

Appendix A.12

Program Effects Methodology

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List of Acronyms

AB	Assembly Bill
Caltrans	California Department of Transportation
CSRP	California State Rail Plan
CTP	California Transportation Plan
FRA	Federal Railroad Administration
GHG	Greenhouse Gas
HSR	California High-Speed Rail
R&R	Ridership and Revenue
RTP	Regional Transportation Plan
PTC	Positive Train Control
SCS	Sustainable Communities Strategy
TCIF	Trade Corridors Improvement Fund
TREDIS	Transportation Economic Development Impact System
UC	University of California
VMT	Vehicle Miles Traveled

1.0 Introduction

The program effects analysis will guide content development for California State Rail Plan (CSRP) Chapter 6.2. The project team expects that the program effects analysis will include both quantitative and qualitative elements analyzed at state and regional levels. Should substantial changes to the described methods be required to implement the approach or meet the Scope of Work, the AECOM team will discuss the circumstances with Caltrans and document the final methodology in the Task 7 Procedural Manual.

The consultant team's overall program effects approach builds upon techniques used in the 2013 CSRP. The team will update the prior information to reflect the 2018 CSRP Vision and new analysis results. We will also expand topical coverage to address all Federal Rail Administration (FRA) and Assembly Bill (AB) 528 requirements. Table 1 illustrates where our proposed methods for addressing each AB 528 and FRA requirement can be found in this methodology memorandum.

We recommend analyzing and reporting these effects at the regional and/or system level for both the 4-year program and 20-year vision. Unlike highway project analysis, it is very difficult to isolate the effects of most individual rail capital projects or services. This difficulty stems from rail scheduling and dispatching's strong performance influence, and the substantially different performance characteristics of passenger and freight rail consists. In many cases, an individual capital project may not create a meaningful performance effect unless it is accompanied by a service change (which itself often requires additional capital projects to be feasible).

The 2013 CSRP included qualitative analyses of climate change and sea level rise, land use and community effects, and other benefits and policy support. The consultant team proposes to refresh this information using new or newly updated Regional Transportation Plan (RTP)/Sustainable Communities Strategy (SCS) plans approved since 2013, ongoing climate adaptation studies, California High-Speed Rail (HSR) environmental studies, and regional goods movement studies. We also recommend giving special attention to AB 528's requirement to discuss freight-related environmental impacts including air quality, land use, and community impacts.

The quantitative and qualitative passenger and freight rail program effects analyses will rely largely upon ridership and revenue (R&R) and freight forecast results; the R&R forecasting methodology is described in Methodology Memorandum #5. As with the R&R forecasts, Network Integration Strategic Service Plan program effects will be based upon the final 2022, 2027, and 2040 Vision Scenario developed in the Network Integration Strategic Service Plan, as described in Methodology Memorandum #2.

Table 1 Program Effects Analysis Requirements

Statutory Reference	Requirement	Methodology Memorandum Section(s)
Cal. Code § 14036(b)(6)(A)	"A freight rail element that contains ... [e]nvironmental impacts that include air quality..."	6.0
Cal. Code § 14036(b)(6)(A)	"A freight rail element that contains ... [e]nvironmental impacts that include ..., land use, and community impacts."	7.0
FRA Guidance Section 5.4.1	"...the effects of the passenger and freight rail elements on... [t]he State's transportation system"	2.0
FRA Guidance Section 5.4.2 49 U.S.C. §§ 22705(b)(2)(A) and (B)	"...the effects of the passenger and freight rail elements on ... [p]ublic and private benefits that exist and are anticipated with the 4 year phase and full 20-year plan and the correlation between public funding contributions and the expected public benefits."	3.0 and 4.0
FRA Guidance Section 5.4.3 49 U.S.C. § 22705(b)(3)(B)	"...the effects of the passenger and freight rail elements on... [r]ail capacity and congestion by corridor."	See Methodology Memorandum #7
FRA Guidance Section 5.4.4 49 U.S.C. § 22705(b)(3)(C)	"...the effects of the passenger and freight rail elements on... [t]ransportation system capacity, congestion, safety, and resiliency including the individual and combined effects on local transit, highway, aviation, and maritime modes.	2.0
FRA Guidance Section 5.4.5 49 U.S.C. §§ 22705(b)(3)(E) and (F)	"...the effects of the passenger and freight rail elements on... {e}nvironmental, economic, and employment conditions..."	3.0, 4.0, 6.0, and 7.0
FRA Guidance Section 5.4.5	"...the effects of the passenger and freight rail elements on... energy consumption and greenhouse gas emissions."	6.0

Statutory Reference	Requirement	Methodology Memorandum Section(s)
FRA Guidance Section 5.4.6 49 U.S.C. § 22705(b)(3)(D)	"...the effects of the passenger and freight rail elements on... [d]istribution of benefits to regions (regional balance)."	1.0
FRA Guidance Section 5.5.4, Passenger Element (49 U.S.C. § 22705(b)(2)(B))	"Describe the public and private economic benefits that exist and are anticipated with the 4 and 20-year plans and the correlation between public funding contributions and the expected public benefits."	3.0
FRA Guidance Section 5.6.2, Freight Element (49 U.S.C. § 22705(b)(2)(B))	"Describe the public and private economic effects that exist and are anticipated with the 4 and 20-year plans and the correlation between public funding contributions and the expected public benefits."	4.0

2.0 Transportation Performance Effects

The 2013 CSRP included a robust analysis of statewide and corridor-level transportation system effects. Chapter 10 of the 2013 Plan primarily used vehicle miles traveled (VMT) reduction resulting from the transfer of auto traffic to passenger rail to calculate passenger program effects. The project team will update this information, potentially at a more fine-grained level, using R&R forecasts developed for the 2018 CSRP. The R&R forecasting process will provide a tool for calculating the change in VMT and vehicle hours traveled, and modal diversion (for rail, highway and air travel) as passenger rail service is expanded.

Modal diversion from truck to rail is the primary effect relevant for freight rail programs. The economics and system performance characteristics of freight rail vs. trucking generally favor rail for specific commodities and long haul movements; the opportunities for diversion from trucking are somewhat limited. However, changes in fuel costs and congestion levels could impact the distances at which rail and truck are more competitive. The 2018 CSRP will examine, at the corridor level, the degree to which rail shares by O-D pair and commodity type are comparable to both statewide and national averages to identify opportunities where improving service levels can result in modal diversion. The project team will develop simple estimates of

potential reductions in truck VMT as appropriate. Additionally, some regional plans, such as the San Joaquin Valley and Southern California Association of Governments, and prior Trade Corridors Improvement Fund (TCIF) project analyses have included specific corridor estimates. The team will utilize these to determine potential modal diversion.

3.0 Passenger Rail Economic Effects

The project team can readily quantify economic effects for the 2018 CSRP despite not including this analysis in the 2013 CSRP. Both the California Transportation Plan (CTP) 2040 and HSR project included economic analyses. We will first look to adapt these existing results for the 2018 CSRP. If additional economic modeling analysis is warranted, the project team suggests considering the Transportation Economic Development Impact System (TREDIS) because this model was used for the CTP 2040 and Caltrans may be procuring a new statewide TREDIS license. The HSR growth inducement analysis also used this TREDIS model, and Cambridge Systematics developed postprocessors to automate transfer of HSR R&R model results into the TREDIS model.

Additionally, researchers at the University of California (UC) at Berkeley and Irvine will be conducting the Rail Economic Study as part of a Task Order under Agreement 65A0529. This task will consider, qualitatively, how the State's demographic and economic trends may change rail's future. Factors to be considered include population and income growth in rail corridors, changes in the State's industrial mix, impacts of the aging of the population, and changes in fuel prices. The researchers will use propensity matching (i.e. comparing population/employment in places where rail service continued vs. in areas where rail service was discontinued) at the county level to examine passenger rail provision's impacts on development. The team will also investigate the enhanced value of real estate near rail stations. Methods developed in the Berkeley research project may also be used for Chapter 6.2.

4.0 Freight Rail Economic Effects

The consultant team proposes enhancing the qualitative freight benefits analysis by drawing heavily, where possible, from benefits analyses conducted for the TCIF program and RTP/SCS projects. Some local-level benefits analyses may be transferrable to the State level for a program-level benefits assessment. For example, the Southern California Association of Governments Comprehensive Regional Goods Movement Study analyzed the benefits of mainline track improvements using the REMI model. This analysis estimated the capacity limitations of current track, the amount of international trade cargo that would not be

accommodated if additional capacity was not added, and losses to the state and regional economy (by assuming this cargo would need to divert to other ports).

The project team can use similar approaches to estimate potential rail-to-truck cargo diversion if investments are not made, how much this might cost shippers, and what additional highway maintenance costs would be incurred. UC researchers may also incorporate these approaches for freight rail in the Rail Economic Study, although without the use of economic impact models (basing more on corridor case studies). The CSRP team will work with UC researchers to determine which if any of these approaches can be incorporated in their work and transferred, as appropriate, to the program effects analysis for the 2018 CSRP. We will also consider other methods for freight rail analysis developed for the UC study in preparing the economic program effects of freight rail.

5.0 Safety Effects

While the CSRP will detail rail transportation's role in supporting and growing the state economy, it will also examine potential adverse impacts to adjacent communities. As traffic volumes grow, it is likely that community concerns—such as safety, noise, and air quality—will also grow.

While the study team does not plan to conduct an independent safety analysis, we will discuss the programs that are intended to support rail safety in California. These programs include Positive Train Control (PTC) and rail grade safety. Our examination of safety program effects will provide an update on PTC implementation status and requirements authorized by Congress in December 2015. We will present, in summary fashion, PTC implementation status in California. We will also discuss current policies and efforts aimed at improving rail grade safety, and will include historical safety information in the CSRP chapters relating to the Passenger Rail Investment and Improvement Act of 2008 (Section 207), and AB 528.

There are also potential safety effects specifically associated with freight rail. Chapter 1.2 of the CSRP will discuss safety impacts including the benefit of freight rail compared to freight on public highways. The study team will build this analysis off the aforementioned modal diversion analysis. We will also discuss freight railroads' PTC implementation on all lines handling regularly scheduled passenger trains and/or toxic inhalation hazard materials, as mandated by the Rail Safety Improvement Act of 2008.

6.0 Air and Noise Emission Effects

While freight and passenger rail projects can bring significant positive environmental and economic benefits to the State, they can also negatively impact communities and the natural environment. The most common effects include contribution to air pollution and greenhouse gas (GHG) emissions and physical impacts such as noise pollution.

The air quality and GHG analysis, which will be led by Dr. Thomas Kear, is detailed in Methodology Memorandum #8.

Noise pollution, which is described by the U.S. Environmental Protection Agency as “unwanted or disturbing sound,” can contribute to significant public health impacts. Train horns must be utilized, by law, as trains approach at-grade crossings to warn motorists and pedestrians. There are currently 43 such quiet zone locations in California.¹ Grade separations also provide noise pollution co-benefits in addition to safety improvements, which we plan to examine. Our noise pollution program effects analysis will also include a qualitative discussion of actions intended to address rail-related noise. We will reference regional plans and possibly the California Air Resources Board’s Sustainable Freight Plan for any noise-related information.

7.0 Community and Other Effects

The 2013 CSRP included qualitative analyses of climate change and sea level rise, land use and community effects, and other benefits and policy support. We propose to refresh this information using new or newly updated RTP/SCS plans approved since 2013, ongoing climate adaptation studies, HSR environmental studies, other Caltrans modal plans, the Sustainable Freight Action Plan, and regional goods movement studies.

Many land use and community effects are indirect and cumulative. For example, passenger rail ridership increases may generate demand for compact, mixed-use development near intercity passenger rail stations. Safe and efficient passenger rail services that are well-integrated with local transportation options may also contribute to community and greening benefits such as improved community livability, land use, safety, and public health. At the same time, increased rail operations can affect neighborhoods near rail lines, yards, and passenger stations. The study team plans to discuss issues around grade crossing impacts, Quiet Zones, and the impacts of land use assumptions associated with the new regional RTP/SCS plans. Some regional goods movement plans have recently raised these issues, but these may not have received sufficient

¹ Source: https://www.fra.dot.gov/eLib/Find#p1_z5_kquiet%20zone%20locations.

attention in the 2013 CSRP. We can address these issues in the 2018 CSRP by drawing heavily on such regional studies. We will also conduct a qualitative assessment of how, if at all, the CSRP might support land use visions in the latest RTP/SCS plans. This will include reviewing each SCS/RTP to identify opportunities for synergy between the passenger rail program and land use visions, such as plans for compact, mixed-use, transit-oriented development.

The UC Berkeley Rail Economic Study team at UC Berkeley is also qualitatively assessing real estate values near rail stations. The assessment may illuminate passenger rail's influence on real estate prices and development potential near stations, which is an important community effect that was minimally explored in the 2013 CSRP. The consultant team proposes incorporating the UC Berkeley findings, where possible, into the 2018 CSRP's community effects analysis.

