as 35 million or 10 million, ONT and its partner organizations must prepare for both.



Some potential land development 15 years out is a parking structure and a central plaza area where it's easier to move vehicles, and while not shown in the picture the SBCTA tunnel would be completed at this point. Some challenges faced with land development is different regulators they must abide to, the FAA is extremely involved with the ONT revenue, CBP and TSA who are focused on safety and security, and combining all of these factors it is a balance for OIAA to figure out, if they want to expand, they must make more money and it must be extremely secure. Some minor issues faced are with international travelers who are not well accustomed with local laws, this will be especially known when the Summer Olympics come in 2028. Some other minor issues are scheduling with their benign about 4 to 5 significant peaks of being extremely busy with bustling movement all throughout the airport. This

be explained by the way flights are scheduled with each flight flying in banks. For new modes of travel such as VTOL (Vertical Take Off and Landing) it will take a longer time to implement because of the need to provide equal access to all modes of travel.

The on-ground vehicle traffic is observed to be totaled at 14,239 vehicles with the largest number of vehicles being private passengers, at 13290 vehicles counted, leaving 949 to various other vehicles. Currently most people either get dropped off in a private vehicle or drop themselves off, however there should be room to grow from mostly private to

other modes of transportation that does not involve a private vehicle. AS previously mentioned, there are prospects of developing a parking structure to hold all of the vehicles or a significant portion, this has faced some criticism because with the advent of self-driving autonomous vehicles

### Positive Growth Outlook

One of only two airports in Southern California without growth caps or operating constraints.

Geographic Area	Population (millions)					
	2019	2020	2021	2022	2050	2019 to 2050 CAGR
Riverside-San Bernardino-Ontario MSA	4,577	4,606	4,653	4,717	6,576	1.2%
Los Angeles-Long Beach MSA	14,085	14,016	13,837	13,898	14,977	0.2%
Los Angeles-Long Beach CSA	18,662	18,622	18,490	18,615	21,554	0.5%
United States	330,145	331,501	332,894	334,194	393,775	0.6%

people could send their car home. However, this would cause a lot of traffic and congestion in the streets, so leaving your vehicle to charge at the parking structure would be a better strategy. The parking structure would also allow more land development as there will be more room to expand since it will no longer be dedicated to housing vehicles horizontally.

Finally with an update on Airport Drive, this is planned to allow people who are leaving or going to the airport to immediately drive to the terminal they wish or leave. This would reduce congestion and give direct access to the terminals; construction begins in 2024 and it is projected to cost \$8 million.

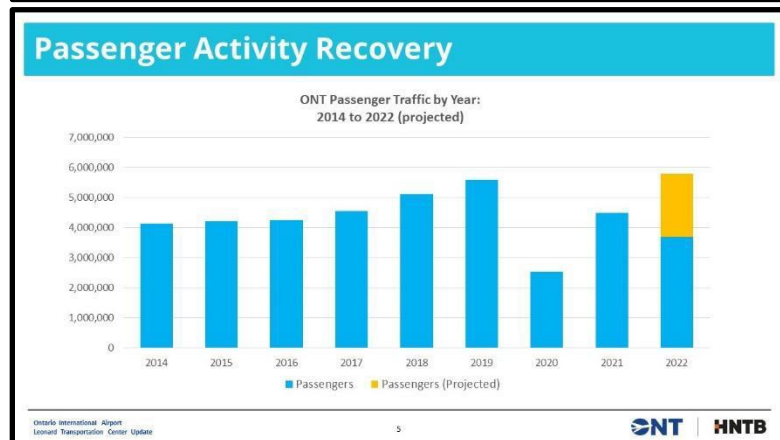
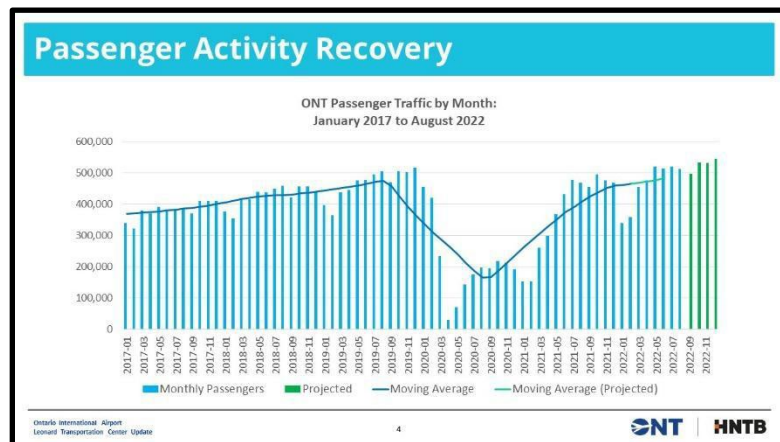
The last speaker gave a brief overview of ONT, from their history to modern day and what future plans the airport has in store and future aviation advancements taking place at the airport. Our next speaker, Justin Bychek, will be adding more information, by going over the economic development, the infrastructure development, and future developments of embracing a multi-modal hub.

## Planes, Quasi-Trains, and Automobiles

**Justin Bychek**, Vice President & Senior Project Manager at HNTB

Mr. Bychek started off his conversation by briefly going over Covid-19 and the recovery times, will go over the state of the union (signifying how Ontario Airport is doing), the opportunities and challenges ahead, and the innovation that will be brought on by a new growth that Ontario was experiencing in 2022.

“Just like everyone is aware, there was significant drop offs during the pandemic” – But really what needs to be highlighted here is that the recovery has been unexpectedly significant as well compared to years prior to the pandemic. The graph shows that prior to 2020, the airport reached its busiest with around 500,000 passengers a month, and now if we see the projected statistics for the rest of the year of 2022, the recovery didn’t only reach the previous peaks pre-pandemic, but it’s also expected to grow even higher, probably reaching nearly 550,000 passengers a month on November. It is especially

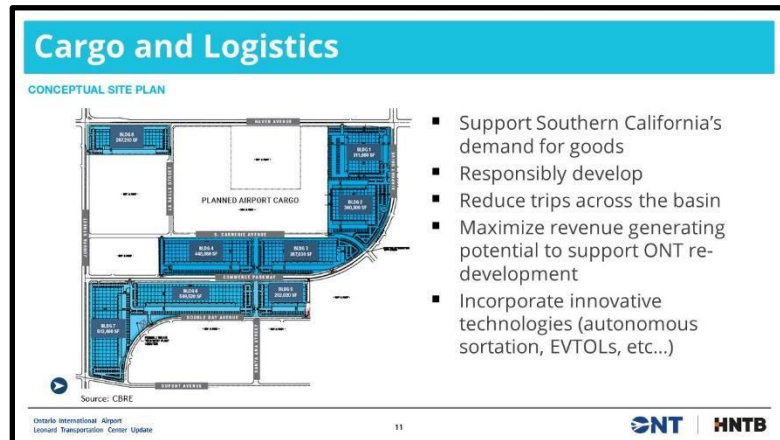
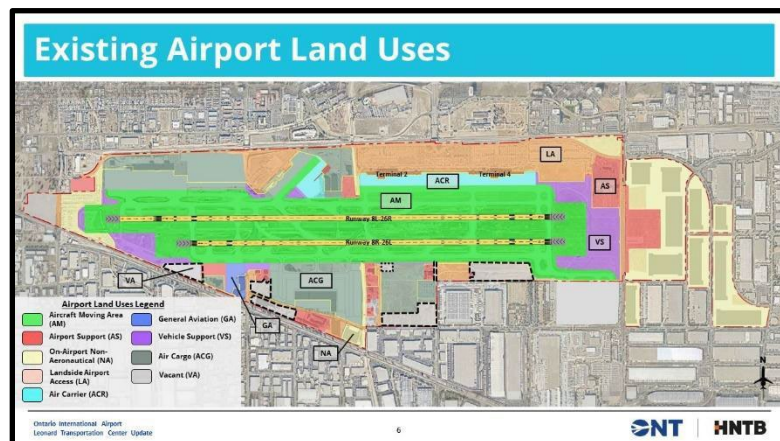


interesting because forecast media was expecting Ontario Airport to reach pre-pandemic levels by 2024, however, as clearly shown in the data, the airport is expected by the end of the fiscal year of 2022.

As it follows from the previous graph, if we analyze passenger traffic per year, we are going to find the same estimates that are expected from the monthly graph. According to this new graph, by the end of 2022, Ontario airport will have reached over pre-pandemic levels, reaching almost 6,000,000 passengers per year. “For those who have been in the airport recently probably noticed that we are busy even after the usual busy hours” Bychek said.

Another thing to talk about is the special role in e-commerce for the development of the Ontario-Rancho area during the pandemic. Another thing that is not a big secret, e-commerce had its boom during the pandemic, and the openings of thousands of square miles of warehouse space in the area made also the difference during covid for Ontario International.

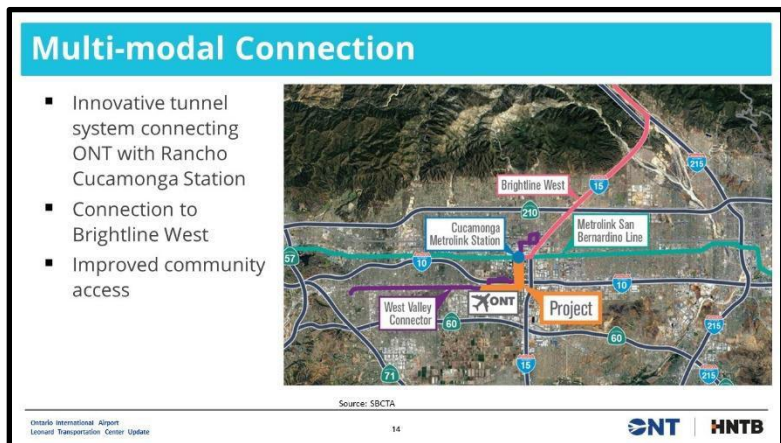
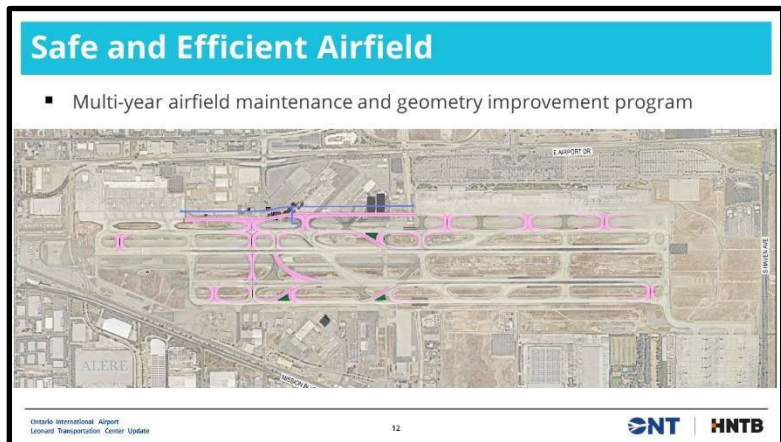
Mr. Bychek moved on with his conversation, now talking about the infrastructure development made in the last five years in Ontario Airport. He mentions that there has been a lot of interest around the airport for cargo spaces, maybe due to the development of warehousing in the region. As shown in the map, sections ACG and VA are being filled with products that arrive to those new warehouses, also, the big yellow area of NA was recently announces to become cargo as well, so now instead of having to go all the way to LAX, airplanes can just land in Ontario to have an easier access to the space made for their products in the IE region. The opportunity that Bychek highlights here is just the idea that they can take advantage of new technologies, new strategies, and primarily diversify the revenue streams that the airport gets. In the yellow section, there are specific plans to develop warehousing solutions right after flight. So, as we can see in the picture there will be a lot of space for different companies to put their products, while incorporating some of the newly developed solutions for logistics like autonomous sortation, EVTOLs, among others. This project will then help SoCal’s demand for goods movement and maximize the revenue to support the redevelopment of Ontario Airport.



Bychek says that as many as there are opportunities, there are also challenges. Since cargo and logistics is an opportunity that they are taking advantage of, the responsibility is to then ensure that this doesn't affect the quality of the air service that is provided, and that it is not going to create air traffic, so he highlights managing the airfield as one of those important priorities, and to ensure this they will have the Multi-year airfield maintenance and geometry program, in which is sort of a new way of imagining the airfield which will allow for more efficiency in landing aircrafts, as shown in the picture, there are new roadways that are going to be built, some modified in order to make landing more time efficient compared to the current airfield design. There are also challenges in the competition for accessing public funding, which then goes along with improving the facilities like building and reconstructing pavement or implementing the new technologies mentioned.

Finally, Bychek finished his presentation by introducing some of the infrastructure development projects outside of the airport, which include things like the West Valley Connector, the Metrolink San Bernardino Line, and the Brightline West mentioned in the other conversation. The idea is to create a tunnel connecting ONT with the Rancho Cucamonga Station which will allow Ontario Airport to be that transportation nexus for the future events that were also mentioned in previous conversations. The introduction of AVs in this project is considered together with different innovative ideas which aim at reducing the carbon footprint, HNTB is taking leadership for the project.

The last speaker added more information regarding ONT including but not limited to embracing a multi-modal hub to infrastructure development and trying to find a balance between cargo and passenger air quality. Our next speaker, Michael Allawos, will go over San Bernardino International Airport (SBD) what services they offer, they're robust Maintenance, Repair and Overhaul (MRO), an Unmanned Aircraft Systems (UAS) Center and sustainability being at the forefront at SBD



## San Bernardino Airport: Post-Pandemic Overview

**Michael Allawos**, Management Consultant, San Bernardino International Airport Authority

Allawos starts the conversation off by introducing the new domestic airline San Bernardino International Airport (SBD) serves, Breeze Airways. The airline offers an affordable fare, with some of the most state-of-the-art technology. The airplane flown is the Embraer E195 aircraft with 118 seats, of which 22 have extra legroom. The flights offered are only to San Francisco and Provo Utah. SBD offers a \$5 parking fee a day which encourages all travelers to use the parking spaces as they please.

The SBD website went through a major overhaul, reorganizing the user interface with a passenger in mind. Things like booking a flight, reserving a car rental, and travel tips cannot be easily accessed through the home page.

While offering a domestic service there are also other brands that fly as well, most popularly the cargo brands such as: UPS, FedEx and Amazon Air. UPS has been a customer since 2018 and employs well over 400 staff during some holidays and it has 5 flights per flight. The planes flown are B747-400, B747-200, and B767-300. FedEx has also been a customer at the airport since 2018 and employs well over 100 staff members depending on the holiday season. FedEx sees less flights between the three at 1 flight per day, and the plane flown is one B757-200. While FedEx has the least in terms of staff, flights, and aircraft used but it still has room to grow. Finally, Amazon Air became a customer in 2021 and flies the most per day out of all three by flying 9 daily flights. Amazon has a facility in the Airport to process cargo, providing the region with 2,100 jobs and the facility itself is very large, being 658,000 sq/ft. Amazon has 14 aircraft used at the airport.

### Growth of Air Cargo at SBD

UPS	FedEx	Amazon Air
 <ul style="list-style-type: none"> <li>Airport Customer since 2018</li> <li>Employs 400+ staff at peak holiday season</li> <li>5 flights per day - B747-400, B747-200, B767-300</li> </ul>	 <ul style="list-style-type: none"> <li>Airport Customer since 2018</li> <li>Employs 100+ staff at peak holiday season</li> <li>1 flight per day</li> <li>B757-200</li> <li>Room for expansion</li> </ul>	 <ul style="list-style-type: none"> <li>Began operations in 2021</li> <li>Currently nine-daily flights</li> <li>Over 2,100 new jobs to-date</li> <li>658,000 sqft air cargo facility</li> <li>14 aircraft parking positions</li> </ul>

San Bernardino Airport is ranked in the top 20 airports in the US for cargo.

### MROs at SBD Maintenance Repair and Overhaul



**AeroPro LLC**

- Aircraft paint, interior and medication center

**Certified Aviation Services**

- Maintenance, modifications, installations, component overhaul, as well as heavy recovery and repairs

**Executive Jet Maintenance**

- Heavy maintenance, airframe repair, and avionics repair

**Unical MRO**

- Aircraft parking and storage, off-wing engine storage, aircraft maintenance, spare parts, and end-of-life solutions

Currently SBD is still involved with MRO (Maintenance Repair and Overhaul) boosting several fields dedicated to MR: AeroPro LLC, Certified Aviation Services, Executive Jet Maintenance,

and Unical MRO. AeroPro LLC is focused on the paint side of things, from interior to exterior it is all about the upkeep and maintenance of paint. Certified Aviation Services focuses on overhaul and repairs, whether it is updating the internal technology, adding new seats or some heavy repairs. Executive Jet Maintenance focuses on the frame and avionics repair side of the aircraft. Finally, Unical MRO which is focused on aircraft maintenance, end-of-life solutions, and the parking, storage of aircraft, and deals with dismantling, repurposing, and or selling of older aircraft.

Amazon owning a facility at SBD not only provides a faster way to receive your packages, but Amazon also brings a lot of sustainability to SBD which is unsurprising since Amazon is globally the sustainable leader boosting. Boosting 5.6 megawatts generated by solar power, it gives power to its all-electric fleet of vehicles: Cargo loaders, Push-back tugs, Baggage tugs, belt loaders, forklifts, and ground power units. Some initiatives taken by Amazon have led to better use and or efficient use; such as water-efficient landscaping has led to efficient use of irrigation, toilets, and faucets. Amazon has also maximized its trees providing a cooler area in the parking lot and has even repurposed some construction to reduce land waste by 75%. Adding onto the sustainable elements any paints Amazon uses are environmentally friendly.

SBD Executive terminal otherwise known as Luxivair is committed to reducing emissions all the while providing guests with a five-star experience. This is not a new trend as this joins an impressive line of alternative fuel vehicles and other green technologies that meet the SCAQM (South Coast Air Quality Management) strict guidelines.

SBD has made it its mission to reduce greenhouse gas emissions, the project is called Green Energy Element; the project aims to achieve this goal by developing and implementing greenhouse reduction measures. One of the many projects that encompass this major push for greenhouse reduction is solar planning. By repurposing the slopes of the capped landfill for solar arrays and

with battery storage of 3 megawatts, some future aspects are to expand this to an additional 9 megawatts, however, currently, this is in the planning and development stage.

There are major incentives to providing hydrogen so SBD is now head of a multilayered and multi-partner Green Hydrogen production cluster, this means SBD will start to produce hydrogen on-site and can be distributed locally whether it is used around the airport around pipes or distributed to key locations such as intermodal which is less than 5 miles away or the Edison power plant which is less than a mile away. Hydrogen is extremely versatile and is 2 and a half times the energy density of natural gas providing more energy. There are also advancements in using hydrogen as a fuel for helicopters however it will not be until 2030 when we will be seeing these types of helicopters. There is also a push from the federal government to have 6 to 8 hubs that produce



hydrogen, which they want to produce 100 tons per day. Such a large project cannot be completed at just one facility but multiple to achieve this goal.

The Southern California “Make Ready” program will provide more EV (Electrical Vehicle) charging stations around the airport and this will reduce carbon emissions over a ten-year period by 10 million kilograms. Currently, in the planning phase, but will soon break ground and two sites will be ready by the end of the year.

Still on the topic of charging there is also interest in creating a fast-charging station under the “Charge Transport” program. The types of charging stations would be 8 DCFC (Direct-Current Fast Charging) stations, 4 to be used by Uber and or Lyft and the other 4 to be used internally by SBD’s fleet of on-ground support vehicles. Currently, this is in the planning and development phases. Currently, the EV fleet of vehicles consists of two all-electric vehicles, while not a lot there are aspirations to convert 76 vehicles into EVs.

SBD also offers a UAS (Unmanned Aircraft Systems) Center to train people on how to fly drones and to get certified. SBD UAS Center has been the site of many different organizations testing their technologies there, such as Caltech. Currently, the Center supports economic, workforce, and educational developments. For available services the Center offers Drone

Policy and Integration Services, UAS-Specific Export Strategy and Compliance Advisory Services, Test Flight, and Product Demonstration Facilities, and Drone Pilot Training.

The current requirements for becoming a certified UAS Pilot are to be at least 16 years old, be able to read, write, and understand English, be in physical and mental condition to fly a drone, pass a background check, and pass the FAA (Federal Aviation Administration) Part 107 exam.

The UAS Center prepares any person qualified for the certification to undergo the Part 107 test: step 1 is test prep, step 2 is ground school where you learn the basics and become accustomed to your drone, and finally step 3 where you engage in advanced skill training. It is worth noting that passing the test and obtaining the certification not only allows you to operate drones but also to operate aircraft, however, you will still be required to go to ground school and learn how to operate your airframe.

The last speaker gave an overview of SBD and what the airport offers. Our next speaker, Ian Chourdri, will go over Autonomous Vehicles (AV) and how this emerging technology can be integrated into airports.



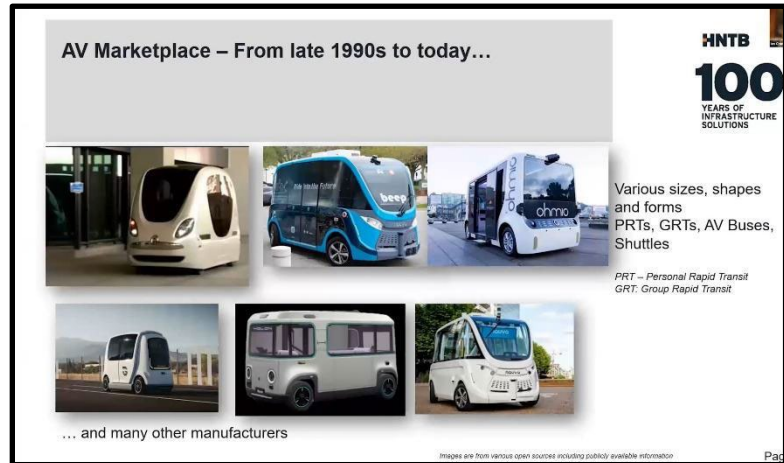
# Transforming Communities Through Cleaner and Sustainable Transportation

Ian Choudri, Senior Vice President, HNTB

Choudri starts off the conversation by explaining the Autonomous Vehicle (AV) market from today to when it started. From humble beginnings in 1999, where it was deployed in Masdar City in the region of Abu Dhabi, where it was completely autonomous and automatically guided. Since then, AV's have evolved into different sizes and shapes, there is not one universally accepted design but instead many unique accepted

designs and many different manufacturers who build and create AVs. Furthermore AVs also formed into distinct groups Personal Rapid Transit (PRT) which can carry up to four to eight people, Group Rapid Transit (GRT) which can carry 12 to 20 people depending on the configuration of the AV and might be able to carry more, AV buses, and shuttles all both of which are being deployed in Western Europe and the United States in places like college campuses, big convention centers, airports, and is being considered for the first mile and solutions; to integrate its abilities to a larger transit and rail network.

Some reasons AVs are considered transformative are because of the wide benefits they offer, such as reducing infrastructure cost because they do not use traditional infrastructure solutions. Quicker deployment compared to traditional means of public transportation. The accessibility and reliability of AVs are better suited for communities. All electric vehicles are much cleaner and have high frequency transportation. The timing of when this can be used comes in two formats on demand to be called on the spot and or a more traditional scheduled time. AV's have an overall reduced maintenance and operational cost because of smaller size. Due to this being an emerging technology it provides new opportunities in the workforce.

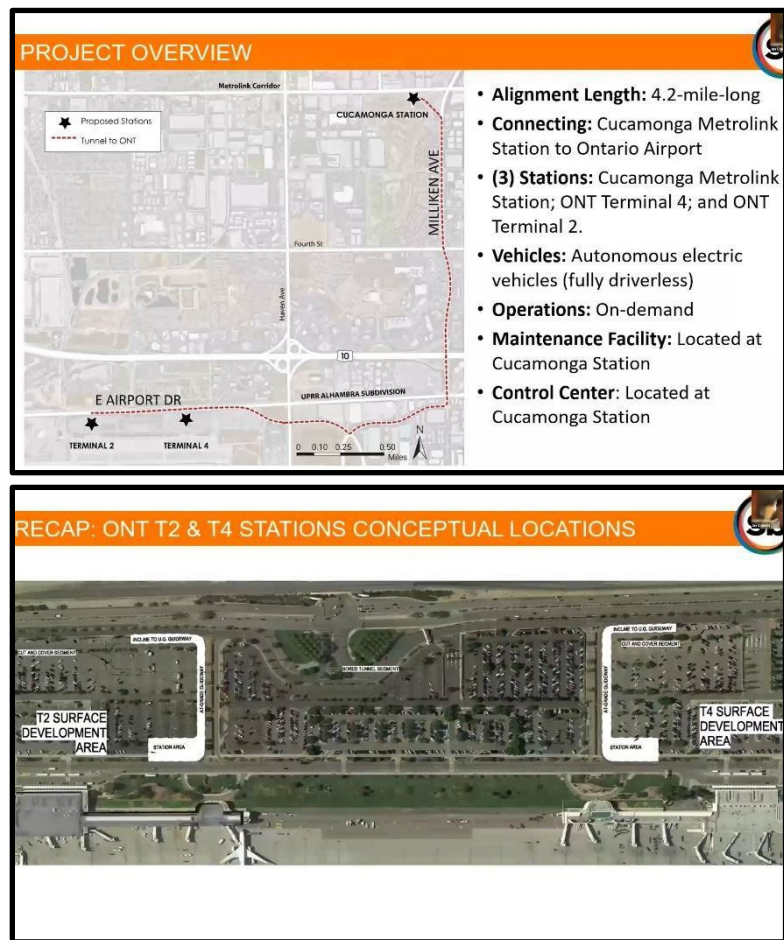


Some places where this system can be best used and follows the

location criteria are the connector between Rancho Cucamonga Station and Ontario International Airport Authority (OIAA); this would be in partnership between several key major players in the region, San Bernardino County Transportation Authority SBCTA, Omnitrans, Federal Transit Administration (FTA), the cities of Rancho Cucamonga and Ontario, and OIAA. Another place where this system can be used is in the city of San Jose, between the San Jose Airport and the Diridon Train Station.

The regional map displays where the project is located and emphasizes what modes of transportation are currently available in the area and what future transportation modes will be coming to the area. The Metrolink Cucamonga station has been there the longest, the next planned station to be added in Cucamonga is the Brightline West high-speed rail to Las Vegas, this is planned to be open in 2028. Another project currently being worked on is the West Valley Connector, which is overseen and implemented by SBCTA. The main project to focus on that is currently under development, is the connector that bridges the gap between Rancho Cucamonga International Airport and the Rancho Cucamonga station.

Looking at the overview of the Rancho connector, the length the connector will span is roughly 4.2 miles long, with three planned stations located on the planned connector: Cucamonga station, Ontario International Airport (ONT) Terminal 2 and ONT Terminal 4. The control center and maintenance facility will both be located in the Cucamonga Station. The vehicles operating here will be fully autonomous and driverless; they will also be operated as an on-demand service. The current status of the Rancho connector is currently ongoing, with the environmental clearance and technology providers pre-qualification are all in process of getting approved. Close coordination with critical stakeholders in the project to ensure problems arise and those that arise, are quickly resolved. With all that being said it is estimated that the completion of this project will take 60 to 64 months which translates into five years and or five years and four months.



# Conclusion

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Since this CC rather than having opinions had more of a set of informational dialogues perhaps all we can conclude is that we are going through a change; from airports changing their business structure, and thus giving more priority to logistics development, to counties planning their freeways with congestion pricing in mind to control the flow of traffic in the region.

The following are the main three takeaways of this Contemporary Conversation:

## **1. Congestion pricing can be the solution**

Congestion pricing will give a way for governments to control the flow of traffic by supply and demand, this can be a solution for the reason that it can bring revenue to the cities, as well as it can incentivize people to stay where they are for longer or shorter periods, which will eventually end up ending traffic for good in the SoCal region.

## **2. Commuter patterns will change in different ways**

The current developments in infrastructure (or at least the ones presented in this CC) suggest that there will be two ways in which the commuter patterns will change. The first one is that people are finally going to start using the car less and public transport more in some areas of the Inland Empire, this is good because it will reduce congestion in freeways and also lower gas usage in general for the whole region. The second change is the times in which commuters will choose to use their cars, now because of tolling and supply and demand, people will choose to either stay longer or leave before to avoid traffic.

## **3. Infrastructure development in airports is shifting its focus to diversify their revenue streams**

From the dialogue on the aviation ecosystem, we can conclude that airports during COVID-19 found the opportunity to follow the trend of the whole IE region and start using their facilities for more logistics purposes than moving people. Warehousing is a big and growing industry that is settling in the Inland Empire, for this reason, the local airports are starting to serve as logistic nodes for bringing and sending goods around the country to and from those warehouses.



**About Leonard Transportation Center**

*The Leonard Transportation Center (LTC) at California State University, San Bernardino opened in 2006 with a focus on regional transportation needs. The vision of Bill and Barbara Leonard was to create a center that focuses on the unique transportation opportunities and challenges the Inland Empire faces. Today, the LTC is working to expand its research and student engagement programs. Focal points include transportation management and governance issues, development of new technologies, and transnational studies. Their vision is to work collaboratively to seek solutions to assist residents, businesses, government and nonprofit agencies, and international partners to work together on improving sustainability and quality of life in the Inland Empire. For more information, visit*

**About HNTB**

*HNTB Corporation is an employee-owned infrastructure solutions firm serving public and private owners and contractors. HNTB's work in California dates back to its founding in 1914. Today, HNTB continues to grow in size and service offerings to clients in California from seven office locations, currently employing more than 350 full-time professionals. With more than a century of service, HNTB understands the life cycle of infrastructure and addresses clients' most complex technical, financial and operational challenges. Professionals nationwide deliver a full range of infrastructure-related services, including award-winning planning, design, program management and construction management. For more information, visit [www.hntb.com](http://www.hntb.com)*

**About San Bernardino International Airport**

*Conveniently located in the heart of the Inland Empire, close to major freeways and just 60 miles from Los Angeles, San Bernardino (SBD) International Airport is strategically positioned to meet growing aviation activity, including cargo, business aviation, general aviation, and commercial airlines by providing competitive rates for aviation companies and local businesses looking to stretch their wings and expand their horizons. With extensive stretches of pristine runway and acres of prime land available for aviation development, SBD International Airport is ready to help our community and region reach new destinations.*

**About San Bernardino Valley College**

*San Bernardino Valley College will become the college of choice for students in the Inland Empire and will be regarded as the alma mater of successful, lifelong learners. We will build our reputation on the quality of our programs and services and on the safety, comfort, and beauty of our campus. We will hold both our students and ourselves to high standards of achievement and will expect all members of the college community to function as informed, responsible, and active members of society. For more information, visit [www.valleycollege](http://www.valleycollege)*



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