



CITT

**CENTER FOR INTERNATIONAL
TRADE AND TRANSPORTATION**

CSULB

COMMUNITY COLLEGE ROLE IN ITS PCB (THE UNIVERSITY PERSPECTIVE) JULY 2, 2020

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TECHNOLOGICAL ADVANCES



Active Steering

- Automatic steering
- Milestone for autonomous trucks
- Increases safety



LiDAR Sensors

- Light Detection and Ranging (LIDAR)
- Scans environment using light waves
- In use today and milestone for autonomous trucks



TECHNOLOGICAL ADVANCES CONT.

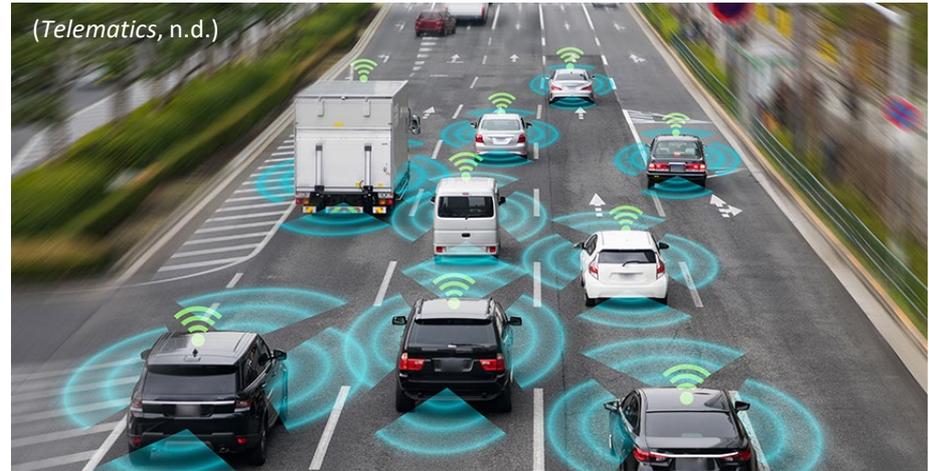
(Martin, 2019)



Fintech

- Allows for contactless and agile payment methods
- Utilized by public transit, freight forwarders, drivers, and many more!

(Telematics, n.d.)



Telematics

- Uses real time data to monitor driving behavior
- Monitors location, speed, and acceleration



ELECTRONIC LOGGING DEVICE (ELD)

“ELDs are intended to create a safer work environment for drivers of commercial motor vehicles, and make it easier and faster to accurately track, manage, and share data on driving and off-duty time.”

-FMCSA

- Hours of Service (HOS)
- Key advantages: compliance, location tracking and route management, and identifies bad driving behavior

*(ELD - Electronic Logging Devices, n.d.)
(Benefits of ELDs, 2017)*



(Site, n.d.)



(ELD Technology Issues Continue to Plague Small-Business Truckers, 2018)





Electric Vehicle Infrastructure Training Program (EVITP)

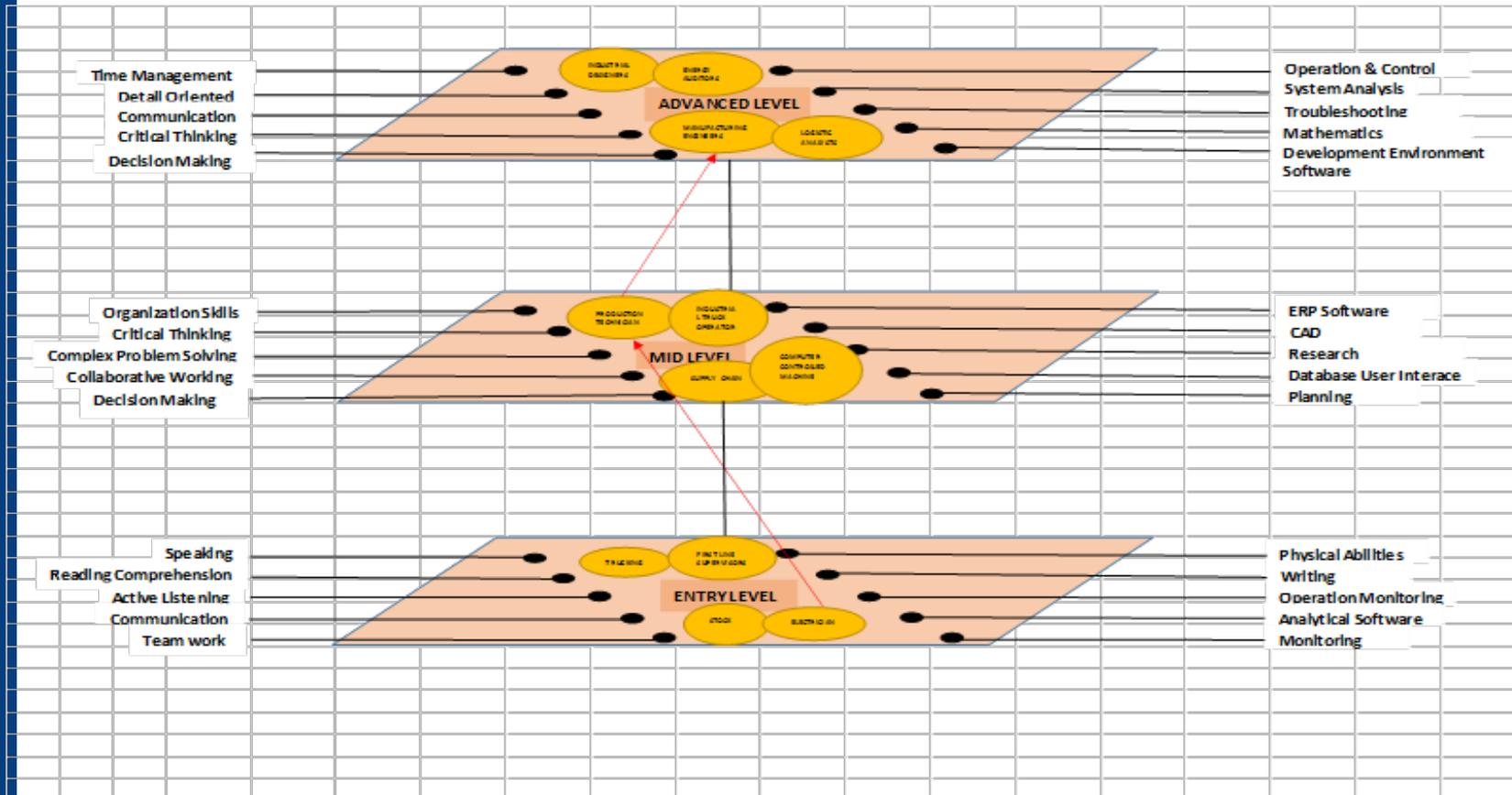


DEMANDED SKILLS AMID COVID-19

- An accelerated rate of technological adoption is required for companies to remain competitive
- Transportation systems are disrupted as commodity demand changes due to COVID-19 impacts
- Digitally shared documents are needed for greater efficiency, transparency, speed, accuracy, and safety
- Collaborative and communication skills are critical for transportation on all levels



TECHNOLOGY AT ALL LEVELS



EMBEDDING ITS IN THE OCCUPATIONS PYRAMID

		<u>Position</u>	<u>Education</u>	<u>SCPro™ Fundamentals Certification</u>
<p>Industry-Valued Certifications: Certified Professional in Supply Chain Management, Certified Production and Inventory Management. Certified Supply Chain Professional</p> <p>Common Skills: Logistics and supply chain management, business and employee management, budgeting, quality assurance and control</p>	\$51.00/Hr.	Supply Chain/Logistics Manager	Bachelor's Degree or Higher	N/A
<p>Industry-Valued Certifications: Forklift Operator Certification</p> <p>Common Skills: Inventory maintenance, warehouse management system, production distribution, manufacturing resource planning, material flow, forklift operation</p>	\$21.86/Hr.	Warehouse/Distribution Supervisor	High School Diploma or equivalent/Less than 5-years experience	N/A
<p>Industry-Valued Certification: N/A</p> <p>Common Skills: Transportation management skills, scheduling, administration skills (payroll processing, transportation management systems)</p>	\$27.58/Hr.	Transportation Supervisor	High School Diploma or Equivalent	Demand Planning
<p>Industry-Valued Certification: Certified Professional Logistician</p> <p>Common Skills: Logisticians and supply chain knowledge, general business skills, productivity software</p>	\$39.48/Hr.	Logistics and Supply Chain Specialist	Bachelor's Degree	Transportation Ops/ Warehousing Ops/ Inventory Mgmt./ Manufacturing & Service Ops/ Supply Mgmt. & Procurement
<p>Industry-Valued Certification: N/A</p> <p>Common Skills: Data entry, order entry, accounting, sales, inventory management</p>	\$15.19/Hr.	Order Processor	High School Diploma or equivalent/Short-term on-the-job-training	Customer Service Operations
<p>Industry-Valued Certification: N/A</p> <p>Common Skills: Sorting and packaging, hand truck maintenance, forklift operation, hand truck operation</p>	\$13.27/Hr.	Shipping and Receiving Clerk	High School Diploma or equivalent/Short-term on-the-job-training	N/A
<p>Industry-Valued Certification: APICS Certification</p> <p>Common Skills: Production and processing, administration and management, accounting software, communication</p>	\$22.58/Hr.	Scheduler/Operations Coordinator	High School Diploma or equivalent/Short-term on-the-job-training	Supply Chain Management Principles

Source: JPMORGAN CHASE Strengthening Los Angeles 2015



Spatial Distribution of Logistics Job Clusters by Density of Jobs

Data Source: 2015 LEHD LODES
(1,430 tracts with no logistics jobs)

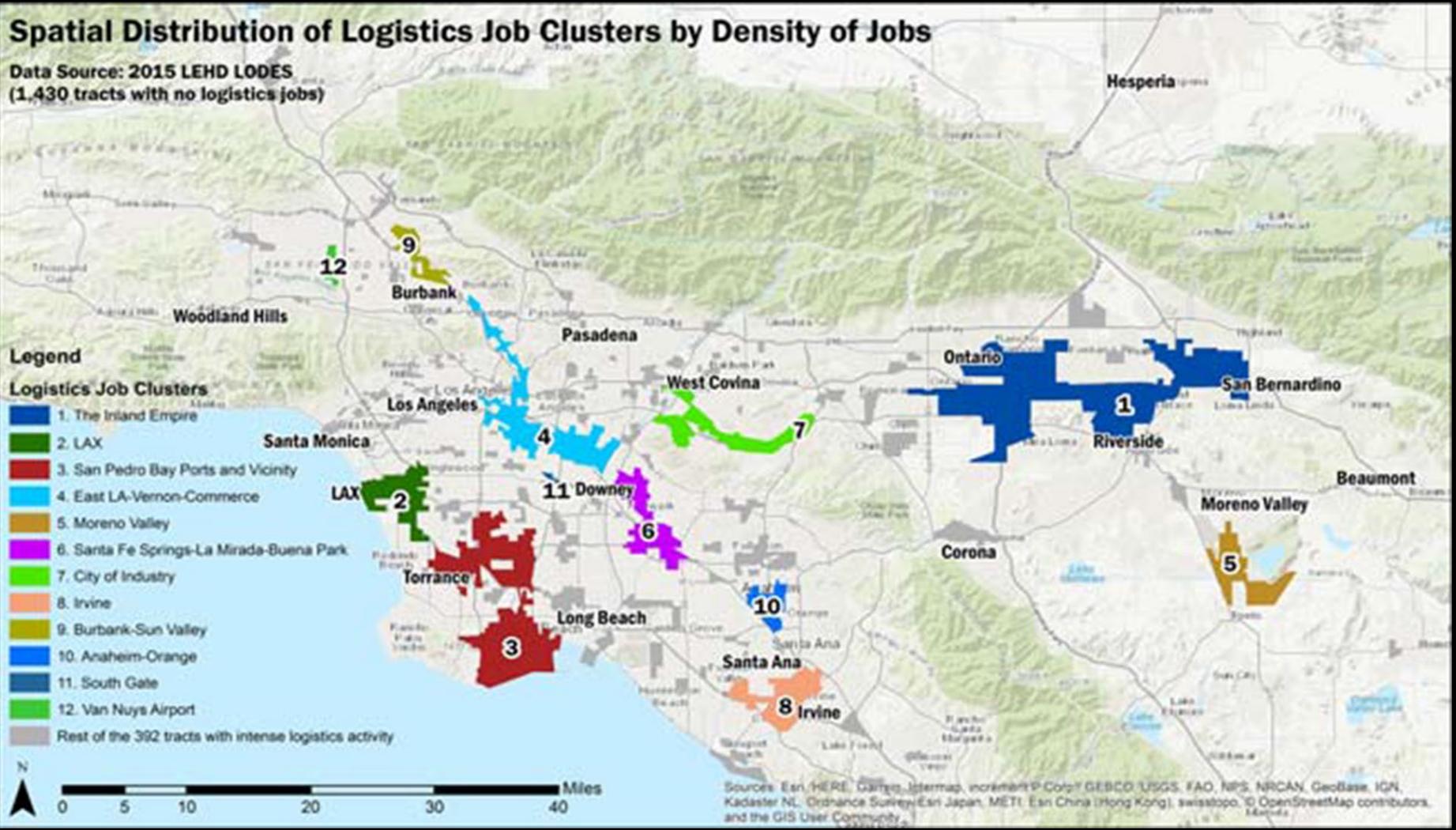
Legend

Logistics Job Clusters

- 1. The Inland Empire
- 2. LAX
- 3. San Pedro Bay Ports and Vicinity
- 4. East LA-Vernon-Commerce
- 5. Moreno Valley
- 6. Santa Fe Springs-La Mirada-Buena Park
- 7. City of Industry
- 8. Irvine
- 9. Burbank-Sun Valley
- 10. Anaheim-Orange
- 11. South Gate
- 12. Van Nuys Airport
- Rest of the 392 tracts with intense logistics activity



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community



EQUITY ISSUES: TECHNOLOGY, EDUCATION, WORKPLACE

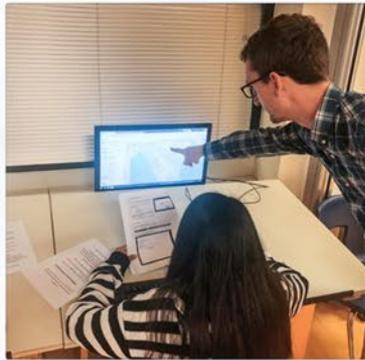
Comparison of existing and potential worker accessibility by mode by travel time.

To existing workers

To adjusted potential workers

Travel time	To existing workers		To adjusted potential workers		To existing workers		To adjusted potential workers	
	By car	By transit	By car	By transit	By car	By transit	By car	By transit
30 min	64,099 (22.5%)	558 (0.2%)	63,653 (22.3%)	729 (0.3%)	64,099 (22.5%)	558 (0.2%)	63,653 (22.3%)	729 (0.3%)
45 min	113,181 (39.7%)	4061 (1.4%)	111,389 (39.1%)	5074 (1.8%)	113,181 (39.7%)	4061 (1.4%)	111,389 (39.1%)	5074 (1.8%)
60 min	159,178 (55.9%)	13,048 (4.6%)	156,803 (55.1%)	15,357 (5.4%)	159,178 (55.9%)	13,048 (4.6%)	156,803 (55.1%)	15,357 (5.4%)







COMMUNITY COLLEGE OF ALLEGHENY COUNTY

BOB KOCH

DEPARTMENT HEAD

AUTOMOTIVE INSTRUCTOR



GENERAL SCHOOL INFORMATION

- School's location: Pittsburgh, PA
- 4 campuses and 3 centers
- Student population size: 25,000+ credit and 17,000+ noncredit

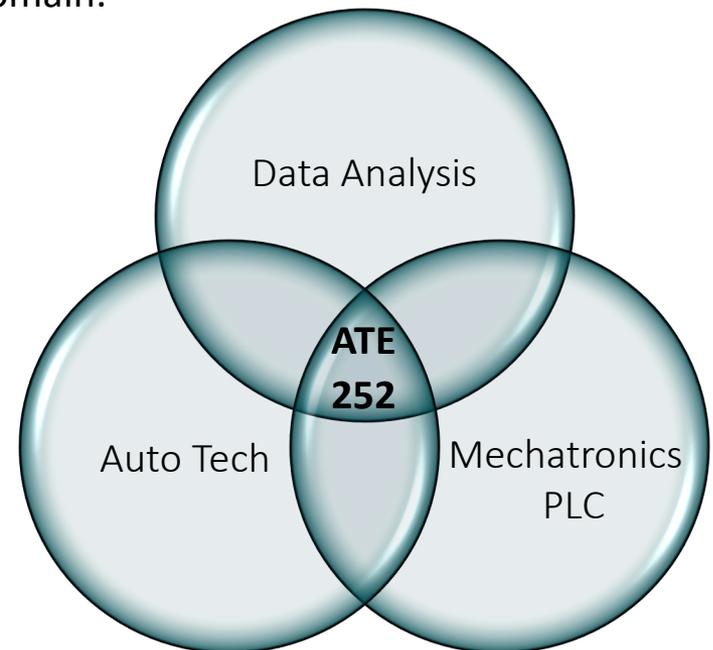


ATE-252 EXP TRANSPORTATION INNOVATION

Drawing on the tools and methods of automotive technology, mechatronics, and data analytics, students explore transportation related problems through hands-on, project-based learning in each discipline.

Students will draw on problem-solving frameworks used by each discipline to generate innovative ideas for presentation. As a survey course, students from all academic disciplines will acquire transferrable skills relevant to their own domain.

- No Enrollment Requirement
- 12 students enrolled



COURSE HIGHLIGHTS

Student goals:

- Traffic control with PLC and collect data for future analysis
- Cars talk to each other
- Applications of data analytics
- Gathering data from non-human actions
- How sensors in cars communicate with each other
- Design transportation sub-station
- Interest in learning more about PLC's
- Mapping functions
- Collecting traffic data, data behind the 576 decision
- Roadway infrastructure specific to electric vehicles



Proposed Course Outline:

- Week 1: Intro
- Week 2: Electricity basics
- Week 3: PLC
- Week 4: PLC (cont)
- Week 5: PLC mini project
- Week 6: sensor data/analytics
- Week 7: clean, assemble, and store
- Week 8: share sensing data mini project
- Week 9: auto sensing crash course
- Week 10: auto systems
- Week 11: donkey car
- Week 12: donkey car simulations
- Week 13: project workshop/prep time
- Week 14: Showcase

<https://www.donkeycar.com/>



RELATIONSHIP TO ITS WORKFORCE

- 1** Expose students to data analytics in a transportation field of their choice
- 2** Introduce students to automotive sensing technology
- 3** Have students write and execute a simple PLC program



CONTACT INFORMATION



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PIMA COMMUNITY COLLEGE

CENTER FOR TRANSPORTATION TRAINING

MISSY BLAIR

ADV. PROGRAM MANAGER



GENERAL SCHOOL INFORMATION

- Located in Tucson, Arizona
- Multi-campus, serving approximately 42,000 students served annually



AUTONOMOUS VEHICLE DRIVER & OPERATIONS SPECIALIST

- Details of the program(s)
 - Sun Corridor connection and PCC reorganization (VP of Workforce & Strategic Partnerships)
 - High level focus on Future of Work & Four Superpowers (AI, Automation, Cloud Computing, and Mobile Tech)
 - Developed in partnership with TuSimple over an 8-month timeframe (start to finish)



PROGRAM HIGHLIGHTS

- What is it?
 - 12 credit certificate program
 - **OSHA 10 (PRIOR LEARNING AVAILABLE)**
 - **LOGISTICS (TRANSPORTATION WAREHOUSING)**
 - **COMPUTER INFORMATION SYSTEMS (HARDWARE)**
 - **ADVANCED INDUSTRIAL TECHNOLOGY (ELECTRONICS)**
 - **INTRO TO AUTONOMOUS VEHICLES (NEW)**
- Speed of delivery
- Collaboration with business and industry
- Cross discipline

- Class A CDL prerequisite
- Approximately 12 students at varying stages of enrollment/progress
- Priority hiring with TuSimple
 - Wage info proprietary; competitive and drivers home most nights/better quality of life



RELATIONSHIP TO ITS WORKFORCE

- Upskill current commercial truck drivers for new technology
 - Communication (verbal and written)
 - Familiar with hardware components
 - Autonomous systems (history, ethics, laws, lidar, cameras, sensors, etc)
 - Electronics/sensors (vs diesel mechanic)
 - Logistics – warehousing
- Reskill current commercial truck drivers
 - May reskill into one of the other program disciplines (also a win!)
- First iteration – as tech evolves → certificate program evolves



CONTACT INFORMATION

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**TRANSPORTATION
WORKFORCE INSTITUTE
AT
LOS ANGELES TRADE-
TECHNICAL COLLEGE**

**MARCY DRUMMOND
SENIOR FELLOW**

ABOUT LATTC AND TWI

- Los Angeles Trade-Technical College (LATTC) is located in the City of Los Angeles
- Annual Headcount: 22,982
- 95% Racial/Ethnic Minority Student Population: 65% Hispanic, 18% African American, 4% Asian, 2% 2 or More Races, 5% Other, 5% White
- 31% of students are 30 and older



The Transportation Workforce Institute (TWI)

- Established in 2015 with grant from Federal Transit Administration
- Hosted by LATTC
- Tri-lateral purpose:
 - Serve as a **workforce development intermediary** for transportation industry
 - **Create model** postsecondary workforce education and training **programs and curriculum**
 - **Build replicable and scalable outreach, pre-collegiate, pre-employment, and incumbent workforce development programs**



ITS-RELATED PROGRAMS AND ACTIVITIES

- LATTC Certificate and Degree Programs
- Youth Programs
- Industry/Labor Market Research and Employer Engagement
- Incumbent Worker Training
- Targeted Programs for Historically Underserved Populations



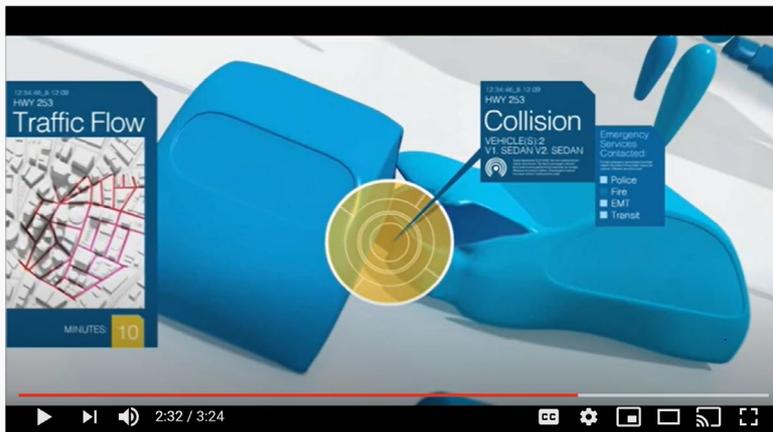
PROGRAM HIGHLIGHTS

- LATTC Certificate and Degree Programs
 - Renamed Diesel Technology Program to Heavy Duty Truck, Transit, and Equipment given expanded competencies and roles of mechanics including pertaining to maintenance and repair of ITS devices/technologies
 - Integration of Electronics Technology and Computer Networking programs in the ATM Pathway
 - Introduction to ITS incorporated in Automotive; Heavy Duty Truck, Transit, and Equipment; and Rail certificate and degree programs
 - Integrating ITS competencies in curriculum throughout all 3 programs (GPS, vehicle connectivity/communication, etc.)



PROGRAM HIGHLIGHTS

- Youth Programs
 - Transportation Youth Academy
 - Include engaging videos to explore ITS and expansive careers in transportation that are related to ITS such as priority traffic signal control
 - Project-based activities that include GIS and planning a new transportation system considering ITS technologies, data, and more



Smart Transportation Integrating Systems for More Efficient



Intelligent Transportation Systems: Your Road to the Future



PROGRAM HIGHLIGHTS

- Transit and Ground Transportation Industry/Labor Market Research and Employer Engagement
 - 13 High-Demand and Hardest-to-Fill Transit Occupations
 - Bus Mechanic, Bus Operator, Electronic Communication Technician, Rail Electronic Communication Inspector
 - Identified gaps between existing community college programs and employer/occupation requirements
- Incumbent Workers
 - LA Metro Joint Apprenticeship Program – Rail Vehicle Maintenance Technician
 - Networking
 - Electronics (including sensors, etc.)
 - Digital and Computing Skills



PROGRAM HIGHLIGHTS

- Targeted Programs for Historically Underserved Populations
 - Transportation Workforce Readiness Program – short-term, noncredit program for entry-level positions at Transit agencies
 - ITS is covered in the Transportation Industry Overview portion of the course
 - Digital and Computing Literacy Curriculum Module

Intelligent Transportation Systems (ITS)

▶ ITS refers to the use of technologies such as Electronics, Computers, Communications, Sensors applied to transportation vehicles and infrastructure to improve:

- Safety
- Productivity
- Reliability
- Informed Travel Choices
- Sustainability
- And much more...



The illustration depicts a city skyline with various buildings. A satellite is shown in the sky, emitting signals. Below the skyline, a road with a traffic light is shown. Several vehicles are depicted: a car with a communication antenna, a car with a sensor, a car with a communication antenna, and a car with a communication antenna. The vehicles are connected to a network of communication and sensor technologies.



PROGRAM CONSIDERATIONS NOW AND AHEAD

- Laptop is first tool students use
- Big data and analytics
- Transit and Ground Transportation Specific
 - First and last modes of transportation
 - Increasing digital and electronics skills
 - Up-Skilling and New-Skilling will be continuous
- Up-Skilling and New-Skilling will be continuous



RELATIONSHIP TO ITS WORKFORCE

- ITS skills and competencies are and will be imbedded throughout multiple occupations
- Focus on ensuring certificate and degree programs incorporate requisite ITS skills
- Monitor labor market/training gaps for specific ITS occupations to determine need for additional curriculum/programs as occupations emerge or change



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