

Coachella Valley Regional Mobility Dialogue Series

Results and Summary



The Future
Intersection of
Technology and
Transportation Jobs

May 21, 2019

Introduction

Modern transportation is currently facing major changes and breakthroughs thanks to transformative technologies. According to the U.S. Department of Transportation, the transportation industry is projected to add a net total of 417,000 jobs nationwide by 2022 as a result of industry growth. With this projected growth in transportation jobs, how do we best prepare the workforce in our region to be successful and support the transportation industry needs? For this Dialogue, regional expert speakers discussed important issues pertaining to the future workforce space, as well as the emerging technologies, such as, automation as it pertains to the transportation industry. Presentations were given by:

- **Eric Cowle**, Transportation Program Manager, CVAG
- **Christopher Gray**, Director of Transportation, WRCOG
- **Shari McMahan**, Provost and Vice President for Academic Affairs, CSUSB

The main takeaways from this Dialogue found that as technologies advance, there needs to be a strong focus on preparing students with the right skills, either technical and/or soft, for future employment. Currently, there are more cross-disciplined jobs that require people to have a larger spectrum of knowledge as compared to previously. One crucial area is cybersecurity, where there is an increasing demand to keep our systems and data safeguarded from breaches and intrusions. Lastly, we looked at the role of California State University, San Bernardino, Palm Desert Campus in the Coachella Valley and how it can help to respond to regional needs.

Eric Cowle – Transportation Program Manager, Coachella Valley Association of Governments

Technology has rapidly changed over the last 35 years. “This has got to be the most exciting time to be in our field because it is changing so fast,” said Cowle. Coming from an engineering background, Cowle explained how the engineering field was based in either design or construction. As opposed to today, engineering is a more diverse, interdisciplinary field. In some aspects, things have not changed, but there are many areas that have changed drastically.

The bricks and mortar are still bridges, pavement and asset management. These have not changed. It used to be that engineers and planners worked together to ensure a level of service in the transportation infrastructure. The question was almost always, do we widen? As indicated by Cowle, “that’s what engineers were doing, they weren’t planning. They were just widening everything as soon as money became available.” Now, everything has changed and what worked years ago, may not be applicable today. Funding is no longer based in the level of service. This is partly because source of revenues has changed. Governments cannot rely upon gas tax as more vehicles are now powered by electricity. Cities are now monitoring Vehicle Miles Traveled (VMT). The technology is

TRANSPORTATION, ENGINEERS AND EMPLOYMENT

Transportation: What hasn't changed?

- Pavement, Bridges – Construction
- Asset Management

What has changed?

- **EVERYTHING ELSE**

time for **CHANGE**

advancing, which is modifying funding streams, and thereby, policies. Two big changes we notice are the electrification of vehicles and the implementation of the Internet of Things (IoT). In IoT, everything is moving towards connectivity, smart lighting, smart watering, and smart parking. “You name it, if there is infrastructure you can make it smart by connecting it to everything else, and largely that is being done through transportation,” said Cowle.

Intelligent Transportation Systems (ITS) monitor traffic using video cameras and sensors that track the flow continuously, as well as origin-destination studies. “If there is an event in town, we can see who is going to it, where they are traveling from, when they are leaving. It is just a different world that didn’t even exist ten years ago,” said Cowle.

Vehicles can communicate with each other and with the infrastructure. This occurrence is known as vehicle-to-vehicle (V2V) communication. This has led to commodities such as broadband internet access to be a part of the transportation network. Broadband is a necessary component in the smart infrastructure as vehicles connect to other vehicles and to the infrastructure. In addition, Mobility as a Service (MaaS) is becoming more and more prevalent as people discontinue vehicle ownership. The services offered by transportation network companies (TNC) such as Uber and Lyft are helping to move this idea forward. There has also been a shift in focus from automobile-centric infrastructure planning, to transportation planning that includes pedestrians and bicyclists. We are seeing infrastructure being retrofitted to accommodate this shift to make it safer and more enjoyable for all.

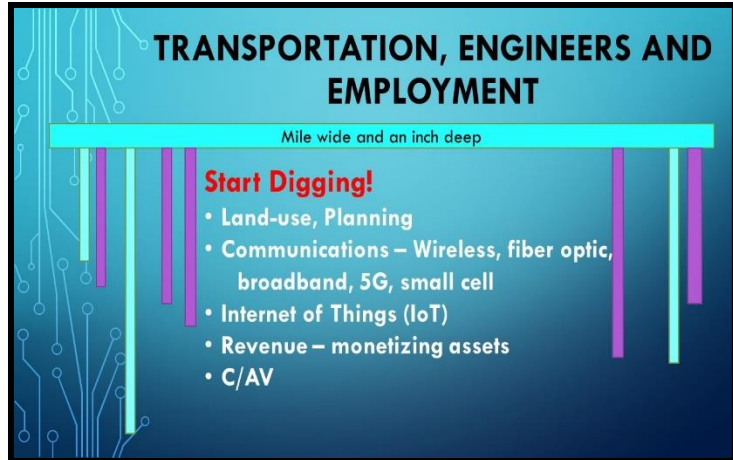
As for the workforce, there has been a shift in employment. Cowle stated that, “we already have two cities that don’t have a Professional Engineer (PE) in charge of Public Works. This didn’t exist 30 years ago, that didn’t exist 20 years ago.” Everything is moving towards the use of consultants. This is primarily because, “it has become too technologically advanced to keep on board a full-time equivalent staff, and pay all their benefits. Also, it has become too technical for cities to keep the necessary staff,” said Cowle.

TRANSPORTATION, ENGINEERS AND EMPLOYMENT

- Coachella Valley
- Cities w/o a PE for Public Works
- No City with an in-house traffic specialist
- Signal Synchronization Project

This is the same for counties and the State of California (Caltrans). Most agencies now rely on consultants for transportation engineering projects. Cowle continued, “The public sector is an open book, because even though, the push is towards not having Professional Engineers, you had better understand the engineering, and you had better understand how things work together in systems.”

“When I graduated we were taught to be a mile wide and an inch deep,” said Cowle. Universities will need to have a better understanding of land use and planning that incorporate aspects of both civil engineering and transportation. In addition, the technology aspects need to be integrated into the system as broadband, 5G, fiber optics and IoT become more integral to the functioning of the transportation infrastructure.



As an example of the transportation infrastructure development In the Coachella Valley, CVAG is implementing a Signal Synchronization Project to optimize traffic flow with synchronized traffic signals. This lays the groundwork for smart cities and allows for better planning, measuring, and tracking tools.

Lastly, Cowle noted that society needs to prepare for the use of drones not only for carrying packages, but for transporting people. We need to prepare the infrastructure for this transition to new modes of travel.

Christopher Gray – Director of Planning and Transportation, Western Riverside Council of Governments (WRCOG)

Christopher Gray continued the conversation with focus on the changing dynamics of jobs in the transportation industry. “According to our researchers, about 60% or 70% of the jobs are probably going to go away in their current form,” said Gray. The majority of these jobs are warehousing and manufacturing positions. This can certainly be a bad thing for employees that hold those jobs but simultaneously, this is a great thing as there is quite a bit of opportunities emerging. Automation and new technologies are changing the industry and how manufacturing works. There is a decrease in demand for humans and an increase in demand for productivity, and this is where automation comes in. Automation is now becoming part of service jobs as seen in call centers and fast food; where you cannot differentiate between talking to a person on the line or a computer. Repetitive jobs are being replaced by robots or computers, whereas jobs that require a heavier level of creativity and communication with people are less likely to be automated.

The use of automation can help augment humans in certain jobs. An example from the transportation construction sector is the “cobot”. This machine is operated under the direction of a human to jack hammer cement slabs. This work decreases the number of people working on the job, but increases the efficiencies for the project.



Another example of using automation is found in the new technologies that are bringing about autonomous vehicles. WRCOG staff had the opportunity to visit the Toyota automation campus and see the engineers teaching one of their vehicles to back up. It was not being programmed, it was being taught. The artificial intelligence (AI) in the vehicle was learning to back up and at the end of two weeks, it had it mastered.

This brings us to a very crucial point, cybersecurity in transportation. We will have to have a substantial amount of cross training in different disciplines. For example, engineers will have to have an understanding of information technology systems (ITS), as well as cybersecurity and communications. For instance, hackers have been known to attack roadside signs, mainly because they are an easy target. Many agencies do not change the locks or simply use the default credentials for these signs. Hackers can then change the password and lock out the agencies.

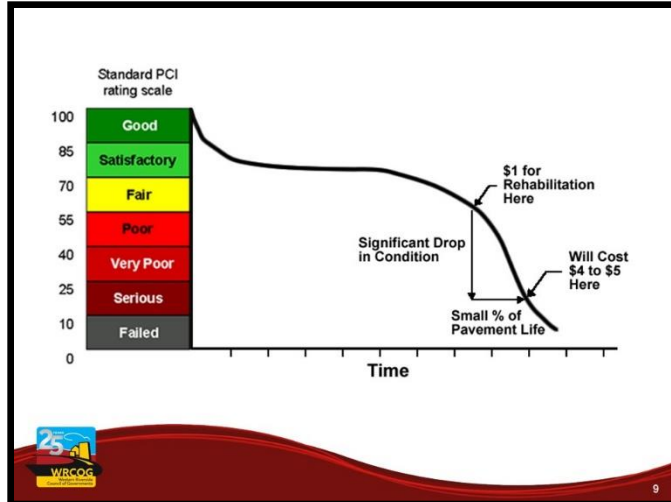


Another example can be found in the City of Banning. This city fell victim to a ransomware attack when an employee opened an email that contained a virus. As a result, Banning had to shut down its computer system for a month. The State of Colorado was also a victim of a breach and the DMV had to resort to issuing paper licenses. Other government agencies that have been hacked recently include the Orange County Transportation Agency, Imperial County, and the City of Atlanta.

Gray stated that one of the efforts by the WRCOG to help combat the possible attacks has been a partnership with the Leonard Transportation Center to review of the current condition of transportation cybersecurity in the Western Riverside region. A case in point is that cybersecurity is a big challenge in the private sector as well, with banks being an important example. Banks spend a tremendous amount of money on cybersecurity prevention and they still get hacked. As compared to the transportation and government arena where cybersecurity spending is not remotely as close to that of financial institutions. Gray urged that it is only a matter of time before our systems are hacked and we must keep security in mind.

Shifting to infrastructure, many cities do not have adequate funds to make the necessary repairs to their infrastructure. This ends up making the costs go up exponentially.

“What we see happening over the next 20 years, is cities are going to be forced to maintain the roads they have. What this all means is that there many people right now with low skills and low tech jobs are probably going to get replaced. They are going to get augmented. They are going to get supplemented by technology,” stated Gray. But for those who are smart, and can communicate well with others, or if they have specific skills such as that in cybersecurity, they will be in demand. There will be quite a different skill set for those in the labor force and industries will change. Gray echoed Cowle’s sentiments on the importance of teaching students both the technical skills as well as the people skills as they will be the things that matter.



Technical skills are clear. We are going to need people that understand cybersecurity and know how to operate and maintain systems. They will need to know how to secure and safeguard our systems from adversaries. As for soft skills, we know that the role of a bus drivers will eventually be obsolete. However, the general public may not feel comfortable getting on a bus with a robot, so the idea is to have a transportation concierge to greet them to ensure that passengers feel safe or to help them with their luggage. This could possibly be a new job developed. It will require great communication and customer service skills.

“There are thousands of people working in warehouses and logistics distribution centers in the Inland Empire. A lot of those jobs are going away,” said Gray. Amazon is an example of a company changing job opportunities to those people affected. As Amazon becomes more automated, they are supporting individuals to become small business owners as delivery drivers.

Jobs will continue to shift and professions that are relevant today may no longer be relevant in the next five or ten years. Gone are the days where people can start and stay in a profession for 40 years. Gray closed with reiterating that we need to ensure that we are providing students with both the technical skills, and the soft skills for a brighter and more sustainable future.

Shari McMahan – Provost and Vice President for Academic Affairs, Cal State University San Bernardino

McMahan opened with discussing the background and physical master plan for the Palm Desert Campus (PDC) for CSUSB. The Palm Desert Campus was originally called the Coachella Valley Center. It opened in 1986 with 80 students. More buildings were erected throughout the decades, and by 2002, the campus officially changed its name to, California State University, San Bernardino, Palm Desert Campus.

Sustainability

- City of Palm Desert Environmental Sustainability Plan
- Campus Capacity Analysis

CSUSB PALM DESERT CAMPUS WE DEFINE THE *Future*

The first four buildings were constructed as a result of funds that were raised through foundations, municipalities, and private gifts. With environmental consciousness in mind, the campus was built to be green and efficient. “The second and third buildings were occupied in 2005, and in 2006 the development began for the Health Sciences Building, which was noted as one of the most environmental sound buildings in the Coachella Valley,” said McMahan.

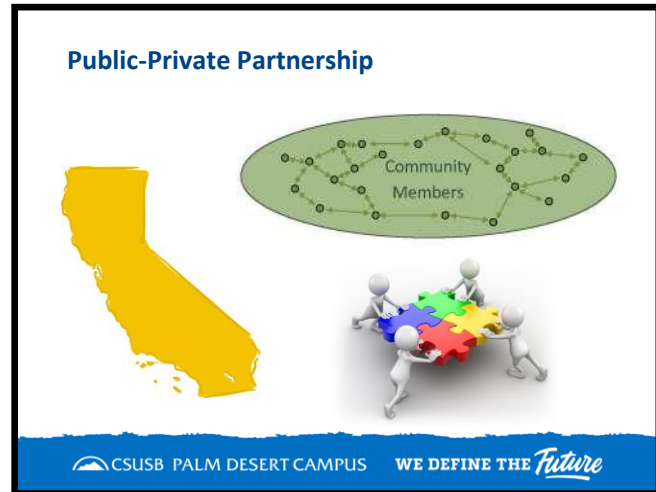
By 2013, PDC had a four year class available to serve students in the Coachella Valley and surrounding areas. Today, there are over 1,400 students occupying the campus with 15 degree and credential programs. The campus has the capacity of up to 1,800 students before the building utilization is maxed out. “The plan is to look at academic expansion and then develop a strategic road map for enhancing our current programs and building out new programs and to do so with community players in mind and involved in the process,” said McMahan.

In the Coachella Valley, there is a lack of accessibility to four year higher education, but CSUSB Palm Desert Campus aims to help students complete their degree. California State University, San Bernardino is the only CSU that occupies territory in both the San Bernardino and Riverside Counties. “We have very low degree attainment rates in both of the counties we serve, so the projection is really to continue building to meet the need. The attainment rate is about 16% in the Coachella Valley,” said McMahan. In certain cases where classes are not available on the Palm Desert Campus, there is free transportation, via the Coyote Cruiser, for students to be transported to the main campus so that they can take those classes. “We are looking at a major expansion of that service and working with Sunline Transit Agency,” McMahan said. Sunline Transit Agency operates their buses with energy efficiency as a top priority, similar to the Palm Desert Campus. Environmentally friendly programming is a key goal. The plan is to build out a route that will pick up and drop off students in the surrounding areas between Indio and San Bernardino.

**Expansion of CSUSB’s
Palm Desert Campus**

CSUSB PALM DESERT CAMPUS WE DEFINE THE *Future*

CSUSB is working to meet the needs of the community. According to McMahan, nearly 300 high school and elementary teachers retire every year in the Coachella Valley so teacher education is a specific goal of the campus. Additionally, there are a number of programs, such as entrepreneurship and cybersecurity that are opening majors at PDC. As part of the CSUSB mission, we are working with the local community college to better align programming to make transferring easier for students. There are also discussions about articulation between institutions so that students can finish their degree faster.



The few of the new programs include, logistics and supply chain management, as well as cybersecurity. The Leonard Transportation Center is developing the Pathway to Logistics Programs that aims to expand the number of students who would like to enter the field of transportation and logistics to enhance the overall economic and community development in the region. McMahan concluded by stating the CSUSB tagline, "We Define the Future." That is the mission and goal of the university in the Inland Empire and Coachella Valley.

Moving the Dialogue Forward: Ideas from the Participants

After the presentations, Dialogue attendees discussed the ideas presented and worked together in groups to find solutions to move the issue forward. The top three ideas from each table have been categorized and summarized below.

Inform students in the Coachella Valley about potential job opportunities. There were a number of participants that pointed out students need to be made aware of the new transportation jobs that are emerging.

- We need to educate students on emerging transportation jobs and pinpoint what jobs are needed here in the Coachella Valley.
- Create more interest for emerging transportation jobs.
- Look towards younger generation of professionals.

Create pipeline from high school to college for transportation jobs. Working groups discussed creating a pipeline or pathway for students in high school and college for transportation industry jobs.

- Create a better pipeline for new industry jobs and educate next generation experts.
- Bridge the gap at the Palm Desert campus and get to full capacity, start educating students on the programs that are available to them.
- It is important for us to start informing students at a younger age and create pathway for transportation industry sector.

Need for cybersecurity, robotics and information technology degrees. There is a need for cybersecurity and robotic experts in the Coachella Valley.

- For the emerging careers, the Coachella Valley is in need of cybersecurity, robotic and ITS experts.
- We need more support for cybersecurity in transportation infrastructure, this should be a priority.
- For the new wave of jobs, it is essential to equip our students with the necessary cybersecurity and ITS skills.

The Leonard Transportation Center (LTC) at California State University San Bernardino (CSUSB), presented a bi-monthly dialogue series on topics relevant to the future of transportation in the Inland Empire. The series, which was open to the public, was sponsored by HNTB Corporation and was held every other month starting in February 2018.

Dialogue topics ranged from understanding the current mobility dilemma and its causes to potential solutions like congestion pricing, transit; emerging technologies such as autonomous and connected vehicles and new ways of funding transportation infrastructure. Attendees had the opportunity to hear from transportation experts and engage in vigorous discussion about the transportation challenges facing the Inland Empire.

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 www.csusb.edu/ltc.