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California Energy Commission
Clean Transportation Program

FINAL PROJECT REPORT

California Sustainable Freight Action Plan: Freight Workforce Development Pilot Project

Prepared for: California Energy Commission

**Prepared by: Center for International Trade and Transportation, a
Center in the College of Professional and International Education at
California State University, Long Beach**

Gavin Newsom, Governor

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The authors have many to thank for the fruition of this pilot workforce development project in sustainable freight including CEC's Tami Haas, Susan Ejlalmaneshan, and Larry Rillera for their guidance throughout the project. The California Sustainable Freight Action Plan (CSFAP) Freight Competitiveness Working Group provided insightful feedback through many hours of meetings. This Working Group included Frank Ramirez from the Governor's Office of Business and Economic Development (GO-Biz), Shrayas Jaktar from the California Workforce Development Board (CWDB), and Larry Rillera from the CEC, all three of whom served on the Curriculum Advisory Board along with Bruce Noble, California Communities Colleges and Brian Trice, Columbia-Willamette Clean Cities Coalition.

CSULB entered into an Interagency Agreement (IA) with the CEC to fund contract work that would result in a comprehensive plan and implementation of a demonstration project that would provide guidance for the CEC's workforce training activities. This IA supported work to develop strategies aligning with the goals of the CSFAP. CSULB deliverables included concept papers, an Implementation Plan, and Charter for a Pilot Project, among other items discussed in this report. The data, processes (including project management), and findings from this IA is included in this report.

The strength of the resulting beta workforce development project, the Sustainable Freight Foundations Certificate Pilot Project (Freight Certificate), rested with the exceptional subject matter expert instructors: Kevin Maggay, SoCalGas; Matt Schrap, California Fleet Solutions; Cameron Roberts, Roberts and Kehagiaras; and Sue Dexter, Sol Price School of Public Policy at the University of Southern California. Appreciation goes to the dedicated Center for International Trade and Transportation (CITT) staff, including student Research Assistants and Associates. Finally, with much gratitude, the authors thank the pilot participants and observers who, during this COVID-19 pandemic, sat through 3-hour Friday afternoon zoom meetings and provided thoughtful feedback after every session. Their insights constitute a large part of this report.

PREFACE

Assembly Bill 118 (Núñez, Chapter 750, Statutes of 2007) created the Clean Transportation Program, formerly known as the Alternative and Renewable Fuel and Vehicle Technology Program. The statute authorizes the CEC to develop and deploy alternative and renewable fuels and advanced transportation technologies to help attain the state's climate change policies. Assembly Bill 8 (Perea, Chapter 401, Statutes of 2013) reauthorizes the Clean Transportation Program through January 1, 2024, and specifies that the CEC allocate up to \$20 million per year (or up to 20 percent of each fiscal year's funds) in funding for hydrogen station development until at least 100 stations are operational.

The Clean Transportation Program has an annual budget of about \$100 million and provides financial support for projects that:

- Reduce California's use and dependence on petroleum transportation fuels and increase the use of alternative and renewable fuels and advanced vehicle technologies.
- Produce sustainable alternative and renewable low-carbon fuels in California.
- Expand alternative fueling infrastructure and fueling stations.
- Improve the efficiency, performance and market viability of alternative light-, medium-, and heavy-duty vehicle technologies.
- Retrofit medium- and heavy-duty on-road and nonroad vehicle fleets to alternative technologies or fuel use.
- Expand the alternative fueling infrastructure available to existing fleets, public transit, and transportation corridors.
- Establish workforce-training programs and conduct public outreach on the benefits of alternative transportation fuels and vehicle technologies.

The project was funded with \$175,000 in Clean Transportation Program monies through an Interagency Agreement (IA) between the CEC and CSULB.

ABSTRACT

To address clean transportation regulations and other energy goals in moving freight sustainably, workforce training and development is critical. California will lead the nation in developing this pioneering pilot workforce development project in sustainable freight. The CITT at CSULB developed this first-of-its kind Sustainable Freight Foundations Certificate for middle managers, funded by the CEC's Clean Transportation Program, with the assistance of GO-Biz.

This report includes recommendations that can directly support the next generation of sustainable freight workforce education and training activities through the Clean Transportation Program. Based on the research gathered, the sustainable freight workforce encompasses a broad range of occupations across a multitude of industries and organizations, in both the private and public sectors. Research points to the case that sustainable freight workforce competencies are foundational skill sets needed to address the expanding role of sustainability within organizations. The potential for future workforce education programs in sustainable freight can vary in content, design, and audience. The rationale behind the concept of sustainability skills as foundational and the possibilities to build out programs will be explored in this report.

Competencies in this pilot centered on identifying stakeholders in the supply chain; understanding regulatory compliance and energy, infrastructure, and sustainability ecosystems; using data and metrics for process improvement; understanding legal issues in risk management; and the analysis and presentation of data. The collaborative Capstone Project involved building sustainability strategies into a company's culture addressing the triple bottom line: people, planet, and profit.

Keywords: California Energy Commission, sustainability, sustainable freight, transportation, workforce development, goods movement, warehousing, ports, rail, trucking, regulatory compliance, supply chain, freight operations, zero-emission vehicle

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EXECUTIVE SUMMARY

The CITT, a center within the College of Professional and International Education (CPIE) at CSULB, in partnership with the CEC and GO-Biz, developed this first-of-its-kind Sustainable Freight Foundations Certificate (Freight Certificate). The CSFAP Freight Competitiveness Working Group (Working Group) which is comprised of representatives from the GO-Biz, CEC, California Air Resources Board (CARB), CWDB, California Department of Transportation (Caltrans), California Employment Training Panel (ETP), and industry stakeholders from rail, drayage, ports, distribution and warehousing, and labor, provided guidance and direction throughout the pilot project development process.

The Freight Certificate addresses the CSFAP's workforce training goals for 1) improved efficiency and reliability, reduced costs, increased productivity, faster transaction speed, and improved worker and public safety; 2) ensuring the existing and future workforce meets the needs of the California sustainable freight transport system and sufficiently skilled labor is available to meet the needs of an expanding freight-related job market; and for 3) collaborating with stakeholders to coordinate resources and strategies to better establish zero or near-zero emission vehicles in their fleets for freight operations. CITT first identified critical occupations in sustainable freight, then researched workforce skill sets required. These competencies centered on identifying stakeholders in the supply chain; understanding regulatory compliance and energy, infrastructure, and sustainability ecosystems; using data and metrics for process improvement; understanding legal issues in risk management; and the analysis and presentation of data. The collaborative Capstone Project involved building sustainability strategies into a company's culture. Veteran industry subject matter experts with extensive teaching experience were selected as instructors. The CITT team captured the course content feedback as valuable data for future programming.

This report includes recommendations that can directly support the next generation of sustainable freight workforce education and training activities through the Clean Transportation Program (CTP). Based on the research gathered, the sustainable freight workforce encompasses a broad range of occupations across a multitude of industries and organizations, in both the private and public sectors. Research points to the case that sustainable freight workforce competencies are foundational skill sets needed to address the expanding role of sustainability within organizations. The potential for future workforce education programs in sustainable freight can vary in content, design, and audience. The rationale behind the concept of sustainability skills as foundational and the possibilities to build out programs will be explored in this report.

Chapter 1: Introduction

For the purposes of this workforce development pilot project, sustainable freight is defined as goods moved in bulk by truck, train, ship, or aircraft in a manner that meets current needs without compromising future generations' abilities to meet their needs. Sustainability in the context of this pilot project also includes economic prosperity. The term "foundational" refers to a curricular design that is introductory, while providing a basis for future workforce skills development. The CSFAP Freight Competitiveness Working Group (discussed in this chapter) agreed on and provided a broad definition of the freight sector based on the concept of value added:

The freight sector constitutes all transportation-based and transportation-dependent enterprises involved in the supply chain from the point of origin to the point of consumption. It also includes reverse logistics chains from the point of origin to the point of termination. The definition includes all carriers and all cargo owners or their intermediaries. It includes all transportation and service providers involved in moving, handling, managing, or planning the flow of cargo. It also includes the transport infrastructure.

CSFAP Action 8

In July 2015, Governor Brown issued Executive Order B-32-15 which directed the California State Transportation Agency (CALSTA), California Environmental Protection Agency (CalEPA), Natural Resources Agency, California Air Resources Board (CARB), California Department of Transportation (Caltrans), California Energy Commission (CEC), and Governor's Office of Business and Economic Development (GO-Biz) to develop a California Sustainable Freight Action Plan (CSFAP) by July 2016. This Executive Order supports an integrated approach for State agencies when developing specific investments, policies, and programs related to the freight transport system that encompass State transportation, environmental, and economic interests. This workforce pilot project is specifically guided by CSFAP State Agency Action 8:

Convene stakeholders and the California Workforce Development Board to identify and implement steps to ensure that the existing and future workforce meets the needs of the California sustainable freight transport system and sufficiently skilled labor is available to meet the needs of an expanding freight-related job market.¹

To support these needs, the CEC funded this pilot workforce project through an Interagency Agreement (IA) with CITT at CSULB. CITT focused on the following CSFAP Guiding Principles in developing the pilot:

- Grow the economic competitiveness of California's freight sector.
- Apply innovative and green technology, along with accompanying infrastructure and applicable practices, to optimize the efficiency of the freight transportation system.
- Invest strategically to accelerate the transition to zero and near-zero emission

¹ "CSFAP_FINAL_07272016.Pdf," accessed September 21, 2020, https://ww2.arb.ca.gov/sites/default/files/2019-10/CSFAP_FINAL_07272016.pdf.

equipment powered by renewable energy sources, including supportive infrastructure.

The pilot workforce project addresses the CSFAP's workforce training goals for 1) improved efficiency and reliability, reduced costs, increased productivity, faster transaction speed, and improved worker and public safety; 2) ensuring the existing and future workforce meets the needs of the California sustainable freight transport system and sufficiently skilled labor is available to meet the needs of an expanding freight-related job market; and for 3) collaborating with stakeholders to coordinate resources and strategies to better establish zero or near-zero emission vehicles in their fleets for freight operations.

Drivers for Freight Sustainability

While California leads the nation in zero-emission vehicle (ZEV) market development, greenhouse gas (GHG) emission reductions, and economic sustainability, the state is also home to designated "extreme" nonattainment regions based on national ambient air quality standards (NAAQS): the San Joaquin Air Pollution Control District Valley, South Coast Air Quality Management District (SCAQMD), and Yolo-Solano Air Quality Management.² To address federal clean air laws, California is required to have State Implementation Plans (SIPs) which describe how areas will attain NAAQS. The SIP identifies the extent of the reductions needed and the necessary actions required to achieve these reductions. Local air districts submit their SIP documents to CARB for review.

Based on these plans, CARB creates regulations that drive technological adoption that move regions toward attainment. This CSFAP workforce development pilot project seeks to support and address this movement toward attainment by examining critical occupations and associated skill sets in moving freight using cleaner energy. By embedding economic and environmental sustainability into freight operations, an intended outcome is to show gains in public health benefits from better air quality and to move towards a more competitive economy using ZE technology. In addressing ZEV policies in moving freight sustainably, workforce training and development is critical. This project was intended to serve as a proof of concept for sustainable freight curricular materials and to provide insight into the kind of education and training infrastructure needed to develop a sustainable freight workforce moving forward.

Based on data gathered for the project, the sustainable freight workforce encompasses a broad range of occupations across a multitude of industries and organizations, in both the private and public sectors. Research points to the case that sustainable freight workforce competencies are foundational skill sets needed to address the expanding role of sustainability within all organizations. The potential for future workforce education programs in sustainable freight can vary in content, design, and audience. The rationale behind the concept of sustainability skills as foundational and the possibilities to build out programs are critical. These considerations are discussed in this report.

Competencies researched for this pilot centered on identifying stakeholders in the

² "Revisions to California State Implementation Plan; South Coast Air Quality Management District, San Joaquin Valley Air Pollution Control District and Yolo-Solano Air Quality Management; Nonattainment New Source Review Requirements for the 2008 8-Hour Ozone Standard," Federal Register, August 20, 2018, <https://www.federalregister.gov/documents/2018/08/20/2018-17835/revisions-to-california-state-implementation-plan-south-coast-air-quality-management-district-san>.

freight supply chain; understanding regulatory compliance; understanding energy, infrastructure, and sustainability ecosystems; using data and metrics for process improvements and reducing transactions costs; understanding legal issues in risk management; and analyzing and presenting data. The research process for identifying these competencies is presented in this report.

Project Background

Regional Workforce Development Initiatives

The Interagency Agreement between CEC and CSULB CITT was itself the result of a separate agreement between CEC and GO-Biz designed to fund contract work resulting in a comprehensive plan to guide the Energy Commission's Alternative and Renewable Fuel and Vehicle Technology Program (ARFVTP) workforce training activities. Strategies were intended to support the goals of the California Sustainable Freight Action Plan including establishing regional training partnerships across the State:

- Establishing a robust, integrated system of pre-apprenticeship pipelines and journey-level upskilling programs in mission-critical occupations in the freight industry.
- Spanning the State with a network of regional training partnerships, driven by local industries and connected to seamless supply-side coalitions of community, workforce, labor, and education partners, that can guarantee a consistent, high-quality supply of skilled labor to manufacture, build, operate, and maintain the State's zero emissions freight infrastructure.
- Aligning regional, multi-modal freight transportation plans with regional workforce initiatives.

Activities included:

- Identifying and prioritizing workforce opportunities associated with implementation of the Sustainable Freight Action Plan.
- Mapping related skill and training requirements in mission-critical occupations across transportation, construction, and manufacturing sectors.
- Developing concepts for high-quality apprenticeship pipelines, from pre-apprenticeship to journey-level upskilling, in order to increase operational efficiency and effective technological deployment across sectors and firms.
- Advancing inclusive local economic development through community workforce agreements, which allow more Californians to benefit from the economic as well as the health and environmental gains of sustainable freight.
- Identifying and convening small working groups of freight industry and workforce experts to outline and prioritize workforce challenges associated with implementing the Sustainable Freight Action Plan.

CSULB Workforce Development Scope of Work

The agreement between CEC and CSULB established a scope of work that identified and implemented the steps needed to ensure that the existing and future workforce meets the needs of the California sustainable freight transport system, and that sufficiently skilled labor is available to meet the needs of an expanding freight-related job market. The scope of work reflected the need to first prioritize the identification of workforce opportunities in order to inform the future development of regional partnerships and pathways that support those opportunities in areas across the State.

The work was effectuated under Agreement 600-16-006 with a one-year performance period and a start date of March 31, 2017. It was intended as a parallel effort to a project in support of CSFAP Agency Action 6. This project, running concurrently and being led by the University of Southern California, utilized Caltrans funding program through Caltrans' Division of Research, Innovation, and System Information (DRISI) to establish targets for increasing the economic competitiveness of the California freight industry. This research project, also done in coordination with GO-Biz, developed metrics for measuring economic competitiveness which included the role of labor in sustaining a vibrant freight sector. GO-Biz convened a working group consisting of freight industry representatives and state agency staff to guide the work under both CSFAP Actions 6 and 8.

CSULB's work was developed under an Interagency Agreement between the university and the Energy Commission to help guide the CEC's workforce training activities and support goals of the California Sustainable Freight Action Plan including:

- Establishing a robust, integrated system of pre-apprenticeship pipelines and journey-level upskilling programs in mission-critical occupations in the freight industry.
- Spanning the State with a network of regional training partnerships, driven by local industries and connected to seamless supply-side coalitions of community, workforce, labor, and education partners, that can guarantee a consistent, high-quality supply of skilled labor to manufacture, build, operate, and maintain the State's zero emissions freight infrastructure.
- Aligning regional, multi-modal freight transportation plans with regional workforce initiatives.

CSULB activities were organized around the following principal tasks:

- Participating in a Kick-Off Meeting conference call to discuss contract requirements and invoice process.
- Identifying and prioritizing workforce opportunities associated with implementation of the Sustainable Freight Action Plan.
- Mapping related skill and training requirements in mission-critical occupations across California transportation, construction, and manufacturing sectors.
- Developing concepts for the development of high-quality apprenticeship pipelines, from pre-apprenticeship to journey-level upskilling, in order to increase operational efficiency and effective technological deployment across sectors and firms.
- Advancing inclusive local economic development through the development of concepts for community workforce agreements, which allow more Californians to benefit from the

economic as well as the health and environmental gains of sustainable freight.

- Identifying and convening at least two in-person working groups of freight industry and workforce experts to outline and prioritize workforce challenges associated with implementing the Sustainable Freight Action Plan.
- Additional virtual working groups will also be held.
- Preparing a report identifying and prioritizing workforce opportunities associated with implementation of the Sustainable Freight Action Plan.
- Preparing career pathway maps for five related skill and training requirements for occupations that are critical to the development of a sustainable freight transport system in California. These occupations can include, but are not limited to the transportation, construction, and manufacturing sectors.

Detailed Cost Estimate for Implementation of Strategies Developed in this Contract

Table 1: Cost Estimate for Initial Interagency Agreement Contract

Cost Category	Total Cost
Direct labor	\$13,996
Fringe Benefits	\$ 3,795
Total Labor	\$17,791
Travel	\$ 2,056
ODCs/Materials	\$ 153
Total Direct Charges	\$ 2,209
F & A	\$ 5,000
Total	\$ 25,000

Source: CITT

Freight Competitiveness Working Group (Working Group)

The Freight Competitiveness Working Group (Working Group) was created to address CSFAP Action 6 and Action 8: 1) to gather data and information to support the freight transportation system’s competitiveness and to set State competitiveness targets and metrics; and 2) to direct workforce development initiatives. The Working Group was comprised of representatives from the GO-Biz, CEC, CARB, CALSTA, California Workforce Development Board (CWDB), Caltrans, Employment Training Panel (ETP), and industry stakeholders from rail, drayage, distribution and warehousing, ports, and labor. Working Group membership was often fluid, with different agency and industry members present at each meeting.

Table 2: Working Group Meetings

Date	Agenda Items
1/25/2018 (Kick-Off Meeting)	<input type="checkbox"/> Review of Work to Date <input type="checkbox"/> Summary of December 2017 peer exchange (Dr. Giuliano’s presentation) <input type="checkbox"/> Critical Occupations at Cluster Level

	<ul style="list-style-type: none"> <input type="checkbox"/> Subset of skills and specializations for 5 clusters <input type="checkbox"/> Selection criteria for KSAs and occupations <input type="checkbox"/> Technology focused pathways at entry to mid-level <input type="checkbox"/> Review of apprenticeship white paper <input type="checkbox"/> Discussion of possible approaches for California Sustainable Freight Action Plan (CSFAP) Workforce Demonstration project
7/19/2018	<ul style="list-style-type: none"> <input type="checkbox"/> Review of Scope of Work and recap of April meeting CSFAP (Economic Competitiveness Phase 1a Meeting 2 presented by Dr. Gen Giuliano) <input type="checkbox"/> Methodology for identifying and prioritizing critical occupations <input type="checkbox"/> Results of analysis of labor market information and job postings for freight-related occupations <input type="checkbox"/> Group discussion on results and narrowing the occupation list <input type="checkbox"/> Discussion on industry engagement to validate occupational list, select career pathway models, and provide input on structure of demonstration pilot
12/20/2018	<ul style="list-style-type: none"> <input type="checkbox"/> Outline of scope of work & review of work done to date <input type="checkbox"/> Purpose of peer exchange <input type="checkbox"/> Analysis of survey findings on workforce development <input type="checkbox"/> Industry outlook on workforce development challenges (The National Perspective) <input type="checkbox"/> Anne-Strauss Wieder- Director, Freight Planning at the North Jersey Transportation Planning Authority <input type="checkbox"/> Rick Blasgen- President & CEO at Council of Supply Chain Management Professionals (CSCMP) <input type="checkbox"/> Bridging the gap through apprenticeships and wrap-up <input type="checkbox"/> Analyzed one year's worth of real time job postings using Burning Glass
3/06/2019	<ul style="list-style-type: none"> <input type="checkbox"/> Review of Work to Date <input type="checkbox"/> Summary of December peer exchange <input type="checkbox"/> Critical Occupations at Cluster Level <ul style="list-style-type: none"> ▪ Subset of skills and specializations for 5 clusters <input type="checkbox"/> Selection criteria for KSAs and occupations <ul style="list-style-type: none"> ▪ Technology focused pathways at entry to mid-level <input type="checkbox"/> Review of apprenticeship white paper <input type="checkbox"/> Discussion of possible approaches for California Sustainable Freight Action Plan (CSFAP) Workforce

	Demonstration project
8/09/2019	<ul style="list-style-type: none"> <input type="checkbox"/> Scope of Work <input type="checkbox"/> Presentation Objectives <input type="checkbox"/> Review of Survey and Outreach Methodology <input type="checkbox"/> Presentation of Sustainable Freight Foundations Certificate <ul style="list-style-type: none"> a. Purpose b. Approach c. Likely content d. Schedule e. Geographic region f. Ask (recruiting participants, employers, etc.)
11/20/2019	<ul style="list-style-type: none"> <input type="checkbox"/> Present outline for the development of a Sustainable Freight Foundations Certificate (Freight Foundations Certificate) <input type="checkbox"/> Present overview, audience, content, design, and format for a pilot certificate <input type="checkbox"/> Receive feedback on approach <input type="checkbox"/> Identify industry/agency partners for Curriculum Advisory Board <input type="checkbox"/> Identify educational and training partners to provide design and delivery options
4/29/20	<ul style="list-style-type: none"> <input type="checkbox"/> Presentation: CSFAP Workforce Development Pilot Demonstration Project: Sustainable Freight Foundations Certificate Implementation Plan <input type="checkbox"/> Group discussion and input <ul style="list-style-type: none"> o COVID-19 impacts on course planning o Learning objectives and content o Curriculum Advisory Board o Instructors o Course format + delivery o Employer partners + mentors o Nominating criteria for participants/recruitment o Opportunities for Certificate expansion
6/05/20	<ul style="list-style-type: none"> <input type="checkbox"/> Presentation: Sustainable Freight Foundations Certificate Implementation Plan Update <input type="checkbox"/> Summary of Requests for Applications <input type="checkbox"/> Summary of Preliminary Completed Applications <input type="checkbox"/> Group discussion and input <input type="checkbox"/> Review guidelines for participant selection <input type="checkbox"/> Discuss purpose and role of potential auditors <input type="checkbox"/> Discussion opportunities for future offerings (same middle

	<p>management cohort)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Discuss opportunities for certificate expansion a) Senior-Level management cohort certificate <input type="checkbox"/> Next steps: Selection of Participants; Search for Digital Skills Building Instructor; Pilot Project Launch Meeting
9/25/20	<ul style="list-style-type: none"> <input type="checkbox"/> Summary of Survey Responses (for all 6 sessions) + short video clip <input type="checkbox"/> Assignments: Highlights <input type="checkbox"/> Capstone Project: Input from working group <input type="checkbox"/> Observer Cohort Feedback <input type="checkbox"/> Issues/Concerns <input type="checkbox"/> Mindful Mobility Tech Talk: Invitation to Present 12/11 <input type="checkbox"/> Next Working Group Meeting: November for Capstone Project Presentations
11/20/20	<ul style="list-style-type: none"> <input type="checkbox"/> Presentations of Participant Capstone Projects. <ul style="list-style-type: none"> o The capstone focuses on the development of a Sustainability Plan for an asset-based trucking and warehouse company. The students will demonstrate their knowledge of freight operations, energy systems, compliance issues, sustainability KPIs and the use of financing programs.

Source: CITT

Pilot Charter

A project deliverable was a Pilot Charter. A charter supports the objective guidance of the project with a set of parameters and rules so that procedures, objectives, and roles are clearly understood by all parties. The Pilot Charter would support the Working Group, Curricular Advisory Board, project development team, and the cohort participants in creating a structured environment for collaboration. Because of the fluidity of Working Group membership and attendance, a Pilot Charter was not developed for the workforce development pilot project. Best practices would ensure that a Pilot Charter would be created at the inception of the project so that parameters and procedures are transparent and accessible.

Project Budget Adjustment

On November 13, 2017, the agreement was amended to include the development and implementation of a pilot project that would allow for the demonstration and validation of the findings from the workforce priorities report. The amended agreement included the following tasks:

- Developing a Freight Workforce Development Pilot Project Concept Paper (Concept Paper). The Concept Paper shall include an outline; identify diverse freight stakeholder needs both unique and common; and identify existing programs and sources of funding that will help support project implementation. CSU Long Beach will also identify up to

10 potential members for a Freight Workforce Working Group (Working Group).

- Preparing a Pilot Project Development Plan for developing a pilot demonstration workforce project that includes: 1) a maximum one-year implementation timeframe with milestones, deliverables, and schedule; 2) identification of partners, facility’s needs, and requisite activities; 3) performance metrics that are related to the development of long-term workforce investment priorities; and 4) lead implementer for each activity.
- Implementing a Freight Workforce Development Pilot Project (Pilot Project), which shall include, but is not limited to: implementing the Pilot Project Development Plan, convening the Working Group, developing a Working Group Charter, assessing required stakeholder partnerships, monitoring implementation, and collecting data.

This latter set of tasks were designed prior to the COVID-19 pandemic. The Project Development Plan initially assumed (and budgeted for) an in-person training but shifted to a virtual pilot once in-person gatherings were no longer feasible.

Deliverables

- Monthly progress reports
- Report identifying and prioritizing workforce opportunities associated with implementation of the Sustainable Freight Action Plan
- Career pathway maps for five related skill and training requirements in mission-critical occupations across transportation, construction, and manufacturing sectors
- Draft version of Concept Paper
- Final version of Concept Paper
- Draft version of Pilot Project Development Plan
- Final version of Pilot Project Development Plan
- A Final Report summarizing:
 - All plans and strategies developed through the workgroup meetings.
 - A detailed cost estimate for implementation of the strategies developed through this contract.
 - A detailed schedule outlining major timetable and milestones for the successful implementation of a workforce training plan.
- Data and results of the Freight Workforce Development Pilot Project.

CITT would provide guidance that can directly support the further refinement of freight workforce training activities funded through the Alternative and Renewable Fuel and Vehicles Program, now known as the CTP.

Table 3: Cost Estimate of Amended Interagency Agreement

Cost Category	Total Cost
Direct labor	\$114,586
Fringe Benefits	\$ 27,886
Total Labor	\$142,471
Travel	\$ 3,773
ODCs	\$ 320

Total Direct Charges	\$146,565
F & A	\$ 36,641
Total	\$183,206*

Source: CITT

*Total is inclusive of original \$25,000 budget

Impacts of COVID-19 on the Freight Industry

The early months of the pandemic caused contraction among both the freight industry and in the public sector (resulting in months-long furloughs and layoffs). During this time, however, this beta certificate program received high interest from across the state. The completion rate was relatively high as well (near 80%). The interest level and completion rate are discussed in chapter 4.

Curriculum Adjustment and Training Delivery

CITT's design for instruction delivery described in the Implementation Plan was unique: it offered both face-to-face and online instruction possibilities. Because of COVID-19 stay-at-home policies, however, the pilot was conducted 100% virtually from July through December 2020.

Table 4: Milestones and Timeline for the Pilot Project

This timeline assumed 100% online delivery due to COVID-19 shelter-in-place mandates.

April 2020
Meet with CSFAP working group
Create Curriculum Advisory Board
Engage labor
Identify online instructors
IT and Operations
Identify guest speakers/panelists
Establish participant requirements
Identify nomination process for participants
Establish minimum/maximum number of participants
Refine learning objectives
Deploy online survey to potential participating employers
Assess labor market value of Freight Foundations Certificate
Continue to develop course budget
Develop MOUs
Subject matter expert (SME) instructors, participating employers, participants
May 2020
Identify and recruit employers and participants
Identify mentors
Develop Pilot Certificate Project Charter

Identify and establish <ul style="list-style-type: none"> • course design • assessment • standards • performance metrics
Refine learning objectives Deploy online survey to potential participating employers Assess labor market value of Freight Foundations Certificate
Determine Continuing Education Credits (CEUs) American Planning Association CSULB CEUs
Convene the Certificate launch webinar and orientation via Zoom for participants Introduce Pilot Certificate Project Charter
Establish instruction and communication protocols Instruction for virtual instruction <ul style="list-style-type: none"> • Trello (for project management and document library) • Slack or email (general communication) Present learning objectives and content Present in-development course design, requirements, assessment, capstone structure Introduce SME instructors

June 2020
Continue to identify and recruit employers, participants, mentors
Develop course materials, including <ul style="list-style-type: none"> • Glossary • Pre-reading material
Identify and establish <ul style="list-style-type: none"> • course design • assessment • standards • performance metrics

July 2020
Meet with CSFAP working group
Match mentors with participants
Disseminate all course material to participants using Trello and Slack

August 2020
Online courses are in session (Scheduling TBD)
Deploy surveys for pilot certificate program feedback following sessions
Monitor asynchronous coursework online courses capstone project collaboration

September 2020
Monitor asynchronous coursework online courses

capstone project collaboration
Analyze survey responses

October 2020
Zoom meetings for capstone project presentations to the CSFAP working group

November and December 2020
Certificates awarded
APA or CSU CEUs awarded
Career pathway maps for 5 related skill and training requirements for mission-critical occupations across transportation, construction, and manufacturing sectors: November 20, 2020
Final report: December 18, 2020

Source: CITT

Organization of the Report

Chapter 2 presents CITT’s research process for defining and identifying occupations and workforce competencies in sustainable freight. From initial research to project’s end, the list of occupations increased nearly ten-fold.

Chapter 3 describes the activities involved with developing the Freight Certificate’s design, target audience and industry sectors, course sessions, learning objectives and content. It also includes the teams involved in the pilot: CITT research team, curriculum advisory board, instructors, participants, and observers.

Chapter 4 covers pilot program implementation. This includes the decision to select two cohorts: participants and observers. Communication platforms are also discussed, as these platforms were critical -- particularly in implementing a virtual pilot program during the COVID-19 pandemic.

Chapter 5 presents participant and observer feedback on the implementation and content of the Freight Certificate. Sample key skillsets and student learning outcomes are included, along with recommendations.

Chapter 6 shows real-world career pathways to sustainable freight jobs as reported by participants and observers. Most reported that sustainability activities were embedded in their current jobs, whether that job was in human resources, customer service, or as a fleet or terminal warehouse manager.

Chapter 7 presents this pilot project management timeline, milestones, and deliverables.

Chapter 8 presents recommendations for next generation programming based on data collected. This includes potential partnering organizations, industries, environmental and equity organizations, as well as types of programming that can accommodate the diverse workforce audiences of sustainable freight.

Appendices include a glossary for this report, deliverable reports and documents, Certificate Letter of Interest and Application, project team biographies, and final exit survey results.

Chapter 2: Critical Sustainable Freight Occupations and Workforce Competencies

The CITT research team was uniquely qualified to research critical sustainable freight occupations and workforce competencies. CITT's mission is to connect and empower the transportation workforce through focusing on education and training programs, applied research that connects labor market analysis to the transportation sector, and community engagement activities that raise awareness of transportation as a career pathway.

CITT's signature programs include its Global Logistics Professional and Maritime Terminal Operator Professional designation programs based at CSULB's College of Professional and International Education. This CITT research team includes researchers with strong industry knowledge and partnerships, in addition to experience in curriculum design for diverse audiences including incumbent workers.

Identifying Sustainable Freight Occupations

The CITT research team's initial research task was to undertake a content analysis of the CSFAP to identify relevant and key occupations in sustainable freight operations. The research team used a combination of historical federal Bureau of Labor Statistics (BLS) labor market data as well as real-time job listings (for a 12-month period) to identify occupations that were in greatest demand and where workforce development efforts would have the greatest impact because of the real and potential number of placement opportunities. To assess real-time job listings and to develop and verify findings, Burning Glass Technology's Labor Insight platform was used.³ The technology, accessed through an existing CSULB license, analyzes hundreds of millions of job listings in real time to help identify jobs, skills, and credentials in greatest demand by job category and location. It is a valuable tool to use in understanding current hiring patterns as well as longer term trends that can guide the development of education, training and workforce development programs.

The top 20 occupations identified were presented at the December 2018 Working Group meeting:

- Heavy and Tractor-Trailer Truck Drivers
- Light Truck or Delivery Services Drivers
- Production, Planning, and Expediting Clerks
- General and Operations Managers
- Logistics Managers
- Industrial Engineering Technicians
- Maintenance and Repair Workers
- General Cargo and Freight Agents
- Logistics Analysts

³ Labor Insight analyzes occupations and their required skills in real time and tracks more than 40,000 sources of job postings on job boards and corporate websites.

- Storage and Distribution Managers
- First-Line Supervisors of Transportation
- Material-Moving Machine and Vehicle Operators
- Transportation Managers
- Computer Systems Analysts
- First-Line Supervisors of Helpers, Laborers, and Material Movers
- First-Line Supervisors of Production and Operating Workers
- Database Administrators
- Commercial Pilots
- Civil Engineers
- Operations Research Analysts
- Transportation Planners

After presenting this initial research, the Working Group organized this list into key industry clusters to facilitate further analysis:

- Trucking/mechanics
- Logistics
- Information Technology/Data Management/Analytics Advanced Manufacturing
- Engineering/Electronics
- Infrastructure Planning and Development

Under the direction of the Working Group, it was decided that the analysis should only focus on private sector operators. This eliminated Infrastructure Planning and Development as a key cluster for purposes of further analysis. Further, the demonstration pilot project was to focus on the following:

- emerging occupations tied to disruptions within the next ten years;
- new technologies associated with zero-emission vehicles; and
- tech skill transfer methods for lower-skilled workers in entry and middle-skill (defined as occupations requiring more than a high school diploma, but less than a four-year university degree) occupations.

With these parameters, the occupations to be targeted would be largely in trucking and logistics. From the outset, the Working Group expressed an interest in ensuring that the workforce component of the CSFAP go beyond the port sector while acknowledging that this sector was a key driver of freight activity in the State.

Identifying Sustainable Freight Workforce Competencies

From December 2018 through October 2019, CITT researchers consulted industry and educational partner stakeholders, performed literature reviews, scanned related sustainable freight programs nationwide, and referenced pertinent job postings across industries to determine competencies for sustainable freight. CITT also conducted on-site visits to companies such as Flexport, Los Angeles Harbor Grain Terminal, the Long Beach Container Terminal, and two CTP educational sites⁴ to further gather data about

⁴ Alternative Fuels Program at Rio Hondo College and the International Brotherhood of Electrical Workers (IBEW)

occupations, competencies, and possible career pathways.

Initial Proposal for CSFAP Training Pilot

In June 2019, CITT identified four potential CSFAP workforce development demonstration pilots and requested the Working Group select one to further develop into a pilot:

- Sustainable Freight
- Compliance
- K12 and Community College Curriculum Development for Mechatronics Technicians for Cargo Handling Equipment (CHE), Material Handling Equipment (MHE), and Trucks
- Energy Foundations

Sustainable Freight

CITT identified a need for professional development workshops in sustainable freight for public and private sector planners (including those from agencies such as CARB and Caltrans) who develop, implement, and enforce regulations affecting freight. Although these occupations are not entry or middle-skill -- a working group-directed criteria for this demonstration project -- this need for education and training in sustainable freight issues is critical, with the growth in last mile deliveries, faster fulfillment demands, and the development of infrastructure required to support this movement of freight. Targeted training concentrating on freight issues could inform policy makers of the implications planning decisions have on economic competitiveness and environmental sustainability.

Compliance

A common requirement across most job postings related to sustainable freight showed a preference for employees with a knowledge of compliance. These findings indicated a strong demand for a workforce development model with an emphasis in compliance to establish a more efficient, sustainable, transparent, and secure freight transport system. The role of compliance is identified as applying compliance knowledge and "translating" that to operations, acting as a liaison between the compliance department and operations. Compliance managers are critical for front line supervisors to monitor various energy, efficiency, security, and emission standards.

K12 and Community College Curriculum Development for Mechatronics Technicians for Cargo Handling Equipment (CHE), Material Handling Equipment (MHE) and Trucks

Mechatronics is the combination of mechanical engineering, electrical engineering, electronics, information technology and systems thinking utilized in the design of products and automation processes. Training programs for mechatronic technicians for CHE, MHE, transit, and trucks can align with programs offered by the National Center for Supply Chain Automation (NCSCA). The research also revealed a large number of training programs targeting the development of these technical skills exist at the community college level.

Energy Foundations Certificate

Another possible demonstration project presented was an energy foundational certificate program offered to entry- and middle-skill workers in jobs associated with the freight industry. This program would offer a suite of foundational skills common to the occupations identified --

including skills related to safety and compliance -- and could provide an overview of various alternative energy platforms.

Middle Managers as Focus

In August 2019, the Working Group directed the CITT research team to focus on a pilot that developed workforce capacity within freight and logistics middle management occupations, addressing a workforce gap identified by industry. Additional direction included the incorporation of compliance and energy foundations components into the pilot project.

By May 2020, the CITT research team developed an Implementation Plan for the Sustainable Freight Foundations Certificate Pilot Workforce Project, which is described at length in this report.

Labor and Apprenticeships

The Working Group discussed organized labor as part of this pilot project, community workforce agreements, and the Related Technical Instruction (RTI) component of a potential apprenticeship program.⁵ The timeline for implementation, particularly for registered apprenticeships and the coordination needed for programs involving unionized labor, exceeded the resources and time available for the pilot project. The Trump Administration's E.O. 13801 supporting the development of industry recognized apprenticeships (IRAPs) was also discussed and considered but was not included as it was still in the nascent phase with guidance from the federal Department of Labor still in development at the time of the pilot project.⁶

Scan Of Other Freight-Related Workforce Development Programs

In reviewing related freight management programs (immediately below), CITT found no program offering both an introduction to regulatory compliance and energy infrastructure tailored specifically for middle managers. This review has informed the development of the Freight Foundations Certificate and helped to identify the gaps it can potentially fill.

CITT Global Logistics Professional (GLP) Program Courses

The GLP Program provides a strong foundation in freight systems but does not offer curricular content in energy systems. The program, by design, is broad-based. The Freight Foundations Certificate has a narrower focus in that it targets middle managerial level positions. CITT is drawing from subject matter expert instructors in the Global Logistics Professional (GLP) program, jointly offered by CITT and CSULB's College of Professional and International Education (CPIE) as well as the Master of Science in Supply Chain Management to develop and implement the pilot. Freight Foundation Certificate instructors cover the following topics in the GLP program:

- Logistics and Transportation Management
- Greening the Supply Chain
- Legal Issues in Freight
- Transportation Infrastructure and Environmental Issues

⁵ Related Technical Instruction (RTI) provides the classroom learning component of a Registered Apprenticeship. RTI is provided in addition to the on-the-job (OJT) training.

⁶ In February 2021, President Biden rescinded E.O. 13801, the Trump Administration's IRAP workforce development program.

- Regulatory and Environmental Issues
- Requirements of U.S. DOT/FMCSA (Federal Motor Carrier Safety Administration)

Transportation Management Certificate (Rutgers University)

Rutgers University, through the Edward J. Bloustein School of Planning and Public Policy, offers a Transportation Management: Vulnerability, Risk and Security Certificate developed and presented by a coalition of faculty and staff from Rutgers School of Engineering, the School of Arts and Sciences, and Rutgers Biomedical and Health Sciences. Required courses include Public Transit Planning and Management and Hazard Mitigation and Planning. In addition, students take a minimum of three (3) electives. Elective course offerings include: Transportation and the Environment; Security and Safety in Maritime Transportation and Port Operations; Rail Transport Systems; Engineering Risk Analysis in Multimodal Transportation Systems; and Risk Communication.

Certificate Of Accomplishment In Freight Management And Operations, National Highway Institute (NHI)

Requirements for this Certificate of Accomplishment include 5 courses encompassing 7 days in addition to an online learning component. Related courses include: Integrating Freight in the Transportation Planning Process; Advanced Freight Planning; Uses of Multimodal Freight Forecasting in Transportation Planning.

NAFA (Fleet Management Association) Fleet Management Sustainability Certificate

This NAFA-sponsored Certificate requires completion of 6 courses with a 50-question multiple choice exam: Building a Sustainable Fleet Program; Sustainable Driver Training; Sustainable Fleet Metrics; Sustainable Leadership and Change Management; Using and Tracking Fuel to Support Sustainability; and Acquiring a Sustainable Fleet: Strategic Mobility Concepts. Instruction is via PDF articles, webinars, and study guides.

1-95 Corridor Coalition Certificate

This Certificate was one week in duration and required pre-reading and a group capstone project. Topics presented included Urban Freight Dynamics And Future Freight Trends; Freight Modeling/Generation; Familiarity With Freight Stakeholders; Land Use And Freight Relationship; and Strategies To Mitigate Freight Impacts.

Caltrans Freight Academy

CITT developed professional development sessions for Caltrans staff over a period of four days. Topics included Freight Planning Perspectives and Challenges; Changing Geography and Economics of Logistics; and Freight Data and Performance Measures.

CITT Battle For The Curb

CITT developed a program with Metropolitan Planning Organization staff members over a period of three days. Topics included the State of the Supply Chain and the Role of Freight Planning at the Municipal Level.

Industry-Identified Occupation Titles

Sustainable freight workforce development is rapidly evolving and expanding to include occupation titles not previously identified or associated with the freight industry. The CITT team researched and updated industry occupation titles, when used in targeted, real-time analytical searches or online job searches, to provide for more accurate and relevant data on

workplace competencies. An important side note is that the Bureau of Labor Statistics (BLS) is currently revising its Standard Occupational Classification (SOC) system to reflect current occupational titles. Some of the occupation titles listed below are therefore not yet listed with the BLS. CITT used some of these newer occupational titles to refine the online job posting searches.

In addition, CITT researched seaport-to-warehouse middle-skills⁷ workforce development needs for the Southern California region upon receiving grant funding provided by the State of California⁸ through the California State University Transportation Consortium. As part of the survey administered to industry, CITT asked for the current occupational titles of jobs including those involved with regulatory compliance, front/back office, data management, and operations and maintenance.⁹ Many of these jobs involve tasks related to addressing sustainability within their organizations. Pilot program participants and observers also contributed occupation titles as part of their final exit surveys. A combination of occupation titles are listed below, aggregated by industry sector. The list for warehousing and retail is extensive and can be applied to a variety of industries that involve freight. Trucking/drayage, warehousing, retail, ports, airports, airlines, rail, tug and barge, industry associations, and public agencies are represented below. This list of over one hundred identified titles is not exhaustive and not limited to middle-skill workers or middle managers but shows the range of occupations within establishments that require skill sets in regulatory compliance, data management, operations and maintenance, and front/back office functions. The inclusion of c-suite titles may be indicative of smaller businesses requiring workers to wear many hats, including those required of executives. Further research requires examining sustainability job tasks required of retailers.

Table 5: Industry-Identified Occupation Titles Related to Sustainable Freight

<i>Sea and Inland Ports:</i>	
<ul style="list-style-type: none"> • Port Engineer • Port Captain • Port Manager • Fleet Manager • Superintendent • Port Captain • Port Manager 	<ul style="list-style-type: none"> • Terminal Manager • Terminal Safety Director • Superintendent • Manager, Air Quality Practices • Environmental Specialist • Health & Safety Director • Director of Trade Development
<i>Tug and Barge:</i>	

⁷ Middle-skills occupations refer to those that require more than a high school diploma, but less than a four-year college degree.

⁸ Senate Bill 1, Transportation Funding (2019-2020)

⁹ Tom O'Brien et al., "Southern California Regional Workforce Development Needs Assessment for the Transportation and Supply Chain Industry Sectors" (Mineta Transportation Institute, October 2020), <https://doi.org/10.31979/mti.2020.1921>.

<ul style="list-style-type: none"> • Vessel Agents • Inlandboatmens Union (IBU) • Schedulers • Equipment Sales Representative • Tank Barge Manager • Customer Service Reps 	<ul style="list-style-type: none"> • Management/Supervisor Trainees • Regulatory Compliance Personnel • Dispatchers • Terminal Managers • Fleet Manager
<i>Trucking/Drayage:</i>	
<ul style="list-style-type: none"> • Dispatcher • Operations Manager • Business Owners 	<ul style="list-style-type: none"> • Executive VP • Chief Operations Officer • Operations Manager
<i>Warehousing, Retail, Freight Forwarders:</i>	
<ul style="list-style-type: none"> • Customer Sales • Customer Service • Business Analyst • Systems Support • Dispatcher • Logistics Coordinator • Fleet Engineer • Fleet Manager • Operations • Systems Support • Safety and Maintenance Engineer • Safety and Enterprise • Logistics Coordinator • Account Manager 	<ul style="list-style-type: none"> • Chief Executive Officer (CEO) • Chief Technology Officer (CTO) • Chief Finance Officer (CFO) • Regulatory and Compliance • Food Safety Coordinator • Functional Manager • Traffic Supervisor • Product Acquisition • Implementation Manager • Administrative Analyst • Equipment Coordinator • Health, Safety, Quality, & Environment (HSQE) Specialist • Documentation Manager • Vice President, Safety and Enterprise
<ul style="list-style-type: none"> • Principal • Chief Operations Officer • Operations Supervisor • Warehouse Managers • General Manager • Warehouse Supervisor • Inventory Supervisors • Human Resources Manager 	<ul style="list-style-type: none"> • Maintenance Specialist • Safety, Security, and Environment (SSE) • Senior Director, Logistics and Customer Compliance • Director, Global Operations • Ocean Export Manager • Planning and Business Sustainability • Special Projects
<i>Airports:</i>	

<ul style="list-style-type: none"> • Senior Strategic Planner • Airport Engineer • Airport Planner 	<ul style="list-style-type: none"> • Sustainable Campus Division • Environmental Supervisor • Environmental Specialist
<i>Airlines:</i>	
<ul style="list-style-type: none"> • Managers 	
<i>Rail:</i>	
<ul style="list-style-type: none"> • Director of Environmental Permitting and Sustainability 	<ul style="list-style-type: none"> • Environmental Permitting and Sustainability
<i>Emergency Operations:</i>	
<ul style="list-style-type: none"> • Emergency Operations Personnel 	
<i>Industry Associations:</i>	
<ul style="list-style-type: none"> • Manager, Government Affairs 	
<i>Public Agencies:</i>	
<ul style="list-style-type: none"> • Transportation Planners (Senior, Associate, Entry) • Goods Movement Liaison • Mayor’s Office of Sustainability • Office of Economic Development • Transportation Manager • Environmental Planner – General • Associate General Planner – General • Senior Environmental Planner • Environmental Specialist • Regional Planner • Air Resources Supervisor 	<ul style="list-style-type: none"> • Energy Commission Specialist • Manager, Government Affairs • Planner • Economic Development Officer • Freight Technology Unit: Supervisor • Energy Commission Specialist • Sustainable Transportation Grant Manager • Traffic Safety Engineer • Safety and Traffic Engineer • Chief, System Planning • Manager, Freight Policy
<ul style="list-style-type: none"> • Air Resources Engineer • Air Pollution Specialist • Air Quality Specialist 	<ul style="list-style-type: none"> • Modeling • Procurement Manager
<i>Shipping Companies:</i>	
<ul style="list-style-type: none"> • Area Sales Manager 	<ul style="list-style-type: none"> • Office Manager

Source: CITT

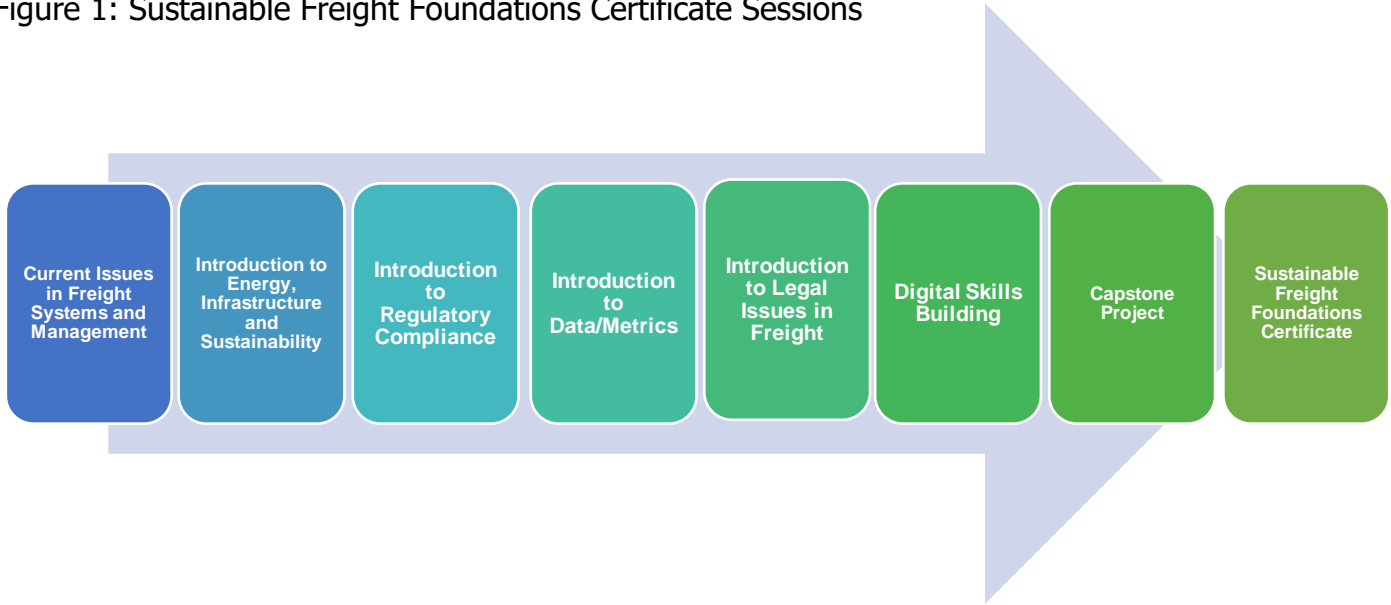
Table 5 is an initial and representative identification of occupation titles in sustainable freight. This list of over one-hundred occupation titles points to the prevalence of sustainable freight job tasks within occupations across multiple industry sectors and managerial levels.

These foundational skills required in sustainable freight – regulatory compliance, front/back office, data management, operations and maintenance -- can be portable (or interchangeable) between sectors and range of management levels. Skills can also be stacked: They can be incrementally developed according to task and level of management. Viewing sustainable freight skill sets as foundational opens up new possibilities to incorporate workforce development programming. Beyond the technical training required, workforce development in sustainable freight requires leadership training in building teams and motivating staff to promote sustainability within an organization. Workforce development in sustainable freight can be viewed as an agent of change within organizations.

Chapter 3: Freight Certificate

Design

Figure 1: Sustainable Freight Foundations Certificate Sessions



Source: CITT

Session #1: Current Issues in Freight Systems and Management

Instructor: Tom O'Brien (Biography is in Appendix B.)

Learning Objectives: To provide students with foundational knowledge in both the macro and micro social, economic, and environmental trends influencing the behavior of the supply chain and its stakeholders. This includes the continuous rise of e-commerce and what it means for the purchasing, warehousing, and delivery dynamics for rail, air, drayage, and ports. Students will also understand the roles, responsibilities and limitations of various public and private sector actors involved in managing and overseeing the flow of goods. The goal is to develop knowledge that contributes to more effective decision making in the workplace. This topic provides necessary context for some of the items addressed in further detail in subsequent topics.

Content:

- Language and Geography of the Supply Chain
- Stakeholders in the Supply Chain
- Supply Chain Trends
- Impact of COVID-19
- Freight Systems and Sustainability
- Group Activity

Session #2: Introduction to Energy, Infrastructure, and Sustainability

Instructor: Kevin Maggay (Biography is in Appendix B.)

Learning Objectives: To provide students with current, up-to-date knowledge of requirements and trends in energy, infrastructure, and sustainability as it pertains to various goods movement facilities and operations; and to provide students with information to make decisions within organizations based on the requirements of customers, service providers, and industry peers.

Content:

- Drivers of Requirements/Trends
- Technology Overviews
- Alternative Fuel and Infrastructure Requirements
- Capital/Operating Costs
- Operational Benefits/Impacts
- Key Stakeholders/Partners

Session #3: Introduction to Regulatory Compliance

Instructor: Matt Schrap (Biography is in Appendix B.)

Learning Objectives: To present information for students to acquire necessary tools to identify the specific regulatory agencies and subsequent programs that directly impact or influence day-to-day operations of transportation and/or warehousing and distribution providers; and to support students in developing a basic understanding of policy formulation, implementation, and enforcement of applicable programs and insight into the history, structure, makeup, and jurisdiction of appropriate state, local, and federal agencies.

Content:

- History of Air Quality Policies in California
- History of Federal Air Quality Policies
- Air Resources Board (CARB) Mission, Effort, Actions
- CARB Actions & Section 177
- CARB In-Use Standards

Session #4: Introduction to Data and Metrics

Instructors: Kevin Maggay and Matt Schrap

Learning Objectives: To provide strategies for collecting, interpreting, and utilizing data to develop metrics and targets that benefit single facilities or organizations as a whole; to find and assess data; to develop and integrate metrics.

Content:

- Discussion on your Metrics
- Data Overview
- Metrics Overview
- Metrics in Processes
- Key Performance Indicators (KPIs)
- Freight Metrics
- Presenting Information

Session #5: Introduction to Legal Issues in Freight

Instructor: Cameron Roberts (Biography in Appendix B.)

Learning Objectives: To gain practical knowledge about the common pitfalls of a domestic and international freight shipment and to learn how to protect a company's interests through planning, negotiating, contracting, and managing risk, focusing on the resource needs of small- and medium-sized-enterprises.

Content:

- Modes and Authorities of International and Domestic Transportation
- What is Sustainable Freight?
- Transportation Intermediaries, Infrastructure, Intermodal Movement
- Shifting Risk
- Sustainable Freight Contracting
- Analysis and Model Contract Drafting

Session #6: Digital Skills Building

Instructor: Sue Dexter (Biography in Appendix B.)

Learning Objectives: To apply Excel applications in freight operations and management and present data using graphics; learn to apply skills in manipulating, analyzing, and presenting data using Excel.

Content:

- Pivot Tables
 - Getting Data ready for pivot
 - Creating a pivot
 - Connecting to data (combining from multiple sources)
 - Summarizing/sorting/filtering data
 - Pivot charts (basic)
- Vlookup
- Data Visualization (Charts / Graphs)
- Useful Formulas: Rank, Sumif, Min, Max

Capstone Project

Instructors: Matt Schrap and Kevin Maggay

Learning Objectives: As a collaborative effort, this Capstone Project will address topics identified by industry subject matter experts as critical to sustainable freight and will use industry-vetted benchmarking and key performance indicators (KPIs). This project would demonstrate the use of knowledge and skills garnered from the course of study.

Using the peer mentor groupings, participants will work remotely in groups of 3 or 4 over a 4-week period, with an estimate of 8 to 10 hours of homework per participant. The CAB, capstone instructors, and CITT research team will convene meetings to discuss objectives, parameters, and assessment for this final assignment.

The teams will be tasked with developing a sustainability outline addressing the triple bottom line (People, Profit, Planet) of a fictitious drayage and warehousing company servicing the ports and the Inland Empire (an area that has a dense concentration of warehousing in Southern California). Participants also will create KPIs and develop a plan to transition fleets and material handling equipment to clean fuels usage. This last task would require the use of Excel data manipulation and presentation skills that were taught in the Digital Skills Building session.

The teams will present their PowerPoint presentations to the Working Group in November 2020.

Target Audience

Small- and medium-sized companies were the primary focus. Freight industry sectors that were targeted included drayage, trucking, rail, manufacturers (OEMs), freight forwarders, distribution and warehousing, terminals, and transloading facilities. Targeted occupations included middle-managerial level positions (not for c-suite managerial level positions). This pilot focused on incumbent workers. Note that the list below is the targeted audience CITT used for applications, prior to implementation. Through research gathered during implementation, there are now over 100 occupational titles associated with sustainable freight (see Table 4).

- Facilities Managers
- Fleet Coordinators/Managers
- Compliance Managers
- Safety and Security Operations Managers/Safety, Security, and Environmental (SSE) Compliance Managers
- Documentation Managers
- Maintenance Managers
- Environmental Planners
- Transportation Planners/Managers
- Freight Program Managers
- Land Use Planners

Recommendation

For future programming, incorporate the updated list of occupation titles provided in this report.

Delivery Format

Due to the COVID-19 pandemic, all sessions were online using Zoom video conferencing, CSULB's BeachBoard, and Slack as platforms. Email was also used to communicate. All instructor-led synchronous sessions were on Fridays from 1:00 to 4:00 on 8/7, 8/14, 8/21, 8/28, 9/11, 9/18. Participants attended two meetings prior to online class sessions (6/26 and 7/31).

Instructors assigned both group and individual homework assignments that were submitted via BeachBoard, Slack, or email.

Pilot Project Participation

CITT Research Team

CITT has extensive experience providing transportation and logistics labor market research and workforce development programming, as described in chapter 2. (CITT research team biographies are in Appendix B.)

Table 5: CITT Research Team

<i>Name</i>	<i>Affiliation</i>	<i>Title</i>
Dr. Tom O'Brien	CSULB CITT	Executive Director
Deanna Matsumoto	CSULB CITT	Education and Workforce Program Developer
Diana Sanchez	CSULB CITT	Research Associate
Eleni Hala	CSULB CITT	Research Assistant

Source: CITT

Curriculum Advisory Board (CAB)

The members of the CAB include subject matter expert representatives from industry and energy policy who provided expertise in the areas related to the curricular content. CAB members also were education and training providers who advised on course delivery, design, implementation, assessment, and replicability. The role of the CAB is to provide input and advice by making recommendations that will shape the quality of this pilot certificate to prepare middle managers with skills aligned with industry. (Biographies are included in Appendix B.)

Duties included the following:

- Attend approximately 4 (60 minute) Zoom meetings between June and November of 2020
- Participate in capstone presentations via Zoom in November of 2020
- Provide recommendations regarding the development of course content and delivery
- Assist in identifying mentors for participants*

*CITT later decided to use the model of peer mentors because of the difficulty identifying mentors in the freight industry during the early stages of the COVID-19 pandemic.

Table 6: Curriculum Advisory Board

Name	Affiliation	Title
Brian Trice	Columbia-Willamette Clean Cities Coalition	Executive Director
Bruce Noble	California Communities Colleges	Regional Manager for Employer Engagement, Energy, Construction & Utilities Sector- California Community Colleges
Shrayas Jaktar	California Workforce Development Board (CWDB)	Policy Specialist at the California Workforce Development Board
Larry Rillera	California Energy Commission	ZEV manufacturing, Workforce, and Equity
Frank Ramirez	Office of Governor Gavin Newsom, GoBiz	Deputy Director, Goods Movement and Sustainable Freight

Source: CITT

Recommendations

The CITT team reached out to a member involved in an equity organization and women subject matter experts in the freight industry so that there would be more diversity on the CAB. Unfortunately, this outreach was conducted at the beginning of the COVID-19 pandemic, and those identified were not able to commit to this round of the project. Strategic and earlier outreach should be planned for future programming to include women and the representatives of equity/Environmental Justice communities.

Instructors

Instructors are subject matter experts with decades of experience who have taught in the Global Logistics Professional (GLP) Designation Program (formerly the Global Logistics Specialist and the Martine Terminal Operations Professional Programs) at the College of Professional and International Education (CPIE) at California State University at Long Beach. Their expertise aligns with the identified critical issues in sustainable freight that form the basis of the certificate. (Biographies are included in Appendix B.)

Table 7: Instructors

Name	Affiliation	Title
Tom O'Brien	CSULB CITT	Executive Director
Kevin Maggay	SoCalGas	Program Manager, Energy and Environmental Affairs
Matt Schrap	Velocity Vehicle Group; California Fleet Solutions	President, California Fleet Solutions & VP Government Programs, Crossroads Finance, Velocity Vehicle Group

Cameron Roberts	Roberts & Kehagiaras LLP	Managing Partner
Sue Dexter	CSULB CITT Global Logistics Professional Program	Lead Instructor and Capstone Director

Source: CITT

Recommendations

In terms of selection, a participant recommended that the instructors come from diverse industry sectors to provide a broad range of industry perspectives.

Participants

Participants were practitioners (working in freight operations, rather than in freight policy) and were chosen from parameters described in chapter 4. One participant had formerly worked in manufacturing, with a logistics background, but was unemployed. (As the roll out of this program came shortly after the heels of the stay-at-home orders, a few participants did lose jobs. Nearly all participants were furloughed, or their establishments required contraction.)

Table 8: Participants

Name	Affiliation	Title
<i>Jessica Alvarenga</i>	Pacific Merchant Shipping Association (PMSA)	Manager, Government Affairs
<i>Tina Backstrom</i>	Los Angeles World Airports	Strategic Planning Manager
<i>Ilyass Boukfri</i>	Universal Truckload Inc	Logistics Coordinator
<i>Morgan Caswell</i>	Port of Long Beach	Manager of Air Quality Practices
<i>Matthew Clark</i>	SSA Pacific Inc	Terminal Manager, Port of West Sacramento
<i>Ronald Costin</i>	Foss Maritime Company	Fleet Operations Manager
<i>Franklyn Harris</i>	Trans-Hold Inc. (A Carrix Enterprise)	Manager
<i>David Hauser</i>	Harbor Division	Vice President
<i>Kimia Khatami</i>	Pacific Harbor Line Railroad	Director of Customer Service
<i>Angel Liu</i>	N/A	N/A
<i>Andrea McKinney</i>	Commodity Forwarders Inc	Food Coordinator and Special Projects
<i>Henry Mayor</i>	Mayor West Coast, LLC	
<i>Ramon Torres</i>	Golden State Logistics	Operations Supervisor
<i>Loc Truong</i>	BNSF Railway	Manager of Environmental Permitting

Source: CITT

Observers

Observers were from public sector agencies, focusing on freight issues and/or environmental policies. Their roles and functions were not in freight operations. (Refer to chapter 4 for a further discussion of this cohort.) They provided feedback on the course content based on

public sector workforce needs.

Table 9: Observers

<i>Name</i>	Affiliation	Title
<i>Christopher Eaves</i>	Eaves Transportation	Principal
<i>Dillon Miner</i>	California Air Resources Board	Air Pollution Specialist
<i>Hector Rangel</i>	District 6 Caltrans	District Freight Liaison & Goods Movement Coordinator
<i>James Shankel</i>	California Department of Transportation/District 7	Senior Freight Specialist
<i>Michael Joseph</i>	California Transportation Commission	Planner/Program Analyst
<i>Stephen Yoon</i>	Southern California Association of Governments	Senior Regional Planner
<i>Zeron Jefferson</i>	Department of Transportation Caltrans	Associate Transportation Planner
<i>Larry Rillera</i>	California Energy Commission	ZEV manufacturing, Workforce, and Equity
<i>Frank Ramirez</i>	Office of Governor Gavin Newsom, GoBiz	Deputy Director, Goods Movement and Sustainable Freight
<i>Michelle Vater</i>	California Energy Commission	Supervisor, Freight and Transit Unit
<i>Alec Kimmel</i>	California State Department of Transportation (Caltrans), District 06	District 06 Branch Chief, System Planning

Source: CITT

Chapter 4 : Pilot Project Implementation

This chapter describes how CITT implemented the Freight Certificate, from disseminating the letters of interest, the application and selection processes, and surveys for content feedback. This chapter also includes an explanation of the decision to select two cohorts: participants and observers. Communication platforms are also discussed, as these platforms were critical, particularly in implementing a new project during the COVID-19 pandemic where instruction was wholly online. Support strategies, such as peer mentoring and providing pre-reading materials, are also discussed.

Letters of Interest

The pilot program was marketed through industry associations, LinkedIn¹⁰, the Governor’s Office website, Chambers of Commerce, California Freight Advisory Committee (CFAC), and statewide CITT contacts, both public and private sector. The strategy was to cast a wide net to see what type of businesses and organizations responded to the letter of interest to gauge interest in the pilot.¹¹ CITT received 51 requests within a 7-day period between May 15 and May 22, 2020. Twenty-one of the responses were from the private sector (40%) while 30 (60%) were from the public sector.

The CITT team received requests from organizations for multiple applications. These organizations were informed that only one staff member per entity could apply.

Table 10: Establishments Requesting Applications

Public Entities	Private Entities
LA Metro	Golden State Logistics (GSL)
Southern California Association of Government (SCAG)	TransWorld Shipping
Port of Long Beach (POLB)	Universal Truckload
Port of Los Angeles (POLA)	Western States Petroleum Association
Los Angeles World Airport (LAWA)	Pacific Harbor Line Railroad (PHL)
Port of West Sacramento	Expeditors
CA DOT, District 7, 8	Transhold, Carrix/SSA Marine

¹⁰ An American business and employment-oriented online service that operates via websites and mobile apps. Launched on May 5, 2003, the platform is mainly used for professional networking, and allows job seekers to post their CVs and employers to post jobs

¹¹ A letter of interest is a letter of inquiry or a prospecting letter to gauge interest.

U.S. Maritime Administration	Ocean Network Express (ONE)
Santa Clara Valley Transportation Authority	Hot Topix/Box Lunch/Her Universe
CA Air Resources Board	Foss Maritime
San Diego Association of Governments (SANDAG)	Mayor USA Logistics/Trucking
California Energy Commission	Harbor Division Drayage
CA Department of General Services	MOMENTUM
CA Transportation Commission (CTC)	Pacific Merchant Shipping Association
Placer County Transportation Planning Agency	CFI Perishables
	Kew Consultants
	Rock-it Cargo
	Burlington Northern Santa Fe Railroad (BNSF)
	Eaves Transportation

Source: CITT

The Application Process

CITT sent out applications to all who responded to the letter of interest. Applicants were asked to complete an application that had further queries about competencies and learning objectives that the potential participant and the supervisor had to complete. (The application is in Appendix I.) Instructors used the responses and examined the participant list to develop content customized to this cohort. Questions included the following:

- Describe how this Freight Foundations Certificate will support workforce development efforts at their organization/company.
- What are the state, local and federal regulatory agencies you deal with in the course of your normal job?
- Is there a particular agency, agencies, or other jurisdictional authorities you are interested in knowing more about?
- Does the company you work for own any diesel fueled or alternative fueled (Nat. Gas, ZEV, Hydrogen) equipment?
- To your knowledge, does the company you work for report equipment information (usage, age, location etc.) to 3rd parties or any state, local or federal regulatory bodies?
- To your knowledge, does your company report other information, not

equipment related, to 3rd parties or any state, local or federal regulatory bodies?

- Do you currently hold any certifications related to your work duties or otherwise?
- What applications/programs do middle managers at your organization or company use most frequently?
- What applications/programs will be critical in the near-term future for middle managers at your company or organization? Does your organization need training and workforce development for these applications and programs?

Participants were also provided the requirements for acceptance:

- Participants agree to attend all online class sessions (100% virtual). All instructor-led synchronous sessions will be on Fridays from 1:00 to 4:00 on 8/7, 8/14, 8/21, 8/28, 9/11, 9/18.
- Participants agree to attend 2 meetings prior to online class sessions (both virtual). Tentative Dates – 6/26 and 7/31, times TBD.
- Participants (and their employers, if applicable) agree to provide input to assist in the development of course content.
- Participants agree to provide feedback after each session to assist in informing future curriculum.
- Participants must complete all assignments, including the Capstone Project. (The Capstone Project will be assigned and led by subject matter expert instructors. Participants will work in assigned teams to complete the project.)

The Selection Process

A selection/evaluation committee was established to choose participants based on criteria presented and discussed at a Working Group meeting involving Curriculum Advisory Board members, instructors, CITT staff, and volunteers from the Working Group. The criteria for participant selection ensured that the candidate 1) is from a targeted industry identified in the Implementation Plan (which focused on freight operations); 2) in middle-management; and 3) from the private sector. Exceptions were made to the last criterion, allowing for a Los Angeles World Airways (LAWA) and a Port of Long Beach (POLB) manager to participate because their jobs entailed equipment conversions to clean energy, and in the case of LAWA, to support their clean fleet initiative.

The Selection Committee chose a cohort of 14. There was near-parity in terms of gender, with 6 out of the 14 women (43%), with the same number of minorities. The statewide geographic distribution figures show that 70% of the participants (10) were from Southern California, while 14% (2) were from Central California. Two (14%) participants were from out-of-state: employees from BNSF and Universal Truckload. These organizations have operations in California and after discussions with the Working Group, were included as participants. Note that CEC funding has no restrictions on out-of-state participants.

In the application process, participants described how this Freight Foundations Certificate will support workforce development efforts at their organization/company. Participants responded this pilot would support their efforts to:

- Plan, design, and deploy nascent technology at the ports
- Boost clean fleet operations and reduce emissions from cargo/freight operations
- Learn energy infrastructure trends for the electrification of equipment
- Enhance managers' ability to identify new business opportunities
- Partner with the state of California to gain broad understanding of regulations and legal issues that would impact future capacity projects in the state
- Address management trend that dictates smaller, diverse management teams (rather than a multitude of specialists)
- Learn to interface with the public, customers, regulatory bodies, and unions as subject matter experts
- Understand regulatory compliance, energy use, and reducing the company's carbon footprint will pose significant challenges, along with cost measures that make the deliverable products affordable to the end users
- Bring back tools to my team and to management to support building roadmaps for each emissions source category and more effective deployments of pilot and large-scale technology
- Understand trends in the trucking industry for more efficient deployment
- Understand data and metrics to improve cargo flow
- Network

Data on the Target Audience: Responses to the Letter of Interest

Although the Implementation Plan targeted first-level or middle managers, many second- and third-level senior management personnel responded to the call for applications. Feedback received from participants and observers were that many times, first-level managers are not receiving communication from state agencies such as GO-Biz, the CEC, and Caltrans. As a result, more senior managers who receive these announcements will identify and select first-level managers to participate. Also, since this is a unique and new program, more senior managers may have wanted to learn more about the program prior to either participating or assigning this program to a lower-level manager. The list below captures the titles of respondents showing interest in the program:

Respondents' Occupation Titles

- Chief, System Planning
- Manager, Freight Policy
- Senior Manager
- Senior Regional Planner
- Vice President
- Manager, Air Quality Practices
- Office Manager
- Independent Agent
- Senior Strategic Planner
- Senior Director, Logistics and Customer Compliance

- Director, Customer Service
- Terminal Manager
- President/Owner
- Operations Manager
- Director of Trade Development
- Director, Global Operations
- Senior Transportation Planner
- Associate Planner
- Research Associate
- Ocean Export Manager
- Manager of Environmental Permitting & Sustainability
- Planning & Business Sustainability

Regional Distribution of Responses

Responses to the Letter of Interest include organizations located in the following AB 617 (CARB’s Community Air Protection Program) communities: South Central Fresno, Stockton, San Bernardino/Muscoy, Wilmington/Carson/West Long Beach.

Table 11: Regional Distribution of Responses

Regional Distribution	# of Requests
Southern California (including Inland Empire)	24
Sacramento	9
Stockton	1
Fresno	1
San Jose	1
Placer County	1
San Diego	1
Washington D.C./Virginia	1
New Orleans, LA	1
Seattle, WA	1
Las Vegas, NV	1
geographic location and organizations not provided	5+

Source: CITT

Recommendations

The responses of interest tilted towards higher levels of management than initially targeted. If the target is first-level managers, marketing should target their supervisors as they are the staff that would be identifying potential participants. Marketing should then be targeted at multiple levels of management, including senior management. Focused marketing in equity

and in Environmental Justice communities should also be prioritized.

Observer Cohort

Many of the applicants are involved in public sector freight and/or environmental policy and their current roles and functions were not in freight operations. As one applicant wrote,

“My organization does not focus on the hands-on work that allows for freight to happen, but rather focuses on the regulations, education, and advocacy for the sustainable component of freight.”

The discussion and decision to include an observer cohort was made at a Working Group meeting and supported by the CAB in an effort to gather more information by selecting candidates who could observe sessions and provide feedback.

Activities required of observers included the following:

- Review course material and learning objectives
- Take all online classes: asynchronous, with time stamped recordings
- Respond to targeted survey questions by providing regularly scheduled feedback via SurveyMonkey
- Attend monthly 1-hour Zoom meetings to discuss learning objectives and content relevant to observer’s organization
- Solicit input from supervisors for future programming in sustainable freight management
- Submit all feedback by December 11, 2020

Instruction and Communication Tools

Constant and timely communication with all participants was key to an effective, customer-focused program. The following platforms were used, with varying degrees of effectiveness.

- **Zoom Video Communications** was used as the online teaching platform as this pilot was totally virtual. Some organizations did not support this platform. However, with the stay-at-home policies, participants were able to use their laptops or phones to participate in the sessions. There are some organizations that do not support their employees using Zoom as a host (for official business) but allow employees to participate using Zoom. These rules are likely to be fluid, but program developers need to understand what the participants’ organizational constraints are given the increasing number of online presentation platforms available.
- **BeachBoard** as a learning management system requires a learning curve to access and use for instructors, students, and program developers and coordinators alike. In addition, BeachBoard involved a cost component for technical assistance from CPIE. These costs covered technical assistance to set up the board and the provision of continuing education units (CEUs), certificates, and digital badges (further described below). One of the reported shortcomings of BeachBoard, according to CITT student Research Assistants who have used BeachBoard extensively, was difficulty in communicating with instructors. As communication with the development

team and instructors had been determined as critical to this pilot's success, CITT mitigated this situation by introducing Slack as a communication tool to all pilot stakeholders.

- **Slack** was chosen as a collaboration and communication tool with varied success. Initially, most of the pilot stakeholders indicated they had no problems accessing Slack (from an early SurveyMonkey survey). However, as the pilot progressed, some participants, observers, instructors, and CAB members were either unable to access or had difficulty accessing Slack.
- **MS Outlook** email was used.
- **SurveyMonkey** was used for stakeholders to provide online, quick, immediate feedback after each session. No participant or observer reported difficulty accessing or using SurveyMonkey.

Session Feedback and Exit Surveys

After each session, participants and observers were required to complete a survey assessing the content of the session. The data from these surveys are included in this report. A final exit survey was also required. (See Appendix J.)

Student Privacy Rights

With the courses 100% virtual and sessions recorded, student privacy rights needed to be addressed. The CITT research team identified this need mid-course. Participants and observers were provided a copy of the California State University Office of the Chancellor's Virtual Learning Student Privacy Rights as they were deemed to be CSULB students.

Pre-Read and Supplemental Resources

Reading materials and glossaries were provided to participants and observers prior to the class start. These documents were uploaded onto Slack, BeachBoard, and emailed. Participants, observers, and instructors were also able to upload supplemental documents to Slack to share with others between sessions which provided context to learn about different industry sectors involved with freight. Slack became a repository of resources for participants, observers, and instructors to use for reference.

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Peer Mentoring

To support participants throughout the program, peer mentoring was encouraged, and teams were formed that included participants from varying industries.

- Provide a support network from the beginning of the sessions
- Provide for increased individual attention
- Develop industry connections
- Provide a collaborative framework
- Encourage retention

Participants reported that the Capstone Project, in particular, provided opportunities for peer mentoring. Examples include participants sharing industry knowledge for equipment and vehicle procurement processes and presentation skills in developing the capstone presentation. Networking, and establishing contacts who have subject matter expertise in their respective sectors, is another example of the power of peer mentoring.

"The most enjoyable aspect was being able to meet and converse with industry peers from range of different backgrounds. Group tasks helped bring us together outside of the scheduled meetings and classes. This gave us the opportunity to see the course content through the different lenses each student brought to the course."

Digital Badging, American Planning Association (APA) American Institute of Certified Planners (AICP) Certificate Maintenance credits, and CPIE Continuing Education Units

Digital badging, continuing education credits (CEUs) and certificate maintenance credits (CMs) can show the value of the educational and training programs to employers and may also encourage retention. For some staff, CEUs can be used as a metric for promotion or raise. This is especially important to employees that do not have a post-secondary degree. Digital badges can validate competencies gained through short-term courses that can be displayed online. At the time of the development of the Implementation Plan, the digital badge for this certificate had not been created. The following description was submitted in December 2020 to the CSULB's ATS (Academic Technological Services) division to validate the competencies presented with this pilot certificate:

With California leading the nation in Low-Emission Vehicle (LEV) criteria pollutant, greenhouse gas (GHG) emission, and Zero-Emission Vehicle (ZEV) regulations under the Clean Air Act, relevant and new skill sets in managing and operating fleets and material and cargo handling equipment are critical. The Sustainable Freight Foundations digital badge validates that the earner demonstrates competencies in foundational skills required to implement sustainable freight practices within an organization.

These skills include the ability to identify 1) both public and private sector stakeholders managing and overseeing the flow of goods; 2) trends in energy, infrastructure, and sustainability as related to freight; and 3) regulatory agencies and programs that influence transportation and/or warehousing and distribution operations. The earner also demonstrates the ability to 4) develop metrics and key performance indicators through collecting, interpreting, and presenting data; 5) analyze, format, and present data using Excel applications; 6) identify, quantify, and limit risk in legal contracts as well as embed sustainability initiatives in legal contracts; 7) collaborate with a team to develop and present a sustainability plan that includes requirements for fleet conversions with zero emissions as a goal.

Participants were surveyed and expressed a preference for Continuing Education Units, Sustainable Freight Foundations Digital Badge, followed by AICP Certification Maintenance units. Observers were surveyed and expressed a preference for AICP Certificate Maintenance credits over Continuing Education Unit credits. One explanation of this difference between these two groups is that many observers are planners as well as members of the APA.

Recommendations

Deploy more than one survey to solidify what communication platforms can be definitively used by all participants. Trying to use various platforms becomes confusing and adds to the workload of the coordinator. MS Teams seems to be the next platform of choice as both public and private sector organizations have plans in place to deploy its use. Cost out use of different platforms.

Pre-reads for all course sessions and glossaries should be available to all participants at the start of the program.

Chapter 5: Freight Certificate Course Content Feedback

This chapter includes feedback received to further develop curriculum content both concurrent with the pilot (including baseline data from applications) and content suggested for future programming.

Participants received survey questions pre-session, during the session (SurveyMonkey surveys), and post-session (exit survey and assignment). The CITT team and instructors continually queried participants to learn the most critical and immediate knowledge, skills, and abilities (KSAs) that could be taught within a short-term program. A 20-hour course such as this pilot Freight Certificate may perhaps constitute an introduction of the topics. The value of having incumbent workers provide additional feedback on content can support validating the relevancy of the curriculum.

Responses received prior to the beginning of the pilot were provided to instructors to refine and develop their course content. Feedback received after each session was also provided to the instructors.

Participant-Identified Aspirational Outcomes

At the project launch sessions (Session 0) held prior to the start of instruction, CITT posed the following question to further refine desired outcomes of participants: What do you want to get out of this certificate program (or from specific sessions)? These responses were added to the baseline bank of data we received from the participant applications. The responses in bold reflect topics mentioned multiple times by participants.

Freight Management Systems

- **Understanding the goods movement/freight management systems**
- A holistic approach to logistics and industry trends
- Learning how logistics works as a civilian
- Understanding how LAWA can impact freight and how freight effects the airport and the movement around the airport. How can we help these providers gain better access to city streets?
- Learning the economics of modal choice and alternative delivery modes
- Learning what are the drivers of freight demand

Business Development

- Understanding business drivers
- Being able to plan and solve problems with potential customers

Regulations

- Understanding regulations and how to comply
- Learning more about regulations, not necessarily on the seaport side, but regulations that the supply chain is facing
- Understand the long-term plan/vision that California has in mind in how they write policies and things that are regulated/ that companies must comply with

- Who are policy makers, how are they designing policies and how does it impact the supply chain?
- Understanding the broader regulatory landscape pertaining to infrastructure investments, investments at ports, and how those regulations impact economics and supply chain
- Understanding of the “how” of compliance
- Learning about zero emission trucks and policies and regulations associated with them

Infrastructure

- Learning about technological advancements with respect to blockchain, analytical programs, and what supply chain partners are using in their day-to-day jobs.
- Understanding the electrical infrastructure of the US and how regulation is pushing toward electrification

Data and Metrics

- Learning about data and metrics from an academic point of view

Other

- **Networking**
- Better facilitation of communication and understanding

Participants and observers reported they obtained skills in process improvement (developing key performance indices), regulatory compliance, business development and acumen, infrastructure planning and purchasing, and in shifting risk with legal contracts. These responses are provided in further detail below.

Feedback for Session #1: Current Issues in Freight Systems and Management

Participants and observers reported that documenting, analyzing, and presenting information are critical components for managers of any level. Participants and observers were asked about the scope of these functions related to freight systems and management. Participants reported that they responded to Requests for Proposals (RFPs), Requests for Qualifications (RFQs), and made presentations. While a few observers reported they respond to RFPs, they reported they write, review, or contribute to the following documents:

- Policy and program development; grant funding opportunities
- Freight regulations to reduce air pollution
- Freight-focused policy documents providing State guidance and/or information sources for local governments and air districts.
- Freight Master Plan implementation Liaison
- Freight Advisory Board Policy Review Grant support Subject matter expert –
- Industrial Lands Design review
- Urban Freight Lab
- California Sustainable Freight Action Plan

- California Freight Mobility Plan
- State Plans and project lists k
- Freight system planning and policy documents
- [Documents] pertaining to grant funded studies
- Specifications for contracts - specifically design and development of capital projects on transportation networks
- Trade Corridor Enhancement Program: this program funds projects which generally support goods movement on California State trade corridors and on the National Highway Freight Network

Based on feedback following the course session, suggestions for further course content include the following:

- Unintended consequences of the Clean Air regulations
- Last mile and inner-city logistics
- Governance of ports (development, management, permitting)
- Warehousing and transloading response to speed/volume
- Local freight policies and multi-modal conflicts
- Freight systems as related to transportation networks

Selected comments:

"The language and geography of the supply chain gave me a global idea about the freight movement system, and from where it's coming from. This can help me make better decisions about where we could dispatch our Truck drivers and Owner- Operators."

"Overall, the assignment allows students to think critically on material from the session by setting up a hypothetical economic and political dilemma. In particular, the request for more information included in the final portion of the assignment is an imaginative way to encourage students to think on the background, network relationships, and critical components of supply chains as identified in the session."

"Everything I do is based off of year-to-year trends, knowing how to interpret these trends helps me to improve my overall operations. Freight systems and sustainability is something that I'm not as versed with and I need to be, this session taught me a lot and has given me a greater perspective on said subject."

"As a business owner it is important to stay informed on trends within your organization. Understanding where the market is headed is vital to the performance and survival of our logistics company. These trends affect not only the immediate day to day operations but the future planning for reinvestment of company resources."

"Knowing who is behind the money is a critical piece of information that I didn't understand or care about before this class. Knowing who the stakeholders are is very important. Sustainability is a must. I know this first-

hand. I'm currently working on updating all my equipment and infrastructure."

"The new Clean Air Action Plan (CAAP) will have a zero-emission target. This directly affects me as a carrier. I also learned about ports having to meet the same criteria. This will also have an effect on me as my business will likely incur more costs to import for my customers."

"This course should almost be mandatory for anyone interested in entering the workplace involving port activities."

Further Recommendations

Categorize and examine types of documents employees are required to develop when developing content and assignments. Incorporate these into assignments that focus on documentation, communication, and presentation skills, commonly mentioned by participants and observers in describing additional skill sets needed for working in freight.

Feedback For Session #2, Introduction to Energy, Infrastructure, and Sustainability

Based on survey feedback following the session, suggestions for further course content include the following:

- cost parity
- specific cost data
- knowledge of pricing
- Availability of energy sources
- Financial acumen to properly analyze the costs involved in sustainable freight projects
- Sustainability mindset
- OEMs
- Tier 1 companies
- Stakeholder interactions
- port requirements and resiliency
- diverse industry perspectives
- labor perspective
- automation and how industry can prepare for it
- improving ZE infrastructure
- types of technology uptake that are most readily adopted with case studies
- applications of new technologies – who are the current leaders
- Embed ethics
- Availability and costs of different energy sources

Selected Comments:

"Knowing high level concepts and they whys behind how policies are written and implemented help me to think broadly and holistically about the supply chain, sustainability, and the role that my industry plays in the big picture. By understanding the ideas and concepts around new technologies and policies that impact my industry, I'm better equipped at doing my job."

"As a motor carrier I appreciated the Tech Overview to discuss the various fuels and infrastructure surrounding them. The zero-emissions goals affect my company directly as we will need to replace all power units in our fleet to fully comply. The automation is a hot topic for people in my industry as it drastically improves the efficiency at the terminals and my drivers are more productive because of it."

"Hydrogen/Electric – benefits and disadvantages for both available options. ZE goals – as we look towards the next version of the Clean Air Action Plan (CAAP), it is important for us to align our equipment with the industry requirement."

"Include instructors and/or presenters from diverse industries so participants can hear different perspectives on topics covered during the session."

"1. Zero-Emission goals. 2. Lacking infrastructure and technology to meet the deadline. Both of these affect me directly as I will need to replace all the power units in my fleet and find infrastructure near me to support it."

Feedback for Session #3: Introduction to Regulatory Compliance

Instructor Matt Schrap queried applicants with the questions below to refine his course content. His questions were included in the application. His goal was to present to middle managers the reasons why they need to comply by providing the history of various air quality regulations.

- What are the state, local and federal regulatory agencies you deal with in the course of your normal job?
- Is there a particular agency, agencies, or other jurisdictional authorities you are interested in knowing more about?
- Does the company you work for own any diesel fueled or alternative fueled (Nat. Gas, ZEV, Hydrogen) equipment?
- To your knowledge, does the company you work for report equipment information (usage, age, location etc.) to 3rd parties or any state, local or federal regulatory bodies?
- To your knowledge, does your company report other information, not equipment related, to 3rd parties or any state, local or federal regulatory bodies?

In developing content, Mr. Shrap also provided suggestions for mechanisms and strategies for freight stakeholders to become involved in decision-making processes using the Administrative Procedures Act.

Based on feedback following the course session, suggestions for future course content includes the following:

- content on think tanks,
- vehicle-grid integration,
- connections to the built environment,
- equity
- Relationships between CARB, SCAQMD, and air quality regulations nationwide
- Federal and international regulatory bodies and implications for air, sea, locomotives
- Briefing on CEQA/NEPA
- Politics of Project Permitting
- Regulatory and Legal Framework for Operators
- Ethics
- CARB In-Use Standards

Selected Comments:

"I always knew that we had to adhere to high environmental benchmarks in our industry but now I understand the why. This course has not made me an expert on the various rules and regulations, but it has given me a solid foundation to work from."

"I am working on air quality projects at LAWA, so this briefing was vital to my understanding of the how and why these regulations were created."

"Learning how CARB came to be and what their original obstacles where was illuminating. It has a direct effect on my business as I am a carrier so learning about why they came to be, the improvements they have made and their goals for the future was extremely useful to me."

"The history information was fascinating – all of it would be of great interest to Environmental Planning (both Air Quality and Environmental Generalists). . . . Appreciated the emphasis on understanding the regulatory process."

"How to conduct a proper research on regulatory rules/standards [and] knowing the history of how and why regulatory rules/standards are in place gives me a better understanding of why I must abide by them."

"This is a place where I feel a whole class can be dedicated to every CARB standard for every component of freight."

"Non-attainment is the basis for more stringent regulation – will help with peer reviews and to forecast what may happen with transportation in the future. Also, regulation works best when it draws input from industry, community, and government."

“Knowledge of federal and international regulatory bodies was covered briefly but could be expanded upon to cover implications for different modes of transport (air, sea, locomotive in particular). The regulatory focus could include more of the legal framework that operators must navigate to run their businesses - beyond what was covered in the Legal Issues class. It could also include a briefing on CEQA/NEPA and the politics of project permitting.”

Feedback for Session #4: Introduction to Data and Metrics

Based on feedback following the course session, suggestions for future course content includes the following:

Public Agency Metrics

Competing or Conflicting Goals

Resource Limitations

Introduce Bleiker Consent Strategies (consent-building rules and milestones)

Bleiker Consent Building strategies could be used to engage stakeholders at all levels throughout decision-making processes. Using these strategies, public agencies could address competing, conflicting goals and resource limitations but would also allow for the embracing of public involvement in the decision-making process. Using these strategies could serve as one avenue to engage AB 617 and equity communities throughout processes involving, for example, Environmental Impact Reports (EIRs) and workforce development initiatives. A participant whose perspective was from an OEM requested that ethics be a component throughout most of the sessions.

Selected Comments:

"KPIs, understanding how to implement work goals and ensuring that these standards can be met using different types of metrics, hands down, one of the best tools that I can utilize. Using metrics, I can now identify trouble areas within my operations and address them accordingly."

" KPIs – I need more of them throughout my operation. Data -I have spent some time combing through the data we have, and I have come to realize we waste a lot of our data. We are recording it, but not evaluating it."

"KPIs and essential data and metrics in the trucking industry – we collect data about the market changes and also about our clients (drivers). This session gave a better understanding about the types of data we can collect."

"I think my own organization. . . could benefit from identifying KPIs in our work more. Too often it seems we are measuring data towards achievement of a goal without a sense of the life cycle or feedback loop. Regardless, understanding the data, metrics, and KPIs used by different members of the supply chain will help improve our transportation projects and programs. It is always good to consider how data can be best presented and how it can tell a story."

Feedback for Session #5: Introduction to Legal Issues in Freight

With the diversity of the participant cohort, further data was needed to create the legal issues session. Prior to presenting his session, instructor Cameron Roberts queried the participants asking, "Does your job include writing, reviewing, or contributing to the following documents that would relate to goods movement?"

Table 12: Legal Documents Used in Freight

Type of Document	Responses (total 14)	%
Contracts from vendors and subcontractors	13	93%
Operational documents, manuals	11	79%
Contracts from customers	10	71%
Best practices: bonded, cargo security, hazardous materials handling	0	0
Insurance and risk management documents	6	43%
Responses added: <ul style="list-style-type: none"> • Overweight permits • Letters, articles, RFPs, speeches, presentations • Policy and Program development, e.g., build a vessel incentive program and guidelines. • Operations manuals, policies, procedures, job safety analysis, risk analysis, job quotes. • MOUs & other agreements • Pricing documents, financial disputes • Claim documents (subrogations, release of liability) 		

Source: CITT

Based on feedback, suggestions for future course content includes the following:

- Take a deeper dive into the City of Los Angeles' Zero Emission Delivery Zone.
- Compare EU or international contract components with comparable contracts in California.
- Provide a session, "Legal Liability for Transportation Professionals," as a single presentation.

- Provide a session on contracting and the implied legal conversation (e.g., cohort insurance for carriers).
- Agencies can work closer with industry to draft contracts to avoid ambiguity.
- Large-scale and complex members of the supply chain should consider a model of risk that fits best for them, even if it means being a “captive.”
- Parties need to agree on what terms will be utilized in a contract. Look at risk-based solutions.
- The complexity of environmental regulation and how companies move that responsibility up and down the supply chain provides context to shipping operations in industrial areas.
- Students can understand the context of multiple environmental regulation origins.
- Change can occur “with the pen” even when primary considerations are the bottom line.
- Build into legal contracts the future cost of sustainable freight provides context regarding the challenges associated with infrastructure development.

Selected Comments:

"There are various modes of transportation involved in freight, and all of them are overseen by various authorities. While the main goal is to move cargo, the newest goal is to move it in a sustainable manner. Sustainability is the key issue discussed in meetings every single day with various stakeholders - can freight move efficiently, and can we decrease emissions along the way. These topics discussed in the lesson were very similar to the goals my members have when looking into the future."

"Learning about sustainable freight is important since I am a carrier and will be held accountable for having my fleet of equipment in compliance. Shifting risk is a concept I was not familiar with prior to this class and has opened my eyes to getting some liabilities off of our back. The contract drafting was great because I got an opportunity to revisit our rental agreement and get it up to snuff based on what I learned in class."

"It was interesting to understand from a broad level on how regulations were written and now how they've made it down to the organizational level of a corporation. It was a good exercise to review how to read/ write contracts and understand how we can shift risks that way."

"I was able to design a better rental agreement for our overweight vehicles. Shifting risk is a concept new to me and I plan on applying it to our workplace in order to protect us from issues moving forward"

Feedback for Session #6: Digital Skills Building

Participants and employers identified digital skills and applications used by middle

managers as well as skills gaps as part of the application process. The following programs and applications were cited as workforce needs:

- Microsoft office* (Excel, Teams, SharePoint, OneDrive, Word, PowerPoint, Mobile/Power applications)
- Data Analytics tools
 - SAP: Systems, Applications, and Products in Data Processing. SAP is a European multinational software that makes enterprise software to manage business operations and customer relations.
 - Tableau
 - SQL: SQL statements are used to perform tasks such as update data on a database or retrieve data from a database. Some common relational database management systems that use SQL are Oracle, Sybase, Microsoft SQL Server, Access, Ingres, etc.
- Zero-emission technology platforms (e.g., zero emission technology inventory (ZETI))

*Identified by multiple respondents

These responses aligned with previously conducted CITT research on workforce education required in transportation and supply chain occupations. The need to learn and master MS applications to communicate and share data collaboratively is in high demand. Since this course focused on operations, the CITT team chose Excel as the application and probed deeper into required skill sets, asking for the following information:

What do you use Excel for in your job?

- Chassis tracking
- maintenance tracking
- inventory
- per diem tracking
- demurrage tracking and
- receipt tracking
- Budgeting for the fiscal year
- aggregating data for regulatory compliance
- Developing scenarios for programs and projects

- Budgeting
- Customer spreadsheets
- Inventory management
- Billing
- Basic analytics
- commodity trends
- Project tracking
- report generation
- estimates
- cost tracking
- Cargo tracking
- Productivity tracking
- Payroll data
- Profit and Loss statements
- Data analysis

CITT then researched data analytics and presentation tools most commonly used in Excel: Pivot Tables, Vlookup, and graphs for presentation. Based on survey results, the majority of participants used graphs for data visualization and pivot tables and requested further training in pivot tables. Interestingly, observers used Excel less frequently and for fewer tasks than the participants. The course content developed into teaching the following applications:

- Pivot Tables
- Pivot Charts
- Index/Match
- Useful Formulas: rank, sumif, countif, min, max
- Data visualization

Instructor Sue Dexter used a heavy-duty truck accident database in South East Los Angeles, an area dense with freight traffic. She also incorporated the use of geographic information systems (GIS) mapping to present the data.

Selected Comments:

"I had a basic understanding of pivot tables and sorting data but enjoyed the deeper dive. I've already used it to handle data in my workflow!"

"I learned how to organize data to find trends and patterns, and that they can be used for freight."

"The instructor's case study was a great example of Excel usage being applicable to the real world."

"Refreshed my memory on table development in Excel and reinforced the value of pivot tables. We work with quite a bit of data at the Port, such as vessel visits, length of visits, and transit mode."

"I learned how to group data in excel and create tables. This will be very useful when compiling huge data into concise reports for client interactions. As well this can be useful when setting performance metrics within our dispatch."

"I was also able to improve upon practical skills in IT and group presentational work."

Recommendations

Introduce these digital skills applications early on in the sessions so that participants can practice and refine their skills throughout the program. Some pre-recorded modules can be provided at the beginning of the course (asynchronous viewing) in addition to the synchronous session(s).

Synchronous discussion sessions with the instructors can provide more targeted help. If the capstone is introduced at the beginning of the course, these digital skills can be incrementally taught with feedback from the instructor following each session.

Guest Presenter

The last hour of the digital skills building presentation featured the Advanced Technology Policy Director at Volvo Group, Dr. Aravind Kailas, who discussed infrastructure, workforce development needs, and partnerships required to deploy heavy-duty battery electric trucks. Participants and observers valued the real-world OEM perspective on clean technology in freight.

"Dr. Aravind Kailas provided a business-eye view of the development of electric vehicles in terms of goods movement. He confirmed the need to match the job to the vehicle and the high level of communication necessary to develop the transportation solution as well as the ancillary support functions (maintenance, charging, infrastructure etc.). The direct benefit comes that I can describe these functions better to my local jurisdiction. .and help provide a full suite solution to any pilot or permanent solution."

Based on feedback following this session, suggestions for further exploration and content included:

- Incorporate more OEM representatives in the sessions
- Public sector agencies and the need to comprehend infrastructure and ancillary support requirements
- battery cycles
- locations of partners
- vehicle-to-job matching
- communication strategies across the battery elective vehicle ecosystem

Capstone Project

The Capstone Project culminated the pilot project. Using the peer mentor groupings, participants worked remotely in groups of 3 or 4 over a 4-week period, with an estimate of 8 to 10 hours of homework per participant. The CAB, capstone instructors, and CITT research team convened a meeting to discuss parameters for this final assignment. The instructors and CITT research met to further refine the parameters.

Via a Zoom conference meeting, instructors provided the parameters for the project which incorporated knowledge, skills, and abilities presented throughout the Freight Certificate program, including adopting the culture of sustainability within an organization. Participants were given a timeframe for submitting questions (similar to working on a grant, with a deadline for questions). Instructors were available for questions and answers.

The teams were tasked with developing a sustainability outline addressing the triple bottom line (People, Profit, Planet) of a fictitious drayage and warehousing company (referred to as SFI) servicing the ports and the Inland Empire (an area that has a dense concentration of warehousing in Southern California). Participants also had to create KPIs and develop a plan to transition fleets and material handling equipment to clean fuels usage. This last task would require the use of Excel data manipulation and presentation. Extensive and detailed parameters, including costs, equipment, fleet information, and location of warehouse were provided to the participants. Participants had to research sustainability plans of both private

and public entities to inform the development of their presentations.

Participants provided a trial presentation via a Zoom conference meeting which was sent as link for instructors and the CITT research team to view asynchronously and provide feedback. The participants had the opportunity to make the suggested edits and additions to their presentations. The final Capstone Projects were presented to the CSFAP Freight Competitiveness Working Group via a Zoom conference meeting. The research team and instructors provided participants with a Capstone Project Checklist as a guide to developing each team’s presentation.

Table 13: Capstone Project Checklist

Task	Check-off list
Identify Key Partners/Stakeholders/Issues	<ul style="list-style-type: none"> ✓ Key partners and stakeholders are clearly identified
	<ul style="list-style-type: none"> ✓ Innovative partnerships are included and explained
	<ul style="list-style-type: none"> ✓ Key issues are clearly identified and reasonable for this project
Provide a rationale for SFI compliance and sales goals	<ul style="list-style-type: none"> ✓ Rationale for compliance and sales goals for the ACT regulation clearly explained ✓ Rationale extends beyond the ACT regulation
Develop Specific, Measurable, Attainable, Relevant, and Time-Bound (SMART) Key Performance Indicators (KPIs) for purchasing ZE vehicles and MHE	<ul style="list-style-type: none"> ✓ KPIs are SMART
<p>Determine how an emphasis on sustainability will require changes in existing SFI contracts (refer to participant risk management contracts homework assignments)</p> <p>OR</p> <p>Determine how to integrate sustainability clauses into your team’s Sustainability Plan “using the pen.”</p>	<ul style="list-style-type: none"> ✓ An existing contract is revised to include at least one sustainability goal that is appropriate for this assignment <p>OR</p> <ul style="list-style-type: none"> ✓ One sustainability clause is integrated into your team’s Sustainability Plan “using the pen”
Create an Excel spreadsheet to show KPIs; ZE growth predictions for ZE vehicles and MHE	<ul style="list-style-type: none"> ✓ Charts and graphs support the goals of the Sustainability Plan ✓ Charts and graphs incorporate titles and headings ✓ Graphics are easy to comprehend
Present an elevator speech to tell your team’s story	<ul style="list-style-type: none"> ✓ Delivery is succinct ✓ Audience in clear ✓ Purpose is clear ✓ Story pulls the audience in

Present Sustainability Plan Outline to working group	<ul style="list-style-type: none"> ✓ Presentation is organized, cohesive, and can be followed easily by audience ✓ Audience is clear ✓ Purpose is clear ✓ Transitions are clear ✓ Conclusions are clear
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Source: CITT

The CITT research team requested that three members of the Freight Competitiveness Working Group serve as a panel, representing leadership within this fictitious drayage and warehousing establishment. Their roles as panelists were to evaluate the presentations based on their industry expertise in freight, trucking, and warehousing. Feedback from panelists included considering the following:

- identify customers
- large retailers and smaller retailers: consider a mix a business types
- what is the size of freight
- tech will get cheaper later rather than earlier
- Investments as part of policy
- landlord considerations
- energy planning earlier rather than later
- tax consequences -- taxes on incentives
- labor costs (teamsters)
- cube out/weight load
- strategies if merchandise is not moving
- achieving sustainability goals and costs to consumers
- price sensitivity and sustainability goals
- critical mass of inefficiencies
- intermodal breakeven analysis
- rental costs per location/area
- consider demurrage/detention

Recommendations

Some participants reported enjoying the creative process of building a real-life project that could serve as a template for a business plan. Some also reported the project required more than the 8-10 hours allotted to complete and came during the busiest time of year for transportation establishments (October-November). A recommendation was made to introduce the Capstone Project at the project launch with the assignments completed cumulatively, rather than as one large project that required considerable coordination with their peers.

"I strongly believe a cumulative approach where you build the company profile throughout the course would have been better for someone like me. This would have allowed me to put the lessons into action in real time and then simply refine them for the Capstone Project. Starting from scratch at the capstone stage caused a large amount of work and proved to be too large of an undertaking for some of our teammates."

One participant also suggested that groups provide their own parameters rather

than having them largely provided by the instructors:

"A lot of the information for the project was provided, a lot had to be researched and it definitely took much longer to complete than the predicted 8 hours. Although research takes time, I think it would have been better to allow for more liberty through more research in order to get more unique presentations for every group."

Supporting and Selecting Instructors

Include compensated office hours and hours for providing feedback on assignments in the MOU for instructors. Also include clear instructions to both instructors as well as participants regarding accessing feedback for assignments regarding what platform will be used and time frame for responses.

Include instructors and/or presenters from diverse industries so participants can hear different perspectives on topics covered during the session. A roundtable panel may also be incorporated into the sessions for this purpose.

"I'll re-iterate the importance of diverse instruction. I think it is important for participants to engage with community/environmental justice representation and learn more about equity in transportation."

"Port participation would probably help to clarify Port policies and perspective considering they are so heavily part of the focus."

Completion Rate of Participant Cohort

Eleven out of the fourteen completed the program. Two participants completed all assignments, but not the Capstone Project. The completion rate is 78%. A 78% completion rate is considered high by post-secondary institutional standards in workforce programming. As a comparison, the nation's largest provider of workforce training is the California Community Colleges. The completion rate for students in certification programs who receive sufficient credit hours to increase their workforce potential is 40%.⁵

Recommendations

The project team continually communicated expectations of the course and provided matrices so participants would know which assignments were outstanding. Reinforce the need for excellent customer service working with participants. Providing industry mentors may be another route to support participant completion. Changing the structure and design of the Capstone Project to start at the beginning of the sessions (and the assignments become cumulative) may encourage a higher Capstone Project completion rate.¹²

¹² "New Study: 70% of California Community College Students Fail | CommunityCollegeReview.Com," Community College Review, accessed December 20, 2020, <https://www.communitycollegereview.com/blog/new-study-70-of-california-community-college-students-fail>.

Chapter 6: Career Pathway Mapping

A task under the IA required CITT to prepare career pathway maps for five related skill and training requirements for occupations that are critical to the development of a sustainable freight transport system in California. Participants and observers reported that sustainability is often embedded in existing jobs, as described in the first chapter that presented occupational titles associated with freight. Some organizations already had positions dedicated to sustainability, while other organizations were likely to build dedicated sustainability positions within the next few years. More than five are included here, as participants provided valuable data describing their pathways to their current occupations. The California Community Colleges' Career Ladders Project¹³ provides this definition of a career pathway:

Each step on a career pathway is designed explicitly to prepare students to progress to the next level of employment and/or education. Career pathways target jobs in industries of importance to local and regional economies. They are designed to create avenues of advancement for the underemployed, the unemployed, incumbent workers, new and future labor market entrants, and to produce a steady supply of qualified workers for employers.¹⁴

CITT queried and received descriptive feedback from participants and observers concerning how they themselves or others can get to these jobs in sustainable freight. The research team learned that many of these middle management jobs are "opportunity occupations" as defined by the Federal Reserve Bank.¹⁵ These jobs provide an above median wage (based on region) and do not require a four-year college degree. Pathways below show competency-based career progression as expressed by respondents: industry experience is a key factor, even though in job descriptions, a college degree might be stated as preferred, but is not required. It is telling to note that when viewing these pathways, no direct mention of the term "sustainability" is included.

In the public sector, a sustainability position may start as an appointee or exempt position. One respondent had a differing perspective, commenting that most businesses are concentrating on net profit and not sustainability. Yet another participant responded:

"[I]t would be safe to say that all of our employees share responsibility towards maintaining and advancing the practical concepts of sustainability through environmental stewardship and ongoing education, so together we can produce a workplace that has zero incidents with a zero-carbon footprint while producing a profitable gain for the employees and employer alike."

¹³ The nonprofit Career Ladders Project was founded by the California Community Colleges' Board of Governors in 2002.

¹⁴ "Defining-Career-Pathways-Ccp.Pdf," accessed February 28, 2021, <http://www.careerladdersproject.org/wp-content/uploads/2011/05/defining-career-pathways-ccp.pdf>.

¹⁵ "Opportunity Occupations Monitor," accessed December 19, 2020, <https://www.frbatlanta.org/cweo/data-tools/opportunity-occupations-monitor>.

From the standpoint of a participant involved in manufacturing, a functional manager could be assigned sustainability roles within an organization. These roles include marketing, regulatory compliance, product development, customer consulting, and vendor onboarding.

Pathway To Sustainability Jobs At A Port Terminal

Front line managing vessel operations to
Terminal Director or Safety Director

In order to get to the Director positions, employees will have to work on the front-line managing vessel operations for a number of years. Industry experience is the most important factor to progress to Terminal Director or Safety Director.

Pathway to Sustainability Jobs on a Tug and Barge

Military Service, United States Army to
Maritime Trade School Training to
Tug USCG Endorsed Tankerman Person in Charge to
Petroleum Operations to
Petroleum Cargo Operations Supervisor to
Petroleum Tank Barge Manager to
Senior Petroleum Tank Barge Manager to
Tank Barge, Fleet Manager (with a
focus on Safety and Regulatory
Compliance)

This participant noted that this Freight Certificate could serve as a relevant program for high school students, similar to a Career and Technical Education (CTE) suite of courses for students interested in directly entering the workforce in the transportation industry.

Pathway to Sustainability Jobs at a Trucking/Drayage Company

Customer Service or Dispatcher to
Dispatch Manager to
Customer Service Manager, Sale Manager, or Operations Manager

Any of these manager positions could be transitioned into a sustainable freight position.

Pathway to Sustainability Jobs with a Freight Forwarder

Human Resources (HR) to
HR/Compliance to
Compliance/Fleet management to
Compliance, Food Safety and Special Projects

This participant serves as a subject matter expert within the organization. She added that critical skills required include technological competency, research, task

and time management, and communication.

Pathway To Sustainability Jobs In Rail

Project/ Field Engineer to

Manager of Engineering to

Manager of Environmental Permitting & Sustainability or Special Projects

Environmental Supervisor to

Manager of Environmental Permitting & Sustainability

Pathway To Sustainability Jobs At A Public Sector Agency

Assistant to the Sustainable Transportation grant manager to

Intern at a transit public planning and research agency to

work on climate change analysis/resiliency of the state highway system at the

Department of Transportation to

Air Pollution Specialist

This observer commented that he was familiar with transportation grants, operations, and infrastructure with his previous public agency experience, and began working in freight in his current position as Air Pollution Specialist.

Pathway To Sustainability Jobs At A Port

Public health, engineering, and environmental-related college backgrounds to

Environmental Planning Division (cross trained in air quality) to

Manager, Air Quality Practices

This participant showed a pathway starting with public health, engineering, or environmental policy college or graduate school backgrounds progressing through environmental planning positions at a port.

Chapter 7: Project Management

Activities conducted and related deliverables under this IA are provided below.

Activities

Table 14: Activities with Completion Dates

Activities	Status	Date
Participating in a Kick-Off Meeting conference call to discuss contract requirements and invoice process.	completed	1/28/2018
Identifying and prioritizing workforce opportunities associated with implementation of the Sustainable Freight Action Plan.	completed	5/29/2018
Mapping related skill and training requirements in mission-critical occupations across California transportation, construction, and manufacturing sectors.	completed	6/16/2018
Developing concepts for the development of high-quality apprenticeship pipelines, from pre-apprenticeship to journey-level upskilling, in order to increase operational efficiency and effective technological deployment across sectors and firms.	Completed (Appendix D)	4/30/2019
Advancing inclusive local economic development through the development of concepts for community workforce agreements, which allow more Californians to benefit from the economic as well as the health and environmental gains of sustainable freight.	Completed (Appendix C)	2/15/2019
Identifying and convening at least two in-person working groups of freight industry and workforce experts to outline and prioritize workforce challenges associated with implementing the Sustainable Freight Action Plan. Additional virtual working groups will also be held.	Completed (Final Report)	1/25/2018; 7/19/2018;12/20/2018; 3/06/2019; 8/09/2019; 11/20/2019; 4/29/2020; 6/05/2020; 9/25/2020; 11/20/2020
Preparing career pathway maps for five related skill and training requirements for occupations that are critical to the development of a sustainable freight transport system in California. These occupations can include, but are not limited to the transportation, construction, and manufacturing sectors.	Completed (Final Report)	12/23/2020
Developing a Freight Workforce Development Pilot Project Concept Paper (Concept Paper). The Concept Paper shall include an outline; identify diverse freight stakeholder needs both unique	Completed (Appendix F)	Draft 8/29/2019; Final 10/31/2019

and common; and identify existing programs and sources of funding that will help support project implementation. CSU Long Beach will also identify up to 10 potential members for a Freight Workforce Working Group (Working Group).		
Preparing a Pilot Project Development Plan for developing a pilot demonstration workforce project that includes: 1) a maximum one-year implementation timeframe with milestones, deliverables, and schedule; 2) identification of partners, facility's needs, and requisite activities; 3) performance metrics that are related to the development of long-term workforce investment priorities; and 4) lead implementer for each activity.	Completed (Appendix G)	4/22/2020
Implementing a Freight Workforce Development Pilot Project (Pilot Project), which shall include, but is not limited to: implementing the Pilot Project Development Plan, convening the Working Group, developing a Working Group Charter, assessing required stakeholder partnerships, monitoring implementation, and collecting data.	Completed (Final Report)	12/11/20

Source: CITT

Timeline Amendment Request

Table 15: Timeline Amendment Request

TIMELINE AMENDMENT REQUEST	
March 31, 2020	Final version of pilot project development plan due
November 20, 2020	Career pathway maps for 5 related skill and training requirements for mission-critical occupations across transportation, construction, and manufacturing sectors.
December 18, 2020	Final report due

Source: CITT

Deliverables

Table 16: Deliverables

Deliverable	Date Submitted
Monthly progress reports	1/31/19; 2/28/19; 3/31/19; 4/30/19; 5/31/19; 6/30/19; 7/31/19; 8/31/19; 9/30/19; 10/31/19; 11/30/19; 12/30, 2019; 1/30/20; 2/29/20;

	3/31/20; 4/30/20; 5/30/20; 6/30/20; 7/31/20; 8/31/20; 9/30/20; 10/31/20; 11/30/20; 12/31/20
Report identifying and prioritizing workforce opportunities associated with implementation of the Sustainable Freight Action Plan	5/29/18
Career pathway maps for five related skill and training requirements in mission-critical occupations across transportation, construction, and manufacturing sectors	12/23/2020
Draft version of Concept Paper	8/29/2019
Final version of Concept Paper	10/31/2019
Draft version of Pilot Project Development (Implementation) Plan	4/22/20
Final version of Pilot Project Development (Implementation) Plan with Addendum	5/4/20
A Final Report summarizing:	12/23/2020
All plans and strategies developed through the workgroup meetings.	12/23/2020
A detailed cost estimate for implementation of the strategies developed through this contract.	4/18/2021
A detailed schedule outlining major timetable and milestones for the successful implementation of a workforce training plan.	4/22/2020
Data and results of the Freight Workforce Development Pilot Project.	12/23/2020
Guidance that can directly support the further refinement of freight workforce training activities funded through the Alternative and Renewable Fuel and Vehicle Technology Program ARFVTP.	12/23/2020

Source: CITT

Chapter 8: Potential Next Steps

While this Freight Certificate focused its training on operations in freight, there are several other potential training designs that have been identified and articulated by participants and observers. This chapter presents potential next steps in developing workforce programming in sustainable freight. These comments point to the clarity and focus this pilot provided:

"This Freight Certificate allowed us to prepare for roles not yet defined in the sustainable freight landscape."

"I'm grateful to know that this program exists and there is some structure being taught for the upcoming changes in our industry. It takes some of the fear and mystery out of the new technologies and requirements."

Similarly, another participant noted the high relevancy of the sessions for establishment:

"After taking the course my company is looking into creating a sustainability manager position within the next 2 years that will help us transition our company to near zero."

Both participant and observer cohorts reported that the cross-sector format was highly beneficial to network and learn about the challenges other industries face.

"[M]ultiple groups focusing on business, equity, planning, engineering, and sustainability could benefit from the certification. Part of the gain comes from simply being exposed to the complexity of the systems in place, but the framework used (history, regulation, impacts, legal, management etc.) allows participants directly and indirectly associated with the industries to gain immediately useful skills. One of the biggest endorsements to this certification was that participants commented multiple times that they were using and benefitting from the previous weeks' lectures!"

Public Sector Focus

The Observer Cohort was given the opportunity to provide data concerning how this Freight Certificate could support workforce development efforts at their organizations. This question was presented at an Observer Cohort feedback session on Zoom where a real time surveying tool was used to capture responses. Not all observers responded to the questions.

- Contribute to regional freight planning efforts
- Evaluate Trade Corridor Enhance Program grant applications for freight infrastructure improvements for funding recommendations
- Provide input into the California Freight Mobility Plan
- Collaborate with local governments to identify funding priorities for transportation
- Plan, design, and build roadway and traffic mobility improvement projects
- Assist Caltrans in identifying freight transportation needs in the San Joaquin Valley, an emerging area for goods movements and warehousing

- Explore moving freight with rail in the San Joaquin Valley
- Support equity and sustainability best practices in moving freight
- embed broader thinking beyond technical freight thinking and acting
- Network

Observers involved in freight and/or environmental policy reported that the following divisions within their organizations could benefit from this Freight Foundations Certificate:

- Industrial and Air Quality Planning and Science Division
- Modeling
- Commissioner Advisors
- Operations Design
- Policy Planning
- Research and Development
- Mobile Source Control
- Transportation and Toxics

Observers also reported that content on the following topics would be relevant:

- Finance/capital/fiscal
- Changes in manufacturing impacting freight
- Land use planning in terms of goods movement to support the expected business/residential uses (proximal and adjacent)
- Efficiency in freight operations
- Export/import dynamic
- Freight policies
- Medium- Heavy-Duty trucks incentives/solicitations
- Agreement Management
- Team Building: tackles interdisciplinary issues, silos, allows for networking
- Communication
- Presentations to different audiences
- Project management
- Strategic thinking

The Branch Chief, Procurement Division, Department of General Services (DGS) was interested in the program because the Standards and Quality Control Manager oversees the Standards and Quality program and the Environmentally Preferable Program (EPP). DGS creates the standards and specifications for statewide procurement operations that includes contracts for state vehicles, parcel delivery, and moving services.

Engagement with Equity and Environmental Justice Organizations

Engaging equity and Environmental Justice (EJ) organizations from the inception of the development phase of programming is essential. An observer responded that “[Equity and Environmental Justice] organizations can gain from learning the history and context of the federal, state, regional and local regulations that affect their communities.” From another perspective, industry and public sector stakeholders have

much to learn from these organizations as well. The involvement of equity and Environmental Justice organizations is a critical element missing in this pilot program. A cohort that combines industry, equity, Environmental Justice organizations, and the public sector to mirror the goals of the triple bottom line would be ideal.

K12 Engagement in Special Investigation Projects

Work with K12 districts to develop the knowledge and skills base for students to learn about sustainability in freight transportation in their daily lives, preferably starting before high school. As an example, students can learn to measure the carbon footprint of their e-commerce deliveries by using geographic information systems.

Seminar Series or Conference Workshops

Feedback brought attention to the fact that the managerial levels represented in the participant cohort were varied. Some had extensive experience in logistics. For those newer to the field, or newer to management, a seminar held after work hours may serve as an onboarding tool to get a high-level overview of freight systems and management without the need for assignments or a capstone. Participants in this seminar would be able to learn the language of freight, supply chain, and equity and environmental concerns. This seminar can also serve as an introduction to careers involved in sustainable freight:

"Knowledge in the public process and/or environmental science is very useful in obtaining a position at my organization. I had a background in government affairs prior to joining my organization, which helped me understand the process of advocacy, but I had to learn everything about freight once I was on the job."

Continuum of Education and Training from the California Community Colleges to the California State University (CSU) System

Coordinate education and training programs with California Community Colleges' Advanced Transportation and Logistics Sector so that a continuum of clean energy workforce programming can extend to the CSU system. See below for possibilities for partnerships.

Sustainable Freight Specialist Designation

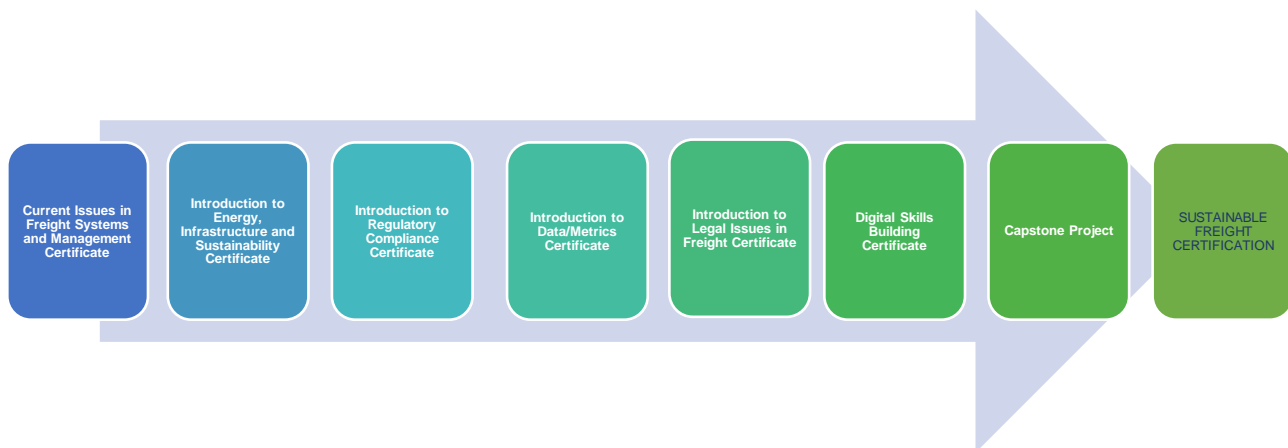
Similar to CSULB's Global Logistics Professional Designation, a Sustainable Freight Specialist program can be developed that offers a series of 3-hour sessions with a culminating capstone that leads to a Specialist designation. An alternative would be to provide access to a menu of courses that can be customized to each participant. Clean fuel technicians, for example, can take a course on regulatory compliance or a course that focuses on strategies to document, analyze, and present data – all skill sets in high demand for clean fuels technicians. These technicians can move on to managerial positions by enrolling in modules similar to those in this pilot certificate. This Specialist designation, along with the Professional designation (described below) can be the products of a partnership between the community colleges and the CSU system. Participants suggested expanding content to include:

- Understanding sustainable development goals as a whole/how they apply to your organization
- Public speaking
- Writing to specific audiences
- Outreach and engagement
- System and methodology building
- Risk strategy creation
- Team building
- Time and project management
- Ability to see opportunities beyond the sustainability challenges (market foresight)
- Financial acumen to properly analyze the costs involved in sustainable freight projects
- Awareness and understanding of ZEV-related KPIs (not just industry-related)

Sustainable Freight Certification or Sustainable Freight Professional Designation

As described in the Implementation Plan, a progression of this Freight Foundations Certificate would be a Sustainable Freight Certification or Professional designation. The Foundations Certificate course serves as the basis, and the sessions become more granular and in-depth, providing a progressively comprehensive series of courses. Both participants and observers provided feedback regarding content that could be expanded upon to begin developing a Sustainable Freight Certification.

Figure 2: Sustainable freight Certification



Source: CITT

Related Technical Instruction (RTI): Registered Apprenticeship The Freight Foundations Certificate can serve as the RTI (classroom) portion of a Registered

Apprenticeship.

Degree Completion Programs with a Freight Concentration

Institutes of Higher Education seeking to attract new students are looking to a range of options which include awarding credit for prior learning. This could come in the form of college credit for workplace experience as well as community college credits. Many universities are responding by developing degree completion programs that allow students to supplement this prior learning and make up missing credits through a combination of classroom based and self-paced courses. This model often allows students to design their own degree pathway, emphasizing content that reflects workplace experiences. The Sustainable Freight Foundations Certificate and the capstone could be incorporated into a degree completion program through a petition to the academic unit conferring the degree.

Engagement with Labor

Unionized labor organizations are major stakeholders in the transportation and supply chain sectors. CITT staff met with the Director of Labor Relations at the Port of Los Angeles to discuss whether the International Longshoremen and Warehouse Union (ILWU) members would be interested in participating in the pilot. CITT learned that union work structure in terms of advancement is strictly controlled by the collective bargaining agreement (CBA), which does not recognize external certificates. There may be possibilities to share curricula content with the training arm of labor organizations.

Potential Partnerships

The further enhancement or customization of the existing Certificate or development of an expanded certification program will require coordination with sponsoring stakeholders, particularly within industry. This will be necessary to ensure that there is industry input into the course materials as well as a set of employers endorsing the certificate or certification through its hiring practices.

During the course of the pilot development, the following organizations were identified as potential partners:

Municipal Equipment Maintenance Association

(MEMA) Clean Cities Coalition

LA Metro

American Public Transportation Association

(APTA) Conference of Minority Transportation

Officials (COMTO) NAFA (Fleet Management

Association)

West Coast Collaborative (WCC)

Green Technology Summit and Expo (GTSC)

Advanced Transportation and Logistics Sector (ATL), California Community

Colleges American Association of Port Authorities (AAPA)

Prologis

California Regional Transit Training Consortium
(CRTTC) TEEMS
Greenlining Institute
Fresno Metro Black Chamber of Commerce

Appendix A: Glossary

BUREAU OF LABOR STATISTICS (BLS) – A unit of the [United States Department of Labor](#). It is the principal fact-finding agency for the [U.S. government](#) in the broad field of [labor economics and statistics](#) and serves as a principal agency of the [U.S. Federal Statistical System](#). The BLS is a governmental statistical agency that collects, processes, analyzes, and disseminates essential statistical data to the American public, the [U.S. Congress](#), other Federal agencies, State and local governments, business, and labor representatives. The BLS also serves as a statistical resource to the United States Department of Labor and conducts research into how much families need to earn to be able to enjoy a decent standard of living.

CALIFORNIA AIR RESOURCES BOARD (ARB) -- The "clean air agency" in the government of California, whose main goals include attaining and maintaining healthy air quality; protecting the public from exposure to toxic air contaminants; and providing innovative approaches for complying with air pollution rules and regulations.

CALIFORNIA CLEAN AIR ACT (CCAA) -- A California law passed in 1988 which provides the basis for air quality planning and regulation independent of federal regulations. A major element of the Act is the requirement that local air districts in violation of the CAAQS must prepare attainment plans that identify air quality problems, causes, trends and actions to be taken to attain and maintain California's air quality standards by the earliest practicable date.

CALIFORNIA DEPARTMENT OF TRANSPORTATION (Caltrans)—Responsible for the design, construction, maintenance, and operation of the California State Highway System, as well as that portion of the Interstate Highway System within the state's boundaries.⁷

CALIFORNIA ENERGY COMMISSION (CEC)—The state agency established by the Warren- Alquist State Energy Resources Conservation and Development Act in 1974 (Public Resources Code, Sections 25000 et seq.) responsible for energy policy. The Energy Commission's five major areas of responsibilities are:

1. Forecasting future statewide energy needs
2. Licensing power plants sufficient to meet those needs
3. Promoting energy conservation and efficiency measures
4. Developing renewable and alternative energy resources, including providing assistance to develop clean transportation fuels
5. Planning for and directing state response to energy emergencies.

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY (CAL/EPA) -- A state government agency established in 1991 for unifying environmental activities related to public health protection in the State of California. There are five boards, departments and offices under the organization of Cal/EPA including the California Air Resources Board (ARB), State Water Resources Control Board (SWRCB) and its nine Regional Water

Quality Control Boards (RWQCB), Department of Pesticide Regulation (DPR), Department of Toxic Substances Control (DTSC) and Office of Environmental Health Hazard Assessment (OEHHA). The Cal/EPA boards, departments and offices are directly responsible for implementing California environmental laws or play a cooperative role with other regulatory agencies at regional, local, state and federal levels.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA - pronounced See' quah) Enacted in 1970 and amended through 1983, established state policy to maintain a high-quality environment in California and set up regulations to inhibit degradation of the environment.

CALIFORNIA FREIGHT ADVISORY COMMITTEE (CFAC)-- Caltrans established the California Freight Advisory Committee (CFAC) in collaboration with the California Transportation Agency (CalSTA) in response to Assembly Bill (AB) 14 (Lowenthal, 2013), consistent with the federal Fixing America's Surface Transportation Act (FAST Act) guidance. The CFAC is a chartered member advisory body representing public and private sector freight stakeholders, including representatives of ports, shippers, carriers, freight-related associations, the freight industry workforce, the transportation department of the State, and local governments.

CALIFORNIA SUSTAINABLE FREIGHT ACTION PLAN (CSFAP):

Governor Brown's Executive Order B-32-15 directs the California State Transportation Agency, California Environmental Protection Agency, Natural Resources Agency, California Air Resources Board, California Department of Transportation, California Energy Commission, and Governor's Office of Business and Economic Development to develop a California Sustainable Freight Action Plan (Action Plan), by July 2016. This Action Plan provides a recommendation on a high-level vision and broad direction to consider for State agencies to utilize when developing specific investments, policies, and programs related to the freight transport system that serves our State's transportation, environmental, and economic interests. Executive Order B-32-15 identifies the need for a broader and more unified approach between State agencies and with stakeholders to improve the efficiency, transition to zero emission technologies, and increase the competitiveness of California's freight transport system.¹⁶

CAP AND TRADE - Cap and Trade is a market-based policy tool for protecting human health and the environment. A cap-and-trade program first sets an aggressive cap, or maximum limit, on emissions. Sources covered by the program then receive authorizations to emit in the form of emissions allowances, with the total amount of allowances limited by the cap. Each source can design its own compliance strategy to meet the overall reduction requirement, including sale or purchase of allowances, installation of pollution controls, implementation of efficiency measures, among other options. Individual control requirements are not specified under a cap- and-trade program, but each emissions source must surrender allowances equal to its actual

¹⁶ \"CSFAP_FINAL_07272016.Pdf.\"

emissions in order to comply. Sources must also completely and accurately measure and report all emissions in a timely manner to guarantee that the overall cap is achieved. (EPA)

CAREER AND TECHNICAL EDUCATION (CTE) -- CTE prepares secondary, postsecondary and adult students with technical, academic and employability skills for success in the workplace and in further education.

CENTER FOR INTERNATIONAL TRADE AND TRANSPORTATION (CITT) – CITT is dedicated to delivering education programs, innovative research, and community outreach in the area of goods movement. CITT is the Long Beach home for four major research centers: METRANS Transportation Center, a U.S. Department of Transportation-designated university transportation center; the U.C. Davis-led National Center for Sustainable Transportation; MetroFreight, a Volvo Research and Education Foundations Center of Excellence in Urban Freight based at the University of Southern California; and the Federal Highway Administration’s Southwest Transportation Workforce Center (SWTWC) covering eight states—California, Arizona, Nevada, New Mexico, Utah, Colorado, Oklahoma and Texas.

CURRICULUM ADVISORY BOARD (CAB) -- Provides input, advice, and support to curriculum content, materials, implementation, and assessment instruments.

C-SUITE -- Refers to the executive-level managers within a company. Common c-suite executives include chief executive officer (CEO), chief financial officer (CFO), chief operating officer (COO), and chief information officer (CIO)

ECOSYSTEM - The interacting system of biological community and its nonliving environment.

ENVIRONMENTAL JUSTICE ADVISORY COMMITTEE (EJAC) -- AB 32 directed ARB to convene an Environmental Justice Advisory Committee to advise ARB on the implementation of AB 32. EJAC is comprised of representatives from communities in the state with the most significant exposure to air pollution, including, but not limited to, communities with minority populations or low-income populations.

ENVIRONMENTAL PROTECTION AGENCY (EPA) - A federal agency created in 1970 to permit coordinated governmental action for protection of the environment by systematic abatement and control of pollution through integration or research, monitoring, standards setting and enforcement activities.

FEDERAL HIGHWAY ADMINISTRATION (FHWA) -- is a division of the U.S. department of transportation. The FHWA is a cabinet-level organization of the Executive Branch of the U.S. Government. The FHWA specializes in highway transportation. The FHWA ensures that the U.S. highways and public roads are in good shape and technologically up to date for traveling.

FREIGHT – goods transported in bulk by truck, train, ship, or aircraft.

GOODS MOVEMENT -- The processes and activities involved in the pickup, movement and delivery of goods (agricultural, consumer, industrial products and raw materials)

from producers/points of origin to consumers/point of use or delivery. 'Goods movement' relies on a series of transportation, financial and information systems for this to occur, that involves an international, national, state, regional and local networks of producers and suppliers, carriers and representative agents from the private sector, the j (federal, state, regional and local governmental agencies) and the general public.

GOVERNOR'S OFFICE OF BUSINESS AND ECONOMIC DEVELOPMENT (GO-Biz) -- The Governor's Office of Business and Economic Development (GO-Biz) serves as the State of California's leader for job growth and economic development efforts. They offer a range of services to business owners including attraction, retention and expansion services, site selection, permit assistance, regulatory guidance, small business assistance, international trade development, and assistance with state government.

INDIRECT SOURCE -- Any facility, building, structure, or installation, or combination thereof, which generates or attracts mobile source activity that results in emissions of any pollutant (or precursor) for which there is a state ambient air quality standard. Examples of indirect sources include employment sites, shopping centers, sports facilities, housing developments, airports, commercial and industrial development and parking lots and garages.

INDIRECT SOURCE CONTROL PROGRAM -- Rules, regulations, local ordinances and land use controls and other regulatory strategies of air pollution control districts or local governments used to control or reduce emissions associated with new and existing indirect sources. Indirect source control programs include regulatory strategies such as transportation control measures (e.g., South Coast's Regulation XV for employer-based trip reduction); parking charges; landuse controls that reduce the need for vehicle travel and increase transit, bicycle and pedestrian access; and source-specific regulations such as truck idling and travel schedule requirements.

INDIRECT SOURCE REVIEW -- A major component of an indirect source control program which applies to new and modified indirect sources. Strategies for indirect source review include permit programs, review and comment on new and modified indirect source projects through the California Environmental Quality Act (CEQA) process and coordination of air quality, transportation and land use policies through local government general plans. Indirect source review reduces emissions from new and modified sources through best available mitigation measures and additional offsite mitigation such as offsets and mitigation fees.

INDUSTRY: a group of establishments that produce similar products or provide similar services; see North American Industry Classification System (NAICS).

INDUSTRY SECTOR – the BLS lists industries arranged in the North American Industry Classification System (NAICS) code order. Each industry sector and subsector is placed into either goods-producing industries or service-providing industries. The use of the term "industry sector" is standard in Department of Labor, Education and Training Administration (DOLETA) documents.

INFRASTRUCTURE -- generally refers to the recharging and refueling network necessary to successful development, production, commercialization and operation of alternative fuel vehicles, including fuel supply, public and private recharging and refueling facilities, standard specifications for refueling outlets, customer service, education and training, and building code regulations.

KEY PERFORMANCE INDICATORS (KPIs) -- The critical (key) indicators of progress toward an intended result. KPIs provides a focus for strategic and operational improvement, create an

analytical basis for decision making and help focus attention on what matters most.¹⁷
KNOWLEDGE, SKILLS, and ABILITIES – Qualities needed in order to complete any task successfully. Knowledge refers to the familiarity with theoretical concepts and factual information. Skills are the proficiencies developed through practice. Ability is the quality of being able to do something.¹⁸

LETTER OF INTEREST – Also known as a letter of inquiry or a prospecting letter to gauge interest.

LINKEDIN -- An American business and employment-oriented online service that operates via websites and mobile apps. Launched on May 5, 2003, the platform is mainly used for professional networking, and allows job seekers to post their CVs and employers to post jobs

MOBILE SOURCES -- Sources of air pollution such as automobiles, motorcycles, trucks, off- road vehicles, boats and airplanes.

NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS) -- Standards established by the U.S. EPA that apply for outdoor air throughout the country. There are two types of NAAQS. Primary standards set limits to protect public health and secondary standards set limits to protect public welfare.

OCCUPATION -- A craft, trade, profession, or other means of earning a living. Also, a set of activities or tasks that employees are paid to perform and that, together, go by a certain name. Employees who are in the same occupation perform essentially the same tasks, whether or not they work in the same industry. Work is organized in a variety of ways. As a result of technological, economic, and sociological influences, nearly every job in the economy is performed slightly differently from any other job. Every job is also similar to a number of other jobs. In order to look at the millions of jobs in the U.S. economy in an organized way, the Dictionary of Occupational Titles (DOT) groups jobs into "occupations" based on their similarities and defines the structure and content of all listed occupations. Occupational definitions are the result of comprehensive studies of how similar jobs are performed in establishments across the nation and are composites of data collected from diverse sources. The term "occupation," as used in the DOT, refers to this collective description of a number of individual jobs performed, with minor variations, in many establishments.

ON-ROAD, ON-ROAD VEHICLE -- Vehicles that are intended by their manufacturer for use on public highways. On-road vehicles must be certified by their manufacturer with the U.S. Department of Transportation (DOT), National Highway Traffic Administration (NHTSA), as compliant with on-highway safety standards as well as certified to all applicable ARB and U.S. EPA on-road emission standards. Compliance with these standards is indicated by separate safety and emissions labels on the vehicle.

PILOT PROJECT – An initial small-scale implementation that is used to prove the viability of a project idea. The pilot project enables an organization to manage the risk of a new idea and

¹⁷ "What Is a Key Performance Indicator (KPI)?," accessed March 12, 2021, <https://kpi.org/KPI-Basics>.

¹⁸ "Knowledge, Skills and Abilities (KSA): Definitions and Examples," Indeed Career Guide, accessed March 15, 2021, <https://www.indeed.com/career-advice/career-development/knowledge-skills-and-abilities>.

identify any deficiencies before substantial resources are committed

RENEWABLE ENERGY -- Resources that constantly renew themselves or that are regarded as practically inexhaustible. These include solar, wind, geothermal, hydro and wood. Although particular geothermal formations can be depleted, the natural heat in the earth is a virtually inexhaustible reserve of potential energy. Renewable resources also include some experimental or less-developed sources such as tidal power, sea currents and ocean thermal gradients.

RELATED TECHNICAL INSTRUCTION (RTI) – The classroom learning component of a registered apprenticeship; may occur at a college, union, internally at a company, private training provider, etc.¹⁹

RENEWABLE RESOURCES -- Renewable energy resources are naturally replenishable, but flow-limited. They are virtually inexhaustible in duration but limited in the amount of energy that is available per unit of time. Some (such as geothermal and biomass) may be stock-limited in that stocks are depleted by use, but on a time scale of decades, or perhaps centuries, they can probably be replenished. Renewable energy resources include biomass, hydro, geothermal, solar and wind. In the future they could also include the use of ocean thermal, wave, and tidal action technologies. Utility renewable resource applications include bulk electricity generation, on-site electricity generation, distributed electricity generation, non-grid-connected generation, and demand-reduction (energy efficiency) technologies.

RINGELMANN CHART -- A series of charts, numbered 0 to 5, that simulate various smoke densities by presenting different percentages of black. A Ringelmann No. 1 is equivalent to 20 percent black; a Ringelmann No. 5 is 100 percent black. They are used for measuring the opacity or equivalent obscuration of smoke arising from stacks and other sources by matching the actual effluent with the various numbers, or densities, indicated by the charts.

SKILLS -- Are measured as handling or manipulating things, data or people, either verbally, manually or mentally to accomplish an objective. Skills can be developed with practice or appropriate training.²⁰

SMOG -- Originally "smog" meant a mixture of smoke and fog. The definition has expanded to mean air that has restricted visibility due to pollution. Pollution formed in the presence of sunlight is called photochemical smog. According to the U.S. EPA, smog is "a mixture of pollutants, principally ground-level ozone, produced by chemical reactions in the air involving smog-forming chemicals. A major portion of smog-formers come from burning of petroleum-based fuels such as gasoline. Other smog-formers, volatile organic compounds, are found in products such as paints and solvents. Smog can harm health, damage the environment and cause poor visibility. Major smog occurrences are often linked to heavy motor vehicle traffic, sunshine, high temperatures and calm winds or temperature inversion (weather condition in which warm air is trapped close to the ground instead of rising). Smog is often worse away from the source of the smog-forming chemicals, since the chemical reactions that result in smog occur in the sky while the reacting chemicals are being blown away from their sources by winds."

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT (SCAQMD) -- the air pollution control agency for all of Orange County and the urban portions of Los Angeles, Riverside and San

¹⁹ "20190510-Apprenticeship-Process-Guide.Pdf," accessed March 12, 2021, <https://miapprenticeship.org/wp-content/uploads/2019/04/20190510-Apprenticeship-Process-Guide.pdf>.

²⁰ "Knowledge, Skills and Abilities (KSA)."

Bernardino counties. This area of 10,743 square miles is home to over 16.8 million people—about half the population of the whole state of California. It is the second most populated urban area in the United States and one of the smoggiest. Its mission is to clean the air and protect the health of all residents in the South Coast Air District through practical and innovative strategies.

STANDARD OCCUPATIONAL CLASSIFICATION SYSTEM (SOC system) -- A federal statistical standard used by federal agencies to classify workers into occupational categories for the purpose of collecting, calculating, or disseminating data.

SUSTAINABILITY -- preserving and enhancing California's people, environment, and prosperity by meeting current needs and improving quality of life without compromising future generations' abilities to meet their needs.

UNITED STATES DEPARTMENT OF ENERGY (U.S. DOE) -- The federal department established by the Department of Energy Organization Act to consolidate the major federal energy functions into one cabinet-level department that would formulate a comprehensive, balanced national energy policy. DOE's main headquarters are in Washington, D.C.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (U.S. EPA) -- A federal agency created in 1970 to permit coordinated governmental action for protection of the environment by systematic abatement and control of pollution through integration or research, monitoring, standards setting and enforcement activities.

WORKFORCE COMPETENCIES -- The capability to apply or use a set of related knowledge, skills, and abilities (KSAs) required to successfully perform critical work functions or tasks in a defined work setting (U.S. Department of Labor, Employment and Training Administration).

ZERO EMISSION (ZE) -- An engine, motor, process, or other energy source, that emits no waste products that pollute the environment or disrupt the climate.

ZERO-EMISSION VEHICLE (ZEV) -- Vehicles which produce no emissions from the on-board source of power (e.g., an electric vehicle).

Appendix B: CITT Research Team, CAB, Instructor Biographies

CITT Research Team

Dr. Thomas O'Brien is the Executive Director of the Center for International Trade and Transportation (CITT) at California State University, Long Beach (CSULB) and the Deputy Director of Long Beach Programs for the METTRANS Transportation Center, a partnership of CSULB and the University of Southern California. Dr. O'Brien is an instructor in CSULB's Master of Science in Supply Chain Management (MSSCM). He is President of the Council of University Transportation Centers (CUTC) where he serves as a member of the CUTC Workforce Development Taskforce and is Chair of the oversight committee of the National Science Foundation's National Center for Supply Chain Technology Education. He is a member of the Transportation Research Board's Intermodal Freight Transport Committee and Urban Freight and Operations Committee. He also serves on the Boards of the Southern California Roundtable of the Council of Supply Chain Management Professionals, Los Angeles Transportation Club, Foreign Trade Association and National Transit Institute. Dr. O'Brien has a Master's degree in Urban Planning and Development and a Ph.D. in Policy, Planning, and Development from the University of Southern California.

Deanna Matsumoto is the Education and Workforce Development Analyst for CITT. She supports the Center's programmatic efforts in policy analysis and research, and education and training program development, including curricular and instructional design. Deanna is currently Project Manager of the Southern California Regional Workforce Development Needs Assessment for the Transportation and Supply Chain Industry Sectors, funded by the California State University Transportation Consortium (CSUTC) and the California Sustainable Freight Action Plan Certificate Pilot Development Project sponsored by the California Energy Commission and the Governor's Office of Business and Economic Development. Her research also includes highway construction and trucking industry workforce needs for the Federal Highway Administration (FHWA) and Assemblymember Jim Frazier, Chair of the Assembly Transportation Committee. She has a Master of Arts degree in Architecture and Urban Planning from the University of California, Los Angeles with a concentration in the Built Environment, and a Bachelor of Arts degree from Yale University.

Diana Sanchez is a Research Associate at the Center for International Trade and Transportation (CITT). She graduated from California State University of Long Beach with a Bachelor of Arts in Economics. She has contributed toward several projects including the California Sustainable Freight Action Plan: Workforce Development for California Energy Commission; she studied the skills gap among transportation incumbents and helped craft the Sustainable Freight Foundations Certificate Pilot Project to eliminate the gap. In recognition of this work, Diana received the Intermodal Association of North America scholarship to study chassis management. She is also the lead publishing author for the article "Where do Females Rise to Leadership Positions? A Cross-Sector Analysis," published through Applied Economics Letters, which supports the existence of a glass cliff.

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Curriculum Advisory Board

Brian Trice has dedicated the last decade of his professional career catalyzing the alternative fuels world, helping fleets and engaging the next generation to take part in the clean energy transition. Mr. Trice began his alternative fuels tenure working for Freightliner in the Pacific Northwest in 2011 as an Alternative Fuels specialist. When he accepted a role with the Columbia Willamette Clean Cities Coalition (CWCCC) in 2012, Mr. Trice expanded his relationships with local, state, regional, and national government entities including the Department of Energy and the Environmental Protection Agency. Mr. Trice served as Manager of Alternative Fuels for Transportation at the Linn-Benton Community College's Advanced Transportation Technology Center (LBCC- ATTC), which is now one of the most advanced alternative fuel education, training, and certification facilities in the Pacific Northwest. Mr. Trice now serves as the CWCCC's Executive Director where he continues to use his passion of working with fleets, young technicians, and promoting education and information dissemination across the clean transportation sector to help fleets improve efficiency, reduce costs, and promote a more sustainable future.

Bruce Noble is Southern California Regional Director of Employer Engagement for the Energy Construction & Utilities Sector (California Community College's Chancellor's Office) for career pathways and employment pipeline creation, economic and workforce development, and CTE program alignment. Mr. Noble engages industry with the twenty-seven Los Angeles and Orange County Community Colleges in creating initiatives that enable employment and career pathways and lifelong learning opportunities. Mr. Noble has experience in management services, business development, energy, environmental/emissions systems, transportation and industrial equipment business and product development, and commercialization of service and distribution and supply chain channels. He has a Master in Business Administration degree from Pepperdine University, George L. Graziadio School of Business and Management

Frank Ramirez is Deputy Director, Goods Movement and Sustainable Freight Unit for the Office of Governor Gavin Newsom. He has worked under the past four administrations, holding positions such as Deputy Director for the Office of Military Support, Senior Policy Analyst for the California Research Bureau, and the Governor's Office of Planning and Research (OPR). He has also served as Economic Development Planner for the California Federation of Technology and Resources. Frank has been a Board Member of the Sacramento Air Pollution Control District and the Stanford Settlement, Chair of the Sacramento and Woodland Planning Commissions, and member of the Committee to Oversee the Conversion of Mather Air Force Base. He completed his Master's degree in Urban Planning from University of Wisconsin and has a B.A. in Political Science/Urban Affairs from the University of the Pacific.

Shrayas Jatkar is an Interagency Policy Specialist for Equity, Climate, and Jobs with the California Workforce Development Board (CWDB). His primary role is building partnerships with state agencies to ensure that climate investments support high-quality jobs and facilitate greater job access for disadvantaged populations. Shrayas also represents the CWDB on various interagency task forces and working groups pertaining to clean transportation and energy. He joined state government in November 2017 after working for over a decade on environmental and economic justice issues with advocacy organizations in California and New Mexico. Shrayas has served in a variety of leadership roles, including the Board of Directors of the California Hydrogen Business Council, SouthWest Organizing Project, and City of Albuquerque Energy Council. He was a Switzer Environmental Fellow while completing his Master's degree in Community Development at UC Davis and has a B.A. in International Affairs from the George Washington University.

Larry Rillera is in charge of ZEV Manufacturing/Workforce/Equity with the California Energy Commission. Through the Clean Transportation Program, Mr. Rillera leads policy, investments, and teams for zero-emission vehicle technology manufacturing, workforce training and development, and equity activities. Larry also serves on many state interagency teams and local public-private-partnerships. Mr. Rillera was the architect of innovative financing mechanisms for solar panel manufacturers through the California Infrastructure Economic Development Bank and for the Electric Vehicle Charging Station Loan Program through the California State Treasurer's Office. Prior to his work with the CEC, Mr. Rillera was former Manager, Legislative Affairs for Caltrans, Superintendent of Parks and Facilities with the City of Palm Desert, and horticulturalist for the City of Newport Beach. Mr. Rillera holds a Bachelor of Science degree in Plant Science from UC Davis and a Master's in Public Policy from the University of Southern California.

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Kevin Maggay has over 15 years in the transportation and goods movement sector. Mr. Maggay is currently a Program Manager at SoCalGas working with government agencies on environmental focused transportation issues. Prior to joining SoCalGas, he was the Assistant Director of Environmental Operations for BNSF Railway, handling the company's air quality

issues throughout its national network. Prior to BNSF, Mr. Maggay was the Air Quality Supervisor at the Port of Los Angeles, overseeing the Air Quality team in developing and implementing the Port's air quality programs. He holds a bachelors degree in Environmental Studies from the University of Southern California and is an Instructor at California State University Long Beach's Global Logistics Professional Designation Program.

Matt Schrap currently holds the position of Vice President of Government Programs for the Velocity Vehicle Group. In his role, Mr. Schrap works directly with state, local and federal governmental organizations, state and local NGOs as well as various industry associations on the impacts of regulatory policy on private business in California. He also assists equipment owners with in-use regulatory compliance standards and helps determine operator eligibility for incentives and grants, government guaranteed loan programs and other public assistance opportunities available for equipment turnover. Mr. Schrap previously held the position of Director of Environmental Affairs for the California Trucking Association and prior to that was a member of the Center for California Studies, State Senate Fellows Program. He is currently an instructor for CITT's Global Logistics Professional Designation Program and holds an M.A. in Public Policy Administration from CSULB and a B.A. in Government from Sacramento State.

Cameron Roberts is a partner at Roberts & Kehagiaras LLP in Long Beach, California, with more than thirty years of experience in international trade. His practice areas include customs law, export compliance, domestic and international transportation law, maritime law, trade and insurance issues. He is a past president of the Foreign Trade Association and Harbor Transportation Club. He is a licensed customs broker and former transportation executive. Mr. Roberts has qualified as an expert witness in Federal court and before the Court of International Trade and Federal Maritime Commission. He is an adjunct professor at California State University, Long Beach teaching legal aspects of supply chain in the Global Logistics Professional Designation program. He earned his B.A. degree in political science and international relations from California State University, Long Beach and his J.D. degree, cum laude, from the Seattle University School of Law.

Sue Dexter is currently a PhD candidate in Urban Planning and Development at the University of Southern California. Her research interests include transportation planning and infrastructure, freight, and environmental policy. She was previously a Program Manager at Toyota Motor North America for 26 years, where she specialized in broad-scale distribution and system development projects and coordinated all aspects of parts distribution center construction, design, and launch. She is a certified Toyota Production Systems instructor and kaizen leader. Sue has a Master's degree in Operational Research from the London School of Economics, and currently serves on the Advisory Board for Cabrillo High School's Academy of Global Logistics (AGL) program.

Guest Speaker **Dr. Aravind Kailas** is the Advanced Technology Policy Director at Volvo Group, where he oversees policy development, technology outreach, and public engagement strategies to further Volvo's interests in automated driving, electromobility, and connectivity. By promoting key corporate positions and creative assets in various forums, Dr. Kailas has been instrumental in enhancing Volvo's technology thought leadership. Dr. Kailas built and managed an extensive personal network of private and public entities to strengthen organic innovation and public affairs initiatives across Volvo Group. He created a public-private partnership for assessing air quality improvements using smart traffic lights along freight

corridors in Southern California. Dr. Kailas also spearheaded local stakeholder development for introducing Volvo's electromobility solutions in North America. Dr. Kailas is also a part-time Instructor at California State University at Long Beach and has previously held positions at the University of North Carolina at Charlotte, QUALCOMM, DOCOMO Innovations, and General Electric. Author of over 100 publications and quoted in many media outlets, Dr. Kailas has served on several R&D and technology panels, and advisory boards of non-profit organizations and academic institutions. His work has been recognized with numerous accolades, including awards from the Transportation Research Board (TRB), the Society of Automotive Engineers (SAE), and the Institute of Electrical and Electronics Engineers (IEEE). He has earned degrees in Applied Mathematics and Electrical and Computer Engineering from the University of Wisconsin-Madison and Georgia Institute of Technology.

Appendix C: Community Workforce Agreements and Approaches for CSFAP Workforce Development

Community Workforce Agreements and Approaches for California Sustainable Freight Action Plan (CSFAP) Workforce Development

Introduction and Purpose

Community Workforce Agreements (CWA) are an integral component of major public and private infrastructure development projects in California and have been in existence since the 1930s. This concept paper explores the possibility of using critical elements of a CWA to develop future workforce development models for implementing the CSFAP for transportation, supply chain, and other logistics-related occupations in California.

Though CWAs focus on the construction trades, specific elements of a CWA can inform the development of workforce agreements in transportation and logistics-related industries. Workforce development approaches using content from the CSFAP Action Plan pilot projects that integrate advanced technologies, alternative fuels, freight and fuel infrastructure, and local economic development opportunities will also be explored.

What is a CWA?

In terms of nomenclature, sometimes a CWA is referred to as a Project Labor Agreement (PLA), though in some cases, a PLA is considered only one component of a CWA. In the latter usage, a PLA is a multi-employer, multi union pre-hire agreement designed to systemize labor relations at a construction site.¹ For purposes of this concept paper, we will use the term CWA.

¹ Renne Sloan Holtzman Sakai (2017) "Community Workforce Agreements and Project Labor Agreements" <http://www.sanjoseca.gov/DocumentCenter/View/70025>

A CWA is a formal, legally binding labor-management agreement that is negotiated between a contractor and local labor organizations for specified construction projects. CWAs have been created to form partnerships, create career pathways, and target certain demographics of a community to create quality jobs and allow minorities to access jobs in the construction industry. A CWA also creates hiring programs to ensure workers will be able to provide labor for the duration of construction without work stoppages.

CWAs (and PLAs) are not without controversy. Some industry associations oppose the use of CWAs citing they do not result in the public benefits they intend to address. Elements of contention include hiring hall practices, benefits, and fees that discriminate against or shut out merit shop (open shop) contractors. These labor concerns may be less prevalent in developing CWAs in transportation and logistics-related industries since a majority of jobs in these sectors are not unionized.

CWA Design

Each CWA is unique as they are tailored to specific community interests. There is no single method guide to create a CWA as they should each be tailored the community it will service. However, key elements of a CWA include the following provisions:

- Utilization of local hire ordinances that were passed by a legislative body covering the terms of public works construction, including that a certain percentage of public work construction and a certain percentage of work hours be performed by local residents;
- Hiring and workforce development of economically disadvantaged and so called at-risk individuals who are local residents;
- Hiring and workforce development of women and members of minority groups, including African Americans, Latinos, Asians, Native Americans, and others;
- Hiring of veterans or Helmets-to-Hardhats (H2H) Programs;

- Apprenticeship utilization requirements and requirements or goals for percentage of employed apprentices who should be local residents;
- Utilization of women- or minority-owned and local small businesses;
- Utilization of union-supported Pre-Apprenticeship Programs as well as of community-based pre-apprenticeship programs;
- Involvement of community-based organizations in the recruitment and monitoring efforts; and the
- Development of an implementation and monitoring process or plan.²

² Cornell University (2011) “Community Workforce Provisions in Project Labor Agreements: A Tool for Building Middle-Class Careers” <https://staging.community-wealth.org/sites/clone.community->

³ Elements included are modeled after research conducted by the Partnership for Working Families. (Accessed 2/13/19). www.forworkingfamilies.org.

Rationales for designing transportation-related workforce development agreement models mirror those for creating established CWAs in the construction trades.³ CWAs can:

- Provide higher quality career opportunities that have a higher pay scale and provide opportunities for advancement, versus low quality seasonal or temporary jobs;
- Connect communities with high unemployment to new career opportunities;
- Attract and support new hires;
- Encourage apprenticeship and pre-apprenticeship participation or other work-based learning;
- Support contractors and businesses who help fund and participate in strong training programs with proven outcomes;
- Guarantee against work stoppages and project disruptions; and
- Provide a neutral arbitrator for labor disputes arising from the work agreement.

Community Benefit Agreements

Elements of Community Benefit Agreements (CBAs) can also be incorporated into a transportation-related workforce agreement. CBAs encourage collaborative approaches between multiple stakeholders – industry, government, educational institutions, and workforce development agencies – to support mutually agreed upon community goals and outcomes for a project. High quality training programs, employment services including recruitment, supportive services and coordination for training and education, and technical assistance provided to HR needs of businesses can be negotiated into agreements. These programs can be spearheaded by a local workforce development agency (WDA). Training funds can also be established for contractors to contribute to workforce development, as in the case of San Francisco’s Bay Area Rapid Transit District’s Major Projects Stabilization Agreement (BART-MPSA)PLA.⁴

Examples of Transportation-related CWAs in California

The Maritime and Aviation Project Labor Agreement for Modernization of the Port of Oakland (MAPLA)

The Port of Oakland Maritime and Aviation Project Labor Agreement (MAPLA) was adopted by the Board of Port Commissioners (Board) in 2000 and updated in 2016 to extend through 2021. The MAPLA was executed to cover the capital projects in the Port’s Aviation and Maritime areas. In response to Board policies, the MAPLA was designed to ensure project labor stability, employment of Port local residents, and utilization of Port-recognized small businesses. Targeting hiring components of the MAPLA include provisions of minimum threshold of labor hours worked from local residents and from apprentices from the local impact area, commonly defined by zip code. The MAPLA would serve as a point of entry for construction trades for these apprentices.⁵

The Alameda Corridor Transportation Authority (ACTA)

The Alameda Corridor Transportation Authority (ACTA) is a joint power authority created by the city of Long Beach and Los Angeles. The ACTA built the Alameda Corridor, which is a 20-mile-long rail cargo expressway that links downtown Los Angeles and the ports of Long Beach. The ACTA was formed to study

rail access, address concerns over the impact of projected train traffic on communities, consolidate trains to reduce freeway congestion, support increased on-dock rail loadings, explore a zero-emission container mover system instead of trucks, and to move empty containers away from residential neighborhoods.⁶Based on language in ACTA documents, construction of the Alameda Corridor was accomplished with the use of a CWA. It is important to note however, that no statement regarding the CWA is present on their website.

Dairy Biomethane for Freight Vehicles

ARB would serve as lead agency to process dairy biogas into biomethane for use in natural gas vehicles to reduce emissions in an area of Kern County (San Joaquin Valley)with a cluster of sixteen dairies within a six-mile radius. Workforce development can focus on the establishment, maintenance, and operation of fueling infrastructure for zero and near-zero emission vehicles using biomethane.

Advanced Technology for Truck Corridors(Southern California) and for Border Ports of Entry(California-Mexico Border)

Caltrans would serve as lead agency for these pilot projects. To reduce freight congestion on Interstates 710, 10, and 15, State Route 60, and to meet the demand for projected binational commercial growth at the California-Mexico border, intelligent transportation systems (ITS),connected and semi-autonomous vehicle technologies, and collaborative logistics can be utilized. Workforce development efforts can focus on the installation, maintenance, and operation of these technologies:

- Freight Signal Priority
- Freight Advanced Traveler Information System
- Eco-Routing
- Probe-enabled traffic monitoring

Similar workforce development training efforts can be implemented in projects such as the Port of Long Beach's Middle Harbor.

Appendix D: Apprenticeship Pipelines from Pre-Apprenticeships to Incumbent Upskilling: Concepts in Apprenticeship Development and Digital Learning for Middle-Skill Logistics

Introduction and Purpose

The logistics, trade, and transportation sectors are rapidly adopting transformational and disruptive technologies including blockchain, the Internet of Things, Electronic Data Interchange (EDI), Artificial Intelligence including machine learning, and last mile technologies to remain competitive. This increased reliance on technological connectivity requires new models of workforce training that focus on IT. Geographic/Geospatial Information Systems (GIS), big data analytics, coding, software development and application, and enterprise resource planning (ERP) are among the targeted skills that logistics and transportation companies need to ensure that information flows support the physical flow of goods in a timely, transparent and secure manner. This disruption impacts both public and private sector employers with organizations struggling to find the talent needed to address technical challenges that impact operational efficiencies, system performance, safety, and security. Coupled with CSFAP requirements, this increased reliance on technological connectivity requires new models of workforce training that focus on IT and meet industry demands.

In addition to technological reliance that demands targeted skills, transportation systems and other physical infrastructure are in need of an upgrade. U.S. infrastructure was rated a D+ by the American Society of Civil Engineers based on the system's capacity, condition, funding, future need, operation and maintenance, public safety, resilience, and innovation.¹ The improvement of the transportation will require a large investment in physical and human capital, creating the potential to strengthen our economy and decrease unemployment rates. President Trump and Congressional Democratic leaders have designated \$1 trillion to incentivize the movement to rebuild U.S infrastructure.

A federal infrastructure package would create more than 11 million jobs that demand every education level. Most of those jobs would require middle skill training and education levels, creating a further demand for apprenticeship and training programs in order to supply a skilled workforce. With the retirement of many skilled baby boomers, the labor skill gap may prolong the

infrastructure program. These skill shortages are already affecting industry, creating training needs in the trucking, transit, air, highway, rail and maritime sectors. ²

¹ <https://www.infrastructurereportcard.org/>

Peer Review Summary and Developing Models:

On March 7th, a peer review among the stakeholders and Center for International Trade and Transportation (CITT) took place in Sacramento. Prior to this peer review, occupations were defined into two clusters, and further divided into five sub clusters in order to create career pathways for each occupation. During the peer review, stakeholders expressed that occupation competencies were of greater interest. As a result, competencies for each occupation previously identified were researched. Developing competencies in the workforce and identifying which competencies are vital for each occupation is now the focus of the pilot program to be conducted by CITT. After competencies for each occupation were identified, we developed two options for the workforce development of those competencies – Apprenticeship program or Certification program. Based upon the research of all the existing apprenticeship models and certification courses, we have identified the best programs currently existing for the supply chain sector. A pilot program can be created using these existing programs and to develop a hybrid program which will have multiple benefits to the employee as well as the employer. There are also few established competency models for skill development within the supply chain industry. These can be incorporated in the final hybrid model to be developed by CITT.

A certification is short term and professionally oriented. A certification involves test-based curriculum that are administered by trade group or industry associations. Certifications are independently administered by companies and are used as a screening method to ensure an individual is qualified with a specific skill set desired by the company. A certification is when a candidate demonstrates the requisite work-related knowledge, skills, and competencies by being tested. They are usually used when skills are technical and are not generally learned in traditional degrees.

Defined by the Department of Labor (DOL), an apprenticeship is an approach that prepares “workers for jobs while meeting the needs of business for a highly-skilled workforce. It is an employer driven ‘learn-while-you-earn’ model that combines on-the-job training, provided by the employer that hires the apprentice, with job related instruction in curricula ties to attainment of national standards.” ³ There are different types of apprenticeship models that are later defined.

Identified Skills and Clusters

The methodology of identifying the occupations and clusters started with identifying the occupations related to California Sustainable Freight Action Plan (CSFAP). Prior work on labor market reports for entry and middle-skill were also reviewed to identify gaps and demands. To do this we used tools like BurningGlass and O*NET. Using these tools we identified the top 20 occupations important to the CSFAP based on job demand.

The next step was categorization of occupations at cluster level based on the directions given by the Working Group. These were again validated through a focus group conducted by CITT. To start with, criteria on how to rank the occupations in terms of importance and relevance were defined. The top 20 occupations with the highest labor demand, focusing on entry to mid-level were selected. Once the occupations were identified, they were defined under two main categories:

- Operational Jobs
- Managerial/Administrative Jobs
 - Includes Regulatory

Under each of these categories we have identified sub-clusters based on the discussions with the working group and focus group:

Operational Occupations

- Trucking/Mechanics
- Logistics-freight movement
- Manufacturing-labor
- Engineering

Managerial/Administrative Occupations

- Logistics-planning and analytics
- Information technology/data management/analytics

³ <https://www.dol.gov/apprenticeship/toolkit/toolkitfaq.htm#1a>

- 1) Engineering
- 2) Advanced Manufacturing
- 3) Infrastructure planning and Development
- 4) Regulatory and oversight
 - Public sector planning, urban planning, etc.

We identified the following criteria which are most important in choosing the top 20 occupations as discussed with the focus group:

- Technical Skills – Hard skills like software, hardware, IT etc.
- Demand (Job openings) – BurningGlass
- Leadership & Communication Competencies – Soft skill, management skills, project management, ability to take charge, critical thinking etc.
- Work Experience – Number of years worked previously. This depends on the position and complexity of the job
- Education Level – Specified for entry and mid-level positions
 - High school, associate degree, bachelor degree, master’s degree
 - Extra Certifications

Each occupation was evaluated based on the 4 criteria:

- The tools used for evaluation were Burning Glass Labor Insight/Jobs™, Bureau of Labor Statistics and O*NET
- We looked at entry and mid-level jobs which had the highest number of openings
- Each cluster was then sorted highlighting complexity of requirements for technical skills, education level, communication skills and other competencies
- Top 5 from each cluster chosen to be presented to the working group for final selection of occupations for developing a career pathway

Based on these Top 5 occupations identified in each cluster, we deep-dived into the skill set requirements for all the identified occupations. The aim was to capture skills that are common across multiple levels of occupations ranging from entry, mid and advanced. This will enable us to build a career pathway for employees to move ahead in their career either in the same cluster

or across clusters. The next step was to segment the skills in three tiers of entry, mid and advanced. Few critical skills were common across all levels.

The identified skills will be used to develop a skill pathway in the transportation industry across clusters. The skill pathway will identify skills at each level and the relevant occupations matching those skill sets. These occupations will be from the earlier list of Top 5 from each cluster.

CSFAP Workforce Development Models

The Alternative and Renewable Fuel and Vehicle Technology Program (ARFVTP)

To meet the needs of a growing clean transportation and fuels market, ARFVTP is investing in manufacturing and workforce training and development, while working with a variety of public and private partners. Through ARFVTP investments, the Energy Commission helps workforce development and training entities to expand their current programs and develop new programs in alternative fuels and advance vehicle technologies for California's advanced transportation sector. The Clean Energy Transportation Initiative (CETI), California Community Colleges Chancellor's Office (CCCCO), Employment Development Department, and Employment Training Panel (ETP) are public partners of the Energy Commission.

Workforce development demands have increased through the expansion of programs and number of partnered agencies in order to train, develop and support the emerging alternative transportation workforce. A CCCCCO initiative created a partnership between the Energy Commission and the Advanced Transportation and Logistics Initiative (ATL) that is hosted by California community colleges across the state. The first ATL Initiative, hosted at San Diego Community College District, awarded California community colleges funds to purchase equipment required for hands on training and advanced technical training for instructors and trainers. The second ATL Initiative focused on developing a high school clean transportation career pilot program for underserved communities. A collaborative effort between the CCCO, California Workforce Development Board, and Mission College established the Energy Transit Apprenticeship Program. California Division of Apprenticeship Standards (DAS) was created and established apprenticeship standards for wages, hours, working conditions, and specific skills required for state certification. The program also supported the implementation of 200 apprenticeships, establishment of the Mission College Department of Transportation Studies, 29 transit career courses, and 2 certificates.

Energy Commission staff proposes a \$1.5 million allocation for workforce training projects for FY 2019-2020. The ARFVTP Investment Plan was implemented by the Assembly Bill (AB) 118 (Statutes of 2007) to serve as guidance for the allocation of program funding. Investment Plans have been released for 12 years and outline analytical methods used to assure greenhouse gas reductions for the Assembly Bill 32 target of 2020.

Apprenticeship Models: Registered Apprenticeships and Industry-Recognized Apprenticeship Models
Apprenticeship models are gaining a resurgence in the U.S. as a cost-effective method to teach employability and occupational skills, which in turn, provide positive rates of return for businesses. Apprenticeships have been shown to improve both the supply and demand sides of the labor market

by also promoting innovation, gains in recruitment, productivity, and workforce quality.⁴ The Obama administration prioritized the apprenticeship model by awarding \$175 million in grants in 2015; in 2017 President Trump authorized increasing federal funding for apprenticeships to \$200 million, receiving bipartisan support. Evolving apprenticeship models include both union-backed construction trades as well high-growth sectors such as energy conservation, health care, information technology, and industry-recognized and supported digital learning driven by employer demands.⁵ ⁶Digital learning through apprenticeships in both the private and public sectors is gaining ground in the U.S., many based on models emanating from the United Kingdom and Germany.⁷ A CSFAP workforce development approach may be to adapt these models to effectively bridge the knowledge gap by providing opportunities to learn complicated, ever-evolving IT skills as an apprentice.

A quality apprenticeship model includes the following elements of workforce development:

- related technical instruction (RI/RTI)
- on-the-job training/learning (OJL/OJT)
- paid wages
- industry credentials that are portable
- adherence to Equal Employment Opportunity (EEO) laws
- safety and supervision training
- mentors
- support services
- competency-based assessment

These components differentiate apprenticeships from other work-based learning such as internships and externships. Delivery of related instruction and training is flexible; it can be customized based on employer and apprentice needs. Programs can employ face-to-face, online, or hybrid models for service delivery. Completing an apprenticeship program yields an industry-recognized, portable credential that proves mastery of skills and competencies required by the occupation. Apprenticeship programs are placed both in union and non-union workplaces.

Apprentices earn a wage while learning and build their skill level through supervised training and classroom or related education. The eligible starting age can be no less than 16 years of age, though most programs require participants to be at least 18. Apprenticeship sponsors delineate selection criteria.

Registered Apprenticeships (RAs)

The Department of Labor (DOL) provides sponsors of RAs access to a nationwide network of technical assistance, customer service, and support at no cost. A RA assures wage progression based on skill gains. At the end of the RA program, apprentices will receive industry-recognized, nationally portable, competency-based credentials issued by the DOL. Registration with the DOL ensures that the apprenticeship program meets national and independent standards for quality and rigor. Depending on the state of the RA, businesses can qualify for state-based tax credits and may be able to claim some expenses for training as a federal tax credit. Furthermore, a RA gives businesses and apprentices access to funding and other resources from federal programs.

The DOL has contracted with eight national industry partners to provide free technical assistance to employers and other apprenticeship sponsors to develop RAs. TRANSPORTs is one of these national industry partners tasked with assisting ports and ports-connected multimodal transportation, distribution, and logistics (TDL) industry sectors in developing RAs. RAs in these sectors include programs for high-demand occupations such as truck drivers, diesel mechanics, heavy equipment mechanics, vehicle inspectors, and electrical technicians.

Industry-Recognized Apprenticeship Programs (IRAPs)

In July of 2017, the DOL issued the Training and Employment Notice (TEN) 03-18, *Creating Industry-Recognized Apprenticeship Programs (IRAPs) to Expand Opportunity in America*, which provides high-level policy suggestions to allow trade associations and other non-governmental entities to certify apprenticeship programs. President Trump issued Executive Order *Expanding Apprenticeships in America* calling for a system of industry-recognized apprenticeships that would not require direct government approval. In fall 2018, the DOL's Education and Training Administration (DOLETA) issued a \$150 million funding opportunity announcement for apprenticeship grants, *Scaling Apprenticeship Through Sector-Based Strategies*.

With the IRAP models, a consortium of regional industry, labor, workforce intermediaries including workforce development agencies, community-based economic development organizations, and training and education providers can potentially act as a certifying/accrediting agency. IRAPs may benefit small- and medium-sized businesses. An apprenticeship sponsor can aggregate industry demand in designing programs and also provide technical assistance to implement these programs. The sponsor can effectively take the burden off smaller businesses that may not be able to afford the additional

staff required to oversee the implementation of apprenticeship programs (e.g., documentation of task competencies, wage provisions, apprenticeship hours).

While the DOL has posited high-level guidelines, there are currently few specific guidelines regarding determining the roles of certifiers/accreditors, or the rigor, quality, and training and competency standards of the IRAP model. Wage progression and the integration of the IRAP model with existing state and federal apprenticeship and workforce systems have not been addressed.⁸ The DOL has, however, issued an Information Collection Request (ICR) for public comment on IRAPs in the fall of 2018 that will close at the end of January 2019. The American Trucking Association (ATA), National Skills Coalition, Institute for American Apprenticeships, Commercial Training Vehicle Association, Commercial Training Vehicle Association, and the National Association of Publicly Funded Truck Driving Schools are among the respondents.⁹

The National Skills Coalition (NSC), a broad-based coalition of business leaders, labor affiliates, education and training providers, community-based organizations, and public workforce agencies, has several suggestions to improve the IRAP model. Among NSC suggestions relevant to this paper are the following:

- Require accreditors to support and work with local industry partnerships to develop and personalize programs to meet the needs of local, small- and mid-sized companies;
- Ascertain wages are provided to apprentices, not stipends;
- Require apprentices receive training in workplace safety;
- Determine how accreditors will ensure quality assurance standards are continuously evaluated to meet business demand and worker needs;
- Align outcome metrics with federal programs such as the Workforce Investment Opportunity Act (WIOA) common measures. This will ensure workers with barriers to employment targeted under WIOA will have access to IRAP programs and conversely, eligible apprentices under an IRAP have access to WIOA resources.

The Commercial Vehicle Training Association, the American Trucking Association (ATA), and the National Association of Publicly Funded Truck Driving Schools' concerns relate to compliance efforts of accreditors/certifiers:

⁸ Jobs for the Future. (2018). "What's Next for Apprenticeship?" www.jff.org/points-of-view/whats-next-apprenticeship/

⁹ DOL. (2019). Responses to ICR for IRAPs. <https://www.regulations.gov/>

- Clarify rules, regulations, and benefits to becoming accreditors/certifiers so that the burdens of developing an IRAP do not outweigh the benefits.

The ATA further requests:

- Define data and performance metrics;
- Define program-to-program consistency in training standards;
- Clarify definition of program assessment organizations and organizations that make accreditation decisions to avoid conflict of interest issues.

The National Association of Workforce Boards, the National Fund for Workforce Solutions, and Advance CTE (a national coalition of Career Technical Education state directors) suggest the following:

- Refine the definition of accreditor/certifier responsibilities (including monitoring and legal liability concerns);
- Define OJL and RI minimum hours;
- Include regulations on program monitoring and oversight;
- Clarify conflict of interest issues among accreditors and the programs they will approve and monitor;
- Include guidelines concerning the charging of fees to apprentices (charges which could constitute a barrier to apprenticeship participation).

Non-Registered Apprenticeship Programs

Apprenticeships not registered with a state or federal agency are preferred by some businesses because they are perceived as more flexible in structure than RAs or IRAPs.¹⁰ Data from 2016 Adult Training and Education Survey (ATES) show widespread use of company-backed efforts that are not registered with a state or federal agency (Jacoby and Lerman, 2019). This model of apprenticeship can synthesize industry-based apprenticeships with federal or state support: for example, government can subsidize off-job components while industry compensates apprentices for OJT. With this model, state agencies, industry associations, or other approved accrediting bodies can develop and monitor metrics. However, RAs and IRAPs can perhaps

¹⁰ Tamar Jacoby and Robert Lerman. (2019). Opportunity America webinar, “Industry-Driven Apprenticeships: What Works, What’s Needed.” https://opportunityamericaonline.org/wp-content/uploads/2019/02/OA_ApprenticeshipReport_2019.pdf

better serve small- and medium-sized businesses with the technical assistance government can provide to develop, monitor, and market apprenticeships using aggregate demand models.

Pre-Apprenticeship Models

A pre-apprenticeship is a program or set of strategies designed to prepare participants to enter and succeed in a Registered Apprenticeship program and has a documented partnership with at least one Registered Apprenticeship program. Pre-apprenticeship programs prepare participants to meet the basic qualifications through an approved training curriculum (including hands-on, voluntary training) for entry into an RA. Pre-apprenticeships can be adapted to meet the needs of the various employers and sponsors they serve, specific training opportunities for the local labor market, and for various populations being trained (including women, justice-involved youth and adults, and other demographic groups that may face barriers to training and employment). Language and math literacy as well as employability and career-readiness skills contextualized to the occupation being apprenticed are offered. They also provide access to career exploration, appropriate support services, and hands-on training that does not displace paid employees. Pre-apprenticeship programs also recruit and pre-screen participants to apprenticeship programs and are viewed by some workforce development stakeholders as indispensable to the success of apprentices, particularly for underrepresented populations.

Employability or career/readiness skills (also referred to as career readiness skills) are ranked high by logistics-related employers for qualities they are seeking in potential workers.¹¹ The California Community Colleges Chancellor's Office (CCCCO), a major state workforce development education and training provider, has aligned the *Doing What Matters for Jobs and the Economy* framework and the *New World of Work (NWoW)* initiative to identify the top 10 employability skills needed for educational and workforce success: adaptability, analysis/solution mindset, collaboration, communication, digital fluency, entrepreneurial mindset, empathy, resilience, self-awareness, and social/diversity awareness. NWoW has developed a 21st-century employability skills curriculum for teaching these skills at over 50 California community colleges, using work-relevant content in direct teaching and online delivery models. In addition, CITT is developing a customized, transportation-focused

¹¹ Rick Blasgen, Council of Supply Chain Management Professionals (CSCMP) lecture, CSULB. (1/29/19). "Connecting, Developing, and Educating Supply Chain Professionals"

employability skills course that will also have flexible delivery models. Embedding these curricula into the pilot apprenticeship model is critical to apprentice persistence and retention. A close fit may be in the pre-apprenticeship stage of the pipeline.

Industry stakeholders at the peer exchange session suggested marketing and career exploration for logistics-related jobs starting in elementary and middle school so that these high demand careers become destination careers, a strategy also suggested by Advance CTE. Pre- apprenticeship programs can fill this gap, while also providing a steady supply of participants to apprenticeships in the logistics sector.

Public Sector Apprenticeships/Workforce Training Models

The National Association of State and Territorial Apprenticeship Directors (NASTAD) has proposed increasing the number and visibility of public sector apprenticeships.¹² Based on input from the stakeholder peer exchange, workforce development efforts are needed in the public sector for planners to understand the dynamics of freight and the supply chain for capital investment and infrastructure decisions. In California, the implementation of state laws on greenhouse gas emissions reduction has changed the skill sets needed for planners, bringing new emphasis on sustainability and integrating transportation and land use planning. These new demands on public sector transportation planners require new models of workforce training that may incorporate apprenticeship designs. The new skill set being demanded by the market requires advanced knowledge, creating an apprenticeship model that is not middle skilled based. The demanded skill set seeks higher and more technical training than that of a midlevel education and capabilities.

A recently created public sector workforce development model is the Workforce Development Professional Apprenticeship Program launched in 2016 with three cohorts from CSU Long Beach, CSU Los Angeles, and CSU Sacramento. The California Workforce Association is Apprenticeship Sponsor. Targeted workforce skills include communication, project management, customer service, business engagement, team building, marketing, and leadership to standardize new workforce development competencies and plan for succession. Criteria for advanced credit is granted based on education and length of service with a workforce

¹²National Association of State and Territorial Apprenticeships Directors (NASTAD). (2019). www.nastad.us

development agency, and half of the required class time is during work hours. Based on a cohort of 25 students, the cost of the classroom training is \$4,000 per student for a total program cost of \$80 – 100,000 (this structure will vary depending on program). Upon completion, the apprentices receive a State Apprenticeship Council Certificate in addition to a California State University Workforce Development Professional Certificate.¹³ This model may be replicated to provide training in logistics and supply chain management for workforce development agency staff, given the high demand for middle-skill jobs in these sectors.

CITT has led two efforts to engage the public sector in freight-related capacity building. In April 2018, Caltrans personnel from different parts of the State and from different units attended a multi-day training academy to understand the geography of the supply chain and the context of freight within transportation planning. In addition, in January and February of 2019, CITT developed a series of seminars entitled “The Battle for the Curb: Managing Local Goods Movement in the Age of E-Commerce” for public and private sector planners to engage in last-mile transportation planning. These approaches to public sector capacity building can serve as models that can be replicated statewide.

Private Sector Apprenticeship Models

Kuehne & Nagel created an apprenticeship model due to employee conflicts among competitors. After experiencing low employee loyalty and high labor demand that increased competition to retain workers, the apprenticeship program was implemented to ensure employee stability. This was an effort to replace temporary workers with permanent, long term employees. Long term employees are desired as it creates an experienced workforce, less money is spent on training, and a certainty of confidence is instilled in the employees who are knowledgeable in their work. The apprenticeship model is a 22-week rotational program intended for junior and senior students enrolled in a 4 year university, or a community college. The different departments apprentices may engage in include airfreight (import/export), seafreight (import/export), key accounts, road + rail, sales, finance, customs brokerage etc. The benefits of the apprenticeship program include:

- Paid work
- Tuition reimbursement
- Flexible hours
- Enrollment in international Freight Forwarding certification program

Between 2015 and 2017, a total of 10 apprentices have been hired and 2 permanent appointments have been made.

Center for Energy Workforce Development

The Center for Energy Workforce Development (CEWD) is a non-profit consortium of electric natural gas and nuclear utilities.¹⁴ Their associations include Edison Electric Institute, American Gas Association, Nuclear Energy Institute, and National Rural Electric Cooperative Association. CEWD was created in efforts to develop the utility industry workforce shortage and is the first partnership to be formed between utilities, their associations, contractors and unions. Through this partnership, a skilled and reliable workforce pipeline is expected in order to meet future industry needs.

CEWD offers different free curriculum, among those are:

- Natural Gas Boot Camp
- Women in Sustainable Employment (WISE) Pathways Career Exploration Workshop
- Troops To Energy Jobs Work Ready Bootcamp
- High School Energy Career Academy
- Fundamentals of Energy
- Get Into Energy Test Prep Workshop

The Energy Industry Fundamentals Certificate Program is a certificate developed by CEWD. The certificate aligns with the Energy Competency Model developed by CEWD and the U.S Department of Labor. It lays the foundation and principles that impact the energy industry and provides the following: compliance with safety and health procedures; how electric power and natural gas generation, transmission, and distribution work; a range of entry-level energy careers; and “hot topics” in energy.

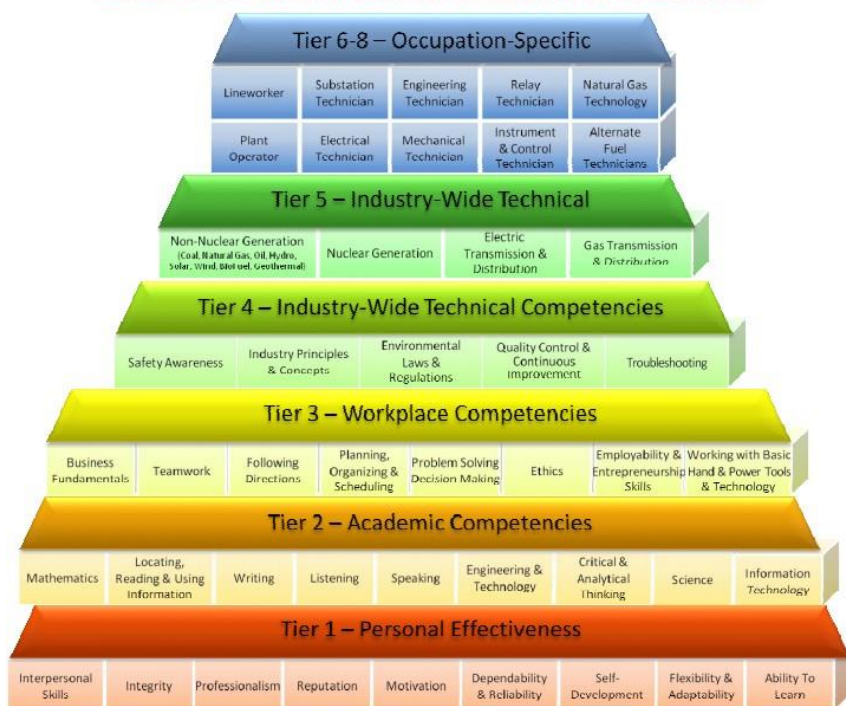
The courses themselves are organized and offered through an Approved Course Provider system. Courses are hosted and taught by instructors teaching in high schools, community colleges, and other education institutions. An application process needed to become an Approved Course Provider is used to ensure all courses are equivalent regardless of the state where the course is taking place. A certificate earned in one state is equivalent to a certificate earned in another state.

The CEWD states that “the purpose of the Energy Industry Fundamentals Certificate is to ensure that potential workers gain an understanding of the energy industry as a prerequisite to occupation-specific training. It also ensures that they gain an understanding of the careers available in the energy industry, as well as the education and training to enter and advance in those careers.”¹⁵ The CEWD developed their own competency model stacked in tiers based on specificity and specialization. Each tier is divided into blocks representing content or the skills, knowledge, abilities and other factors that are essential to successful performance in the industry. Not all competencies are required for all of the jobs in the energy business; for example, all competencies on the lower tiers are not necessarily needed to achieve the competencies needed on upper-level tiers.¹⁶

¹⁵ <http://cewd.org/curriculum/about-the-eif-certificate.php>

¹⁶ <http://www.cewd.org/curriculum/downloads/Energy%20Competency%20Model%20September%202010.pdf>

ENERGY INDUSTRY COMPETENCY MODEL GRAPHIC



The Competency Building Block model is intended to help teachers, students, Career One Stops and potential employees understand the competencies required to work in the energy industry.

Certification Programs

The transportation and supply chain industries have many certification programs which focus on skill development and enhancement for new entrants as well as middle skill workers. The aim of these

certifications is to ensure that the workforce is ready to transition to the next role with the right set of skill sets. It is desirable to obtain certifications focused on a specific function. While there are a number of supply chain managers certifications related to specific industries, general certifications include:

- Certified Supply Chain Professional (CSCP) – APICS The Association for Operations Management
- Certified in Production and Inventory Management (CPIM) – APICS
- The Association for Operations Management
- Certified Professional in Supply Management (CPSM) – Institute of Supply Management

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- SCOR/P – Supply Chain Council
- Certification in Transportation and Logistics (CTL) – American Society for Transportation and Logistics
- Energy Industry Fundamentals Certificate Program – CEWD

International Society of Sustainability Professionals

This certification provides 1) a macro examination of the core business processes and stakeholders within SCM, identifying strategic opportunities for the application of sustainability principles and 2) specific application of tools at a tactical level to achieve sustainability objectives.

Learning outcomes are:

- Understanding how the supply chain is an integrated system.
- Key Levers within supply chain network.
- Strengths and limitations of 3rd party certification
- Vendor qualification and selection tools
- Reporting - Internal and external

Three popular certification courses

The Certified Supply Chain Professional (CSCP) and Certificate in Production and Inventory Management (CPIM) offered by The Association for Operations Management (APICS)

CSCP is ideal for General Supply Chain Careers. First launched in 2006, over 13,000 supply chain professionals in 78 countries have since gained the CSCP. According to the APICS, it “provides

you with a mastery of supply chain management best practices and distinguishes you as an industry expert with specialized, high-level knowledge and skills.”

The eligibility requirements for the CSCP require one of the following:

- Another APICS or ISM certification, plus two years of related business experience;
- A bachelor’s degree or equivalent, plus two years of related business experience; or
- Five years of related business experience.

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CPIM: Ideal for a Career in Inventory Management

The CSCP can be “mixed and matched” with other certifications, should you later decide to venture deeper into a specific area. According to their experts, if you’re seeking a career in inventory management, then APICS’ CPIM is the best certification to get. You get the CPIM if you want to learn production planning and scheduling and inventory management. It’s very plant floor focused.”

No bachelor’s degree is required, and you need only two or more years of experience in the field. The Certified Professional in Supply Management (CPSM) from the Institute for Supply Management (ISM): Ideal for a Career in Procurement

This certification equips professionals with shared language, terminology and ideas. And like APICS, the ISM says that those with the certification can earn more: ISM’s own salary survey for 2013 states that professionals with a CPSM earn 9 percent more than those without it.

Requirements for the certification are:

- Three years of full-time, professional supply chain management experience (nonclerical, nonsupport) with a bachelor’s degree from a regionally accredited institution or international equivalent, or;
- Five years of full-time, professional supply chain management experience (nonclerical, nonsupport) without a qualified bachelor’s degree, and;
- Successfully pass three CPSM exams or pass the Bridge Exam if you’re a CPM “in good standing.” (The CPM is an older certification from the ISM, now retired.)

SCPro™ from the Council of Supply Chain Management Professionals (CSCMP)

The certification has three levels, and thus offers those who take it the opportunity to explore supply chain issues on a much deeper level. Level One is equivalent to the CSCP. At Level Two, you go deeper: there are case studies you have to solve, like you’d get in a master’s degree program. At Level Three, you execute performance improvement in an actual company—either your own company, or they’ll find you one. You have to make real world changes.”

SCPro™ Level One: Cornerstones of Supply Chain Management Exam

Fee: \$975; Member Fee: \$650

This multiple-choice exam assesses your knowledge of the eight elements of supply chain management.

SCPro™ Level Two: Analysis and Application of Supply Chain Challenges Exam

Fee: \$1,500; Member Fee: \$1,095

This case study-based exam assesses your ability to apply supply chain knowledge.

SCPro™ Level Three: Initiation of Supply Chain Transformation

Unlike any other certification program, successful completion of this “real world” project demonstrates your ability to positively impact an organization with an array of supply chain management skills.¹⁷

Women in Sustainable Employment (WISE) Pathways Pilot Program

WISE Pathways is a comprehensive, forty - hour career exploration and workplace skills development program. Workshop topics include:

- Energy and construction industry overviews, including safety
- Resume preparation, online applications, and interviewing skills
- Teamwork, work habits, conflict management, and sexual harassment

In partnership with Northern Virginia Community College (NVCC), WISE Pathways was able to host courses and a career coach to teach the modules. NVCC also facilitated WorkKeys Assessments for participants to earn one college credit upon completing the program. The program was piloted in January 2014 with six women enrolled. A boot camp approach offered two modules per day for six days. At the end, five of the women earned the WorkKeys, and all women earned the Virginia Career Readiness Certificate which is equivalent to the National Career Readiness Certificate. Two women are now employed by Washington Gas, one is employed by Utiliquest.

Key takeaways:

- Exposure to non-traditional jobs for women needs to begin early.
- Partners were happy to help women enter the industry, but wished the pool was greater.
- Be clear about minimum qualifications, including criminal backgrounds and driving offenses.
- Offer the program at an ideal time for business partners and when hiring is at its peak.
- Women who portray an interest and have experience should be the targeted recruitment group.

	Apprenticeship	Certification
Challenges of Implementation	<ul style="list-style-type: none"> • Time Lag • Not always industry recognized • Not all apprenticeships are recognized by the Department of Labor (DOL) • Sponsor must operate the program 	<ul style="list-style-type: none"> • Although requested, there is no industry wide recognition for what skills should be assessed • Not accepted by many “corners of the job market”
Stakeholders	<ul style="list-style-type: none"> • Employee • Employer • Industry associates 	<ul style="list-style-type: none"> • Employee • Employer • Industry associates
Employer Benefits	<ul style="list-style-type: none"> • Customized training • Increased knowledge • Enhanced employee retention • Safer workplace (reduce worker compensation costs) • Stable and reliable pipeline • Systematic approach to training 	<ul style="list-style-type: none"> • Individual contains necessary skills tailored to company needs • Qualified talent is easier to find • Easier to find workers with soft skills
Worker Benefits:	<ul style="list-style-type: none"> • Hands-on career training • An Education • A career • National credential (if recognized by DOL)¹⁸ 	<ul style="list-style-type: none"> • Significant salary premium • Help individuals enter the labor market • Pave the path for experienced worker’s upward mobility¹⁹ • Distinguishes candidates to be more qualified for a job • Facilitates lateral movement of career

¹⁸ <https://www.dol.gov/apprenticeship/toolkit/toolkitfaq.htm#3c>

¹⁹ https://www.burning-glass.com/wp-content/uploads/BurningGlass_certifications_2017.pdf

		opportunities
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Reviewing Criteria

The two suggested models in this paper are apprenticeship model and a certification program. Before choosing a path, it is important to look into certain criteria which might impact the final outcome of this pilot project. Some of the main criteria are:

- Whose grant is it? Do we need endorsement from an industry partner?
- What is the turn-around rate we are looking at in terms of employment readiness? If it is less than a year, a certification program would be more apt. If the stakeholders are looking for learning on the job and preparing for the next move, an on-the-job apprenticeship model would be the right path.
- Does the scope include having apprenticeships and certifications with accreditations or nationally recognized credentials? If yes, then what are the minimum expectations?
- Are we looking for to partner with external organizations or industry leaders for the models? For the apprenticeship model we can partner with CITT's existing programs like GLS and MTOP. For the certifications we will have to look for external partners who have done supply chain certifications in the past.
- If chosen, what kind of apprenticeship program should be implemented?

Appendix E: Sustainable Freight Workforce Development Concept Paper (Draft)

SUSTAINABLE FREIGHT WORKFORCE DEVELOPMENT CONCEPT PAPER (DRAFT)

CEC Workforce Development
Grant Number: C1016 – G9001
August 29, 2019



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California State University, Long Beach**

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Introduction and Purpose

To address the workforce development calls to action addressed in the State of California's *Future of Work: Technology and the Future-Ready Workforce* and *Artificial Intelligence: A Roadmap to Shared Prosperity*, CITT will create a pilot project to train and upskill freight sector new hires and incumbents, focusing on critical technologies identified by industry. The type of workforce development model created will be determined collaboratively by industry, K12 and postsecondary educators and trainers, workforce development agencies, and other stakeholders. Apprenticeship and certificate models are included as examples in this paper.

Disruptive technologies including alternative fuels and infrastructure required to support new energy platforms are critical to industries associated with freight movement. This disruption impacts both public and private sector employers with organizations struggling to find the talent needed to address technical challenges that impact operational efficiencies, system performance, safety, and security. Key examples of these types of jobs are operations and maintenance (O & M) workers for fueling infrastructure installation and mechatronic technicians (entry- and middle-skilled workers), and Compliance Managers/Officers for public agencies as well as for private establishments (advanced-skilled workers). Many of these new occupations do not have Standard Occupation Classification System codes (O*NET-SOC codes). Updated O*NET-SOC codes are needed so workforce development efforts can more closely align with competencies associated with new occupations such as EV Technician and Fuel Cell Technician.²¹

As directed by previous CSFAP Working Group peer exchanges, this demonstration pilot project will focus on the following:

- emerging occupations tied to disruptions within the next ten years;
- new technologies associated with zero-emission vehicles; and
- tech skill transfer methods for lower-skilled workers in entry and middle-skill jobs.

Through a series of peer exchange webinars, stakeholders will help identify gaps in workforce competencies required for these new occupations, while looking to related industries to mine talent that possess adjacent skills – in-demand skills that are transferable. For example, what constitutes “technology” for electric vehicles? Technology can be defined as a convergence of various disciplines, communication modules, software, mastery of trades, mechanical and IT aptitude.²² As an example, fleet managers can look to EV infrastructure installers and electricians to train in EV vehicle predictive, corrective, reactive, and maintenance positions to fill the skills gap.

Initial Proposal for CSFAP Training Pilots

After analyzing competencies, CITT identified four potential CSFAP workforce development demonstration pilots and requested the working group select one to further develop into a developmental pilot:

1. Sustainable Freight
2. Compliance
3. K12 and Community College Curriculum Development for Mechatronics Technicians for Cargo Handling Equipment (CHE), Material Handling Equipment (CHE), and Trucks
4. Energy Foundations

²¹ California community college faculty are currently advocating the creation of these new O*NET-SOC codes.

²² ACT Expo, Long Beach, CA. (2019). “Workforce Development Workshop: Training for the Electric Vehicle Ecosystem.”

1. Sustainable Freight

CITT identified a need for professional development workshops in sustainable freight for public and private sector planners (including those from agencies such as CARB and Caltrans) who develop, implement, and enforce regulations affecting freight. Although these occupations are not entry or middle-skill -- a working group-directed criteria for this demonstration project -- this need for education and training in sustainable freight issues is critical with the growth in last mile deliveries, faster fulfillment demands, and the development of infrastructure required to support this movement of goods. Targeted training concentrating on freight issues can inform policy makers of the implications planning decisions have on economic competitiveness and environmental sustainability.

Sample Sustainable Freight Certificate Models

CITT Caltrans Freight Academy and the Battle for the Curb

CITT has led two efforts to engage the public and private sectors in freight-related capacity building. In April 2018, Caltrans personnel attended a multi-day training academy to understand the geography of the supply chain and the context of freight within transportation planning. Additionally, in January and February of 2019, CITT developed a series of seminars entitled “The Battle for the Curb: Managing Local Goods Movement in the Age of E-Commerce” for public and private sector planners to engage in last-mile transportation planning. These approaches to public sector capacity building can serve as models that can be replicated statewide.

2. Compliance

With changing international trade agreements, it is imperative for industry to remain compliant in order to establish a more efficient, sustainable, transparent, and secure freight transport system. The role of compliance is identified as applying compliance knowledge and “translating” that to operations, acting as a liaison between the compliance department and operations. Compliance managers will be critical for front line supervisors to monitor various energy, efficiency, security, and emission standards.

In order to gain further insight from industry and skills demanded, CITT evaluated several job postings in the transportation, supply chain, and logistics sectors. A common trait across most postings showed a preference for employees with a knowledge of compliance. These findings indicate a strong demand for a workforce development model with an emphasis in compliance.

Sample Compliance Certificate Model

Hazardous Materials (HAZMAT) Certificate

The Hazardous Materials Certificate is used to categorize hazard classes and packing groups based on the transportation risk presented. This certificate primarily ensures that individuals are able to safely package and handle hazardous material and provide emergency responses applicable to the specific hazard material being transported.²³

K12 and Community College Curriculum Development for Mechatronics Technicians for Cargo Handling Equipment (CHE), Material Handling Equipment (MHE) and Trucks

²³ “HAZMAT Certification Requirements” National Environmental Trainers Inc. Accessed July 8, 2019. <https://www.natlenvtrainers.com/blog/article/hazmat-certification-requirements>

Mechatronics is the synergistic combination of mechanical engineering, electrical engineering, electronics, information technology and systems thinking, utilized in the design of products and automation processes. Future training programs for mechatronic technicians for CHE, MHE, transit, and trucks can possibly align with programs offered by the National Center for Supply Chain Automation (NCSCA).

Sample Mechatronic Technician Program Models

The Alternative and Renewable Fuel and Vehicle Technology Program (ARFVTP)

To meet the needs of a growing clean transportation and fuels market, ARFVTP is investing in manufacturing and workforce training and development, while working with a variety of public and private partners, including the California Community College Chancellor's Office, Clean Energy Transportation Initiative, Employment Development Department, and the Employment Training Panel.

National Alternative Fuels Training Consortium (NAFTC)

The NAFTC aims to promote, support, and expand the use of alternative fuel vehicles by educating the nation through curriculum development, training implementation, program management, and outreach and education activities. NAFTC offers more than 35 courses and workshops about topics ranging from natural gas vehicles to safety training for transportation professionals as well as first responders. NAFTC has partnered with educational institutions in over 20 states as well as institutions in Canada.

Festo Mechatronics Certification & Apprenticeship Program

Festo's apprenticeship program is in advanced manufacturing and allows individuals to learn skills while earning an associate's degree in mechatronics. Curricula covers electrical, machining, engineering, PLC, and general education. Completion of the program may lead to potential careers as maintenance technician, manufacturing technician, automation specialist, and service technician. The certification is broken down into three levels: (1) pneumatics, hydraulics, industrial electricity; (2) fluid power and automation; and (3) mechatronics. The certification serves as a portable credential.

Energy Foundations Certificate

Another possible demonstration program can be an energy foundational certificate program offered to entry- and middle-skill workers in the jobs associated with the freight industry. This program would offer a suite of foundational skills common to the occupations identified, including skills related to safety and compliance, and will provide an overview of various alternative energy platforms. The program can include a capstone project in the participant's industry or occupation.

Sample Energy Foundations Programs and Certificates

Center for Energy Workforce Development Energy Industry Fundamentals Certificate Program

The Center for Energy Workforce Development (CEWD) is a non-profit consortium of electric natural gas and nuclear utilities.²⁴ Their associations include Edison Electric Institute, American Gas Association, Nuclear Energy Institute, and National Rural Electric Cooperative Association. CEWD was created in efforts to develop the utility industry workforce shortage and is the first partnership to be formed between utilities, their associations, contractors and unions. CEWD offers the following free courses:

²⁴ <http://cewd.org/curriculum/about-cewd.php>

- Natural Gas Boot Camp
- Women in Sustainable Employment (WISE) Pathways Career Exploration Workshop
- Troops To Energy Jobs Work Ready Boot camp
- High School Energy Career Academy
- Fundamentals of Energy
- Get Into Energy Test Prep Workshop

The Energy Industry Fundamentals certificate aligns with the Energy Competency Model developed by CEWD and the U.S Department of Labor. It lays the foundation and principles that impact the energy industry and provides instruction in 1) compliance with safety and health procedures; 2) electric power and natural gas generation, transmission, and distribution work; 3) a range of entry-level energy careers; and 4) “hot topics” in energy. The courses themselves are organized and offered through an Approved Course Provider system. Courses are hosted and taught by instructors teaching in high schools, community colleges, and other education institutions. An application process needed to become an Approved Course Provider is used to ensure all courses are equivalent regardless of the state where the course is taking place. A certificate earned in one state is equivalent to a certificate earned in another state.

The International Brotherhood of Electrical Workers (IBEW) Electric Vehicle Infrastructure Training Program (EVITP)

The International Brotherhood of Electrical Workers (IBEW) has partnered with the Electric Vehicle Infrastructure Training Program (EVITP), a nationwide training program, to train licensed electricians to properly install electric vehicle supply equipment.²⁵

Women in Sustainable Employment (WISE) Pathways Pilot Program

WISE Pathways is a comprehensive, forty-hour career exploration and workplace skills development program. Workshop topics include:

- Energy and construction industry overviews, including safety
- Resume preparation, online applications, and interviewing skills
- Teamwork, work habits, conflict management, and sexual harassment

In partnership with Northern Virginia Community College (NVCC), WISE Pathways hosts courses and a career coach to teach the modules. NVCC also facilitated WorkKeys Assessments for participants to earn one college credit upon completing the program. A boot camp approach offered two modules per day for six days.

WORKING GROUP SELECTION: SUSTAINABLE FREIGHT CERTIFICATION

Methodology for Selection

CITT solicited input from working groups in December 2018, March 2019, & June 2019 and composed a summary video of different initiatives to gather working group feedback using SurveyMonkey. In addition, CITT actively recruited working group responses with follow-up calls. CITT also conducted on-site visits to employers and reviewed job postings to validate competencies presented. In July 2019, working group members chose Sustainable Freight as the CSFAP development project.

²⁵ “Home | EVITP – Electric Vehicle Infrastructure Training Program.” EVITP. Accessed June 4, 2019. <https://evitp.org/>.

Outcomes

Intended outcomes for participants are to 1) develop the skill sets (particularly digital and technical skills) needed by employees to address the emerging shifts in sustainable freight in operations and management that require more efficient and green practices; 2) demonstrate cross-functional skills and practical expertise in critical areas of sustainable freight including financial sustainability; 3) contribute value and drive change in their companies; 4) and model agility, flexibility, and the value of continuous learning while contributing to the company's growth.

Topics Selected for the Sustainable Freight Certification

Critical issues in sustainable freight identified in the FHWA-sponsored Southern California Regional Freight Study (2018) include compliance, security, safety, land use, regional governance, growth, congestion, and air quality.²⁶ CITT used these identified issues as possible certificate topics leading to a Sustainable Freight Certification pilot tailored to both entry/middle-skilled and advanced-skilled participants. In addition to these issues, CITT added career exploration, digital literacy, and energy foundations to address emerging workforce competencies required by AI. For the Sustainable Freight Certification, the advanced-skilled participants would require completed coursework for twelve topics, while the entry/middle-skilled participants would require coursework for seven topics. (Please refer to chart on page 8.)

Sustainable Freight Foundations Certificate

The pilot project will be the development and launching of the Sustainable Freight Foundations Certificate. Both entry/middle-skilled and advanced skilled certifications would start with a Foundations Certificate in Sustainable Freight which would touch on each of the critical issues identified by the FHWA, listed previously. The Foundations certificate could also be used to inform which issues are most salient for workforce development from the perspective of industry and public sector agencies.

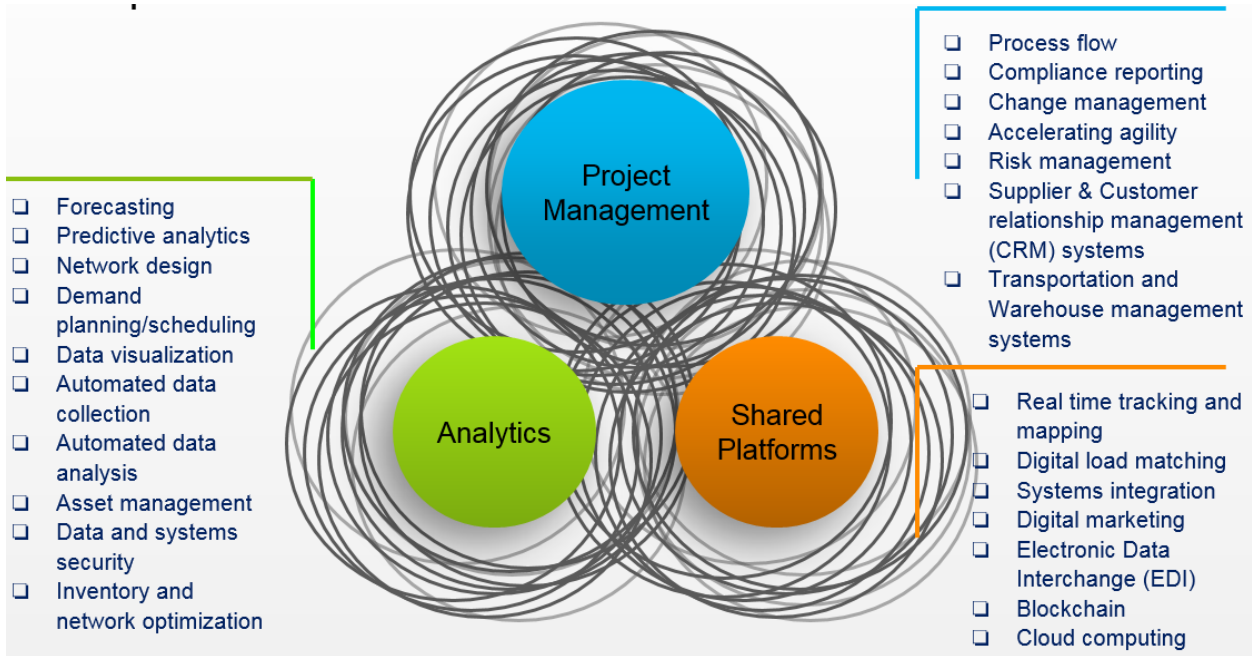
²⁶ FHWA. (2018) Southern California Regional Freight Study. Retrieved from https://ops.fhwa.dot.gov/freight/freight_analysis/reg_ind_studies/so_cal_study.htm

SUSTAINABLE FREIGHT CERTIFICATION PROGRAM

Module	Entry/Middle Level Competencies	Advanced level Competencies
SUSTAINABLE FREIGHT FOUNDATIONS CERTIFICATE	x	x
Digital Literacy	x	x
Alternative Fuels (Energy Foundations)	x	x
Compliance	x	x
Security	x	x
Safety	x	x
Land use		x
Regional Governance		x
Growth		x
Congestion		x
Air Quality		x
21st century employability skills including Key Performance Indicators	x	x

CITT is currently researching specific topics and competencies for each module as requested by the working group. As an example, please refer to the infographic on page 9 for emerging digital skills required for the sustainable freight sector (advanced-skilled workers).

EMERGING DIGITAL SKILLS NEEDED IN THE SUSTAINABLE FREIGHT SECTOR

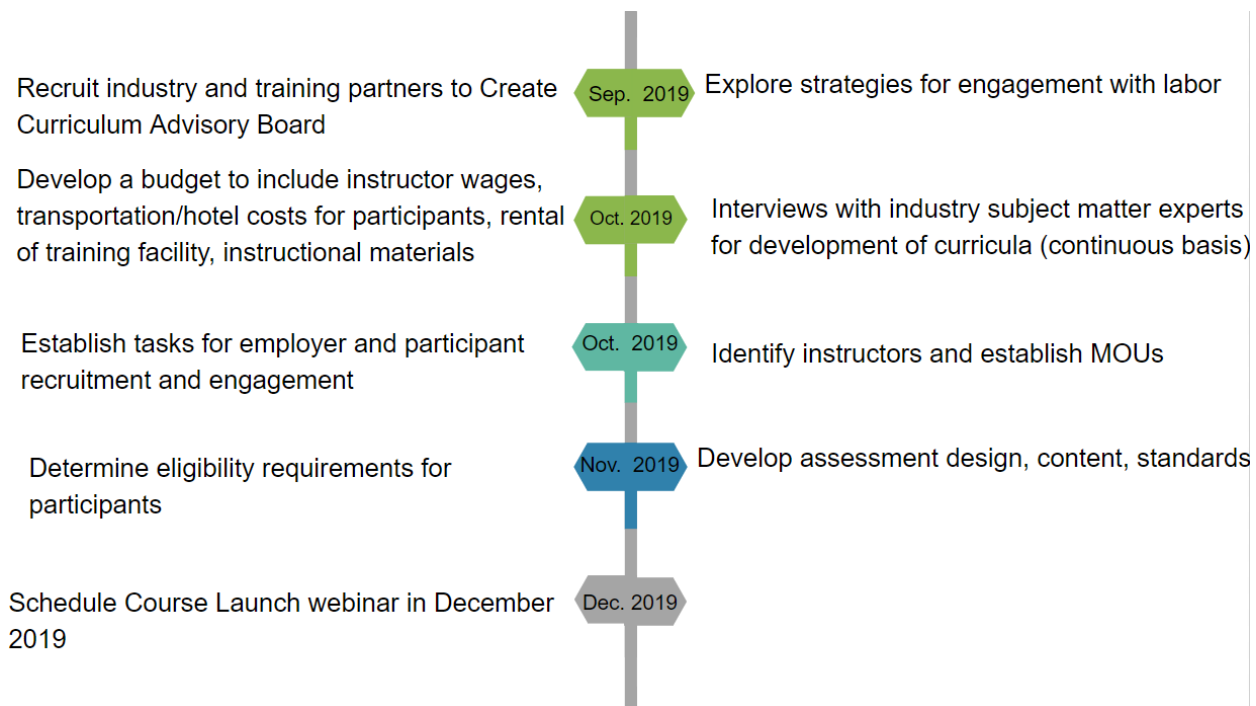


Design of Certificates leading to Sustainable Freight Certification

Each certificate will be approximately 30 hours of training, both face to face and online, with subject matter experts as instructors for each module. The pilot can be at one location, but the grant can sponsor participants from other parts of the state. The pilot project can be developed for entry/middle-skilled employees and/or advanced-skilled employees with a culminating capstone project tailored to each participant for the certification. The capstone project, which can be collaborative, would involve topics identified by industry SMEs as critical to sustainable freight and use industry-vetted benchmarking and key performance indicators (KPIs). This project would demonstrate the use of knowledge and skills garnered from course of study (e.g., compliance, systems thinking, life-cycle costing, use of digital tools, etc.).

Timeline and Next Steps

CITT suggested the following timeline at the August 8, 2019 working group meeting. However, discussions to extend the deadlines are planned for early September.



Apprenticeship Models

The CSFAP pilot project may lead to the development of an apprenticeship program. The following section includes examples and models.

Apprenticeship models are gaining a resurgence in the U.S. as a cost-effective method to teach employability and occupational skills, which in turn, provide positive rates of return for businesses. Apprenticeships have been shown to improve both the supply and demand sides of the labor market by also promoting innovation, gains in recruitment, productivity, and workforce quality.²⁷ The Obama administration prioritized the apprenticeship model by awarding \$175 million in grants in 2015; in 2017 President Trump authorized increasing federal funding for apprenticeships to \$200 million, receiving bipartisan support. Evolving apprenticeship models include both union-backed construction trades as well high-growth sectors such as energy conservation, health care, information technology, and industry-recognized and supported digital learning driven by employer demands.^{28 29} Digital learning through apprenticeships in both the private and public sectors is gaining ground in the U.S., many based on models emanating from the United Kingdom and Germany.³⁰

A quality apprenticeship model includes the following elements of workforce development:

- related technical instruction (RI/RTI)
- on-the-job training/learning (OJL/OJT)
- paid wages
- industry credentials that are portable

²⁷ Urban Institute. (2018). "Making A Robust Apprenticeship System in the U.S. Why and How?" <https://www.urban.org/features/apprenticeships>.

²⁸ University Ventures. (2018). "Making Apprenticeships Work: Five Policy Recommendations." www.insidehighered.com/

²⁹ Department of Labor, Education and Training Administration (DOLETA). (1/22/19). *Apprenticeship: History and Fitzgerald Act*. www.dol.gov.

³⁰ Thomas Lichtenberge, Inside Higher Education. (2018). "German Apprenticeships: Made for America," www.insidehighered.com and Ryan Craig and Tom Bewick, University Ventures. (2018). "Making Apprenticeships Work: Five Policy Recommendations." www.universityventures.com

- adherence to Equal Employment Opportunity (EEO) laws
- safety and supervision training
- mentors
- support services
- competency-based assessment

These components differentiate apprenticeships from other work-based learning such as internships and externships. Delivery of related instruction and training is flexible; it can be customized based on employer and apprentice needs. Programs can employ face-to-face, online, or hybrid models for service delivery. Completing an apprenticeship program yields an industry-recognized, portable credential that proves mastery of skills and competencies required by the occupation. Apprenticeship programs are placed both in union and non-union workplaces.

Apprentices earn a wage while learning and build their skill level through supervised training and classroom or related education. The eligible starting age can be no less than 16 years of age, though most programs require participants to be at least 18. Apprenticeship sponsors delineate selection criteria.

Registered Apprenticeships (RAs)

The Department of Labor (DOL) provides sponsors of RAs access to a nationwide network of technical assistance, customer service, and support at no cost. A RA assures wage progression based on skill gains. At the end of the RA program, apprentices will receive industry-recognized, nationally portable, competency-based credentials issued by the DOL. Registration with the DOL ensures that the apprenticeship program meets national and independent standards for quality and rigor. Depending on the state of the RA, businesses can qualify for state-based tax credits and may be able to claim some expenses for training as a federal tax credit. Furthermore, a RA gives businesses and apprentices access to funding and other resources from federal programs.

The DOL has contracted with eight national industry partners to provide free technical assistance to employers and other apprenticeship sponsors to develop RAs. TransPORTs is one of these national industry partners tasked with assisting ports and ports-connected multimodal transportation, distribution, and logistics (TDL) industry sectors in developing RAs. RAs in these sectors include programs for high-demand occupations such as truck drivers, diesel mechanics, heavy equipment mechanics, vehicle inspectors, and electrical technicians.

Industry-Recognized Apprenticeship Programs (IRAPs)

In July of 2017, the DOL issued the Training and Employment Notice (TEN) 03-18, *Creating Industry-Recognized Apprenticeship Programs (IRAPs) to Expand Opportunity in America*, which provides high-level policy suggestions to allow trade associations and other non-governmental entities to certify apprenticeship programs. President Trump issued Executive Order *Expanding Apprenticeships in America* calling for a system of industry-recognized apprenticeships that would not require direct government approval. In fall 2018, the DOL's Education and Training Administration (DOLETA) issued a \$150 million funding opportunity announcement for apprenticeship grants, *Scaling Apprenticeship Through Sector-Based Strategies*.

With the IRAP models, a consortium of regional industry, labor, workforce intermediaries including workforce development agencies, community-based economic development organizations, and training and education providers can potentially act as a certifying/accrediting agency. IRAPs may benefit small- and medium-sized businesses. An apprenticeship sponsor can aggregate industry demand in designing programs and also provide technical assistance to implement these programs. The sponsor can

effectively take the burden off smaller businesses that may not be able to afford the additional staff required to oversee the implementation of apprenticeship programs (e.g., documentation of task competencies, wage provisions, apprenticeship hours).

While the DOL has posited high-level guidelines, there are currently few specific guidelines regarding determining the roles of certifiers/accreditors, or the rigor, quality, and training and competency standards of the IRAP model. Wage progression and the integration of the IRAP model with existing state and federal apprenticeship and workforce systems have not been addressed.³¹ The DOL has, however, issued an Information Collection Request (ICR) for public comment on IRAPs in the fall of 2018 that will close at the end of January 2019. The American Trucking Association (ATA), National Skills Coalition, Institute for American Apprenticeships, Commercial Training Vehicle Association, Commercial Training Vehicle Association, and the National Association of Publicly Funded Truck Driving Schools are among the respondents.³²

The National Skills Coalition (NSC), a broad-based coalition of business leaders, labor affiliates, education and training providers, community-based organizations, and public workforce agencies, has several suggestions to improve the IRAP model. Among NSC suggestions relevant to this paper are the following:

- Require accreditors to support and work with local industry partnerships to develop and personalize programs to meet the needs of local, small- and mid-sized companies;
- Ascertain wages are provided to apprentices, not stipends;
- Require apprentices receive training in workplace safety;
- Determine how accreditors will ensure quality assurance standards are continuously evaluated to meet business demand and worker needs;
- Align outcome metrics with federal programs such as the Workforce Investment Opportunity Act (WIOA) common measures. This will ensure workers with barriers to employment targeted under WIOA will have access to IRAP programs and conversely, eligible apprentices under an IRAP have access to WIOA resources.

Non-Registered Apprenticeship Programs

Apprenticeships not registered with a state or federal agency are preferred by some businesses because they are perceived as more flexible in structure than RAs or IRAPs.³³ Data from 2016 Adult Training and Education Survey (ATES) show widespread use of company-backed efforts that are not registered with a state or federal agency (Jacoby and Lerman, 2019). This model of apprenticeship can synthesize industry-based apprenticeships with federal or state support: for example, government can subsidize off-job components while industry compensates apprentices for OJT. With this model, state agencies, industry associations, or other approved accrediting bodies can develop and monitor metrics. However, RAs and IRAPs can perhaps better serve small- and medium-sized businesses with the technical assistance government can provide to develop, monitor, and market apprenticeships using aggregate demand models.

Pre-Apprenticeship Models

³¹ Jobs for the Future. (2018). "What's Next for Apprenticeship?" www.jff.org/points-of-view/whats-next-apprenticeship/

³² DOL. (2019). Responses to ICR for IRAPs. <https://www.regulations.gov/>

³³ Tamar Jacoby and Robert Lerman. (2019). Opportunity America webinar, "Industry-Driven Apprenticeships: What Works, What's Needed." https://opportunityamericaonline.org/wp-content/uploads/2019/02/OA_ApprenticeshipReport_2019.pdf

A pre-apprenticeship is a program or set of strategies designed to prepare participants to enter and succeed in a Registered Apprenticeship program and has a documented partnership with at least one Registered Apprenticeship program. Pre-apprenticeship programs prepare participants to meet the basic qualifications through an approved training curriculum (including hands-on, voluntary training) for entry into an RA. Pre-apprenticeships can be adapted to meet the needs of the various employers and sponsors they serve, specific training opportunities for the local labor market, and for various populations being trained (including women, justice-involved youth and adults, and other demographic groups that may face barriers to training and employment). Language and math literacy as well as employability and career-readiness skills contextualized to the occupation being apprenticed are offered. They also provide access to career exploration, appropriate support services, and hands-on training that does not displace paid employees. Pre-apprenticeship programs also recruit and pre-screen participants to apprenticeship programs and are viewed by some workforce development stakeholders as indispensable to the success of apprentices, particularly for underrepresented populations.

21st century work skills are ranked high by logistics-related employers for qualities they are seeking in potential workers.³⁴ The California Community Colleges Chancellor's Office (CCCCO), a major state workforce development education and training provider, has aligned the *Doing What Matters for Jobs and the Economy* framework and the *New World of Work (NWoW)* initiative to identify the top 10 employability skills needed for educational and workforce success: adaptability, analysis/solution mindset, collaboration, communication, digital fluency, entrepreneurial mindset, empathy, resilience, self-awareness, and social/diversity awareness. NWoW has developed a 21st-century employability skills curriculum for teaching these skills at over 50 California community colleges, using work-relevant content in direct teaching and online delivery models. In addition, CITT is developing a customized, transportation-focused employability skills course that will also have flexible delivery models. Embedding these curricula into the pilot apprenticeship model is critical to apprentice persistence and retention. A close fit may be in the pre-apprenticeship stage of the pipeline. Industry stakeholders at the peer exchange session suggested marketing and career exploration for logistics-related jobs starting in elementary and middle school so that these high demand careers become destination careers, a strategy also suggested by Advance CTE. Pre-apprenticeship programs can fill this gap, while also providing a steady supply of participants to apprenticeships in the logistics sector.

Public Sector Apprenticeships/Workforce Training Models

The National Association of State and Territorial Apprenticeship Directors (NASTAD) has proposed increasing the number and visibility of public sector apprenticeships.³⁵ Based on input from the stakeholder peer exchange, workforce development efforts are needed in the public sector for planners to understand the dynamics of freight and the supply chain for capital investment and infrastructure decisions. In California, the implementation of state laws on greenhouse gas emissions reduction has changed the skill sets needed for planners, bringing new emphasis on sustainability and integrating transportation and land use planning. These new demands on public sector transportation planners require new models of workforce training that may incorporate apprenticeship designs. The new skill set being demanded by the market requires advanced knowledge, creating an apprenticeship model that is not middle skilled based. The demanded skill set seeks higher and more technical training than that of a midlevel education and capabilities.

A recently created public sector workforce development model is the Workforce Development Professional Apprenticeship Program launched in 2016 with three cohorts from CSU Long Beach, CSU Los Angeles, and CSU Sacramento. The California Workforce Association is Apprenticeship Sponsor.

³⁴ Rick Blasgen, Council of Supply Chain Management Professionals (CSCMP) lecture, CSULB. (1/29/19). "Connecting, Developing, and Educating Supply Chain Professionals"

³⁵ National Association of State and Territorial Apprenticeships Directors (NASTAD). (2019). www.nastad.us

Targeted workforce skills include communication, project management, customer service, business engagement, team building, marketing, and leadership to standardize new workforce development competencies class and plan for succession. Criteria for advanced credit is granted based on education and length of service with a workforce development agency, and half of the required time is during work hours. Based on a cohort of 25 students, the cost of the classroom training is \$4,000 per student for a total program cost of \$80 – 100,000 (this structure will vary depending on program). Upon completion, the apprentices receive a State Apprenticeship Council Certificate in addition to a California State University Workforce Development Professional Certificate.³⁶ This model may be replicated to provide training in logistics and supply chain management for workforce development agent staff, given the high demand for middle-skill jobs in these sectors.

³⁶ California Workforce Association. (2019). <https://calworkforce.org/WDP-apprenticeship/>

Appendix F: California Sustainable Freight Action Plan (CSFAP) Workforce Development Pilot Demonstration Project Concept Paper

Sustainable Freight Foundations Certificate for Transportation and Fleet Managers

October 31, 2019

Center for International Trade and Transportation at
California State University, Long Beach

EXECUTIVE SUMMARY

Environmental and compliance mandates and disruptive transportation and supply chain technologies have acutely changed the face of program management and supervision within transportation organizations. Targeting the managerial workforce in both public and private sector transportation departments, this proposed pilot demonstration project will incorporate content-specific FHWA-identified sustainable freight issues relevant to California with the digital, project management, leadership, and communication skills required for technology transfer among the transportation workforce. The Fourth Wave of environmental innovation includes disruptive technologies such as sensors, automation, data analytics, and AI to increase efficiencies and reduce costs, while lowering GHG³⁷. Fourth Wave technologies also include blockchain, sharing platforms, mobile ubiquity – all competencies that are now required for sustainable freight. The environmental costs of operating fleets affect the bottom line: strategic roadmaps coupled with professional development are required to identify inefficiencies in production, improve operations, increase revenue, and enhance sustainability. Critical issues in sustainable freight identified in the FHWA-sponsored Southern California Regional Freight Study include compliance, security, safety, land use, regional

³⁷ Environmental Defense Fund. (2018) Business and the Fourth Wave of Environmentalism: Findings from Environmental Defense Fund's 2018 Fourth Wave Adoption Benchmark Study. Retrieved from https://utility.edf.org/apps/files/business_and_the_fourth_wave.pdf

governance, growth, congestion mitigation, and air quality.³⁸ Intended outcomes for participants are to 1) develop the digital and technical skill sets needed by transportation planners and fleet managers to address the emerging shifts in sustainable freight in management that require more efficient and green practices; 2) demonstrate cross-functional skills and practical expertise in critical areas of sustainable freight, including financial sustainability; 3) contribute value and drive change in their companies; and 4) model agility, flexibility, and the value of continuous learning while contributing to the company's growth.

TARGET AUDIENCE

Targeted occupations include public and private sector transportation planners, economists, transportation managers, fleet managers, municipal planners, engineers, compliance managers, safety and security operations managers, and planning and freight program managers.

DESIGN

The design of the pilot demonstration Sustainable Freight Foundations Certificate (Foundations Certificate) will be 20 hours of face-to-face instruction based at California State University, Long Beach combined with online coursework. The final capstone projects will be completed remotely and presented to the CSFAP Working Group via Zoom.

SUSTAINABLE FREIGHT FOUNDATIONS CERTIFICATE FOR TRANSPORTATION/FLEET MANAGERS

The pilot demonstration project will be the development and launching of the [Sustainable Freight Foundations Certificate for Transportation/Fleet Managers](#). This Foundations Certificate would touch on critical issues identified by the FHWA study and referenced in the Executive Summary. A Subject Matter Expert (SME) will lead a final capstone project that will demonstrate a mastery of application of technical content, digital, and management skills gained from this series of introductory sessions. Upon successful completion of the capstone project, the participant will receive the Sustainable Freight Foundations Certificate for Transportation and Fleet Managers.

This Foundations Certificate will also serve to inform which issues are deemed most critical for workforce development from the perspective of employer and employee stakeholders. This data will then inform the development of a suite of certificates that will lead to a [Sustainable Freight Certification for Transportation and Fleet Managers](#).

SUGGESTED SESSION TOPICS

CITT researchers consulted industry and educational partner stakeholders, performed literature reviews, and referenced pertinent job postings across industries to determine competencies for sustainable freight planning, management, and compliance. CITT will continue to interview industry stakeholders to further refine these competencies.

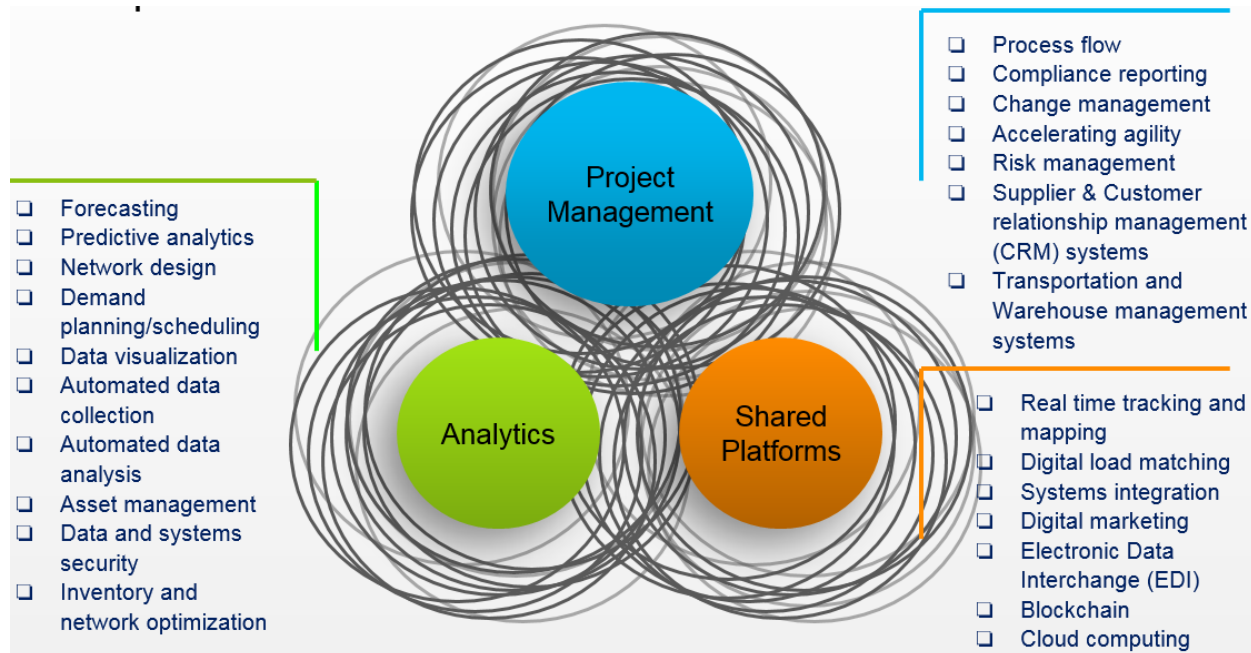
INTRODUCTION TO DIGITAL COMPETENCIES

While digital competencies will be presented as one discrete certificate, these skills will also be incorporated into the design of the capstone project to demonstrate mastery. The

³⁸ FHWA. (n.d.) Southern California Regional Freight Study. Retrieved from https://ops.fhwa.dot.gov/freight/freight_analysis/reg_ind_studies/so_cal_study.htm

Introduction to Digital Competencies for Transportation/Fleet Managers Session will cover some of the competencies listed in the infographic on the following page.

Digital Competencies in Transportation Management



INTRODUCTION TO REGULATORY COMPLIANCE SESSION

Content for this session will cover regulatory compliance for agencies and will provide an overview of policies regarding hazard mitigation, security, and other freight safety concerns. Topics for this session may include an overview of the following regulatory bodies and policies:

- EPA
- OSHA
- CARB
- CEQA
- Customs and Border Protection (CBP)
- Other Near/Zero-Emissions Regulations
- Hazard Mitigation Policies
- Vulnerabilities Assessment/Crisis Management

LAST MILE AND SUPPLY CHAIN: CRITICAL LAND USE ISSUES SESSION

As e-commerce grows, and both urban and rural land use forms rapidly change, transportation and fleet managers will need to understand the nuances of the last mile delivery landscape. Topics for this session may include an introduction to the following issues:

- Land Use Conflicts
- Congestion Mitigation
- Infrastructure Regulations
- Growth and Development Patterns and Zoning
- Alternative Delivery Modes

INTRODUCTION TO ENERGY AND INFRASTRUCTURE SESSION

Policies for Zero or Near-Zero Emission mandates require content knowledge of energy systems and the infrastructure required to support these systems. Topics for this session may include introductory content on the following:

- Hydrogen Fuel Cells
- BEV Technology
- Alternative Fuels Infrastructure
- Connected Vehicle Technology
- Battery Electric High Voltage Safety

CAPSTONE PROJECT

The capstone project, which will be a collaborative effort, would involve topics identified by industry SMEs as critical to sustainable freight and use industry-vetted benchmarking and key performance indicators (KPIs). This project would demonstrate the use of knowledge and skills garnered from course of study (e.g., compliance, systems thinking, life-cycle costing, use of digital tools, etc.).

PARTNERING ORGANIZATIONS and AGENCIES

CITT will partner with the California Community Colleges' Advanced Transportation and Logistics Program, the Southern California Regional Transit Training Consortium (SCRITC), Clean Cities Coalition, American Public Transportation Association (APTA), California Trucking Association, Alternative and Renewable Fuels and Vehicle Technology Program (ARFVTP), National Electrical Manufacturers Association (NEMA), Electric Vehicle Infrastructure Training Program (EVITP), the Ports of Los Angeles and Long Beach (POLA and POLB), railway companies, municipal fleet managers, municipal city planners, as well as private fleet enterprises, to develop and implement the program.

SIMILAR PROGRAMS: RUTGERS

Rutgers University, through the Edward J. Bloustein School of Planning and Public Policy offers a *Transportation Management: Vulnerability, Risk and Security Certificate* developed and presented by a coalition of faculty and staff from Rutgers School of Engineering, the School of Arts and Sciences, and Rutgers Biomedical and Health Sciences. Required courses include *Public Transit Planning and Management* and *Hazard Mitigation and Planning*. In addition, students take a minimum of three (3) electives. Elective course offerings include: *Transportation and the Environment; Security and Safety in Maritime Transportation and Port*

Operations; Rail Transport Systems; Engineering Risk Analysis in Multimodal Transportation Systems; and Risk Communication.

APA CONTINUING EDUCATION UNITS

CITT will explore the possibility of providing American Planning Association (APA) Continuing Education Units (CEUs) through the American Institute of Certified Planners (AICP), the professional institute for APA, upon completing the capstone project. CITT is a certified APA CEU provider.

Appendix G: Implementation Plan

California Sustainable Freight Action Plan Workforce Development Pilot Project Development Implementation Plan

Sustainable Freight Foundations Certificate (with Addendum)

April 22, 2020

Center for International Trade and
Transportation at California State
University, Long Beach

California Energy Commission
Governor's Office of Business and Economic Development

EXECUTIVE SUMMARY OF THE CALIFORNIA SUSTAINABLE FREIGHT ACTION PLAN (CSFAP)

In July 2015, Governor Brown issued Executive Order B-32-15, which provides a vision for California's transition to a more efficient, more economically competitive, and less polluting freight transport system. This transition of California's freight transport system is essential to supporting the State's economic development in coming decades while reducing harmful pollution affecting many California communities. A skilled and nimble workforce will be one key factor in promoting California's competitiveness as firms continue to adjust to rapidly evolving markets. Expanding well-paid trade sector job opportunities for State residents, including those living in disadvantaged communities in the trade sector, will improve the State's overall economic health and support the transition to a sustainable freight transport system.

To support these needs, the California Energy Commission (CEC) partnered with the Governor's Office of Business and Economic Development (GO-Biz) and the Center for International Trade and Transportation (CITT) at California State University, Long Beach (CSULB) to convene working groups with industry stakeholders and the California Workforce Development Board. The working group's task is to identify and implement steps to ensure that sufficiently skilled labor is available to meet the needs of an expanding freight-related job market.

EXECUTIVE SUMMARY OF THE CSFAP CERTIFICATE PILOT DEVELOPMENT PROJECT

Environmental and compliance regulations and disruptive transportation and supply chain technologies have acutely changed responsibilities for manufacturers, freight, logistics, and public and private fleet establishments. The COVID-19 pandemic, moreover, may have further

disrupted demands on the middle managerial workforce. Compliance reporting, efficient and effective program management, foundational knowledge of energy ecosystems, and the use of data require targeted training at the **middle managerial** level: strategic roadmaps are required to identify inefficiencies in production, improve operations, increase revenue, and enhance both environmental and economic sustainability. Therefore, this Sustainable Freight Foundations Certificate (Freight Foundations Certificate) will 1) incorporate industry-specific sustainable freight content critical to California; 2) address emerging shifts in sustainable freight management that require more efficient and green practices (including industry response to the COVID-19 pandemic) that balance environmental sustainability with a firm's economic sustainability; and 3) develop the technical skill sets needed to comply with state, federal, regional, and local regulations to implement more efficient, green, and economically sustainable freight practices.

BACKGROUND

The Center for International Trade and Transportation (CITT) researched critical issues in sustainable freight, including those identified in the FHWA-sponsored Southern California Regional Freight Study and the San Pedro Bay Ports Clean Air Action Plan (CAAP). The FHWA study cited the following issues as critical to sustainable freight systems: compliance, security,

safety, land use, regional governance, growth, congestion mitigation, and air quality.¹ A collaboration between the Port of Los Angeles and Port of Long Beach, the CAAP introduced air pollution reduction strategies including the Clean Truck Program, vessel pollution reduction programs and advanced new technology, while allowing port development, job creation and economic development to continue.² CITT researchers also consulted industry and educational partner stakeholders, performed literature reviews, scanned related sustainable freight programs nationwide, and referenced pertinent job postings across industries to determine competencies for sustainable freight planning, management, and compliance. In reviewing related freight management programs (described in this plan), we found no program offering both an introduction to regulatory compliance and energy infrastructure tailored specifically for middle managers. Our design for delivery is also unique: this Freight Foundations Certificate offers both face-to-face and online instruction, with a final instructor-guided, collaborative capstone project that can demonstrate participant mastery of content learned.

In June of 2019, CITT identified four potential workforce development pilots to present to the working group: Sustainable Freight Certificate, Compliance Certificate; Energy Foundations Certificate; or the development of a K12-to-community college mechatronics technician curriculum. After receiving input from the working group at the August 2019 meeting, CITT refined the focus to freight and logistics management with the Sustainable Freight Certificate and later requested a no-cost extension to develop and implement the pilot.

TIMELINE AMENDMENT REQUEST

March 31, 2020: Final version of pilot project development plan due

November 20, 2020: Career pathway maps for 5 related skill and training requirements for mission-critical occupations across transportation, construction, and manufacturing sectors.

December 18, 2020: Final report due

While the intent remains to deliver a hybrid class (combined face-to-face and online) in August 2020, we recognize that the ever-evolving situation with COVID-19 may necessitate the delivery of a fully online version of the certificate or a shift in the delivery date of a hybrid course to later in the year. Those decisions will be coordinated with CEC, GO-Biz and the working group. The curriculum developed, however, will assume hybrid delivery for maximum replicability in the future.

TARGET AUDIENCE

Small and medium sized (SME) companies will be the focus. Freight sectors that will be targeted include drayage, trucking, rail, manufacturers (OEMs), freight forwarders, distribution and warehousing, and transloading facilities. Targeted occupations include:

Facilities Managers

Fleet Coordinators/Managers

Compliance Managers

¹ FHWA. (n.d.) Southern California Regional Freight Study. Retrieved from https://ops.fhwa.dot.gov/freight/freight_analysis/reg_ind_studies/so_cal_study.htm

² <https://www.portoflosangeles.org/environment/air-quality/san-pedro-bay-ports-clean-air-action-plan>
Safety and Security Operations Managers/Safety, Security, and Environmental (SSE)

Compliance Managers

Documentation Managers

Maintenance Managers

Environmental Planners

Transportation Planners/Managers

Freight Program Managers

With this training, the middle managerial level freight workforce will be able to:

identify critical issues in freight systems; regulatory compliance; and in energy, sustainability and infrastructure;

use data and metrics in decision-making processes;

develop the technical skill sets needed to address the emerging shifts in sustainable freight systems that require more efficient and green practices;

demonstrate cross-functional skills and practical expertise in critical areas of sustainable freight, including financial sustainability;

contribute value and drive change in their companies/agencies; and

model agility, flexibility, technological transfer, and the value of continuous learning while contributing to the organization's growth.

This pilot program will focus on incumbent workers.

CITT will host the hybrid course sessions at the California State University, Long Beach campus with the option of sponsoring participants from other parts of the state, specifically from CalEPA's Environmental Justice areas, including the San Joaquin Valley and the Inland Empire.³ Fully online sessions are also in development and will be discussed in detail below.

DESIGN

The CSFAP State Interagency Working Group (working group), comprised of representatives

from the Governor’s Office of Business and Economic Development (GO-Biz), California Energy Commission (CEC), Air Resources Board (ARB), California Workforce Development Board (CWDB), Caltrans, Employment Training Panel (ETP), and industry stakeholders from rail, drayage, ports, and labor, will continue to provide feedback on the content, design, implementation, and assessment of this Freight Foundations Certificate. CITT is developing this project with an eye towards an agile pilot that can be replicated statewide; relevant for port, truck, rail, air freight sectors, and manufacturers; relevant for both private and public sectors; and customized depending on industry sector and employer needs. CITT will also explore designing this pilot as a model of a public-private partnership (PPP) for capacity building within government agencies as well as within a cross-sector of freight-related industries. CITT contributed to the development of a similar PPP model with CSULB’s College of Engineering and Caltrans Materials Engineering and Testing Services: a Joint Training and Certification Program (JTCP) that ensures consistent training and certification for highway construction technicians for both industry contractors and agency personnel.⁴

³ CalEPA, Designation of Disadvantaged Communities. April 2017. <https://calepa.ca.gov/wp-content/uploads/sites/6/2017/04/SB-535-Designation-Final.pdf>

⁴ <https://dot.ca.gov/programs/engineering-services/joint-training-certification-program-jtcp>

This Freight Foundations Certificate will also serve to inform which issues are deemed most critical for workforce development from the perspective of employer and employee stakeholders. This data could then inform the future development of a suite of certificates that can lead to an industry-recognized and/or sponsored Sustainable Freight Foundations **Certification** (versus a Certificate). This extended certification process may be developed in a phase 2 following this pilot Freight Foundations Certificate program, should the CEC and GO-Biz decide to explore this possibility. The extended Certification allows for a more in-depth exploration of some of the topics introduced in the Foundations Certification. These include use of alternative delivery methods to the last mile (Freight Management), the economics of alternative fuel systems (Energy Fundamentals), Communicating with EJ Communities (Compliance) and Geospatial Analysis for Sustainable Freight (Digital Applications). The expected make-up of both the Certificate and Certification are depicted below.

COURSE DELIVERY

With the COVID-19 pandemic and statewide shelter in place policies in place at the time of this writing, CITT will present two course delivery options: one fully online, and a hybrid version (face-to-face and online). Currently, the California State University Chancellor’s Office is requiring all virtual instruction through June of 2020.

Hybrid Session

Hybrid delivery will be twenty hours of face-to-face instruction with an additional twenty hours of a combination of online coursework and project-based collaboration, pre-reading (including a glossary of terminology that will be frequently used in the program), and a culminating capstone project.

The twenty contact hours will consist of two 8-hour days and one 4-hour day at the College of Professional and International Education Building on the campus of California State University, Long Beach.

The final capstone projects will be completed remotely and presented to the CSFAP working group via Zoom. Capstone projects serve as culminating projects that integrate the knowledge

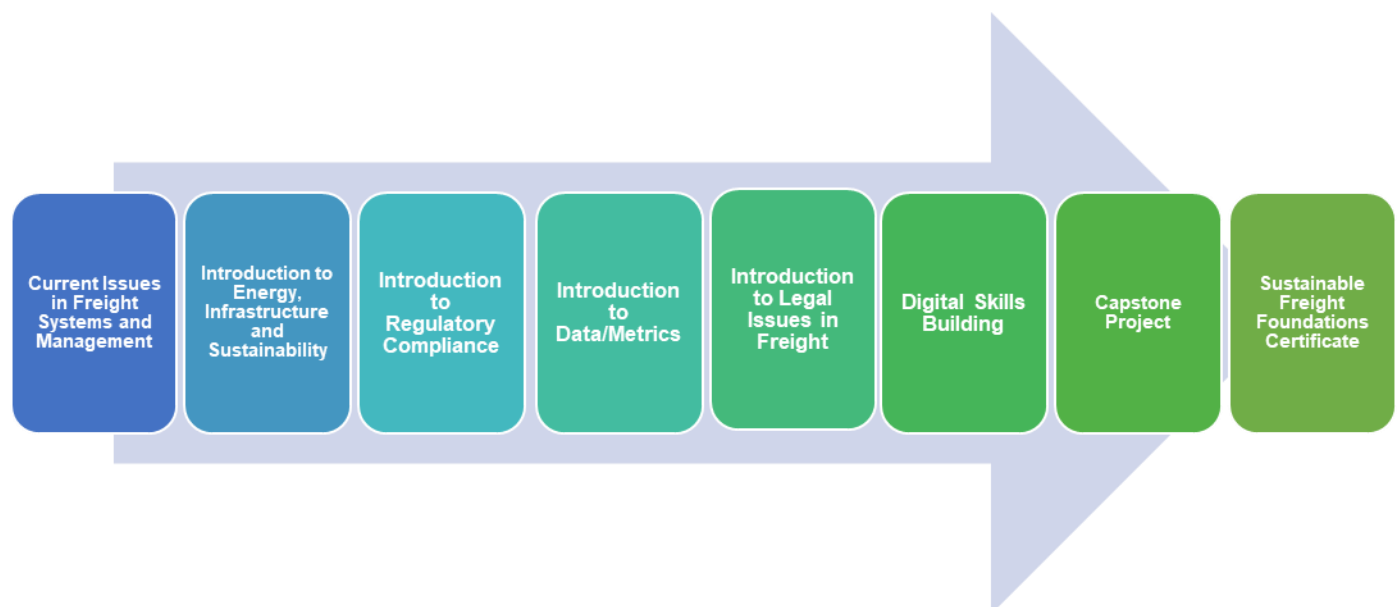
and skills gained from the course of study. CITT currently delivers a fully online version, including group capstone project, of its Global Logistics Professional (GLP) program.

Fully Online Session

The fully online session will consist of pre-readings (including a glossary of terminology that will be frequently used in the program), synchronous meetings and regular check-ins. Asynchronous options may include readings and posts to discussion boards; self-assessments; recorded lectures (e.g., open-sourced Screencastify); Zoom meetings for collaborative work; and participant-created projects such as slide presentations with participant and instructor responses.

The final capstone projects will be completed remotely and presented to the CSFAP working group via Zoom.

PILOT FREIGHT FOUNDATIONS CERTIFICATE



CERTIFICATE CONTENT

CITT has identified two lead subject matter experts who will assist in developing learning objectives, assessment design, and the final capstone project. In tandem, CITT will deploy online surveys to potential participating employers to gather specific data on course content. Note that CITT has deployed a middle-skill workforce gap analysis survey in transportation and supply chain industry sectors through a SB 1-funded California State University Transportation Consortium grant. Data gathered from this project includes critical technical skills required for middle managerial staff; this data will also inform curriculum content. Four principal topic areas constitute the proposed face-to-face portion of the Freight Foundations Certificate, described below.

CURRENT ISSUES IN FREIGHT SYSTEMS AND MANAGEMENT (4 hours)

Learning objectives:

To provide students with foundational knowledge in both the macro and micro social, economic, and environmental trends influencing the behavior of the supply chain and its stakeholders. This includes the continuous rise of e-commerce and what it means for the purchasing, warehousing, and delivery dynamics for rail, air, drayage, and ports. Students will also understand the roles, responsibilities and limitations of various public and private sector actors involved in managing and overseeing the flow of goods. The goal is to develop knowledge that contributes to more effective decision making in the workplace. This topic provides necessary context for some of the items addressed in further detail in subsequent topics:

Geography of the Supply Chain

Economics of Mode Choice and Alternative Delivery Modes

Cybersecurity/Fleet Safety

Infrastructure Requirements and Regulations

Freight Demand

Freight Stakeholders

Critical First and Last Mile Issues for Freight

California Environmental Justice Statutes associated with Freight

INTRODUCTION TO ENERGY, INFRASTRUCTURE, AND SUSTAINABILITY (6 hours)

Learning objectives:

To gain current, up-to-date knowledge of requirements and trends of energy, infrastructure, and sustainability as it pertains to various goods movement facilities and operations. Participants will be able to apply this knowledge to their own operations and decision-making processes and get a better understanding of what is required of customers, service providers, and colleagues.

Content:

Drivers of Requirements/Trends

Technology Overviews

Alternative Fuel and Infrastructure Requirements

Capital/Operating Costs

Operational Benefits/Impacts

Key Stakeholders/Partners

INTRODUCTION TO REGULATORY COMPLIANCE (6 hours)

Learning objectives:

To provide students with the necessary tools to identify the specific regulatory agencies and subsequent programs that directly impact or influence day-to-day operations of transportation and/or warehousing and distribution providers. Students will come away with a basic understanding of policy formulation, implementation, and enforcement of applicable programs and will also gain insight into the history, structure, makeup, and jurisdiction of appropriate state, local and federal agencies.

Content:

Course will consist of a lecture and interactive discussion on various appropriate regulatory agencies along with a survey of direct or indirect student experience with the agencies.

Each agency and subsequent policies will be examined in the context of transportation operations, and students will participate in a "name the agency" exercise where different legal or regulatory concepts will be presented and then identified and analyzed through active discussion.

Students will also be faced with specific "event" scenarios, where each agency response and subsequent policy will need to be identified by the students. Group discussion on class answers with appropriate corrections as necessary will follow.

INTRODUCTION TO DATA AND METRICS (4 hours)

Learning objectives:

To provide an introduction on how to collect, interpret, and utilize data to develop metrics and targets that benefit single facilities or organizations as a whole. Within the rapidly changing goods movement industry, organizations are relying more heavily on data and metrics to increase efficiency, assess strengths and weaknesses, and make sound decisions. At a facility- or organization-level, data and metrics can be used to maximize productivity and enhance services offered. In many cases, organizations have been collecting data but have not used it to their benefit. These skills will also be incorporated into the design of the culminating capstone project to demonstrate mastery.

Content:

Finding Data
Assessing Data
Developing Metrics
Integrating Metrics

TOPICS ONLINE

The hybrid approach also features two sessions delivered online: Legal Issues in Freight Management and the development of the Capstone Project.

LEGAL ISSUES IN FREIGHT MANAGEMENT (2 hours)

Learning objectives:

The students will gain practical knowledge about the common pitfalls of a domestic and international freight shipment and how to protect a company's interests through planning, negotiating, contracting, and managing risk.

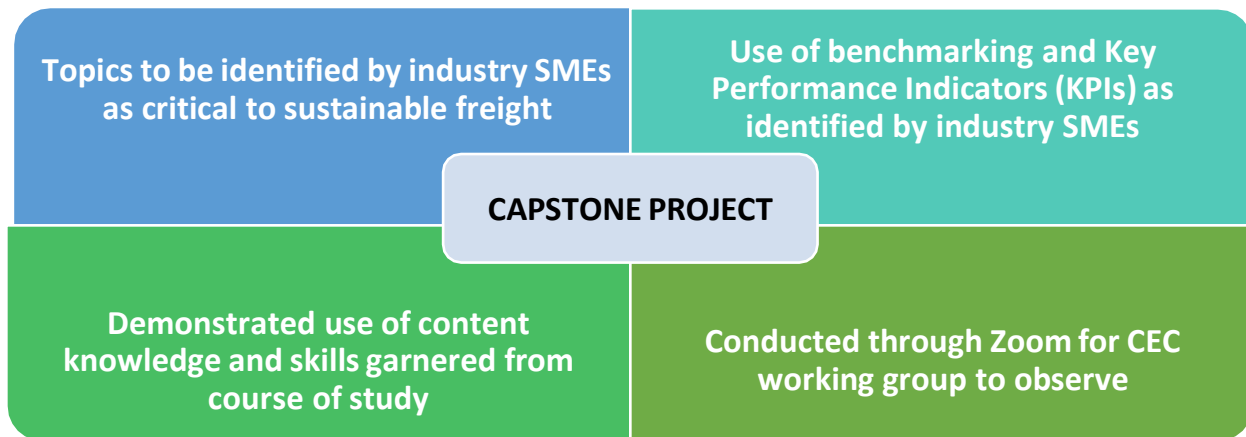
Content:

Risk Management in the Context of Sustainable Freight Operations

CAPSTONE PROJECT (18 hours)

As a collaborative effort, this capstone project will address topics identified by industry SMEs as critical to sustainable freight and use industry-vetted benchmarking and key performance indicators (KPIs). This project would demonstrate the use of knowledge and skills garnered from the course of study. Upon successful completion of the capstone project and presentation

to the CSFAP working group, the participant will receive the Sustainable Freight Foundations Certificate. The total hours include project collaboration, presentation to the working group, and office hours with the instructors.



PARTICIPANT FEEDBACK TO INFORM FUTURE CURRICULUM

Participants and their employers will provide feedback on the pilot course content and delivery to inform the development of a potential Sustainable Freight Certification (versus this Freight Foundations Certificate) program, where each session will provide a deeper dive into critical issues identified. Feedback can also provide data for customization of certificates based on industry sector and/or management level.

PARTNERING ORGANIZATIONS AND AGENCIES

Partnerships with industry and public agency stakeholders are crucial to determine objectives, validate content and course relevance to industry; provide guidance on curriculum development, including design; support and facilitate effective marketing, implementation, and assessment strategies; and to ensure replicability statewide and across industries. CITT is currently partnering with or has plans to partner with the following organizations:

California Governor’s Office of Business and Economic Development

California Energy Commission

California Air Resources Board

California Workforce Development Board

California Employment Training Panel

California Community Colleges’ Advanced Transportation and Logistics (ATL) Program

College of Professional and International Education, California State University, Long Beach

MEMA (Municipal Equipment Maintenance Association)

PFSA (Public Fleet Supervisors Association)

California Trucking Association (CTA)

BNSF

TTSI (Total Transportation Services)

Clean Cities Coalition

Electric Vehicle Infrastructure Training Program (EVITP)

Caltrans

Los Angeles World Airports (LAWA)

Los Angeles Transportation Club (LATC)
Harbor Trucking Association (HTA)
CSCMP (Council of Supply Chain Management Professionals)
ISM (Institute for Supply Management)
Esri Geographic Information Systems
American Planning Association (APA)
Port of Hueneme
Port of Los Angeles
Port of Long Beach
Port of San Diego
Port of Stockton
SoCalGas
South Coast Air Quality Management District
The California Endowment
The Greenlining Institute

SCAN OF SIMILAR PROGRAMS

A review of the following programs has informed the development of the Freight Foundations Certificate and helped to identify the gaps it fills:

CITT GLOBAL LOGISTICS PROFESSIONAL (GLP) PROGRAM COURSES

CITT is drawing from subject matter expert instructors in its Global Logistics Professional (GLP) program, jointly offered by CITT and CSULB's College of Professional and International Education (CPIE) as well as the Master of Science in Supply Chain Management to develop and implement the pilot. Foundation Certificate instructors cover the following topics in the GLP program:

Logistics and Transportation Management
Greening the Supply Chain
Legal Issues in Freight
Transportation Infrastructure and Environmental Issues
Regulatory and Environmental Issues

Requirements of U.S. DOT/FMCSA (Federal Motor Carrier Safety Administration)

The GLP Program provides a strong foundation in freight systems but does not offer curricular content in energy systems. The program, by design, is broad-based. The Freight Foundations Certificate has a narrower focus in that it targets middle managerial level positions.

TRANSPORTATION MANAGEMENT CERTIFICATE (RUTGERS UNIVERSITY)

Rutgers University, through the Edward J. Bloustein School of Planning and Public Policy offers a *Transportation Management: Vulnerability, Risk and Security Certificate* developed and presented by a coalition of faculty and staff from Rutgers School of Engineering, the School of Arts and Sciences, and Rutgers Biomedical and Health Sciences. Required courses include *Public Transit Planning and Management* and *Hazard Mitigation and Planning*. In addition, students take a minimum of three (3) electives. Elective course offerings include:

Transportation and the Environment; Security and Safety in Maritime Transportation and Port Operations; Rail Transport Systems; Engineering Risk Analysis in Multimodal Transportation Systems; and Risk Communication.

CERTIFICATE OF ACCOMPLISHMENT IN FREIGHT MANAGEMENT AND OPERATIONS,

NATIONAL HIGHWAY INSTITUTE (NHI)

Requirements for this Certificate of Accomplishment include 5 courses encompassing 7 days in addition to an online learning component. Related courses include: *Integrating Freight in the Transportation Planning Process; Advanced Freight Planning; Uses of Multimodal Freight Forecasting in Transportation Planning.*

NAFA (FLEET MANAGEMENT ASSOCIATION) FLEET MANAGEMENT SUSTAINABILITY CERTIFICATE

This NAFA-sponsored Certificate requires completion of 6 courses with a 50-question multiple choice exam: *Building a Sustainable Fleet Program; Sustainable Driver Training; Sustainable Fleet Metrics; Sustainable Leadership and Change Management; Using and Tracking Fuel to Support Sustainability; and Acquiring a Sustainable Fleet: Strategic Mobility Concepts.*

Instruction is via PDF articles, webinars, and study guides.

I-95 CORRIDOR COALITION CERTIFICATE, CALTRANS FREIGHT ACADEMY, CITT’S BATTLE FOR THE CURB

1-95 Corridor Coalition Certificate	Caltrans Freight Academy	CITT Battle for the Curb
<p>Duration: One week (plus pre-reading and group capstone project)</p> <p>Related Topics: Urban freight dynamics and future freight trends Freight modeling/generation Familiarity with freight stakeholders Land use and freight relationship Strategies to mitigate freight impacts</p>	<p>Duration: Four days</p> <p>Related Topics: Freight Planning Perspectives and Challenges Changing Geography and Economics of Logistics Freight Data and Performance Measures</p>	<p>Duration: Three Days</p> <p>Related Topics: State of the Supply Chain The Role of Freight Planning at the Municipal Level</p>

CONTINUING EDUCATION UNITS

CITT will explore the possibility of providing American Planning Association (APA) Continuing Education Units (CEUs) through AICP, the American Institute of Certified Planners, the professional institute for APA, upon completing the capstone project. CITT is a certified APA CEU provider. CITT will also explore providing California State University CEUs through CSULB.

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TASKS FOR PILOT PROJECT COMPLETION (HYBRID SESSIONS)

This timeline assumes the ability to begin instruction with no instruction delivery changes due to COVID-19 shelter-in-place mandates. The delivery of the hybrid face-to-face sessions is scheduled for August 6, 7, and 8, 2020 with final deliverables due in November and December 2020.

April
Meet with CSFAP working group
Create Curriculum Advisory Board
○ Engage labor
Identify online instructor
○ Legal Issues in Freight module
Identify guest speakers/panelists
Establish participant requirements
Identify nomination process for participants
Establish minimum/maximum number of participants
Refine learning objectives
Deploy online survey to potential participating employers
Assess labor market value of Freight Foundations Certificate
Continue to develop course budget
Develop MOUs
○ Subject matter expert (SME) instructors, participating employers, participants

May
Identify and recruit employers and participants
Identify mentors
Identify and establish course design assessment standards performance metrics
Determine Continuing Education Credits (CEUs) American Planning Association CSULB CEUs
Convene the Certificate launch webinar through Zoom for participants Establish communication protocols Instruction for virtual instruction Trello (for project management and document library) Slack or email (general communication) Present learning objectives and content Present in-development course design, requirements, assessment, capstone structure Introduce SME instructors

15

June
Continue to identify and recruit employers, participants, mentors
Develop course materials, including Glossary Pre-reading material

Identify and establish course design assessment standards performance metrics
--

July
Meet with CSFAP working group
Match mentors with participants
Disseminate all course material to participants using Trello and Slack

August
Face-to-face and online courses are in session
Deploy surveys for pilot certificate program feedback
Monitor asynchronous coursework online courses capstone project collaboration

September
Monitor asynchronous coursework online courses capstone project collaboration

October
Monitor asynchronous coursework online courses capstone project collaboration
Schedule Zoom meetings for capstone project presentations to the CSFAP working group

November and December
Career pathway maps for 5 related skill and training requirements for mission-critical occupations across transportation, construction, and manufacturing sectors: November 20, 2020
Final report: December 18, 2020

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ADDENDUM

Included in this addendum are additions made after the final Implementation Plan was submitted. Text in bold are the additions or clarifications.

TARGET AUDIENCE

Small and medium sized (SME) companies will be the focus. Freight sectors that will be targeted include drayage, trucking, rail, manufacturers (OEMs), freight forwarders, distribution and warehousing, **terminals**, and transloading facilities. Targeted occupations include **middle- managerial level positions (not for C-suite managerial level positions):**

Add **Land Use Planners**

COURSE DELIVERY

With the COVID-19 pandemic and statewide shelter in place policies in place at the time of this writing, CITT will deliver this course 100% online. As of April 17, 2020, the California State University Chancellor's Office is requiring all virtual instruction through August 24, 2020.

CERTIFICATE CONTENT

INTRODUCTION TO DIGITAL SKILLS BUILDING: IT AND OPERATIONS (6 HOURS)

Learning Objectives:

The Introduction to Digital Skills Building session will cover technical applications and competencies needed for freight operations and management.

Content (TBD):

Project management tools

Shared platforms

Automated data collection tools

Visualization tools

Analytic tools

Inventory maintenance tools

CITT will further refine requested skills through surveys that will be deployed in May.

LEGAL ISSUES IN FREIGHT MANAGEMENT (2 HOURS)

Learning objectives:

The students will gain practical knowledge about the common pitfalls of a domestic and international freight shipment and how to protect a company's interests through planning, negotiating, contracting, and managing risk **focusing on the resource needs of small- and medium-sized enterprises (SMEs).**

CAPSTONE PROJECT (10 HOURS)

PARTNERING ORGANIZATIONS AND AGENCIES

Add **West Coast Collaborative**

TASKS FOR PILOT PROJECT COMPLETION (100% ONLINE SESSIONS)

This timeline assumes 100% online delivery due to COVID-19 shelter-in-place mandates. The synchronous and asynchronous coursework will begin in August 2020 with capstone projects presented to the working group in October 2020; final deliverables will be due November 20th and December 18th, 2020. Additions to the timeline are in bold.

April
Meet with CSFAP working group

Create Curriculum Advisory Board
○ Engage labor
Identify online instructors
○ IT and Operations
Identify guest speakers/panelists
Establish participant requirements
Identify nomination process for participants
Establish minimum/maximum number of participants
Refine learning objectives
Deploy online survey to potential participating employers
Assess labor market value of Freight Foundations Certificate (move to May)
Continue to develop course budget
Develop MOUs
○ Subject matter expert (SME) instructors, participating employers, participants

May
Identify and recruit employers and participants
Identify mentors
Develop Pilot Certificate Project Charter
Identify and establish course design assessment standards performance metrics
Refine learning objectives
Deploy online survey to potential participating employers
Assess labor market value of Freight Foundations Certificate
Determine Continuing Education Credits (CEUs) American Planning Association CSULB CEUs
Convene the Certificate launch webinar and orientation via Zoom for participants
○ Introduce Pilot Certificate Project Charter

Establish **instruction and** communication protocols
Instruction for virtual instruction
Trello (for project management and document library)
Slack or email (general communication)
Present learning objectives and content
Present in-development course design, requirements, assessment, capstone structure
Introduce SME instructors

June

Continue to identify and recruit employers, participants, mentors

Develop course materials, including

Glossary

Pre-reading material

Identify and establish course design

assessment

standards

performance metrics

July

Meet with CSFAP working group

Match mentors with participants

Disseminate all course material to participants using Trello and Slack

August

Online courses are in session (Scheduling TBD)

Deploy surveys for pilot certificate program feedback following sessions

Monitor asynchronous coursework

online courses

capstone project collaboration

September

Monitor asynchronous coursework

online courses

capstone project collaboration

Analyze survey responses

October

Zoom meetings for capstone project presentations to the CSFAP working group

November and December

Certificates awarded

APA or CSU CEUs awarded

Career pathway maps for 5 related skill and training requirements for mission-critical occupations across transportation, construction, and manufacturing sectors: November 20, 2020

Final report: December 18, 2020



California Sustainable Freight Foundations Certificate For Middle Managers A Workforce Development Pilot Project for the California Sustainable Freight Action Plan

*Developed by the
Center for International Trade and Transportation College
of Professional and International Education California
State University, Long Beach
California Energy Commission
Governor's Office of Business and Economic Development*

EXECUTIVE SUMMARY OF THE CALIFORNIA SUSTAINABLE FREIGHT ACTION PLAN (CSFAP)

In July 2015, Governor Brown issued Executive Order B-32-15, which provides a vision for California's transition to a more efficient, more economically competitive, and less polluting freight transport system. This transition of California's freight transport system is essential to supporting the State's economic development in coming decades while reducing harmful pollution affecting many California communities. To support these needs, the California Energy Commission (CEC) partnered with the Governor's Office of Business and Economic Development (GO-Biz) and the Center for International Trade and Transportation (CITT) at California State University, Long Beach (CSULB) to convene working groups with industry stakeholders and the California Workforce Development Board. The working group's task is to identify and implement steps to ensure that sufficiently skilled labor is available to meet the needs of an expanding freight-related job market. CITT, CEC, and GO-Biz, together with the guidance of the working group, developed this pilot workforce development program for middle managers involved with freight.

LEARNING OBJECTIVES FOR THE CERTIFICATE

Environmental and other compliance regulations and disruptive technologies have changed workforce responsibilities for managers in transportation and supply chain industry sectors. The COVID-19 pandemic, moreover, has further increased these demands. Compliance reporting, efficient and effective program management, foundational knowledge of energy ecosystems, and the use of data require targeted training at the middle managerial level; for instance, strategic roadmaps are required to identify inefficiencies in production, improve operations, increase revenue, and enhance both environmental and economic sustainability.

TARGET AUDIENCE

Small and medium sized (SME) companies will be the focus. Freight sectors that will be targeted include drayage, trucking, rail, manufacturers (OEMs), freight forwarders, distribution and warehousing, terminals, and transloading facilities. Targeted occupations include:

- Facilities Managers
- Fleet Coordinators/Managers
- Compliance Managers
- Safety and Security Operations Managers/Safety, Security, and Environmental (SSE) Compliance Managers
- Documentation Managers
- Maintenance Managers
- Environmental Planners
- Transportation Planners/Managers
- Land Use Planners
- Freight Program Managers

CERTIFICATE MODULES

Module	Description
Current Issues in Freight Systems and Management	Delineate the roles, responsibilities and limitations of various public and private sector actors involved in managing and overseeing the flow of goods
Introduction to Energy, Infrastructure and Sustainability	Gain current, up-to-date knowledge of requirements and trends in energy, infrastructure, and sustainability
Introduction to Regulatory Compliance	Acquire necessary tools to identify the specific regulatory agencies and subsequent programs that directly impact or influence day-to-day operations of transportation and/or warehousing and distribution providers
Introduction to Data/Metrics in Freight Management	Acquire strategies for collecting, interpreting, and utilizing data to develop metrics and targets that benefit single facilities or organizations as a whole; find and assess data; develop and integrate metrics
Legal Issues in Freight Management	Gain practical knowledge about the common pitfalls of a domestic and international freight shipment; learn how to protect a company's interests through planning, negotiating, contracting, and managing risk, focusing on the resource needs of small- and medium-sized enterprises (SMEs)

Introduction to Digital Skills Building: IT/Operations	Learn how digital tools can improve your operations. Content TBD and will be further informed by employer/participant input.
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Capstone Project	The participation in this capstone project will embed all of the employability skills identified as critical by industry (collaboration, critical thinking and problem solving based on data, communication, process improvement) together with the skills and knowledge presented in this Certificate program. Participants will be expected to work in groups and dedicate approximately 10 hours of asynchronous hours toward the project.
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CERTIFICATE CONTENT

CITT identified industry and education subject matter experts who assisted in developing learning objectives, content, delivery, assessment design, and the final capstone project. CITT will deploy online surveys to potential participating employers and participants to gather specific data on requested course content. Note that CITT has deployed a middle-skill (more than a high school diploma, less than a four-year college degree) workforce gap analysis survey in transportation and supply chain industry sectors through a SB 1-funded California State University Transportation Consortium grant. Data gathered from this project includes critical technical skills required for middle managerial staff; this data also informs the curriculum content. In addition, a Curriculum Advisory Board together with the CSFAP working group will continue to provide guidance.

COURSE DELIVERY

Course sessions will be taught 100% online by industry subject matter experts through California State University, Long Beach's College of Professional and International Education (CPIE) beginning in July 2020 through October 2020, a roughly three-month period. Mandatory class sessions will be online using Zoom on Friday afternoons (from 1 – 4), with homework and a collaborative group project (capstone) due in October. The capstone will be presented via Zoom to the Sustainable Freight Action Plan working group in October and November 2020. A California Sustainable Freight Foundations Certificate will be presented to participants who have successfully completed all the sessions, including the capstone project. Certificates will be presented by December 31, 2020.

Subject	Date	Method of Instruction
Certificate Overview (Mandatory)	Friday, July 31, 2020	Online (Zoom)
Current Issues in Freight	Friday, August 7, 2020	Online

Energy, Infrastructure, and Sustainability	Friday, August 14, 2020	Online
Regulatory Compliance	Friday, August 21, 2020	Online
Data and Metrics in Freight	Friday, August 28, 2020	Online
Legal Issues in Freight	Friday, September 11, 2020	Online
Digital Skills/IT and Operations	Friday, September 18, 2020	Online

Capstone Project Development + presentation to working group	TBD by teams	Online
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PROGRAM COST

There will no cost to this pilot certification program. If the participant/student or employer would like continuing education units (CEUs), there will be a fee of \$40 paid by the participant/student or employer to CPIE.

APPLICATION PROCESS

As this is a statewide initiative and pilot participation is limited, if you as an employer or as an employee is interested in participating or have questions, **please send an email as soon as possible, but no later than May 22, 2020 confirming interest to the Project Manager, Deanna Matsumoto, at deanna.matsumoto@csulb.edu**. You will receive a confirmation email upon receipt and will be emailed an application.

Appendix I: Application



California Sustainable Freight Foundations (CSFAP) Certificate For Middle Managers A Workforce Development Pilot Project for the California Sustainable Freight Action Plan

Developed by the Center for International Trade and Transportation (College of Professional and International Education, California State University, Long Beach), California Energy Commission, and the Governor's Office of Business and Economic Development

APPLICATION PROCESS

Please submit this completed application by **June 5, 2020** to the CSFAP Pilot Workforce Development Project Manager, Deanna Matsumoto, at deanna.matsumoto@csulb.edu. If you would like to write your answers out by hand, you may print these pages, fill it out, and take pictures with your phone to send me. You will receive a confirmation email upon receipt. **Please complete all sections, including the survey. We want to ensure that our teaching content aligns with your organization's workforce needs for middle managers.**

Name of Organization/Company

Organization/Company Address

Participant Name and Title

Participant Contact Information (email, phone)

Supervisor Name and Title, if applicable

For Participant: Please describe in 4-5 sentences how this CSFAP Freight Foundations Certificate will provide value to your organization and what you would like to gain from this program.

For Supervisor (if applicable): Please describe in 4-5 sentences how this CSFAP Freight Foundations Certificate will support workforce development efforts at your organization/company.

PROGRAM COST

There will be no cost to this pilot certification program. If the participant/student or employer would like continuing education units (CEUs), there will be a fee of \$40 paid by the participant/student or employer to CPIE. CITT will also explore providing APA CEUs.

TENTATIVE SCHEDULE

All online sessions with instructors and two orientation sessions (one in late June (date TBD) and one on July 31) are mandatory. Instructor-led online course sessions will tentatively be held on select Friday afternoons: August 7, August 14, August 28, September 11, and September 18. The capstone project presentations via zoom to the CSFAP Working Group will be in late October or November.

CONTINUE TO NEXT PAGE

EMPLOYEE/EMPLOYER SURVEY FOR COURSE CONTENT (REQUIRED)

1. What are the state, local and federal regulatory agencies you deal with in the course of your normal job?

2. Is there a particular agency, agencies, or other jurisdictional authorities you are interested in knowing more about?

3. Does the company you work for own any diesel fueled or alternative fueled (Nat. Gas, ZEV, Hydrogen) equipment? If so, what types?

4. How many locations does the company you work for operate?

5. To your knowledge, does the company you work for report equipment information (usage, age, location etc.) to 3rd parties or any state, local or federal regulatory bodies?

6. To your knowledge, does your company report other information, not equipment related, to 3rd parties or any state, local or federal regulatory bodies?

7. Do you currently hold any certifications related to your work duties or otherwise?

8. What applications/programs do middle managers at your organization or company use most frequently?

9. What applications/programs will be critical in the near-term future for middle managers at your company or organization? Does your organization need training and workforce development for these applications and programs?

CONTINUE TO NEXT PAGE

REQUIREMENTS FOR ACCEPTANCE

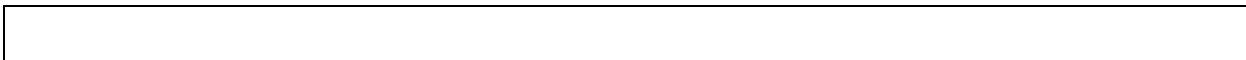
REQUIREMENTS FOR ACCEPTANCE: PARTICIPANTS

- Participants agree to attend all online class sessions (100% virtual). All instructor-led synchronous sessions will be on Fridays from 1:00 to 4:00 on 8/7, 8/14, 8/21, 8/28, 9/11, 9/18.
- Participants agree to attend 2 meetings prior to online class sessions (both virtual). Tentative Dates – 6/26 and 7/31, times TBD.
- Participants (and their employers, if applicable) agree to provide input to assist in the development of course content.
- Participants agree to provide feedback after each session to assist in informing future curriculum.
- Participants must complete all assignments, including the collaborative capstone project. (Capstone projects will be assigned and led by subject matter expert instructors. Participants will work in assigned teams to complete the project.)
- Participants are expected to complete homework assignments on their personal time (non-work hours).
- Participants must present their capstone projects via Zoom to the CSFAP working group in late fall, 2020. This presentation will take approximately one hour.
- Participants and their employers (if applicable) agree to provide feedback on this certificate program. This will likely be through an interview process in November or December 2020.

REQUIREMENTS FOR ACCEPTANCE: EMPLOYERS

- Employers agree to allow participants to attend all online class sessions (100% virtual). All instructor-led synchronous sessions will be on Fridays from 1:00 to 4:00 on 8/7, 8/14, 8/21, 8/28, 9/11, 9/18.
- Employers agree to allow participants to work on assigned collaborative capstone projects for a total of 8 hours during work hours – date and time TBD.
- Employers agree to allow participants to present their capstone projects via Zoom to the CSFAP working group during work hours in late fall, 2020. This presentation will take approximately one hour.
- Employers agree to have their organization's name listed on all reporting documents for this pilot program.

CONTINUE TO NEXT PAGE



Signature of Supervisor (If applicable): _____

Date: _____

Signature of Applicant: _____

Date: _____

THANK YOU FOR COMPLETING THE APPLICATION.

Please email to Deanna.Matsumoto@csulb.edu by June 5, 2020, close of business

Appendix J: Exit Survey

Q3 How did you find out about this pilot program?

Answered: 17 Skipped: 0

#	RESPONSES	DATE
1	President of our company has an active network within the transportation industry. I was invited through my work.	1/13/2021 12:06 AM
2	DOT Email blast	1/5/2021 4:09 PM
3	A colleague shared the opportunity with me.	12/11/2020 8:48 PM
4	My manager received notice through the Sustainable Freight Working Group.	12/11/2020 5:59 PM
5	Through my professional networks, I received an email with directions on how to apply.	12/11/2020 4:15 PM
6	An email blast from GO-BIZ that was further distributed via the California Sustainable Freight Action Plan distribution list (to confirm I received via the CSFAP distribution).	12/11/2020 11:27 AM
7	While working on another project with the CITT staff.	12/10/2020 8:03 PM
8	Regional Vice President Joe Carrillo	12/8/2020 2:08 PM
9	California Freight Advisory Committee.	12/7/2020 3:55 PM
10	I received a general email notice regarding the pilot class and realized that while I was not the intended target for the certification, I could see great value in the information and experience.	12/7/2020 8:28 AM
11	LinkedIn ad	12/6/2020 11:58 AM
12	My supervisor Nathan Loftice recommended this to me as part of my development into Sustainability.	12/4/2020 2:01 PM
13	Larry Rillera told me at a CEC Ports Collaborative Meeting in San Diego.	12/4/2020 1:31 PM
14	Ron Ron Costin with Foss	12/3/2020 9:15 PM
15	CSFAP Interagency Team	12/2/2020 5:04 PM
16	Through attending a governor's business and economic development meeting	12/2/2020 7:25 AM
17	The owner of my company reached out to me and asked if I would participate.	12/2/2020 6:51 AM

Q4 What positions at your organization would benefit from this Sustainable Freight Foundations program? Please list the job titles, including your title.

Answered: 17 Skipped: 0

#	RESPONSES	DATE
1	Business Development / Sales and Operations	1/13/2021 12:06 AM
2	Compliance coordinators (including myself - though my title is technically Food Safety Coordinator), Compliance Manager	1/5/2021 4:09 PM
3	Manager, Government Affairs	12/11/2020 8:48 PM
4	Air Pollution Specialists (mine) Air Resources Supervisor 1	12/11/2020 5:59 PM
5	Transportation Planners of all levels (Entry, Associate, Senior) - especially the Goods Movement Liaison, Air Quality Specialist, and Regional Planner roles Environmental Planners Engineers in the Traffic Safety and Maintenance Division	12/11/2020 4:15 PM
6	Transportation Planners, Associate Transportation Planners, Senior Transportation Planners, Environmental Planners--General, Associate Environmental Planners--General, and Senior Environmental Planners--who focus on Generalist tasks. Although all levels could potentially benefit, the content provided in the Sustainable Freight Foundations pilot program would not be recommended for anyone who did not have at least a couple of years of experience in their position and would further caveat that Transportation Planners and Environmental Planners should only be considered based on recommendations from their supervisors that they have sufficient accrued experience/knowledge to be recommended for this program.	12/11/2020 11:27 AM
7	Customer Service Representatives, Management/Supervisor trainees, Interns, Regulatory Compliance Personnel. Other industry individuals that would benefit from the program would be Vessel Agents, Dispatchers, Terminal Managers, Business Entrepreneurs, State/Federal Regulators, Equipment Sales Personnel that would support this industry segment, high school/college business majors.	12/10/2020 8:03 PM
8	General Manager Warehouse Supervisor	12/8/2020 2:08 PM
9	Sustainable Campus Division - Environmental Supervisor or Environmental Specialist, Airport Planners, also Airport Engineers. Also some of the airline employees/managers would do well with My title is different from the majority of titles at the airport so it may not apply.	12/7/2020 3:55 PM
10	Having worked in public works and departments of transportation, multiple positions would be informed by the certification. Planning and engineering positions at all levels would more readily include the need to maintain large vehicle accessibility as well as be exposed to the complicated network of interactions and regulations that industrial goods movement must abide. Groups focused on business development (in Seattle that is the Office of Economic Development) would benefit similarly. The Mayor's Office of Sustainability would also benefit by understanding more clearly the regulations associated with industrial goods movement. Additionally, as a peripheral benefit, groups seeking to better understand equity would have some gain - likely as a secondary audience benefitting from the perspectives of those who completed this certification.	12/7/2020 8:28 AM
11	Operation Managers, Dispatchers, and New business owners.	12/6/2020 11:58 AM
12	Manager of Environmental Permitting & Sustainability, Director of Environmental Permitting & Sustainability	12/4/2020 2:01 PM
13	Manager of Air Quality Practices Environmental Specialist	12/4/2020 1:31 PM
14	I'm currently not formally employed, however I was a Marketing and Regulatory professional for over a decade in the polymer films field. This course provided insight into the freight and transport industry's current state as it relates to the CSFAP. I can see this benefiting a functional manager assigned an additional sustainability role.	12/3/2020 9:15 PM
15	Freight Technology Unit: Supervisor, Air Pollution Specialist, Energy Commission Specialist	12/2/2020 5:04 PM
16	Terminal Manager Health & Safety Director Port Manager	12/2/2020 7:25 AM
17	My position, Executive VP and Chief Operations Officer. Also my Operations Manager would benefit from this program.	12/2/2020 6:51 AM

Q5 What other skills are needed for jobs that involve sustainable freight at your organization (in addition to the knowledge/skills/abilities (KSAs) presented with this certificate)?

Answered: 15 Skipped: 2

#	RESPONSES	DATE
1	Project Management Data Analytics	1/13/2021 12:06 AM
2	Communication skills and research	1/5/2021 4:09 PM
3	Communication skills are very important at my organization. We need to be able to communicate with a variety of stakeholders using a variety of mediums in order to develop very specific messaging to different people.	12/11/2020 8:48 PM
4	Knowledge of Federal and international regulatory bodies was covered briefly, but could be expanded upon to cover implications for different modes of transport (air, sea, locomotive in particular). The regulatory focus could include more of the legal framework that operators must navigate to run their businesses - beyond what was covered in the Legal Issues class. It could also include a briefing on CEQA/NEPA and the politics of project permitting.	12/11/2020 5:59 PM
5	Not sure	12/11/2020 4:15 PM
6	I felt that this program did a great job with the cross representation of material that was presented through each of the topic specific modules.	12/10/2020 8:03 PM
7	KSA's covers it all, I have nothing else to add besides experience!	12/8/2020 2:08 PM
8	For densely developed urban areas, a knowledge of the network's needs to get goods from various distribution nodes to final sales point. This is a more granular view of a transportation network and may not be easily relatable to the needs at port facilities.	12/7/2020 8:28 AM
9	Sustainability mindset : thinking about ourselves, without forgetting the coming generations.	12/6/2020 11:58 AM
10	I think understanding the Sustainable Development Goals as a whole and how they can apply to your organization is something that should be furthered explored in this class.	12/4/2020 2:01 PM
11	Public speaking Writing to a specific audience Outreach and engagement	12/4/2020 1:31 PM
12	System and methodology building, risk strategy creation, awareness and understanding of ZEV related KPIs (not just industry related), ability to see opportunities beyond the sustainability challenges i.e. market foresight	12/3/2020 9:15 PM
13	Communications, strategic thinking, public speaking,	12/2/2020 5:04 PM
14	Financial acumen to properly analyze the costs involved in sustainable freight projects	12/2/2020 7:25 AM
15	Perhaps knowledge of pricing and availability of energy sources.	12/2/2020 6:51 AM

Q6 What professional development opportunities in sustainable freight do you currently have at your workplace?

Answered: 16 Skipped: 1

#	RESPONSES	DATE
1	Our company offers scholarships to staff working towards a field within transportation.	1/13/2021 12:06 AM
2	My work supported my pursuit of this and if any other certifications come around	1/5/2021 4:09 PM

3	Others in my workplace have been there for decades, and i believe it is because they allow for growth within our existing roles.	12/11/2020 8:48 PM
4	CARB pays for continuing education classes that align with our job duties. Most staff are also encouraged to work in a variety of Offices and Divisions in order to gain familiarity with different aspects of sustainable freight (incentives, enforcement, regulation...etc.)	12/11/2020 5:59 PM
5	Not sure	12/11/2020 4:15 PM
6	Actually it would be safe to say that all of our employees share responsibility towards maintaining and advancing the practical concepts of sustainability through environmental stewardship and ongoing education, so together we can produce a workplace that has zero incidents with a zero carbon foot print while producing a profitable gain for the employees and employer alike.	12/10/2020 8:03 PM
7	Besides taking this course I'm not sure at my level if there are any other developmental opportunities in the company, as far as my workplace there are none.	12/8/2020 2:08 PM
8	None	12/7/2020 3:55 PM
9	We are encouraged to seek training and attend webinars such as those from TRB, ITE, AASHTO, FHWA and others. Those cover a broad range of topics but do contain freight and sustainability components.	12/7/2020 8:28 AM
10	Not sure.	12/6/2020 11:58 AM
11	Director of Permitting and Sustainability, VP of environmental	12/4/2020 2:01 PM
12	Conferences Internal trainings related to public speaking, program management, leadership	12/4/2020 1:31 PM
13	N/A	12/3/2020 9:15 PM
14	External training, classes, and conferences for freight sector activity are available.	12/2/2020 5:04 PM
15	opportunities to be involved in the purchasing of equipment and learn from colleagues who are already winning grants and buying electric equipment.	12/2/2020 7:25 AM
16	Currently we have none but we are looking to change that.	12/2/2020 6:51 AM

Q7 Which of these statements best describes a sustainable freight position within your organization? (select all that apply)

Answered: 17 Skipped: 0

ANSWER CHOICES	RESPONSES	
Sustainability responsibilities are embedded in existing job positions at my organization (e.g., operations manager/technician).	52.94%	9
My organization currently has a position or positions dedicated to sustainability.	35.29%	6
Dedicated sustainability positions are currently in the process of development at my organization.	17.65%	3
Dedicated sustainability positions will likely be created within the next few years.	35.29%	6

Total Respondents: 17

#	PLEASE COMMENT HERE:	DATE
1	After taking this class and sharing the knowledge and experience it was decided that we would need someone within our organization who takes a more active role towards sustainability. Originally it was tasked to business development but it is bigger than that.	1/13/2021 12:06 AM
2	My organization does not focus on the hands-on work that allows for freight to happen, but rather focuses on the regulations, education, and advocacy for the sustainable component of freight.	12/11/2020 8:48 PM
3	Most of our freight programs focus directly on the intersection of cost, equity, and environmental sustainability.	12/11/2020 5:59 PM
4	Efforts specific to sustainable freight are typically addressed by Transportation Planners, Associate Transportation Planners, or Senior Transportation Planners.	12/11/2020 11:27 AM
5	This position would be more than one person could handle, rather I see this as being something that a cross functioning team would be engaged in. Perhaps led by someone that has project management and people skills.	12/10/2020 8:03 PM
6	In my region there is a strong incentive for sustainable infrastructure, SSA Marine is currently working with the Port of Stockton to meet the regulations.	12/8/2020 2:08 PM
7	We have a Chief Sustainability Officer and a Sustainable Campus Group that is dedicated to ensuring LAWA compliance to regulations.	12/7/2020 3:55 PM
8	As noted above, the City of Seattle has an Office of Sustainability dedicated to better understanding and developing sustainability policies and goals.	12/7/2020 8:28 AM
9	Most Businesses are focussing only on the net profit.	12/6/2020 11:58 AM

10	Currently Sustainability is folded into the permitting roles at BNSF but I think in the future there could be a role or two solely dedicated to sustainability.	12/4/2020 2:01 PM
11	N/A but in the past these were combined with Marketing Management functions due to product development, customer consulting and vendor onboarding	12/3/2020 9:15 PM
12	Position will likely start with an appointee position	12/2/2020 5:04 PM
13	There may well be someone at the cooperate level in a sustainability position that I am not aware of.	12/2/2020 7:25 AM
14	After taking the course my company is looking into creating a sustainability manager position within the next 2 years that will help us transition our company to near zero.	12/2/2020 6:51 AM

Q8 Please describe pathways that can lead to positions involving sustainable freight within your organization. As an example, how did you arrive at your current position?

Answered: 15 Skipped: 2

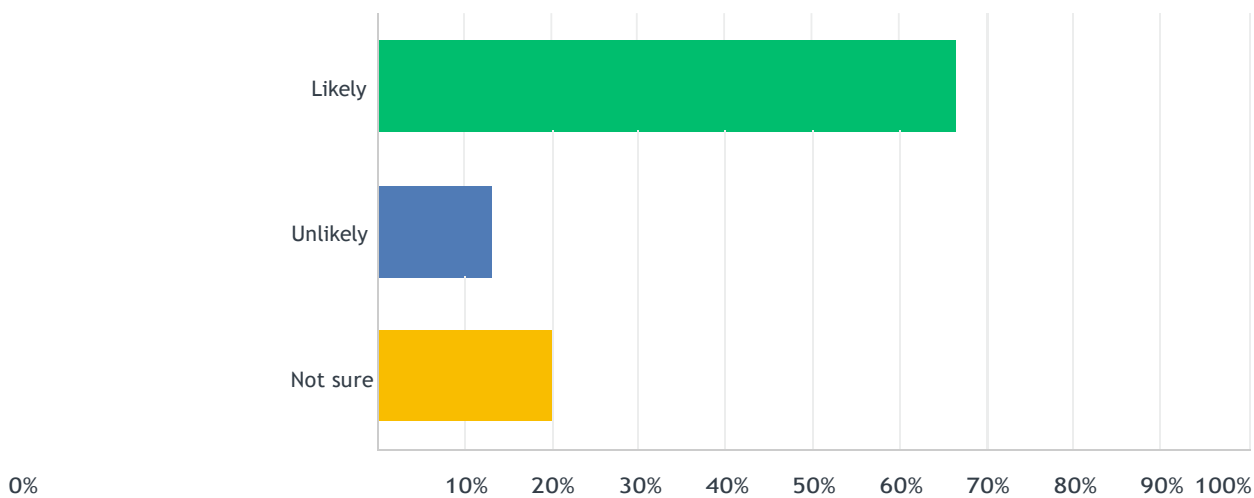
#	RESPONSES	DATE
1	Started from the bottom now I am here. (sorry!) I believe it is crucial for cross training within certain positions in our organization. After several years in customer service and dispatch I transitioned to sales. I was able to better address client pain points in sales meetings as a result of knowing the fleet and its' capacity to produce deliverable results.	1/13/2021 12:06 AM
2	Knowledge in the public process and/or environmental science is very useful in obtaining a position at my organization. I had a background in government affairs prior to joining my organization, which helped me understand the process of advocacy but I had to learn everything about freight once I was on the job.	12/11/2020 8:48 PM
3	I worked in UC San Diego's transportation office as an assistant to the Sustainable Transportation grant manager in 2009, interned with SANDAG for a year working in transit, then spent 4 years at Caltrans working on climate change analysis and resiliency of the state highway system. So, although I hadn't worked in freight up until my current position, I was familiar with transportation grants, operations, and infrastructure.	12/11/2020 5:59 PM
4	For the moment we have to rely on our staff working with or in the Goods Movement Office in our Headquarters for informing themselves and others on the topic of sustainable freight. In the future, if the Department sees it become ore of a priority, a separate or specialized Branch may be created and filled by staff with a skillset catered to those roles.	12/11/2020 4:15 PM
5	(attrition and no one else wanted to do what I do..... just kidding). Building on the concept of "the more you know, the more you realize what you don't know". Having started in the maritime industry 43 years ago, I took for granted how much things cost and how much planning and coordination was required to make things happen. The immediate decisions are the easy ones, the long term (future) decisions are where the deliberation is most important. This course presents a great opportunity that can be used as a work force melting pot where a cross section of an organizations team members can attend (along with students from other disciplines) which can provide a safe haven for brainstorming.	12/10/2020 8:03 PM
6	I arrived at my position by fate, yes "Fate", I was working on my Master degree in Mental Health and Counseling and was approached by Carrix due my history as a Stevedore while I was in the military, this doesn't necessarily transfer over to the civilian world of transportation and logistics. In saying this, this course has broadened and introduced me to a greater understanding of how things work in California. Now I do have a pathway that is in line with Carrix and it's future incentive for sustainable infrastructure.	12/8/2020 2:08 PM
7	Currently, freight operations are the responsibility of the freight forwarder, airlines, and cargo companies. We simply lease space.	12/7/2020 3:55 PM
8	The position I have at the Seattle Department of Transportation is not officially developed. I	12/7/2020 8:28 AM

manage the Freight Program because there was no other person with even anecdotal experience regarding freight, rail, large vehicle movement or strong (at that time) industrial business connections. My knowledge was developed over time, and I believe this is similar to multiple persons working on large vehicle/goods transportation. Part of the reason I was so intrigued by the Sustainable Freight Certification was because it offered perspective within organizations and companies with which I work but do not completely understand.

9	The Passion for learning and the love of the planet.	12/6/2020 11:58 AM
10	Project/ Field Engineer -> Manager of Engineering -> Manager of Environmental Permitting & Sustainability or Special projects Environmental Supervisor -> Manager of Environmental Permitting & Sustainability	12/4/2020 2:01 PM
11	I was a recent graduate from a masters program at UCLA. You will find public health, engineering, and environmental related college students are well positioned for sustainability jobs in goods movement. Once in the Environmental Planning Division at the Port, I was able to cross train in air quality. Five years later and here we are.	12/4/2020 1:31 PM
12	In my former position, the CEO requested a review of all regulatory standards and compliance regulations applicable to industries with significant polymer use. From there I was asked to build a department.	12/3/2020 9:15 PM
13	Will need to embed broader thinking beyond technical freight thinking and acting.	12/2/2020 5:04 PM
14	Through management positions either as a terminal or safety director. In order to get to those positions you have to work on the front line managing vessel operations for a number of years.	12/2/2020 7:25 AM
15	Most employees start as dispatchers, learning the operation. Then there are opportunities to advance into management positions such as dispatch manager, customer service manager or operations manager. Any of these manager positions could be transitioned into a sustainable freight position.	12/2/2020 6:51 AM

Q9 Would your workplace support course sessions during non-work hours, after 5 PM on weekdays?

Answered: 15 Skipped: 2

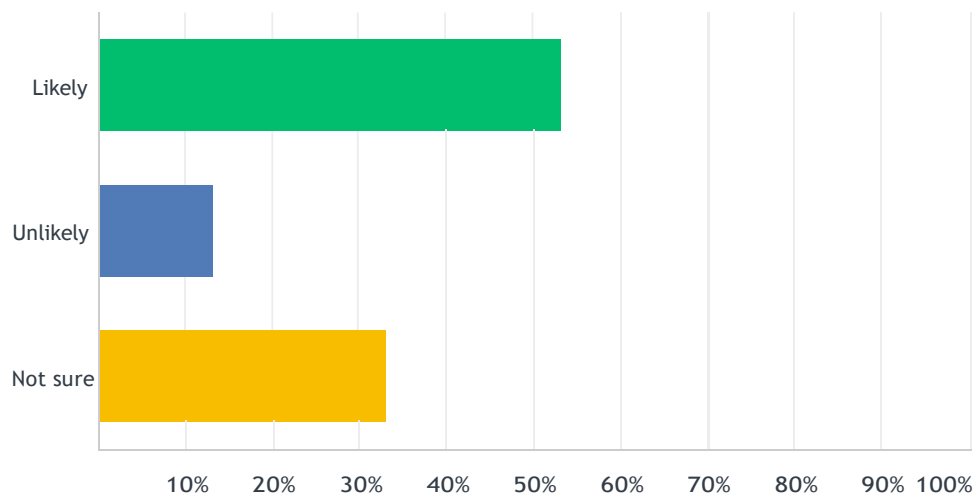


ANSWER CHOICES	RESPONSES	
Likely	66.67%	10
Unlikely	13.33%	2
Not sure	20.00%	3
TOTAL		15

#	PLEASE COMMENT HERE:	DATE
1	Friday is a crucial day for harbor drayage companies so it was not ideal for myself.	1/13/2021 12:06 AM
2	Scheduling is flexible	1/5/2021 4:09 PM
3	Training typically occurs between 8am and 5pm on weekdays.	12/11/2020 11:27 AM
4	Most likely with tuition reimbursement.	12/10/2020 8:03 PM
5	If it's feasible and doesn't cause a conflict with whomever is taking the course, I'm sure they would support taking classes during no-working hours, I believe this would be the best options, attempting to do these sessions during work hours is near impossible for some of us.	12/8/2020 2:08 PM
6	if it would be required to pay overtime, no	12/7/2020 3:55 PM
7	Seattle has a strong training/career development ethic and has supported formal and informal education for years.	12/7/2020 8:28 AM
8	I think they would prefer it so we can still do a full work day. I'm lucky enough to have Nathan let me dedicate work hours on Friday afternoons to this class.	12/4/2020 2:01 PM
9	It is unlikely during furloughs. We are furloughed until September of 2021. It is more likely not during furloughs but it's harder. That means flexing days for staff or offering overtime.	12/4/2020 1:31 PM
10	N/A	12/3/2020 9:15 PM
11	The company would support this but employee enthusiasm may not be high.	12/2/2020 7:25 AM
12	Yes, our workplace would support course sessions after work hours.	12/2/2020 6:51 AM

Q10 Would your workplace support course sessions on Saturdays?

Answered: 15 Skipped: 2



0%

10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Final Exit Survey: Sustainable Freight Certificate

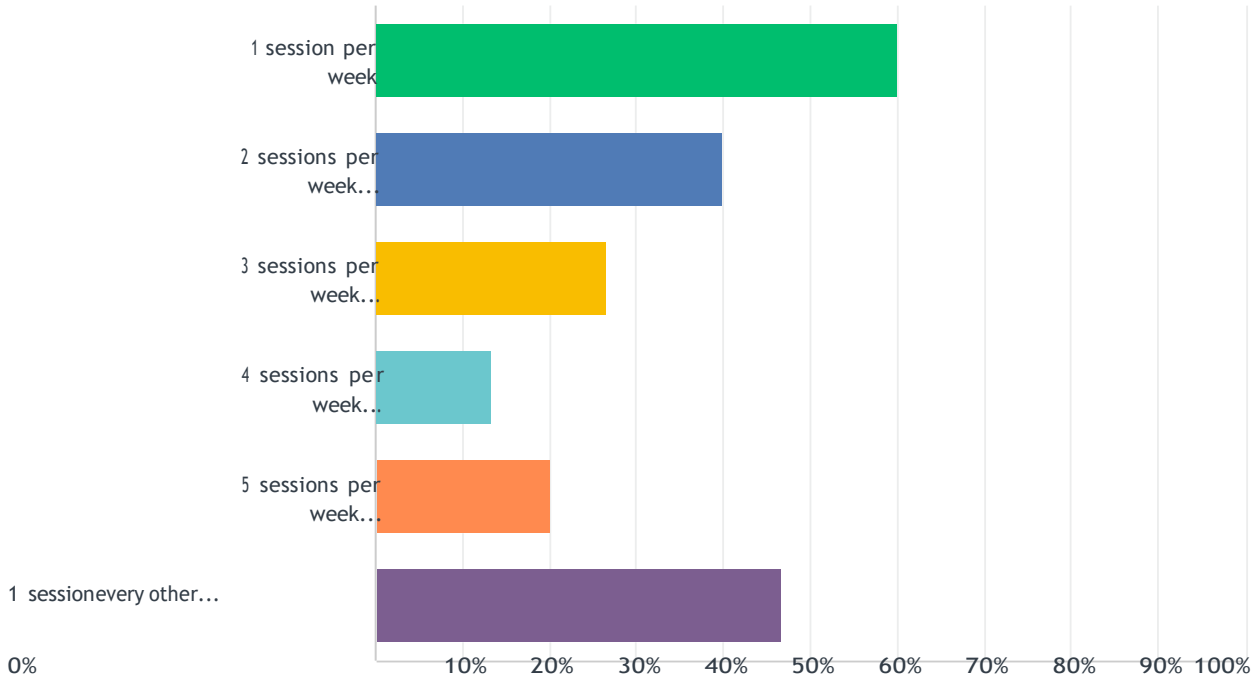
ANSWER CHOICES	RESPONSES	
Likely	53.33%	8
Unlikely	13.33%	2
Not sure	33.33%	5
TOTAL		15

#	PLEASE COMMENT HERE:	DATE
1	Scheduling is flexible	1/5/2021 4:09 PM
2	see above.	12/11/2020 11:27 AM
3	Most likely with tuition reimbursement.	12/10/2020 8:03 PM
4	Again if there are no conflicts with scheduling (there are times when we have vessel on the weekend) I don't see this being an issue.	12/8/2020 2:08 PM
5	if it would be required to pay overtime, no	12/7/2020 3:55 PM
6	I have never encountered that specific condition, but I think it would be considered at the managerial/division level to ensure the course work was accessible equitably.	12/7/2020 8:28 AM
7	Same response as above.	12/4/2020 2:01 PM
8	Same as the above.	12/4/2020 1:31 PM
9	N/A	12/3/2020 9:15 PM
10	Again, the company would support this but employee enthusiasm may not be high.	12/2/2020 7:25 AM
11	Yes, we would be willing to accommodate courses on Saturdays as long as the employees were available.	12/2/2020 6:51 AM

Q11 If sessions are held during work hours, what frequency could your workplace accomodate? Please note that for future programming, some class sessions may be longer in terms of hours.

Answered: 15 Skipped: 2

Final Exit Survey: Sustainable Freight Certificate



ANSWER CHOICES	RESPONSES	
1 session per week	60.00%	9
2 sessions per week (accelerated sessions)	40.00%	6
3 sessions per week (accelerated sessions)	26.67%	4
4 sessions per week (accelerated sessions)	13.33%	2
5 sessions per week (accelerated sessions)	20.00%	3
1 session every other week (2 sessions per month)	46.67%	7

Total Respondents: 15

#	PLEASE COMMENT HERE:	DATE
1	Wednesday - midweek - would be my choice as it is the slowest day of the week. For myself transportation seems like everyone needs their cargo to start the week and Friday is always a clean up day.	1/13/2021 12:06 AM
2	I think once a week for three hours (the way it was done) is the most frequent a working person would be able to set aside work for a session.	12/11/2020 8:48 PM
3	I do not know if there's a maximum, but I have attend 3 day workshops before on topics related to my job.	12/11/2020 5:59 PM
4	All of the above are potentially feasible.	12/11/2020 11:27 AM
5	In some instances the program might be better received if the class sessions were compressed into as few as days as possible but the challenge will be for the students to adsorb so much information in such a short period of time. Also, the home work is beneficial and the course ending Capstone presentation is a fantastic learning opportunity in many levels.	12/10/2020 8:03 PM
6	I personally had issues with sessions during working hours, attempting to concentrate was difficult especially at the warehouse when I have no stop traffic, i.e. email, phone calls inbound and outbound truck and containers.	12/8/2020 2:08 PM
7	As with all organizations, there is an implied benefit out for cost (time) in. The goal at any level	12/7/2020 8:28 AM

Final Exit Survey: Sustainable Freight Certificate

of attendance would be to manage work load without placing undue burden on the attendee or their coworkers. I believe the 1-2 session per week model would perform that function but am concerned about additional bandwidth being unavailable. As a caveat, a full week out - the 5 sessions model - may be attractive as a way to commit to a short term impact to work load.

8	Dispatchers receive many calls during the day, consequently, it's hard for them to focus at the end of the day. But recording the sessions was a great idea. Thank you	12/6/2020 11:58 AM
9	I think my workplace would like to consolidate the number of meetings that could occur per week.	12/4/2020 2:01 PM
10	I wouldn't do two. We're too busy.	12/4/2020 1:31 PM
11	N/A but personally 1 session a week is better	12/3/2020 9:15 PM
12	It depends on the total time required and delivery method. Online is limited to no more than 90 minutes	12/2/2020 5:04 PM
13	Anymore than once a week would be disruptive	12/2/2020 7:25 AM
14	We have a minimal staff and could only support courses during work hours a few times per week without disrupting the operations.	12/2/2020 6:51 AM

Q12 Are there any final comments you would like to add (in addition to your reflection paragraphs assignment)?

Answered: 12 Skipped: 5

#	RESPONSES	DATE
1	I appreciate the patience with my work. We are a small organization so some departments are only one person. COVID really impacted our internal staff. Seems like every week we are short staffed in all departments. Pardon my delay! Please invite me to future opportunities if available. I have been out of traditional school for some time so it was good to be in and around a learning environment. Thank you it was a wonderful experience that I would recommend without hesitation.	1/13/2021 12:06 AM
2	Congratulations on a very successful program! I really appreciated the opportunity to audit the classes and learn from other experts in freight. As previously discussed, I think this could be the backbone for a series of classes or an entire program and that it very well addresses knowledge and skills that are pertinent to jobs within the freight sector. Please do not hesitate to contact me with any further feedback or questions. Best, Dillon Miner	12/11/2020 5:59 PM
3	The broad range of participants in the course brought a very dynamic perspective to the curriculum. The instructors were top notch! I'm going to miss the Friday afternoon interactions.	12/10/2020 8:03 PM
4	None at this time.	12/8/2020 2:08 PM
5	As mentioned above, multiple groups focusing on business, equity, planning, engineering, and sustainability could benefit from the certification. Part of the gain comes from simply being exposed to the complexity of the systems in place, but the framework used (history, regulation, impacts, legal, management etc.) allows participants directly and indirectly associated with the industries to gain immediately useful skills. One of the biggest endorsements to this certification was that participants commented multiple times that they were using and benefitting from the previous weeks lectures! This speaks volumes of the instructors and participants both. Thank you for the opportunity to observe the beginning of what I hope will become an industry-wide certification.	12/7/2020 8:28 AM
6	It was great content. Hopefully, all participants could understand not only the language but also the purpose.	12/6/2020 11:58 AM
7	I enjoyed my time and this class greatly. Thank you to all those who put this together and allowing me to participate. Special thanks to the facilitators (Deanna & Eleni) and all the professors. -Loc	12/4/2020 2:01 PM

8	I really appreciated the knowledge of our course instructors and working with Deanna. I think this is a really valuable first step and you will continue to see overwhelming interest in a course like this.	12/4/2020 1:31 PM
9	No, it's all in the summary of recommendations I submitted.	12/3/2020 9:15 PM
10	suggest costing out a training	12/2/2020 5:04 PM
11	A very enjoyable experience. Session content was always interesting and relatable to my industry. However, sessions always seemed rushed, a lot of content to get through in a short time. I welcome student questions and conversation during the class sessions. However, one or two students consistently took up a disproportionate amount of class time with their questions and anecdotes. I found it frustrating that my learning time was being cut short because of their interruptions. Working groups with fellow students were highly beneficial, but it's also important to have the independent assignments.	12/2/2020 7:25 AM
12	I'm grateful to know that this program exists and there is some structure being taught for the upcoming changes in our industry. It takes some of the fear and mystery out of the new technologies and requirements.	12/2/2020 6:51 AM