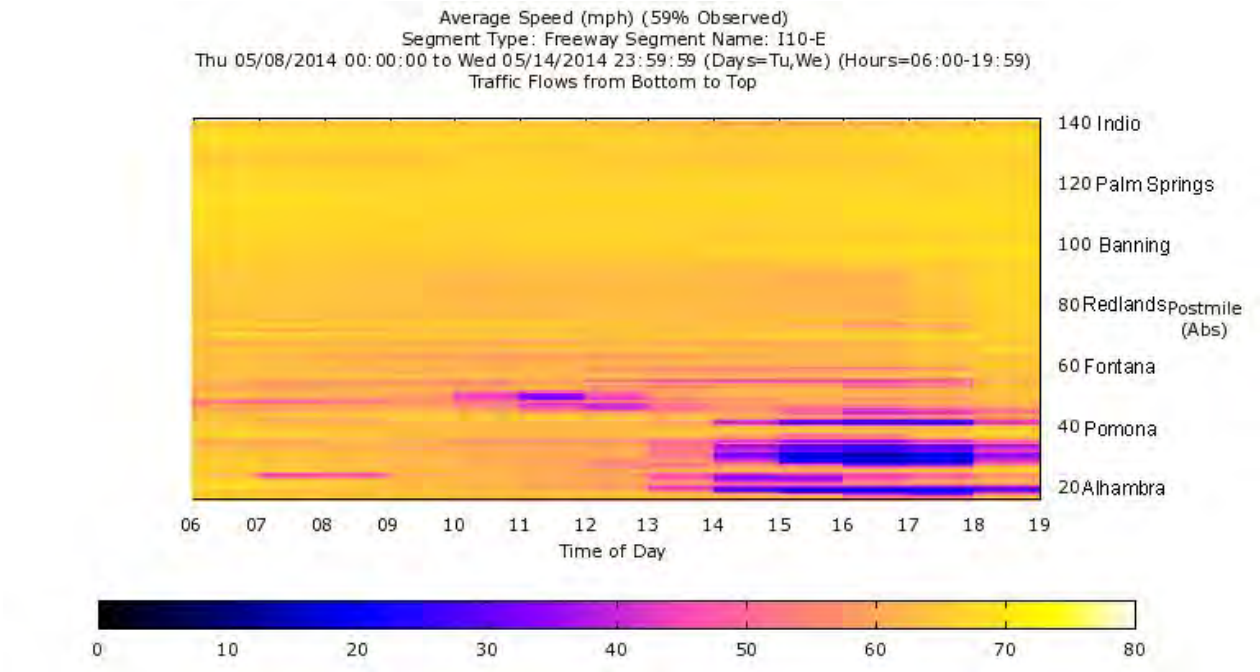
APPENDIX A: CONGESTION AND TRAVEL TIME MAPPING

Regional Highway Congestion

These figures are “heat maps” which denote the average observed speeds in the eastbound direction along the corridor, as reported by PeMS, and provide a visual representation of where congestion occurs, how slowly the traffic is moving, and how long the congestion lasts (purple, blue, and black shading indicate slower speeds and increasing congestion). Hours of the day are shown across the bottom, from 6 AM to 7 PM. Geographic locations are shown vertically, with Alhambra at the bottom and Indio at the top for figures showing eastbound traffic and with Indio at the bottom and Alhambra at the top for figure showing westbound traffic. The colors represent travel speeds as indicated in the scale at the bottom, with black and blue colors showing where and when congestion occurs.

Figure 1 shows that on a normal weekday eastbound congestion occurs between the hours of 2:00 and 7:00 PM (14 and 17 in the horizontal axis), mostly in several areas between Alhambra and Pomona (vertical axis).

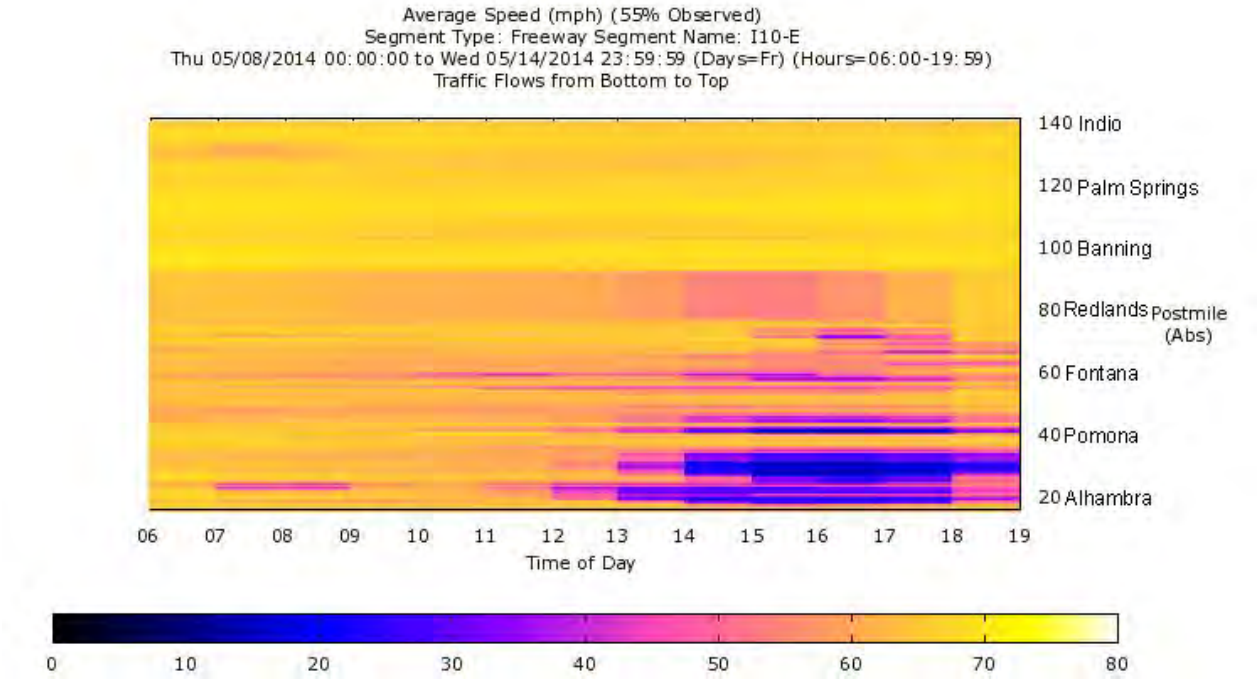
Figure 1. Average Observed Speeds for Eastbound I-10 on a Normal Weekday



Source: PeMS, Caltrans, Accessed: 10/28/2014, Data collected for 5/13/2014-5/14/2014

Figure 2 shows a similar congestion pattern for a normal Friday, but with a longer duration of slower speeds in the congested areas and more areas of the Corridor affected by reduced speeds. It is noteworthy that the eastern half of the corridor has minimal areas with reduced speeds throughout the day on typical weekdays and Fridays.

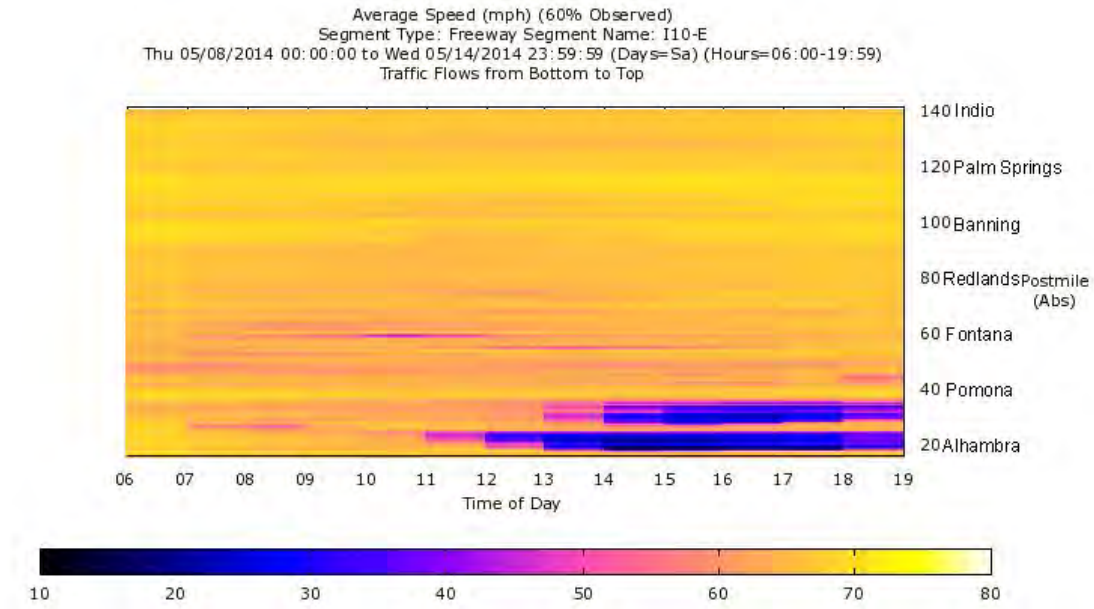
Figure 2. Average Observed Speeds for Eastbound I-10 on a Normal Friday



Source: PeMS, Caltrans, Accessed: 10/28/2014, Data collected for 5/9/2014

Figure 3 shows the congestion pattern for a normal Saturday, which indicates several areas of congestion between Alhambra and Pomona throughout much of the afternoon, but little congestion in the rest of the Corridor.

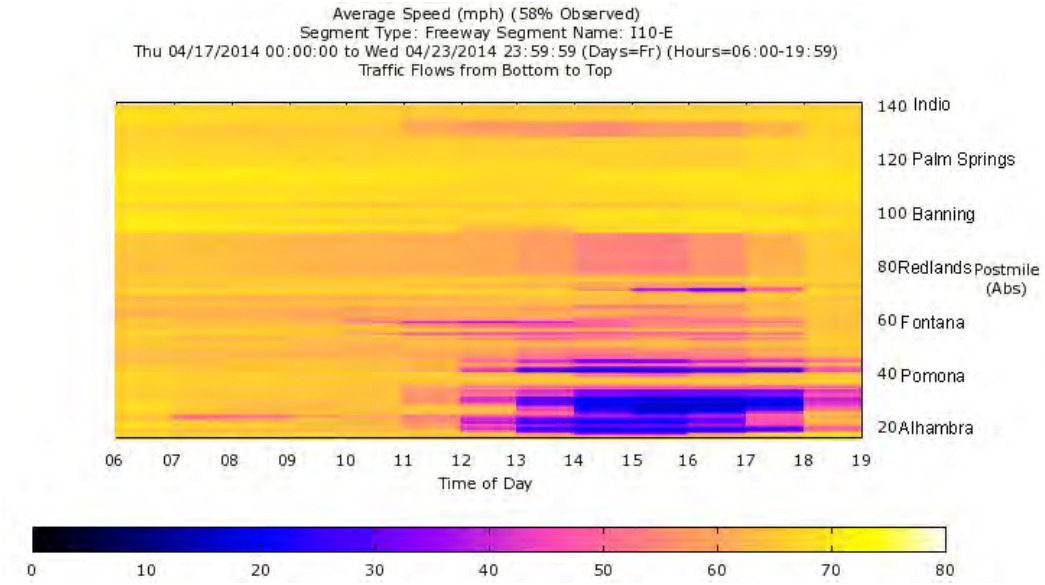
Figure 3. Average Observed Speeds for Eastbound I-10 on a Normal Saturday



Source: PeMS, Caltrans, Accessed: 10/28/2014, Data collected for 5/10/2014

For the sake of comparing typical conditions with worst-case conditions, congestion charts were obtained from PeMS for the peak weekend that in 2014 included Easter and the Coachella Festival. **Figure 4** shows I-10 eastbound speeds on the Friday leading into the peak weekend, and shows a pattern of congestion similar to the normal Friday.

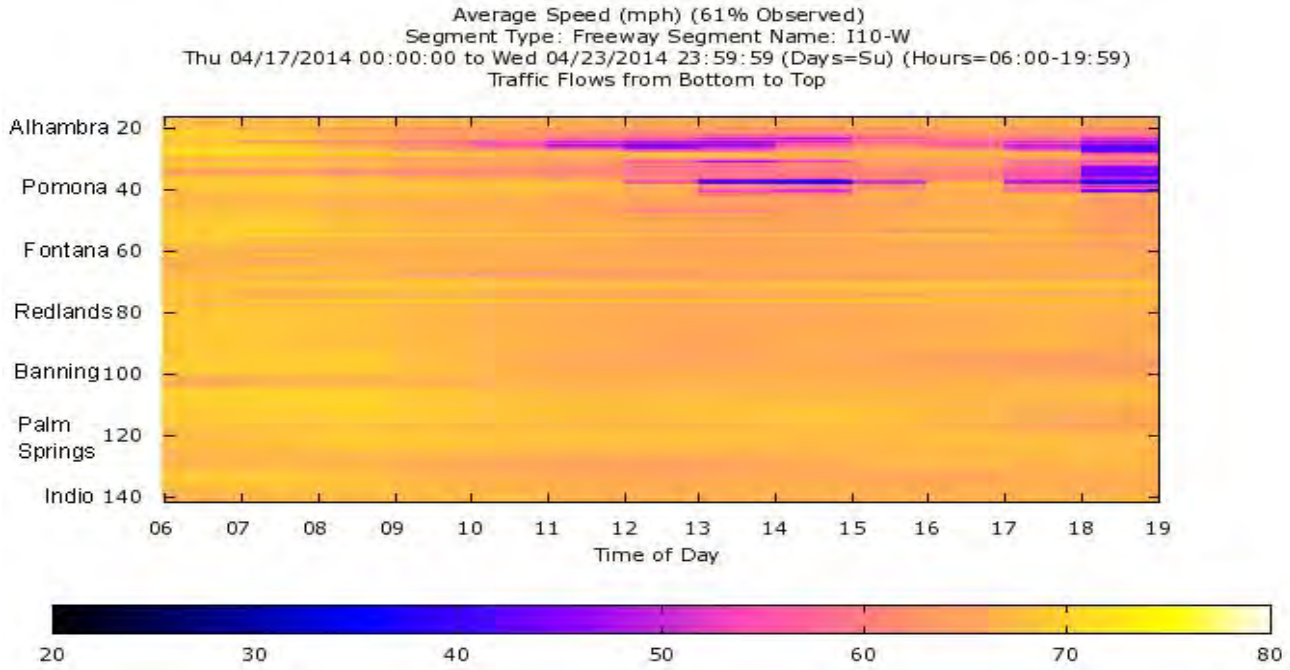
Figure 4. Average Observed Speeds for Eastbound I-10 on the Peak Friday



Source: PeMS, Caltrans, Accessed: 10/28/2014, Data collected for 4/18/2014

Figure 5 shows westbound I-10 travel speeds on the Sunday of the peak weekend. The only congestion on the peak Sunday occurred during the midday and early evening hours in the area between Pomona and Alhambra.

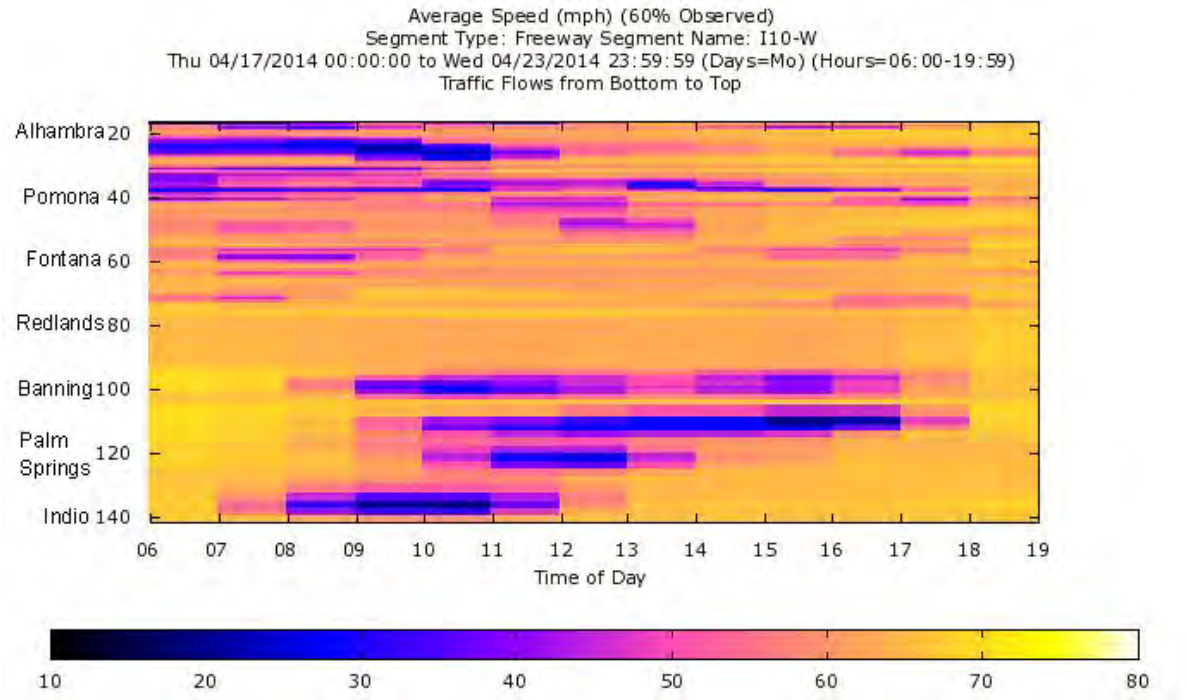
Figure 5. Average Observed Speeds for Westbound I-10 on the Peak Weekend Sunday



Source: PeMS, Caltrans, Accessed: 10/28/2014, Data collected for 4/20/2014

Figure 6 shows westbound I-10 travel speeds on the Monday following the Coachella Festival. Traffic is particularly congested between Indio and Banning through most of the morning and afternoon, with congestion present from 9:00 am to 6:00 pm. In the western half of the corridor, westbound I-10 exhibits typical commute congestion between Pomona and Alhambra in the morning hours, as well as periodic slowing in several areas at different times throughout the afternoon.

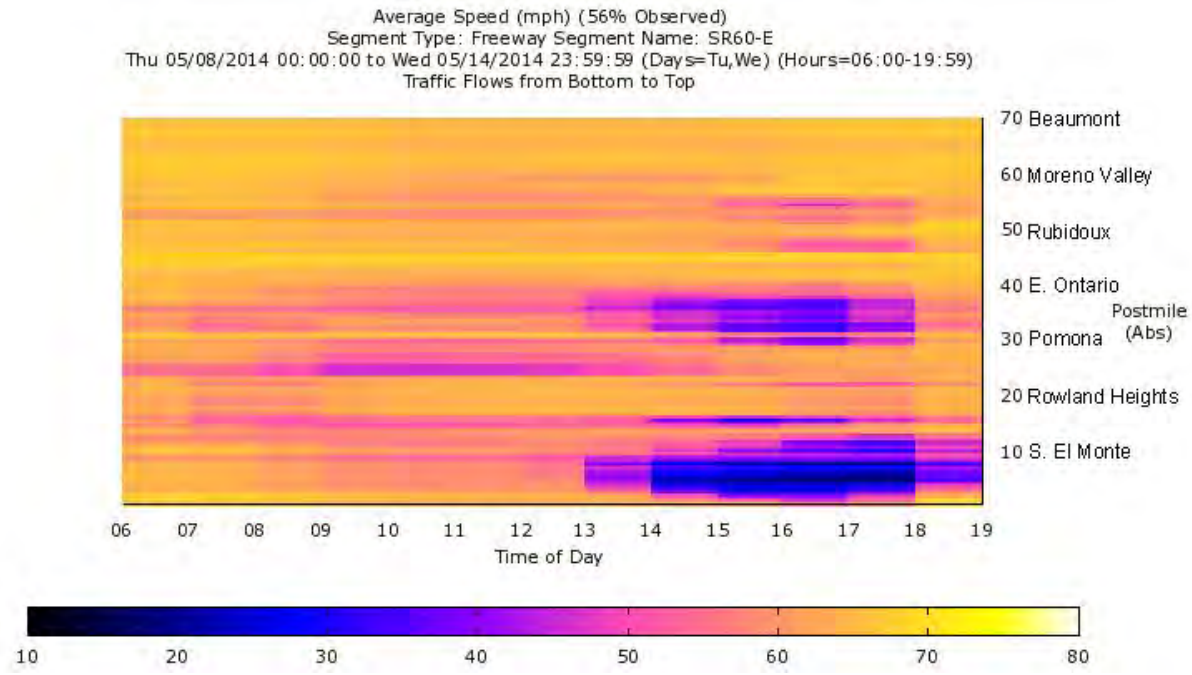
Figure 6. Average Observed Speeds for Westbound I-10 on the Monday following the Peak Weekend



Source: PeMS, Caltrans, Accessed: 10/28/2014, Data collected for 4/21/2014

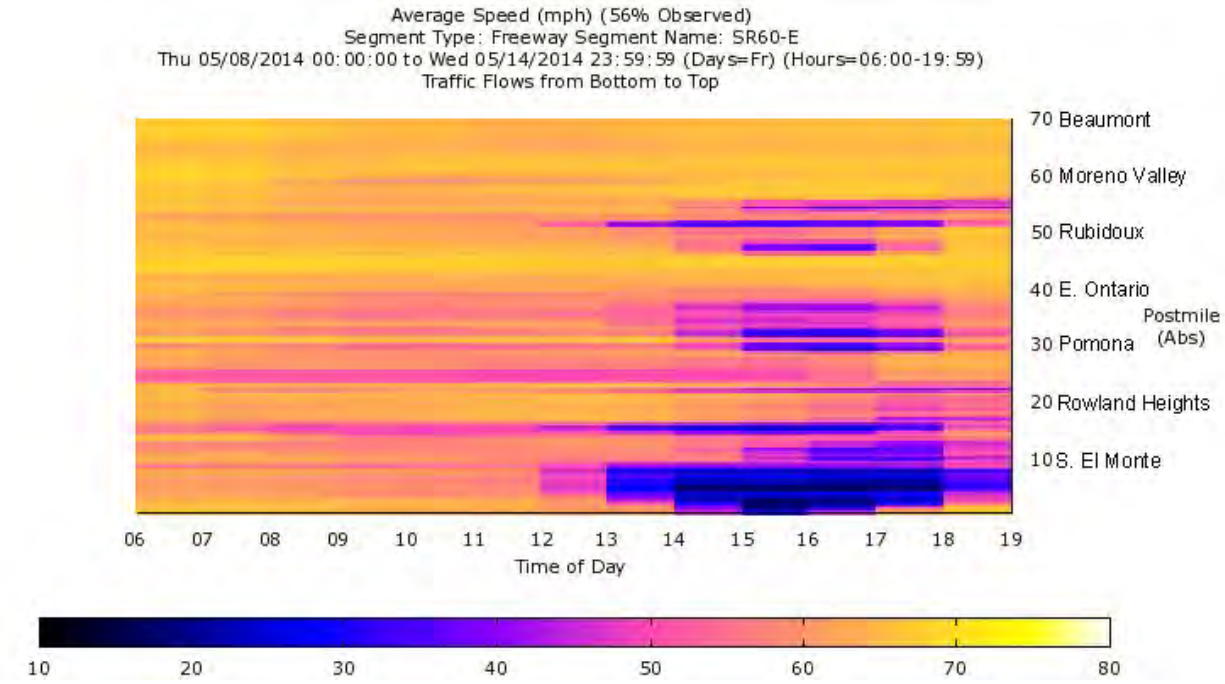
Figures 7 through **10** are similar to the previous figures, but portray traffic congestion along the corridor's other key highways – SR-60 and SR-91. Much of the SR-60 corridor is congested from East Los Angeles to Rowland Heights, from Pomona to East Ontario, and from Rubidoux to Moreno Valley on normal weekday afternoons. On normal Fridays the congestion through these areas intensifies. The eastbound SR-91 is congested for much of its length from Anaheim to Riverside during most of the afternoon on normal weekdays and Fridays.

Figure 7. Average Observed Speeds for Eastbound SR-60 on a Normal Weekday



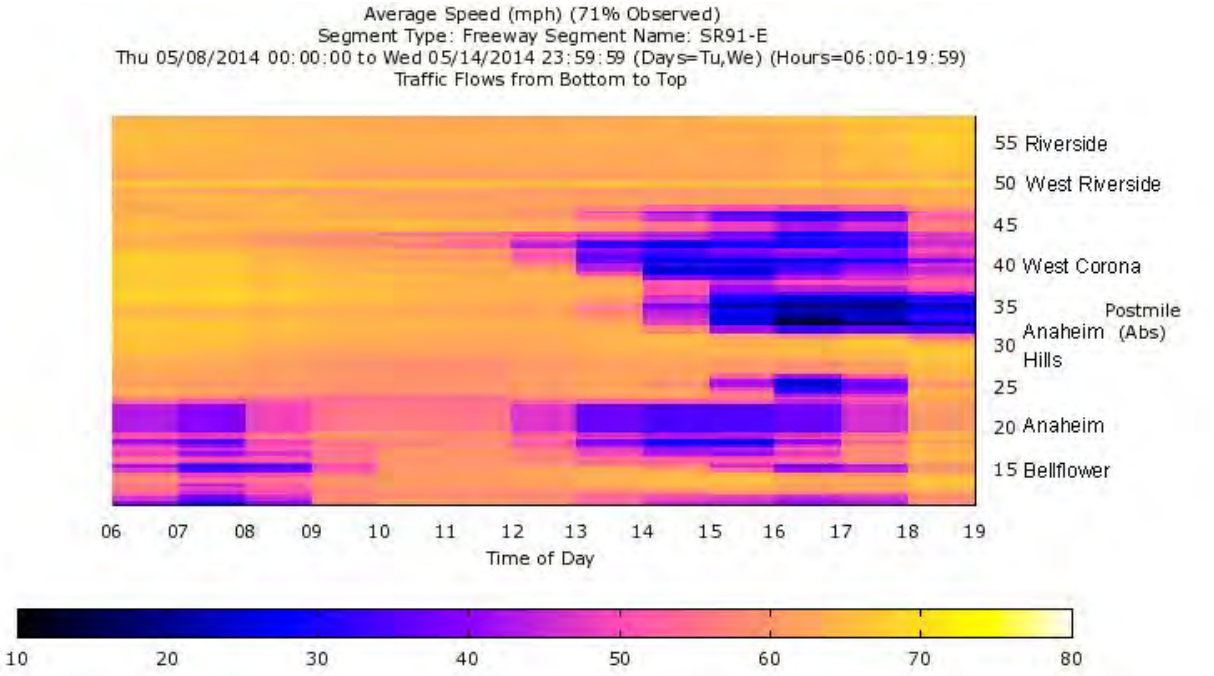
Source: PeMS, Caltrans, Accessed: 10/28/2014, Data collected for 5/13/2014-5/14/2014

Figure 8. Average Observed Speeds for Eastbound SR-60 on a Normal Friday



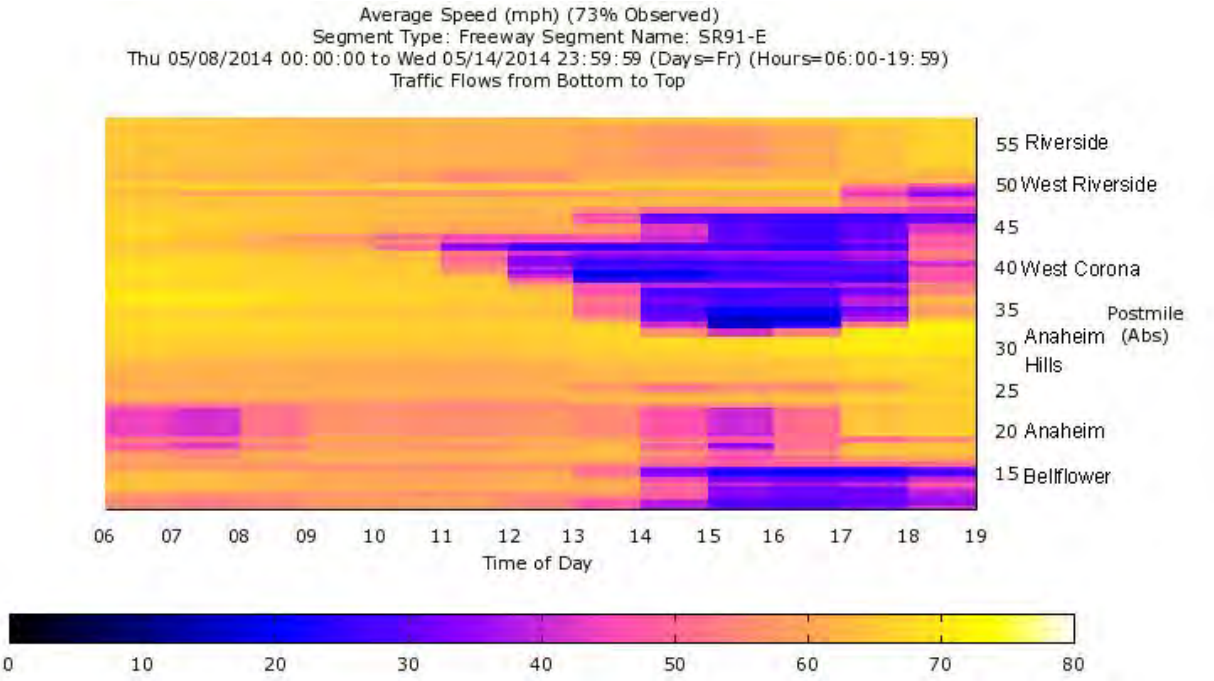
Source: PeMS, Caltrans, Accessed: 10/28/2014, Data collected for 5/9/2014

Figure 9. Average Observed Speeds for Eastbound SR-91 on a Normal Weekday



Source: PeMS, Caltrans, Accessed: 10/28/2014, Data collected for 5/13/2014-5/14/2014

Figure 10. Average Observed Speeds for Eastbound SR-91 on a Normal Friday



Source: PeMS, Caltrans, Accessed: 10/28/2014, Data collected for 5/9/2014

APPENDIX B: OUTREACH PLAN AND SURVEY RESULTS

RCTC

STAKEHOLDER AND PUBLIC OUTREACH PLAN

Coachella Valley – San Gorgonio Pass Corridor Rail Service Development Plan

Presented to the Riverside County Transportation Commission

By HDR, Inc.

September 2014

The Riverside County Transportation Commission (RCTC) values the experience and opinions of stakeholders and the public in the preparation of a Service Development Plan for the Coachella Valley-San Gorgonio Pass Corridor Rail Service. To achieve a successful decision making process for the proposed new rail corridor, RCTC must reach out to engage stakeholders, including elected officials, agencies, railroads, and other key groups, along with the general public, in and around the rail corridor.

This Stakeholder and Public Outreach Plan will serve as a blueprint for RCTC to engage community members during this current phase, which will last 12 months. Outreach activities will be integrated with the technical work program to provide information and incorporate ideas and feedback. The input that is received will facilitate fully informed decisions by RCTC Commissioners at key decision points.

This planning effort will have two distinct geographic areas and approach. For areas in Riverside County the team will work closely with stakeholders including cities, transportation providers, and other local stakeholders. For surrounding counties within the study area the team will work directly and exclusively with the transportation planning agencies and will not engage in outreach to the public or other stakeholders.

STAKEHOLDER AND PUBLIC OUTREACH ACTIVITIES

CONTACT DATABASE

In order to ensure that information is communicated to the appropriate stakeholders, a contact database will be prepared and will be comprised of elected officials, public agencies, tribal representatives, railroads, transit operators, convention/tourism groups, economic partnership organizations and other interested parties. A draft will be provided for review in summer 2014. The database will be updated at regular intervals, such as after meetings or inquiries.

Deliverables:

- Draft contact database for planning team review
- Finalize contact database and provide to the team
- Maintain and update contact database for the duration of the study and provide updated copies to the team at periodic intervals

WEBSITE

In order to ensure that the most current information is shared with the public, RCTC's existing webpages will be updated to provide information about the Service Development Plan, process, purpose and need, and timeline. The webpages will be housed under RCTC's existing website, www.rctc.org, within the "Planning" section. The pages also will include historical information about past studies, fact sheet, announcements about public meetings, and a link to make comments and to register to receive study updates. All inquiries received through the website will be researched, draft responses will be drafted

for RCTC and HDR approval, responses will be sent in a timely manner and inquiries will be added to the inquiry/response log. Links to the webpages will be requested from partnering agencies.

Deliverables:

- Update the existing webpages to reflect the current planning phase
- Maintain webpages to include the latest planning information throughout the Service Development Plan
- Research, draft, obtain approval and respond to inquiries, and document these inquiries and responses in a log
- Contact partnering agencies to request that links be established from partnering agency websites

Fact Sheet and FAQs

The existing fact sheet will be revised to reflect ongoing planning updates to ensure that stakeholders are aware of status and progress of the study. A Spanish version of the fact sheet also will be developed. A set of Frequently Asked Questions (in English and Spanish) also will be created, with RCTC's positions on various issues. Both the English and Spanish versions of these publications will be posted to the webpages and used with stakeholder/public communications. Copies also will be provided to partner agencies, corridor cities and key stakeholders for distribution.

Deliverables:

- Review and update fact sheet at periodic intervals to reflect the current status of the study
- Develop a set of Frequently Asked Questions
- Translate and prepare Spanish versions of the fact sheet and FAQs and post to webpages

Social Media Campaign

A Facebook page will be developed specifically for this study and RCTC's existing Twitter account also will be used to inform and engage stakeholders and the public during this phase of the study. The focus of the social media campaign will be to provide information and update on the study effort. These outreach tools will allow RCTC to reach a wider audience than traditional communication methods. Approved social media messages also will be communicated to partner agencies and stakeholders to encourage them to promote the study status via their social media.

Deliverables:

- Create Facebook page for the study and develop followers through email blasts, collateral materials, websites, agency/legislator email blasts and website links, other stakeholder Facebook accounts, and links between RCTC's Twitter account and this Facebook page
- Schedule social media posts to provide updates on the status of the study
- Research and respond to posted inquiries to convey or clarify RCTC's position on issues related to the study
- Provide information to technical team about any trending topics

- Provide approved social media messaged to partner agencies and encourage posting to their social media sites
- Monitor Facebook activity and provide report of analytics

Support for Quarterly Technical Advisory Committee Meetings

Each quarter or at key milestones, the team will convene a meeting of project stakeholders, as identified on page 5. Meetings may be in-person or via conference call. An agenda and summary of each meeting will be prepared and provided to the team. The summaries will serve to document next steps in the study development process. Meeting participation will be logged in the stakeholder database and a report of participants provided to the technical team.

Deliverables:

- Convene and attend quarterly meetings
- Prepare meeting agendas and summaries and provide to team
- Log TAC attendance and provide summary of participation to team

Support for Stakeholder Briefings

Up to 20 stakeholder briefings will be scheduled, and a summary of each meeting will be prepared. The briefings will serve to inform stakeholders of the status of the study and obtain their input and advice on what best serves their community, agency or region. The briefings also will serve as an opportunity for stakeholders to suggest preferred alignments and station locations. A record of these briefings will be logged in the stakeholder database and a report of participants will be provided to the technical team.

Deliverables:

- Schedule and attend stakeholder briefings
- Prepare meeting summaries and provide to team
- Log briefing participants and provide summary to team

Public Meetings and Webinar

Two public meetings will be coordinated in Riverside County along the study corridor. One of the meetings will include a webinar with video streaming online for full accessibility by the public, including displays, presentations and online discussion. The meetings will be structured using a traditional “open house” format to allow visitors the opportunity to view proposed corridors/alternatives and to speak one-on-one with team members. Public input will be documented electronically via iPad kiosks or on written comment cards. A meeting summary, noting key themes and responses will be drafted and provided to the team after each meeting.

Public meeting support will be provided by the public outreach team, including research of meeting venues, coordination of dates and times with the team, organization of facility details (including equipment and insurance, if applicable), meeting notification, set-up, materials (sign-in sheets,

comment cards and signage), photography, refreshments and preparation of summary reports. Meeting materials will be provided in English and Spanish; a staff member will be dedicated to assist Spanish speakers, as needed.

One of the meetings will include a webinar for online participation. A live video will be produced and streamed from the meeting with real-time input through a weblink, social media links (Facebook, Twitter) and a chat feature, which will be included on all meeting notices. Webinar participants will receive the same information and equal opportunity to participate as those who attend the meetings in person. After the meeting, the live broadcast recording will be archived and made available.

Deliverables:

- Coordinate venue and secure insurance
- Prepare/conduct meeting notification
- Develop sign-in sheets, comment cards, directional signage, photographs, refreshments and summary reports
- Conduct concurrent webinar with live broadcast recording for one meeting
- Draft and distribute meeting summaries

AGENCY OUTREACH SUMMARY

PARTNERS AND METHODS OF ENGAGEMENT	Monthly Mgmt. Meetings	Quarterly TAC Meetings	In-Person Meetings	Periodic Conference Calls	Periodic Written Updates
	Weekly call & monthly meetings	Quarterly or at key milestones	2x, first meeting prior to TAC	Quarterly, or as needed	Monthly or quarterly
AGENCY PARTNERS					
RCTC (Lead)	X	X	X	X	
CVAG	X	X	X		
SANBAG		X	X		X
Metro		X	X		X
OCTA		X	X		X
SCRRA		X			
SCAG		X			
Caltrans, District 7		X			
Caltrans, District 8		X			
County of Riverside		X			
City of Riverside		X			
City of Palm Springs		X			
City of Rancho Mirage		X			
City of Indio		X			
FEDERAL/STATE PARTNERS					
FRA		X		X	
CalSTA		X	X	X	
CT Div of Rail		X	X	X	
RAIL/TRANSIT PARTNERS					
LOSSAN*		X			X
RTA		X			X
Pass Transit		X			X
Omnitrans		X			X
SunLine		X	X		
TRIBAL PARTNERS					
Morongo BMI		X	X		
Cabazon BMI		X	X		
Agua Caliente BCI		X	X		

* Staffed by OCTA

ELECTED OFFICIALS OUTREACH SUMMARY

PARTICIPANTS AND METHODS OF ENGAGEMENT	Key Decision Making	Ad Hoc Policy Committee Meetings	In-Person Consultations	Periodic Status Updates to be Provided by RCTC Staff
	At key milestones	Every other month, starting Nov.	Begin scheduling in Sept./Oct.	2x, Begin in fall
RCTC Commission	X	X		X
CVAG Board				X
SunLine Board				X
RTA Board				X
Corridor Mayors				X
Individual Elected Officials			X	X

RAILROAD OUTREACH SUMMARY

PARTICIPANTS AND METHODS OF ENGAGEMENT	Quarterly TAC Meetings	In-Person Consultations
	Quarterly or at key milestones	As needed
PARTICIPATING RAILROADS		
Union Pacific	X	X
Burlington Northern Santa Fe	X	X
Amtrak	X	X

OTHER STAKEHOLDER OUTREACH SUMMARY

PARTNERS AND METHODS OF ENGAGEMENT	In-Person Consultations	Website/ Social Media	Public Meetings/ Webinar	Fact Sheet Distribution	Member Survey?*
	1x, begin in August	Monthly updates	Spring 2015	Fall	Winter
ORGANIZATIONS					
Coachella Valley Economic Partnership	X	X	X	X	X

Inland Empire Economic Partnership	X	X	X	X	X
Rail Passenger Association of CA and NV		X	X	X	X
Train Riders Association of CA		X	X	X	X
Southwest Passenger Rail Association	X	X	X	X	X
Center for Community Action and EJ		X	X	X	X
Auto Club	X	X	X	X	X
Goldenvoice		X	X		X
Greater Palm Springs Convention and Visitors Bureau	X	X	X	X	X
Palm Springs Aerial Tramway		X	X	X	X

* Brief questionnaire to organizations for feedback on purpose and need or other topics

Summary of Public Meetings

February 23 and 26, 2015

Background/Meeting Notification

The Stakeholder and Public Outreach Plan for the Coachella Valley-San Gorgonio Pass Corridor Rail Service Study includes two public meetings to solicit feedback about the project Purpose and Need. One meeting was held Monday, February 23 at Banning City Hall; the second meeting was held Thursday, February 26 at the Coachella Valley Association of Governments offices in Palm Desert. The February 26 meeting included a webcast option.

A variety of communication methods were used to invite visitors to the meetings:

- Postcards mailed to the project database, with additional copies mailed to cities and partner agencies
- Postcards and reminders emailed to the project database and partner agencies
- Multiple Facebook postings; social media engagement with partner agencies and stakeholders
- Advertisements in five newspapers
- Press release sent to print and broadcast media
- Announcements on RCTC website and partner agency websites
- Announcements at RCTC Commission meeting, Ad Hoc Committee meeting, Technical Advisory Committee meeting

Meeting Participation

At both public meetings, visitors were asked to sign in at a registration table. The Banning meeting had 22 registrants, and the Palm Desert meeting had 75 registrants. Some of the meeting visitors opted not to sign in at the table. The webcast had 56 participants. As of April 3, there were 98 additional views of the webcast after the public meeting.

After the meetings, the visitor contact information was added to the database; 88 were new additions to the database.

Meeting Input – Verbal

During both meetings, project team members worked to engage visitors in meaningful discussions about their existing travel patterns and future rail service needs. Exhibits were placed around the perimeter of the meeting rooms to prompt discussion between the team members and visitors. The exhibits provided images of:

- Existing transit and rail connections
- Potential bus connections
- Possible routes for the new rail service. This exhibit also showed general “catchment areas” for future stations.

Banning Meeting Verbal Input

The following comments were made by Banning meeting visitors when they talked with project team members at the exhibits:

A Los Angeles resident noted that rail service would be ideal for his visits to casinos in Cabazon and Palm Springs. He said that current bus connections are not reliable. He recommended following the Alhambra Line, with a stop at Cal Poly, Pomona.
A Beaumont resident said he commutes four days per week to Pasadena. The trip is about an hour and a half if he leaves by 4 or 4:30 am and arrives in Los Angeles by 6 am to catch the Gold Line. He said he occasionally uses the CommuterLink bus service to San Bernardino. He would like an express bus service from the Pass area direct to Pasadena.
A Banning couple travel to Los Angeles County or Orange County 4-6 times per year for recreational trips. The have used Metrolink to go to Los Angeles County and Riverside County; they said they take the San Bernardino Line on

weekends. They would have liked to have rail service from the Pass to the Riverside County Courthouse, due to recent Jury Duty. They also would use the train to go to Palm Springs for tourism activities, but noted the need for a shuttle bus from the Palm Springs station, since it is not close to hotels. They said that Beaumont residents would not want to drive east to Cabazon to catch the train, since they would be half-way to Palm Springs by then. They also pointed out there are several large senior communities in Beaumont that could benefit from the rail service and that SunLine bus service takes too long. The rail service needs to be faster with fewer stops than a bus line. They enjoy traveling by train, because it is less stressful than driving, they can use internet service and sit at a table and talk.
A visitor said he travels frequently between the Pass and Los Angeles, but he noted the need for a stop at Ontario Airport and in Pomona.
A visitor said he travels between Indio and Los Angeles or Orange County on a regular basis. He said service between the Imperial Valley and Loma Linda would be his furthest east and west points, with a Sprinter-like car from Banning.
A visitor said she travels to Riverside and Orange County during the week and to Los Angeles on weekends. She drives during off-peak hours to avoid traffic.
A visitor said he goes to Riverside, Ontario, Indio and Orange County approximately two days each week by driving. He noted that a stop at ONT is critical for the rail service, plus stations in Loma Linda, Palm Springs and Indio to make the rail line viable. He said a Banning station is very important and that a Beaumont station would be too far to travel.
A visitor said that Amtrak service is too infrequent now on this line. Once service is established to the Coachella Valley, RCTC can focus on expanding service to Phoenix. He would consider taking an express bus to downtown Riverside to connect with Metrolink service to continue traveling west.
A visitor said that if Amtrak service were offered from the Pass to LAUS, he would consider continuing on to the Central Coast via Amtrak. He noted heavy traffic on Beaumont Avenue from travelers bound for Glamis; there also is heavy traffic on the 79.

Palm Desert Meeting Verbal Input

The following comments were made by Palm Desert meeting visitors when they talked with project team members at the exhibits:

SunLine express bus service is needed along Interstate 10.
A visitor said she travels to Los Angeles 3-4 times per year, but he would travel there more frequently, if rail service were available. Current travel is limited by lack of train stations in Coachella Valley. She would like more train access to the beach and to Los Angeles museums.
A visitor said he travels regularly to Los Angeles by driving. He would take the train, even if the train took an hour longer than driving; his drive is about three hours. He would use service to travel to the VA Hospital in Loma Linda and to museums in LA. Stations should be placed near major LA attractions.
A visitor suggested building a separate set of train tracks above the existing freight tracks to avoid having to share tracks or acquiring additional right of way. He noted that train stations and trains attract homeless encampments, so housing issues need to be addressed. Trains can connect low income residents with jobs, since not just the wealthy need transportation. He also noted that Hispanic outreach is needed; low income residents have difficulty attending meetings, since they are more likely to work at night. He also suggested holding a meeting closer to a train station or to low income areas in the future. He suggested double-tracking to improve operations and to have better integration between freight and passenger rail service. He recommended considering the use of clean technology, such as electric-powered locomotives, although he said this type of technology is costly and the price may exceed the life expectancy of the trains. RCTC must work to educate the public of the downside of not adding rail.
A visitor said that compared to other countries, the U.S. is far behind in passenger rail service. She asked how commuter rail will interact with freight rail and what will it cost to “buy time” on the freight rail tracks. This could make the cost prohibitive to riders. She asked if the CVR service would connect to a LA to Las Vegas train, to Phoenix or to Lancaster. She also asked if the Las Vegas High Speed Rail is still being studied and if it is considering Victorville as a station.
A visitor said he would use the train from Los Angeles to Palm Springs. A bus connection is needed to Palmdale. The Palm Desert station needs to be improved; there are problems from wind and sand. A good station is need for the Coachella Valley.
A visitor made note that freight rail is important to our economy, and care needs to be taken to avoid undue impacts

to the railroad. He suggested a separate rail line for passenger rail, but funding needs to be a combination of public and private sources, since passenger rail is for the public good. San Bernardino and Riverside need more connections for passenger rai, and a better connection is needed between Metrolink and Amtrak systems, with commerce interaction. The passenger rail service needs to be comfortable, include food, Wi-fi connections, and attractive for both leisure and commuter travelers. RCTC needs to start thinking about funding now, rather than wait until the EIR process. Improvements are needed with rail sidings and noise abatement.
A visitor said that the most feasible new route would be to have the Sunset Limited run to Anaheim and a new route to San Diego. Most Metrolink stations could accommodate Amtrak service.
Using existing Amtrak rails makes the most sense, said a visitor from La Quinta, who also envisioned how the service would expand job markets and help disadvantaged communities, such as Mecca. A theme park is being considered in Indio; tourists could get the same experience in the Coachella Valley as in Las Vegas.
A visitor asked if three stations would definitely be selected for the service. She also noted that bus service connections need to be considered.

Meeting Input – Surveys

During both meetings, written surveys were distributed to visitors to request input about their travel patterns and potential future use of rail and transit service. The survey results are provided separately.

Coachella Valley Rail TAC Survey Results

Survey Name: San Gorgornio Pass - Coachella Valley Rail Study Survey for Technical Advisory Committee
Response Status: Partial & Completed

1. Which agency/organization do you represent?

Responses (in order of submission)		
Riverside Transit Agency		
SunLine Transit Agency		
Morongo Band of Mission Indians		
CVR Project Team		
SCAG		
SCRRA		
OCTA/LOSSAN		
Riverside County Transportation Commission		
Morongo Band of Mission Indians		
Department of Transportation CALTRANS		
SCAG		
City of Riverside		
Agua Caliente Band of Cahuilla Indians		
Cathedral City		
City of Calimesa		
SANBAG		
SCRRA/Metrolink		
CVAG		
City of Rancho Mirage		
L.A. Metro		
Metrolink		
Total	21	
Skipped	2	

2. Did you personally participate in this week's TAC meeting (November 19)?

Answer Choices	Number of Response(s)	Responses
Yes	17	73.91%
No	6	26.09%
Total	23	100%
Skipped	0	

3. If you participated personally, how did you participate?

Answer Choices	Number of Response(s)	Responses
a. Attended at the SCAG Riverside office	8	42.11%
b. Attended via via videoconference at the SCAG Los Angeles Office	2	10.53%
c. Attended via videoconference at the SCAG Orange County office	0	0%
d. Attended via videoconference at the CVAG office	2	10.53%
e. Participated via conference call	7	36.84%
Total Responses	19	
Skipped	4	

4. If you didn't participate personally, why didn't you participate? (choose the best response)

Answer Choices	Number of Response(s)	Responses
a. Someone else from my agency participated	0	0%
b. I had conflict at that time	3	75%
c. I did not receive a meeting invitation	0	0%
d. Other (specify)	1	25%
Total	4	
Skipped	19	

Written Response for "Other"	Not aware that I am a member

5. As a member of the Coachella Valley Rail Technical Advisory Committee, how would you like to be involved? (check all that apply)

Answer Choices	Number of Response(s)	Responses
a. Take part in future TAC meetings	20	86.96%
b. Receive periodic status update reports	22	95.65%
c. Provide updates to my board or city council	10	43.48%
d. Attend a public meeting	9	39.13%
e. Forward project information to local stakeholders	7	30.43%
f. Give feedback about draft Purpose and Need	17	73.91%
g. Give input on alternatives to be studied	20	86.96%
h. Give feedback on alternatives analysis results	19	82.61%
i. Other	2	9%
Total	23	
Skipped	0	

6. Rate your level of interest in each area of the study from 1-10 (1=low, 10=high)

	1	2	3	4	5	6	7	8	9	10	Total	Rating
a. Market Analysis	0	0	2	1	0	1	1	1	9	8		
	0.00%	0.00%	8.70%	4.35%	0.00%	4.35%	4.35%	4.35%	39.13%	34.78%	23	8.35
b. Purpose of Need Statement	0	0	0	1	2	2	4	2	1	11		
	0.00%	0.00%	0.00%	4.35%	8.70%	8.70%	17.39%	8.70%	4.35%	47.83%	23	8.22
c. Identification of Alternatives	0	0	0	0	1	2	2	3	4	11		
	0.00%	0.00%	0.00%	0.00%	4.35%	8.70%	8.70%	13.04%	17.39%	47.83%	23	8.74
d. Preliminary Service Planning	0	0	0	0	0	1	2	2	6	9		
	0.00%	0.00%	0.00%	0.00%	0.00%	4.35%	8.70%	8.70%	26.09%	39.13%	23	8.48
e. Alternatives Evaluation	0	0	0	0	0	2	2	3	5	45.45		
	0.00%	0.00%	0.00%	0.00%	0.00%	9.09%	9.09%	13.64%	22.73%	10.00%	23	8.86

7. Rate your level of interest in each area of the study from 1-10 (1=low, 10=high)

	1	2	3	4	5	6	7	8	9	10	Total	Average
a. Rail corridor alternatives	0	0	0	1	0	0	1	3	5	13		
	0.00%	0.00%	0.00%	4.35%	0.00%	0.00%	4.35%	13.04%	21.74%	56.52%	23	9.13
b. Bus alternatives	0	0	0	1	7	2	2	5	1	5		
	0.00%	0.00%	0.00%	4.35%	30.43%	8.70%	8.70%	21.74%	4.35%	21.74%	23	7.13
c. Potential station locations	0	0	0	0	1	1	3	1	5	12		
	0.00%	0.00%	0.00%	0.00%	4.35%	4.35%	13.04%	4.35%	21.74%	52.17%	23	8.91
d. Conncting service to stations	0	0	0	0	4	0	3	2	3	11		
	0.00%	0.00%	0.00%	0.00%	17.39%	0.00%	13.04%	8.70%	13.04%	47.83%	23	8.43
e. Rail infrastructure investment needs	0	0	0	0	3	1	1	1	7	9		
	0.00%	0.00%	0.00%	0.00%	13.64%	4.55%	4.55%	4.55%	31.82%	40.51%	22	8.59
f. Service levels and schedules	0	0	0	0	2	2	0	4	5	9		
	0.00%	0.00%	0.00%	0.00%	9.09%	9.09%	0.00%	18.18%	22.73%	40.91%	23	8.59
h. Capital costs	0	0	0	1	4	1	1	4	3	9		
	0.00%	0.00%	0.00%	4.35%	17.39%	4.35%	4.35%	17.39%	13.04%	39.13%	23	8.09
i. Operating costs	0	0	0	2	4	1	1	4	3	8		
	0.00%	0.00%	0.00%	8.70%	17.39%	4.35%	4.35%	17.39%	13.04%	34.78%	23	7.83
j. Ridership estimates	0	0	0	1	2	1	1	2	5	11		
	0.00%	0.00%	0.00%	4.35%	8.70%	4.35%	4.35%	8.70%	21.74%	47.83%	23	8.61
k. Environmental constraints	0	1	0	2	4	3	0	1	3	9		
	0.00%	4.35%	0.00%	8.70%	17.39%	13.04%	0.00%	4.35%	13.04%	39.13%	23	7.52

8. Does this meeting format (with options to attend in person, by video conference, or conference call work well for you?

Answer Choices	Number of Response(s)	Responses
Yes	23	100.00%
No	0	0.00%
Comments	1	
Total	23	
Skipped	0	
Comment	The video conference did not work well	

9. For future TAC meetings, is Wednesday morning a convenient meeting time?

Answer Choices	Number of Response(s)	Responses
Yes	18	78.20%
No	5	21.74%
Total	23	
Skipped	0	

10. Please provide any comments you have:

Comments

How we can improve future TAC meetings?

1. I was not able to view power point presentation for the webinar
2. Get agenda out sooner
3. The meeting ran well
4. Consider moving meeting to Tuesday morning

The value to you of the information in the handouts (project fact sheet and status update report)

1. Handouts are very helpful
2. Valuable
3. Excellent
4. Well done. Very informative

Any additional information you would like to see in the fact sheet or status update report

1. A some point a schedule of tasks or activities and their associated start and completion dates
2. Progress update

Other

1. Wednesday mornings are fine, but I have a standing conflict from 11-noon and will have to make sure that other staff participate to supplement
2. Very good meeting

APPENDIX C: AMTRAK PACIFIC SURFLINER OPERATIONS & MAINTENANCE COSTS

Pacific Surfliner Operational Expenses

	State Fiscal Year 2010-11	State Fiscal Year 2011-2012
Rail Operations Maintenance of Way Maintenance of Equipment Transportation (Train Movement) Station On-board Services	$98,826,221	$106,401,372
Administration	$1,500,000	$1,500,000
Marketing	$2,300,000	$2,300,000
Total Annual Operating and Maintenance Costs	$102,626,221	$110,201,372
Annual Train Miles	$1,600,001	$1,563,915
Unit Cost per Train Mile	$64.14	$70.47
Average Unit Cost per Train Mile	$67.30	

Source: Pacific Surfliner South Corridor Service Development Plan. Caltrans, May 2013

APPENDIX D: STATION ACCESS ANALYSIS

APPENDIX D: STATION ACCESS ANALYSIS

Coachella Valley Route Alternatives
Hypothetical Bus Schedules
Using Alternative 4A (shortest train running times among alternatives being advanced)
Two routes at each station

Indio

Indio	1	2A	2B	3
Lv origin	9:15 AM		2:45 PM	
Arr Indio station	9:45 AM		3:15 PM	
WB Train departure time	9:50 AM		3:20 PM	
EB Train arrival time		1:33 PM		6:38 PM
Lv Indio station		1:38 PM		6:43 PM
Arr destination		2:08 PM		7:13 PM
Total revenue hours	**0:35**		**1:47**	**0:35**
Daily revenue hours	**5:54**			
# vehicles	**2**			
# pull-outs	**6**			
recovery time	**1:14**			

Rancho Mirage

Rancho Mirage	1	2	3	4
Lv origin	9:30 AM	12:33 PM	3:00 PM	5:38 PM
Arr RM station	10:00 AM	1:03 PM	3:30 PM	6:08 PM
WB Train departure time	10:05 AM		3:35 PM	
EB Train arrival time		1:08 PM		6:13 PM
Lv RM station	10:10 AM	1:13 PM	3:40 PM	6:18 PM
Arr destination	10:40 AM	1:43 PM	4:10 PM	6:48 PM
Total revenue hours	**1:10**	**1:10**	**1:10**	**1:10**
Daily revenue hours	**9:20**			
# vehicles	**2**			
# pull-outs	**8**			
recovery time	**0:00**			

Palm Springs

Palm Springs	1	2	3	4
Lv origin	9:40 AM	12:18 PM	3:10 PM	5:23 PM
Arr Palm Springs station	10:10 AM	12:48 PM	3:40 PM	5:53 PM
WB Train departure time	10:15 AM		3:45 PM	
EB Train arrival time		12:53 PM		5:58 PM
Lv Palm Springs station	10:20 AM	12:58 PM	3:50 PM	6:03 PM
Arr destination	10:50 AM	1:28 PM	4:20 PM	6:33 PM
Total revenue hours	**1:10**	**1:10**	**1:10**	**1:10**
Daily revenue hours	**9:20**			
# vehicles	**2**			
# pull-outs	**8**			
recovery time	**0:00**			

Cabazon

Cabazon	1	2	3	4
Lv origin	9:55 AM	12:03 PM	3:25 PM	5:08 PM
Arr Cabazon station	10:25 AM	12:33 PM	3:55 PM	5:38 PM
WB Train departure time	10:30 AM		4:00 PM	
EB Train arrival time		12:38 PM		5:43 PM
Lv Cabazon station	10:35 AM	12:43 PM	4:05 PM	5:48 PM
Arr destination	11:05 AM	1:13 PM	4:35 PM	6:18 PM
Total revenue hours	**1:10**	**1:10**		**2:53**
Daily revenue hours	**10:26**			
# vehicles	**2**			
# pull-outs	**6**			
recovery time	**1:06**			

Loma Linda

Loma Linda	1	2	3	4
Lv origin	10:30 AM	11:28 AM	4:00 PM	4:33 PM
Arr Loma Linda station	11:00 AM	11:58 AM	4:30 PM	5:03 PM
WB Train departure time	11:05 AM		4:35 PM	
EB Train arrival time		12:03 PM		5:08 PM
Lv Loma Linda station	11:10 AM	12:08 PM	4:40 PM	5:13 PM
Arr destination	11:40 AM	12:38 PM	5:10 PM	5:43 PM
Total revenue hours	**1:10**	**1:10**	**1:10**	**1:10**
Daily revenue hours	**9:20**			
# vehicles	**4**			
# pull-outs	**8**			
recovery time	**0:00**			

		decimal	# days	Annual
Total daily rev hours	**44:20:00**	44.33	365	16181.67
total # vehicles	**12**			
total # pull-outs	**36**			
total recovery time	**2:20**			

Notes:
1) Where layover time is less than 40 minutes, trips are combined in a single run; while this increases revenue hours, it generally allows for a more efficient use of resources
2) Loma Linda needs 2 buses in the am and pm; the 11:10 am departure cannot return to the station in time for the 11:28 am train arrival and the 4:40 pm departure cannot return to the station in time to meet the 5:24 pm train arrival

Coachella Valley Route Alternatives
Hypothetical Bus Schedules
Using Alternative 4B (longest train running times)
Two routes at each station

Indio

Indio	1	2A	2B	3
Lv origin	9:15 AM		2:45 PM	
Arr Indio station	9:45 AM		3:15 PM	
WB Train departure time	9:50 AM		3:20 PM	
EB Train arrival time		1:49 PM		6:54 PM
Lv Indio station		1:54 PM		6:59 PM
Arr destination		2:24 PM		7:29 PM
Total revenue hours	**0:35**		**1:31**	**0:35**
Daily revenue hours	**5:22**			
# vehicles	**2**			
# pull-outs	**6**			
recovery time	**0:42**			

Rancho Mirage

Rancho Mirage	1	2	3	4
Lv origin	9:30 AM	12:49 PM	3:00 PM	5:54 PM
Arr RM station	10:00 AM	1:19 PM	3:30 PM	6:24 PM
WB Train departure time	10:05 AM		3:35 PM	
EB Train arrival time		1:24 PM		6:29 PM
Lv RM station	10:10 AM	1:29 PM	3:40 PM	6:34 PM
Arr destination	10:40 AM	1:59 PM	4:10 PM	7:04 PM
Total revenue hours	**1:10**	**1:10**	**1:10**	**1:10**
Daily revenue hours	**9:20**			
# vehicles	**2**			
# pull-outs	**8**			
recovery time	**0:00**			

Palm Springs

Palm Springs	1	2	3	4
Lv origin	9:40 AM	12:34 PM	3:10 PM	5:39 PM
Arr Palm Springs station	10:10 AM	1:04 PM	3:40 PM	6:09 PM
WB Train departure time	10:15 AM		3:45 PM	
EB Train arrival time		1:09 PM		6:14 PM
Lv Palm Springs station	10:20 AM	1:14 PM	3:50 PM	6:19 PM
Arr destination	10:50 AM	1:44 PM	4:20 PM	6:49 PM
Total revenue hours	**1:10**	**1:10**	**1:10**	**1:10**
Daily revenue hours	**9:20**			
# vehicles	**2**			
# pull-outs	**8**			
recovery time	**0:00**			

Cabazon

Cabazon	1	2	3	4
Lv origin	9:55 AM	12:19 PM	3:25 PM	5:24 PM
Arr Cabazon station	10:25 AM	12:49 PM	3:55 PM	5:54 PM
WB Train departure time	10:30 AM		4:00 PM	
EB Train arrival time		12:54 PM		5:59 PM
Lv Cabazon station	10:35 AM	12:59 PM	4:05 PM	6:04 PM
Arr destination	11:05 AM	1:29 PM	4:35 PM	6:34 PM
Total revenue hours	**1:10**	**1:10**	**1:10**	**1:10**
Daily revenue hours	**9:20**			
# vehicles	**2**			
# pull-outs	**8**			
recovery time	**0:00**			

Loma Linda

Loma Linda	1A	1B	2	3
Lv origin	10:30 AM	11:44 AM	4:00 PM	4:49 PM
Arr Loma Linda station	11:00 AM	12:14 PM	4:30 PM	5:19 PM
WB Train departure time	11:05 AM		4:35 PM	
EB Train arrival time		12:19 PM		5:24 PM
Lv Loma Linda station	11:10 AM	12:24 PM	4:40 PM	5:29 PM
Arr destination	11:40 AM	12:54 PM	5:10 PM	5:59 PM
Total revenue hours		**2:24**	**1:10**	**1:10**
Daily revenue hours	**9:28**			
# vehicles	**4**			
# pull-outs	**6**			
recovery time	**0:08**			

		decimal	# days	Annual
Total daily rev hours	**42:50:00**	42.83	365	15634.17
total # vehicles	**12**			
total # pull-outs	**36**			
total recovery time	**0:50**			

Notes:
1) Where layover time is less than 40 minutes, trips are combined in a single run; while this increases revenue hours, it generally allows for a more efficient use of resources
2) Loma Linda needs 2 buses in the pm; the 4:40 pm departure cannot return to the station in time to meet the 5:24 pm train arrival

Coachellla Valley Preliminary Bus Plan

Assumptions:

- Each station will be served by two routes. Depending on the individual station, one route may operate to the north of the station and the other to the south, or each route may be designed to serve specific locations where demand for service is expected. The routes will be timed to meet each train with sufficient time to transfer between bus and train.
- Using the draft rail schedules, four daily trips will be scheduled on each bus route. Two trips will bring passengers to the station and two will distribute passengers from the station.
- Trains and buses will operate every day of the year. Metrolink has limited service on six holidays (New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, and Christmas Day). Many Metrolink lines do not operate on these days.
- Routes will generally be oriented east of the station, under the assumption that passengers are less likely to backtrack to reach a station, unless there is a major identified destination to the west.
- Routes will have a round trip running time of less than one hour. Prior experience with StationLink (shuttles connecting Metrolink stations with employment sites) in Orange County revealed a notable decline in demand for locations more than 20 minutes from a Metrolink station, even if that location was a major trip generator such as UC Irvine. Given the greater distances involved in the Coachella Valley, the assumption is that bus riders will be willing to ride up to 25 to 30 minutes.
- Special event shuttle service is not considered in this estimate, because vehicle requirements and operating cost are significantly higher for special event service. Major events such as the Coachella Festival provide their own shuttle service.
- Opportunities to utilize existing bus service are noted. The primary advantage to relying on existing bus service is lower cost, since a new service does not have to be established and funded. The primary disadvantage is that existing service will not wait for a late train, since it serves many other trip generators and usually has timed transfers at other locations.
- Operating cost is estimated at $100 per revenue hour for costing purposes.

Requirements to serve five stations are outlined in Table 1.

Table 1
Bus Operation and Cost

# Routes	Daily Revenue Hours	Annual Revenue Hours	Annual Cost
10	44.33	16,181.67	$1,618,167

Possibilities for each general station location are noted below.

Indio

Most key economic development zones (as identified in *the City of Indo Economic Development Action Plan 2014-2019*) are within a short distance of the rail line and I-10, including:

- North Freeway Commercial Zone
- Indio Boulevard Revitalization Corridor
- Fantasy Springs Leisure and Hospitality District
- The Downtown Arts and Culture District
- Indio Fashion Mall District
- Northgate Mixed Use District

The Indio station is the eastern terminus of the rail line. It may be desirable to have a bus route extend to Coachella and other communities contiguous to Hwy 111 to connect the rail line to residential areas south and east of Indio.

SunLine Transit provides service throughout the Coachella Valley, with a transfer center at Hwy 111 & Flower in Indio. Seven bus routes serve this location.

Rancho Mirage

Eisenhower Medical Center and Agua Caliente Resort and Spa are the major employers in Rancho Mirage. Other attractions include the Westin Mission Hills Golf Resort and Spa, The River, and Rancho Las Palmas Shopping Center. All are within a reasonable distance of the rail line and I-10.

Sunline Transit Route 32 crosses the rail line at Monterey. Route 53 crosses the rail line at Cook.

Palm Springs

Palm Springs has numerous tourist-oriented businesses and hotels within the city limits. The Palm Springs Amtrak Station is near Indian Canyon Drive. The Palm Springs Convention Center and Palm Springs International Airport are within 15 minutes of the Amtrak Station.

Sunline Transit operates several routes in Palm Springs, but there is no service to the rail station.

Cabazon

The Morongo Casino Resort and Spa and several outlet malls are among the major employment sites and trip attractors in Cabazon.

SunLine Transit's Commuter Link 220 stops in Cabazon, but this express bus route does not provide community circulation. The Commuter Link 220 serves Thousand Palms and Palm Desert to the east. Pass Transit's Route 1 (operated by the City of Banning) and Beaumont's Route 2 provide connections from Casino Morongo and the Desert Hills Outlet Mall Casino Resort to the Cities of Banning and Beaumont.

Loma Linda

The VA Loma Linda Health Care System is the major destination in Loma Linda. The Union Pacific Yuma Subdivision tracks are just north of the VA, and it may be possible to locate the proposed train station within walking distance. The VA Hospital is served by Omnitrans Routes 2, 202, and 325, by Riverside Transit Agency's Route 14, and by Beaumont's Commuter Link 120.

Summary

This is a preliminary bus plan, intended to match the level of detail in the corresponding alternatives analysis of the rail alternatives. With reasonable assumptions on unit costs and number and length of routes, this preliminary plan has estimated operating costs.

These assumptions may be adjusted in several ways as more detailed rail plans are developed. Each station may not need two routes. Some routes may be shorter than 30 minutes in length. A decision may be made to operate longer routes in certain locations (e.g., between Cabazon and Twentynine Palms). Shuttles from residential areas to the stations may not be needed, especially if sufficient parking is available at the stations. Many transit agencies have discontinued shuttles to the station from residential areas due to very poor productivity.

All five rail stations are within the service area of at least one existing bus system. It may be more cost-effective to have local transit systems operate the rail shuttles, as opposed to using a private contractor, for the following reasons:

- Loma Linda and Indio are 70 miles apart. It would be very difficult for a private contractor to operate all rail shuttles from a single location, especially given the deadhead time and distance involved.
- The OCTA StationLink model can serve as a blueprint for bus operations. Numerous StationLink routes serve specific Metrolink stations within Orange County and are designed to connect the stations with employment locations. These routes are independent of regular fixed route service, which allows them to wait for late trains. The rail shuttles thus would not be incorporated into existing fixed routes, but might still be operated more efficiently by the local transit agencies.

APPENDIX E: ENVIRONMENTAL TECHNICAL MEMOS

Memo

Date:	Monday, September 28, 2015
Project:	Coachella Valley – San Gorgonio Pass Rail Corridor
To:	JD Douglas
From:	Kelly Czechowski
Subject:	Fine Level Screening for Agricultural Resources

Introduction

This technical memorandum contains the Draft Fine-Level Screening Constraints Analysis for Agricultural Resources for the Coachella Valley-San Gorgonio Pass Rail Corridor Service Project proposed by the Riverside County Transportation Commission (RCTC). This analysis considers four rail passenger route alternatives (i.e., 1, 4-A, 4-B, and 5) located between Los Angeles Union Station (LAUS) and Colton along existing rail corridors within Los Angeles, Orange, San Bernardino, and Riverside counties. These alternatives share the same beginning and end points (i.e., LAUS and Colton) and comprise the western study area of the project. The eastern study area is not considered in this analysis because it consists of a single 72-mile segment, and its consideration would therefore result in no differentiation between alternatives. The purpose of this memorandum is to provide an initial evaluation of the route alternatives and quantification of conceptual environmental effects to determine the potential to affect substantially more environmentally sensitive areas in specific environmental categories compared with other route alternatives. Impacts are generalized for resources within and adjacent to a buffer surrounding the right-of-way for each alternative route.

Methodology

The Coachella Valley–San Gorgonio Pass Rail Corridor Service alternatives were generally evaluated against the fine-level screening criteria defined in Section 4.2 of the Alternatives Analysis Methodology, and the results of this evaluation are presented herein. During fine-level screening, route alternatives (or combinations of route alternatives) will be identified in the Alternatives Analysis that offer the highest potential ridership; the least potential construction, operating, and maintenance cost; and the least potential impact on communities and the environment, as well as appropriate mitigation feasibility. This effort will provide information

regarding potential environmental impacts for each route alternative for ultimate selection of an alternative to be carried forward as the proposed project.

Fine-level screening was based on open-source aerial imagery and/or geographic information systems (GIS) data, which will be used to characterize portions of each route alternative. Because several route alternatives, each with lengths on the order of 60 miles, were carried forward from coarse-level screening, field visits were not conducted during fine-level screening. In September 2015, HDR conducted a review for the project in order to identify potential resource-related constraints for agricultural resources. This research encompassed the project route for all alternatives brought forward from the course-level screening analysis and a 40-foot buffer from the centerline, or an 80-foot total buffer, including both sides of the rail line.

For the purposes of this analysis, a conservative impact potential is assumed, which includes acquisition of right-of-way of the entirety of the 80-foot buffer around each of the route alternatives. Using this conservative assumption for each alternative, any portion of identified agricultural resource would be affected by the project.

During the later stages of fine-level analysis, it was determined that sufficient passenger train slots are available under current operating agreements for Route Alternative 1. Based on this information, additional infrastructure (e.g. no improvements to the existing rail route) would not be required or needed if RCTC dedicates that needed slots to the Coachella Valley service. In no additional infrastructure is required, no direct environmental impacts are anticipated to occur. However, in the event that additional infrastructure is needed for Route Alternative 1, this memorandum contains applicable information about the types of environmental resources that may occur within and along Route Alternative 1.

Regulatory Setting

Farmland Protection Policy Act of 1981– 7 United States Code 4201-4209 and 7 CFR 658

The Farmland Protection Policy Act (FPPA, 7 U.S.C. Section 4201 et seq.) is intended to protect farmland and requires federal agencies to coordinate with the U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS), if their activities may irreversibly convert farmland to nonagricultural use, either directly or indirectly. The stated purpose of the FPPA is to "minimize the extent to which federal programs contribute to the unnecessary conversion of farmland to nonagricultural uses." The FPPA requires federal agencies to examine potential direct and indirect effects to farmland of a proposed action and its alternatives before approving any activity that would convert farmland to nonagricultural use. USDA issues regulations to implement the FPPA (7 CFR, Chapter VI Part 658).

For the purpose of FPPA, important farmland includes prime farmland, unique farmland, and farmland of statewide or local importance, as defined by Section 1540(c)(1) of the FPPA. Classification standards differ from state to state; each state may set its own criteria for classification in each category. Federal farmland classification criteria may differ from those developed by the California Department of Conservation (DOC). Farmland subject to FPPA requirements can be forestland, pastureland, cropland, or other land, but not water or urban built-up land. The FPPA exempts the following land types:

- Soil types not suitable for crops, such as rocky terrain or sand dunes.
- Sites where the project's right-of-way is entirely within a delineated urban area and the project requires no prime or unique farmland, nor any farmland of statewide or local importance.
- Farmland that has already been converted to industrial, residential, or commercial or is used for recreational activity.

The FPPA applies to projects and programs sponsored or financed in whole or in part by the federal government. FPPA implementing regulations spell out requirements to ensure that federal programs, to the extent practical, are compatible with state, local, and private programs and policies to protect farmland.

Farmland Mapping and Monitoring Program

The Farmland Mapping and Monitoring Program (FMMP) is the only statewide land use inventory conducted on a regular basis. DOC administers the FMMP, under which it maintains an automated map and database system to record changes in agricultural land use. "Important Farmland" under the FMMP is listed by category, as described below. The categories are defined according to USDA land inventory and monitoring criteria, as modified for California:

- **Prime Farmland** – Prime Farmland is land with the best combination of physical and chemical features to sustain long-term agricultural crop production. These lands have the soil quality, growing season, and moisture supply necessary to produce sustained high yields. Soil must meet the physical and chemical criteria determined by the NCRS. Prime Farmland must have been used for production of irrigated crops at some time during the 4 years prior to the FMMP's mapping date.

- **Farmland of Statewide Importance** – Farmland of Statewide Importance is similar to Prime Farmland but with minor differences, such as having greater slopes or soils with a lesser ability to store moisture. Farmland of Statewide Importance must have been used

for production of irrigated crops at some time during the 4 years prior to the mapping date.

- **Unique Farmland** – Unique Farmland has lesser quality soils than Prime Farmland or Farmland of Statewide Importance. Unique Farmland is used for producing the state's leading agricultural crops. These lands usually are irrigated, but may include non-irrigated orchards or vineyards found in some climatic zones. Unique Farmland must have been used for crops at some time during the 4 years prior to the mapping date.

- **Farmland of Local Importance** – Farmland of Local Importance is farmland that is important to the local agricultural community as determined by each county's board of supervisors and local advisory committees.

California Farmland Conservancy Program Act (Public Resources Code Sections 10200 to 10277)

This act provides a mechanism for the DOC to establish agricultural conservation easements on farmland. Agricultural conservation easement, or easement, means an interest in land, less than fee simple, which represents the right to prevent the development or improvement of the land for any purpose other than agricultural production. The easement is granted for the California Farmland Conservancy Program by the owner of a fee simple interest in land to a local government, nonprofit organization, resource conservation district, or to a regional park or open-space district or regional park or open-space authority that has the conservation of farmland among its stated purposes or as expressed in the entity's locally adopted policies. It shall be granted in perpetuity as the equivalent of covenants running with the land. The landowner may make a request to the DOC that the easement be reviewed for possible termination 25 or more years from the date of sale of the agricultural conservation easement.

Existing Setting

The route alternatives are located in a generally developed urban setting and traverse about 38 local jurisdictions within Los Angeles, Orange, Riverside, and San Bernardino counties. In general, the rail-dominated corridors along which the alternatives follow do not provide usable agricultural opportunities.

Results

Each of the alternatives considered in this analysis generally are within existing rail right-of-way. The agricultural resources identified as part of this analysis are outside of the rail right-of-way. Therefore, there is a low likelihood that agricultural land would be incorporated into the project.

Later phases of the project planning and environmental analysis will identify potential for temporary occupancy or proximity impacts and analyze the potential for use of land for agricultural resources. Early identification of agricultural resources can inform the design and engineering of the project so as to avoid use of agricultural resources, ensure incorporation of the statute's requirements for the evaluation of avoidance alternatives, and assist with selection of a least overall harmful alternative.

Alternative 1

Without more detailed information on the design, construction, and right-of-way requirements associated with the alternative, a determination on the potential for use of and conversion of designated farmland is not possible. Using the "worst-case" assumption of right-of-way acquisition from the entirety of the 80-foot buffer around Alternative 1, approximately 0.84 acre of grazing land and 1.86 acres of Farmland of Local Importance may be impacted.

Alternative 4-A

Similar to Alternative 1, without more detailed information on the design, construction, and right-of-way requirements associated with the alternative, a determination on the potential for use of and conversion of designated farmland is not possible. Using the "worst-case" assumption of right-of-way acquisition from the entirety of the 80-foot buffer around Alternative 4-A, approximately 0.36 acre of grazing land may be impacted.

Alternative 4-B

There is no difference in the potential for use of or conversion of designated farmland between Alternatives 4-A and 4-B, as indicated in Appendix B. Using the "worst-case" assumption of right-of-way acquisition from the entirety of the 80-foot buffer around Alternative 4-B, approximately 0.36 acre of grazing land may be impacted.

Alternative 5

There is no difference in the potential for use of or conversion of designated farmland between Alternatives 4-A and 5, as indicated in Appendix B. Using the "worst-case" assumption of right-of-way acquisition from the entirety of the 80-foot buffer around Alternative 5, approximately 0.36 acre of grazing land may be impacted.

Conclusion

As described above, based on currently available information on the route alternatives, agricultural resources should not be a limiting factor for any of the alternatives under consideration. Generally, Alternative 1 includes the greatest acreage of agricultural resources within its buffer area, while Alternatives 4-A, 4-B, and 5 include the least acreage of agricultural resources within the buffer areas. Once additional design, right-of-way, and construction information is available for the alternatives, if conversion of designated farmland is identified, then an agricultural analysis would be required.

Appendix A
Figures

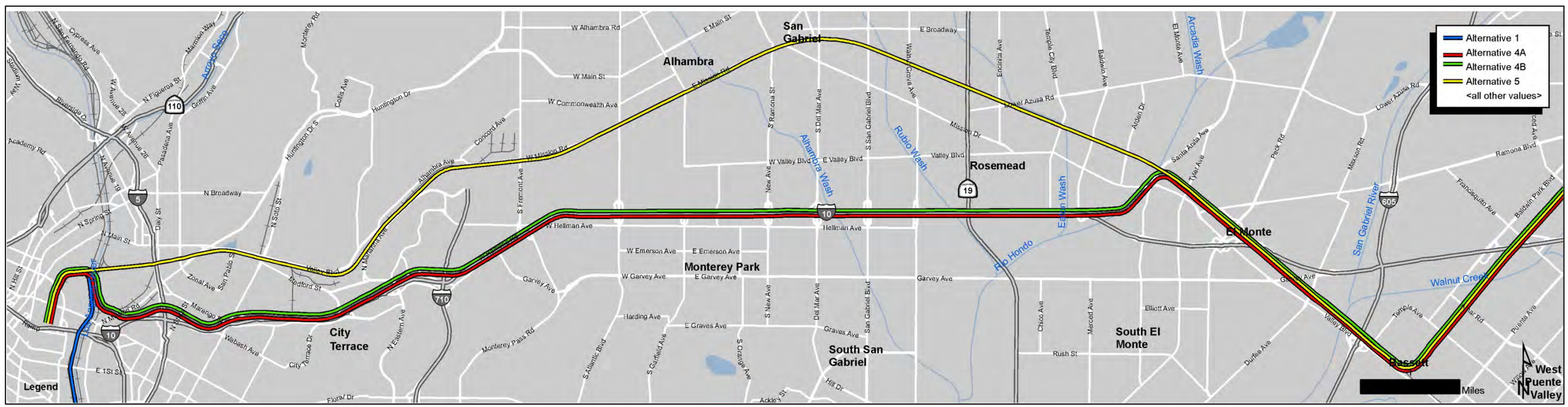
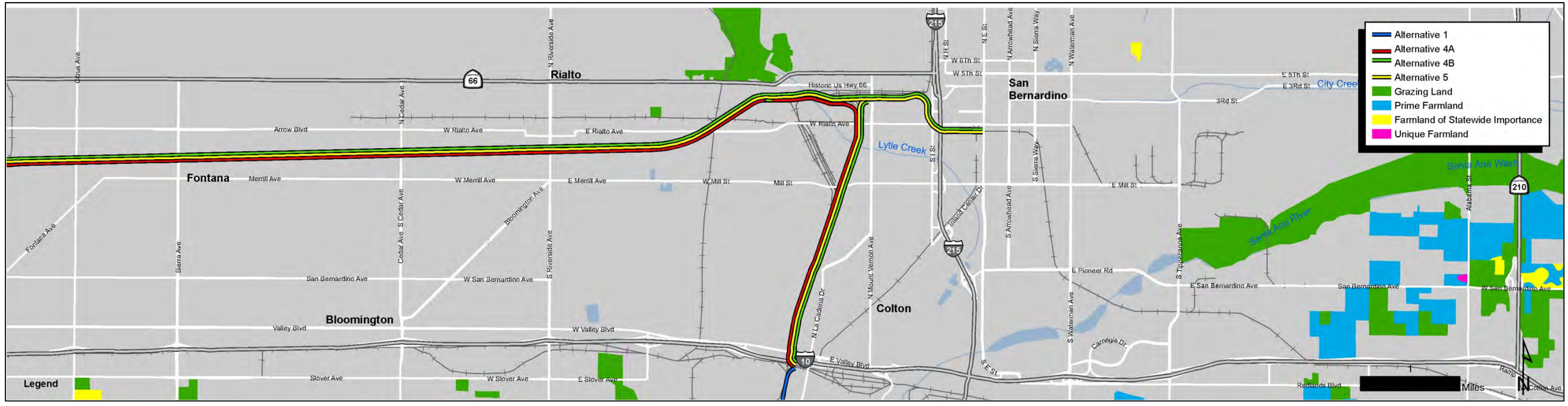


Figure 1 (Sheet 1 of 5)
Farmland Mapping and Monitoring Program Agricultural Designations
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives



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Farmland Mapping and Monitoring Program Agricultural Designations
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives

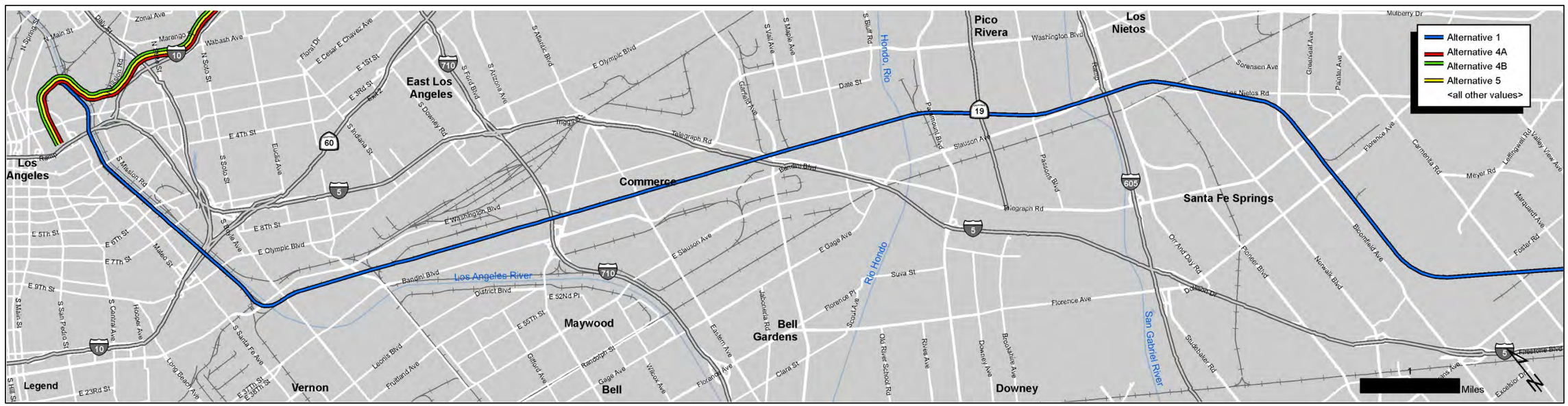

Figure 1 (Sheet 3 of 5)
Farmland Mapping and Monitoring Program Agricultural Designations
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives

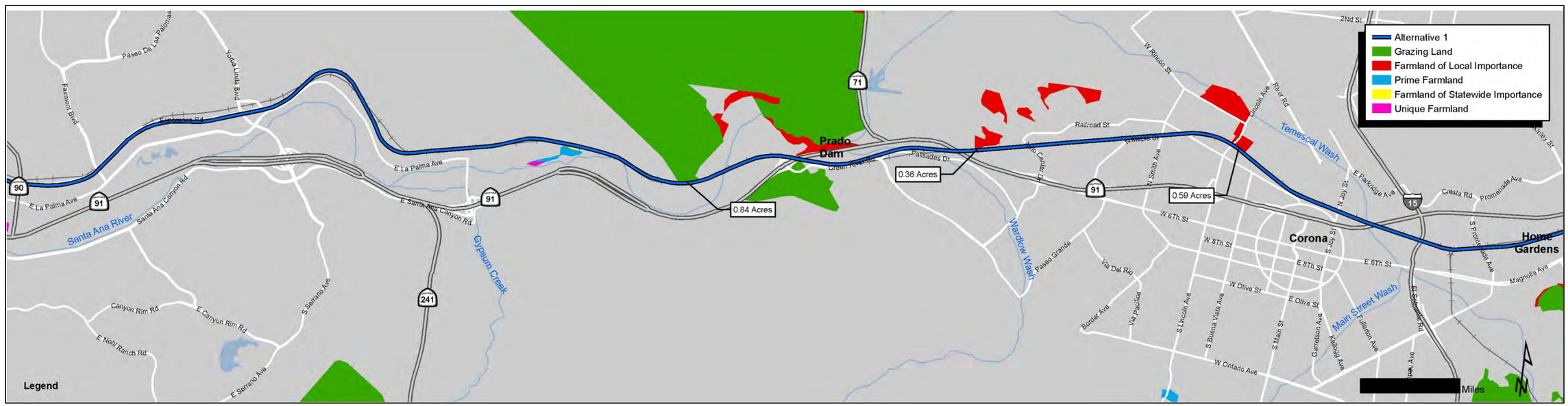

Figure 1 (Sheet 4 of 5)
Farmland Mapping and Monitoring Program Agricultural Designations
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives

Figure 1 (Sheet 5 of 5)
Farmland Mapping and Monitoring Program Agricultural Designations
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives

Appendix B
Summary Table

Environmental Resource	Alternative 1	Alternative 4-A	Alternative 4-B	Alternative 5
Agricultural Resources	Type of Farmland:	Type of Farmland:	Type of Farmland:	Type of Farmland:
Grazing Land	0.84 acres in Corona (Riverside County)	0.36 acres in Fontana (San Bernardino County)	0.36 acres in Fontana (San Bernardino County)	0.36 acres in Fontana (San Bernardino County)
Farmland of Local Importance	1.86 acres in Corona and Highgrove (Riverside County)	0 acres	0 acres	0 acres
Prime Farmland	0 acres	0 acres	0 acres	0 acres
Farmland of Statewide Importance	0 acres	0 acres	0 acres	0 acres
Unique Farmland	0 acres	0 acres	0 acres	0 acres

September 24, 2015

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Subject: Draft Coachella Valley–San Gorgonio Pass Rail Corridor Service: Fine-Level Screening for Air Quality and Climate Change

Introduction

This technical memorandum contains the Draft Fine-Level Screening Constraints Analysis for *Air Quality and Climate Change* for the Coachella Valley-San Gorgonio Pass Rail Corridor Service Project proposed by the Riverside County Transportation Commission. This analysis considers four rail passenger route alternatives (i.e., 1, 4-A, 4-B, and 5) located between Los Angeles Union Station (LAUS) and Colton along existing rail corridors within Los Angeles, Orange, San Bernardino, and Riverside counties. These alternatives share the same beginning and end points (i.e., LAUS and Colton) and comprise the western study area of the project. The eastern study area is not considered in this analysis because it consists of a single alternative, a 72-mile segment, and its consideration would therefore result in no differentiation between alternatives. The purpose of this memorandum is to provide an initial evaluation of the route alternatives and quantification of conceptual environmental effects to determine the potential to affect substantially more environmentally sensitive areas in specific environmental categories compared with other route alternatives. Impacts are generalized for resources within and adjacent to a buffer surrounding the right-of-way for each alternative route.

Methodology

The Coachella Valley–San Gorgonio Pass Rail Corridor Service alternatives were generally evaluated against the fine-level screening criteria defined in Section 4.2 of the Alternatives Analysis Methodology, and the results of this evaluation are presented herein. During fine-level screening, route alternatives (or combinations of route alternatives) will be identified in the Alternatives Analysis that offer the highest potential ridership; the least potential construction, operating, and maintenance cost; and the least potential impact on communities and the environment, as well as appropriate mitigation feasibility. This effort will provide information regarding potential environmental impacts for each route alternative for ultimate selection of an alternative to be carried forward as the proposed project.

Fine-level screening was based on open-source aerial imagery and/or geographic information systems (GIS) data, which will be used to characterize portions of each route alternative. Because several route alternatives, each with lengths on the order of 60 miles, were carried forward from coarse-level screening, field visits were not conducted during fine-level screening. In September 2015, ICF conducted a review for the project in order to identify potential resource-related constraints for the evaluation of air quality and climate change. This research encompassed the project route for all alternatives brought forward from the course-level screening analysis and a 300-foot buffer from centerline, or a 600-foot total buffer, including both sides of the rail line. Figure 1 in Appendix A shows an overview location map. Note that actual resources will likely be evaluated within 500 feet of the route alternative, for a total buffer of 1,000 feet for the air quality and climate change analysis.

The air quality and climate change analysis is primarily based on the number of sensitive receptors located within the analyzed 600-foot buffer, as the number of affected sensitive receptors is assumed to be a proxy for the relative impact that would result from construction and operation of the proposed project. The total number of sensitive receptors within the analyzed 600-foot buffer was then summed to present a comparison between the alternatives to help determine potential impacts associated with each alternative. It is anticipated that the greatest amount of impacts would be associated with more heavily populated areas with elevated concentrations of sensitive receptors. Note that in addition to the number of affected sensitive receptors, the overall project length was also used as a proxy for potential impacts, as emissions could be proportional to route length in the following manner.[1]

- Construction mass emissions could be proportional to alignment length.
- Operational rail mass emissions could be proportional to alignment length.[2]
- Construction and operational health risks and pollutant concentration impacts could be proportional to alignment length.
- Operational motor vehicle mass emissions could be inversely proportional to alignment length.

During the later stages of fine-level analysis, it was determined that sufficient passenger train slots are available under current operating agreements for Route Alternative 1. Based on this information, additional infrastructure (e.g. no improvements to the existing rail route) would not be required or needed if RCTC dedicates that needed slots to the Coachella Valley service. In no additional infrastructure is required, no direct environmental impacts are anticipated to occur. However, in the event that additional infrastructure is needed for Route Alternative 1, this memorandum contains applicable information about the types of environmental resources that may occur within and along Route Alternative 1.

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[1] Overall impacts involve a variety of interconnected variables (e.g., construction activity, effects on traffic, rail activity data) whose influence on project emissions will not be known until the emissions analysis is completed.

[2] Total motor vehicle emissions would be dependent upon changes in motor vehicle activity that may not necessarily be correlated to route length and may instead be related to other factors, such as the local area's sensitivity to rail travel effects on regional travel modes.

Existing Setting

The project area is in an area that is classified as nonattainment or maintenance for several state and federal ambient air quality standards. Table 2 below summarizes the region's attainment status with regard to the National Ambient Air Quality Standards (NAAQS) or California Ambient Air Quality Standards (CAAQS).

Table 1. Regional Attainment Status

Pollutants	Federal Classification	State Classification
Ozone (1-hour standard)	--	Nonattainment
Ozone (8-hour standard)	Extreme Nonattainment	--
Course Particulate Matter (PM10)	Maintenance	Nonattainment
Fine Particulate Matter (PM2.5)	Nonattainment	Nonattainment
Carbon Monoxide (CO)	Serious Maintenance	Attainment
Nitrogen Dioxide (NO_2)	Unclassified/Attainment	Nonattainment
Sulfur Dioxide (SO_2)	Attainment	Attainment
Lead	Attainment *	Attainment *

* Note that while the Los Angeles portion of the South Coast Air Basin (SCAB) is considered nonattainment with respect to both federal and state lead, the San Bernardino County portion of the SCAB is considered to be in attainment.

Sources: U.S. Environmental Protection Agency 2013[3]; California Air Resources Board 2014[4]

Regulatory Setting

The air quality and climate change analysis is primarily based on South Coast Air Quality Management District (SCAQMD) thresholds of significance to evaluate California Environmental Quality Act (CEQA) impacts and General Conformity *de minimis* thresholds to evaluate effects related to the National Environmental Policy Act (NEPA). This will include an evaluation of:

- construction and operational criteria pollutant and greenhouse gas (GHG) emissions
- local carbon monoxide (CO) hot spots
- local particulate matter smaller than 10 microns in diameter (PM10) and particulate matter smaller than 2.5 microns in diameter (PM2.5) hot spots
- a health risk assessment evaluating potential health risks to existing nearby sensitive receptors from exposure to diesel particulate matter emissions from construction and operational activities
- localized impacts on nearby sensitive receptors using SCAQMD's *Localized Significance Threshold Methodology for CEQA Evaluations*

[3] U.S. Environmental Protection Agency. 2013. The Green Book Nonattainment Areas for Criteria Pollutants. Last Revised: December 05, 2013. Available: http://www3.epa.gov/airquality/greenbk/. Accessed: September 21, 2015.

[4] California Air Resources Board. 2014. Area Designations Maps/ State and National. Last Revised: August 22, 2014. Available: http://www.arb.ca.gov/desig/adm/adm.htm. Accessed: September 21, 2015.

- whether the project satisfies General Conformity requirements

The project area falls under the jurisdiction of SCAQMD. Table 2 below summarizes SCAQMD's adopted CEQA thresholds of significance for criteria pollutant and GHG emissions.

Table 2. South Coast Air Quality Management District Thresholds of Significance

Criteria Air Pollutant	Construction Threshold (pounds per day)	Operational Threshold (pounds per day)
Volatile organic compounds	75	55
Oxides of nitrogen (NO_X)	100	55
CO	550	550
Sulfur oxides (SO_X)	150	150
PM10	150	150
PM2.5	55	55
Lead	3	3
Greenhouse Gases	**Industrial Threshold (metric tons per year)**	**Draft Commercial/Residential Project Threshold (metric tons per year)**
Carbon dioxide equivalent (CO_2e)	10,000	3,000

As the Federal Railroad Administration is likely the lead agency under NEPA, the General Conformity *de minimis* thresholds will be used to evaluate effects related to NEPA. The table below summarizes the applicable *de minimis* thresholds.

Table 3. General Conformity *de minimis* Thresholds

Criteria Air Pollutant	General Conformity *de minimis* threshold (tons per year)
Ozone (reactive organic gases/volatile organic compounds or oxides of nitrogen [NO_X])	10
PM10	100
PM2.5	100
CO	100

Results

Alternative 1

Sensitive Receptors

Table 4 summarizes sensitive receptors located within the 600-foot buffer for Alternative 1. Alternative 1 would have the fewest sensitive receptors affected by the project, with approximately 1.5 times fewer total residences (approximately 1.5 times fewer single-family residences and 1.9 times fewer multi-family residences) and 3.4 times fewer schools than the

other alternatives (receptors associated with Alternatives 4-A, 4-B, and 5 are generally similar). There are no hospitals within the buffer for Alternative 1.

Alignment Length

Table 4 also indicates that Alternative 1 represents the alternative with the greatest route length, which could result in the highest amount of construction emissions, operational rail criteria pollutant and GHG emissions, and health risk and pollutant concentration impacts among all alternatives evaluated.

In addition, if motor vehicle mass emissions are correlated with alignment length only, operational mass emissions associated with Alternative 1 could be the lowest, without taking into consideration the influence of the local area's sensitivity to rail travel effects on regional travel modes. With additional access to rail, the longer the alignment, the greater the capacity for higher ridership and fewer emissions from motor vehicles.

Table 4. Route Alternative 1 Environmental Resources within Right-of-Way and Buffer

Environmental Resource	Resources within Right-of-Way and Buffer
Single-family Residences	3,524
Multi-family Residences	576
Hotels	0
Hospitals	0
Schools	18
Places of Worship	10
Parks	30
Alignment Length (miles)	68

Identified sensitive receptors are within 300 feet of the route alternative, for a total buffer of 600 feet.

Alternative 4-A

Sensitive Receptors

Table 5 summarizes sensitive receptors located within the 600-foot buffer for Alternative 4-A. Alternative 4-A would, in general, have a similar amount of sensitive receptors affected by the project when compared to Alternatives 4-B and 5. When compared to Alternative 1, Alternative 4-A would have approximately 1.5 times more total residences (approximately 1.5 times more single-family residences and 1.9 times more multi-family residences) and 3.4 times more schools. There are three hospitals within the buffer for Alternative 4-A, whereas there are no hospitals within the buffer for Alternative 1.

Alignment Length

Table 5 also indicates that Alternative 4-A represents the alternative with the shortest alignment length, which could result in the lowest construction emissions, operational rail criteria pollutant and GHG emissions, and health risk and pollutant concentration impacts among all route alternatives evaluated.

In addition, if motor vehicle mass emissions are correlated with alignment length only, operational mass emissions associated with Alternative 4-A could be the highest, without taking into consideration the influence of the local area's sensitivity to rail travel effects on regional travel modes. With additional access to rail, the longer the alignment, the greater the capacity for higher ridership and fewer emissions from motor vehicles..

Table 5. Route Alternative 4-A Environmental Resources within Right-of-Way and Buffer

Environmental Resource	Resources within Right-of-Way and Buffer
Single-family Residences	5,226
Multi-family Residences	1,081
Hotels	2
Hospitals	3
Schools	61
Places of Worship	15
Parks	27
Alignment Length (miles)	59

Identified sensitive receptors are within 300 feet of the route alternative, for a total buffer of 600 feet.

Alternative 4-B

Sensitive Receptors

Table 6 summarizes sensitive receptors located within the 600-foot buffer for Alternative 4-B. Alternative 4-B would, in general, have a similar amount of sensitive receptors affected by the project when compared to Alternatives 4-A and 5. When compared to Alternative 1, Alternative 4-B would have approximately 1.5 times more total residences (approximately 1.5 times more single family residences and 1.9 times more multi-family residences) and 3.4 times more schools. There are three hospitals within the buffer for Alternative 4-B, whereas there are no hospitals within the buffer for Alternative 1.

Alignment Length

Table 6 also indicates that Alternative 4-B is similar in length to Alternative 5. Consequently, impacts related to construction emissions, operational motor vehicle and rail criteria pollutant and GHG emissions, health risks, and pollutant concentrations are anticipated to be similar for both Alternatives 4-B and 5.

As Alternative 4-B is shorter than Alternative 1, impacts associated with construction emissions, rail criteria pollutant and GHG emissions, health risks, and pollutant concentrations are anticipated to be lower for Alternative 4-B than for Alternative 1, with slightly higher motor vehicle emissions associated with Alternative 4-B. As Alternative 4-B is slightly longer (by approximately 3%) than Alternative 4-A, these impacts are anticipated to be similar to or slightly higher than Alternative 4-A.

Table 6. Route Alternative 4-B Environmental Resources within Right-of-Way and Buffer

Environmental Resource	Resources within Right-of-Way and Buffer
Single-family Residences	5,301
Multi-family Residences	1,081
Hotels	2
Hospitals	3
Schools	61
Places of Worship	15
Parks	27
Alignment Length (miles)	61

Identified sensitive receptors are within 300 feet of the route alternative, for a total buffer of 600 feet.

Alternative 5

Sensitive Receptors

Table 7 summarizes sensitive receptors located within the 600-foot buffer for Alternative 5. Alternative 5 would, in general, have a similar amount of sensitive receptors affected by the project when compared to Alternatives 4-A and 4-B. When compared to Alternative 1, Alternative 5 would have approximately 1.5 times more total residences (approximately 1.5 times more single-family residences and 1.9 times more multi-family residences) and 3.4 times more schools. There are five hospitals within the buffer for Alternative 5, the most among all route alternatives evaluated, whereas there are no hospitals within the buffer for Alternative 1.

Alignment Length

Table 7 also indicates that Alternative 5 is similar in length to Alternative 4-B. Consequently, impacts related to construction emissions, operational motor vehicle and rail criteria pollutant and GHG emissions, health risks, and pollutant concentrations are anticipated to be similar.

As Alternative 5 is shorter than Alternative 1, impacts associated with construction emissions, rail criteria pollutant and GHG emissions, health risks, and pollutant concentrations are anticipated to be lower for Alternative 5 than for Alternative 1, with slightly higher motor vehicle emissions associated with Alternative 5. As Alternative 5 is slightly longer (by approximately 3%) than Alternative 4-A, these impacts are anticipated to be similar to or slightly higher than Alternative 4-A.

Table 7. Route Alternative 5 Environmental Resources within Right-of-Way and Buffer

Environmental Resource	Resources within Right-of-Way and Buffer
Single-family Residences	5,252
Multi-family Residences	1,111
Hotels	1
Hospitals	5
Schools	54

Environmental Resource	Resources within Right-of-Way and Buffer
Places of Worship	13
Parks	28
Alignment Length (miles)	61

Identified sensitive receptors are within 300 feet of the route alternative, for a total buffer of 600 feet.

Conclusion

Sensitive Receptors

In general, Alternative 1 would have the fewest resources affected of all the route alternatives. Consequently, Alternative 1 could have the lowest impacts related to health risks and exposure of sensitive receptors to elevated pollutant concentrations,[5] as there are fewer receptors with the potential for exposure to criteria air pollutant and GHG emissions. Impacts associated with Alternatives 4-A, 4-B, and 5 would be equal.

Alignment Length

Alternative 1 is the longest, which indicates that this alternative could result in the highest construction criteria pollutant and GHG emissions, operational rail criteria pollutant and GHG emissions, and health risk and pollutant concentration impacts[6] among all alternatives analyzed. It is anticipated that Alternatives 4-A, 4-B, and 5 would be generally similar.

[5] Impacts related to health risks and pollutant concentrations could be greater than for other route alternatives if the shorter route is adjacent to a greater numbers of resources (sensitive receptors) when compared to the other alternatives.

[6] As there are fewer sensitive receptors associated with Alternative 1, impacts related to health risks and pollutant concentrations could be less than for other route alternatives if the longer alignment is adjacent to fewer numbers of resources (sensitive receptors) when compared to the other alternatives.

Appendix A
Figures

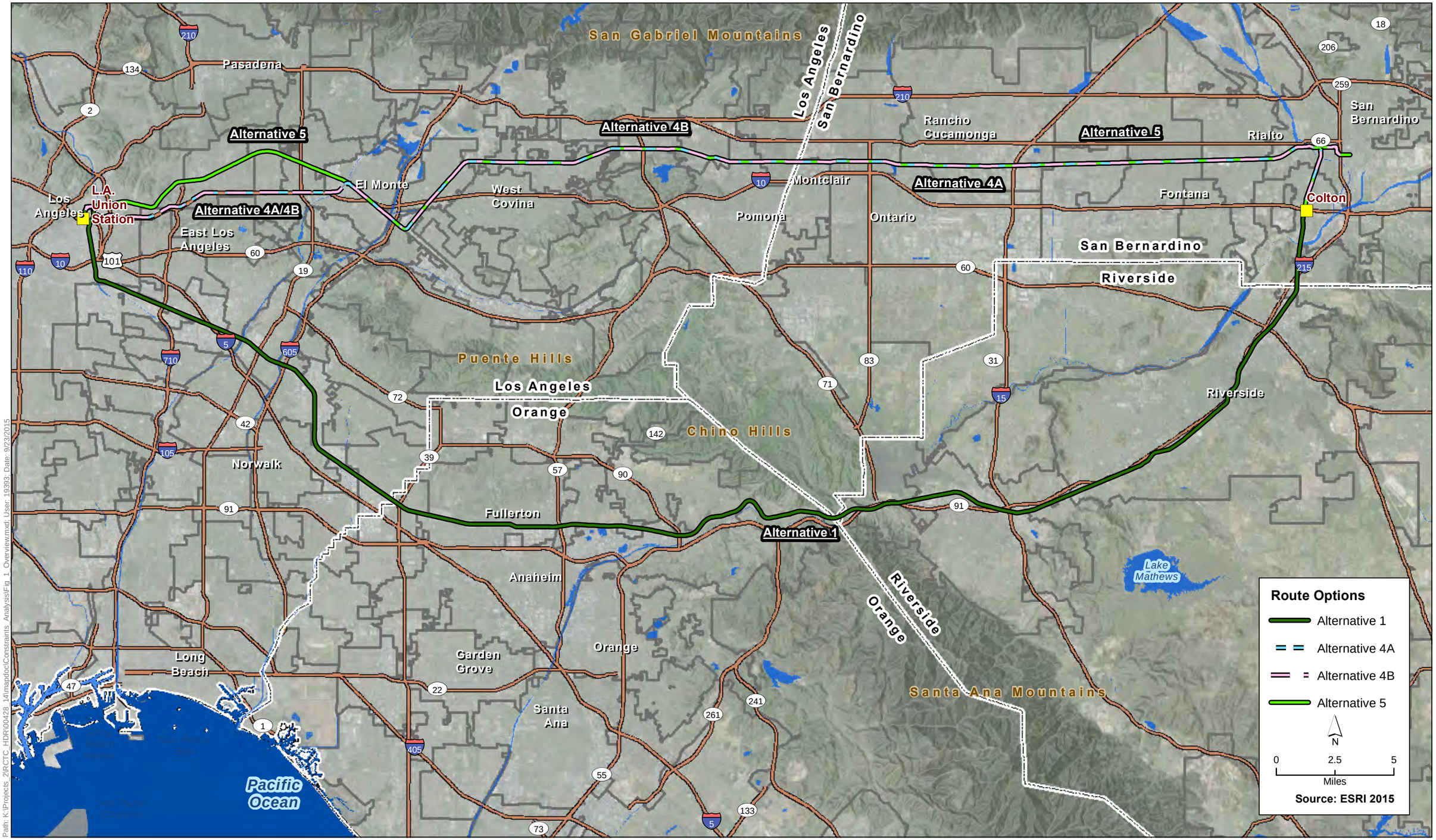

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Figure 1
Location Overview
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives

Appendix B
Summary Table

Environmental Resource	Alternative 1	Alternative 4-A	Alternative 4-B	Alternative 5
Single-family Residences	3,524	5,226	5,301	5,252
Multi-family Residences	576	1,081	1,081	1,111
Hotels	0	2	2	1
Hospitals	0	3	3	5
Schools	18	61	61	54
Places of Worship	10	15	15	13
Parks	30	27	27	28
Alignment Length (miles)	68	59	61	61

September 23, 2015

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Subject: Draft Coachella Valley–San Gorgonio Pass Rail Corridor Service: Fine-Level Screening for Environmental Justice

Introduction

This technical memorandum contains the Draft Fine-Level Screening Constraints Analysis for ***Environmental Justice*** for the Coachella Valley–San Gorgonio Pass Rail Corridor Service Project proposed by the Riverside County Transportation Commission. This analysis considers four rail passenger route alternatives (i.e., 1, 4-A, 4-B, and 5) located between Los Angeles Union Station (LAUS) and Colton along existing rail corridors within Los Angeles, Orange, San Bernardino, and Riverside counties. These alternatives share the same beginning and end points (i.e., LAUS and Colton) and comprise the western study area of the project. The eastern study area is not considered in this analysis because it consists of a single alternative, a 72-mile segment, and its consideration would therefore result in no differentiation between alternatives. The purpose of this memorandum is to assess whether any of the four proposed route alternatives has the potential to affect substantially more environmental justice populations than the other alternatives. Therefore, this memorandum considers and compares the populations considered in minority and poverty of each of the four alternatives and discusses possible impacts in general terms.

Fine-level screening is being conducted to further evaluate the reasonable and feasible route alternatives remaining after the coarse-level screening. The evaluation contained herein includes an initial evaluation of the route alternative and quantification of conceptual environmental effects to determine the potential to affect substantially more environmentally sensitive areas in specific environmental categories compared with other route alternatives. Impacts are generalized for resources within and adjacent to a buffer surrounding the right-of-way for each alternative route. The evaluation in this memorandum will include a constraints-level evaluation of environmental justice and community impacts.

Methodology

The Coachella Valley–San Gorgonio Pass Rail Corridor Service alternatives were generally evaluated against the fine-level screening criteria defined in Section 4.2 of the Alternatives Analysis Methodology, and the results of this evaluation are presented herein. During fine-level

screening, route alternatives (or combinations of route alternatives) will be identified in the Alternatives Analysis that offer the highest potential ridership; the least potential construction, operating, and maintenance cost; and the least potential impact on communities and the environment, as well as appropriate mitigation feasibility. This effort will provide information regarding potential environmental impacts for each route alternative for ultimate selection of an alternative to be carried forward as the proposed project.

Fine-level screening was based on open-source aerial imagery and/or geographic information systems (GIS) data, which will be used to characterize portions of each route alternative. Because several route alternatives, each with lengths on the order of 60 miles, were carried forward from coarse-level screening, field visits were not conducted during fine-level screening. In September 2015, ICF conducted a review for the project in order to identify potential resource-related constraints for the evaluation of environmental justice. This research encompassed the project alignment for all alternatives brought forward from the course-level screening analysis and a 40-foot buffer from the centerline of the right-of-way for each alignment, for a total buffer of 80 feet, with the route alternatives shown in Figure 1 in Appendix A.

The methodology for screening the effects of the route alternatives on environmental justice populations, or any identifiable population group meeting the requirements for minority or low income, includes the following.

- Define the project area and review census block groups and tracts for each alternative alignment.
- Determine thresholds for minority and low-income populations to identify potential impacts.
- Compare the potential for adverse impacts among the route alternatives evaluated by averaging the percentage of the population considered a minority and in poverty.

The analysis of potential environmental justice impacts is based on data from the 2000 and 2010 U.S. Census, and poverty rates are shown by county, state, and country for earlier time periods to represent change between 1960 and 2010. Thematic census maps were generated for this analysis showing the percentage of persons below the poverty level and the percentage of persons who are Hispanic or of a race other than white from the U.S. Census data generated in 2013. The geography used in the evaluation for the screening analysis is by any census block group that is within the 80-foot total buffer. The block group represents the smallest geography for which the most important data are readily available (i.e., both for race/ethnicity and poverty). The setting information is provided at the county, state, and country level. The thresholds used to determine potential impacts are provided in the *Thresholds* section below.

The comparison of potential impacts among the alternatives was reached by taking the percentages of minority population or population below poverty level for each census block or tract within a 40-foot buffer on each side of each route alternative and creating an overall average for each alternative. By comparing the overall average, ICF was able to determine which alternative has a larger population of poverty or minority populations in comparison to the other route alternatives. The evaluation calculates the overall percentage by census block for each alternative with all census blocks and tracts weighted the same, regardless of how much

area is included within the route alternative or population numbers within each census tract. The constraints level of analysis provides a generalized look into environmental justice populations along each route alternative and creates a percentage for comparison based on available data provided by the U.S. Census Bureau. Due to the large amount of census tracts and blocks (up to 138 blocks for just Alternative 5) within the buffer, a detailed review of demographic information for each census block or tract within the study area was not conducted for this screening analysis.

During the later stages of fine-level analysis, it was determined that sufficient passenger train slots are available under current operating agreements for Route Alternative 1. Based on this information, additional infrastructure (e.g. no improvements to the existing rail route) would not be required or needed if RCTC dedicates that needed slots to the Coachella Valley service. In no additional infrastructure is required, no direct environmental impacts are anticipated to occur. However, in the event that additional infrastructure is needed for Route Alternative 1, this memorandum contains applicable information about the types of environmental resources that may occur within and along Route Alternative 1.

Thresholds

Poverty thresholds are the dollar amounts used to determine poverty status. Each person or family is assigned one out of 48 possible poverty thresholds according to the size of the family or ages of the members. The same thresholds are used throughout the U.S, and do not vary geographically. Although the thresholds in some sense reflect families' needs, they are intended for use as a statistical yardstick, and not as a complete description of what people and families need to live. Table 1 shows the poverty thresholds used by the U.S. Census in calculating poverty levels by size of family unit.

Table 1. Poverty Thresholds for 2013 by Size of Family

Size of Family Unit	Poverty Threshold ($)
1	11,888
2	15,142
3	18,552
4	23,834
5	28,265
6	31,925
7	36,384
8	40,484
9 or more	48,065

For family units as a weighted average threshold.

Source: U.S. Census Bureau. (How the Census Bureau Measures Poverty, Measure of Need [Poverty Thresholds]). Excel data accessed on 9/10/2015 from http://www.census.gov/hhes/www/poverty/about/overview/measure.html.

As this is a screening-level evaluation, this analysis was not developed in accordance with U.S. Department of Transportation (DOT) Order 5610.2 to *Address Environmental Justice in Minority Populations and Low-Income Populations* and the Council on Environmental Quality's (CEQ) *Environmental Justice–Guidance Under the National Environmental Policy Act*; however, the analysis utilizes definitions and requirements from these guidance documents in the fine-level screening. Race and income are socioeconomic characteristics critical to the consideration of a project's impacts on minority and low-income populations referred to as environmental justice populations. The CEQ guidance defines a minority person as any individual who is a member of any of the following population groups: American Indian, Alaska Native, Asian, Pacific Islander, Black, or Hispanic. A low-income person is defined as any individual whose household income is at or below the U.S. Census Bureau's annual statistical poverty thresholds, which are based on the Department of Health and Human Services poverty guidelines.

The results below include the percentage of census block or tract that is considered in poverty or a minority based on available 2013 U.S. Census data. The analysis also includes the percentage of census blocks and tracts for each route alternative that have more than 50% minority populations. The block groups composing the project area qualify as minority populations because they contain minority populations greater than 50%.

Existing Setting

Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. The Federal Highway Administration (FHWA) provided a directive for use in complying with Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, dated February 11, 1994. The 1994 Presidential Executive Order directed every federal agency to make environmental justice part of its mission by identifying and addressing the effects of all programs, policies, and activities on "minority populations and low-income populations."

The need to consider environmental justice is also embodied in federal regulations, including Title VI of the Civil Rights Act of 1964, the National Environmental Policy Act of 1969 (NEPA), laws governing the use of federal aid (Section 109(h) of United States Code [USC] Title 23), and Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU).

Executive Order 12898 directs federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of agency programs, policies, and activities on minority populations and low-income populations. The fundamental environmental justice principles are threefold.

- To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and/or low-income populations.
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.

- To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority populations and/or low-income populations.

The communities of particular concern to the assessment of environmental justice are those identified as minority or low-income communities. These environmental justice communities are defined in accordance with Executive Order 12898 as identifiable groups of people, typically living in geographic proximity. Low-income and minority populations are defined as follows.

Low-income population is any readily identifiable group of low-income persons who live in geographic proximity, and, if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who will be similarly affected by a proposed DOT program, policy, or activity.

Minority population is any readily identifiable group of minority persons who live in geographic proximity, and, if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who will be similarly affected by a proposed DOT program, policy, or activity.

Executive Order 12898 established responsibility for federal agencies to address environmental justice in minority and low-income populations. Should a federal nexus, such as funding or permitting, become a part of the proposed project, the effects of the project on minority and low-income populations would need to be addressed. If future projects disproportionately adversely affect areas with concentrations of poor or minority populations, such as with substantial noise, land use/housing disturbance, land use incompatibility, aesthetic impacts, substantial light and glare, or impacts on recreational resources, these impacts could be considered in conflict with the purpose of environmental justice regulations.

The area defined as the affected area includes four existing rail lines, identified as Alternatives 1, 4-A, 4-B, and 5, within Los Angeles, Orange, San Bernardino, and Riverside counties in Southern California, with the beginning point of LAUS and the end point in Colton, as shown in Figure 1. The area evaluated includes a 40-foot buffer from the centerline or an 80-foot buffer surrounding the railway. Census blocks and tracts that are included within the buffer area were evaluated in this analysis.

As shown in Table 2, of the four counties evaluated for the project, Orange County has the lowest percentage of people considered in poverty from 1960 through 2010, whereas Riverside County has the fewest amount of people in poverty by numbers for the same time period, although the percentage is higher overall. Los Angeles has the highest poverty rate from 1980 to 2000, with San Bernardino County having a larger percentage of people in poverty in 2010. Overall, Los Angeles has the largest percentage of population in poverty and the largest amount of people in comparison to the other counties evaluated.

Table 3 shows demographics and minority populations for all four counties within the project area and the state of California for 2010. Minority population statistics are for persons who are Hispanic or of a race other than white, as reported in the Census. According to the 2010 Census data, the largest population of non-whites are located in Los Angeles (49.7%) and San Bernardino (43.3%) counties, which are the only two counties that exceed the state average (42.9%) for non-whites. The lowest percentage of people considered a minority are located in Riverside County (39.0%), followed closely by Orange County (39.2%).

Table 2. Population, Poverty Rates, and Persons in Poverty by County, State, and Nationwide from 1960 to 2010

Area	1960	1970	1980	1990	2000	2010
Total Population						
Los Angeles	5,927,399	6,902,701	7,338,827	8,682,078	9,349,771	9,684,503
Orange	693,008	1,401,954	1,902,996	2,369,931	2,803,533	2,985,156
Riverside	296,785	447,712	651,793	1,143,985	1,511,153	2,157,713
San Bernardino	483,896	658,800	869,141	1,377,485	1,662,617	1,995,666
California	15,234,350	19,425,370	23,106,594	29,003,219	33,100,044	36,575,460
United States	175,034,505	198,059,959	220,845,766	241,977,859	273,882,232	301,333,410
Poverty Rates						
Los Angeles	13.0	10.9	13.4	15.1	17.9	17.1
Orange	10.4	6.5	7.3	8.5	10.3	11.7
Riverside	18.9	13.6	11.3	11.5	14.2	15.6
San Bernardino	16.9	12.2	11.1	12.7	15.8	17.6
California	14.4	11.1	11.4	12.5	14.2	15.3
United States	22.1	13.7	12.4	13.1	12.4	14.9
Persons in Poverty						
Los Angeles	771,547	752,554	984,816	1,308,255	1,674,599	1,658,231
Orange	72,112	90,484	138,585	200,860	289,475	349,220
Riverside	56,074	60,680	73,394	131,690	214,084	335,557
San Bernardino	81,652	80,225	96,284	174,727	263,412	350,982
California	2,199,376	2,152,716	2,626,580	3,627,585	4,706,130	5,590,100
United States	38,684,545	27,124,985	27,392,580	31,742,864	33,899,812	44,852,527

Sources: https://www.census.gov/hhes/www/poverty/data/census/1960/index.html
http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_12_5YR_S1701&prodType=table
Note: Data labeled as the year 2010 are from the 2008–2012 American Community Survey 5-Year estimate
(accessed: September 8, 2015)

Table 3. Demographic Data and Minority Populations by County/State, 2010

	Los Angeles County (%) (2010)	Orange County (%) (2010)	Riverside County (%) (2010)	San Bernardino County (%) (2010)	California (%) (2010)
Race					
White	50.3	60.8	61.0	56.7	57.6
Black or African American	8.7	1.7	6.4	8.9	6.2
American Indian and Alaska Native	0.7	0.6	1.1	1.1	1.0
Asian	13.7	17.9	6.0	6.3	13.0
Native Hawaiian other Pacific Islander	0.3	0.3	0.3	0.3	0.4
Some other race	21.8	14.5	20.5	21.6	17.0
Two or more races	4.5	4.2	4.8	5.0	4.9
Origin					
Hispanic	47.7	33.7	45.5	49.2	37.6
Not Hispanic (One Race)	52.3	66.3	54.5	50.8	62.4
Minority					
Non-White	49.7	39.2	39.0	43.3	42.4

Source: U.S. Census Bureau 2010.

Community Impacts

NEPA, as amended, established that the federal government use all practicable means to ensure that all Americans have safe, healthful, productive, and aesthetically and culturally pleasing surroundings (42 USC 4331(b)(2)). FHWA, in its implementation of NEPA (23 USC 109(h)), directs that final decisions regarding projects are to be made in the best overall public interest. This requires taking into account adverse environmental effects, such as the destruction or disruption of human-made resources, community character and cohesion, and the availability of public facilities and services.

Railroad facilities have been part of the local setting since the 1800s in many areas surrounding the route alignments. Therefore, the rail right-of-way is an existing feature in this area. The rail corridor is owned by multiple parties including Atchison, Topeka, and Santa Fe, the predecessor to Burlington Northern Santa Fe, which operates freight and commuter rail service on the lines; Southern California Regional Rail Authority; Los Angeles County Metropolitan Transportation Authority; and the San Bernardino Associated Governments. The rail corridor includes subsurface infrastructure (e.g., bridges, drainage facilities, utility lines). The rail line is single-, double-, and sometimes triple-tracked.

The alternatives traverse 38 cities within Los Angeles, Orange, Riverside, and San Bernardino counties. Land within the 80-foot buffer includes a variety of uses: transportation, utilities,

single- and multi-family residential, education, commercial, industrial, agricultural, open space and recreation, and vacant.[1]

The existing land use setting is similar for all four route alternatives in that the two largest land uses are transportation, communications, and utilities, which compose 40–61% of the land uses along each route alignment; and industrial uses, which compose 19–21% of the land uses along each route alignment. Differences in land uses along the alternatives include the types of residential use (single-family versus multi-family use) and the varying amounts of commercial and vacant land located within the 80-foot buffer.

Results

The following sections summarize the findings of the fine-level screening for environmental justice and briefly consider possible project impacts on these resources by route alternative. Figures depicting the distribution of areas with high levels of minority populations or populations below the poverty level are provided in Appendix A. Appendix B includes summary tables comparing all route alternatives; individual impact tables for each route alternative are provided below.

Alternative 1

Poverty

There are 72 census tracts that were evaluated within the 80-foot buffer for Alternative 1. A calculation to determine the average poverty rate for all census tracts included within the buffer amounted to an average of 16.69%, which is the lowest among all the route alternatives evaluated (Alternatives 1, 4-A, 4-B, and 5). The poverty rates within the census tracts range from 0% (Census Tract 218.13, City of Anaheim, Orange County) to 48.5% (Census Tract 2060.50, City of Los Angeles, Los Angeles County) along this route alternative, which is also the lowest range for all route alternatives evaluated. Table 4 shows the summary of affected environmental resources for Alternative 1. In relation to all other alternatives, Alternative 1 has the fewest people considered in poverty (16.69%), although the poverty rate is still higher in comparison to California (15.3%) and the country (14.9%) from the 2010 Census (Table 2).

Table 4. Alternative 1 Environmental Justice Populations within Right-of-Way and Buffer

Environmental Resource	Within Right-of-Way and Buffer
Environmental Justice Populations	For all Census tracts within an 80-foot total buffer: • 16.69% average rate of poverty • 39% minority populations • 28% of block group census tracts with more than 50% minority population

[1] Southern California Association of Governments (SCAG). 2010. 2008 Existing Land Use Database for Los Angeles, Orange, Riverside, and San Bernardino Counties. http://gisdata.scag.ca.gov/Pages/GIShome.aspx. Accessed September 15, 2015.

Minority Population

There are 106 block group census tracts that were evaluated within the 80-foot buffer for Alternative 1. The percentage of minority population for all census tracts within the buffer combined was 39%, which is the lowest among all the route alternatives evaluated and lower than the percentage of minority populations in California (42.4%) from the 2010 Census (Table 3). The percentage of minority persons within the census block group tracts ranges from 0% (Block Group 2, Census Tract 117.22, City of Placentia, Orange County) to 91% (Block Group 4, Census Tract 1106.05, City of Fullerton, Orange County) for this alternative, which is also the lowest range of minority populations for all route alternatives evaluated. Alternatives 1, 4-A, and 4-B have the same high minority rate of 91%, although the block group census tract found with the highest percentage of minority populations for Alternative 1 is within the City of Fullerton, whereas the block group census tract with the same highest percentage is within the City of Rosemead for Alternatives 4-A and 4-B. The population in this census tract is considered mostly Asian. In comparison to all other alternatives, Alternative 1 has the fewest minority population, with 28% of block group census tracts having more than 50% minority populations as compared to the other route alternatives.

Alternative 4-A

Poverty

There are 89 census tracts that were evaluated within the 80-foot buffer for Alternative 4-A. A calculation to determine the average poverty rate for all census tracts included within the buffer amounted to an average of 18.66%, which is the second lowest among all the route alternatives evaluated. The poverty rates within the census tracts range from 3.1% (Census Tract 4019.02, City of Claremont, Los Angeles County) to 49% (Census Tract 2031, City of Los Angeles, Los Angeles County) along this route alternative, which is also the second lowest range for all route alternatives evaluated, with Alternative 1 being the lowest. Table 5 shows the summary of affected environmental resources for Alternative 4-A. In relation to all other alternatives, Alternative 4-A has the second fewest people considered in poverty.

Table 5. Alternative 4-A Environmental Justice Populations within Right-of-Way and Buffer

Environmental Resource	Within Right-of-Way and Buffer
Environmental Justice Populations	For all Census tracts within an 80-foot total buffer: • 18.66% average rate of poverty • 49% minority populations • 46% of block group census tracts with more than 50% minority population

Minority Population

There are 125 block group census tracts that were evaluated within the 80-foot buffer for Alternative 4-A. The percentage of minority population for all census tracts within the buffer combined was 49%, which is the second lowest among all the route alternatives evaluated, the same as Alternative 4-B, and higher than the percentage of minority populations in California

(42.4%) from the 2010 Census (Table 3). The percentage of minority persons within the census block group tracts ranges from 7% (Block Group 3, Census Tract 4020.02, City of Claremont, Los Angeles County) to 91% (Block Group 1, Census Tract 4336.01, City of Rosemead, Los Angeles County) for this alternative, which is the second lowest range of minority populations for all route alternatives evaluated and the same as Alternative 4-B. Alternatives 1, 4-A, and 4-B have the same high minority rate of 91%, although the block group census tract found with the highest percentage of minority populations for Alternatives 4-A and 4-B is in the City of Rosemead rather than within the City of Fullerton, as for Alternative 1. The population in this census tract is considered mostly Asian with large populations of Hispanic persons. In comparison to all other alternatives, Alternative 4-A has the second fewest minority population, with 46% of block group census tracts having more than 50% minority populations as compared to the other route alternatives, which is also the same as Alternative 4-B.

Alternative 4-B

Poverty

There are 90 census tracts that were evaluated within the 80-foot buffer for Alternative 4-B. A calculation to determine the average poverty rate for all census tracts included within the buffer amounted to an average of 19.12%, which is the highest among all the route alternatives evaluated. The poverty rates within the census tracts range from 3.1% (Census Tract 4019.02, City of Claremont, Los Angeles County) to 60.2% (Census Tract 57.01, City of San Bernardino, San Bernardino County) along this route alternative, which is also the largest range for all route alternatives evaluated and the same as Alternative 5. Table 6 shows the summary of affected environmental resources for Alternative 4-B. In relation to all other alternatives, Alternative 4-B has the largest percentage of people considered in poverty.

Table 6. Route Alternative 4-B Environmental Justice Populations within Right-of-Way and Buffer

Environmental Resource	Within Right-of-Way and Buffer
Environmental Justice Populations	For all Census tracts within an 80-foot total buffer: • 19.12% average rate of poverty • 49% minority populations • 46% of block group census tracts with more than 50% minority population

Minority Population

There are 127 block group census tracts that were evaluated within the 80-foot buffer for Alternative 4-B. The percentage of minority population for all census tracts within the buffer combined was 49%, which is the second lowest among all the route alternatives evaluated, the same as Alternative 4-A, and higher than the percentage of minority populations in California (42.4%) from the 2010 Census (Table 3). The percentage of minority persons within the census block group tracts ranges from 7% (Block Group 3, Census Tract 4020.02, City of Claremont, Los Angeles County) to 91% (Block Group 1, Census Tract 4336.01, City of Rosemead, Los Angeles

County) for this alternative, which is the second lowest range of minority populations for all route alternatives evaluated and the same as Alternative 4-A. Alternatives 1, 4-A, and 4-B have the same high minority rate of 91%, although the block group census tract found with the highest percentage of minority populations for Alternatives 4-A and 4-B is in the City of Rosemead rather than within the City of Fullerton, as for Alternative 1. In comparison to all other alternatives, Alternative 4-B has the second fewest minority population, with 46% of block group census tracts having more than 50% minority populations as compared to the other route alternatives, which is also the same as Alternative 4-A.

Alternative 5

Poverty

There are 95 census tracts that were evaluated within the 80-foot buffer for Alternative 5. A calculation to determine the average poverty rate for all census tracts included within the buffer amounted to an average of 18.74%, which is the second highest among all the route alternatives evaluated and is similar to Alternative 4-A (18.66%). The poverty rates within the census tracts range from 3.1% (Census Tract 4019.02, City of Claremont, Los Angeles County) to 60.2% (Census Tract 57.01, City of San Bernardino, San Bernardino County) along this route alternative, which is also the largest range for all route alternatives evaluated and the same as Alternative 4-B. Table 7 shows the summary of affected environmental resources for Alternative 5. In relation to all other alternatives, Alternative 5 has the second largest percentage of people considered in poverty.

Table 7. Route Alternative 5 Environmental Justice Populations within Right-of-Way and Buffer

Environmental Resource	Within Right-of-Way and Buffer
Environmental Justice Populations	For all Census tracts within an 80-foot total buffer: • 18.74% average rate of poverty • 51% minority populations • 50% of block group census tracts with more than 50% minority population

Minority Population

There are 138 block group census tracts that were evaluated within the 80-foot buffer for Alternative 5. The percentage of minority population for all census tracts within the buffer combined was 51%, which is the highest among all the route alternatives evaluated, and higher than the percentage of minority populations in California (42.4%) from the 2010 Census (Table 3). The percentage of minority persons within the census block group tracts ranges from 7% (Block Group 3, Census Tract 4020.02 City of Claremont, Los Angeles County) to 93% (Block Group 1, Census Tract 4811, City of San Gabriel, Los Angeles County) for this alternative, which is the highest range of minority populations for all route alternatives evaluated. The population in this census tract is considered mostly Asian with large populations of Hispanic persons. In comparison to all other alternatives, Alternative 5 has the largest minority population, with 50%

of block group census tracts having more than 50% minority populations as compared to the other route alternatives.

Conclusion

The block groups composing the project area qualify as minority populations because they contain minority populations greater than 50%. Based on these demographic characteristics, and in considering the overall general demographics for each of the counties in the study area, 28% of the census block groups for Alternative 1, 46% of the census block groups for Alternatives 4-A and 4-B, and 50% of the census block groups for Alternative 5 contain minority populations, respectively. Overall, Alternative 1 is considered to have the fewest environmental justice populations, with the lowest poverty rate and the fewest minority populations. Alternative 4-B has the largest population of persons in poverty, while Alternative 5 has the largest minority populations and the most census tracts with more than 50% minority populations.

The area of the highest poverty (more than 40.1%) and minority (more than 68.8%) populations combined adjacent to all alternatives is found in the City of Los Angeles (Census Tract 2060.10) in Los Angeles County, north of LAUS on the westernmost end of the project area. This area near Mission Junction experiences a minority population of 82% and a poverty rate of 44.6%. Other areas along the route alternatives experience high poverty levels ***or*** large minority populations, but in most cases not both. Areas of high rates of poverty (more than 40.1%) or minority (more than 68.8%) populations include other areas of Los Angeles and the cities of Alhambra, San Gabriel, Rosemead, Temple City, El Monte, Baldwin Park, Fontana, and San Bernardino for Alternatives 4-A, 4-B, and 5; for Alternative 1, these areas include other areas of Los Angeles and the cities of Vernon, Norwalk, Fullerton, Chino Hills, Riverside, Highgrove, and Colton.

Community Impacts

The proposed project would operate within an existing rail corridor for all alternatives. Adjacent properties are located in an area where railroad facilities have existed as part of the local community setting for many decades and, in some cases, communities along each route alternative were originally established in association with the railroad. Although passenger rail service is currently provided along the existing railways, the introduction of additional passenger service would not adversely affect community character and cohesion because of the existing use (i.e., commuter rail and freight service) along the right-of-way, although the populations surrounding the rail line would likely experience additional impacts related to noise, air quality, traffic, etc. with the expansion of rail service through their communities. These concerns would be evaluated in more detail as a part of the project analysis once an alternative is chosen. Community disruption is addressed in the Land Use memo.

Appendix A
Figures

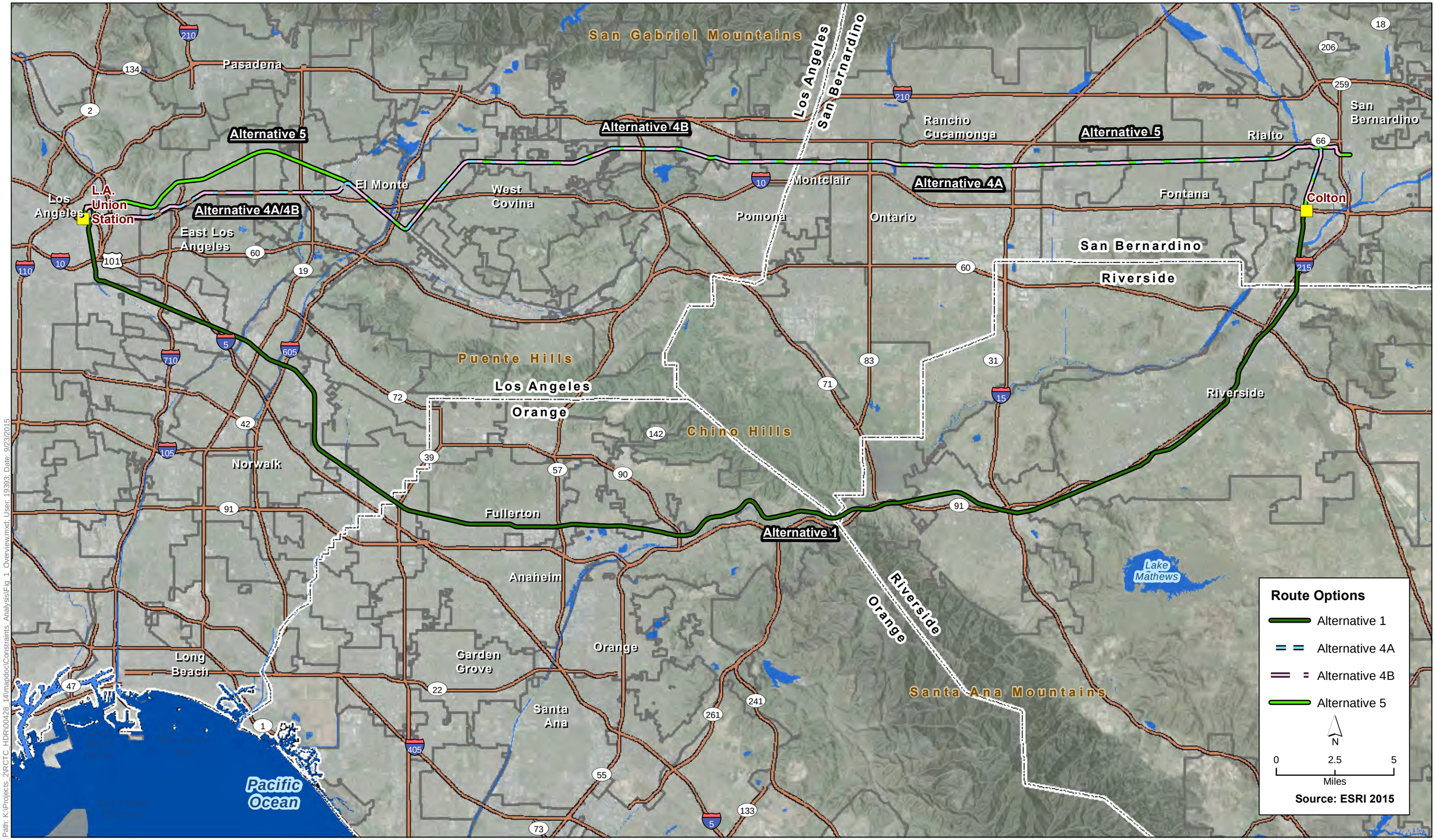

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Figure 1
Location Overview
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives

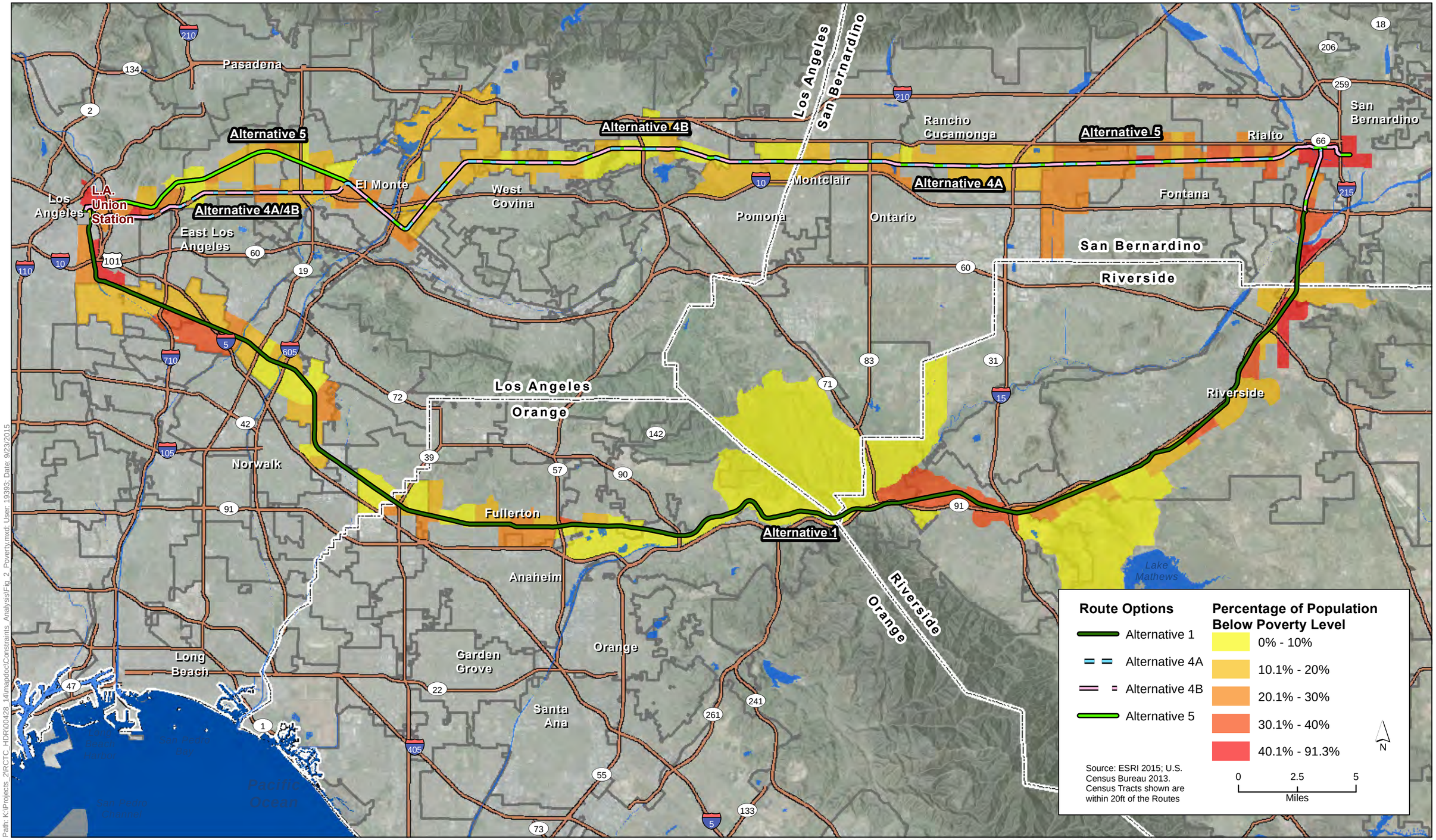

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Figure 2
Populations Below the Poverty Level
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives

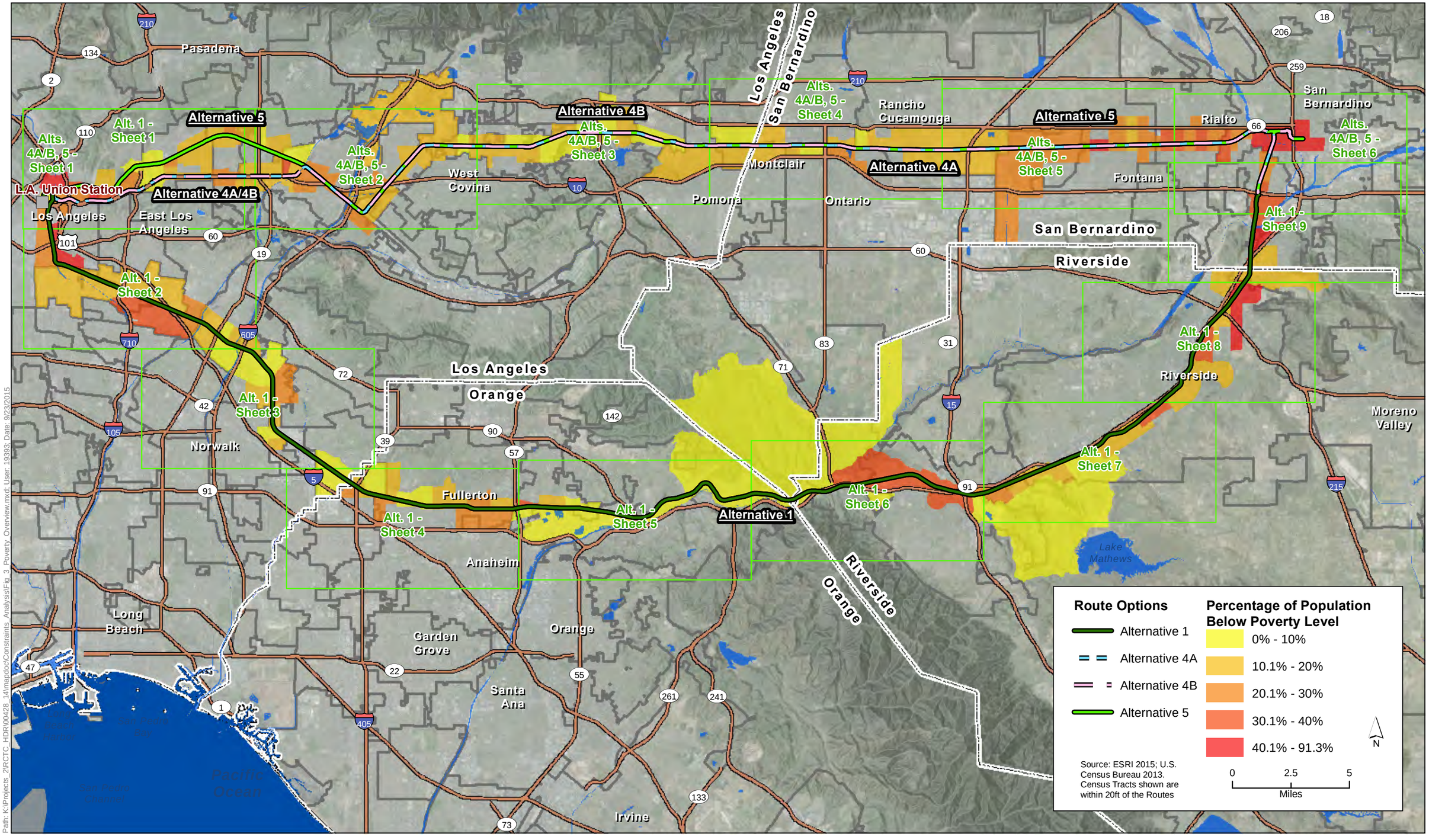

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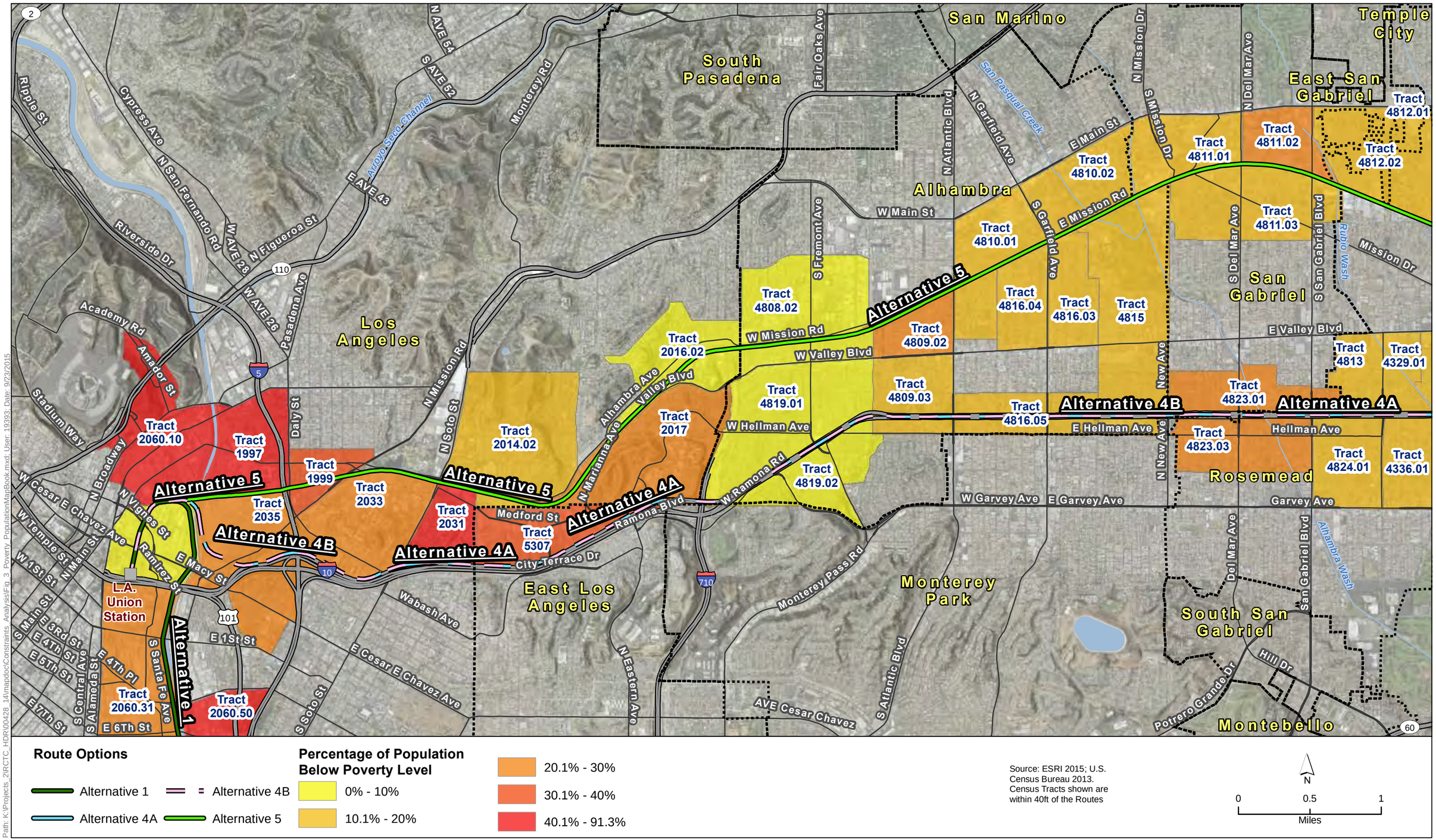
Figure 3
Populations Below the Poverty Level
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives



Route Options

- Alternative 1
- Alternative 4B
- Alternative 4A
- Alternative 5

Percentage of Population Below Poverty Level

- 0% - 10%
- 10.1% - 20%
- 20.1% - 30%
- 30.1% - 40%
- 40.1% - 91.3%

Source: ESRI 2015; U.S. Census Bureau 2013. Census Tracts shown are within 40ft of the Routes

N

0 0.5 1 Miles

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Figure 3
Populations Below the Poverty Level Along Alternative 1 - Sheet 1
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives

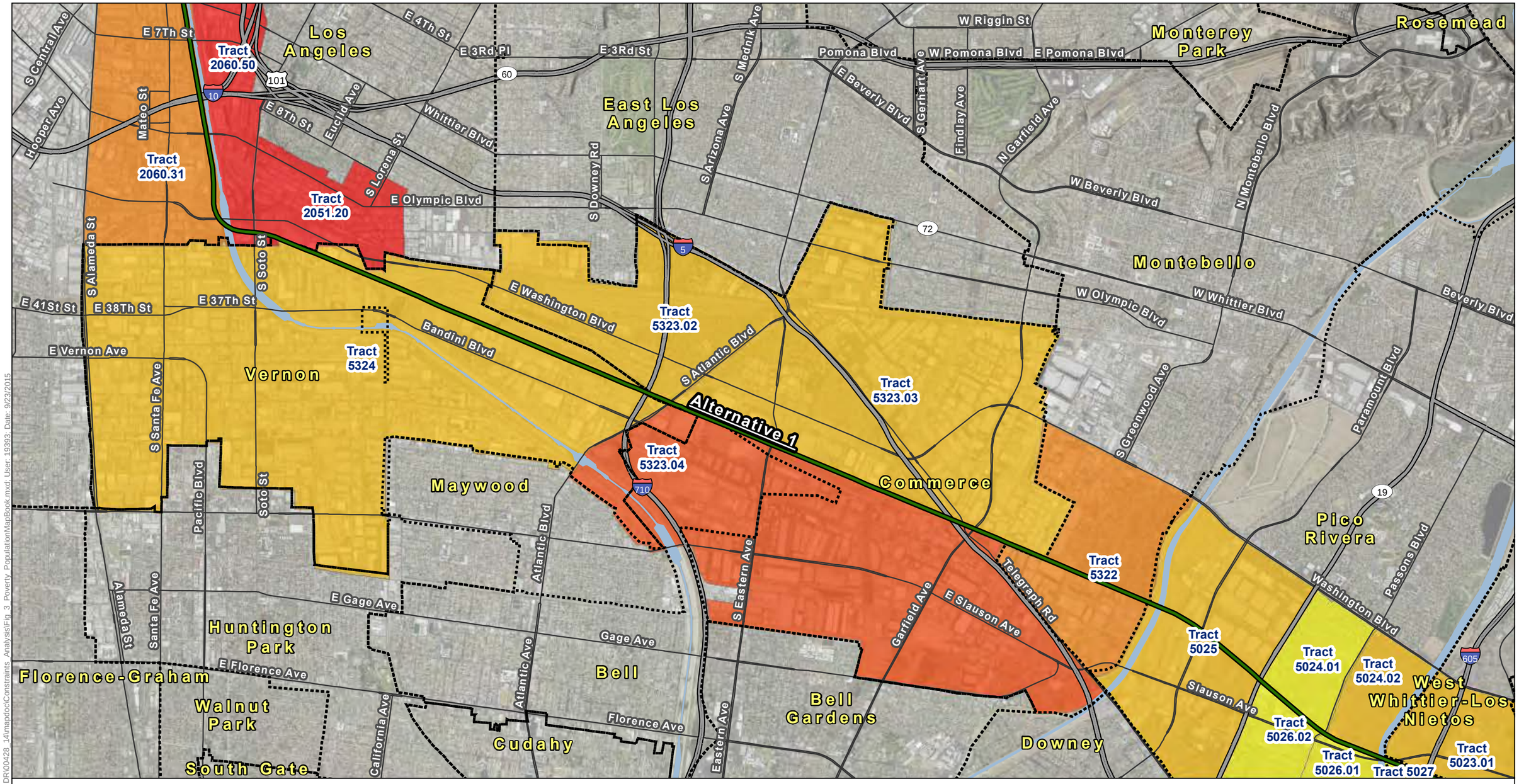

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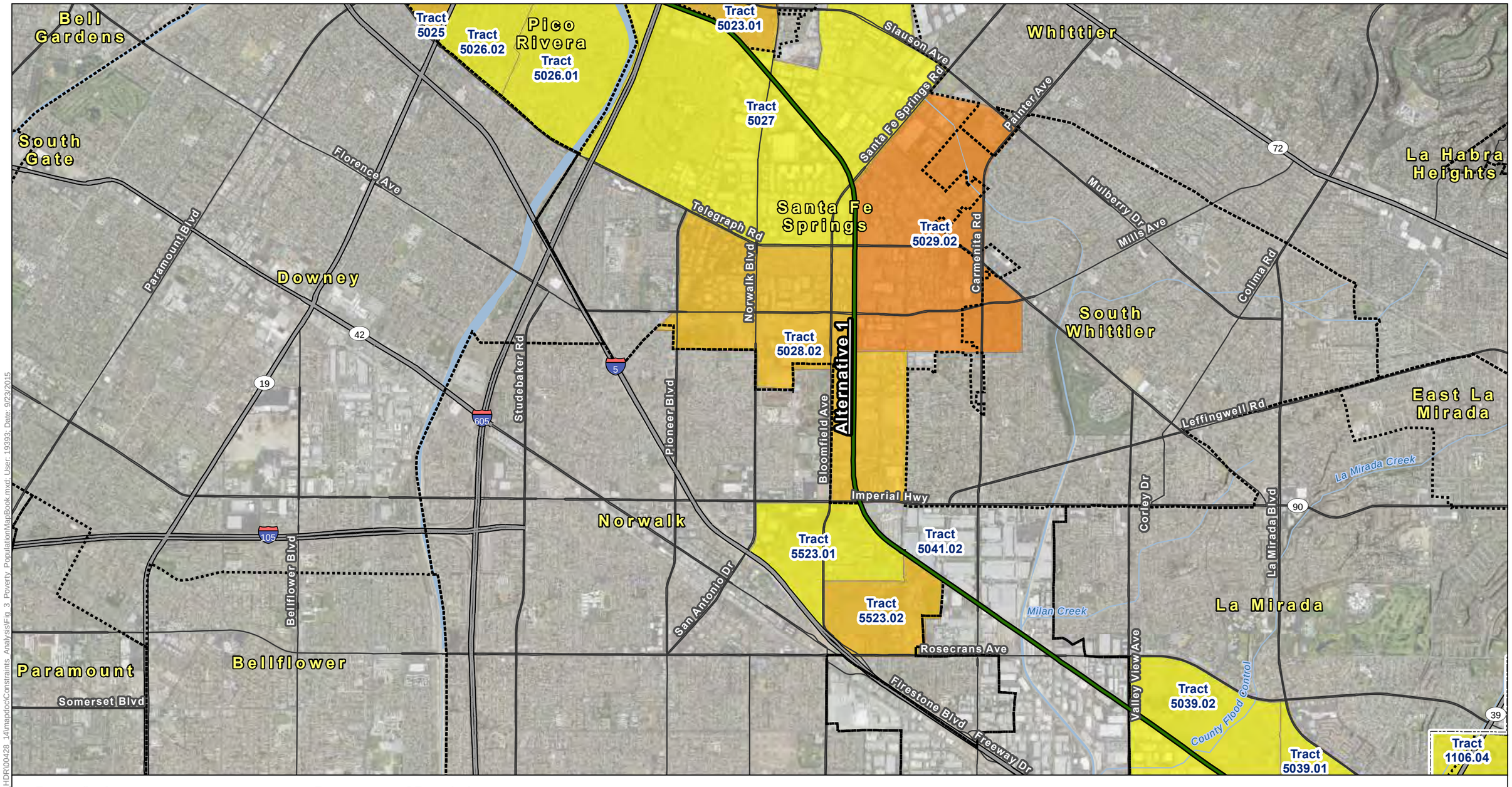
Figure 3
Populations Below the Poverty Level Along Alternative 1 - Sheet 2
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives



Route Options

- Alternative 1
- Alternative 4A
- Alternative 4B
- Alternative 5

Percentage of Population Below Poverty Level

- 0% - 10%
- 10.1% - 20%
- 20.1% - 30%
- 30.1% - 40%
- 40.1% - 91.3%

Source: ESRI 2015; U.S. Census Bureau 2013. Census Tracts shown are within 40ft of the Routes

N

0 0.5 1 Miles

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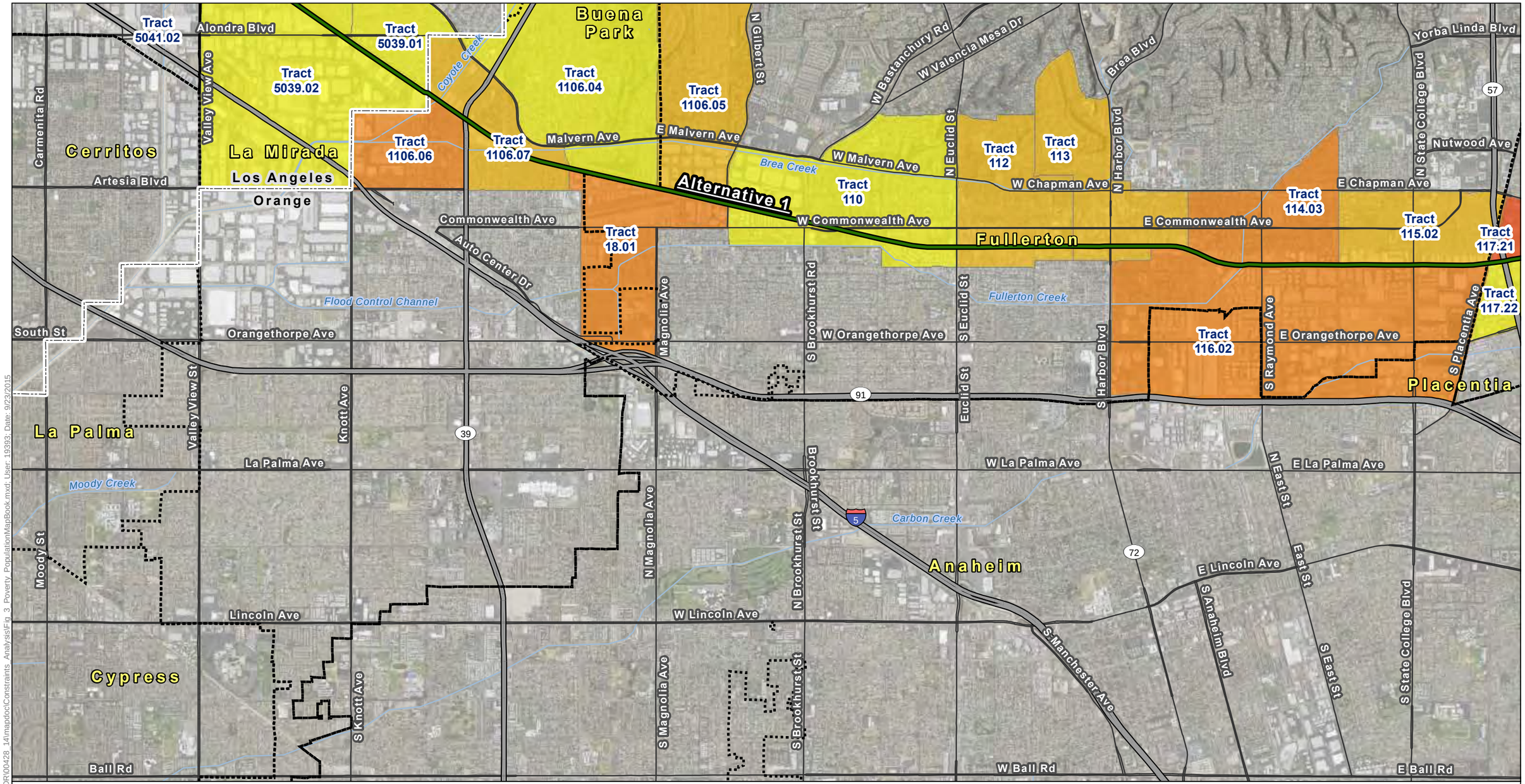
Figure 3
Populations Below the Poverty Level Along Alternative 1 - Sheet 3
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives



Route Options

- Alternative 1
- Alternative 4A
- Alternative 4B
- Alternative 5

Percentage of Population Below Poverty Level

- 0% - 10%
- 10.1% - 20%
- 20.1% - 30%
- 30.1% - 40%
- 40.1% - 91.3%

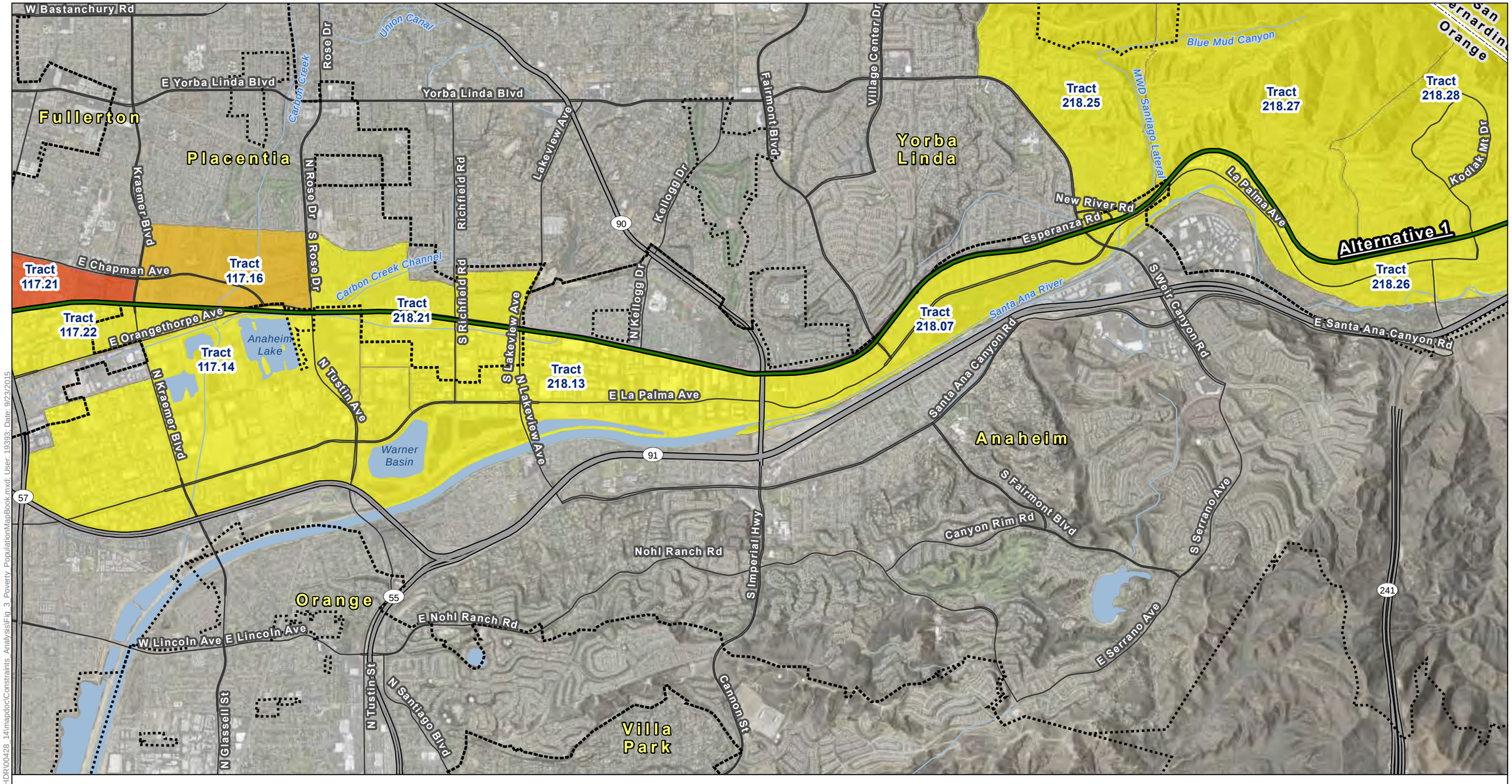
Source: ESRI 2015; U.S. Census Bureau 2013. Census Tracts shown are within 40ft of the Routes

N

0 0.5 1 Miles

Path: K:\Projects_2\RCTC_HDR\00428_14\mapdoc\Constraints_Analysis\Fig_3_Poverty_PopulationMapBook.mxd; User: 19393; Date: 9/23/2015

Figure 3
Populations Below the Poverty Level Along Alternative 1 - Sheet 4
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives



Route Options

- Alternative 1
- Alternative 4A
- Alternative 4B
- Alternative 5

Percentage of Population Below Poverty Level

- 0% - 10%
- 10.1% - 20%
- 20.1% - 30%
- 30.1% - 40%
- 40.1% - 91.3%

Source: ESRI 2015; U.S. Census Bureau 2013. Census Tracts shown are within 40ft of the Routes

N

0 0.5 1 Miles

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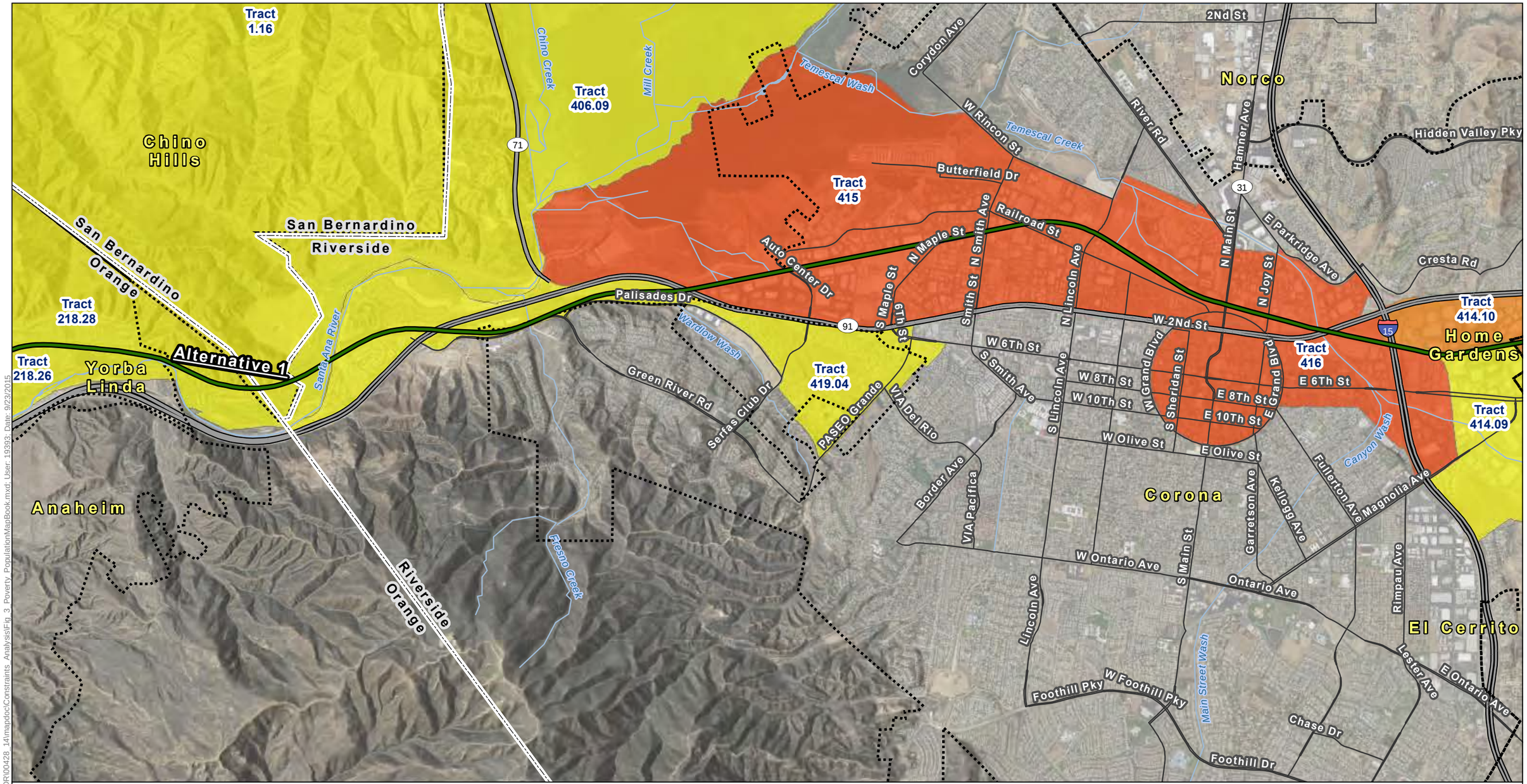
Figure 3
Populations Below the Poverty Level Along Alternative 1 - Sheet 5
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives



Route Options

- Alternative 1
- Alternative 4A
- Alternative 4B
- Alternative 5

Percentage of Population Below Poverty Level

- 0% - 10%
- 10.1% - 20%
- 20.1% - 30%
- 30.1% - 40%
- 40.1% - 91.3%

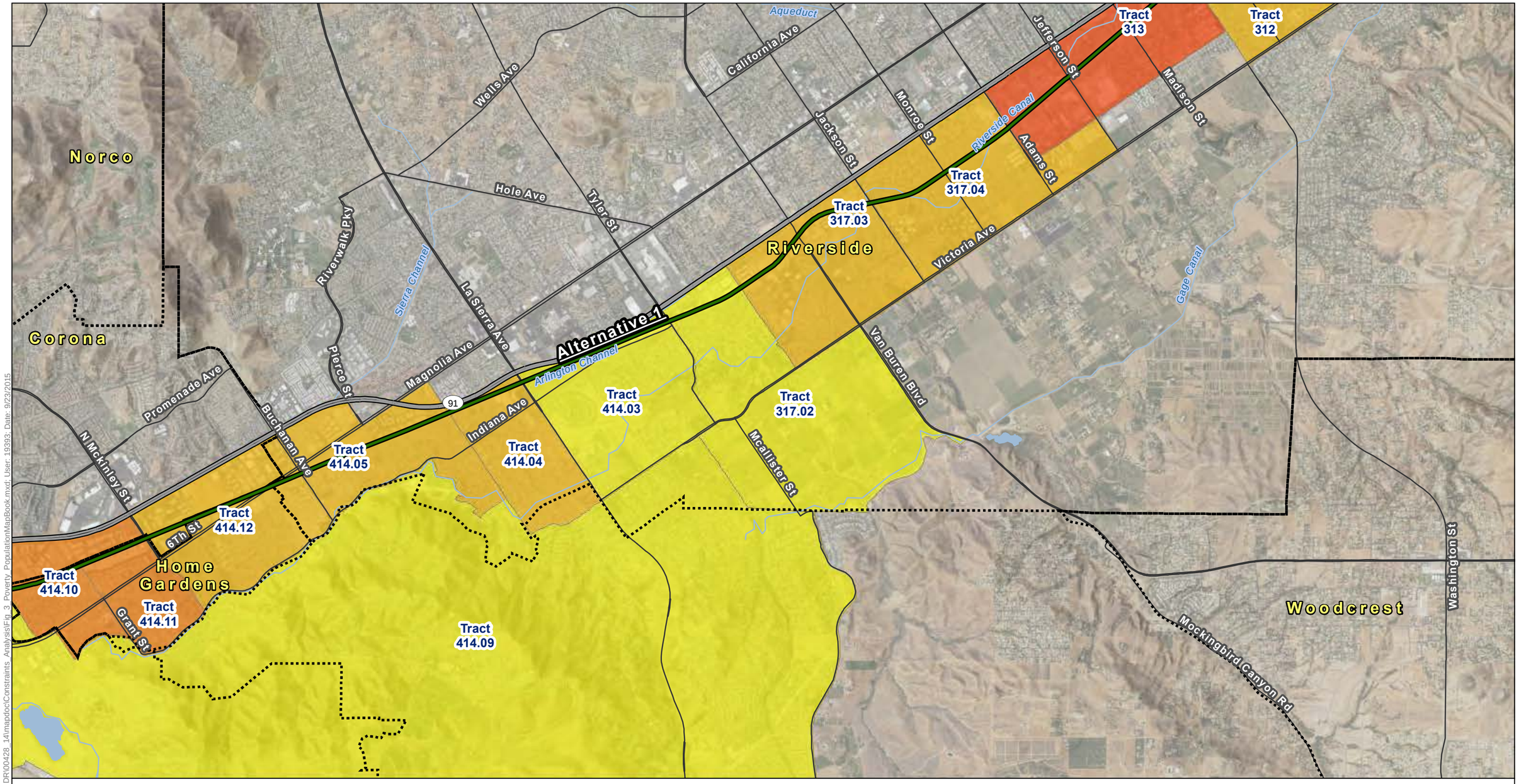
Source: ESRI 2015; U.S. Census Bureau 2013. Census Tracts shown are within 40ft of the Routes

N

0 0.5 1 Miles

Path: K:\Projects_2\RCTC_HDR\00428_14\mapdoc\Constraints_Analysis\Fig_3_Poverty_PopulationMapBook.mxd; User: 19393; Date: 9/23/2015

Figure 3
Populations Below the Poverty Level Along Alternative 1 - Sheet 6
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives



Route Options

- Alternative 1
- Alternative 4A
- Alternative 4B
- Alternative 5

Percentage of Population Below Poverty Level

- 0% - 10%
- 10.1% - 20%
- 20.1% - 30%
- 30.1% - 40%
- 40.1% - 91.3%

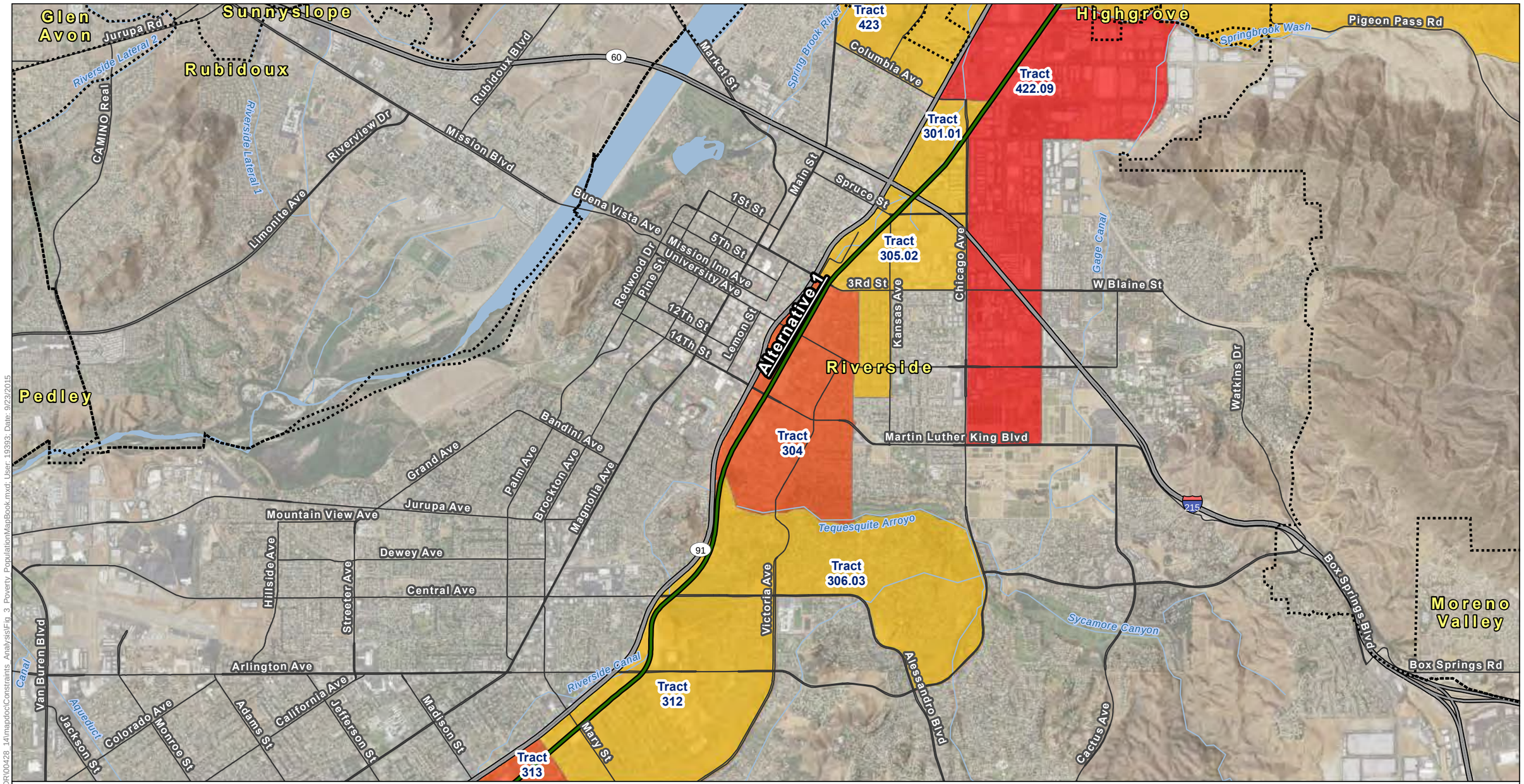
Source: ESRI 2015; U.S. Census Bureau 2013. Census Tracts shown are within 40ft of the Routes

N

0 0.5 1 Miles

Path: K:\Projects_2\RCTC_HDR\00428_14\mapdoc\Constraints_Analysis\Fig_3_Poverty_PopulationMapBook.mxd; User: 19393; Date: 9/23/2015

Figure 3
Populations Below the Poverty Level Along Alternative 1 - Sheet 7
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives



Route Options

- Alternative 1
- Alternative 4A
- Alternative 4B
- Alternative 5

Percentage of Population Below Poverty Level

- 0% - 10%
- 10.1% - 20%
- 20.1% - 30%
- 30.1% - 40%
- 40.1% - 91.3%

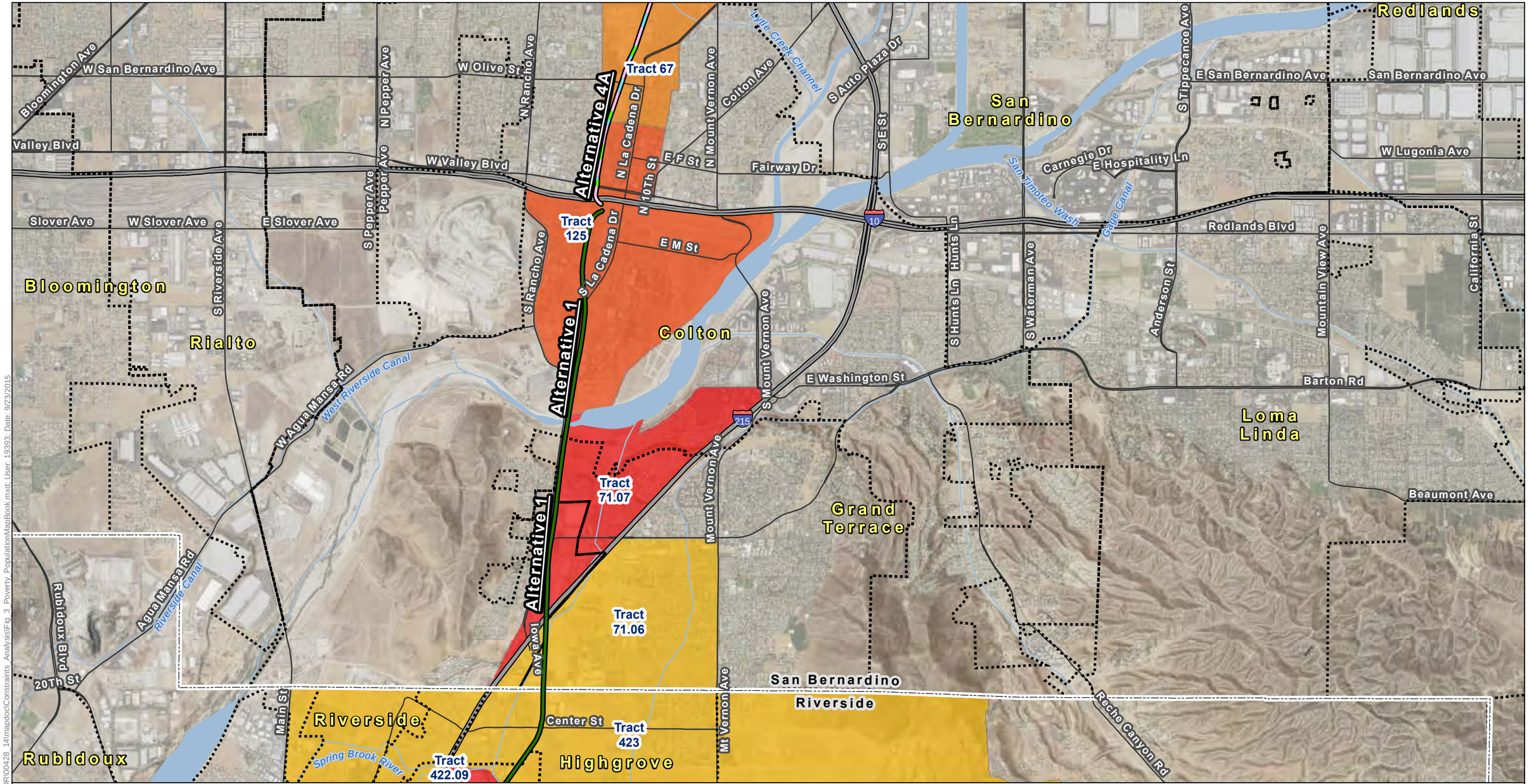
Source: ESRI 2015; U.S. Census Bureau 2013. Census Tracts shown are within 40ft of the Routes

N

0 0.5 1 Miles

Path: K:\Projects_2\RCTC_HDR\00428_14\mapdoc\Constraints_Analysis\Fig_3_Poverty_PopulationMapBook.mxd User: 19393; Date: 9/23/2015

Figure 3
Populations Below the Poverty Level Along Alternative 1 - Sheet 8
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives



Route Options

- Alternative 1
- Alternative 4A
- Alternative 4B
- Alternative 5

Percentage of Population Below Poverty Level

- 0% - 10%
- 10.1% - 20%
- 20.1% - 30%
- 30.1% - 40%
- 40.1% - 91.3%

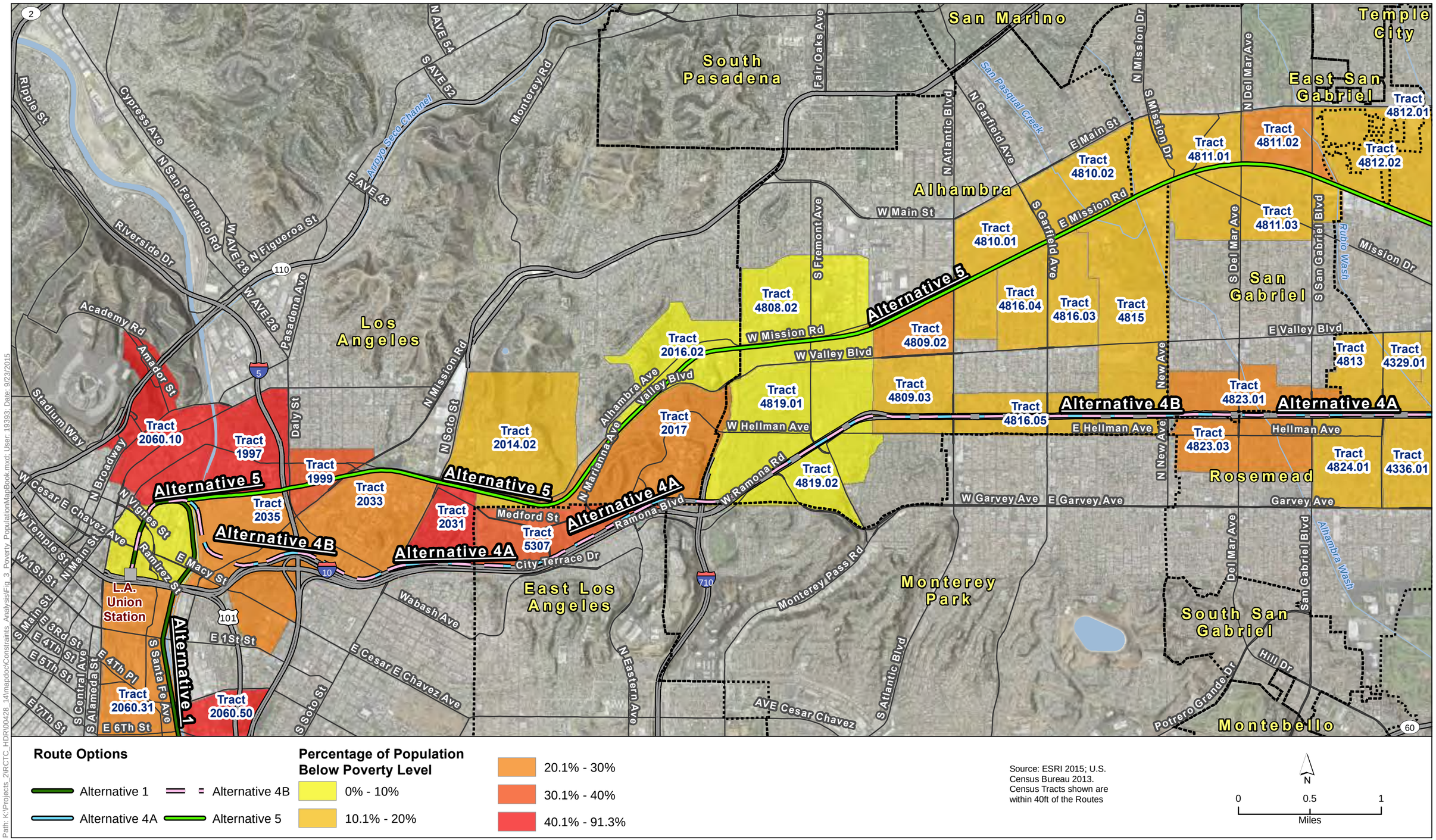
Source: ESRI 2015; U.S. Census Bureau 2013. Census Tracts shown are within 40ft of the Routes

N

0 0.5 1 Miles

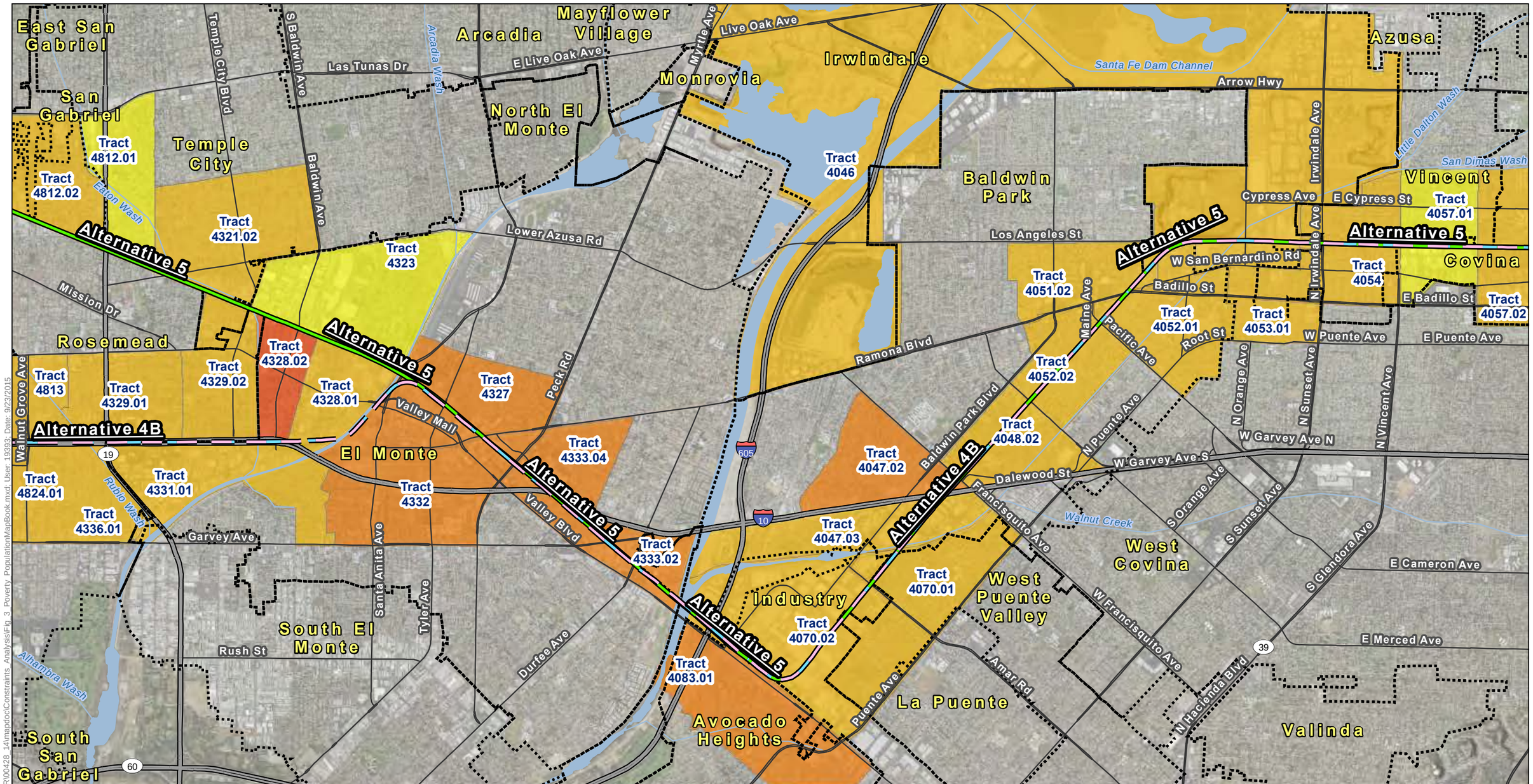
Path: K:\Projects_2\RCTC_HDR\00428_14\mapdoc\Constraints_Analysis\Fig_3_Poverty_PopulationMapBook.mxd; User: 19393; Date: 9/23/2015

Figure 3
Populations Below the Poverty Level Along Alternative 1 - Sheet 9
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives



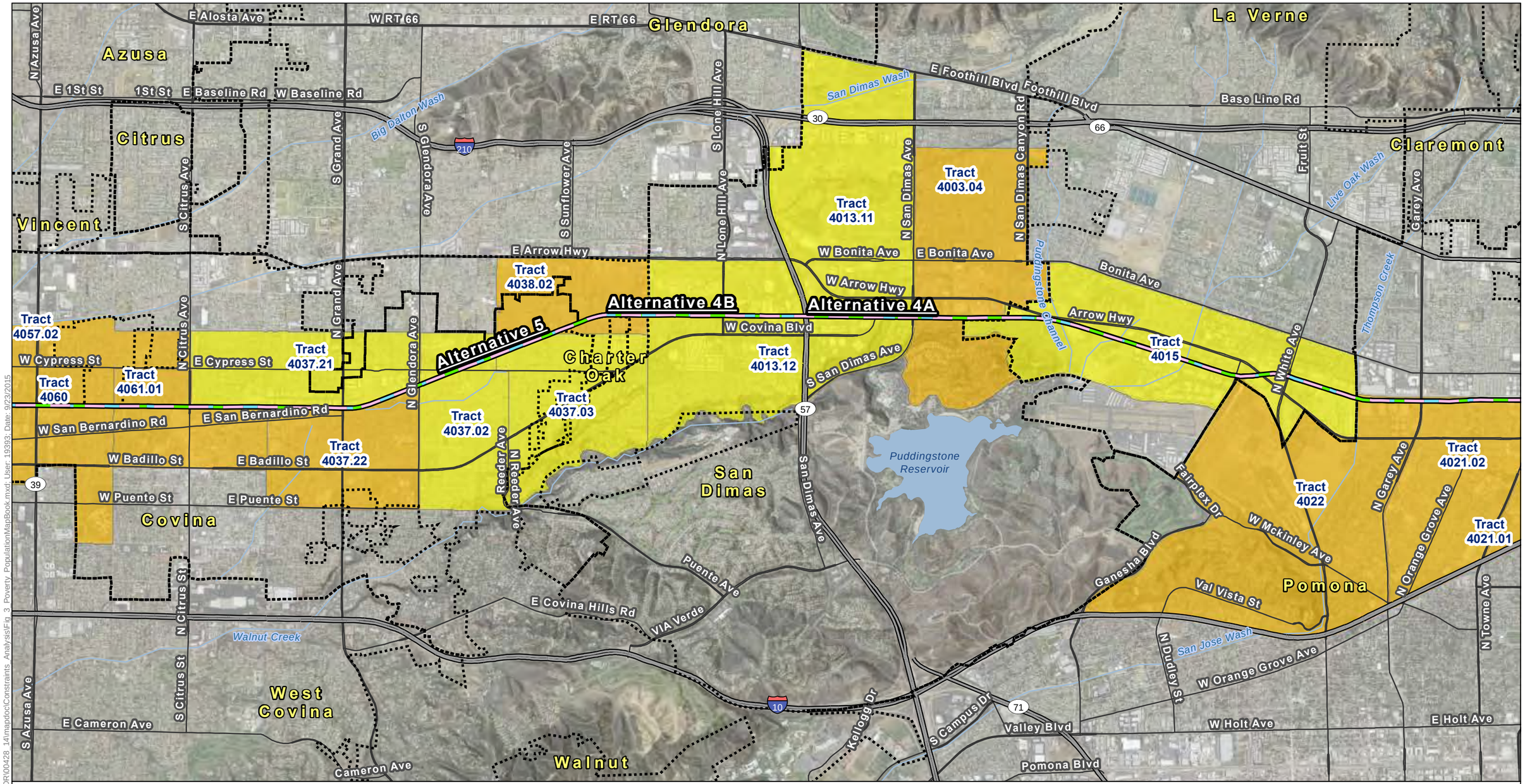
Path: K:\Projects_2\RCTC_HDR\00428_14\mapdoc\Constraints_Analysis\Fig_3_Poverty_PopulationMapBook.mxd User: 19393; Date: 9/23/2015

Figure 3
Populations Below the Poverty Level Along Alternatives 4A, 4B, and 5 - Sheet 1
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives



Path: K:\Projects_2\RCTC_HDR\00428_14\mapdoc\Constraints_Analysis\Fig_3_Poverty_PopulationMapBook.mxd User: 19393 Date: 9/23/2015

Figure 3
Populations Below the Poverty Level Along Alternatives 4A, 4B, and 5 - Sheet 2
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives



Route Options

- Alternative 1
- Alternative 4B
- Alternative 4A
- Alternative 5

Percentage of Population Below Poverty Level

- 0% - 10%
- 10.1% - 20%
- 20.1% - 30%
- 30.1% - 40%
- 40.1% - 91.3%

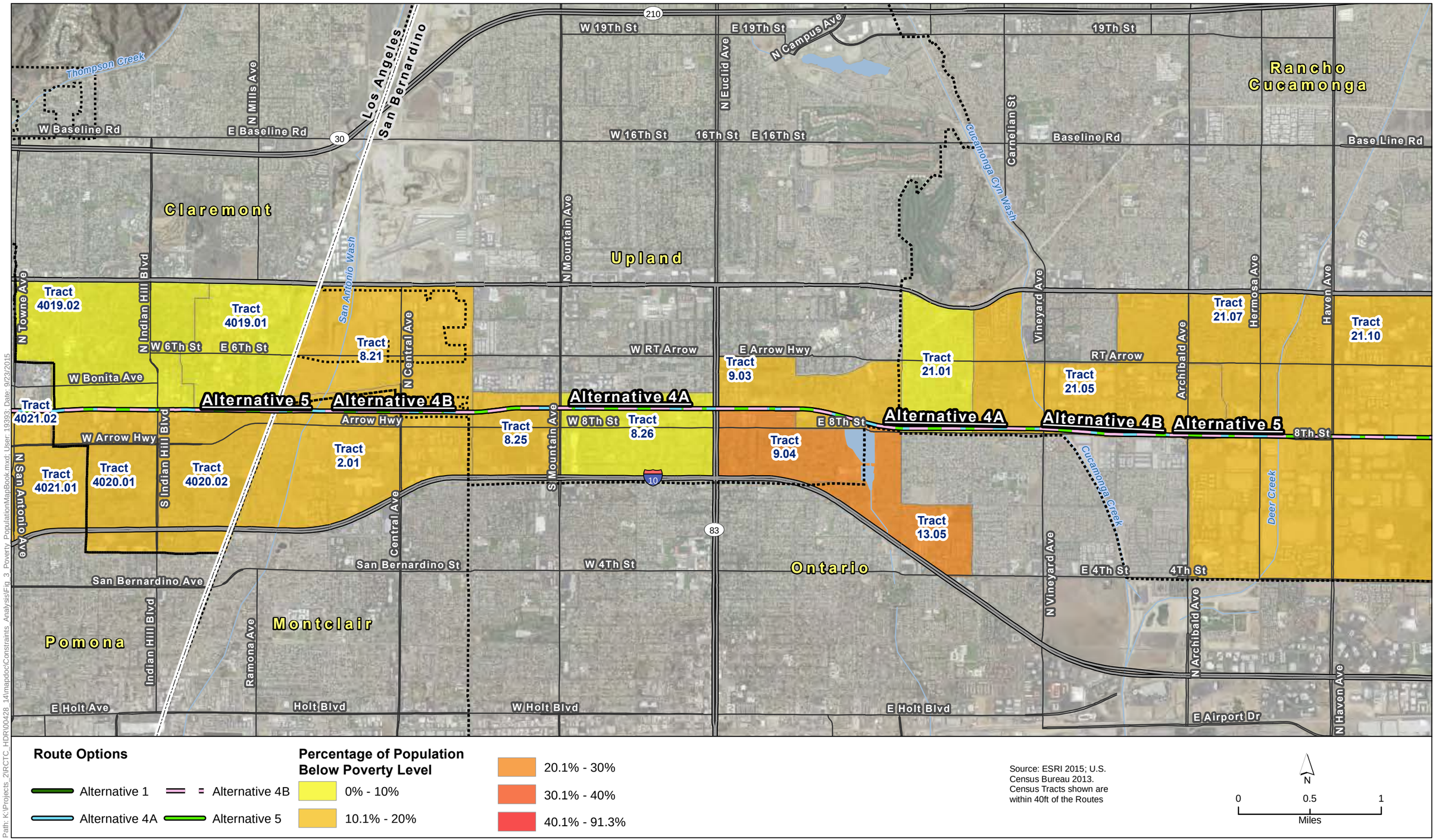
Source: ESRI 2015; U.S. Census Bureau 2013. Census Tracts shown are within 40ft of the Routes

N

0 0.5 1 Miles

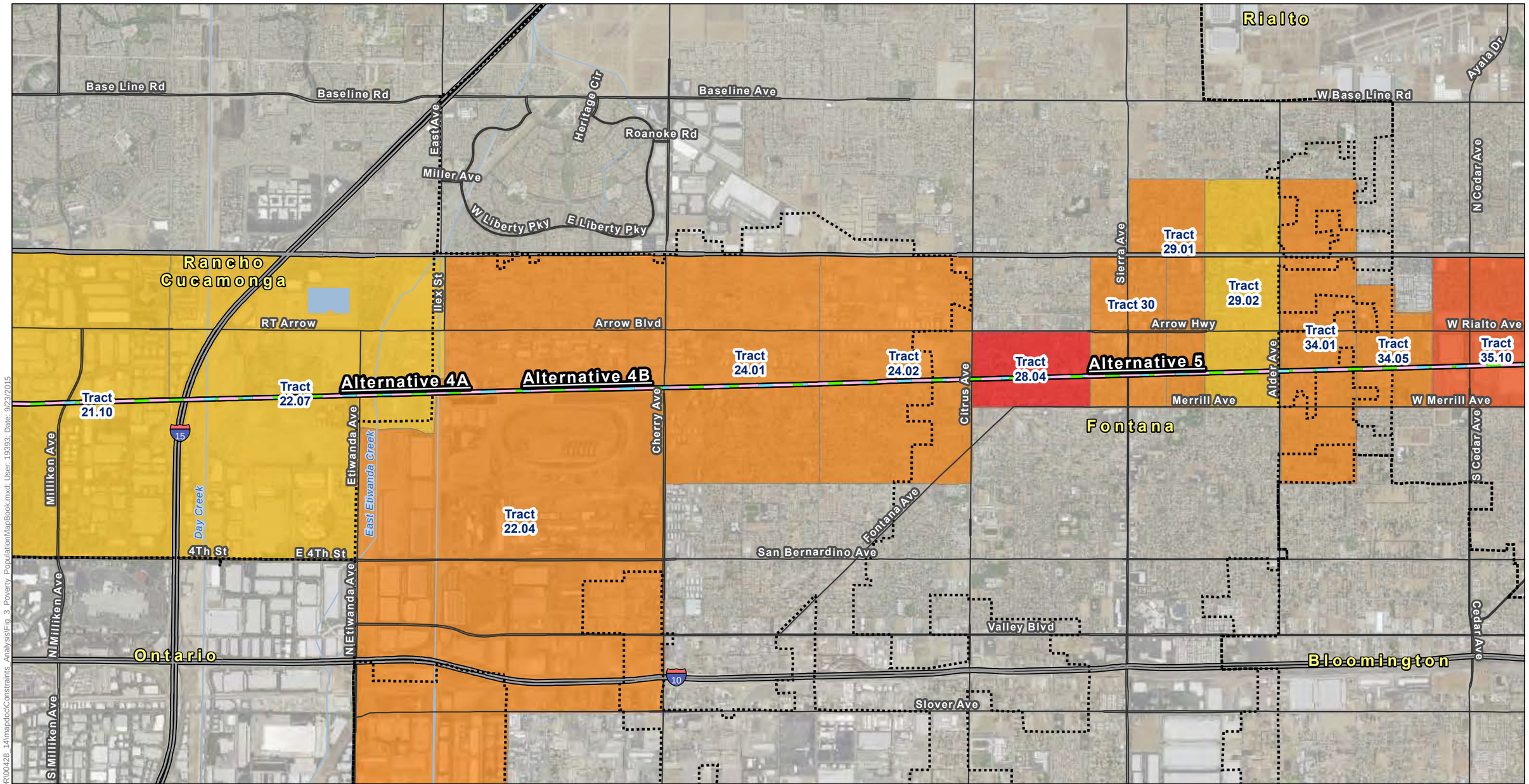
Path: K:\Projects_2\RCTC_HDR\00428_14\mapdoc\Constraints_Analysis\Fig_3_Poverty_PopulationMapBook.mxd User: 19393; Date: 9/23/2015

Figure 3
Populations Below the Poverty Level Along Alternatives 4A, 4B, and 5 - Sheet 3
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives



Path: K:\Projects_2\RCTC_HDR\00428_14\mapdoc\Constraints_Analysis\Fig_3_Poverty_PopulationMapBook.mxd; User: 19393; Date: 9/23/2015

Figure 3
Populations Below the Poverty Level Along Alternatives 4A, 4B, and 5 - Sheet 4
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives



Route Options

- Alternative 1
- Alternative 4A
- Alternative 4B
- Alternative 5

Percentage of Population Below Poverty Level

- 0% - 10%
- 10.1% - 20%
- 20.1% - 30%
- 30.1% - 40%
- 40.1% - 91.3%

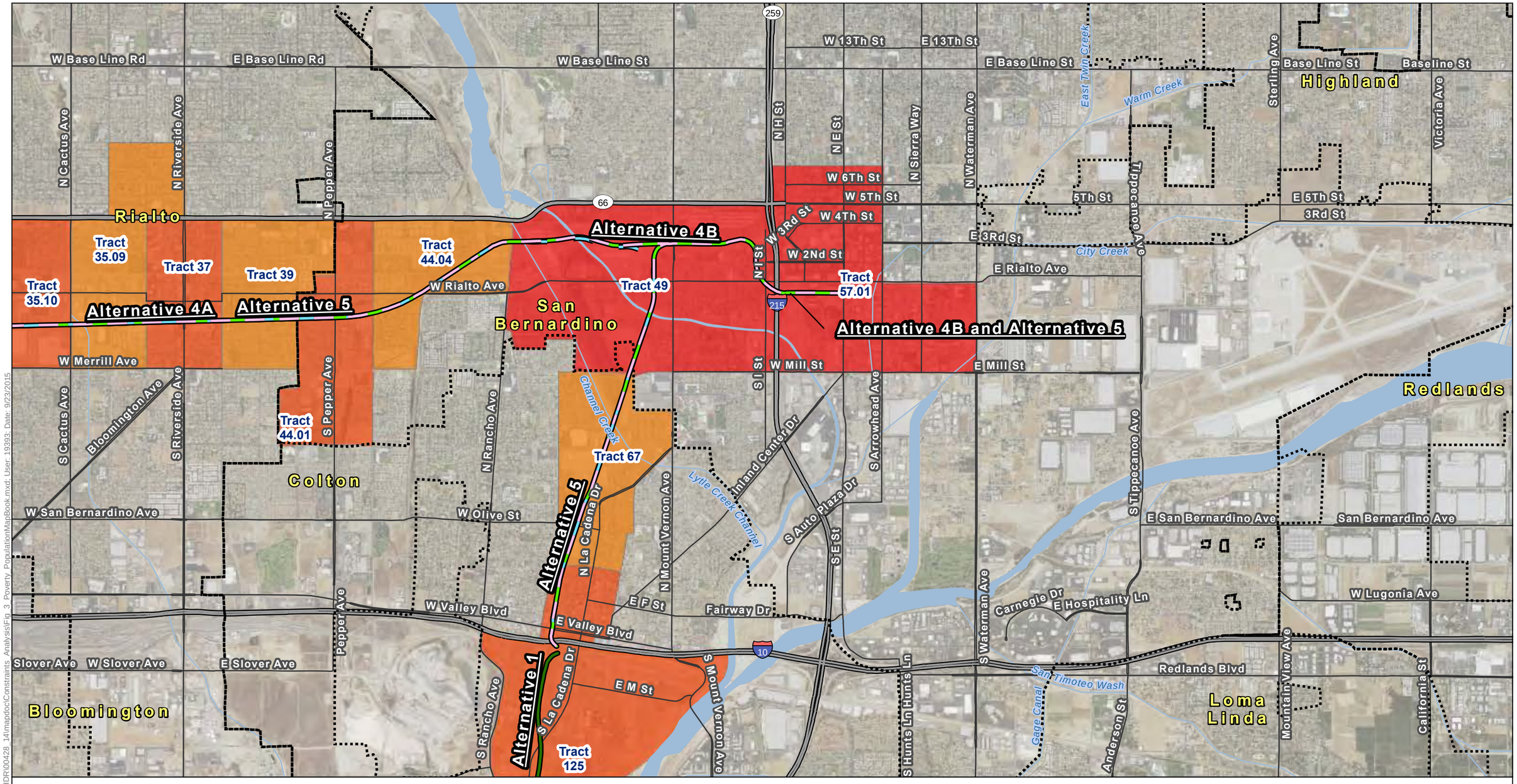
Source: ESRI 2015; U.S. Census Bureau 2013. Census Tracts shown are within 40ft of the Routes

N

0 0.5 1 Miles

Path: K:\Projects_2\RCTC_HDR\00428_14\mapdoc\Constraints_Analysis\Fig_3_Poverty_PopulationMapBook.mxd User: 19393; Date: 9/23/2015

Figure 3
Populations Below the Poverty Level Along Alternatives 4A, 4B, and 5 - Sheet 5
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives



Route Options

- Alternative 1
- Alternative 4A
- Alternative 4B
- Alternative 5

Percentage of Population Below Poverty Level

- 0% - 10%
- 10.1% - 20%
- 20.1% - 30%
- 30.1% - 40%
- 40.1% - 91.3%

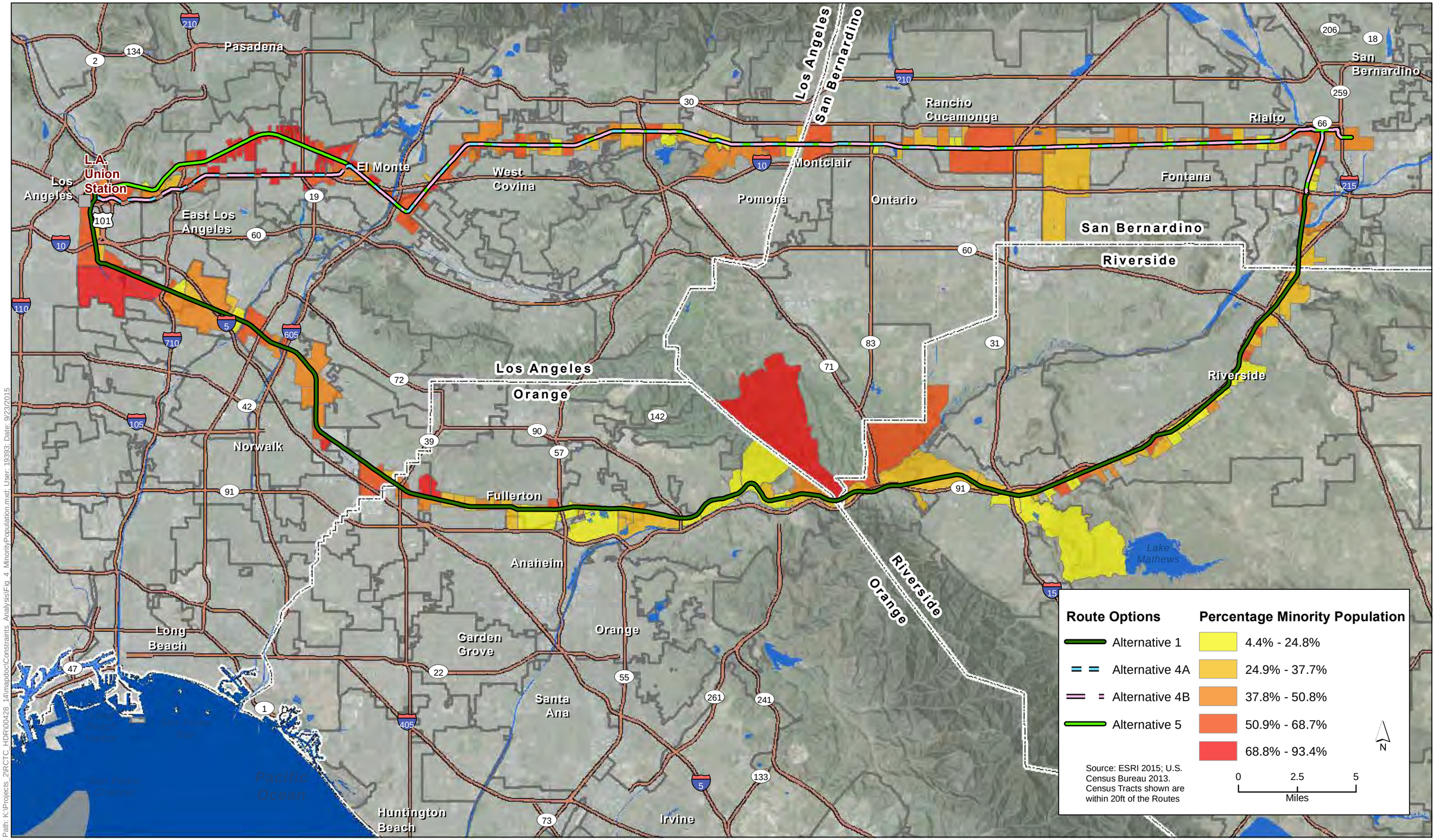
Source: ESRI 2015; U.S. Census Bureau 2013. Census Tracts shown are within 40ft of the Routes

N

0 0.5 1 Miles

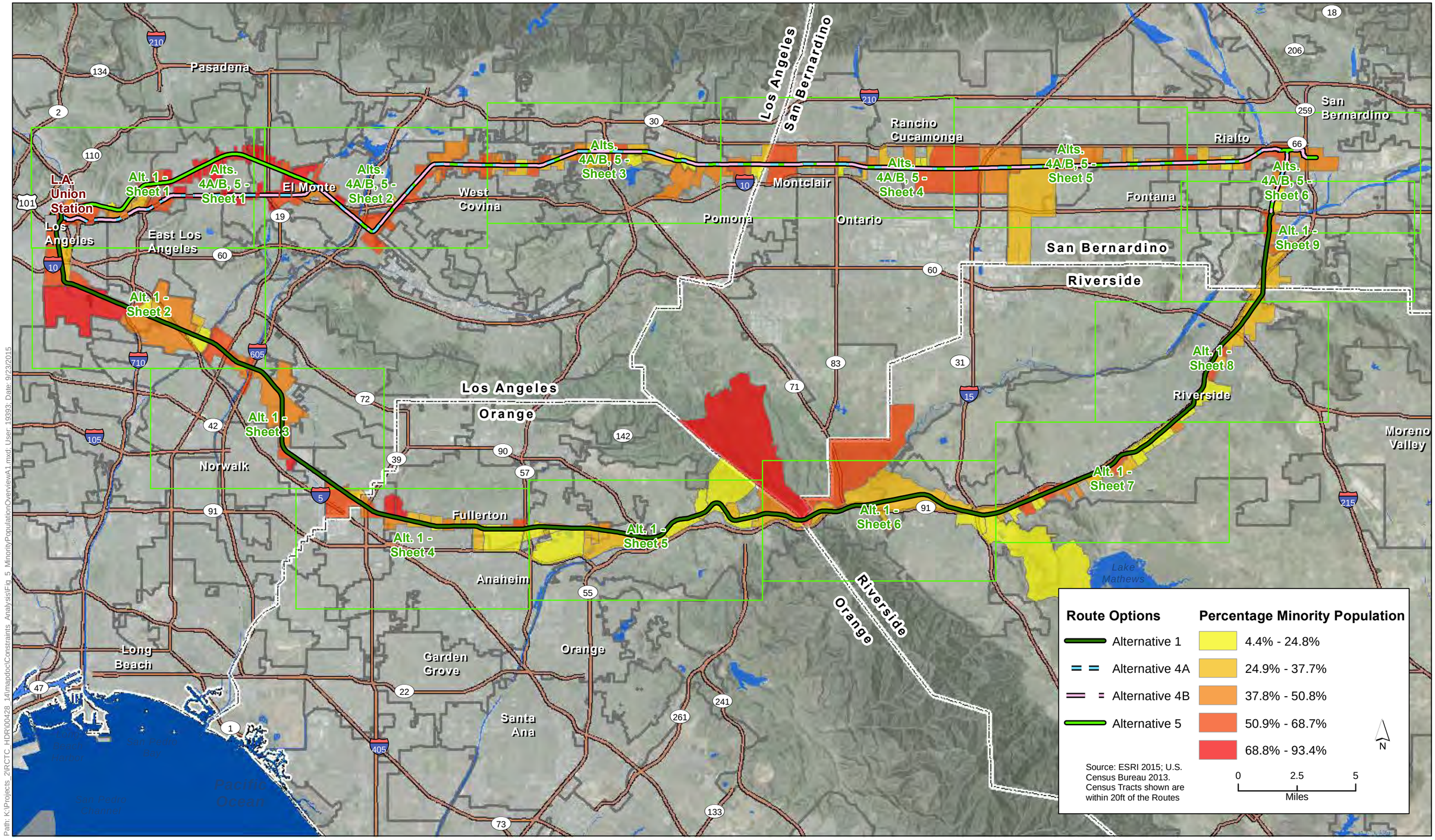
Path: K:\Projects_2\RCTC_HDR\00428_14\mapdoc\Constraints_Analysis\Fig_3_Poverty_PopulationMapBook.mxd User: 19393; Date: 9/23/2015

Figure 3
Populations Below the Poverty Level Along Alternatives 4A, 4B, and 5 - Sheet 6
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives



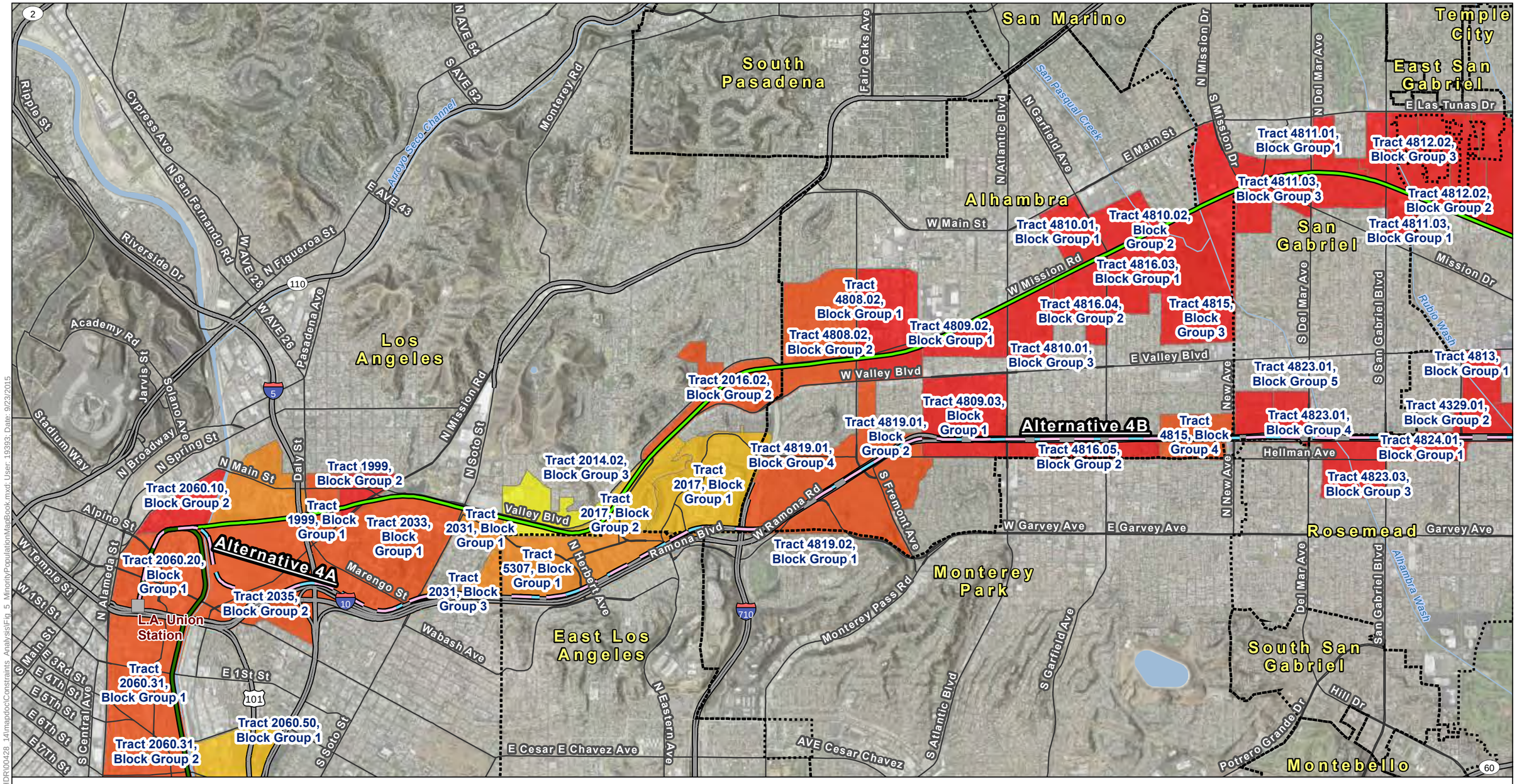
Path: K:\Projects_2\RCTC_HDR\00428_14\mapdoc\Constraints_Analysis\Fig_4_MinorityPopulation.mxd; User: 19393; Date: 9/23/2015

Figure 4
Minority Population
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives



Path: K:\Projects_2\RCTC_HDR\00428_14\mapdoc\Constraints_Analysis\Fig_5_MinorityPopulationOverviewA1.mxd User: 19393 Date: 9/23/2015

Figure 5
Minority Population
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives



Route Options

- Alternative 1
- Alternative 4B
- Alternative 4A
- Alternative 5

Percent Minority Populations

- 4.4% - 24.8%
- 24.9% - 37.7%
- 37.8% - 50.8%
- 50.9% - 68.7%
- 68.8% - 93.4%

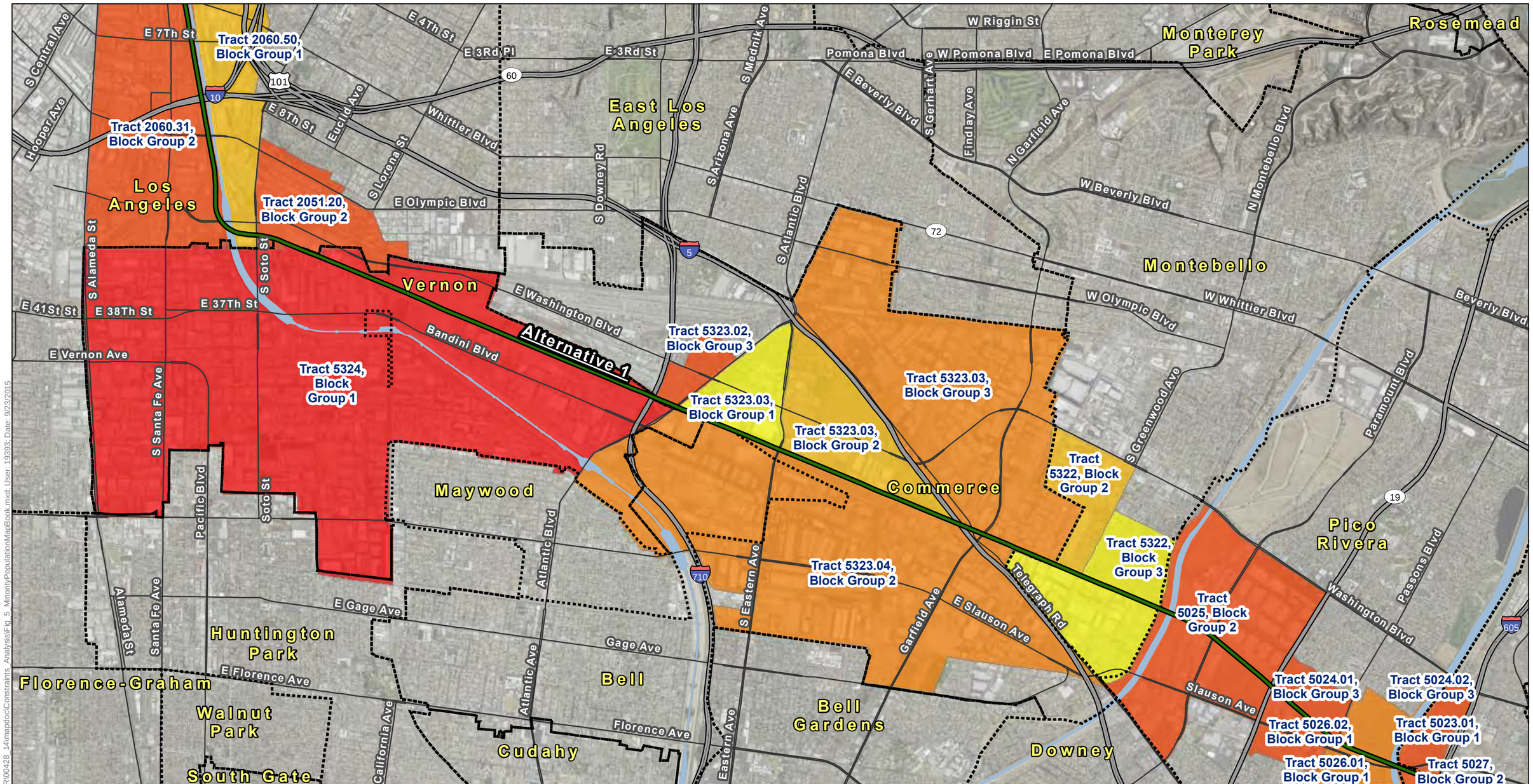
Source: ESRI 2015; U.S. Census Bureau 2013.
Census Tract/Block Group shown are within 40ft of the Routes

N

0 0.5 1
Miles

Path: K:\Projects_2\RCTC_HDR\00428_1\4\mapdoc\Constraints_Analysis\Fig_5_MinorityPopulationMapBook.mxd User: 19393, Date: 9/23/2015

Figure 5
Minority Population Along Alternative 1 - Sheet 1
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives



Route Options

- Alternative 1
- Alternative 4B
- Alternative 4A
- Alternative 5

Percent Minority Populations

- 4.4% - 24.8%
- 24.9% - 37.7%
- 37.8% - 50.8%
- 50.9% - 68.7%
- 68.8% - 93.4%

Source: ESRI 2015; U.S. Census Bureau 2013.
Census Tract/Block Group shown are within 40ft of the Routes

N

0 0.5 1 Miles

Path: K:\Projects_2\RCTC_HDR\00428_14\mapdoc\Constraints_Analysis\Fig_5_MinorityPopulationMapBook.mxd User: 19393, Date: 9/23/2015

Figure 5
Minority Population Along Alternative 1 - Sheet 2
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives

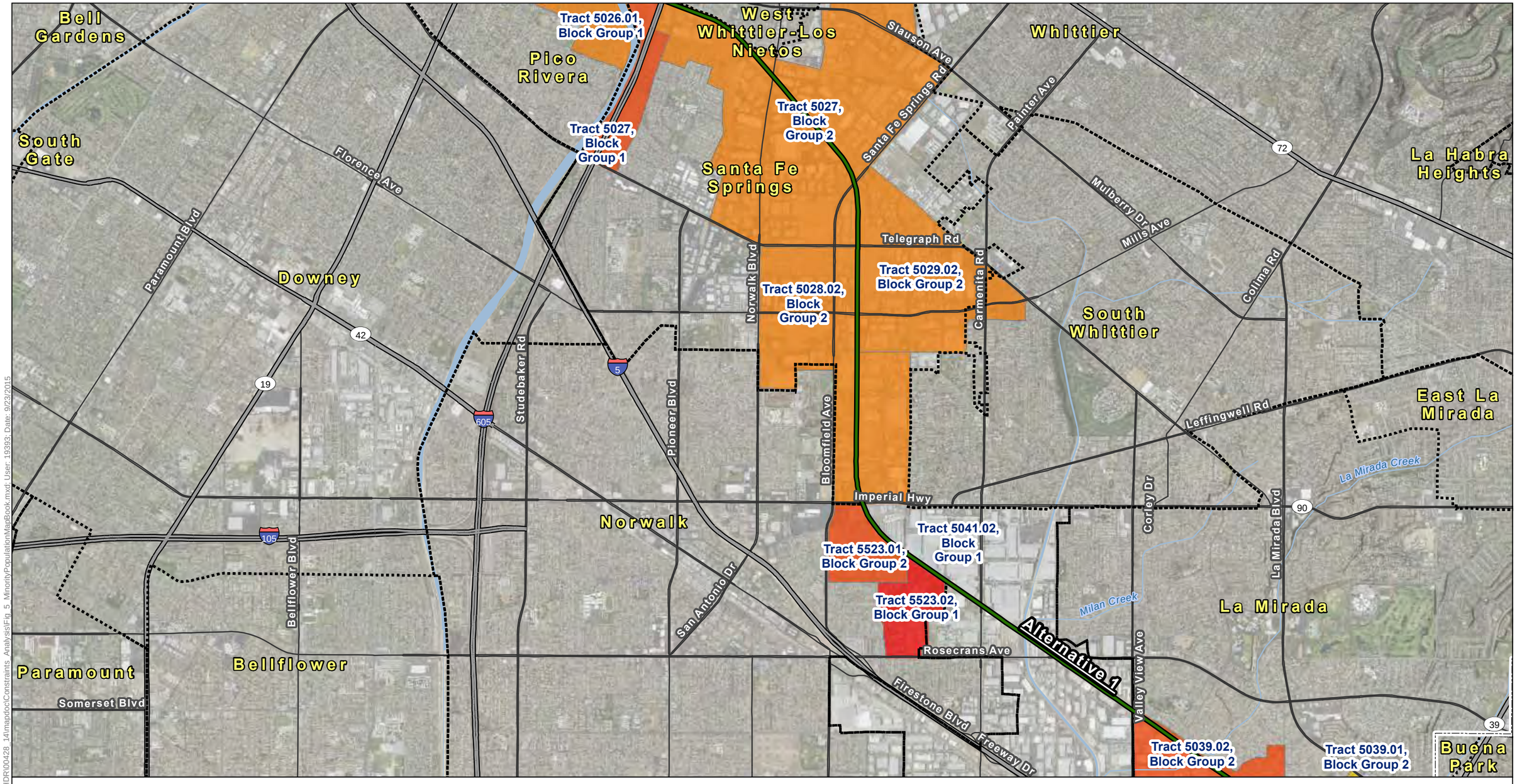


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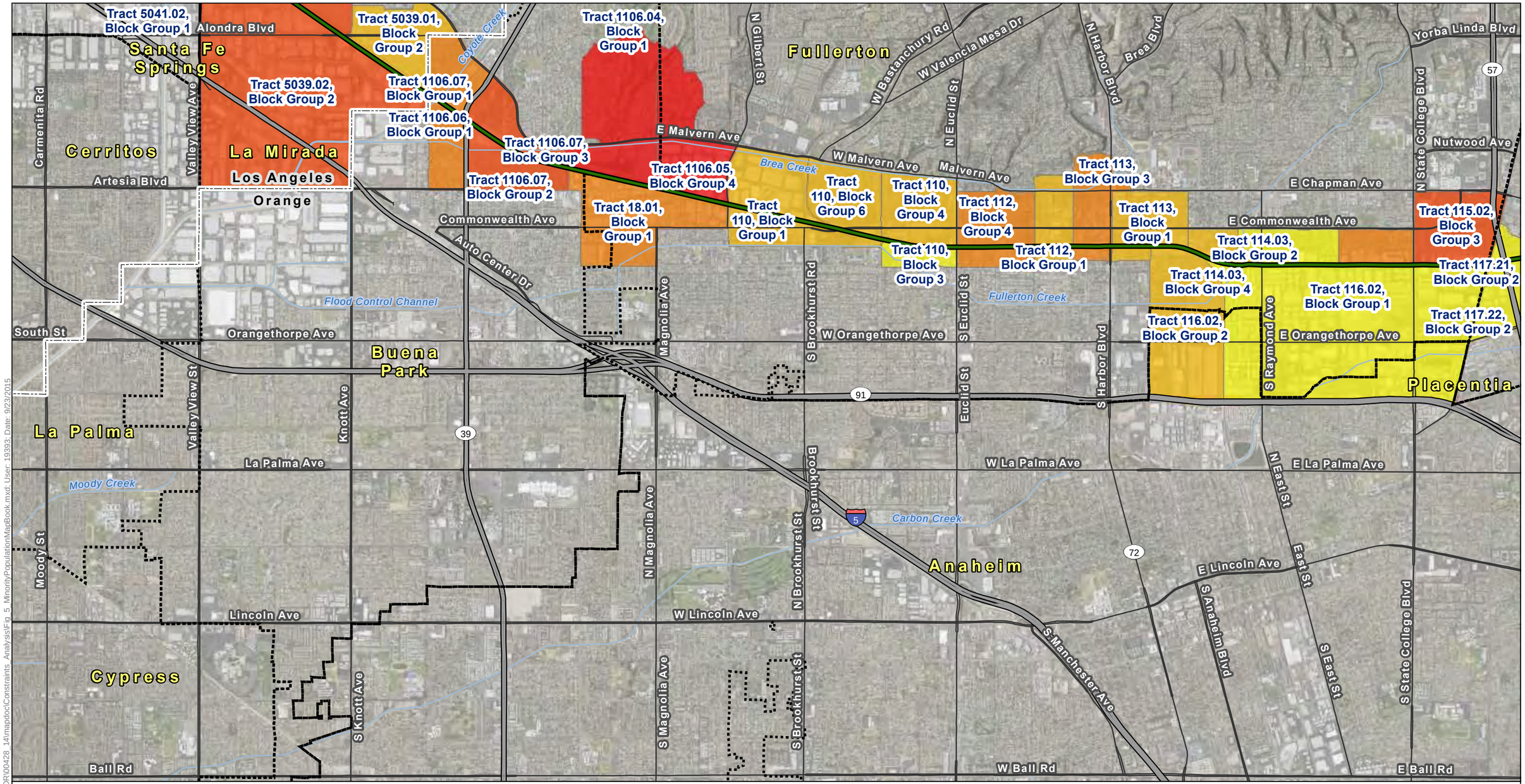
Figure 5
Minority Population Along Alternative 1 - Sheet 3
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives



Route Options

- Alternative 1
- Alternative 4A
- Alternative 4B
- Alternative 5

Percent Minority Populations

- 4.4% - 24.8%
- 24.9% - 37.7%
- 37.8% - 50.8%
- 50.9% - 68.7%
- 68.8% - 93.4%

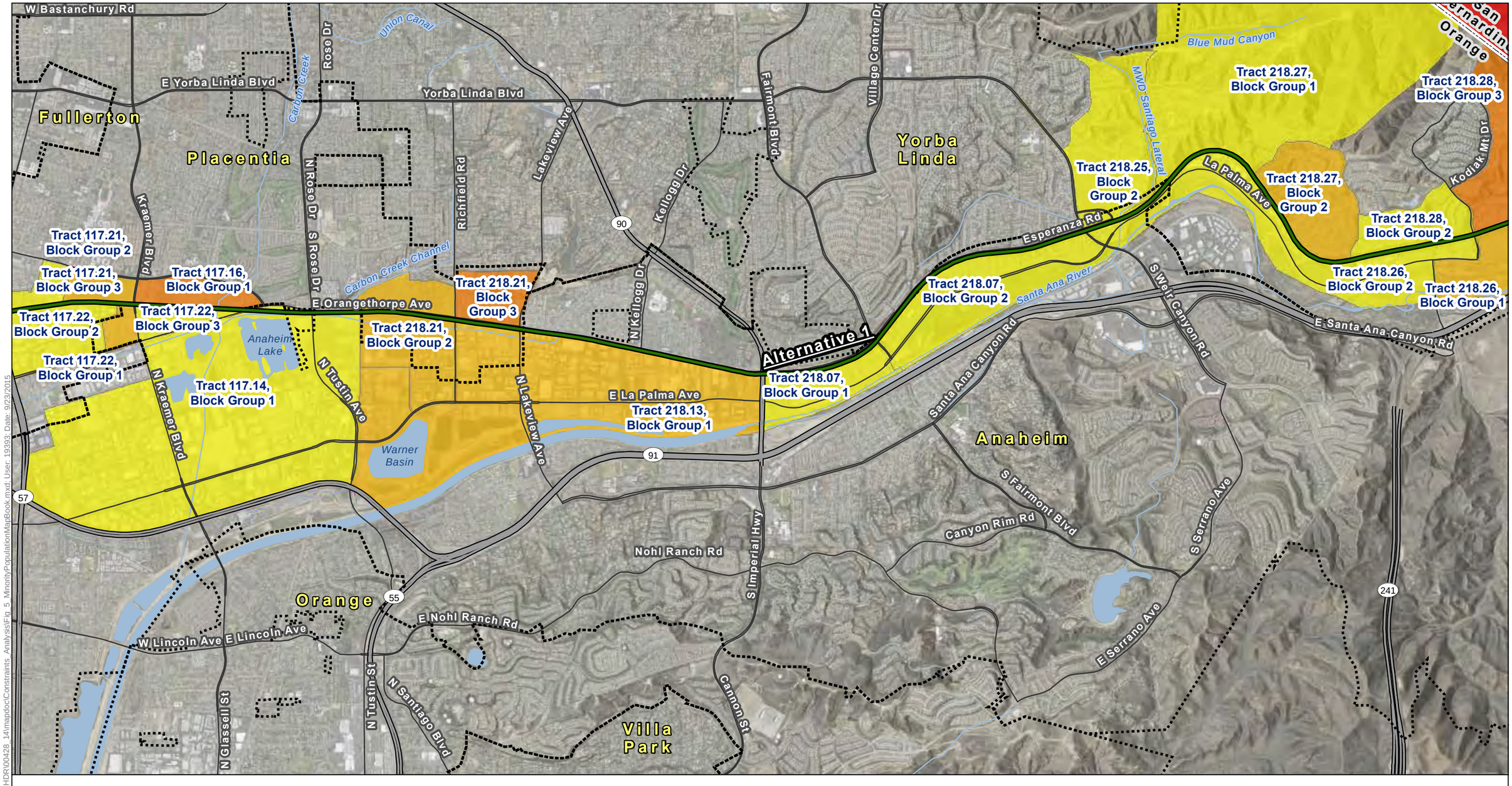
Source: ESRI 2015; U.S. Census Bureau 2013.
Census Tract/Block Group shown are within 40ft of the Routes

N

0 0.5 1
Miles

Path: K:\Projects_2\RCTC_HDR\00428_14\mapdoc\Constraints_Analysis\Fig_5_MinorityPopulationMapBook.mxd User: 19393; Date: 9/23/2015

Figure 5
Minority Population Along Alternative 1 - Sheet 4
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives



Route Options

- Alternative 1
- Alternative 4A
- Alternative 4B
- Alternative 5

Percent Minority Populations

- 4.4% - 24.8%
- 24.9% - 37.7%
- 37.8% - 50.8%
- 50.9% - 68.7%
- 68.8% - 93.4%

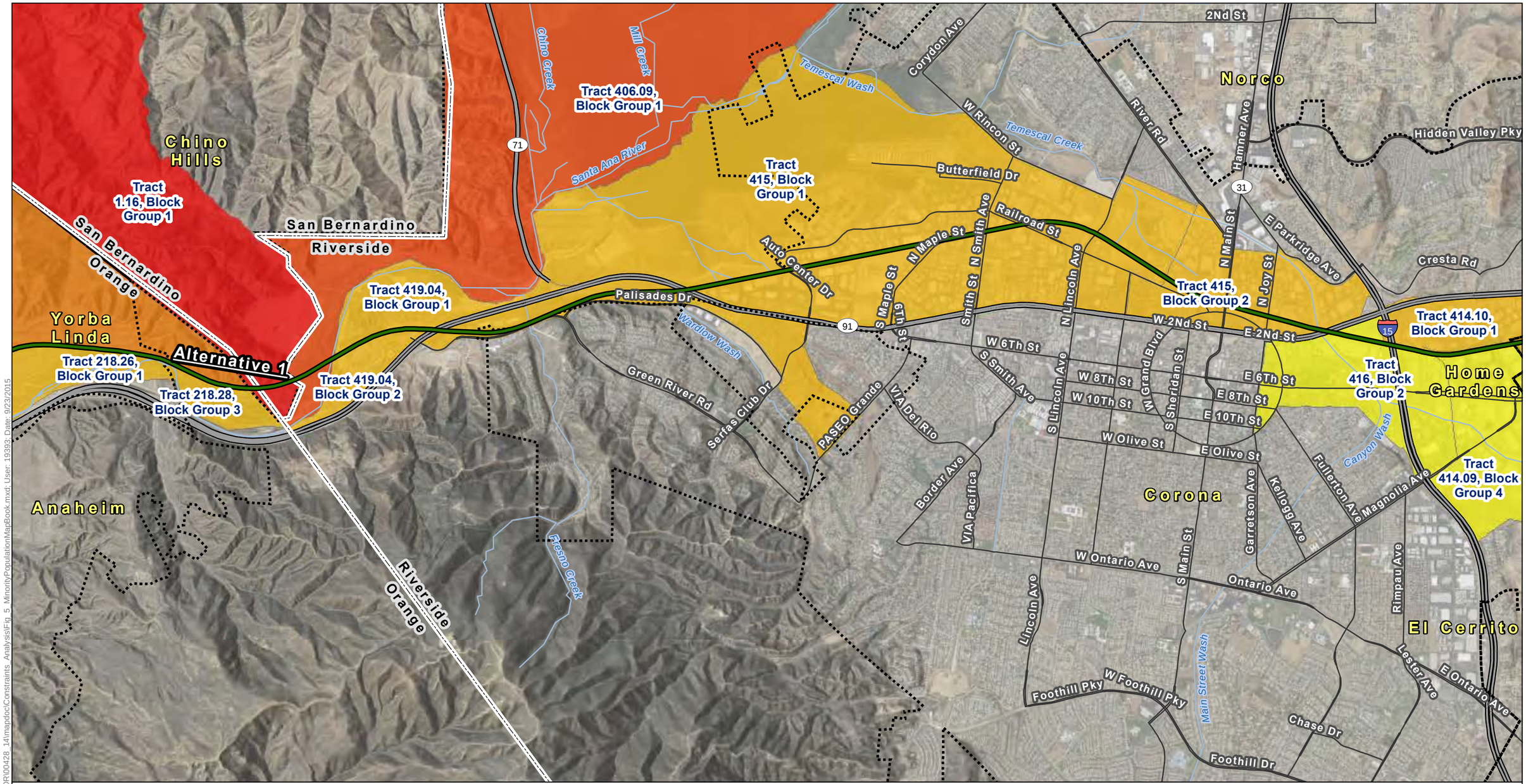
Source: ESRI 2015; U.S. Census Bureau 2013.
Census Tract/Block Group shown are within 40ft of the Routes

N

0 0.5 1
Miles

Path: K:\Projects_2\RCTC_HDR\00428_14\mapdoc\Constraints_Analysis\Fig_5_MinorityPopulationMapBook.mxd User: 19393 Date: 9/23/2015

Figure 5
Minority Population Along Alternative 1 - Sheet 5
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives



Route Options

- Alternative 1
- Alternative 4A
- Alternative 4B
- Alternative 5

Percent Minority Populations

- 4.4% - 24.8%
- 24.9% - 37.7%
- 37.8% - 50.8%
- 50.9% - 68.7%
- 68.8% - 93.4%

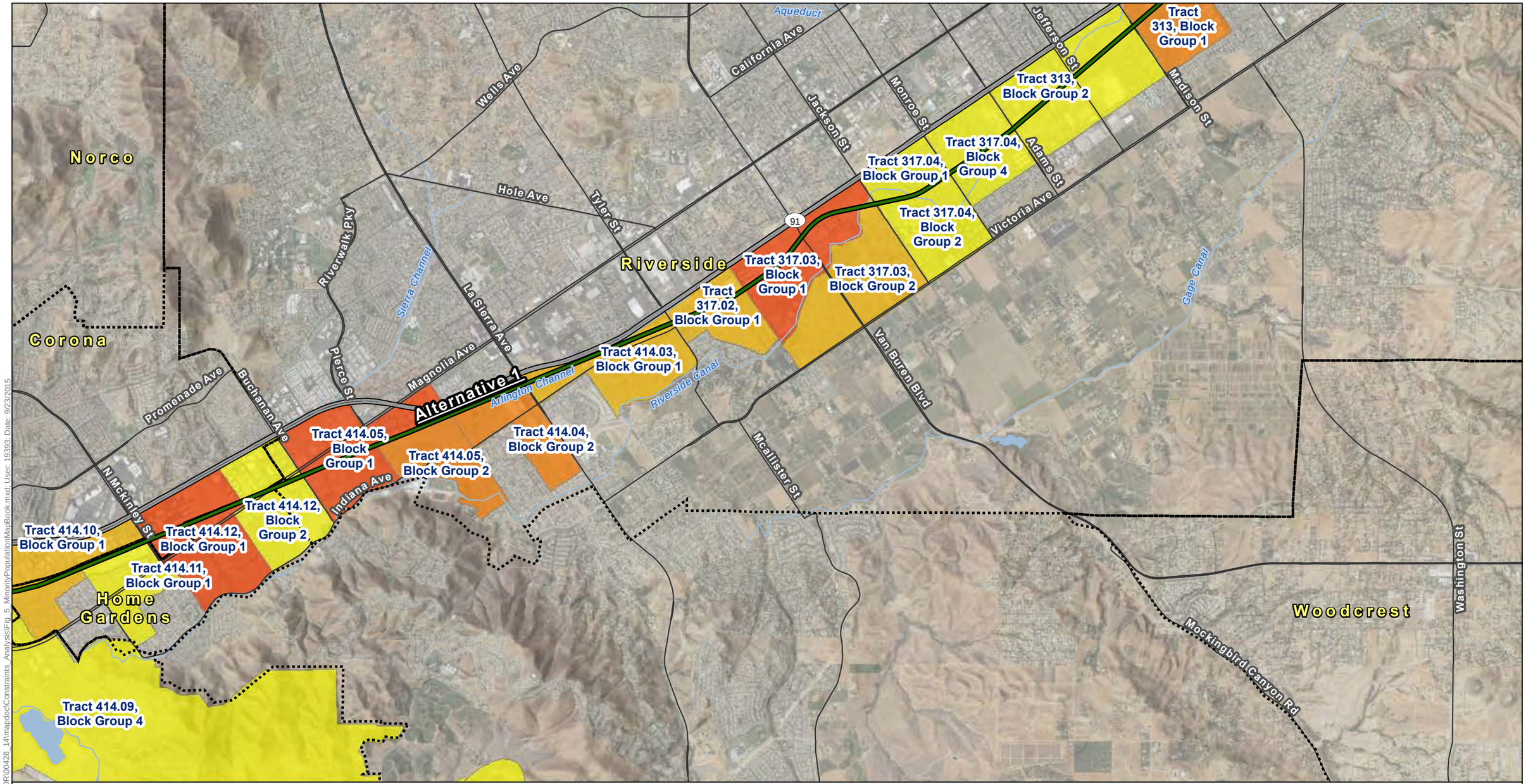
Source: ESRI 2015; U.S. Census Bureau 2013.
Census Tract/Block Group shown are within 40ft of the Routes

N

0 0.5 1
Miles

Path: K:\Projects_2\RCTC_HDR\00428_14\mapdoc\Constraints_Analysis\Fig_5_MinorityPopulationMapBook.mxd; User: 19393; Date: 9/23/2015

Figure 5
Minority Population Along Alternative 1 - Sheet 6
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives



Route Options

- Alternative 1
- Alternative 4B
- Alternative 4A
- Alternative 5

Percent Minority Populations

- 4.4% - 24.8%
- 24.9% - 37.7%
- 37.8% - 50.8%
- 50.9% - 68.7%
- 68.8% - 93.4%

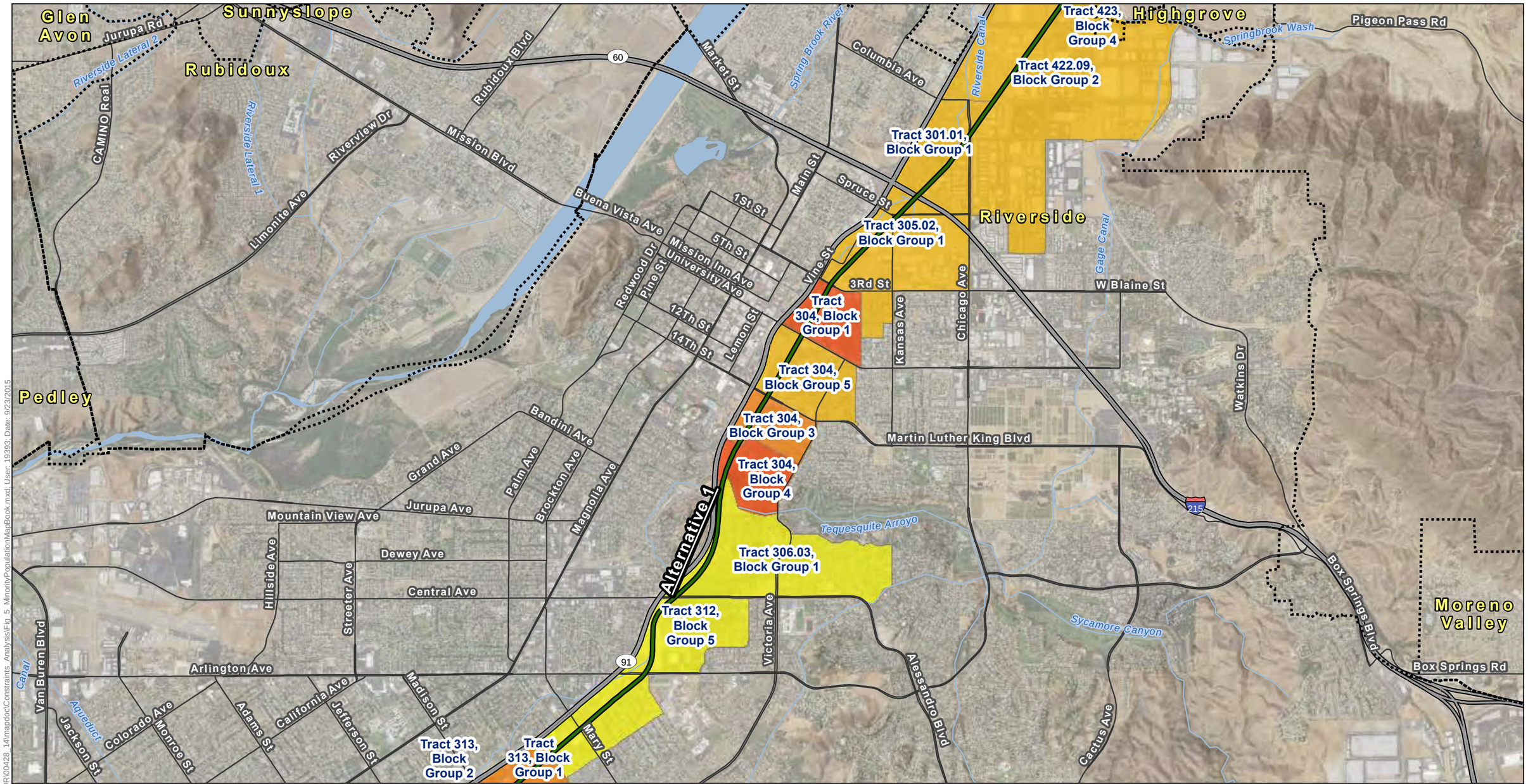
Source: ESRI 2015; U.S. Census Bureau 2013.
Census Tract/Block Group shown are within 40ft of the Routes

N

0 0.5 1
Miles

Path: K:\Projects_2\RCTC_HDR\00428_14\mapdoc\Constraints_Analysis\Fig_5_MinorityPopulationMapBook.mxd User: 19393 Date: 9/23/2015

Figure 5
Minority Population Along Alternative 1 - Sheet 7
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives



Route Options

- Alternative 1
- Alternative 4A
- Alternative 4B
- Alternative 5

Percent Minority Populations

- 4.4% - 24.8%
- 24.9% - 37.7%
- 37.8% - 50.8%
- 50.9% - 68.7%
- 68.8% - 93.4%

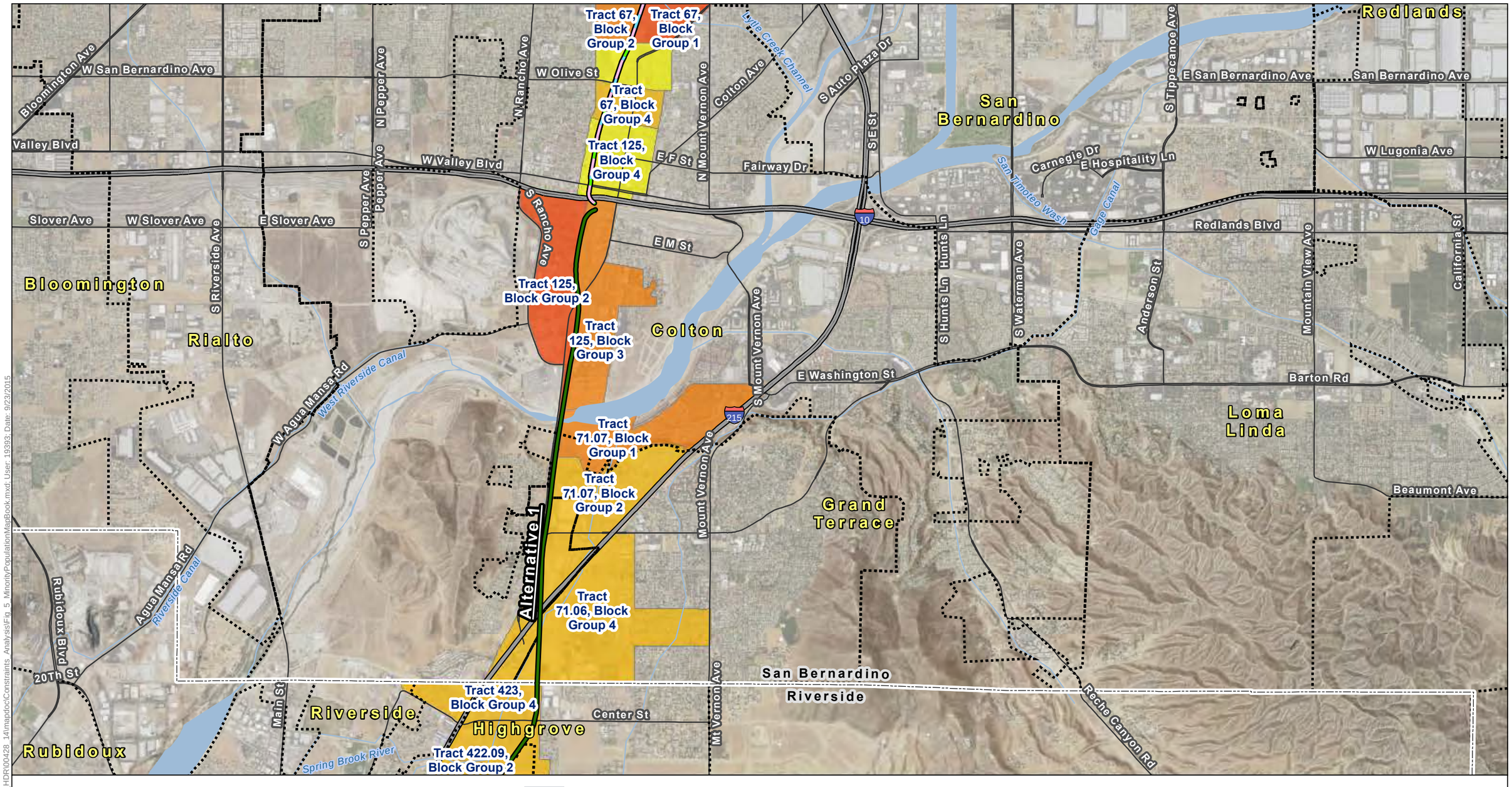
Source: ESRI 2015; U.S. Census Bureau 2013.
Census Tract/Block Group shown are within 40ft of the Routes

N

0 0.5 1
Miles

Path: K:\Projects_2\RCTC_HDR\00428_14\mapdoc\Constraints_Analysis\Fig_5_MinorityPopulationMapBook.mxd User: 19393 Date: 9/23/2015

Figure 5
Minority Population Along Alternative 1 - Sheet 8
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives



Route Options

- Alternative 1
- Alternative 4A
- Alternative 4B
- Alternative 5

Percent Minority Populations

- 4.4% - 24.8%
- 24.9% - 37.7%
- 37.8% - 50.8%
- 50.9% - 68.7%
- 68.8% - 93.4%

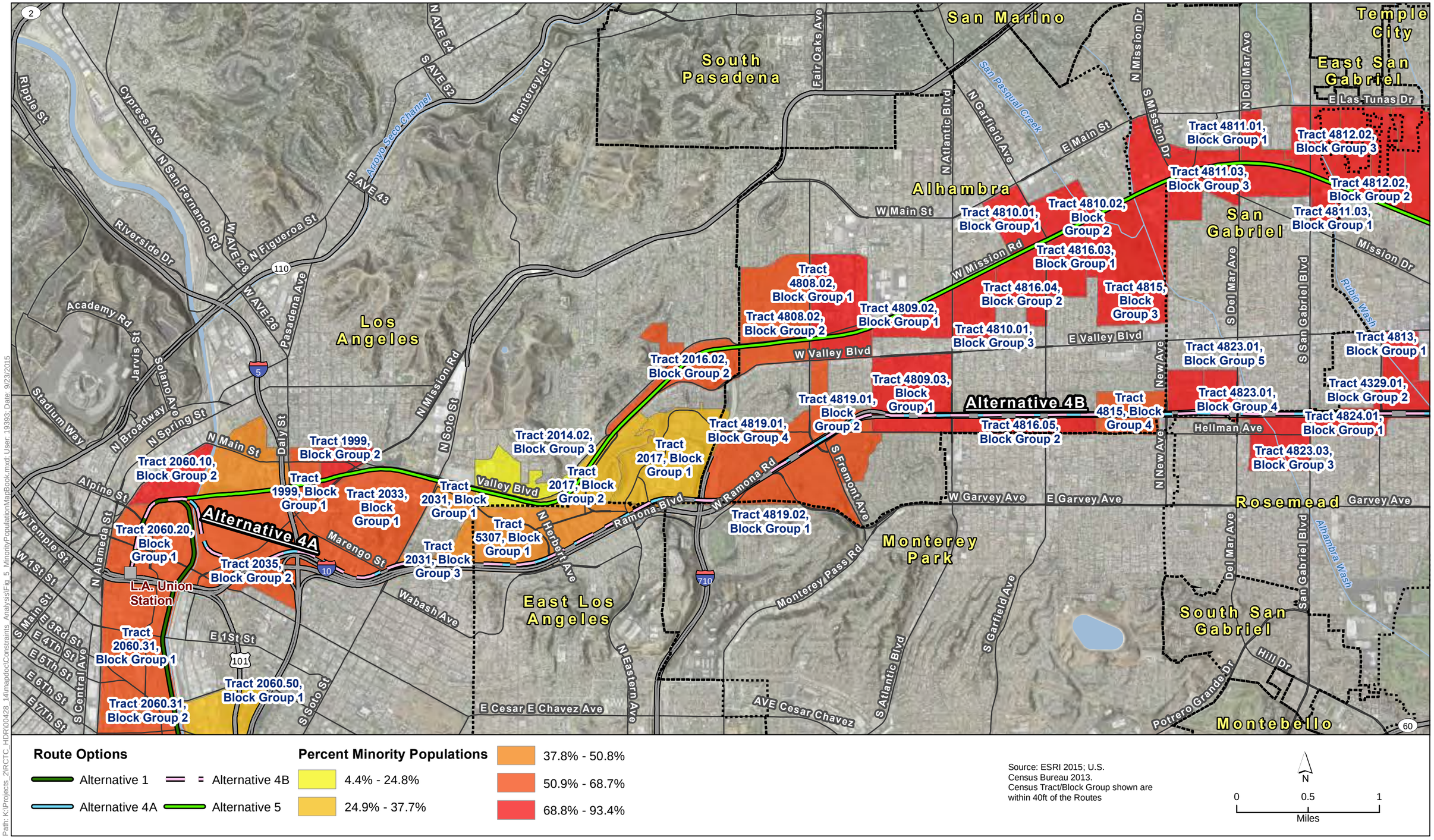
Source: ESRI 2015; U.S. Census Bureau 2013.
Census Tract/Block Group shown are within 40ft of the Routes

N

0 0.5 1 Miles

Path: K:\Projects_2\RCTC_HDR\00428_14\mapdoc\Constraints_Analysis\Fig_5_MinorityPopulationMapBook.mxd, User: 19393, Date: 9/23/2015

Figure 5
Minority Population Along Alternative 1 - Sheet 9
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives



Path: K:\Projects_2\RCTC_HDR\00428_1\4\map\doc\Constraints_Analysis\Fig_5_MinorityPopulationMapBook.mxd User: 19393, Date: 9/23/2015

Figure 5
Minority Population Along Alternatives 4A, 4B, and 5 - Sheet 1
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives

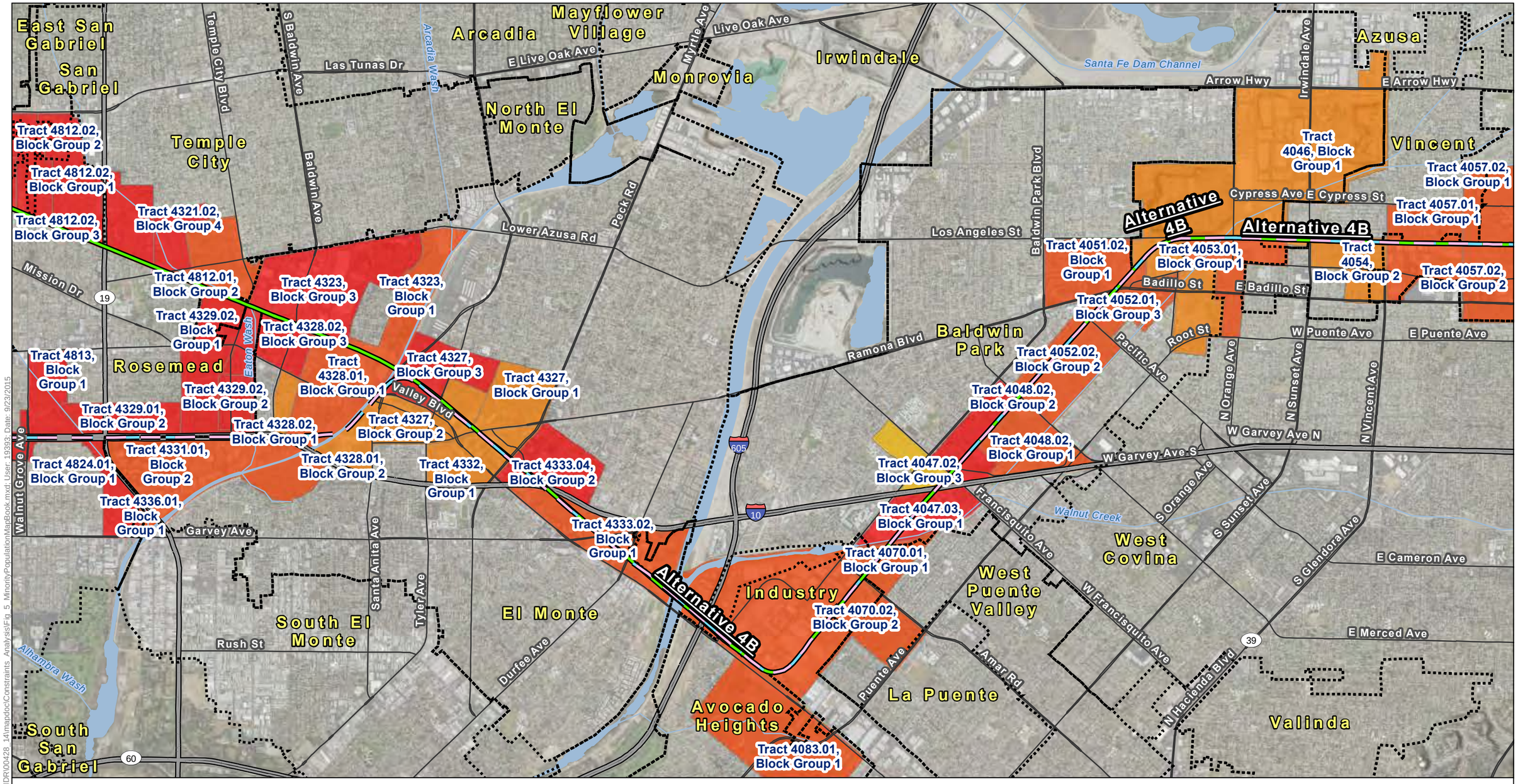
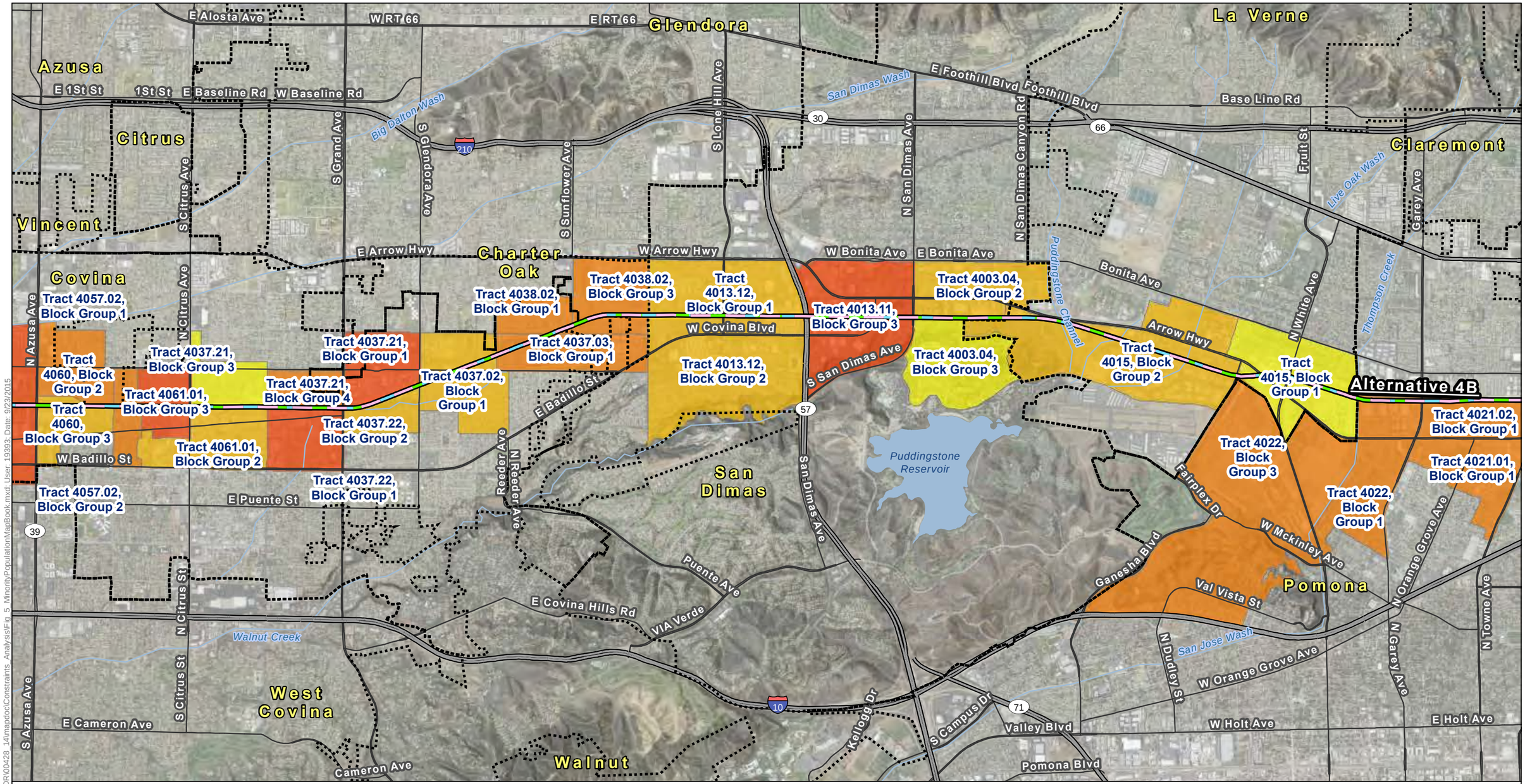


Figure 5
Minority Population Along Alternatives 4A, 4B, and 5 - Sheet 2
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives



Route Options

- Alternative 1
- Alternative 4A
- Alternative 4B
- Alternative 5

Percent Minority Populations

- 4.4% - 24.8%
- 24.9% - 37.7%
- 37.8% - 50.8%
- 50.9% - 68.7%
- 68.8% - 93.4%

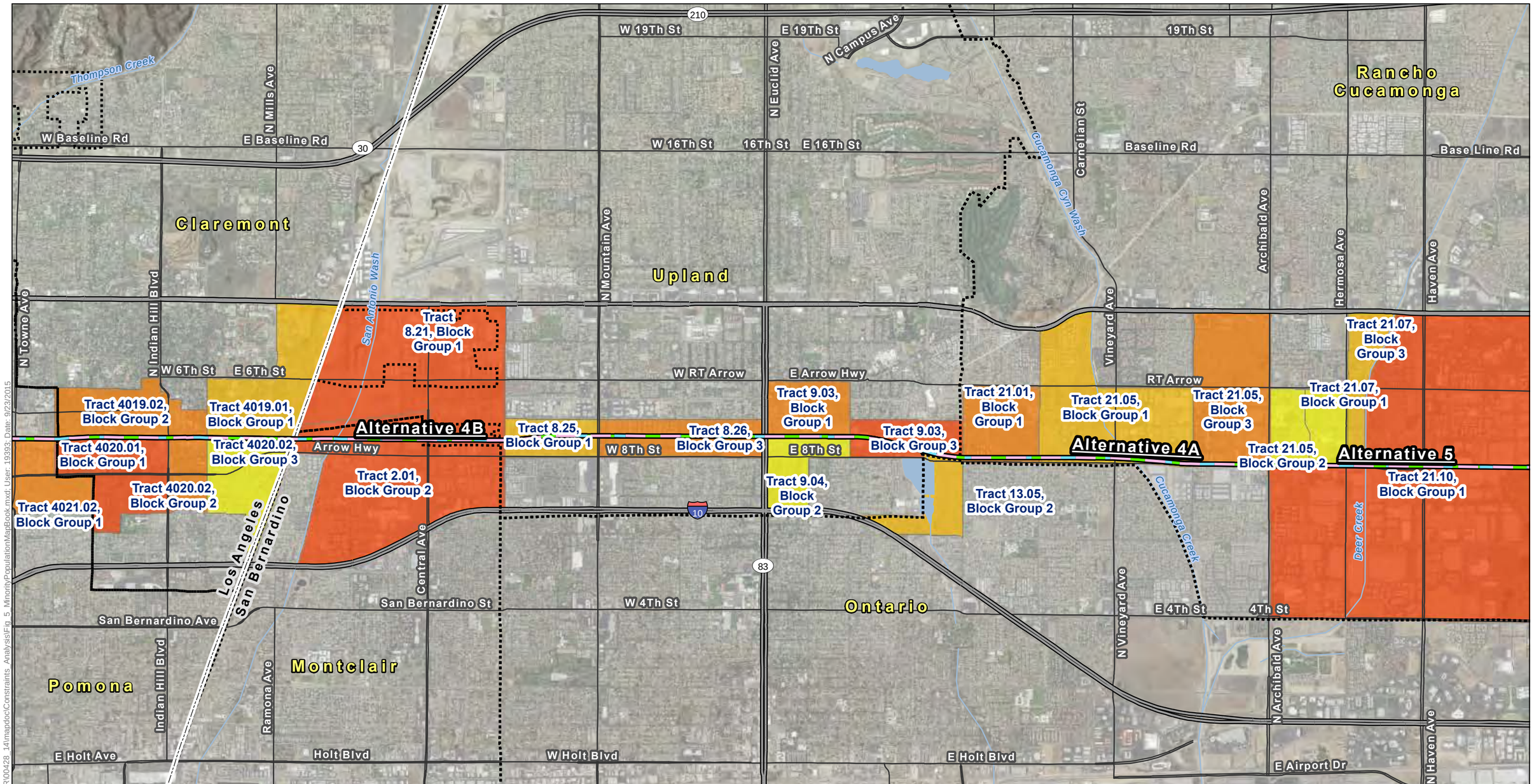
Source: ESRI 2015; U.S. Census Bureau 2013.
Census Tract/Block Group shown are within 40ft of the Routes

N

0 0.5 1 Miles

Path: K:\Projects_2\RCTC_HDR\00428_14\mapdoc\Constraints_Analysis\Fig_5_MinorityPopulationMapBook.mxd User: 19393 Date: 9/23/2015

Figure 5
Minority Population Along Alternatives 4A, 4B, and 5 - Sheet 3
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives



Route Options

- Alternative 1
- Alternative 4B
- Alternative 4A
- Alternative 5

Percent Minority Populations

- 4.4% - 24.8%
- 24.9% - 37.7%
- 37.8% - 50.8%
- 50.9% - 68.7%
- 68.8% - 93.4%

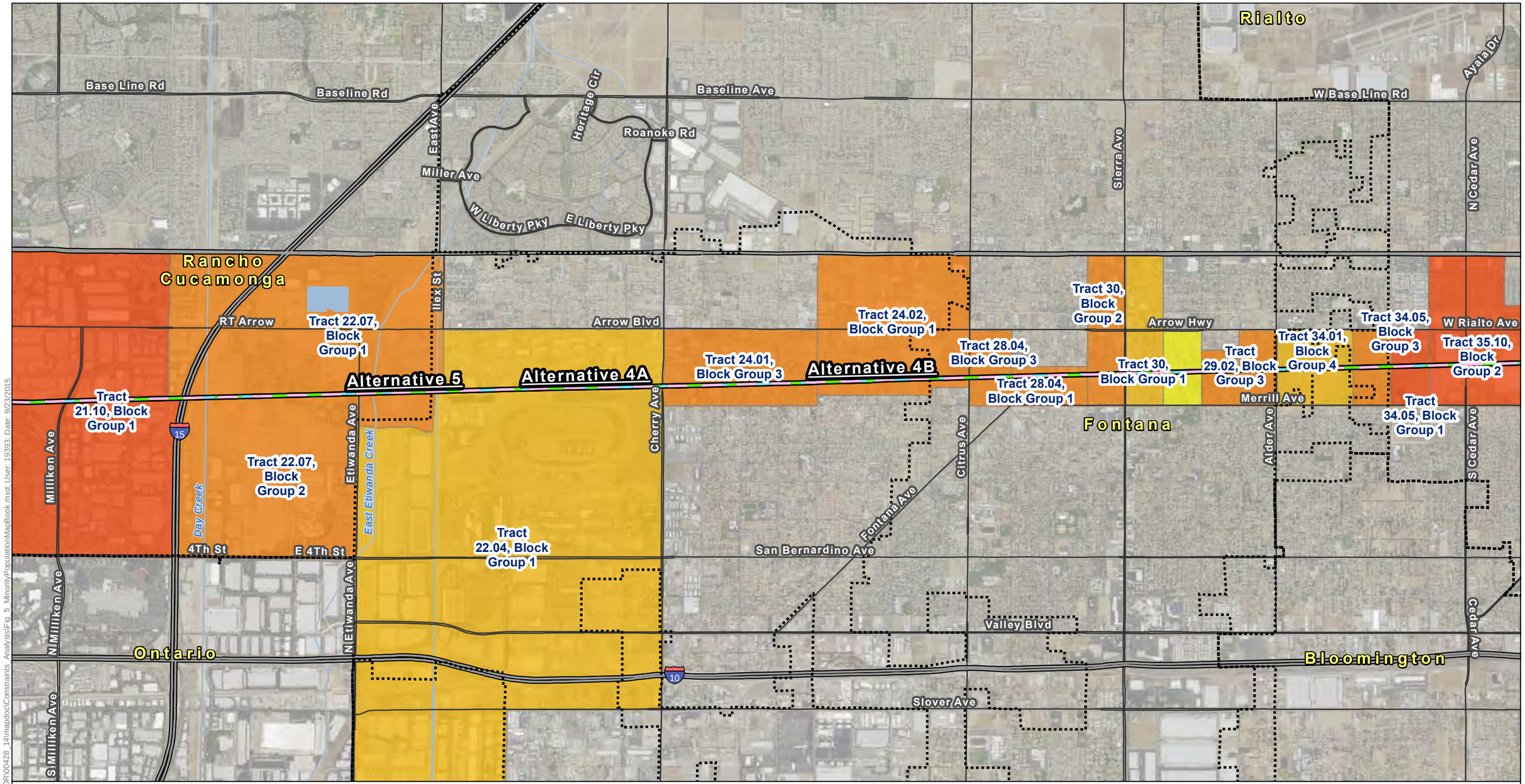
Source: ESRI 2015; U.S. Census Bureau 2013.
Census Tract/Block Group shown are within 40ft of the Routes

N

0 0.5 1
Miles

Path: K:\Projects_2\RCTC_HDR\00428_14\mapdoc\Constraints_Analysis\Fig_5_MinorityPopulationMapBook.mxd User: 19393 Date: 9/23/2015

Figure 5
Minority Population Along Alternatives 4A, 4B, and 5 - Sheet 4
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives



Route Options

- Alternative 1
- Alternative 4A
- Alternative 4B
- Alternative 5

Percent Minority Populations

- 4.4% - 24.8%
- 24.9% - 37.7%
- 37.8% - 50.8%
- 50.9% - 68.7%
- 68.8% - 93.4%

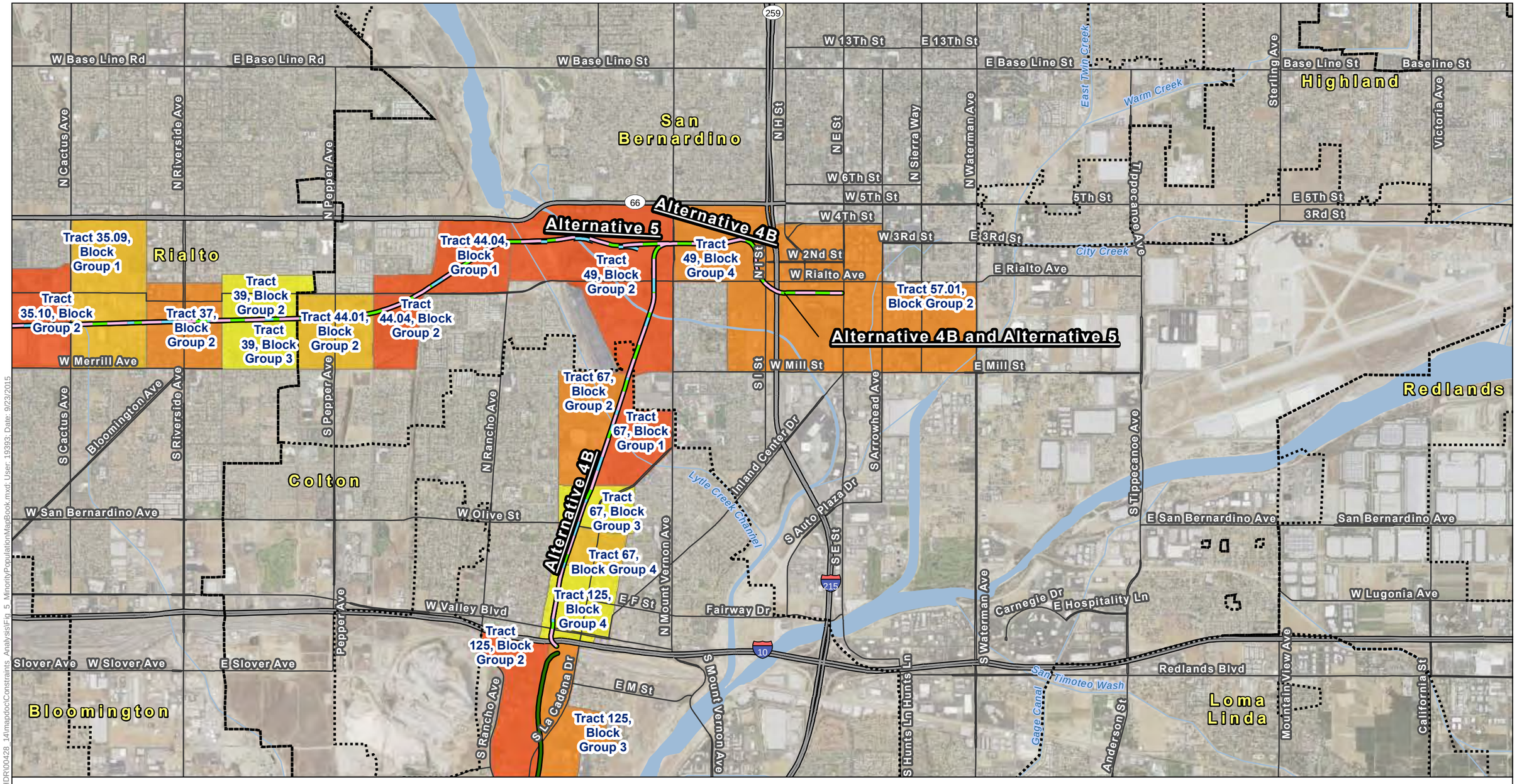
Source: ESRI 2015; U.S. Census Bureau 2013.
Census Tract/Block Group shown are within 40ft of the Routes

N

0 0.5 1
Miles

Path: K:\Projects_2\RCTC_HDR\00428_14\mapdoc\Constraints_Analysis\Fig_5_MinorityPopulationMapBook.mxd User: 19393 Date: 9/23/2015

Figure 5
Minority Population Along Alternatives 4A, 4B, and 5 - Sheet 5
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives



Route Options

- Alternative 1
- Alternative 4B
- Alternative 4A
- Alternative 5

Percent Minority Populations

- 4.4% - 24.8%
- 24.9% - 37.7%
- 37.8% - 50.8%
- 50.9% - 68.7%
- 68.8% - 93.4%

Source: ESRI 2015; U.S. Census Bureau 2013.
Census Tract/Block Group shown are within 40ft of the Routes

N

0 0.5 1
Miles

Path: K:\Projects_2\RCTC_HDR\00428_14\mapdoc\Constraints_Analysis\Fig_5_MinorityPopulationMapBook.mxd User: 19393 Date: 9/23/2015

Figure 5
Minority Population Along Alternatives 4A, 4B, and 5 - Sheet 6
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives

Appendix B
Summary Tables

Table B-1. Comparison of Route Alternatives by Percentage of Persons in Poverty

	Alternative 1	Alternative 4-A	Alternative 4-B	Alternative 5
Average Rate of Poverty by Percentage (for all Census Tracts Combined)	16.69	18.66	19.12	18.74
Number of Census Tracts Evaluated	72	89	90	95
Lowest Poverty Rate	0	3.1	3.1	3.1
Census Tract	218.13	4019.02	4019.02	4019.02
Location	City of Anaheim, Orange County	City of Claremont, Los Angeles County	City of Claremont, Los Angeles County	City of Claremont, Los Angeles County
Highest Poverty Rate	48.5	49	60.2	60.2
Census Tract	2060.50	2031	57.01	57.01
Location	City of Los Angeles, Los Angeles County	City of Los Angeles, Los Angeles County	City of San Bernardino, San Bernardino County	City of San Bernardino, San Bernardino County

Source: US Census Bureau 2013. Data from census tracts that are within a 40-foot buffer from the centerline of the right-of-way.

Table B-2. Comparison of Route Alternatives by Percentage of Minority Persons

	Alternative 1	Alternative 4-A	Alternative 4-B	Alternative 5
Percentage Minority Populations (for all Census Tracts Combined)	39	49	49	51
Number of Block Group Census Tracts Evaluated	106	125	127	138
Lowest Minority Population by Percentage	4	7	7	7
Census Tract	Block Group 2, Census Tract 117.22	Block Group 3, Census Tract 4020.02	Block Group 3, Census Tract 4020.02	Block Group 3, Census Tract 4020.02
Location	City of Placentia, Orange County	City of Claremont, Los Angeles County	City of Claremont, Los Angeles County	City of Claremont, Los Angeles County
Highest Minority Population by Percentage	91	91	91	93
Census Tract	Block Group 4, Census Tract 1106.05	Block Group 1, Census Tract 4336.01	Block Group 1, Census Tract 4336.01	Block Group 2, Census Tract 4811.02
Location	City of Fullerton, Orange County	City of Rosemead, Los Angeles County	City of Rosemead, Los Angeles County	City of Rosemead, Los Angeles County

Source: US Census Bureau 2013. Data from census tracts that are within a 40-foot buffer from the centerline of the right-of-way.

Table B-3. Comparison of Route Alternatives by Percentage of Minority Persons

	Alternative 1	Alternative 4-A	Alternative 4-B	Alternative 5
Percentage of Block Group Census Tracts with less than 50% Minority Populations (for all Census Tracts Combined)	72%	54%	54%	50%
Percentage of Block Group Census Tracts with more than 50% Minority Populations (for all Census Tracts Combined)	28%	46%	46%	50%

Source: US Census Bureau 2013. Data from census tracts that are within a 40-foot buffer from the centerline of the right-of-way.

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Subject: Draft Coachella Valley–San Gorgonio Pass Rail Corridor Service: Fine-Level Screening for Cultural Resources

Introduction

This technical memorandum contains the Draft Fine-Level Screening Constraints Analysis for ***Cultural Resources*** for the Coachella Valley-San Gorgonio Pass Rail Corridor Service Project proposed by the Riverside County Transportation Commission. This analysis considers four rail passenger route alternatives (i.e., 1, 4-A, 4-B, and 5) located between Los Angeles Union Station (LAUS) and Colton along existing rail corridors within Los Angeles, Orange, San Bernardino, and Riverside counties. These alternatives share the same beginning and end points (i.e., LAUS and Colton) and comprise the western study area of the project. The eastern study area is not considered in this analysis because it consists of a single alternative, a 72-mile segment, and its consideration would therefore result in no differentiation between alternatives. The purpose of this memorandum is to assess whether any of the four proposed route alternatives has the potential to affect substantially more cultural resources or culturally sensitive areas than the other alternatives. Therefore, this memorandum considers and compares the cultural resources sensitivity of each of the four alternatives and discusses possible impacts in general terms.

Methodology

The fine-level screening study areas for cultural resources include a 40-foot buffer surrounding the right-of-way for each alternative. For historical built resources, the buffer includes all properties with parcel lines crossed by the 40-foot buffer.

Precise information on the number and locations of significant archaeological and built environment resources can only be obtained through a formal cultural resources record review at a California Historical Resource Information System data center. In the absence of performing such a review, cultural resource sensitivity was considered using alternative methodologies. The following sections describe the methodologies used to characterize historical built resources and archaeological sensitivity of the project alternatives.

Historical Built Resources

In order to identify areas of historical built resource sensitivity without conducting formal record searches at appropriate cultural resource information centers, research at the fine-level screening stage focused on identification of properties within the four alternative study areas that: (1) have been listed on the National Register of Historic Places (NRHP); or (2) have been recorded in the California Historical Resources Inventory (HRI) and found eligible for NRHP listing, or listed in or found eligible for listing in the California Register of Historical Resources (CRHR), or listed in or found eligible for listing in a local government register of historical resources; or (3) are historic districts and other significant groupings of historical resources identified in city surveys or designated by municipalities.

National Register of Historic Places Layer in Google Earth Pro. A Google Earth overlay of properties listed in the NRHP, which is available at the online Google Earth Library, was used to identify NRHP-listed properties within the historical resources study area. This overlay was created using National Park Service source data dating to 2009 and made available at the Google Earth Library webpage. These data are not official National Park Service data, and come with a 6-year gap. Therefore, it is possible that NRHP-listed properties not identified in this fine-level screening could be subsequently identified through comprehensive record searches conducted at appropriate cultural resources information centers. However, the overlay provides the fastest means of identifying NRHP-listed properties in the four alternative study areas. Each of the NRHP-listed locations within or relatively close to the study areas was briefly researched online to confirm that it has not been delisted and to determine whether or not it is located within the historical resources study area. Six properties listed in the NRHP prior to 2010 were identified within the alternative study areas. Tables 1 through 4 below list those six properties by alternative. It is possible that additional properties close to the alternative alignments have been listed on the NRHP since 2010.

California Historical Resources Inventory Database. Information from the California HRI was used to identify properties within the historical resources study areas that are eligible for listing in the NRHP, or that are listed in or eligible for listing in the CRHR or a local register of historical resources. The HRI information dates to 2012 and is organized in a Microsoft Access database. It consists of properties evaluated for historical significance and found eligible or ineligible for listing in the NRHP, CRHR, and/or local designation. Properties within zip codes crossed by the proposed alternatives were extracted from the HRI database. Properties in that extracted population were then georeferenced to create a spreadsheet of HRI entries for properties within or close to the alternative study areas. This process resulted in an approximately 5% failure rate (5% of HRI properties within the relevant zip codes could not be georeferenced). The spreadsheet of georeferenced properties within or close to the study areas included 31 property entries (some for the same property). Each property in the spreadsheet was researched using Google Earth Pro and historic aerial photographs to determine if it still exists and to identify its exact location in relation to (within or outside) the study areas. This research effort revealed that most properties in the HRI spreadsheet have been demolished or are located outside but near the study areas. One locally designated property was identified within the study area for Alternative 1 (see Table 1 below). It is possible that properties listed in the CRHR after 2012, determined to be NRHP or CRHR eligible after 2012, or found to qualify as historical resources under the California Environmental Quality Act (CEQA) as a result of local designations after 2012 are located within the alternative study areas.

In addition to the methodological limits of easily accessible data mentioned above, the study area limits resulted in some inconsistencies worth noting. In one case, a park is included in the study area because the 40-foot buffer crosses into the far northern end of the park's sizeable parcel. The NRHP-listed Ygnacio Palomares Adobe is located within the park property, but at a distance of over 800 feet from the 40-foot buffer line. Elsewhere (along Alternative 5 in San Gabriel), the 40-foot buffer comes within approximately 85 feet of the San Gabriel Mission church building. However, the church building is not within the study area because Mission Road is situated between the mission property and the 40-foot buffer. The San Gabriel Mission is listed on the NRHP and is a California Historical Landmark (CHL). Consequently, it should be noted that alternative buffers crossing parcels farther than 40 feet from the alternative alignments have the potential to result in study areas with a greater number of historical resources than the number of resources accounted for in this analysis.

Local Historic District and Survey Documentation. ICF maintains an electronic library of local historic district and survey documentation. This documentation has been gathered within the last 5 years but may not be up to date in some cases. The library's contents for each community through which the alternative study areas pass were consulted to determine if they include portions of locally designated historic districts, Historic Preservation Overlay Zones (HPOZs), or historic preservation-oriented area specific plans. This research has determined that the alternatives pass through four locally designated historic districts, two historic-preservation oriented area specific plans, and one HPOZ (the HPOZ was identified in a survey conducted for the City of San Bernardino in 1991, but is not regulated as such by the City; it is included here as an area with documented historical resource sensitivity). The local historic districts, historic preservation-oriented area specific plans, and HPOZs identified are listed below for each alternative in Tables 1 through 4.

Archaeology

Unlike historical built resources, information about the locations of archaeological resources is protected by state law and can only be obtained through a formal cultural resources record review at a California Historical Resource Information System data center. In the absence of performing such a review, this document considers the extent and distribution of archaeologically sensitive areas across the project alternatives based on environmental attributes that tend to co-occur with precontact archaeological resources. Although historical archaeological resources also tend to co-occur with the same environmental attributes, historical archaeological sensitivity can be much more precisely performed by reviewing historical maps and literature. This analysis is a low-resolution tool that, when used in the absence of a cultural resources records review, can help to define differences in the relative sensitivity of each of the project alternatives and to identify and prioritize areas where archaeological study would be advisable once a preferred alternative is identified.

For the purposes of this analysis, the phrase *archaeological sensitivity* refers to a given area's likelihood to contain archaeological resources. Under this definition, an area with a high degree of archaeological sensitivity has a greater chance to contain archaeological resources, whereas an area with a low degree of archaeological sensitivity has a lesser chance to contain archaeological resources. In addition to considering general archaeological sensitivity, this analysis considers *buried site sensitivity* or the potential for a given area to contain buried archaeological resources.

Archaeological sensitivity analyses typically consider a range of environmental attributes that co-occur with archaeological resources and use these relationships to predict resource distributions across the landscape. This analysis considers two environmental attributes for general archaeological sensitivity, *proximity to a perennial water source* and *slope*. These attributes were selected because numerous studies have demonstrated their strong relationship with archaeological resource distributions (including, but not limited to, Christenson 1990; Robbins-Wade 1990; Lothrop et al. 1987; Johnston 2010; Ingbar and Hall 2014). For buried site sensitivity, this study considers *landform age*—an attribute that can be used to consider the timing of precontact and historical landscape use relative to the period in which a given landform was geomorphically active. The following briefly describes each of the attributes that were considered and how they influence archaeological sensitivity.

Proximity to a Perennial Water Source: Proximity to a fresh and permanent water source was a particularly important consideration for precontact peoples because, with the exception of early irrigation efforts in the southwest, there was no infrastructure to transport water in the region during the precontact period other than by manually carrying it. In recognition of this, numerous researchers have studied the spatial relationship between archaeological resources and freshwater sources across North America (including, but not limited to, Christenson 1990; Robbins-Wade 1990; Lothrop et al. 1987; Ingbar and Hall 2014). These studies have generally observed that as distance to fresh water decreases, the frequency of archaeological sites and range of archaeological site types increases—with the vast majority of sites located within 1,000 meters, and most habitation sites located within 200 meters, of a freshwater source.

Although a fairly consistent spatial relationship between many archaeological site types and freshwater sources has been repeatedly observed, *channel migration* has the capacity to alter the present-day distance between archaeological resources and freshwater sources. Channel migration results in a stream channel migrating closer or farther away from a fixed point on the landscape over time. To account for this factor, this analysis makes the assumption that the Holocene-aged alluvial landforms in the study area roughly approximate the extent of channel migration during the period for which there is documented evidence for human occupation of North America. Therefore, for the purposes of this study, an area will be considered near a freshwater source if it is located on a Holocene-aged alluvial landform or within 1,000 meters of such a landform.

Slope: With some exceptions, humans tend to spend much of their time in relatively flat areas. As a result, the physical remains of human activities also tend to occur in these areas. The relationship between slope and archaeological resources has been established across multiple studies (including, but not limited to, Ingbar and Hall 2014; Johnston 2010). These studies have generally observed that as slope increases, the frequency of archaeological site types decreases—with the vast majority of archaeological resources located on slopes of less than 15 degrees. The remainder of the archaeological resources tended to be petroglyphs, rockshelters or caves, and stone quarries—resources that would require some degree of topographic relief to provide bedrock exposures. Based on the information presented above, and for the purposes of this study, a given area will be considered to have a sufficiently low slope to be highly sensitive for archaeological resources if it has a slope of less than 15 degrees.

Landform Age: The age and environment in which a landform is created has direct bearing on when it becomes accessible for human use, how humans interact with it once it becomes

accessible, and how the material remains of these activities are preserved. Landforms are useful analytical units because each type has a unique set of physical attributes and can be recognized and contrasted at the macroscopic scale. The age and depositional environment of a landform can also provide insight into whether buried archaeological resources are likely to be present. The study area extends across several geologic units (landforms that share an origin) of varying ages. This study divides these units into two categories (*Pre-Human Occupation* and *Human Occupation*) based on their age of formation relative to the period in which humans have occupied North America.

- *Pre-Human Occupation:* Landforms that formed prior to the period for which there is documented evidence of human occupation of North America, which is approximately at the Pleistocene- to Holocene-epoch transition (Meltzer 2004; Erlandson et al. 2007).
- *Human Occupation:* Landforms formed during the period for which there is documented evidence of human occupation of North America, including areas filled during the historic and modern periods.

General Archaeological Sensitivity

Using the attributes listed above, the study area was divided into areas of either high or low archaeological sensitivity. Additional gradations of archaeological sensitivity were avoided for the sake of clarity. The criteria for defining each level of archaeological sensitivity are described below.

- **Low.** Areas greater than 1,000 meters from Holocene-aged alluvial landforms or from a perennial water source on a Pleistocene-aged or older landform or on a slope greater than 15 degrees.
- **High.** Areas less than 1,000 meters from Holocene-aged alluvial landforms or from a perennial water source on a Pleistocene-aged or older landform or on a slope of less than 15 degrees.

Buried Site Sensitivity

The study area was also divided into areas of either high or low buried site sensitivity. As indicated previously, some of the landforms in the study area have the potential to contain buried archaeological resources. Based on the information presented in the landform age section, the following are the criteria for each level of buried site sensitivity.

- **Low:** Except in instances of anthropogenic filling (e.g., levee construction, road and rail prism), any *pre-human occupation* landforms and any areas situated outside of locations defined as having low general archaeological sensitivity.
- **High:** Any *human occupation* landforms located within areas of high general archaeological sensitivity.

Limitations and Considerations

- The approach to defining archaeological sensitivity presented in this document is based on previously observed tendencies for the environmental attributes listed above to co-vary with the distribution of archaeological resources. It is important to acknowledge, however, that the areas defined as having low general sensitivity for archaeological resources may

still contain archaeological resources, but that their frequency is significantly lesser than in areas defined as having high general sensitivity for archaeological resources.

- The distributions of general archaeological and buried site sensitivity areas are based on existing data sources that vary in resolution. Therefore, the boundaries between the various sensitivity areas may be more nebulous than their graphical depiction conveys.
- The landform age analysis uses a 1:100,000 scale geologic map for the sake of expediency. Both the scale of the map and the chronological resolution of the geologic units are coarse-grained and are likely to result in the characterization of larger areas defined as having a high general archaeological sensitivity and high buried site sensitivity than if finer-grained data (i.e., USDA soils or 1:24,000 scale geologic maps) were used.
- The proximity to perennial water analysis uses both a 1:100,000 scale geologic map and current hydrologic data. These sources may not accurately reflect the locations of pre-development water sources and the extent to which they may have migrated in the precontact past. It is highly likely that this has resulted in the characterization of larger areas defined as having general archaeological sensitivity than if different data sources (i.e., stream information traced from historical General Land Office maps, finer grained geologic map data) were used.

Existing Setting

The four alternatives are located in highly developed urban or suburban areas, much of which was extensively modified during the historic and modern era. Some relatively short segments of Alternative 1 pass through areas of open space in the eastern Anaheim Hills and Prado Basin vicinity. Many of the identified historical resources along the alternatives were directly or indirectly associated with the rail alignments and consist mainly of railroad station buildings or buildings constructed for processing or storing commodities for railroad shipment, especially agricultural commodities. This is to be expected; the establishment of rail lines attracted development of depots and stations, industrial buildings related to railroad shipping, and nearby commercial and residential districts. As a consequence of this pattern of development, the older surviving districts of many communities are located along or close to historic railroad corridors. In general, the occurrence of historic period archaeological resources in the study areas is expected to follow this same pattern.

Ethnographically documented groups occupying the four alternative study areas consist of the Gabrielino/Tongva, concentrated to the west, transitioning to Serrano and Cahuilla Native American groups toward the east in the area of Alternatives 4-A, 4-B, and 5, which is a transitional zone among the three groups. The southern and southwestern portion of Alternative 1 is a transitional area between the Gabrielino/Tongva and the Luiseno. All four groups are speakers of Takic languages, which are part of the Uto-Aztecan linguistic stock (Bean 1978; Bean and Smith 1978a, 1978b).

Regulatory Setting

Section 106 of the National Historic Preservation Act

Projects considered federal undertakings are subject to compliance with Section 106 of the National Historic Preservation Act (NHPA). Section 106 of the NHPA requires that, before beginning any undertaking, a federal agency must take into account the effects of the undertaking on historic properties and afford the Advisory Council on Historic Preservation an opportunity to comment on these actions. Specific regulations regarding compliance with Section 106 state that, although the tasks necessary to comply with Section 106 may be delegated to others, the federal agency is ultimately responsible for ensuring that the Section 106 process is completed according to statute. The Section 106 process has four basic steps.

1. Initiation of the Section 106 process
2. Identification of historic properties within the area of potential effect (APE)
3. Assessment of adverse effects on historic properties
4. Resolution of adverse effects on historic properties

National Register of Historic Places

Under Section 106 of the NHPA, cultural resource significance is evaluated in terms of eligibility for listing in the NRHP. NRHP significance criteria applied to evaluate the cultural resources in this study are defined in 36 Code of Federal Regulations 60.4 as the quality of significance in American history, architecture, archaeology, engineering, and culture as present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and

a. that are associated with events that have made a significant contribution to the broad patterns of our history; or
b. that are associated with the lives of persons significant in our past; or
c. that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
d. that have yielded, or may be likely to yield, information important in prehistory or history.

As mentioned above, eligibility for listing in the NRHP requires that a resource not only meet one of the significance criteria listed above but also possess integrity. Integrity is the ability of a property to convey its significance. There are seven aspects or qualities of historical integrity: location, design, setting, materials, workmanship, feeling, and association. The evaluation of a resource's integrity must be grounded in an understanding of that resource's physical characteristics and how those characteristics relate to its significance.

California Environmental Quality Act and Cultural Resources

CEQA requires public agencies to evaluate the implications of their projects on the environment and includes significant historic resources as part of the environment. Public agencies must treat any cultural resource as significant unless the preponderance of evidence demonstrates

that it is not historically or culturally significant (California Code of Regulations [CCR] Title 14 §15064.5). A historic resource is considered significant if it meets the definition of *historical resource* or *unique archaeological resource*, as detailed below.

Historical Resources

The term *historical res*ource includes, but is not limited to, any object, building, structure, site, area, place, record, or manuscript that is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California Public Resources Code (PRC) (PRC §5020.1(j)). Historical resources may be designated as such through three different processes.

1. Official designation or recognition by a local government pursuant to local ordinance or resolution (PRC §5020.1(k))
2. A local survey conducted pursuant to PRC §5024.1(g)
3. The property is listed in or eligible for listing in the NRHP (PRC §5024.1(d)(1))

The process for identifying historical resources is typically accomplished by applying the criteria for listing in the CRHR (CCR Title 14 §4852), which states that a historical resource must be significant at the local, state, or national level under one or more of the following four criteria.

a. It is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
b. It is associated with the lives of persons important in our past.
c. It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master, or possesses high artistic values.
d. It has yielded, or may be likely to yield, information important in prehistory or history.

The same integrity considerations used to determine if a resource retains enough original characteristics to qualify it for NRHP listing are also employed to determine if a resource qualifies as a *historical resource* for the purpose of CEQA. The integrity of a potential historical resource must be judged with reference to the particular criteria under which it stands to be eligible for listing in the CRHR (CCR Title 14 §4852(c)). Finally, as noted in item 2 above, resources not evaluated for CRHR eligibility can qualify as historical resources under CEQA if they are determined to be locally significant as part of a survey meeting the requirements of PRC §5024.1(g).

Results and Potential Impacts

The following sections summarize the findings of the fine-level screening for cultural resources and briefly considers possible project impacts on these resources by project alternative. Figures depicting the distribution of areas with high general archaeological sensitivity and buried site sensitivity are provided in Appendix A.

During the later stages of fine-level analysis, it was determined that sufficient passenger train slots are available under current operating agreements for Route Alternative 1. Based on this information, additional infrastructure (e.g. no improvements to the existing rail route) would

not be required or needed if RCTC dedicates that needed slots to the Coachella Valley service. In no additional infrastructure is required, no direct environmental impacts are anticipated to occur. However, in the event that additional infrastructure is needed for Route Alternative 1, this memorandum contains applicable information about the types of environmental resources that may occur within and along Route Alternative 1.

Alternative 1

Historic Built Environment

Two NRHP-listed properties and one property designated as significant by the City of Placentia are located within the study area of Alternative 1. Additionally, the Alternative 1 study area includes portions of three locally designated historic districts. This alternative passes through western Riverside and San Bernardino counties, northwestern Orange County, and the Los Angeles Basin.

The northeastern portion of Alternative 1 within San Bernardino County extends south from southern Colton into Riverside County. Within Riverside County, Alternative 1 passes through Highgrove, Riverside, and Corona. Although the current effort identified no NRHP-listed properties within this portion of the study area, the Riverside segment of this alternative is aligned close to multiple NRHP-listed properties, and it passes through relatively narrow portions of the City of Riverside's locally designated Seventh Street and Seventh Street East Historic Districts. North and south of the Seventh Street and Seventh Street East Historic Districts, Alternative 1 passes at a distance over 1 mile through an expansive area that the City of Riverside has identified as a Citrus Thematic Industrial Potential Historic District.

Through the Orange County communities of Placentia and Fullerton, the Alternative 1 study area includes two locally designated historical resources in Placentia (the Santa Fe District and the Mutual Orange Association building) and two NRHP-listed properties in Fullerton (the Fullerton Union Pacific Depot and the Santa Fe Railway Passenger and Freight Depot). Fullerton has a high concentration of NRHP-listed properties located outside but in the vicinity of the Alternative 1 study area.

Moving northwest and west, Alternative 1 passes through Buena Park, La Mirada, Norwalk, Santa Fe Springs, West Whittier, Pico Rivera, Montebello, and Commerce. Along this portion of Alternative 1 there are no NRHP-listed properties within or close to the study area. No locally designated historic districts within or close to the Alternative 1 study area were identified in these communities. This stretch of Alternative 1 does not appear to be highly sensitive for historical resources. No historical resources, districts, or HPOZs are within the study area at the west end of Alternative 1, where it is aligned north-south as it approaches Los Angeles's Union Station. However, this portion of Alternative 1 is aligned fairly close to a number of NRHP-listed properties, including Union Station and several other NRHP-listed railroad properties.

With the methodological limits explained above in mind, at this stage of analysis the *Alternative 1 study area's historical resource sensitivity appears to be roughly equivalent to Alternative 4-A, and slightly lower than Alternatives 4-B and 5.* The Alternative 1 study area has one fewer NRHP-listed property than Alternative 4-A. One NRHP-listed property in Alternative 4-A (the Ygnacio Palomares Adobe, which is also within the Alternatives 4-B and 5 study areas) is unlikely to be affected by the project because it is more than 800 feet from the rail alignment.

The Alternative 4-A study area passes through approximately 0.5 mile of locally designated historic district area (the Citrus Processing District in Colton) and approximately 0.5 mile of historic preservation-oriented specific plan area (the Upland Historic Downtown Specific Plan Area). The Alternative 1 study area incorporates more local individual resources or district areas than Alternative 4-A (four versus two), but the combined length of Alternative 1 study area segments passing through established historic districts or preservation-oriented area specific plans (approximately 1 mile) far surpasses the roughly two-block length of Alternative 1 study area passing through designated Riverside historic district areas. Alternative 4-A would have greater overall sensitivity than Alternative 1 but for the presence of a large potential district in the Alternative 1 study area. Indeed, approximately 1 mile of the Alternative 1 study area in the vicinity of the two established City of Riverside Seventh Street Districts also passes through an area identified by the City of Riverside as a Citrus Thematic Industrial Potential Historic District. For these reasons, Alternative 1 appears to be roughly as sensitive overall for historical resources as Alternative 4-A.

Archaeological Sensitivity

Alternative 1 encompasses 552 acres (83% of the total surface area) of land characterized as having high general archaeological sensitivity. Of the area characterized as having high general archaeological sensitivity, 356 acres (53% of the total surface area) are defined as having a high degree of sensitivity for buried archaeological sites (Table 1). Alternative 1 encompasses a slightly larger area than Alternatives 4-A, 4-B, and 5 and has a proportionally larger area of general archaeological sensitivity. This alternative appears to have a proportionally smaller area of high buried site sensitivity compared to Alternatives 4-A, 4-B, and 5.

Potential Impacts

Historical Built Environment. Impacts within the Alternative 1 study area would depend on the types of project activities that could physically alter historical resources or properties on which historical resources are located, or that could result in indirect impacts on historical resources. Demolition of such resources would result in direct impacts. Physical alteration of such resources is likely to result in direct impacts unless the alterations meet historic preservation standards. Indirect impacts can result from alterations to properties within which historical resources are located, even if the resources (a building, for example) are not physically altered. Certain historic buildings can be subject to impacts from construction vibration or from the vibratory effects of rail operations. At this stage, it is not clear exactly what impacts on historical resources would occur as a result of the proposed project.

Archaeological Resources. Because no archaeological resources were identified during this analysis and the nature of the proposed project-related activities has not been established, little can be concluded about possible impacts on archaeological resources in this alternative. In general, however, impacts on archaeological resources are a result of ground-disturbing activities that directly affect a resource through destruction of some or all of the resource. Impacts on significant archaeological resources that cannot be avoided by the project are typically mitigated through archaeological data recovery and curation in a federally accredited repository.

Table 1. Alternative 1 Environmental Resources within Right-of-Way and Buffer

Environmental Resource	Resources within Right-of-Way and Buffer
NRHP-listed properties	Two properties or resource groupings: • Santa Fe Railway Passenger and Freight Depot in Fullerton, Orange County • Fullerton Union Pacific Depot in Fullerton, Orange County
Locally designated historic districts, HPOZs, and historic specific plan areas; properties in HRI listed in or eligible for listing in the CRHR or a local register; properties in HRI eligible for listing in NRHP	Four properties or resource groupings: • Seventh Street Historic District in Riverside, Riverside County • Seventh Street East Historic District in Riverside, Riverside County, California • Mutual Orange Association Building in Placentia, Orange County • Santa Fe District in Placentia, Orange County
Archaeological sensitivity	665 total acres 84% (552 acres) high general archaeological sensitivity 53% (354 acres) high buried site sensitivity

Alternative 4-A

Historic Built Environment

Three NRHP-listed properties, portions of one locally designated historic district, and portions of one historic preservation-oriented area specific plan are located within the Alternative 4-A study area. Alternative 4-A passes through the Inland Empire area of western San Bernardino and eastern Los Angeles counties, the San Gabriel Valley portion of Los Angeles County, and eastern City of Los Angeles.

Within San Bernardino County, this alternative extends north from Colton to San Bernardino, and then turns west and passes through Rialto, Fontana, Rancho Cucamonga, and Upland. Of these, the Colton and Upland segments of Alternative 4-A appear to have the greatest historical resource sensitivity. The alignment passes through the City of Colton's Citrus Processing Historic District immediately north of Interstate 10 and the City of Upland's Historic Downtown Specific Plan Area. Additionally, Alternative 4-A crosses a portion of the long segment of Euclid Avenue through Upland and Ontario that is listed on the NRHP. Although the Claremont and Pomona portions of the Alternative 4-A study area in eastern Los Angeles County contain two NRHP-listed properties (Claremont's Atchison, Topeka, and Santa Fe Railroad Station and Pomona's Ygnacio Palomares Adobe), the Alternative 4-A study areas in these two communities appear less sensitive in terms of potential for multiple historical resources than the Alternative 4-A study areas in Colton and Upland.

Farther west, Alternative 4-A passes along the edges of the original downtown areas of La Verne, San Dimas, Covina, Baldwin Park, and El Monte. In these communities, there are no NRHP-listed properties and no locally designated historic districts in the vicinity of Alternative 4-A. West of northern El Monte, Alternative 4-A follows Interstate 10 and passes through Rosemead, Alhambra, and eastern Los Angeles. There are no NRHP-listed properties, locally designated

historic districts, or HPOZs within or in the vicinity of the Alternative 4-A study area in Rosemead, Alhambra, or eastern Los Angeles.

As explained above in the Alternative 1 results section, with the methodological limits of the current analysis in mind, the *Alternative 4-A study area's historical resource sensitivity appears to be roughly equivalent to Alternative 1 and slightly lower than Alternatives 4-B and 5*.

Archaeological Sensitivity

Alternative 4-A encompasses 511 acres (87% of the total surface area) of land characterized as having high general archaeological sensitivity. Of this area, 479 acres (81% of the total surface area) are characterized as having a high degree of sensitivity for buried archaeological sites (Table 2). The extent of Alternative 4-A differs only slightly from Alternatives 4-B (16 fewer acres) and 5 (18 fewer acres); as a result, *the extent and distribution of land with high general archaeological sensitivity and high buried site sensitivity for this alternative is slightly less than that of Alternatives 4-B and 5.*

Potential Impacts

The same historical built resource and archaeological resource impact considerations discussed for Alternative 1 above apply to Alternative 4-A.

Table 2. Alternative 4-A Environmental Resources within Right-of-Way and Buffer

Environmental Resource	Resources within Right-of-Way and Buffer
NRHP-listed properties	Three properties or resource groupings: • Euclid Avenue in Upland, San Bernardino County • Atchison, Topeka, and Santa Fe Railway Station in Claremont, Los Angeles County • Ygnacio Palomares Adobe in Pomona, Los Angeles County
Locally designated historic districts, HPOZs, and historic specific plan areas; properties in HRI listed in or eligible for listing in the CRHR or a local register; properties in HRI eligible for listing in NRHP	Two properties or resource groupings: • Citrus Processing District in Colton, San Bernardino County • Upland Historic Downtown Specific Plan Area in Upland, San Bernardino County
Archaeological sensitivity	572 total acres 87% (511 acres) high general archaeological sensitivity 81% (464 acres) high buried site sensitivity

Alternative 4-B

Historic Built Environment

Alternative 4-B is identical to Alternative 4-A except for a segment of Alternative 4-B that extends to the east and southeast from Alternative 4-A at a distance of approximately 1.5 miles in the City of San Bernardino. Because of this additional segment, the Alternative 4-B study area

contains one more NRHP-listed property than Alternative 4-A (for a total of four), and one more locally designated historic district, historic specific plan area, or HPOZ than Alternative 4-B (for a total of three).

The portion of the Alternative 4-B study area extending east from the alignment it shares with Alternative 4-A includes the NRHP-listed Atchison, Topeka, and Santa Fe Railway Passenger and Freight Depot in San Bernardino. The study area also passes through the Santa Fe Railroad Workers HPOZ, which was identified in a citywide historical resources survey of San Bernardino conducted in 1991. The City of San Bernardino has not formally adopted this HPOZ, and the City does not enforce any historic preservation regulations within the identified HPOZ. The northeastern portion of Alternative 4-B extending east and southeast from Alternative 4-A was surveyed in 2011–2012 by ICF for the Downtown San Bernardino Passenger Rail Project. Some of the historical resources identified as part of that effort have since been demolished, and mitigation was completed for many of the identified historical resources along the rail alignment. Nevertheless, the Santa Fe Railroad Workers HPOZ should still be considered sensitive for historical resources.

With the methodological limits explained above in mind, the *historical resource sensitivity of the Alternative 4-B study area appears to be greater than Alternatives 1 and 4-A and slightly lower than Alternative 5*.

Archaeological Sensitivity

Alternative 4-B encompasses 527 acres (90% of the total surface area) of land characterized as having high general archaeological sensitivity. Of this area, 480 acres (82% of the total surface area) are characterized as having a high degree of sensitivity for buried archaeological sites (Table 3). As indicated previously, *the extent and distribution of land with high general archaeological sensitivity and high buried site sensitivity for this alternative is greater than Alternative 1, slightly greater than Alternative 4-A, and comparable to Alternative 5.*

Potential Impacts

The same historical built resource and archaeological resource impact considerations discussed for Alternative 1 above apply to Alternative 4-B.

Table 3. Alternative 4-B Environmental Resources within Right-of-Way and Buffer

Environmental Resource	Resources within Right-of-Way and Buffer
NRHP-listed properties	Four properties or resource groupings: • Atchison, Topeka, and Santa Fe Railway Passenger and Freight Depot in San Bernardino, San Bernardino County • Euclid Avenue in Upland, San Bernardino County • Atchison, Topeka, and Santa Fe Railway Station in Claremont, Los Angeles County • Ygnacio Palomares Adobe in Pomona, Los Angeles County
Locally designated historic districts, HPOZs, and historic specific plan areas; properties	Three properties or resource groupings: • Santa Fe Railroad Workers HPOZ in San Bernardino, San Bernardino County

Environmental Resource	Resources within Right-of-Way and Buffer
in HRI listed in or eligible for listing in the CRHR or a local register; properties in HRI eligible for listing in NRHP	• Citrus Processing District in Colton, San Bernardino County • Upland Historic Downtown Specific Plan Area in Upland, San Bernardino County
Archaeological sensitivity	588 total acres 90% (527 acres) high general archaeological sensitivity 82% (480 acres) high buried site sensitivity

Alternative 5

Historic Build Environment

Alternative 5 is identical to Alternative 4-B east of El Monte. At Santa Anita Avenue in El Monte, Alternative 5 veers away from Alternative 4-B and extends to the northwest through Rosemead. Alternative 5 turns to the southwest in San Gabriel, continues through Alhambra, and then turns to the west in eastern City of Los Angeles. Alternative 5 has the same number of NRHP-listed properties as Alternative 4-B (four total). Its study area passes through one more historic district or other grouping of historical resources (four total) than the Alternative 4-B study area.

West of El Monte, the Alternative 5 study area encounters historical resource sensitivity only in San Gabriel. There the study area crosses through the City of San Gabriel's historic preservation-oriented Mission District Specific Plan area. Additionally, the northern boundary of the study area's 40-foot buffer is situated approximately 85 feet south of the San Gabriel Mission Church building, one of the oldest buildings in Southern California.

With the methodological limits explained above in mind, the *Alternative 5 study area's historical resource sensitivity appears to be greater than the other three alternatives.* Although no individual historical resources are located within the Alternative 5 study area through San Gabriel's Mission District Specific Plan area, the mission church building's relatively close proximity to the rail alignment pushes Alternative 5 above Alternative 4-B on the scale of historical resource sensitivity.

Archaeological Sensitivity

Alternative 5 encompasses 515 acres (87% of the total surface area) of land characterized as having high general archaeological sensitivity. Of this area, 462 acres (78% of the total surface area) are characterized as having a high degree of sensitivity for buried archaeological sites (Table 4). As indicated previously, the extent and distribution of land with high general archaeological sensitivity and high buried site sensitivity for this alternative is comparable to Alternatives 4-A and 4-B. The extent and distribution of land with high general archaeological sensitivity and high buried site sensitivity for this alternative is greater than Alternative 1, slightly greater than Alternative 4-A, and comparable to Alternative 4-B.

Potential Impacts

The same historical built resource and archaeological resource impact considerations discussed for Alternative 1 above apply to Alternative 5.

Table 4. Alternative 5 Environmental Resources within Right-of-Way and Buffer

Environmental Resource	Resources within Right-of-Way and Buffer
NRHP-listed properties	Four properties or resource groupings: • Atchison, Topeka, and Santa Fe Railway Passenger and Freight Depot in San Bernardino, San Bernardino County • Euclid Avenue in Upland, San Bernardino County • Atchison, Topeka, and Santa Fe Railway Station in Claremont, Los Angeles County • Ygnacio Palomares Adobe in Pomona, Los Angeles County
Locally designated historic districts, HPOZs, and historic specific plan areas; properties in HRI listed in or eligible for listing in the CRHR or a local register; properties in HRI eligible for listing in NRHP	Four properties or resource groupings: • Santa Fe Railroad Workers HPOZ in San Bernardino, San Bernardino County • Citrus Processing District in Colton, San Bernardino County • Upland Historic Downtown Specific Plan Area in Upland, San Bernardino County • Historic Mission District Specific Plan Area in San Gabriel, Los Angeles County
Archaeological sensitivity	590 total acres 87% (515 acres) high general archaeological sensitivity 78% (462 acres) high buried site sensitivity

Conclusion

The information from the built environment and archaeological resource sensitivity analysis indicates a slight difference in cultural resources sensitivity among the four alternatives. Alternative 1 appears to be less sensitive than Alternatives 4-A, 4-B, and 5. Alternative 4-A appears to be more sensitive than Alternative 1 and slightly less sensitive than Alternatives 4-B and 5. Alternative 4-B appears to be more sensitive than Alternative 1, slightly more sensitive than Alternative 4-A, and fairly equivalent to Alternative 5. Alternative 5 appears to be more sensitive than Alternatives 1 and 4-A and fairly equivalent to Alternative 4-B.

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Appendix A
Figures

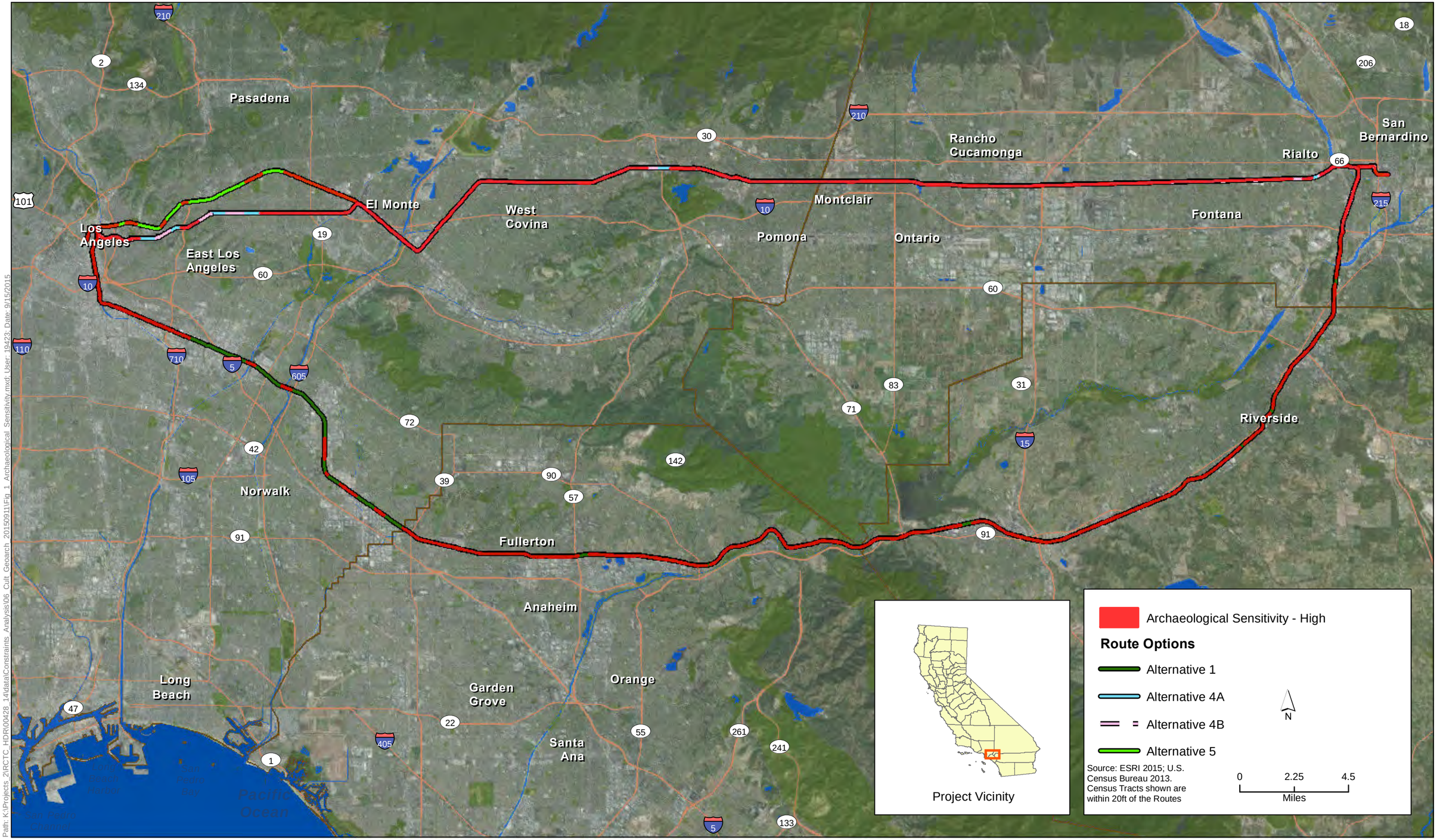

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Figure 1
Archaeological Sensitivity
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives

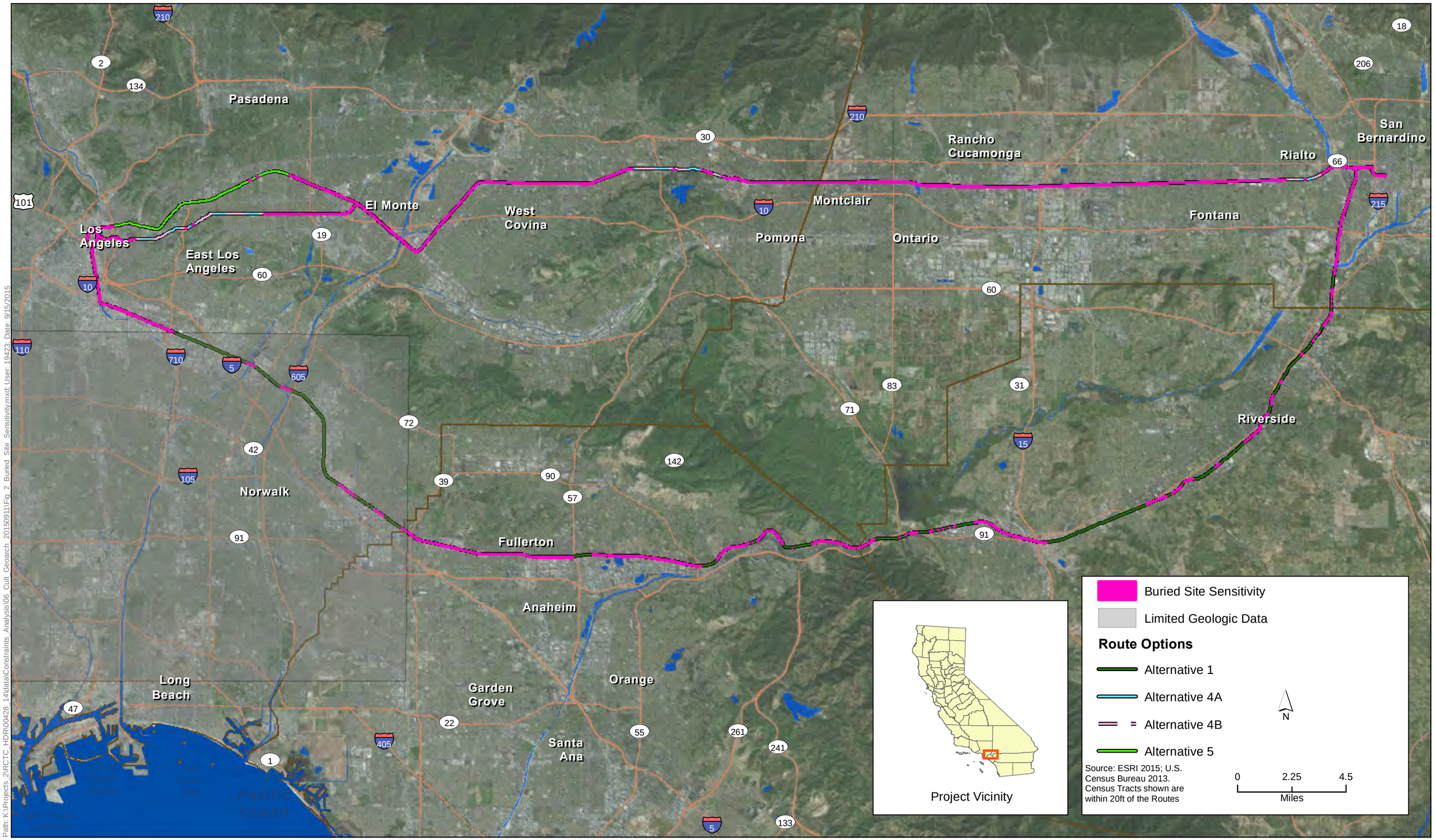

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Figure 2
Buried Site Sensitivity
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives

Appendix B
Summary Table

Environmental Resource	Resources within Right-of-Way and Buffer			
	Alternative 1	Alternative 4-A	Alternative 4-B	Alternative 5
NRHP-listed properties	Two properties or resource groupings: • Santa Fe Railway Passenger and Freight Depot in Fullerton, Orange County • Fullerton Union Pacific Depot in Fullerton, Orange County	Three properties or resource groupings: • Euclid Avenue in Upland, San Bernardino County • Atchison, Topeka, and Santa Fe Railway Station in Claremont, Los Angeles County • Ygnacio Palomares Adobe in Pomona, Los Angeles County	Four properties or resource groupings: • Atchison, Topeka, and Santa Fe Railway Passenger and Freight Depot in San Bernardino, San Bernardino County • Euclid Avenue in Upland, San Bernardino County • Atchison, Topeka, and Santa Fe Railway Station in Claremont, Los Angeles County • Ygnacio Palomares Adobe in Pomona, Los Angeles County	Four properties or resource groupings: • Atchison, Topeka, and Santa Fe Railway Passenger and Freight Depot in San Bernardino, San Bernardino County • Euclid Avenue in Upland, San Bernardino County • Atchison, Topeka, and Santa Fe Railway Station in Claremont, Los Angeles County • Ygnacio Palomares Adobe in Pomona, Los Angeles County
Locally designated historic districts, HPOZs, and historic specific plan areas; properties in HRI listed in or eligible for listing in the CRHR or a local register; properties in HRI eligible for listing in NRHP	Four properties or resource groupings: • Seventh Street Historic District in Riverside, Riverside County • Seventh Street East Historic District in Riverside, Riverside County, California	Two properties or resource groupings: • Citrus Processing District in Colton, San Bernardino County • Upland Historic Downtown Specific Plan Area in Upland, San Bernardino County	Three properties or resource groupings: • Santa Fe Railroad Workers HPOZ in San Bernardino, San Bernardino County • Citrus Processing District in Colton, San Bernardino County	Four properties or resource groupings: • Santa Fe Railroad Workers HPOZ in San Bernardino, San Bernardino County • Citrus Processing District in Colton, San Bernardino County

Environmental Resource		Resources within Right-of-Way and Buffer			
		Alternative 1	Alternative 4-A	Alternative 4-B	Alternative 5
		• Mutual Orange Association Building in Placentia, Orange County • Santa Fe District in Placentia, Orange County		• Upland Historic Downtown Specific Plan Area in Upland, San Bernardino County	• Upland Historic Downtown Specific Plan Area in Upland, San Bernardino County • Historic Mission District Specific Plan Area in San Gabriel, Los Angeles County
Archaeological sensitivity	Total acres	665	572	588	590
	High general archaeological sensitivity	84% (552 acres)	87% (511 acres)	90% (527 acres)	87% (515 acres)
	High buried site sensitivity	53% (354 acres)	81% (464 acres)	82% (480 acres)	78% (462 acres)

Memo

Date:	Monday, September 28, 2015
Project:	Coachella Valley – San Gorgonio Pass Rail Corridor
To:	JD Douglas
From:	Kelly Czechowski
Subject:	Fine Level Screening for Floodplains

Introduction

This technical memorandum contains the Draft Fine-Level Screening Constraints Analysis for identified floodplains for the Coachella Valley-San Gorgonio Pass Rail Corridor Service Project proposed by the Riverside County Transportation Commission (RCTC). This analysis considers four rail passenger route alternatives (i.e., 1, 4-A, 4-B, and 5) located between Los Angeles Union Station (LAUS) and Colton along existing rail corridors within Los Angeles, Orange, San Bernardino, and Riverside counties. These alternatives share the same beginning and end points (i.e., LAUS and Colton) and comprise the western study area of the project. The eastern study area is not considered in this analysis because it consists of a single 72-mile segment, and its consideration would therefore result in no differentiation between alternatives. The purpose of this memorandum is to provide an initial evaluation of the route alternatives and quantification of conceptual environmental effects to determine the potential to affect substantially more environmentally sensitive areas in specific environmental categories compared with other route alternatives. Impacts are generalized for resources within and adjacent to a buffer surrounding the right-of-way for each alternative route.

Methodology

The Coachella Valley–San Gorgonio Pass Rail Corridor Service alternatives were generally evaluated against the fine-level screening criteria defined in Section 4.2 of the Alternatives Analysis Methodology, and the results of this evaluation are presented herein. During fine-level screening, route alternatives (or combinations of route alternatives) will be identified in the Alternatives Analysis that offer the highest potential ridership; the least potential construction, operating, and maintenance cost; and the least potential impact on communities and the environment, as well as appropriate mitigation feasibility. This effort will provide information

regarding potential environmental impacts for each route alternative for ultimate selection of an alternative to be carried forward as the proposed project.

Fine-level screening was based on open-source aerial imagery and/or geographic information systems (GIS) data, which will be used to characterize portions of each route alternative. Because several route alternatives, each with lengths on the order of 60 miles, were carried forward from coarse-level screening, field visits were not conducted during fine-level screening. In September 2015, HDR conducted a review for the project in order to identify potential constraints for floodplains. This research encompassed the project route for all alternatives brought forward from the course-level screening analysis and a 40-foot buffer from the centerline, or an 80-foot total buffer, including both sides of the rail line.

For the purposes of this analysis, a conservative impact potential is assumed, which includes acquisition of right-of-way of the entirety of the 80-foot buffer around each of the route alternatives. Using this conservative assumption for each alternative, any portion of identified agricultural resource would be affected by the project.

During the later stages of fine-level analysis, it was determined that sufficient passenger train slots are available under current operating agreements for Route Alternative 1. Based on this information, additional infrastructure (e.g. no improvements to the existing rail route) would not be required or needed if RCTC dedicates that needed slots to the Coachella Valley service. In no additional infrastructure is required, no direct environmental impacts are anticipated to occur. However, in the event that additional infrastructure is needed for Route Alternative 1, this memorandum contains applicable information about the types of environmental resources that may occur within and along Route Alternative 1.

Regulatory Setting

Floodplain Management (Executive Order 11988) Executive Order 11988 requires that federal agency construction, permitting, or funding of a project avoid incompatible floodplain development, be consistent with the standards and criteria of the National Flood Insurance Program (NFIP), and restore and preserve natural and beneficial floodplain values.

National Flood Insurance Act (42 U.S.C. 4001 et seq.) The purpose of the National Flood Insurance Act is to identify flood-prone areas and provide insurance. The act requires purchase of insurance for buildings in special flood-hazard areas. The act is applicable to any federally assisted acquisition or construction project in an area identified as having special flood hazards. Projects

should avoid construction in, or develop a design to be consistent with, Federal Emergency Management Agency (FEMA)-identified flood-hazard areas.

Floodplain Management and Protection (U.S. Department of Transportation Order 5650.2) and Flood Disaster Protection Act (42 U.S.C. Section 4001–4128) The purpose of these acts is to identify flood-prone areas and to provide insurance. The act requires purchase of insurance for buildings in special flood-hazard areas.

Cobey-Alquist Flood Plain Management Act (Water Code Section 8400 et seq.) This act documents the state's intent to support local governments in their use of land use regulations to accomplish floodplain management and to provide assistance and guidance as appropriate.

Existing Setting

The route alternatives are located in a generally developed urban setting and traverse about 38 local jurisdictions within Los Angeles, Orange, Riverside, and San Bernardino counties. In general, the rail-dominated corridors along which the alternatives follow do cross multiple areas where 100-year floodplains are identified.

Results

Each of the alternatives considered in this analysis generally are within existing rail right-of-way. The floodplains identified as part of this analysis are outside of the rail right-of-way. Later phases of the project planning and environmental analysis will identify potential for temporary occupancy or proximity impacts and analyze the potential for encroachment into identified floodplains. Early identification of where these floodplains occur can inform the design and engineering of the project so as to avoid floodplains to the maximum extent practicable, ensure incorporation of the statute's requirements for the evaluation of avoidance alternatives, and assist with selection of a least overall harmful alternative. Table 1 provides a summary of all the alternatives under consideration.

Table 1: Floodplain Acreage Summary

Environmental Resource	Alternative 1	Alternative 4-A	Alternative 4-B	Alternative 5
100-Year Floodplains (acres)	25.14 acres	36.28 acres	36.26 acres	36.51 acres

Conclusion

Generally, Alternative 5 includes the greatest acreage of identified 100-year floodplains within its buffer area, while Alternative 1 includes the least acreage of floodplains within the buffer area. Once additional design, right-of-way, and construction information is available for the alternatives, if encroachment into floodplains is identified, then a floodplain analysis would be required.

Appendix A
Figures

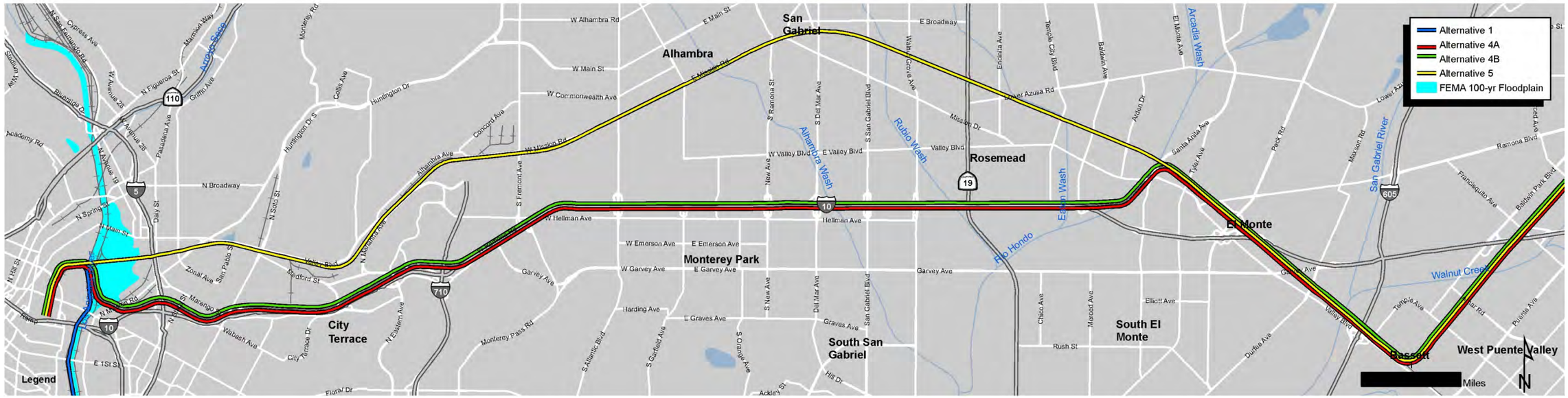

Figure 1 (Sheet 1 of 5)
100-Year Floodplains
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives

Figure 1 (Sheet 2 of 5)
100-Year Floodplains
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives

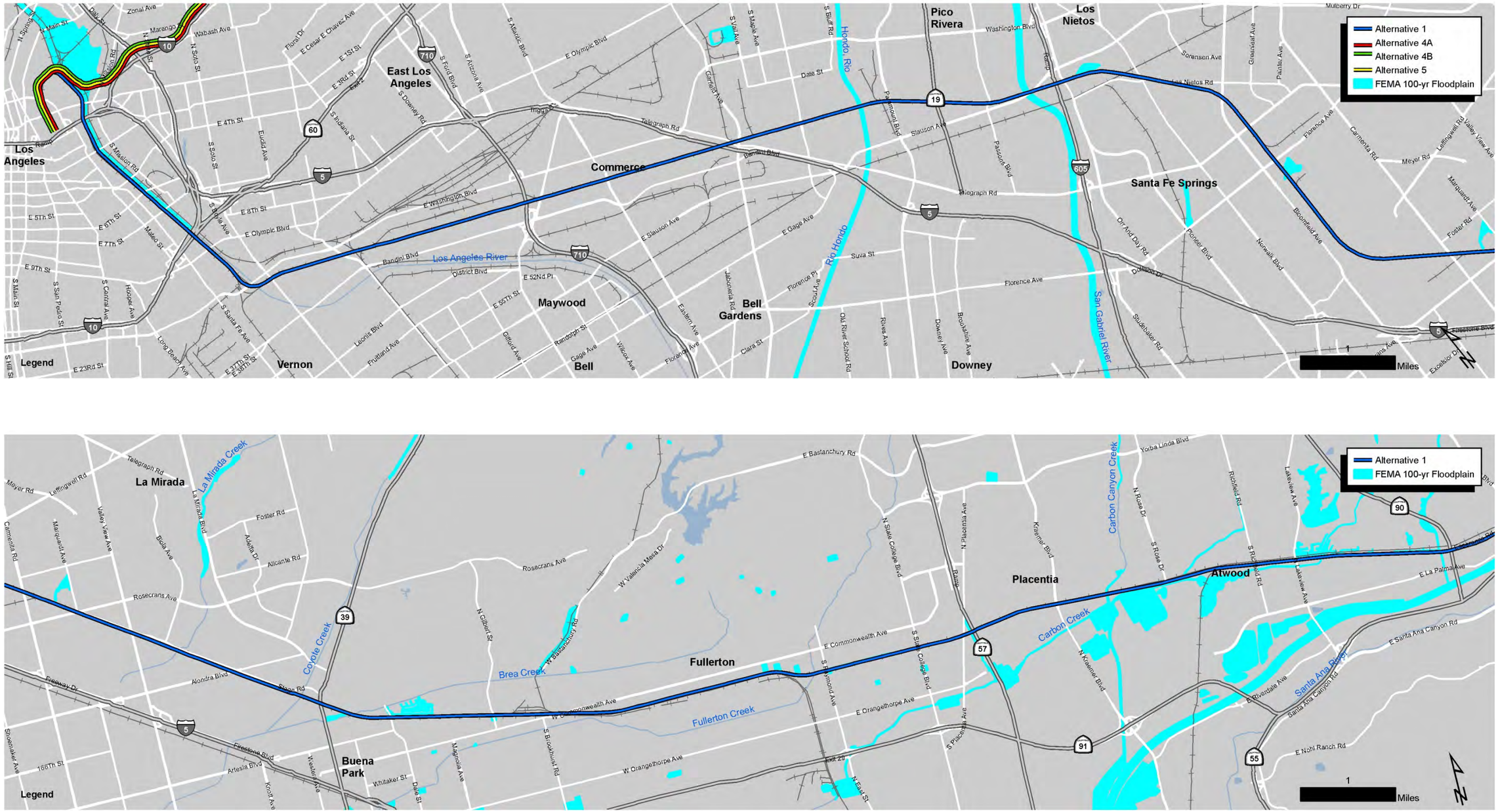

Figure 1 (Sheet 3 of 5)
100-Year Floodplains
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives

Figure 1 (Sheet 4 of 5)
100-Year Floodplains
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives

Figure 1 (Sheet 5 of 5)
100-Year Floodplains
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives

September 21, 2015

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HDR
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San Diego, California 92123

Subject: Draft Coachella Valley–San Gorgonio Pass Rail Corridor Service: Fine-Level Screening for Land Use

Introduction

This technical memorandum contains the Draft Fine-Level Screening Constraints Analysis for ***Land Use*** for the Coachella Valley-San Gorgonio Pass Rail Corridor Service Project proposed by the Riverside County Transportation Commission. This analysis considers four rail passenger route alternatives (i.e., 1, 4-A, 4-B, and 5) located between Los Angeles Union Station (LAUS) and Colton along existing rail corridors within Los Angeles, Orange, San Bernardino, and Riverside counties. These alternatives share the same beginning and end points (i.e., LAUS and Colton) and comprise the western study area of the project. The eastern study area is not considered in this analysis because it consists of a single alternative, a 72-mile segment, and its consideration would therefore result in no differentiation between alternatives. The purpose of this memorandum is to provide an initial evaluation of the route alternatives and quantification of conceptual environmental effects to determine the potential to affect substantially more environmentally sensitive areas in specific environmental categories compared with other route alternatives. Impacts are generalized for resources within and adjacent to a buffer surrounding the right-of-way for each alternative route.

Methodology

The Coachella Valley–San Gorgonio Pass Rail Corridor Service alternatives were generally evaluated against the fine-level screening criteria defined in Section 4.2 of the Alternatives Analysis Methodology, and the results of this evaluation are presented herein. During fine-level screening, route alternatives (or combinations of route alternatives) will be identified in the Alternatives Analysis that offer the highest potential ridership; the least potential construction, operating, and maintenance cost; and the least potential impact on communities and the environment, as well as appropriate mitigation feasibility. This effort will provide information regarding potential environmental impacts for each route alternative for ultimate selection of an alternative to be carried forward as the proposed project.

Fine-level screening was based on open-source aerial imagery and/or geographic information systems (GIS) data, which will be used to characterize portions of each route alternative.

Because several route alternatives, each with lengths on the order of 60 miles, were carried forward from coarse-level screening, field visits were not conducted during fine-level screening. In September 2015, ICF conducted a review for the project in order to identify potential resource-related constraints for the evaluation of land use. This research encompassed the project alignment for all alternatives brought forward from the course-level screening analysis and a 40-foot buffer from centerline, or 80-foot total including both sides of the rail line. Figure 1 in Appendix A shows an overview location map.

The land use analysis is primarily based on Southern California Association of Governments (SCAG) data and a review of applicable policies, including respective County General Plans.

The SCAG database is based on the 2008 GIS land use dataset for 2009. The dataset is parcel-based and developed with SCAG 2005 land use information, InfoUSA 2008 employment data, 2005–2008 new construction data, and inputs from local jurisdictions in the SCAG region. The existing land use data in the SCAG data are shown at a parcel level for reference only and in many areas accurately depict the existing land use, but in some areas are generalized.[1]

Additionally, for the purposes of this analysis, adopted County General Plans were used to determine consistency with applicable policies. Below is a brief summary of the statuses of updates of applicable General Plans.

Los Angeles County General Plan

The Los Angeles County General Plan was adopted in 1980. The Los Angeles County 2035 General Plan will replace the adopted General Plan, including all of the elements (excluding the Housing Element), land use distribution maps, and circulation maps.

Orange County

The County General Plan Modernization Project was completed in 2005 and since then updates have occurred to the Housing Element in 2014 and the Land Use, Resources, and Safety Elements in 2013.

Riverside County

The comprehensive update to the General Plan was adopted in October 2003 as part of the Riverside County Integrated Project. Since its adoption, 83 General Plan Amendments have been adopted by the Board of Supervisors through a series of resolutions as of December 2008.

San Bernardino County

The General Plan text was adopted by the Board of Supervisors on March 13, 2007. It became effective on April 12, 2007.

[1] Southern California Association of Governments (SCAG). 2010. 2008 Existing Land Use Database for Los Angeles, Orange, Riverside, and San Bernardino Counties. http://gisdata.scag.ca.gov/Pages/GIShome.aspx. Accessed September 15, 2015.

Existing Setting

The project area includes several cities located within the SCAG region. In total, the alternatives traverse 38 cities within Los Angeles, Orange, Riverside, and San Bernardino counties. Land within the 80-foot buffer includes a variety of uses: transportation, utilities, single- and multi-family residential, education, commercial, industrial, agricultural, open space and recreation, and vacant.[2]

The existing land use setting is similar for all four route alternatives in that the two largest land uses are transportation, communications, and utilities, which compose 40–61% of the land uses along each route alignment; and industrial uses, which compose 19–21% of the land uses along each route alignment. Differences in land uses along the alternatives include the types of residential use (single-family versus multi-family use) and the varying amounts of commercial and vacant land located within the 80-foot buffer.

Regulatory Setting

The following identifies relevant objectives and/or policies included in applicable county general plans.

County of Los Angeles General Plan

Transportation Element[3]

Objective: To achieve an efficient, balanced, integrated, multi-modal transportation system that will satisfy short- and long term travel needs for the movement of people and goods.

> **Policy 6**: Support the development of a mass transportation system that will provide a viable alternative to the automobile.
>
> **Policy 11:** Support development of rail transit or exclusive bus lanes in high demand corridors where sufficient patronage, cost-effectiveness, and support of land use policies are assured.

Land Use Element[4]

Objective: To coordinate land use with existing and proposed transportation networks.

> **Policy 21:** Protect identified Potential Agricultural Preserves by discouraging inappropriate land division and allowing only use types and intensities compatible with agriculture.

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[2] Southern California Association of Governments (SCAG). 2010. 2008 Existing Land Use Database for Los Angeles, Orange, Riverside, and San Bernardino Counties. http://gisdata.scag.ca.gov/Pages/GIShome.aspx. Accessed September 15, 2015.
[3] County of Los Angeles. *County of Los Angeles General Plan*, *Transportation Element.* 1980. http://planning.lacounty.gov/assets/upl/project/gp_web80-transportation.pdf. Accessed September 17, 2015.
[4] County of Los Angeles. *County of Los Angeles General Plan*, *Land Use Element.* 1980. http://planning.lacounty.gov/assets/upl/project/gp_web80-land-use.pdf. Accessed September 17, 2015.

County of Orange General Plan

Land Use Element[5]

Policy 4: To plan an integrated land use and transportation system that accommodates travel demand.

Transportation Element[6]

Objective 1.1: Establish a circulation plan that accommodates the General Plan Land Use Element of the County.

Objective 1.2: Establish a circulation plan that is designed to serve as a balanced transportation system (auto, rail, transit, bus, truck, bicycle, pedestrian, etc.).

Objective 6.1: Develop and promote a transportation system and strategies that are consistent with Rule 2202 South Coast Air Quality Management District (SCAQMD) and the County Transportation Demand Management (TDM) Ordinance (Ordinance No. 3820).

County of Riverside General Plan

Land Use Element [7]

Policy LU 10.4 Provide options to the automobile in communities, such as transit, bicycle and pedestrian trails, to help improve air quality.

Policy LU 12.3 Locate transit stations in community centers and at places of public, employment, entertainment, recreation, and residential concentrations.

Policy LU 12.7 Review projects for consistency with the County's Transportation Demand Ordinance.

Transportation Element[8]

Policy C 1.1 Design the transportation system to respond to concentrations of population and employment activities, as designated by the Land Use Element and in accordance with the Circulation Plan, Figure C-1.

Policy C 1.3 Support the development of transit connections that link the community centers located throughout the County and as identified in the Land Use Element and in the individual area plans.

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[5] County of Orange. *County of Orange General Plan Land Use Element.* Amended 2013. http://ocplanning.net/civicax/filebank/blobdload.aspx?blobid=39478. Accessed September 17, 2015.
[6] County of Orange. *County of Orange General Plan Transportation Element.* 2005 http://ocplanning.net/civicax/filebank/blobdload.aspx?blobid=39478. Accessed September 17, 2015.
[7] County of Riverside. *County of Riverside General Plan Land Use Element.* 2003 http://planning.rctlma.org/Portals/0/genplan/content/gp/chapter03.html. Accessed September 17, 2015.
[8] County of Riverside. County of Riverside General Plan Transportation Element. 2003 http://planning.rctlma.org/Portals/0/genplan/content/gp/chapter04.html#TOC3_19. Accessed September 17, 2015

Policy C 1.4 Utilize existing infrastructure and utilities to the maximum extent practicable and provide for the logical, timely, and economically efficient extension of infrastructure and services.

Policy C 1.6 Cooperate with local, regional, state, and federal agencies to establish an efficient circulation system.

Policy C 13.1 Support continued development and implementation of the Riverside County Transportation Commission Rail Program including new rail lines and stations, the proposed California High Speed Rail System with at least two (2) stations in Riverside County, the Coachella Valley Commuter Rail Service, and the proposed Intercity Rail Corridor between Calexico and Los Angeles.

Policy C 13.2 Support continued improvements to AMTRAK and MetroLink rail passenger service within Riverside County and throughout the southern California region.

Policy C 13.4 Construct new grade separations or reconstruct existing grade separations as necessary for the smooth flow of traffic within the County consistent with plans developed by WRCOG and CVAG.

Policy C 13.6 Reserve, where warranted, the future use of abandoned rail right-of-way for alternative transportation purposes so that an integrated and mutually supportive set of transportation projects may be defined for Riverside County.

Policy C 13.7 Dedicate right-of-way and land for future transit centers in community centers and/or major activity areas (high concentrations of employment and residential uses) and in areas that minimize noise impacts on surrounding residential and sensitive land uses.

County of San Bernardino 2007 General Plan

Land Use Element[9]

Policy CI 1.1 The County's comprehensive transportation system will be developed according to the Circulation Policy Map (the Circulation Element Map), which outlines the ultimate multi-modal (non-motorized, highway, and transit) system to accommodate the County's mobility needs and provides the County's objectives to be achieved through coordination and cooperation between the County and the local municipalities in the County, adjacent counties and cities within those counties, Caltrans, and SANBAG.

Policy CI 2.7 Coordinate with Caltrans, SANBAG, the Southern California Association of Governments (SCAG) and other agencies regarding transportation system improvements in the County's Measure I and other adopted Capital Improvement Programs.

[9] County of San Bernardino. April 2007. *County of San Bernardino 2007 General Plan*. http://www.sbcounty.gov/Uploads/lus/GeneralPlan/FINALGP.pdf. Accessed September 17, 2015.

***Circulation and Infrastructure Element*[10]**

Policy CI 3.2 Assist Omnitrans, Metrolink, and other transit agencies in coordinating the location and scheduling of public transit routes, services, and facilities for better coordination with bus and rail transit systems.

Policy CI 3.3 Extend public transit between residential areas and industrial/urban employment centers.

Policy CI 4.5 Coordinate with local and regional transportation agencies and cities to plan and construct new multi-modal transportation facilities on the basis of this General Plan that are consistent throughout the neighboring jurisdictions.

Results

During the later stages of fine-level analysis, it was determined that sufficient passenger train slots are available under current operating agreements for Route Alternative 1. Based on this information, additional infrastructure (e.g. no improvements to the existing rail route) would not be required or needed if RCTC dedicates that needed slots to the Coachella Valley service. In no additional infrastructure is required, no direct environmental impacts are anticipated to occur. However, in the event that additional infrastructure is needed for Route Alternative 1, this memorandum contains applicable information about the types of environmental resources that may occur within and along Route Alternative 1.

Alternative 1

As indicated in Table 1 below, the right-of-way and 80-foot buffer includes potentially sensitive land uses. These uses include single- and multi-family residential, education, open space, and commercial land uses. (Commercial land uses have been discussed due to possible loss of parking and/or access, as described below.) Land uses include approximately 3,524 single-family residences, 576 multi-family residences, 18 schools, one library, 10 places of worship, and 30 parks.[11]

[10] Ibid.
[11] Southern California Association of Governments (SCAG). 2010. 2008 Existing Land Use Database for Los Angeles, Orange, Riverside, and San Bernardino Counties. http://gisdata.scag.ca.gov/Pages/GIShome.aspx. Accessed September 15, 2015.

Table 1. Alternative 1 Environmental Resources within Right-of-Way and Buffer

Environmental Resource	Resources within Right-of-Way and Buffer*
Land Use and Planning	Commercial (2%) Education (<1%) Mixed Commercial and Industrial (<1%) Multi-family Residential (<1%) Open Space/Recreation (1%) Other Residential (<1%) Single-family Residential (2%) *percentage indicates percentage of total acreage of all land uses in route alternative right-of-way and 80-foot buffer.

Source: SCAG 2010 (http://gisdata.scag.ca.gov/Pages/GIShome.aspx)

Community Disruption

Although Alternative 1 would traverse an existing rail corridor, proposed property acquisition could result in potential land use impacts related to community disruption. The acquisition of residential uses could result in the disruption or division of an existing community. As previously stated, approximately 3,524 single-family residences and 576 multi-family residences are located within the right-of-way and buffer. Depending on the proposed location and amount of residential use acquisition, existing single-family or multi-family residential neighborhoods could be divided or disrupted during construction and operation of the alternative.

Approximately 8.2 acres of commercial service uses (2% of total land uses) are located within the right-of-way and buffer. Acquisition of commercial uses or businesses could result in the temporary or permanent loss of the businesses or access to the uses. Loss of parking could also occur depending on the exact location and amount of property that would be acquired.

Consistency with Applicable Plans

This alternative would traverse Los Angeles, Orange, Riverside, and San Bernardino counties and would be subject to the policies and objectives of the general plans of these four counties. As stated in applicable county objectives relevant to the project, the alternative aims to provide an alternative reliable transportation service other than the automobile. Construction and operation would be generally consistent with policies and objectives related to rail, transit, coordination with applicable regional agencies, and facilitation of ridership. Implementation of the alternative would also support policies and objectives that promote connectivity within the region.

Agricultural Resources

Approximately 1.5 acre (<1%) of the total land uses within the right-of-way and buffer are agricultural uses. It is not known at this time if proposed acquisition of agricultural uses would occur under this alternative. Loss of agricultural uses could result in a land use impact.

Alternative 4-A

As indicated in Table 2 below, the right-of-way and 80-foot buffer includes potentially sensitive land uses. These uses include single- and multi-family residential, education, open space, and commercial land uses. (Commercial land uses have been discussed due to possible loss of parking and/or access, as described below.) Land uses include approximately 5,226 single-family residences, 1,081 multi-family residences, two hotels, three hospitals, 61 schools, one library, 15 places of worship, and 27 parks.[12]

Table 2. Alternative 4-A Environmental Resources within Right-of-Way and Buffer

Environmental Resource	Resources within Right-of-Way and Buffer*
Land Use and Planning	Commercial (5%) Education (1%) Mixed Commercial and Industrial (<1%) Multi-family Residential (3%) Open Space/Recreation (2%) Other Residential (2%) Single-family Residential (15%) *percentage indicates percentage of total acreage of all land uses in route alternative right-of-way and 80-foot buffer.

Source: SCAG 2010 (http://gisdata.scag.ca.gov/Pages/GIShome.aspx)

Community Disruption

Similar to Alternative 1, although Alternative 4-A would traverse an existing rail corridor, proposed property acquisition could result in potential land use impacts related to community disruption. The acquisition of residential uses could result in the disruption or division of an existing community. As previously stated, approximately 5,226 single-family residences and 1,081 multi-family residences are located within the right-of-way and buffer. This amounts to approximately 20% of the total land uses located in the right-of-way and buffer for this alternative, as shown in Table 2. Depending on the proposed location and amount of residential use acquisition, existing single-family or multi-family residential neighborhoods could be divided or disrupted during construction and operation of the alternative.

Approximately 26 acres (5% of the total land uses) located within the right-of-way and buffer are commercial uses, as shown in Table 2. Acquisition of commercial uses or businesses could result in the temporary or permanent loss of the businesses or access to the uses. Loss of parking could also occur depending on the exact location and amount of property that would be acquired.

Consistency with Applicable Plans

This alternative would traverse Los Angeles and San Bernardino counties. Therefore, this alternative would be subject to applicable policies and objectives included in the County of Los Angeles and County of San Bernardino adopted general plans. As stated in applicable county

[12] Ibid.

objectives relevant to the project, the alternative aims to provide an alternative reliable transportation service other than the automobile. Construction and operation would be generally consistent with policies and objectives related to rail, transit, coordination with applicable regional agencies, and facilitation of ridership in the County of Los Angeles and County of San Bernardino general plans.

Agricultural Resources

Approximately 4 acres (1%) of the total land uses within the right-of-way and buffer are agricultural uses. It is not known at this time if proposed acquisition of agricultural uses would occur under this alternative. Loss of agricultural uses could result in a land use impact.

Alternative 4-B

As shown in Table 3 below, the right-of-way and 80-foot buffer includes potentially sensitive land uses. These uses include single- and multi-family residential, education, open space, and commercial land uses. (Commercial land uses have been discussed due to possible loss of parking and/or access, as described below.) Land uses include approximately 5,301 single-family residences, 1,081 multi-family residences, two hotels, three hospitals, 61 schools, one library, 15 places of worship, and 27 parks.[13]

Table 3. Alternative 4-B Environmental Resources within Right-of-Way and Buffer

Environmental Resource	Resources within Right-of-Way and Buffer*
Land Use and Planning	Commercial (5%) Education (1%) Mixed Commercial and Industrial (<1%) Multi-family Residential (3%) Open Space/Recreation (2%) Other Residential (2%) Single-family Residential (15%) *percentage indicates percentage of total acreage of all land uses in route alternative right-of-way and 80-foot buffer.

Source: SCAG 2010 (http://gisdata.scag.ca.gov/Pages/GIShome.aspx)

Community Disruption

The acquisition of residential uses could result in the disruption or division of an existing community. As previously stated, approximately 5,301 single-family residences and 1,081 multi-family residences are located within the right-of-way and buffer. This amounts to approximately 20% of the total land uses located in the right-of-way and buffer for this alternative, as shown in Table 3. Compared to Alternatives 1, 4-A, and 5, this alternative has the highest combined total of residential units. Depending on the proposed location and amount of residential use acquisition, existing single-family or multi-family residential neighborhoods could be divided or disrupted during construction and operation of the alternative.

[13] Ibid.

Approximately 26 acres (5% of the total land uses) located within the right-of-way and buffer are commercial uses, as shown in Table 3. Acquisition of commercial uses or businesses could result in the temporary or permanent loss of the businesses or access to the uses. Loss of parking could also occur depending on the exact location and amount of property that would be acquired.

Consistency with Applicable Plans

This alternative would traverse Los Angeles and San Bernardino counties. Therefore, this alternative would be subject to applicable policies and objectives included in the County of Los Angeles and County of San Bernardino adopted general plans. As stated in applicable county objectives relevant to the project, the alternative aims to provide an alternative reliable transportation service other than the automobile. Construction and operation would be generally consistent with policies and objectives related to rail, transit, coordination with applicable regional agencies, and facilitation of ridership in the County of Los Angeles and County of San Bernardino general plans.

Agricultural Resources

Approximately 4 acres (1%) of the total land uses within the right-of-way and buffer are agricultural uses. It is not known at this time if proposed acquisition of agricultural uses would occur under this alternative. Loss of agricultural uses could result in a land use impact.

Alternative 5

As shown in Table 4 below, the right-of-way and 80-foot buffer includes potentially sensitive land uses. These uses include single- and multi-family residential, education, open space, and commercial land uses. (Commercial land uses have been discussed due to possible loss of parking and/or access, as described below.) Land uses include approximately 5,252 single-family residences, 1,111 multi-family residences, one hotel, five hospitals, 54 schools, one library, 13 places of worship, and 28 parks.[14]

Table 4. Alternative 5 Environmental Resources within Right-of-Way and Buffer

Environmental Resource	Resources within Right-of-Way and Buffer*
Land Use and Planning	Commercial (6%) Education (2%) Mixed Commercial and Industrial (<1%) Multi-family Residential (3%) Open Space/Recreation (1%) Other Residential (1%) Single-family Residential (15%) *percentage indicates percentage of total acreage of all land uses in route alternative right-of-way and 80-foot buffer.

Source: SCAG 2010 (http://gisdata.scag.ca.gov/Pages/GIShome.aspx)

[14] Ibid.

Community Disruption

The acquisition of residential uses could result in the disruption or division of an existing community. As previously stated, approximately 5,252 single-family residences and 1,111 multi-family residences are located within the right-of-way and buffer. This amounts to approximately 20% of the total land uses located in the right-of-way and buffer for this alternative, as shown in Table 4. Depending on the proposed location and amount of residential use acquisition, existing single-family or multi-family residential neighborhoods could be divided or disrupted during construction and operation of the alternative.

This alternative contains the most commercial uses compared to all of the route alternatives. Approximately 35 acres (6% of the total land uses) located within the right-of-way and buffer are commercial uses, as shown in Table 4. Acquisition of commercial uses or businesses could result in the temporary or permanent loss of the businesses or access to the uses. Loss of parking could also occur depending on the exact location and amount of property that would be acquired.

Consistency with Applicable Plans

This alternative would traverse Los Angeles and San Bernardino counties. Therefore, this alternative would be subject to applicable policies and objectives included in the County of Los Angeles and County of San Bernardino adopted general plans. As stated in applicable county objectives relevant to the project, the alternative aims to provide an alternative reliable transportation service other than the automobile. Construction and operation would be generally consistent with policies and objectives related to rail, transit, coordination with applicable regional agencies, and facilitation of ridership in the County of Los Angeles and County of San Bernardino general plans.

Agricultural Resources

This alternative contains the most acres of agricultural uses within its right-of-way and buffer. Approximately 6 acres (1%) of the total land uses within the right-of-way and buffer are agricultural uses. It is not known at this time if proposed acquisition of agricultural uses would occur under this alternative. Loss of agricultural uses could result in a land use impact.

Conclusion

Alternative 5 contains the most acres of agricultural uses within its right-of-way and buffer and the most commercial uses compared to all of the route alternatives. Alternatives 4-B and 5 contain the highest number of residential uses within the right-of-way and buffer compared to the other route alternatives. Depending on the exact amount and location of proposed acquisition of property, potential impacts on land uses could occur during construction and operation. Additionally, loss of parking or access to land uses could also lead to disruption of communities located along the route alternatives.

All route alternatives aim to provide an alternative reliable transportation service other than the automobile. Construction and operation would be generally consistent with policies and objectives related to rail, transit, coordination with applicable regional agencies, and facilitation of ridership.

Appendix A
Figures

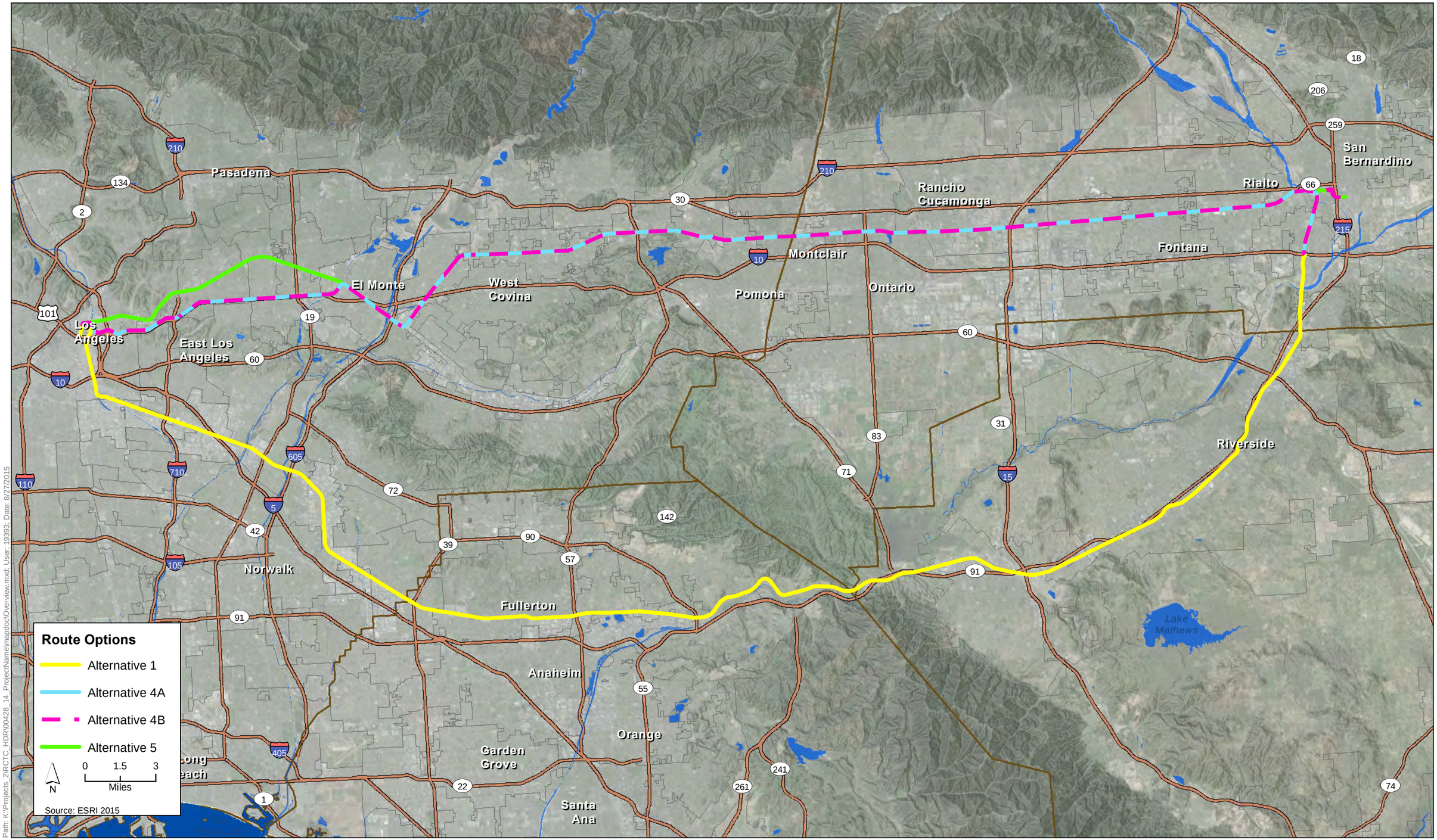

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Figure 1
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives

Appendix B
Summary Table

Resources within Right-of-Way and Buffer	Alternative 1	Alternative 4-A	Alternative 4-B	Alternative 5
Commercial	2%	5%	5%	6%
Education	<1%	1%	1%	2%
Mixed Commercial and Industrial	<1%	<1%	<1%	<1%
Multi-family Residential	<1%	3%	3%	3%
Open Space/Recreation	1%	2%	2%	1%
Other Residential	<1%	2%	2%	1%
Single-family Residential	2%	15%	15%	15%

*percentage indicates percentage of total acreage of all land uses in route alternative right-of-way and 80-foot buffer.
Source: SCAG 2010 (http://gisdata.scag.ca.gov/Pages/GIShome.aspx)

September 24, 2015

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Subject: Draft Coachella Valley–San Gorgonio Pass Rail Corridor Service: Fine-Level Screening for Noise and Vibration

Introduction

This technical memorandum contains the Draft Fine-Level Screening Constraints Analysis for ***Noise and Vibration*** for the Coachella Valley-San Gorgonio Pass Rail Corridor Service Project proposed by the Riverside County Transportation Commission. This analysis considers four rail passenger route alternatives (i.e., 1, 4-A, 4-B, and 5) located between Los Angeles Union Station (LAUS) and Colton along existing rail corridors within Los Angeles, Orange, San Bernardino, and Riverside counties. These alternatives share the same beginning and end points (i.e., LAUS and Colton) and comprise the western study area of the project. The eastern study area is not considered in this analysis because it consists of a single alternative, a 72-mile segment, and its consideration would therefore result in no differentiation between alternatives. The purpose of this memorandum is to provide an initial evaluation of the route alternatives and quantification of conceptual environmental effects to determine the potential to affect substantially more environmentally sensitive areas in specific environmental categories compared with other route alternatives. Impacts are generalized for resources within and adjacent to a buffer surrounding the right-of-way for each alternative route.

Methodology

The Coachella Valley–San Gorgonio Pass Rail Corridor Service alternatives were generally evaluated against the fine-level screening criteria defined in Section 4.2 of the Alternatives Analysis Methodology, and the results of this evaluation are presented herein. During fine-level screening, route alternatives (or combinations of route alternatives) will be identified in the Alternatives Analysis that offer the highest potential ridership; the least potential construction, operating, and maintenance cost; and the least potential impact on communities and the environment, as well as appropriate mitigation feasibility. This effort will provide information regarding potential environmental impacts for each route alternative for ultimate selection of an alternative to be carried forward as the proposed project.

Fine-level screening was based on open-source aerial imagery and/or geographic information systems (GIS) data, which will be used to characterize portions of each route alternative.

Because several route alternatives, each with lengths on the order of 60 miles, were carried forward from coarse-level screening, field visits were not conducted during fine-level screening. In September 2015, ICF conducted a review for the project in order to identify potential resource-related constraints for the evaluation of noise and vibration. This research encompassed the project alignment for all alternatives brought forward from the course-level screening analysis and a 300-foot buffer from centerline, for a 600-foot total buffer including both sides of the rail line. A 600-foot buffer was used in the noise constraints analysis to identify land uses that may potentially be exposed to noise and vibration impacts due to increases in horn sounding on at-grade crossings and wayside noise from train passbys added by the project. In addition, a 100-foot buffer from centerline (200-foot total) was analyzed to assess potential first-row noise impacts and potential groundborne vibration impacts. Figure 1 in Appendix A shows an overview location map.

The noise and vibration analysis is primarily based on Southern California Association of Governments (SCAG) GIS land use data and a review of aerial imagery for locations of at-grade crossings.

During the later stages of fine-level analysis, it was determined that sufficient passenger train slots are available under current operating agreements for Route Alternative 1. Based on this information, additional infrastructure (e.g. no improvements to the existing rail route) would not be required or needed if RCTC dedicates that needed slots to the Coachella Valley service. In no additional infrastructure is required, no direct environmental impacts are anticipated to occur. However, in the event that additional infrastructure is needed for Route Alternative 1, this memorandum contains applicable information about the types of environmental resources that may occur within and along Route Alternative 1.

Existing Setting

The project area includes several cities located within the SCAG region. In total, the route alternatives traverse 38 cities within Los Angeles, Orange, Riverside, and San Bernardino counties. Land within the 600-foot buffer includes a variety of noise-sensitive uses: single- and multi-family residential, hotels, hospitals, schools, libraries, places of worship, and parks. There are also several commercial, industrial, and open space areas.

Regulatory Setting

The Federal Transit Administration (FTA) governs noise standards for federally funded transit projects.

Federal Transit Administration Standards for Transit Noise

FTA has published and implemented impact assessment procedures and criteria pertaining to noise. In addition, noise impact criteria have been adopted to assess noise contributions and potential impacts on the existing environment from rapid transit sources. The noise impact criteria defined in the FTA's *Transit Noise and Vibration Impact Assessment* (FTA Manual)[1] are

[1] Federal Transit Administration. 2006. *Transit Noise and Vibration Impact Assessment*. May. Available: http://www.fta.dot.gov/documents/FTA_Noise_and_Vibration_Manual.pdf.

based on an objective that calls for maintaining a noise environment that is considered acceptable for noise-sensitive land uses.

For noise from transit operations, FTA's three land use categories are as follows.

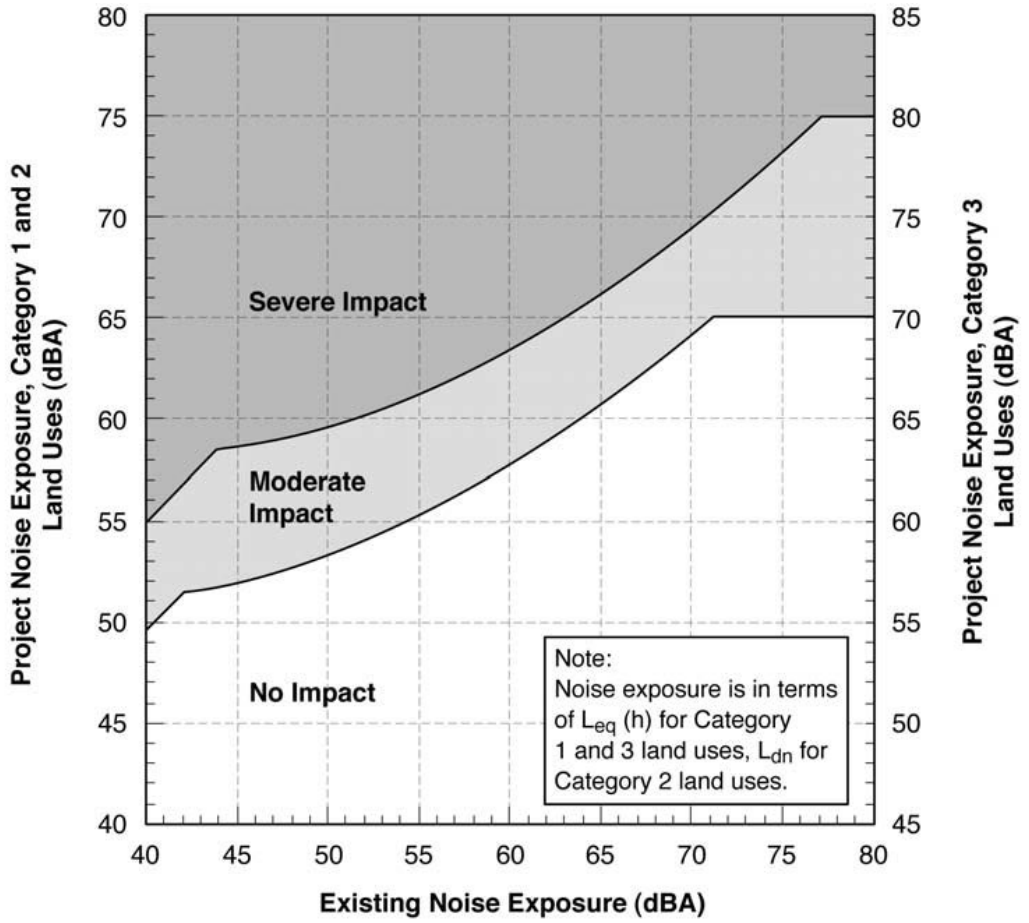
- **Category 1**: Tracts of land where quiet is an essential element of their intended purpose, such as outdoor amphitheaters, concert pavilions, and national historic landmarks with significant outdoor use.
- **Category 2**: Residences and buildings where people normally sleep, including homes, hospitals, and hotels.
- **Category 3**: Institutional land uses (schools, places of worship, libraries) that are typically available during daytime and evening hours. Other uses in this category can include medical offices, conference rooms, recording studios, concert halls, cemeteries, monuments, museums, historical sites, parks, and recreational facilities.

Noise exposure values are reported as the day-night (L_{dn}) average sound level for residential land uses (Category 2) or hourly equivalent continuous noise level (L_{eq}[h]) for other land uses (Categories 1 and 3). Commercial and industrial uses are not included in the vast majority of cases because they are generally compatible with higher noise levels. Exceptions include commercial land uses with a feature that receives significant outdoor use, such as a playground, or uses that require quiet as an important part of their function, such as recording studios.

In the FTA Manual, the noise impact criteria for construction and operation of rapid transit facilities consider a project's contribution to existing noise levels using a sliding scale according to the land uses affected. The criteria correspond to heightened community annoyance due to the introduction of a new transit facility relative to existing ambient noise conditions.

Noise impacts are assessed by comparing existing outdoor exposures with future project-related outdoor noise levels, as illustrated in Graph 1 below. The criterion for each degree of impact is based on a sliding scale that is dependent on the existing noise exposure and the increase in noise exposure due to a project.

Graph 1. FTA Noise Impact Criteria



Source: Federal Transit Administration 2006[2]

The noise impact categories are as follows.

- **No Impact:** A project, on average, will result in an insignificant increase in the number of instances where people are "highly annoyed" by new noise.
- **Moderate Impact:** The change in cumulative noise is noticeable to most people but may not be enough to cause strong adverse community reactions.
- **Severe Impact:** A significant percentage of people would be highly annoyed by the noise, perhaps resulting in vigorous community reaction.

Note that the project's contribution relative to the existing noise levels shown in Graph 1 differs according to the level of existing noise exposure. For example, a project contribution of 59 A-weighted decibels (dBA) L_{dn} would be considered a severe impact at a Category 2 receiver with an existing noise exposure of up to 50 dBA L_{dn} (a difference of 9 dB), whereas a project contribution of 69 dBA L_{dn} would result in a severe impact at a Category 2 receiver with an existing noise exposure of up to 70 dBA L_{dn} (a difference of 1 dB). The justification for this

[2] Ibid

sliding scale recognizes that people who are already exposed to high levels of noise in the ambient environment are expected to tolerate small increases in noise in their community according to the level of their existing noise exposure.

Federal Transit Administration Standards for Construction Noise

FTA has developed methods for evaluating construction noise levels, which are discussed in the FTA Manual. The FTA Manual does not contain standardized criteria for assessing construction noise impacts, but includes guidelines for suggested noise limits for residential uses exposed to construction noise to describe levels that may result in an adverse community reaction. These guidelines are summarized in Table 1.

Table 1. FTA Construction Noise Impact Guidelines

Land Use	8-hour L_{eq} (dBA), Day	8-hour L_{eq} (dBA), Night
Residential	80	70
Commercial	85	85
Industrial	90	90

Source: Federal Transit Administration 2006[3]

Thresholds for construction noise may be set at the local level according to expected hours of equipment operation and the noise limits specified in the noise ordinances of the applicable jurisdictions.

Federal Transit Administration Impact Criteria for Groundborne Vibration

The FTA vibration impact criteria for the land use categories described above are shown in Table 2. The criteria are based on the frequency of events and related to groundborne vibration that can cause human annoyance or interfere with the use of vibration-sensitive equipment. The criteria for acceptable groundborne vibration are based on the maximum levels for a single event (L_{max}) and expressed in terms of root mean square (RMS) velocity levels.

FTA provides a procedure to determine whether or not a transit project requires a vibration analysis. Transit projects that involve rubber-tired vehicles rarely show potential for vibration impacts and, therefore, usually do not require vibration analysis.

Potential Damage to Fragile Buildings

FTA analysis guidelines call for an investigation of the potential for vibration-induced damage to "fragile" or "extremely fragile" buildings.[4] Damage to a building is possible (but not necessarily probable) if groundborne vibration levels exceed the following criteria.

- A 0.20-inch-per-second peak particle velocity (PPV) (approximately 100 velocity decibels [VdB]) for non-engineered timber and masonry buildings.

[3] Ibid
[4] Ibid

- A 0.12-inch-per-second PPV (approximately 95 VdB) for buildings that are extremely susceptible to vibration damage.

Table 2. Groundborne Vibration Impact Criteria for General Assessment

Land Use Category	Groundborne Vibration Impact Levels (VdB re 1 micro-inch/sec)		
	Frequent Events[a]	Occasional Events[b]	Infrequent Events[c]
Category 1: Buildings where vibration would interfere with interior operations.	65 VdB[d]	65 VdB[d]	65 VdB[d]
Category 2: Residences and buildings where people normally sleep.	72 VdB	75 VdB	80 VdB
Category 3: Institutional land uses with primarily daytime use.	75 VdB	78 VdB	83 VdB

Notes:

[a] The term "frequent events" is defined as more than 70 vibration events from the same source each day. Most rapid transit projects fall into this category.

[b] The term "occasional events" is defined as between 30 and 70 vibration events from the same source each day. Most commuter trunk lines have operations in this range.

[c] The term "infrequent events" is defined as fewer than 30 vibration events of the same kind each day. This category includes most commuter rail branch lines.

[d] This criterion limit is based on levels that are acceptable for most moderately sensitive equipment, such as optical microscopes. Vibration-sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the heating, ventilation, and air-conditioning systems and stiffened floors.

Source: Federal Transit Administration 2006[5]

Results

Alternative 1

As indicated in Table 3 below, the 600-foot buffer includes potentially sensitive land uses. These uses include single- and multi-family residential, schools, libraries, places of worship, and park land uses. Land uses within the 600-foot buffer include approximately 3,524 single-family residences, 576 multi-family residences, 18 schools, 1 library, 10 places of worship, and 30 parks.[6]

Table 3. Alternative 1 Environmental Resources within Right-of-Way and 600-foot Buffer

Environmental Resource	Resources within Right-of-Way and Buffer	Count within 300 feet of Centerline	Count within 100 feet of Centerline

[5] Ibid

[6] Southern California Association of Governments (SCAG). 2010. 2008 Existing Land Use Database for Los Angeles, Orange, Riverside, and San Bernardino Counties. http://gisdata.scag.ca.gov/Pages/GIShome.aspx. Accessed September 15, 2015.

Environmental Resource	Resources within Right-of-Way and Buffer	Count within 300 feet of Centerline	Count within 100 feet of Centerline
Noise and Vibration	Residences (Single-family)	3,524	1,133
	Residences (Multi-family) [1]	576	132
	Hotels	0	0
	Hospitals	0	0
	Schools	18	11
	Libraries	1	0
	Places of Worship	10	8
	Parks	30	n/a
	Grade Crossings	48	

Source: SCAG 2010[7]

[1] Does not account for total numbers of individual units within each structure. Number of noise-sensitive receptors affected may be higher depending on density of units.

Increased Noise Levels from Rail Activity

Although Alternative 1 would traverse an existing rail corridor, additional rail trips would result in increased wayside noise levels and more frequent horn soundings at the 48 grade crossings along the corridor. As previously stated, approximately 3,524 single-family residences and 576 multi-family residences are located within the 600-foot buffer for Alternative 1. As defined by FTA, these are Category 2 land uses, or places where people normally sleep. Depending on the number of rail vehicle round-trips added by the project, the highest potential for increased noise levels would be at Category 2 use areas located in the vicinity of grade crossings. Potential increases in noise from rail may also occur due to an increased level of wayside noise exposure from added rail roundtrips on the Alternative 1 corridor.

Perceptible Levels of Groundborne Vibration

The potential for perceptible levels of groundborne vibration inside of buildings may occur depending on the number of rail roundtrips added to the Alternative 1 corridor and the distance to the sensitive receiver. This may occur within 100 feet of centerline, at up to 1,133 single-family residences, 132 multi-family residences, 11 schools, and 8 places of worship, although the closest adjacent uses would experience the largest vibration effect.

Alternative 4-A

As indicated in Table 4 below, the 600-foot buffer includes potentially sensitive land uses. These uses include single- and multi-family residential, hotels, hospitals, schools, libraries, places of worship, and park land uses. Land uses include approximately 5,226 single-family residences, 1,081 multi-family residences, 2 hotels, 3 hospitals, 61 schools, 1 library, 15 places of worship, and 27 parks.[8]

[7] Ibid
[8] Ibid

Table 4. Alternative 4-A Environmental Resources within Right-of-Way and 600-foot Buffer

Environmental Resource	Resources within Right-of-Way and Buffer	Count within 300 feet of Centerline	Count within 100 feet of Centerline
Noise and Vibration	Residences (Single-family)	5,226	2,079
	Residences (Multi-family) [1]	1,081	422
	Hotels	2	0
	Hospitals	3	0
	Schools	61	41
	Libraries	1	0
	Places of Worship	15	7
	Parks	27	n/a
	Grade Crossings	86	

Source: SCAG 2010[9]

[1] Does not account for total numbers of individual units within each structure. Number of noise-sensitive receptors affected may be higher depending on density of units.

Increased Noise Levels from Rail Activity

Similar to Alternative 1, although Alternative 4-A would traverse an existing rail corridor, additional rail trips would result in increased wayside noise levels and more frequent horn soundings at the 86 grade crossings along the corridor. As previously stated, approximately 5,226 single-family residences, 1,081 multi-family residences, 2 hotels, and 3 hospitals are located within the 600-foot buffer for Alternative 4-A. As defined by FTA, these are Category 2 land uses, or places where people normally sleep. Depending on the number of rail vehicle round-trips added by the project, the highest potential for increased noise levels would be at Category 2 use areas located in the vicinity of grade crossings. Potential increases in noise from rail may also occur due to an increased level of wayside noise exposure from added rail roundtrips on the Alternative 4-A corridor.

Perceptible Levels of Groundborne Vibration

The potential for perceptible levels of groundborne vibration inside of buildings may occur depending on the number of rail roundtrips added to the Alternative 4-A corridor. This could occur within 100 feet of centerline, at up to 2,079 single-family residences, 422 multi-family residences, 41 schools, and 7 places of worship, although the closest adjacent uses would experience the largest vibration effect.

Alternative 4-B

As indicated in Table 5 below, the 600-foot buffer includes potentially sensitive land uses. These uses include single- and multi-family residential, hotels, hospitals, schools, libraries, places of worship, and park land uses. Land uses include approximately 5,301 single-family residences,

[9] Ibid

1,081 multi-family residences, 2 hotels, 3 hospitals, 61 schools, 1 library, 15 places of worship, and 27 parks.[10]

Table 5. Alternative 4-B Environmental Resources within Right-of-Way and 600-foot Buffer

Environmental Resource	Resources within Right-of-Way and Buffer	Count within 300 feet of Centerline	Count within 100 feet of Centerline
Noise and Vibration	Residences (Single-family)	5,301	2,114
	Residences (Multi-family) [1]	1,081	422
	Hotels	2	0
	Hospitals	3	0
	Schools	61	41
	Libraries	1	0
	Places of Worship	15	7
	Parks	27	n/a
	Grade Crossings	91	

Source: SCAG 2010[11]

[1] Does not account for total numbers of individual units within each structure. Number of noise-sensitive receptors affected may be higher depending on density of units.

Increased Noise Levels from Rail Activity

Similar to Alternative 4-A, although Alternative 4-B would traverse an existing rail corridor, additional rail trips would result in increased wayside noise levels and more frequent horn soundings at the 91 grade crossings along the corridor. As previously stated, approximately 5,301 single-family residences, 1,081 multi-family residences, 2 hotels, and 3 hospitals are located within the 600-foot buffer for Alternative 4-B. As defined by FTA, these are Category 2 land uses, or places where people normally sleep. Depending on the number of rail vehicle round-trips added by the project, the highest potential for increased noise levels would be at Category 2 use areas located in the vicinity of grade crossings. Potential increases in noise from rail may also occur due to an increased level of wayside noise exposure from added rail roundtrips on the Alternative 4-B corridor.

Perceptible Levels of Groundborne Vibration

The potential for perceptible levels of groundborne vibration inside of buildings may occur depending on the number of rail roundtrips added to the Alternative 4-B corridor. This could occur within 100 feet of centerline, at up to 2,114 single-family residences, 422 multi-family residences, 41 schools, and 7 places of worship, although the closest adjacent uses would experience the largest vibration effect.

[10] Ibid
[11] Ibid

Alternative 5

As indicated in Table 6 below, the 600-foot buffer includes potentially sensitive land uses. These uses include single- and multi-family residential, hotels, hospitals, schools, libraries, places of worship, and park land uses. Land uses include approximately 5,252 single-family residences, 1,111 multi-family residences, 1 hotel, 5 hospitals, 54 schools, 1 library, 13 places of worship, and 28 parks.[12]

Table 6. Alternative 5 Environmental Resources within Right-of-Way and 600-foot Buffer

Environmental Resource	Resources within Right-of-Way and Buffer	Count within 300 feet of Centerline	Count within 100 feet of Centerline
Noise and Vibration	Residences (Single-family)	5,252	2,054
	Residences (Multi-family) [1]	1,111	399
	Hotels	1	0
	Hospitals	5	1
	Schools	54	33
	Libraries	1	0
	Places of Worship	13	7
	Parks	28	n/a
	Grade Crossings	104	

Source: SCAG 2010[13]

[1] Does not account for total numbers of individual units within each structure. Number of noise-sensitive receptors affected may be higher depending on density of units.

Increased Noise Levels from Rail Activity

Similar to Alternative 4-A, although Alternative 5 would traverse an existing rail corridor, additional rail trips would result in increased wayside noise levels and more frequent horn soundings at the 104 grade crossings along the corridor. As previously stated, approximately 5,252 single-family residences, 1,111 multi-family residences, 1 hotel, and 5 hospitals are located within the 600-foot buffer for Alternative 5. As defined by FTA, these are Category 2 land uses, or places where people normally sleep. Depending on the number of rail vehicle round-trips added by the project, the highest potential for increased noise levels would be at Category 2 use areas located in the vicinity of grade crossings. Potential increases in noise from rail may also occur due to an increased level of wayside noise exposure from added rail roundtrips on the Alternative 5 corridor.

Perceptible Levels of Groundborne Vibration

The potential for perceptible levels of groundborne vibration inside of buildings may occur depending on the number of rail roundtrips added to the Alternative 5 corridor. This could occur within 100 feet of centerline, at up to 2,054 single-family residences, 399 multi-family

[12] Ibid
[13] Ibid

residences, 1 hospital, 33 schools, and 7 places of worship, although the closest adjacent uses would experience the largest vibration effect.

Conclusion

Alternatives 4-A, 4-B, and 5 include a comparable number of residential uses within the right-of-way and buffer. Alternative 5 contains the highest number of grade crossings, with 104 at-grade crossings. As such, implementation of Alternative 5 would likely result in the highest number of noise-sensitive uses exposed to increased horn noise, depending on the locations of crossings relative to residential uses.

Alternative 4-B would affect the highest number of residential uses in the first row (closest in vicinity) relative to the proposed corridor. As such, implementation of Alternative 4-B would likely result in the highest number of noise-sensitive uses exposed to increased wayside noise and groundborne vibration events. However, wayside noise impacts would likely number much fewer than impacts from horn noise.

Alternative 1 would affect the lowest number of residential uses, and also includes the lowest number of grade crossings among the route alternatives (not factoring in existing and future rail traffic along each respective rail line). Implementation of Alternative 1 would likely result in the lowest number of noise-sensitive uses exposed to increased horn or wayside noise.

Appendix A
Figures

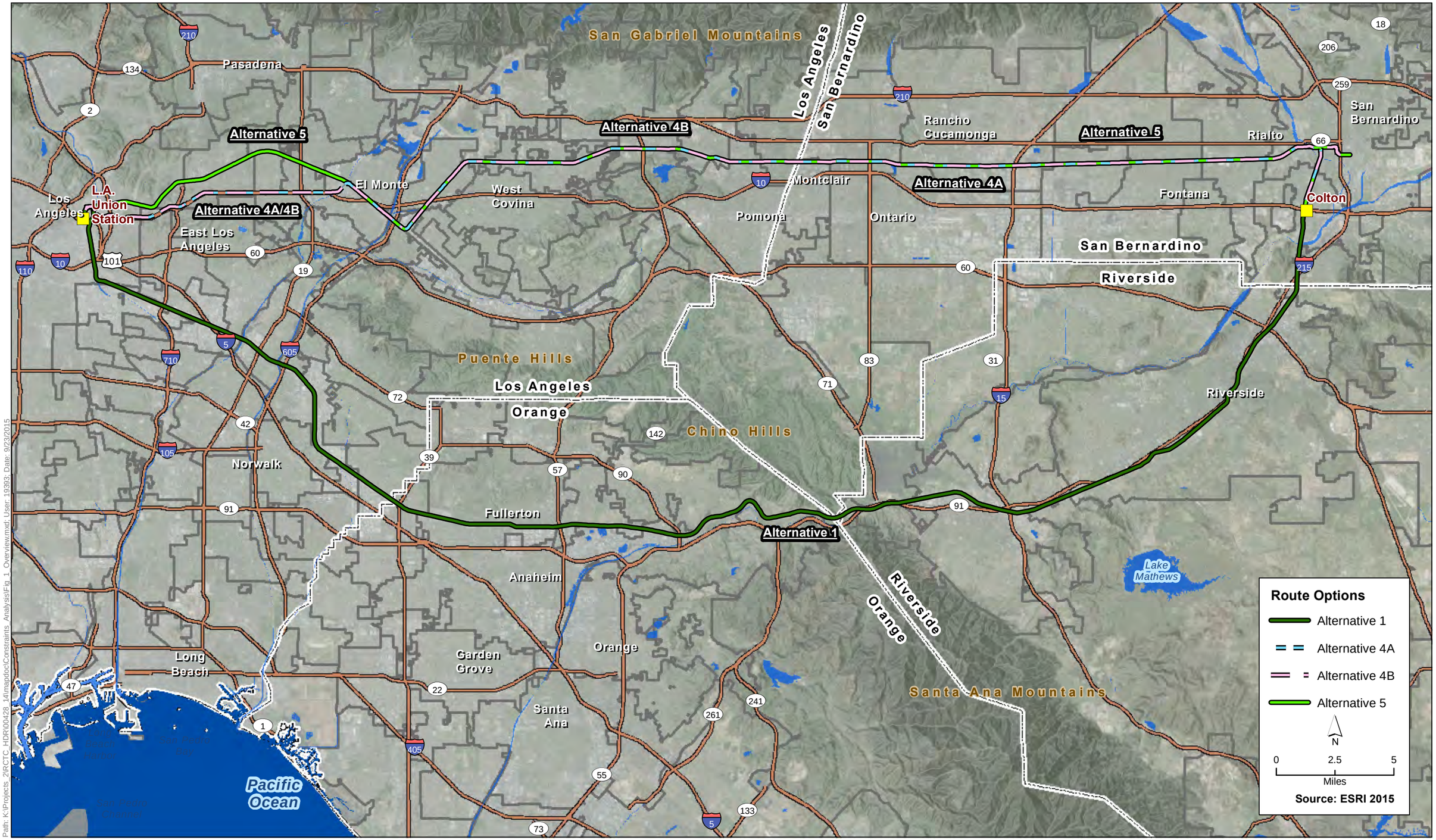


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Figure 1
Location Overview
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives

Appendix B
Summary Table

Resources within Right-of-Way and Buffer	Alternative 1		Alternative 4-A		Alternative 4-B		Alternative 5	
	Within 300 feet of centerline	Within 100 feet of centerline	Within 300 feet of centerline	Within 100 feet of centerline	Within 300 feet of centerline	Within 100 feet of centerline	Within 300 feet of centerline	Within 100 feet of centerline
Residences (Single-family)	3,524	1,133	5,226	2,079	5,301	2,114	5,252	2,054
Residences (Multi-family) [1]	576	132	1,081	422	1,081	422	1,111	399
Hotels	0	0	2	0	2	0	1	0
Hospitals	0	0	3	0	3	0	5	1
Schools	18	11	61	41	61	41	54	33
Libraries	1	0	1	0	1	0	1	0
Places of Worship	10	8	15	7	15	7	13	7
Parks	30	n/a	27	n/a	27	n/a	28	n/a
Grade Crossings	48		86		91		104	

Source: SCAG 2010[14]

[1] Does not account for total numbers of individual units within each structure. Number of noise-sensitive receptors affected may be higher depending on density of units.

[14] Southern California Association of Governments (SCAG). 2010. 2008 Existing Land Use Database for Los Angeles, Orange, Riverside, and San Bernardino Counties. http://gisdata.scag.ca.gov/Pages/GIShome.aspx. Accessed September 15, 2015.

September 24, 2015

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Subject: Draft Coachella Valley–San Gorgonio Pass Rail Corridor Service: Fine-Level Screening for Section 4(f)/6(f)

Introduction

This technical memorandum contains the Draft Fine-Level Screening Constraints Analysis for ***Section 4(f)/6(f)*** for the Coachella Valley-San Gorgonio Pass Rail Corridor Service Project proposed by the Riverside County Transportation Commission. This analysis considers four rail passenger route alternatives (i.e., 1, 4-A, 4-B, and 5) located between Los Angeles Union Station (LAUS) and Colton along existing rail corridors within Los Angeles, Orange, San Bernardino, and Riverside counties. These alternatives share the same beginning and end points (i.e., LAUS and Colton) and comprise the western study area of the project. The eastern study area is not considered in this analysis because it consists of a single alternative, a 72-mile segment, and its consideration would therefore result in no differentiation between alternatives. The purpose of this memorandum is to provide an initial evaluation of the route alternatives and quantification of conceptual environmental effects to determine the potential to affect substantially more environmentally sensitive areas in specific environmental categories compared with other route alternatives. Impacts are generalized for resources within and adjacent to a buffer surrounding the right-of-way for each alternative route.

Methodology

The Coachella Valley–San Gorgonio Pass Rail Corridor Service alternatives were generally evaluated against the fine-level screening criteria defined in Section 4.2 of the Alternatives Analysis Methodology, and the results of this evaluation are presented herein. During fine-level screening, route alternatives (or combinations of route alternatives) will be identified in the Alternatives Analysis that offer the highest potential ridership; the least potential construction, operating, and maintenance cost; and the least potential impact on communities and the environment, as well as appropriate mitigation feasibility. This effort will provide information regarding potential environmental impacts for each route alternative for ultimate selection of an alternative to be carried forward as the proposed project.

Fine-level screening was based on open-source aerial imagery and/or geographic information systems (GIS) data, which will be used to characterize portions of each route alternative.

Because several route alternatives, each with lengths on the order of 60 miles, were carried forward from coarse-level screening, field visits were not conducted during fine-level screening. In September 2015, ICF conducted a review for the project in order to identify potential resource-related constraints for the evaluation of Section 4(f) and Section 6(f) properties. This research encompassed the project route for all alternatives brought forward from the course-level screening analysis and a 40-foot buffer from the centerline, or an 80-foot total buffer, including both sides of the rail line. Figure 1 in Appendix A shows an overview location map.

Without more detailed information on the design, construction, and right-of-way requirements associated with each alternative, a determination on the potential for use of any of the identified Section 4(f)/6(f) resources is not possible. For the purposes of this analysis, a conservative impact potential is assumed, which includes acquisition of right-of-way of the entirety of the 80-foot buffer around each of the route alternatives. Using this conservative assumption for each alternative, any portion of identified Section 4(f)/6(f) resources would be affected by the project.

During the later stages of fine-level analysis, it was determined that sufficient passenger train slots are available under current operating agreements for Route Alternative 1. Based on this information, additional infrastructure (e.g. no improvements to the existing rail route) would not be required or needed if RCTC dedicates that needed slots to the Coachella Valley service. In no additional infrastructure is required, no direct environmental impacts are anticipated to occur. However, in the event that additional infrastructure is needed for Route Alternative 1, this memorandum contains applicable information about the types of environmental resources that may occur within and along Route Alternative 1.

Regulatory Setting

U.S. Department of Transportation Act (23 U.S.C. § 138 and 49 U.S.C. 303(c) [Section 4(f)])

Section 4(f) of the U.S. Department of Transportation Act of 1966, codified in federal law at 49 United States Code (U.S.C.) 303, declares that "it is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites." Section 4(f) specifies that the U.S. Secretary of Transportation may approve a transportation program or project requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or land of an historic site of national, state, or local significance (as determined by the federal, state, or local officials having jurisdiction over the park, area, refuge, or site) only if:

- there is no prudent and feasible alternative to using that land; and
- the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.

Compliance with Section 4(f) is required for transportation projects that are undertaken by an operating administration of the U.S. Department of Transportation (DOT) or that may receive federal funding and/or discretionary approvals from DOT. The lead agency for the proposed action is the Federal Railroad Administration (FRA), which is an operating administration of the

DOT. The FRA's Procedures for Considering Environmental Impacts (64 FR 28545, May 26, 1999) contains FRA processes and protocols for analyzing the potential use of Section 4(f) resources. In addition, although not subject to the Title 23 Section 774 regulations regarding Section 4(f) for highways and transit projects, the FRA uses these regulations, as well as the Federal Highway Administration's Section 4(f) Policy Paper[1] as additional guidance when applying the requirements established in Section 4(f).

Section 6(f) of the Land and Water Conservation Fund Act (16 U.S.C. § 460l-8(f) and 36 C.F.R. Part 59.1)

State and local governments often obtain grants through the Land and Water Conservation Fund (LWCF) Act to acquire or make improvements to parks and recreation areas. Section 6(f) of the act prohibits the conversion of property acquired or developed with these grants to a non-recreational purpose without the approval of the National Park Service (NPS). Section 6(f) directs NPS to ensure that replacement lands of comparable value and function, or monetary compensation (used to enhance the remaining land), location, and usefulness are provided as conditions to such conversions. Based on a review of the LWCF grant listings, it appears that there are no resources within the 80-foot buffer of any of the alternatives.

Section 4(f) Applicability

Generally, a use under Section 4(f) would not occur unless property from a Section 4(f) protected resource is permanently incorporated into a transportation facility or temporarily occupied during construction of the transportation project, resulting in substantial impacts on the resource. Less commonly, constructive use (permanent proximity impacts) can occur if proximity impacts of a transportation project would result in impacts that are so severe that the protected activities, features, or attributes of the Section 4(f) resource are substantially impaired.

Existing Setting

Section 4(f) properties include publicly owned parks and recreation facilities that are open to the public, publicly owned wildlife and waterfowl refuges, and historic sites listed in or eligible for the National Register of Historic Places (NRHP). In some circumstances, public school play areas may qualify for protection under Section 4(f). In order for school play areas to be considered in Section 4(f) analysis, the play areas need to be open to the public during non-school hours typically through a joint use agreement between a school district and a city or recreation agency. Similarly, hiking and bicycle trails may qualify for protection under Section 4(f) if the primary purpose of the trail is for recreation as opposed to transportation.

The functions and attributes of all potential Section 4(f) resources, as well as their relative importance and value, are established through consultation with the officials with jurisdiction over a given resource. Accordingly, some of the resources presented in this screening-level analysis may be determined not to be protected under Section 4(f) at a later date. Nonetheless,

[1] U.S. Department of Transportation, Federal Highway Administration. 2012. Office of Planning, Environment, and Realty Project Development and Environmental Review. *Section 4(f) Policy Paper*. July 20. Washington, DC. Available: https://www.environment.fhwa.dot.gov/4f/4fpolicy.pdf.

all potential Section 4(f) resources are listed as part of this analysis to provide a conservative comparison of the alternatives under consideration. It should be noted that in the case of historic sites, only known NRHP-listed properties are discussed in this analysis and additional research and analysis will be required to identify NRHP-eligible historic sites that would also be protected under Section 4(f). While archaeological sites listed in or eligible for listing in the NRHP can qualify for Section 4(f) protection, they generally are not considered in Section 4(f) analysis because a majority of archaeological sites do not warrant preservation in place. Additional research and examination of the archaeological resources within the project study area would be required to determine if any of the archaeological resources identified would warrant preservation in place; therefore, no discussion of such resources is presented in this analysis.

The route alternatives are located in a generally developed urban setting and traverse about 38 local jurisdictions within Los Angeles, Orange, Riverside, and San Bernardino counties. In general, the rail-dominated corridors along which the alternatives follow do not provide usable recreational opportunities. Accordingly, recreational Section 4(f) resources are not heavily prevalent along any of the four alternatives under consideration. Furthermore, due to the urbanized nature of the project corridors, there are no known wildlife or waterfowl refuges identified within the 80-foot buffer used to identify Section 4(f) resources. There a number of park and recreational resources as well as some known NRHP-listed historic properties located adjacent to the rail corridor and/or within the 80-foot buffer, as discussed below. These properties have been identified as potentially meeting the definitions of Section 4(f) protected properties as set forth in 23 CFR 774.17.

Results

Each of the alternatives considered in this analysis generally are within existing rail right-of-way. The Section 4(f) resources identified as part of this analysis are outside of the rail right-of-way. Therefore, there is a low likelihood that land from any of the Section 4(f) resources listed below would be incorporated into the project. Later phases of the project planning and environmental analysis will identify potential for temporary occupancy or proximity impacts and analyze the potential for use of Section 4(f) resources. However, based on the current route alternatives and 80-foot buffer used to identify Section 4(f) resources, there is a low potential for any of the project alternatives to require a Section 4(f) approval. Early identification of Section 4(f) resources can inform the design and engineering of the project so as to avoid use of Section 4(f) resources, ensure incorporation of the statute's requirements for the evaluation of avoidance alternatives, and assist with selection of a least overall harmful alternative.

Alternative 1

There are six park facilities within the 80-foot buffer area of Alternative 1, as indicated in Table 1. In addition, there are two school play areas and one multi-modal trail along the Santa Ana River that may qualify for protection under Section 4(f). In addition to park and recreational properties, there are two known NRHP-listed historic sites that are close to the rail right-of-way.

Using the conservative assumption of right-of-way acquisition from the entirety of the 80-foot buffer around Alternative 1, small portions of each of the park and recreation resources listed would be required. Because these acquisitions would be small and would only affect the outer boundaries of each resource, it can reasonably be assumed that a *de minimis* impact

determination and approval would suffice for each of the park and recreation resources. Proximity impacts associated with the alternative would include noise, dust kicked up by passing trains, and potential changes in access and the visual environment. Given the rail-oriented environment in which these resources are located, proximity impacts of these sorts are unlikely to be of a severity that would substantially impair the protected activities, features, or attributes of these resources.

If the Santa Ana River Trail is determined to be a Section 4(f) resource, because Alternative 1 crosses over the trail, disruption of the regular use of the trail during construction would need to be minimized to avoid a potential use resulting from temporary occupancy. This can be accomplished through provision of detours, limitation of construction hours, additional safety measures (e.g., protective temporary structures over the trail), or other means to ensure that the trail can continue to function during construction.

Similarly, the two NRHP-listed properties are rail-associated historic sites. It can reasonably be assumed that any impacts on these properties would not compromise the preservationist intent of their NRHP-listed status and, therefore, Section 4(f) approval of a use can be carried out using a *de minimis* impact determination.

Table 1. Alternative 1 Section 4(f) Resources within Right-of-Way and Buffer

Environmental Resource	Resources within Right-of-Way and Buffer
Section 4(f) (may also be Section 6(f))	Six park or recreational properties: • Amerige Park, Fullerton • Brush Canyon Park, Yorba Linda • Chino Hills State Park, Puente-Chino Hills • Don Derr Park, Riverside • John Zimmerman Park, Norwalk • Parque de Los Ninos Three recreational properties that are potentially protected under Section 4(f): • Woodsboro Elementary School play areas, Anaheim • Arlington High School play areas, Riverside • Santa Ana River Trail, Grand Terrace
NRHP-listed properties	Two properties or resource groupings: • Santa Fe Railway Passenger and Freight Depot in Fullerton, Orange County • Fullerton Union Pacific Depot in Fullerton, Orange County

Alternative 4-A

There are 11 park facilities within the 80-foot buffer area of Alternative 4-A, as indicated in Table 2. In addition, there are six school play areas and one multi-modal trail along the San Gabriel River that may qualify for protection under Section 4(f). In addition to park and recreational properties, there are three known NRHP-listed historic sites that are close to the rail right-of-way.

Similar to Alternative 1, without more detailed information on the design, construction, and right-of-way requirements associated with the alternative, a determination on the potential for use of any of the below-listed Section 4(f) resources is not possible. Using the "worst-case" assumption of right-of-way acquisition from the entirety of the 80-foot buffer around Alternative 4-A, small portions of each of the park and recreation resources listed would be required. Because these acquisitions would be small and would only affect the outer boundaries of each resource, it can reasonably be assumed that a *de minimis* impact determination and approval would suffice for each of the park and recreation resources. Proximity impacts associated with the alternative would include noise, dust kicked up by passing trains, and potential changes in access and the visual environment. Given the rail-oriented environment in which these resources are located, proximity impacts of these sorts are unlikely to be of a severity that would substantially impair the protected activities, features, or attributes of these resources.

Similar to the Santa Ana River Trail under Alternative 1, if it is determined that the San Gabriel River trail is a Section 4(f) resource, and because Alternative 4-A crosses over the trail, disruption of the regular use of the trail during construction would need to be minimized to avoid a potential use resulting from temporary occupancy.

There are three NRHP-listed properties under Alternative 4-A. The rail-associated historic site—the Atchison, Topeka, and Santa Fe Railway Station—can be treated in much the same way as the Santa Fe Railway Passenger and Freight Depot and the Fullerton Union Pacific Depot under Alternative 1. It can reasonably be assumed that any impacts on these properties would not compromise the preservationist intent of their NRHP-listed status and, therefore, Section 4(f) approval of a use can be carried out using a *de minimis* impact determination. Impacts on the other two historic sites—Euclid Avenue and the Ygnacio Palomares Adobe—would depend on the types of project activities that stand to physically alter the historical resource or properties on which historical resources are located, or that stand to result in indirect impacts. Demolition of such resources would result in a use under Section 4(f). Physical alteration of such resources is likely to result in a use under Section 4(f) unless the alterations meet historic preservation standards, in which case a *de minimis* impact finding may be appropriate. Indirect impacts can result from alterations to properties within which historical resources are located, even if the resources (a building, for example) are not physically altered. Certain historic buildings can be subject to impacts from the vibratory effects of rail operations, which would require analysis for constructive use under Section 4(f).

Table 2. Alternative 4-A Environmental Resources within Right-of-Way and Buffer

Environmental Resource	Resources within Right-of-Way and Buffer
Section 4(f) (may also be Section 6(f))	11 park or recreation properties: • Ramona Gardens Recreation Center, Los Angeles • Pioneer Park, El Monte • Rio Hondo Bike Path, El Monte • Santa Fe Trail Historical Park, El Monte • Edna Park, Covina • Khaler Russell Park, Covina

Environmental Resource	Resources within Right-of-Way and Buffer
	• Lordburg Park, La Mirada • Palomares Park, Pomona • College Park, Claremont • Fern Reservoir Park, Upland • Wardens Field, Upland Seven recreational properties that are potentially protected under Section 4(f): • San Gabriel River Trail • Torch Middle School play areas, City of Industry • Foster Elementary School, Baldwin Park • Charles D. Jones Junior High School, Baldwin Park • Vineland Elementary School, Baldwin Park • Northview High School, Covina • Charter Oak High School, Covina
NRHP-listed properties	Three properties or resource groupings: • Euclid Avenue in Upland, San Bernardino County • Atchison, Topeka, and Santa Fe Railway Station in Claremont, Los Angeles County • Ygnacio Palomares Adobe in Pomona, Los Angeles County

Alternative 4-B

Other than the presence of one additional historic site—the Atchison, Topeka, and Santa Fe Railway Passenger and Freight Depot in San Bernardino—there is no difference in the potential for use of Section 4(f) resources between Alternatives 4-A and 4-B, as indicated in Table 3. As with the other rail-oriented historic sites discussed under Alternatives 1 and 4-A, the Atchison, Topeka, and Santa Fe Railway Passenger and Freight Depot in San Bernardino would have the same potential or lack thereof for Section 4(f) use.

Table 3. Alternative 4-B Environmental Resources within Right-of-Way and Buffer

Environmental Resource	Resources within Right-of-Way and Buffer
Section 4(f) (may also be Section 6(f))	There is no difference in regard to Section 4(f) properties between Alternatives 4-A and 4-B 11 park or recreation properties: • Ramona Gardens Recreation Center, Los Angeles • Pioneer Park, El Monte • Rio Hondo Bike Path, El Monte • Santa Fe Trail Historical Park, El Monte

Environmental Resource	Resources within Right-of-Way and Buffer
	• Edna Park, Covina • Khaler Russell Park, Covina • Lordburg Park, La Mirada • Palomares Park, Pomona • College Park, Claremont • Fern Reservoir Park, Upland • Wardens Field, Upland Seven recreational properties that are potentially protected under Section 4(f): • San Gabriel River Trail • Torch Middle School play areas, City of Industry • Foster Elementary School, Baldwin Park • Charles D. Jones Junior High School, Baldwin Park • Vineland Elementary School, Baldwin Park • Northview High School, Covina • Charter Oak High School, Covina
NRHP-listed properties	Four properties or resource groupings: • Atchison, Topeka, and Santa Fe Railway Passenger and Freight Depot in San Bernardino, San Bernardino County • Euclid Avenue in Upland, San Bernardino County • Atchison, Topeka, and Santa Fe Railway Station in Claremont, Los Angeles County • Ygnacio Palomares Adobe in Pomona, Los Angeles County

Alternative 5

There are eight park facilities within the 80-foot buffer area of Alternative 5, as indicated in Table 4. In addition, there are six school play areas that may qualify for protection under Section 4(f). In addition to park and recreational properties, there are four known NRHP-listed historic sites that are close to the rail right-of-way, which are the same as those listed for Alternative 4-B. The only resources captured under Alternative 5 that are not discussed under Alternative 4-A or 4-B are Lincoln Park in Los Angeles and the Alhambra Golf Course in Alhambra. The Alhambra Golf Course does not appear to qualify for Section 4(f) protection because it serves as a for-profit golf facility; however, ownership of the property is unclear and until additional research can be done to determine its ownership and function (private vs public recreation), it has been included in this analysis to be conservative.

Similar to the other alternatives described, without more detailed information on the design, construction, and right-of-way requirements associated with the alternative, a determination on the potential for use of any of the below-listed Section 4(f) resources is not possible. Using the "worst-case" assumption of right-of-way acquisition from the entirety of the 80-foot buffer around Alternative 5, small portions of each of the park and recreation resources listed would be required. Because these acquisitions would be small and would only affect the outer

boundaries of each resource, it can reasonably be assumed that a *de minimis* impact determination and approval would suffice for each of the park and recreation resources. Proximity impacts associated with the alternative would include noise, dust kicked up by passing trains, and potential changes in access and the visual environment. Given the rail-oriented environment in which these resources are located, proximity impacts of these sorts are unlikely to be of a severity that would substantially impair the protected activities, features, or attributes of these resources.

Regarding historic sites, the same considerations described under Alternatives 1, 4-A, and 4-B apply.

Table 4. Alternative 5 Environmental Resources within Right-of-Way and Buffer

Environmental Resource	Resources within Right-of-Way and Buffer
Section 4(f) (may also be Section 6(f))	Eight park or recreation properties: • Lincoln Park, Los Angeles • Edna Park, Covina • Khaler Russell Park, Covina • Lordburg Park, La Mirada • Palomares Park, Pomona • College Park, Claremont • Fern Reservoir Park, Upland • Wardens Field, Upland Six recreational properties that are potentially protected under Section 4(f): • Alhambra Golf Course • Torch Middle School play areas, City of Industry • Foster Elementary School, Baldwin Park • Charles D. Jones Junior High School, Baldwin Park • Vineland Elementary School, Baldwin Park • Northview High School, Covina • Charter Oak High School, Covina
NRHP-listed properties	Four properties or resource groupings: • Atchison, Topeka, and Santa Fe Railway Passenger and Freight Depot in San Bernardino, San Bernardino County • Euclid Avenue in Upland, San Bernardino County • Atchison, Topeka, and Santa Fe Railway Station in Claremont, Los Angeles County • Ygnacio Palomares Adobe in Pomona, Los Angeles County

Conclusion

As described above, based on currently available information on the route alternatives, Section 4(f) considerations should not be a limiting factor for any of the alternatives under

consideration. Generally, Alternative 4-B includes the greatest number of Section 4(f) resources within its buffer area, while Alternative 1 includes the fewest Section 4(f) resources. However, for all of the project alternatives, assuming a worst-case scenario wherein small portions of Section 4(f) property right-of-way may be acquired, it is likely that *de minimis* impact findings can be made for all of the Section 4(f) resources identified in this analysis. Additionally, there is no material difference between the four alternatives in the relative severity of potential impacts or overall importance of Section 4(f) resources.

Once additional design, right-of-way, and construction information is available for the alternatives, if a use of a Section 4(f) resource is identified, then a Section 4(f) Evaluation would be required. As part of the evaluation measures to minimize harm to Section 4(f) resources, avoidance alternatives and a least overall harm comparison of alternatives will be required. The DOT agency (Federal Transit Administration or FRA) cannot approve the use of a Section 4(f) resource unless it can be demonstrated in the Section 4(f) Evaluation that there is no prudent and feasible alternative to using that land, and the project includes all possible planning to minimize harm to the resource resulting from the use. It should also be noted that as an alternative, if the Federal Transit Administration takes on responsibility as the federal agency tasked with approving the project, certain programmatic Section 4(f) evaluations may be applicable to the project that may streamline the processing of Section 4(f) approval.

Appendix A
Figures

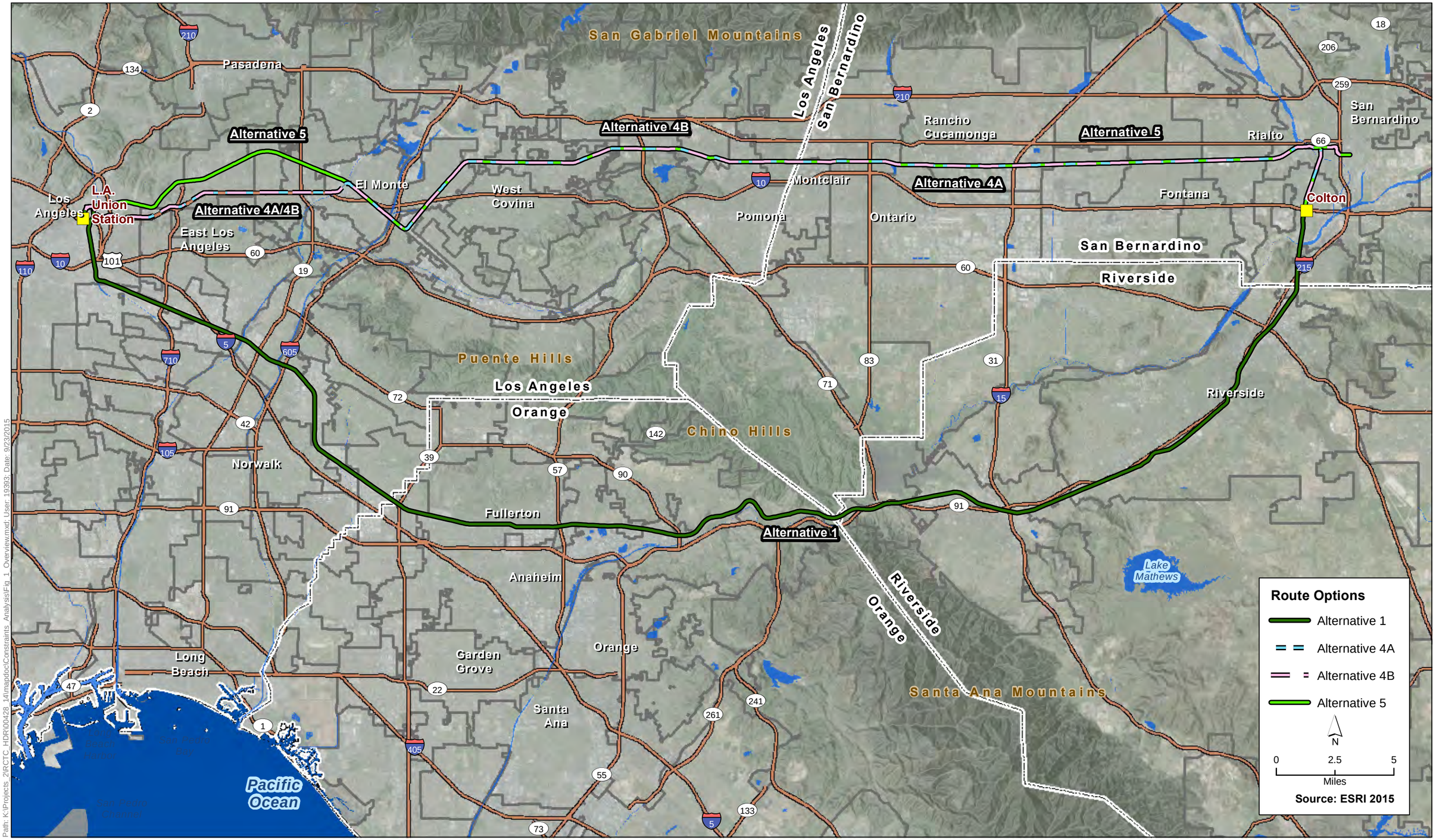

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Figure 1
Location Overview
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives

Appendix B
Summary Table

Environmental Resource	Alternative 1	Alternative 4-A	Alternative 4-B	Alternative 5
Section 4(f) (may also be Section 6(f))	Six park or recreational properties: • Amerige Park, Fullerton • Brush Canyon Park, Yorba Linda • Chino Hills State Park, Puente-Chino Hills • Don Derr Park, Riverside • John Zimmerman Park, Norwalk • Parque de Los Ninos Three recreational properties that are potentially protected under Section 4(f): • Woodsboro Elementary School play areas, Anaheim • Arlington High School play areas, Riverside • Santa Ana River Trail, Grand Terrace	11 park or recreation properties: • Ramona Gardens Recreation Center, Los Angeles • Pioneer Park, El Monte • Rio Hondo Bike Path, El Monte • Santa Fe Trail Historical Park, El Monte • Edna Park, Covina • Khaler Russell Park, Covina • Lordburg Park, La Mirada • Palomares Park, Pomona • College Park, Claremont • Fern Reservoir Park, Upland • Wardens Field, Upland Seven recreational properties that are potentially protected under Section 4(f): • San Gabriel River Trail • Torch Middle School play areas, City of Industry • Foster Elementary School, Baldwin Park • Charles D. Jones Junior High	11 park or recreation properties: • Ramona Gardens Recreation Center, Los Angeles • Pioneer Park, El Monte • Rio Hondo Bike Path, El Monte • Santa Fe Trail Historical Park, El Monte • Edna Park, Covina • Khaler Russell Park, Covina • Lordburg Park, La Mirada • Palomares Park, Pomona • College Park, Claremont • Fern Reservoir Park, Upland • Wardens Field, Upland Seven recreational properties that are potentially protected under Section 4(f): • San Gabriel River Trail • Torch Middle School play areas, City of Industry • Foster Elementary School, Baldwin Park • Charles D. Jones Junior High	Eight park or recreation properties: • Lincoln Park, Los Angeles • Edna Park, Covina • Khaler Russell Park, Covina • Lordburg Park, La Mirada • Palomares Park, Pomona • College Park, Claremont • Fern Reservoir Park, Upland • Wardens Field, Upland Six recreational properties that are potentially protected under Section 4(f): • Alhambra Golf Course • Torch Middle School play areas, City of Industry • Foster Elementary School, Baldwin Park • Charles D. Jones Junior High School, Baldwin Park • Vineland Elementary School, Baldwin Park • Northview High School, Covina • Charter Oak High School, Covina

Environmental Resource	Alternative 1	Alternative 4-A	Alternative 4-B	Alternative 5
		School, Baldwin Park • Vineland Elementary School, Baldwin Park • Northview High School, Covina • Charter Oak High School, Covina	School, Baldwin Park • Vineland Elementary School, Baldwin Park • Northview High School, Covina • Charter Oak High School, Covina	
NRHP-listed properties	Two properties or resource groupings: • Santa Fe Railway Passenger and Freight Depot in Fullerton, Orange County • Fullerton Union Pacific Depot in Fullerton, Orange County	Three properties or resource groupings: • Euclid Avenue in Upland, San Bernardino County • Atchison, Topeka, and Santa Fe Railway Station in Claremont, Los Angeles County • Ygnacio Palomares Adobe in Pomona, Los Angeles County	Four properties or resource groupings: • Atchison, Topeka, and Santa Fe Railway Passenger and Freight Depot in San Bernardino, San Bernardino County • Euclid Avenue in Upland, San Bernardino County • Atchison, Topeka, and Santa Fe Railway Station in Claremont, Los Angeles County • Ygnacio Palomares Adobe in Pomona, Los Angeles County	Four properties or resource groupings: • Atchison, Topeka, and Santa Fe Railway Passenger and Freight Depot in San Bernardino, San Bernardino County • Euclid Avenue in Upland, San Bernardino County • Atchison, Topeka, and Santa Fe Railway Station in Claremont, Los Angeles County • Ygnacio Palomares Adobe in Pomona, Los Angeles County

September 24, 2015

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Subject: Draft Coachella Valley–San Gorgonio Pass Rail Corridor Service: Fine Level Screening for Visual Resources

Introduction

This technical memorandum contains the Draft Fine-Level Screening Constraints Analysis for ***Visual Resources*** for the Coachella Valley-San Gorgonio Pass Rail Corridor Service Project proposed by the Riverside County Transportation Commission. This analysis considers four rail passenger route alternatives (i.e., 1, 4-A, 4-B, and 5) located between Los Angeles Union Station (LAUS) and Colton along existing rail corridors within Los Angeles, Orange, San Bernardino, and Riverside counties. These alternatives share the same beginning and end points (i.e., LAUS and Colton) and comprise the western study area of the project. The eastern study area is not considered in this analysis because it consists of a single alternative, a 72-mile segment, and its consideration would therefore result in no differentiation between alternatives. The evaluation contained herein includes an initial evaluation of the route alternative and quantification of conceptual environmental effects to determine the potential to affect substantially more environmentally sensitive areas in specific environmental categories compared with other route alternatives. Impacts are generalized for resources within and adjacent to a buffer surrounding the right-of-way for each alternative route.

Methodology

The Coachella Valley-San Gorgonio Pass Rail Corridor Service alternatives were generally evaluated against the fine-level screening criteria defined in Section 4.2 of the Alternatives Analysis Methodology, and the results of this evaluation are presented herein. During fine-level screening, route alternatives (or combinations of route alternatives) will be identified in the Alternatives Analysis that offer the highest potential ridership; the least potential construction, operating, and maintenance cost; and the least potential impact on communities and the environment, as well as appropriate mitigation feasibility. This effort will provide information regarding potential environmental impacts for each route alternative for ultimate selection of an alternative to be carried forward as the proposed project.

Fine-level screening was based on open-source aerial imagery and/or geographic information systems (GIS) data, which will be used to characterize portions of each route alternative. Because several route alternatives, each with lengths on the order of 60 miles, were carried

forward from coarse-level screening, field visits were not conducted during fine-level screening. In September 2015, ICF conducted a review for the project in order to identify potential resource-related constraints for the evaluation of visual resources.

The visual resources analysis screening area is defined as the area of visual effect (AVE), which comprises viewsheds, or what people can see in the landscape. The AVE and its viewsheds are defined by the physical constraints of the environment and the physiological limits of human sight. Physical constraints of the environment include landform, land cover, and atmospheric conditions. Landform is a major factor in determining the AVE because it can limit views or provide an elevated perspective for viewers. Similarly, land cover such as trees and buildings can limit views, while low-growing vegetation and the absence of structures can allow for unobscured views. Atmospheric conditions such as smoke, dust, fog, or precipitation can temporarily reduce visibility.

The physiological limits of human sight are affected by location, proximity, and light. Location refers to the topographic position of the viewer such as being even with, above, or below what is being observed. Proximity is broken down into three distance zones: foreground (up to 0.5 mile from the viewer), middleground (0.5 mile to 3 to 5 miles from the viewer), and background (from 3 to 5 miles to infinity). Features in the landscape are more dominant and have a greater importance the closer the resource is to the viewer, whereas importance is reduced the farther away features are from the viewer. This is because details and features in the landscape, including project elements, become lost and make up a smaller portion of the total landscape as distance from the viewer increases. In the background, the scale and color of existing landscape elements and project features blend so that only broad forms, large-scale patterns, and muted colors are evident. Light influence also plays a large role in affecting views, such as during the daytime when views are more readily available versus the nighttime when darkness greatly reduces the ability to see details and color in the landscape without bright moonlight or artificial light sources. In addition, lighting levels change throughout the day, making color and individual forms more prominent with more light and less distinct as light decreases.

The environment's physical constraints and limits of human sight combine to provide for viewsheds that range from restrictive to expansive and AVEs that range from being smaller and more confined to larger and wider reaching.[1, 2]

For the proposed project, the visual resources analysis screening area is composed of the route alternatives brought forward from the course-level screening analysis. These alternatives are shown in Figure 1 in Appendix A. The route alternatives and associated buffers were overlain in Google Earth® and their locations were evaluated in relation to sensitive visual resources. Sensitive visual resources evaluated include state and county scenic routes, recreational areas, trails, vegetation along the route alternatives, and scenic features such as areas with established high-quality landscaped streetscapes. The AVEs were established through this process.

[1] Federal Highway Administration. 2015. *Guidelines for the Visual Impact Assessment of Highway Projects*. (FHWA-HEP-15-029.) USDOT (US Department of Transportation). pp. 4-5 – 4-9, 6-3 – 6-4. Washington, DC. January.
[2] Litton, R. Burton, Jr. 1968. *Forest Landscape Description and Inventories – A Basis for Land Planning and Design*. (U.S. Department of Agriculture Forest Service Research Paper PSW-49) Pacific Southwest Forest and Range Experiment Station. pp. 3–5. Berkeley, CA.

The AVEs for the route alternatives comprise the 40-foot buffer surrounding the right-of-way for each alternative and include locations where visual resources (scenic routes, trails, recreational areas) would have views of the alternative right-of-way and 40-foot buffer, because sensitive resources adjacent to the right-of-way and buffer could be affected by the proposed alternatives. As described in more detail below under *Existing Setting*, the affected area is highly developed in a manner that limits the AVEs.

During the later stages of fine-level analysis, it was determined that sufficient passenger train slots are available under current operating agreements for Route Alternative 1. Based on this information, additional infrastructure (e.g. no improvements to the existing rail route) would not be required or needed if RCTC dedicates that needed slots to the Coachella Valley service. In no additional infrastructure is required, no direct environmental impacts are anticipated to occur. However, in the event that additional infrastructure is needed for Route Alternative 1, this memorandum contains applicable information about the types of environmental resources that may occur within and along Route Alternative 1.

Existing Setting

The alternatives all follow existing rail corridors through highly developed areas in Los Angeles and San Bernardino counties. Alternative 1 also travels through highly developed portions of Orange and Riverside counties. These areas are mostly flat, except close to where the Chino Hills and Santa Ana Mountains meet (Alternative 1), close to Chino Hills State Park[3] and Santa Ana Canyon, and near the San Jose Hills (Alternatives 4-A, 4-B, and 5), where the Frank G. Bonelli Regional Park is located.

The alternatives pass through residential and industrial areas that abut the existing right-of-way, in addition to passing by and crossing local roadways and larger highways and interstates. Buildings, vegetation in the form of trees and shrubs associated with landscaping, and noise/visual barriers along the right-of-way act to restrict most views available from the route alternatives to the immediate foreground so that views are of the development immediately abutting the route alternative. Views to the middleground and background beyond tend to be unavailable. However, intermittent views to the middleground and background are available from limited vantage points along the route alternatives where roadway corridors or elevation allow for views beyond the immediate foreground. The same development along the right-of-way acts to prevent views toward the route alternatives from developed areas beyond the development abutting the right-of-way.

Open space areas along the route alternatives are sparse and generally limited to local parks, recreational facilities, and vacant lots. However, larger open space areas are provided in this urban setting and within the AVE by Chino Hills State Park (Alternative 1) and Frank G. Bonelli Regional Park (Alternatives 4-A, 4-B, and 5). Waterways in the AVE are largely channelized within the urban setting and tend to lack recreational opportunities. Two national historical

[3] California Department of Parks and Recreation. *Visit a Park – California State Parks Map*. Available: http://www.parks.ca.gov/parkindex. Accessed: September 17, 2015.

trails,[4] the Juan Bautista de Anza and Old Spanish National Historic Trails, cross the route alternatives and are discussed under each alternative.

All alternatives have the same types of affected viewers, which include residential, recreational, commercial, institutional, and industrial viewers and roadway travelers.

Results

Alternative 1

Alternative 1 travels south of and is largely independent of Alternatives 4-A, 4-B, and 5, only sharing a very small segment of the western terminus for all alternatives. Alternative 1 terminates in the same location as the eastern termini for Alternatives 4-A, 4-B, and 5 that approach from the terminus from the north, but Alternative 1 approaches this location from the south. Alternative 1 passes through mostly industrial; transportation, communications, and utilities; and vacant land uses and offers views of these utilitarian and undeveloped land uses. These areas can be seen on Figure 1 in Appendix A as the lighter-colored areas of development that are recognizable because of the sparse landscaping, larger gaps between structures, and larger-sized buildings with flat, lightly colored roofs associated with such development. In comparison, residential areas appear darker on the figure because of the denser spacing of smaller-sized buildings, with darker shingled roofs, and the presence of mature landscaping. As seen on Figure 1, the route alternative also passes through residential areas, but noise barriers are present in many areas between the right-of-way and residential areas and these barriers largely limit the availability of views from private residences. As identified in Table 1, below, sensitive visual resources are also located along the route alternative and would also be affected.

Alternative 1 has two crossings with the Juan Bautista de Anza National Historic Trail. The crossings in both Los Angeles and Riverside counties are developed, near rail facilities and industrial and commercial land uses, with no visible indication that the historic trail crosses there.

State Route (SR) 91 is an Official State Scenic Highway west of Yorba Linda Regional Park, but development between the route alternative and SR-91 prevents views of the route alternative. East of the officially designated segment to the Orange/Riverside county line, SR-91 is an Eligible State Scenic Highway[5] and an officially designated Viewscape Corridor in Orange County.[6] This portion of SR-91 passes through Santa Ana Canyon, where the Chino Hills and Santa Ana Mountains meet, close to Chino Hills State Park. Alternative 1 travels along the base of the Chino Hills through the canyon, approximately 0.25 mile from SR-91, but views of the route alternative are available from portions of the Orange County–designated viewscape corridor where gaps in vegetation and a lack of development allow for such views. The canyon,

[4] National Park Service. *California Parks*. Available: http://www.nps.gov/state/ca/index.htm. Accessed: September 17, 2015.
[5] California Department of Transportation. 2013. *Eligible (E) and Officially Designated (OD) Routes*. Available: http://www.dot.ca.gov/hq/LandArch/scenic/cahisys.htm. Accessed: September 23, 2015.
[6] County of Orange. 2014. *County of Orange General Plan 2005 – Transportation Element*. Available: http://ocplanning.net/planning/generalplan2005. Accessed: September 23, 2015.

undeveloped and vegetated hilly terrain, and the winding nature of the roadway contribute to SR-91's scenic qualities and to the scenic qualities of nearby recreational areas.

Chino Hills State Park is an important recreational, open space area given its location in a highly urbanized environment, and there are a number of trails in the park that may have views of Alternative 1. There are also several other sensitive visual resources close to the state park in Yorba Linda and Corona, including the Santa Ana River Trail Bikeway, Featherly Regional Park, Brush Canyon Park, Sycamore Park, Canyon Recreational Vehicle (RV) Park, Green River Golf Club, Butterfield Park, Contreras Park, North Main Streetscape, and hilly, open space terrain that make this portion of the route alternative visually sensitive. Once through this area, the route alternative continues to traverse a mix of residential, commercial, and industrial land uses.

Table 1. Route Alternative 1 Visual Resources within Right-of-Way and Buffer

Environmental Resource	Resources within Right-of-Way and Buffer
National Trails	• Juan Bautista de Anza National Historic Trail in Los Angeles and Riverside
Local Parks/ Recreational Areas/Scenic Features	• Rio Hondo Bike Path in Montebello • Passons Boulevard Streetscape and Pathway underpass in Pico Rivera • San Gabriel River Mid Trail in Santa Fe Springs • John Zimmerman Park in Norwalk • Tot Lot at Sycamore Lane in Buena Park • Dale Street Streetscape and Pathway underpass in Buena Park • Bastanchury Park, Fullerton Pooch Park, Independence Park, Amerige Park, and Harbor Boulevard and South Lemon Street Streetscapes and Sidewalks/Pathways underpass in Fullerton • Placentia Civic Center and Parque De Los Niños in Placentia • Vineyard Church of Anaheim park and State Route 90/East Orangethorpe interchange loop trail in Anaheim • Santa Ana River Trail Bikeway, Featherly Regional Park, Brush Canyon Park, Sycamore Park, Canyon RV Park, and hilly terrain in Yorba Linda • Chino Hills State Park and Associated Trails near Corona • Green River Golf Club, Butterfield Park, Contreras Park, and North Main Streetscape in Corona • Magnolia Avenue Artistic Median Stormwater Swale, Arlington High School and California School for the Deaf Sports Fields, Don Derr Park, Olivewood Cemetery, Lincoln Park, North Park, Catania Drive community park, and Hunter Park in Riverside • Mature trees, shrubs, and landscaping along the right-of-way and within the buffer
Eligible State Scenic Routes	• SR-91 near Corona
County Scenic Route	• SR-91 in Orange County from SR-57 to Orange and Riverside county lines is an Orange County–designated Viewscape Corridor

Alternative 4-A

Alternatives 4-A and 4-B share the same route, except at the eastern terminus where Alternative 4-B has an additional segment that travels slightly farther east. Alternative 4-B passes through

more residential areas and fewer industrial; transportation, communications, and utilities; and vacant land uses than Alternative 1. Therefore, Alternative 4-A offers more views of residential areas and slightly fewer views of utilitarian industrial and commercial areas and undeveloped land uses from the train. A large segment of Alternative 4-A travels through residential areas within the median of Interstate (I) 10 for just over 6.25 miles, between I-710 and the Baldwin Avenue exit in El Monte. However, I-10 has noise barriers to largely limit the availability of views of I-10 and Alternative 1, as seen from private residences, greatly reducing the potential for adverse visual impacts along this segment. As identified in Table 2, below, sensitive visual resources are also located along the route alternative and would also be affected.

Alternative 4-A does not cross any eligible or officially designated state or county scenic routes. Alternative 4-A has four crossings with the Old Spanish National Historic Trail in Alhambra, Baldwin Park, Covina, and La Verne. The crossings are developed, with no visible indication that the historic trail crosses there. One of the most sensitive areas would be near Frank G. Bonelli Regional Park because this park provides an important recreational and open space resource in a highly urbanized area. However, development along the route alternative is likely to ensure that views from the park are minimally affected.

Table 2. Alternative 4-A Visual Resources within Right-of-Way and Buffer

Environmental Resource	Resources within Right-of-Way and Buffer
National Trails	• Old Spanish National Historic Trail in Alhambra, Baldwin Park, Covina, and La Verne
Local Parks/ Recreational Areas/Scenic Features	• Ramona Gardens Recreation Center in Los Angeles • Pioneer Park, Santa Fe Trail Historical Park, and Rio Hondo Bike Path in El Monte • Bassett Park in La Puente • Vineland Elementary School Sports Fields • Northview High School Sports Fields, Kahler Russell Park, Charter Oak High School Sports Fields, Saint Louise De Marillac Catholic Church Sports Fields in Covina • Frank G. Bonelli Regional Park and University of La Verne Campus West Athletics Facilities in San Dimas • Palomares Park and College Park in Pomona • Rosa Torrez Park in Claremont • Old Town Park and Empire Lakes Golf Course in Rancho Cucamonga • Gateway Park in San Bernardino • Mature Trees, shrubs, and landscaping along the right-of-way and within the buffer

Alternative 4-B

Alternatives 4-A and 4-B share the same route, except at the eastern terminus where Alternative 4-B has an additional segment that travels slightly farther east. This additional segment is approximately 1.5 miles long and occurs at the bend in the route alternative where both alternatives head south to the eastern terminus. Therefore, the difference in impacts on visual resources resulting from Alternative 4-B, compared to Alternative 4-A, would only occur from the additional 1.5-mile segment and a different station at the end of this segment. Compared to

Alternative 4-A, the only additional visual resource affected would be the San Bernardino Stadium in San Bernardino (refer to Table 3, below).

Much of this 1.5-mile segment travels past an existing railyard and commercial and industrial land uses. A small portion of the segment passes through approximately two blocks of residential land uses. The station would be in an area that is already developed with commercial and industrial land uses, and additional connectivity to these businesses and to the San Bernardino Stadium may be perceived favorably. Therefore, the primary difference in visual impacts resulting from Alternative 4-B would be a very small increase in the number of additional sensitive residential viewers that would be affected by changes along portions of the 1.5-mile segment passing by their homes.

Table 3. Alternative 4-B Visual Resources within Right-of-Way and Buffer

Environmental Resource	Resources within Right-of-Way and Buffer
National Trails	• Old Spanish National Historic Trail in Alhambra, Baldwin Park, Covina, and La Verne
Local Parks/ Recreational Areas/Scenic Features	• Ramona Gardens Recreation Center in Los Angeles • Pioneer Park, Santa Fe Trail Historical Park, and Rio Hondo Bike Path in El Monte • Bassett Park in La Puente • Vineland Elementary School Sports Fields • Northview High School Sports Fields, Kahler Russell Park, Charter Oak High School Sports Fields, Saint Louise De Marillac Catholic Church Sports Fields in Covina • Frank G. Bonelli Regional Park and University of La Verne Campus West Athletics Facilities in San Dimas • Palomares Park and College Park in Pomona • Rosa Torrez Park in Claremont • Old Town Park and Empire Lakes Golf Course in Rancho Cucamonga • Gateway Park and San Bernardino Stadium in San Bernardino • Mature trees, shrubs, and landscaping along the right-of-way and within the buffer

Alternative 5

The western portion of Alternative 5 shares the same western terminus but then travels north of Alternatives 4-A and 4-B until El Monte, where it rejoins with and shares the same routes as Alternatives 4-A and 4-B. Therefore, impacts for Alternative 5 are largely the same as those described for Alternatives 4-A and 4-B, with the exception of the western deviation. In addition to the affected visual resources identified in Table 4, residential viewers would be affected by Alternative 5. The western deviation of Alternative 5 has a similar number of residences that abut the right-of-way, compared to the western route of Alternatives 4-A and 4-B. For the western portion of Alternatives 4-A and 4-B, the route is mostly within the I-10 median, and I-10 has noise barriers to largely limit the availability of views from private residences. In a similar manner, the availability of views toward the western portion of Alternative 5 are largely limited from private residences because the route alternative is within a concrete channel that is at a lower elevation than the surround area to greatly limit views.

Like Alternatives 4-A and 4-B, Alternative 5 has four crossings with the Old Spanish National Historic Trail. The difference is that Alternative 5 crosses the Old Spanish National Historic Trail in El Monte, as opposed to in Alhambra, close to Gibson Mariposa Park. The crossings in both El Monte and Alhambra are developed, with no visible indication that the historic trail crosses there. Like Alternative 4-B, Alternative 5 would affect views from the San Bernardino Stadium in San Bernardino and result in the same impacts from that location.

Table 4. Alternative 5 Visual Resources within Right-of-Way and Buffer

Environmental Resource	Resources within Right-of-Way and Buffer
National Trails	• Old Spanish National Historic Trail in El Monte, Baldwin Park, Covina, and La Verne
Local Parks/ Recreational Areas/Scenic Features	• Lincoln Park in Los Angeles • Alhambra Golf Course in Alhambra • Plaza Park and Smith Park in San Gabriel • Gibson Mariposa Park and Rio Hondo Bike Path in El Monte • Bassett Park in La Puente • Vineland Elementary School Sports Fields • Northview High School Sports Fields, Kahler Russell Park, Charter Oak High School Sports Fields, Saint Louise De Marillac Catholic Church Sports Fields in Covina • Frank G. Bonelli Regional Park and University of La Verne Campus West Athletics Facilities in San Dimas • Palomares Park and College Park in Pomona • Rosa Torrez Park in Claremont • Old Town Park and Empire Lakes Golf Course in Rancho Cucamonga • Gateway Park and San Bernardino Stadium in San Bernardino • Mature trees, shrubs, and landscaping along the right-of-way and within the buffer

Conclusions

A similar amount of existing vegetation removal and trimming would occur among the alternatives and result in site-specific visual impacts. Alternative 1 generally passes through more industrial areas than Alternatives 4-A, 4-B, and 5. However, the portion of the route alternative close to Chino Hill State Park is visually sensitive and stands out as an area that warrants careful consideration regarding impacts that could affect visual resources, especially when factored with views from SR-91. For example, the construction and operation of an additional rail track may be accommodated within the buffer with little impact if the footprint is minimized. However, larger-scale changes such as the construction and operation of a new station could result in a much higher degree of visual impact and would require careful consideration for siting and aesthetic design of such features.

Alternative 1 has two crossings with the Juan Bautista de Anza National Historic Trail, which equates to fewer historic trail crossings than Alternatives 4-A, 4-B, and 5. However, all trail crossings are developed, with no visual evidence of the trails. Therefore, an expansion of rail service would result in only a slight visual change.

Alternatives 4-A, 4-B, and 5 pass through more residential areas and fewer industrial; transportation, communications, and utilities; and vacant land uses than Alternative 1. Therefore, Alternatives 4-A, 4-B, and 5 offer more views of residential areas and slightly fewer views of utilitarian industrial and commercial areas and undeveloped land uses.

In addition to the visual resources that Alternatives 4-A, 4-B, and 5 would affect along the shared route (refer to Alternatives 4-A and 4-B, above), Alternative 5 would also affect Lincoln Park in Los Angeles, Alhambra Golf Course in Alhambra, Plaza Park and Smith Park in San Gabriel, and Gibson Mariposa Park in El Monte. The equates to a similar number of additional resources that would be independently affected by Alternatives 4-A and 4-B (but not by Alternative 5), which include Ramona Gardens Recreation Center in Los Angeles and Pioneer Park and Santa Fe Trail Historical Park in El Monte. However, Lincoln Park and the Alhambra Golf Course, which would be affected by Alternative 5, are much larger and could be affected to a greater degree depending on the location of proposed project facilities and the amount of vegetation removal and trimming along the route alternative that would act to open up views available to sensitive recreational viewers, in addition to roadway users and nearby business and residential viewers. Therefore, Alternative 5 could affect visual resources slightly more than Alternatives 4-A and 4-B.

Generally, because Alternative 1 travels through more industrial areas, it would affect visual resources to a lesser degree than Alternatives 4-A, 4-B, and 5. However, an area of concern with Alternative 1 is the Chino Hills State Park and the SR-91 portion of the segment where there is a much higher concentration of sensitive visual resources compared to those found along any one segment of Alternatives 4-A, 4-B, and 5.

Appendix A
Figures

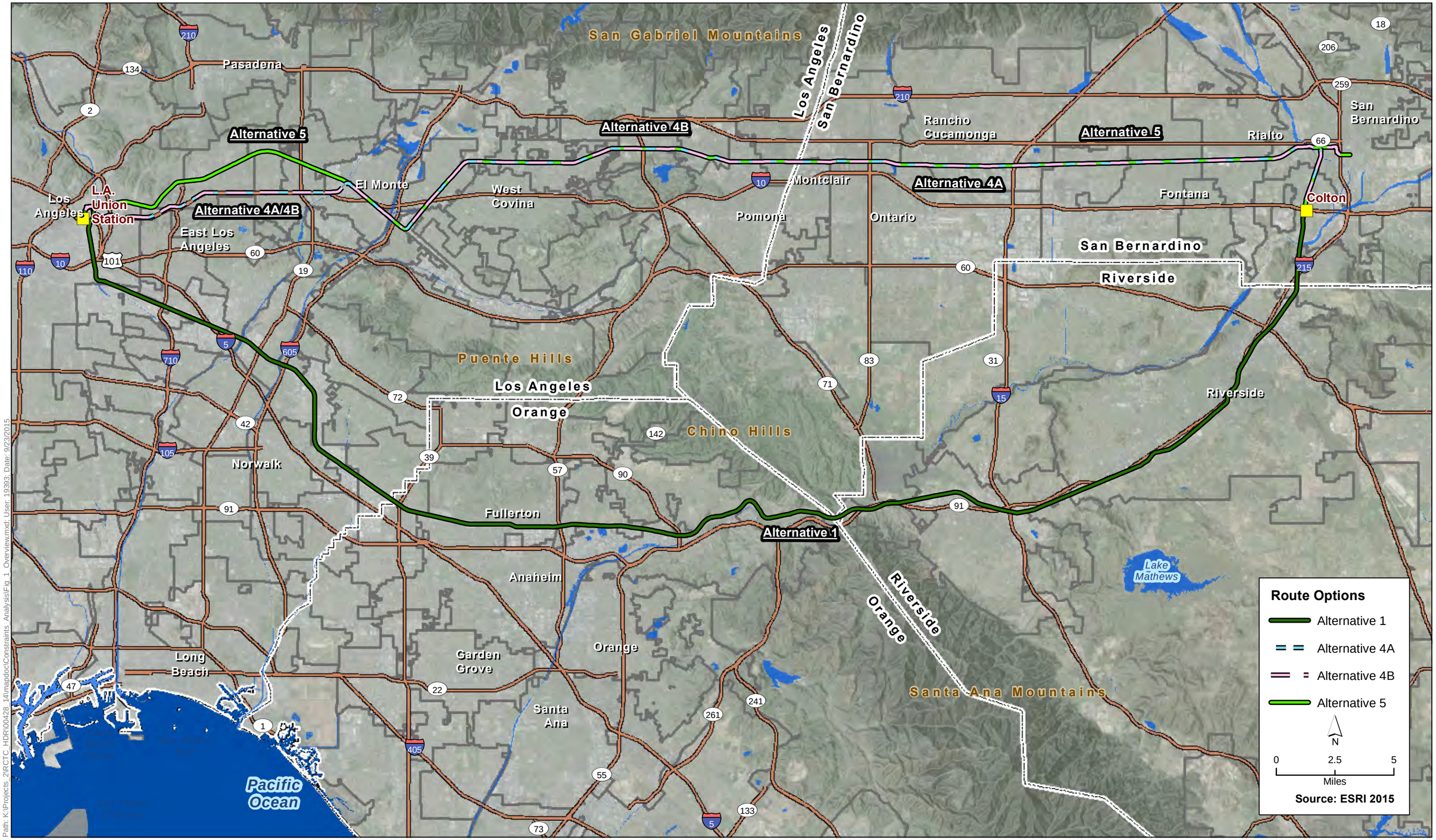

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Figure 1
Location Overview
Coachella Valley – San Gorgonio Pass Rail Corridor Route Alternatives

Appendix B
Summary Table

Environmental Resource	Alternative 1	Alternative 4-A	Alternative 4-B	Alternative 5
National Trails	• Juan Bautista de Anza National Historic Trail in Los Angeles and Riverside	• Old Spanish National Historic Trail in Alhambra, Baldwin Park, Covina, and La Verne	• Old Spanish National Historic Trail in Alhambra, Baldwin Park, Covina, and La Verne	• Old Spanish National Historic Trail in El Monte, Baldwin Park, Covina, and La Verne
Local Parks/ Recreational Areas/Scenic Features	• Rio Hondo Bike Path in Montebello • Passons Boulevard Streetscape and Pathway underpass in Pico Rivera • San Gabriel River Mid Trail in Santa Fe Springs • John Zimmerman Park in Norwalk • Tot Lot at Sycamore Lane in Buena Park • Dale Street Streetscape and Pathway underpass in Buena Park • Bastanchury Park, Fullerton Pooch Park, Independence Park, Amerige Park, and Harbor Boulevard and South Lemon Street Streetscapes and Sidewalks/Pathways underpass in Fullerton • Placentia Civic Center and Parque De Los Niños in Placentia • Vineyard Church of Anaheim park and State Route 90/East Orangethorpe interchange loop trail in Anaheim • Santa Ana River Trail Bikeway, Featherly Regional Park, Brush Canyon Park, Sycamore Park, Canyon RV Park, and hilly terrain in Yorba Linda • Chino Hills State Park and	• Ramona Gardens Recreation Center in Los Angeles • Pioneer Park, Santa Fe Trail Historical Park, and Rio Hondo Bike Path in El Monte • Bassett Park in La Puente • Vineland Elementary School Sports Fields • Northview High School Sports Fields, Kahler Russell Park, Charter Oak High School Sports Fields, Saint Louise De Marillac Catholic Church Sports Fields in Covina • Frank G. Bonelli Regional Park and University of La Verne Campus West Athletics Facilities in San Dimas • Palomares Park and College Park in Pomona • Rosa Torrez Park in Claremont • Old Town Park and Empire Lakes Golf Course in Rancho Cucamonga • Gateway Park in San Bernardino • Mature Trees, shrubs, and landscaping along the right-of-way and within the buffer	• Ramona Gardens Recreation Center in Los Angeles • Pioneer Park, Santa Fe Trail Historical Park, and Rio Hondo Bike Path in El Monte • Bassett Park in La Puente • Vineland Elementary School Sports Fields • Northview High School Sports Fields, Kahler Russell Park, Charter Oak High School Sports Fields, Saint Louise De Marillac Catholic Church Sports Fields in Covina • Frank G. Bonelli Regional Park and University of La Verne Campus West Athletics Facilities in San Dimas • Palomares Park and College Park in Pomona • Rosa Torrez Park in Claremont • Old Town Park and Empire Lakes Golf Course in Rancho Cucamonga • Gateway Park and San Bernardino Stadium in San Bernardino • Mature trees, shrubs, and landscaping along the right-of-way and within the buffer	• Lincoln Park in Los Angeles • Alhambra Golf Course in Alhambra • Plaza Park and Smith Park in San Gabriel • Gibson Mariposa Park and Rio Hondo Bike Path in El Monte • Bassett Park in La Puente • Vineland Elementary School Sports Fields • Northview High School Sports Fields, Kahler Russell Park, Charter Oak High School Sports Fields, Saint Louise De Marillac Catholic Church Sports Fields in Covina • Frank G. Bonelli Regional Park and University of La Verne Campus West Athletics Facilities in San Dimas • Palomares Park and College Park in Pomona • Rosa Torrez Park in Claremont • Old Town Park and Empire Lakes Golf Course in Rancho Cucamonga • Gateway Park and San Bernardino Stadium in San Bernardino • Mature trees, shrubs, and landscaping along the right-of-way and within the buffer

Environmental Resource	Alternative 1	Alternative 4-A	Alternative 4-B	Alternative 5
	Associated Trails near Corona • Green River Golf Club, Butterfield Park, Contreras Park, and North Main Streetscape in Corona • Magnolia Avenue Artistic Median Stormwater Swale, Arlington High School and California School for the Deaf Sports Fields, Don Derr Park, Olivewood Cemetery, Lincoln Park, North Park, Catania Drive community park, and Hunter Park in Riverside • Mature trees, shrubs, and landscaping along the right-of-way and within the buffer			
Eligible State Scenic Routes	• SR-91 near Corona	N/A	N/A	N/A
County Scenic Route	• SR-91 in Orange County from State Route 57 to Orange and Riverside County Lines is an Orange County Designated Viewscape Corridor	N/A	N/A	N/A
Does not affect the following:	• National or state forests • National or state Wild and Scenic Rivers • National Scenic Byways or All-American Roads • National or state wildlife refuges/areas or ecological reserves • Designated state scenic routes	• National or state forests • National or state Wild and Scenic Rivers • National Scenic Byways or All-American Roads • National or state wildlife refuges/areas or ecological reserves • State parks • Eligible or designated state or county scenic routes	• National or state forests • National or state Wild and Scenic Rivers • National Scenic Byways or All-American Roads • National or state wildlife refuges/areas or ecological reserves • State parks • Eligible or designated state or county scenic routes	• National or state forests • National or state Wild and Scenic Rivers • National Scenic Byways or All-American Roads • National or state wildlife refuges/areas or ecological reserves • State parks • Eligible or designated state or county scenic routes

APPENDIX F RIDERSHIP FORECASTING METHODOLOGY AND RESULTS

MEMO

TO: JD Douglas, HDR

FROM: Bill Woodford

CC:

DATE: October 30, 2015

SUBJECT: **DRAFT** Coachella Valley Ridership Forecasting Methodology and Results.

This memorandum summarizes the methodology and results of the ridership forecasting process employed for the Coachella Valley-San Gorgonio Pass Rail Corridor Service Development Plan.

METHODOLOGY

Ridership forecasts were prepared by Amtrak and its ridership forecasting consultant under contract to the Caltrans Division of Rail. As part of the Amtrak California program, Amtrak and Caltrans have developed an intercity rail ridership model that is used to project ridership and estimate revenue for a variety of rail service initiatives in the State including both improvements to existing services and new trains serving new geographic markets.

The intercity rail ridership forecasting model estimates ridership and revenue for geographic markets where rail service is currently provided using the following process:

a. Obtain recent ridership counts and actual revenue for each station-to-station combination in the relevant geographic market area
b. Quantify the utility (quality) of service (e.g., travel time and scheduled train times) for the existing service at the time the counts and revenue were collected
c. Estimate the service quality improvements (or degradation) associated with the specific rail plan
d. Obtain projections of corridor population, employment, and income growth to determine how underlying markets will change over time
e. Factor existing ridership to account for changes in service quality, population, employment, and income to estimate future ridership

In cases where rail service does not currently exist, a similar process is followed with the exception that steps a and b are replaced by a set of surrogate ridership and service quality estimates. These surrogates are obtained from a corridor where service is currently being offered that is similar to that proposed for the new corridor. The surrogate information is adjusted to represent service and socioeconomic characteristics for the new corridor.

The surrogate approach was used to forecast Coachella Valley ridership since the proposed service is more similar to the current operation of the *Pacific Surfliner* between San Luis Obispo and Los Angeles (frequent, daily, corridor service) rather than the *Sunset Limited* (3 times per week, long distance) which currently operates in the corridor.

Each step in the forecasting process is described in the sections that follow.

Step 1. Define Station Pair Surrogates

In this step, each station-to-station pair for the Coachella Valley service was assigned to a comparable station pair from Amtrak's *Pacific Surfliner*. This assignment is shown in Table 1. The rows and columns represent the station name (or code) for a stop in the Coachella Valley-Los Angeles corridor. The contents of each cell show the *Pacific Surfliner* station pair that is used as a surrogate.

Table 2 presents current station-to-station ridership assigned to each Coachella Valley station .

Table 1. Assignment of Surrogate *Pacific Surfliner* Station Pairs to Coachella Valley Station Pairs

Surrogate Pair	IDO	RAM	PSN	CBZ	LML	RLT	SNB	MNC	RIV	ONA	POS	FUL
Indio (IDO)												
Rancho Mirage (RAM)	GTA-GUA											
Palm Springs (PSN)	SBA-GUA	SBA-GTA										
Cabazon (CBZ)	CPN-GUA	CPN-GTA	SBA-GTA									
Loma Linda (LML)	VEC-GUA	VEC-GTA	CPN-GTA	VEC-CPN								
Rialto (RLT)	VEC-GUA	VEC-GTA	CPN-GTA	VEC-CPN	OXN-VEC							
San Bernardino (SNB)	VEC-GUA	VEC-GTA	CPN-GTA	VEC-CPN	OXN-VEC							
Montclair (MNC)	VEC-GUA	VEC-GTA	CPN-GTA	VEC-CPN	OXN-VEC	RIV-FUL	RIV-FUL					
Riverside- Downtown (RIV)	OXN-GUA	OXN-GUA	OXN-SBA+GTA	OXN-CPN	OXN-VEC		RIV-FUL					
Ontario (Airport) (ONA)	PSN-ONA	PSN-ONA	PSN-ONA	PSN-ONA	PSN-ONA							
Pomona (POS)	PSN-POS	PSN-POS	PSN-POS	PSN-POS	PSN-POS				RIV-FUL	RIV-FUL		
Fullerton (FUL)	VNC-GUA	VNC-GUA	VNC-SBA+GTA	VNC-CPN	VNC-VEC	RIV-FUL	RIV-FUL	RIV-FUL	RIV-FUL	RIV-FUL	RIV-FUL	
LA Union Station (LAX)	LAX-GUA	LAX-GUA	LAX-SBA+GTA	CBZ-LAX	LAX-VEC	RIV-LAX	RIV-LAX	RIV-LAX	RIV-LAX	RIV-LAX	RIV-LAX	FUL-LAX

Code	Station	Code	Station
GUA	Guadalupe-Santa Maria	VEC	Ventura
GTA	Goleta	OXN	Oxnard
SBA	Santa Barbara	VNC	Van Nuys
CPN	Carpenteria		

Table 2. Base (Year 2013) Annual Ridership From Surrogate Cities Assigned to Coachella Valley Station Pairs

Surrogate Pair Base Ridership	IDO	RAM	PSN	CBZ	LML	RLT	SNB	MNC	RIV	ONA	POS	FUL
Indio												
Rancho Mirage	162											
Palm Springs	1,222	238										
Cabazon	39	789	238									
Loma Linda	205	1,316	789	1,055								
Rialto	205	1,316	789	1,055	384							
San Bernardino	205	1,316	789	1,055	384							
Montclair	205	1,316	789	1,055	384	192	192					
Riverside-Downtown	245	245	10,345	828	384		192					
Ontario (Airport)	12	12	12	12	12							
Pomona	6	6	6	6	6				192	192		
Fullerton*	521	521	9,703	884	1,808	192	192	192	192	192	192	
LA Union Station*	2,677	2,677	46,006	94	9,091	2,014	2,014	2,014	2,014	2,014	2,014	39,881

Step 2. Assemble Population, Employment and Income Projections

The intercity model uses population, employment, and income projections to grow current travel markets to represent the future year. These projections are based on county-level projections from Moody's for all areas within the typical capture area of each station. Alternatives can have slightly different capture areas due to differences in station locations and the ways that different stations may have capture areas that overlap.

Table 3 presents the socioeconomic assumptions for Alternatives 1, 2, and 3. Tables 4 and 5 present socioeconomic assumptions for Alternatives 4 and 5, respectively.

Table 3. Overview of Socioeconomic Assumptions for Alternatives 1, 2, and 3

	Population		Employment		Income	
Alternatives 1, 2, and 3	**2013**	**2040**	**2013**	**2040**	**2013**	**2040**
Indio	127,944	193,316	30,148	41,866	3,454,011	8,339,808
Rancho Mirage	83,545	126,006	22,503	31,164	2,255,345	5,439,342
Palm Springs	72,558	108,526	19,414	26,540	1,958,725	4,698,628
Cabazon	130,426	188,437	35,008	45,565	3,520,747	8,260,473
Loma Linda	580,509	774,719	162,300	190,722	15,668,953	34,979,271
Rialto	0	0	0	0	0	0
San Bernardino	573,577	744,514	161,586	183,471	15,481,344	33,976,347
Montclair	0	0	0	0	0	0
Riverside- Downtown	707,130	1,040,917	182,542	244,227	19,088,906	45,324,010
Ontario (Airport)	826,131	1,113,227	238,558	284,469	22,702,069	50,761,597
Pomona	1,076,727	1,398,829	406,901	502,083	39,868,477	81,657,579
Fullerton	2,163,137	2,820,496	888,778	1,110,639	88,494,203	179,964,159
LA Union Station	4,024,682	5,224,849	1,559,887	1,944,116	153,972,592	312,463,944
Anaheim, CA	805,876	1,058,324	369,271	463,173	36,488,800	74,421,793
Santa Ana, CA	986,638	1,295,773	459,644	576,540	44,702,117	91,175,102
Irvine, CA	870,270	1,148,160	394,100	495,195	38,946,621	79,703,169
San Juan Capistrano, CA	472,699	622,776	213,990	268,738	21,234,351	43,410,760
San Clemente Pier, CA	223,799	302,731	96,736	122,311	9,593,988	19,937,872
Oceanside, CA	158,843	226,944	63,256	80,218	6,681,414	14,210,445
Carlsbad (Village), CA	194,085	277,287	75,603	95,872	8,165,535	17,366,086
Carlsbad (Poinsettia), CA	277,237	396,085	107,880	136,802	11,663,892	24,806,230
Encinitas, CA	288,390	412,019	113,468	143,889	12,133,122	25,804,169
Solana Beach, CA	374,868	535,568	148,596	188,435	15,771,394	33,541,878
Sorrento Valley, CA	772,093	1,103,079	308,765	391,545	32,483,416	69,084,241
Old Town, CA	415,342	593,393	166,079	210,605	17,474,203	37,163,335
San Diego, CA	1,047,588	1,496,674	418,517	530,722	44,073,996	93,734,556
Glendale, CA	1,119,781	1,453,702	448,540	559,023	42,839,575	86,936,397
Burbank Airport, CA	1,070,481	1,389,701	423,470	527,778	40,953,493	83,108,881
Van Nuys, CA	1,426,476	1,851,853	572,246	713,201	54,572,804	110,747,200
Chatsworth, CA	762,441	990,039	299,070	373,169	29,182,519	59,281,756
Simi Valley, CA	388,276	512,950	140,850	191,745	15,370,354	33,456,107
Moorpark, CA	247,246	331,451	83,538	123,030	10,067,031	23,097,864
Camarillo, CA	210,905	282,693	71,833	105,715	8,585,021	19,687,978
Oxnard, CA	164,104	220,476	52,717	78,633	6,709,800	15,510,629
Ventura, CA	173,892	233,454	59,636	88,896	7,108,867	16,400,998
Carpinteria, CA	58,458	76,406	21,997	32,140	2,375,719	5,095,316
Santa Barbara, CA	23,669	30,014	10,080	14,456	955,650	1,877,159
Goleta, CA	37,426	47,458	15,884	22,779	1,511,090	2,968,198
Lompoc-Surf, CA	25,047	31,761	9,423	13,514	1,011,297	1,986,466
Guadalupe-Santa Maria, CA	34,314	44,933	12,469	16,064	1,335,018	2,638,193
Grover Beach, CA	50,467	69,923	19,299	19,880	1,827,454	3,655,711
San Luis Obispo, CA	86,949	120,470	34,042	35,066	3,148,485	6,298,354

Table 4. Overview of Socioeconomic Assumptions for Alternative 4

	Population		Employment		Income	
Alternative 4	**2013**	**2040**	**2013**	**2040**	**2013**	**2040**
Indio	127,944	193,316	30,148	41,866	3,454,011	8,339,808
Rancho Mirage	83,545	126,006	22,503	31,164	2,255,345	5,439,342
Palm Springs	72,558	108,526	19,414	26,540	1,958,725	4,698,628
Cabazon	130,426	188,437	35,008	45,565	3,520,747	8,260,473
Loma Linda	580,509	774,719	162,300	190,722	15,668,953	34,979,271
Rialto	478,486	621,099	135,895	154,305	12,914,754	28,343,969
San Bernardino	229,947	298,476	64,780	73,554	6,206,484	13,621,147
Montclair	255,582	331,778	87,754	105,834	8,566,453	17,864,083
Riverside- Downtown	707,130	1,040,917	182,542	244,227	19,088,906	45,324,010
Ontario (Airport)	826,131	1,113,227	238,558	284,469	22,702,069	50,761,597
Pomona	1,076,727	1,398,829	406,901	502,083	39,868,477	81,657,579
Fullerton	2,163,137	2,820,496	888,778	1,110,639	88,494,203	179,964,159
LA Union Station	4,024,682	5,224,849	1,559,887	1,944,116	153,972,592	312,463,944
Anaheim, CA	805,876	1,058,324	369,271	463,173	36,488,800	74,421,793
Santa Ana, CA	986,638	1,295,773	459,644	576,540	44,702,117	91,175,102
Irvine, CA	870,270	1,148,160	394,100	495,195	38,946,621	79,703,169
San Juan Capistrano, CA	472,699	622,776	213,990	268,738	21,234,351	43,410,760
San Clemente Pier, CA	223,799	302,731	96,736	122,311	9,593,988	19,937,872
Oceanside, CA	158,843	226,944	63,256	80,218	6,681,414	14,210,445
Carlsbad (Village), CA	194,085	277,287	75,603	95,872	8,165,535	17,366,086
Carlsbad (Poinsettia), CA	277,237	396,085	107,880	136,802	11,663,892	24,806,230
Encinitas, CA	288,390	412,019	113,468	143,889	12,133,122	25,804,169
Solana Beach, CA	374,868	535,568	148,596	188,435	15,771,394	33,541,878
Sorrento Valley, CA	772,093	1,103,079	308,765	391,545	32,483,416	69,084,241
Old Town, CA	415,342	593,393	166,079	210,605	17,474,203	37,163,335
San Diego, CA	1,047,588	1,496,674	418,517	530,722	44,073,996	93,734,556
Glendale, CA	1,119,781	1,453,702	448,540	559,023	42,839,575	86,936,397
Burbank Airport, CA	1,070,481	1,389,701	423,470	527,778	40,953,493	83,108,881
Van Nuys, CA	1,426,476	1,851,853	572,246	713,201	54,572,804	110,747,200
Chatsworth, CA	762,441	990,039	299,070	373,169	29,182,519	59,281,756
Simi Valley, CA	388,276	512,950	140,850	191,745	15,370,354	33,456,107
Moorpark, CA	247,246	331,451	83,538	123,030	10,067,031	23,097,864
Camarillo, CA	210,905	282,693	71,833	105,715	8,585,021	19,687,978
Oxnard, CA	164,104	220,476	52,717	78,633	6,709,800	15,510,629
Ventura, CA	173,892	233,454	59,636	88,896	7,108,867	16,400,998
Carpinteria, CA	58,458	76,406	21,997	32,140	2,375,719	5,095,316
Santa Barbara, CA	23,669	30,014	10,080	14,456	955,650	1,877,159
Goleta, CA	37,426	47,458	15,884	22,779	1,511,090	2,968,198
Lompoc-Surf, CA	25,047	31,761	9,423	13,514	1,011,297	1,986,466
Guadalupe-Santa Maria, CA	34,314	44,933	12,469	16,064	1,335,018	2,638,193
Grover Beach, CA	50,467	69,923	19,299	19,880	1,827,454	3,655,711
San Luis Obispo, CA	86,949	120,470	34,042	35,066	3,148,485	6,298,354

Table 5. Overview of Socioeconomic Assumptions for Alternative 5

	Population		Employment		Income	
Alternative 5	**2013**	**2040**	**2013**	**2040**	**2013**	**2040**
Indio	127,944	193,316	30,148	41,866	3,454,011	8,339,808
Rancho Mirage	83,545	126,006	22,503	31,164	2,255,345	5,439,342
Palm Springs	72,558	108,526	19,414	26,540	1,958,725	4,698,628
Cabazon	130,426	188,437	35,008	45,565	3,520,747	8,260,473
Loma Linda	580,509	774,719	162,300	190,722	15,668,953	34,979,271
Rialto	0	0	0	0	0	0
San Bernardino	573,577	744,514	161,586	183,471	15,481,344	33,976,347
Montclair	283,364	367,841	97,293	117,338	9,497,614	19,805,884
Riverside- Downtown	707,130	1,040,917	182,542	244,227	19,088,906	45,324,010
Ontario (Airport)	826,131	1,113,227	238,558	284,469	22,702,069	50,761,597
Pomona	1,076,727	1,398,829	406,901	502,083	39,868,477	81,657,579
Fullerton	2,163,137	2,820,496	888,778	1,110,639	88,494,203	179,964,159
LA Union Station	4,024,682	5,224,849	1,559,887	1,944,116	153,972,592	312,463,944
Anaheim, CA	805,876	1,058,324	369,271	463,173	36,488,800	74,421,793
Santa Ana, CA	986,638	1,295,773	459,644	576,540	44,702,117	91,175,102
Irvine, CA	870,270	1,148,160	394,100	495,195	38,946,621	79,703,169
San Juan Capistrano, CA	472,699	622,776	213,990	268,738	21,234,351	43,410,760
San Clemente Pier, CA	223,799	302,731	96,736	122,311	9,593,988	19,937,872
Oceanside, CA	158,843	226,944	63,256	80,218	6,681,414	14,210,445
Carlsbad (Village), CA	194,085	277,287	75,603	95,872	8,165,535	17,366,086
Carlsbad (Poinsettia), CA	277,237	396,085	107,880	136,802	11,663,892	24,806,230
Encinitas, CA	288,390	412,019	113,468	143,889	12,133,122	25,804,169
Solana Beach, CA	374,868	535,568	148,596	188,435	15,771,394	33,541,878
Sorrento Valley, CA	772,093	1,103,079	308,765	391,545	32,483,416	69,084,241
Old Town, CA	415,342	593,393	166,079	210,605	17,474,203	37,163,335
San Diego, CA	1,047,588	1,496,674	418,517	530,722	44,073,996	93,734,556
Glendale, CA	1,119,781	1,453,702	448,540	559,023	42,839,575	86,936,397
Burbank Airport, CA	1,070,481	1,389,701	423,470	527,778	40,953,493	83,108,881
Van Nuys, CA	1,426,476	1,851,853	572,246	713,201	54,572,804	110,747,200
Chatsworth, CA	762,441	990,039	299,070	373,169	29,182,519	59,281,756
Simi Valley, CA	388,276	512,950	140,850	191,745	15,370,354	33,456,107
Moorpark, CA	247,246	331,451	83,538	123,030	10,067,031	23,097,864
Camarillo, CA	210,905	282,693	71,833	105,715	8,585,021	19,687,978
Oxnard, CA	164,104	220,476	52,717	78,633	6,709,800	15,510,629
Ventura, CA	173,892	233,454	59,636	88,896	7,108,867	16,400,998
Carpinteria, CA	58,458	76,406	21,997	32,140	2,375,719	5,095,316
Santa Barbara, CA	23,669	30,014	10,080	14,456	955,650	1,877,159
Goleta, CA	37,426	47,458	15,884	22,779	1,511,090	2,968,198
Lompoc-Surf, CA	25,047	31,761	9,423	13,514	1,011,297	1,986,466
Guadalupe-Santa Maria, CA	34,314	44,933	12,469	16,064	1,335,018	2,638,193
Grover Beach, CA	50,467	69,923	19,299	19,880	1,827,454	3,655,711
San Luis Obispo, CA	86,949	120,470	34,042	35,066	3,148,485	6,298,354

Step 4. Calculate Market and Growth Factors

The intercity model uses socioeconomic projections of population, employment, and income to adjust the surrogate ridership to represent:

1. Differences in population between the surrogate area and the corridor being modeled (Market Factor)
2. Projected growth in population, employment, and income between the present and future years (Market Growth)

This calculation is illustrated with an example for the Indio to Los Angeles station pair and the information shown in Table 6.

Table 6. Example Population, Employment, and Income for Indio to Los Angeles Station Pair

	Population		Employment		Income	
	2013	2040	2013	2040	2013	2040
Coachella Valley						
Indio	127,944	193,316	30,148	41,866	3,454,011	8,339,808
LA Union Station	4,024,682	5,224,849	1,559,887	1,944,116	153,972,592	312,463,944
Surrogate						
Guadalupe-Santa Maria, CA	34,314	44,933	12,469	16,064	1,335,018	2,638,193
LA Union Station	4,024,682	5,224,849	1,559,887	1,944,116	153,972,592	312,463,944
Surrogate Ridership 2,677						

The Market Factor is used to adjust ridership from the surrogate station so that it represents the population characteristics of the Coachella Valley corridor . This factor is estimated separately for each station pair using the following formula (and examples).

$$MarketFactor = \left(\frac{OriginPop_{Coachella}}{OriginPop_{Surrogate}} \times \frac{DestinPop_{Coachella}}{DestinPop_{Surrogate}} \right)^{0.55}$$

$$MarketFactor = \left(\frac{127{,}944}{34{,}314} \times \frac{4{,}024{,}682}{4{,}024{,}682} \right)^{0.55}$$

$$MarketFactor = 2.0623$$

The Market Growth Factor accounts for growth in the Coachella corridor between 2014 and 2040. This computation and examples are presented below:

$$MarketGrowth = \left(\frac{\sqrt{OriginPop_{Coachella-2040} \times DestinPop_{Coachella-2040}}}{\sqrt{OriginPop_{Coachella-2014} \times DestinPop_{Coachella-2014}}} \right)^{0.70} \times \left(\frac{\sqrt{OriginEmp_{Coachella-2040} \times DestinEmp_{Coachella-2040}}}{\sqrt{OriginEmp_{Coachella-2014} \times DestinEmp_{Coachella-2014}}} \right)^{0.4738} \times \left(\frac{\sqrt{OriginInc_{Coachella-2040} \times DestinInc_{Coachella-2040}}}{\sqrt{OriginInc_{Coachella-2014} \times DestinInc_{Coachella-2014}}} \right)^{0.30}$$

$$MarketGrowth = \left(\frac{\sqrt{193{,}316 \times 5{,}244{,}846}}{\sqrt{127{,}944 \times 4{,}024{,}682}} \right)^{0.70} \times \left(\frac{\sqrt{41{,}866 \times 1{,}944{,}116}}{\sqrt{30{,}148 \times 1{,}559{,}887}} \right)^{0.4738} \times \left(\frac{\sqrt{8{,}339{,}808 \times 312{,}463{,}944}}{\sqrt{3{,}454{,}011 \times 153{,}972{,}592}} \right)^{0.30}$$

$$MarketGrowth = 1.26592 \times 1.13877 \times 1.26919$$

$$MarketGrowth = 1.8297$$

Step 5. Compute Service Factor

The service factor represents the relative utility (quality) of the corridor service compared to the utility of surrogate service. This factor is used to adjust estimated ridership up or down to represent the running time, frequency and convenience of each train in the service plan. The overall service factor is computed from the sum of all individual train factors for both the surrogate service and the proposed corridor service.

This computation is illustrated for the Indio to Los Angeles station pair in Table 7.

Table 7. Train Utilities for Surrogate and Proposed Service

Surrogate Service							
	Depart	Arrive	Travel Time	Hours to Next	Hours from Prior	Transfer	
Train#	Time	Time	(Hours)	Train	Train	(1=yes,0=no)	Utility
761	7:35	12:16	4.68	7.4	16.6	0	0.000115
777	15:00	19:36	4.60	16.6	7.4	0	0.000147
774	7:30	12:15	4.75	6.7	17.3	0	0.000109
790	14:11	19:10	4.98	17.3	6.7	0	0.000121
							0.000246

Alternative 4b							
	Depart	Arrive	Travel Time	Hours to Next	Hours from Prior	Transfer	
Train#	Time	Time	(Hours)	Train	Train	(1=yes,0=no)	Utility
901	7:50	11:11	3.35	7.7	16.3	0	0.000253
903	15:30	18:51	3.35	16.3	7.7	0	0.000319
902	10:10	13:39	3.48	7.1	16.9	0	0.000271
904	17:15	20:44	3.48	16.9	7.1	0	0.000258
							0.000551

Individual train utilities are computed as:

$$TrainUtility = DirectOrTransferFactor \times TimeSlotFactor \times TravelTime^{-3.42}$$

Where

DirectOrTransferFactor = 1 (if no transfer) or 0.3715 (if trip requires transfer to bus)

TimeSlotFactor = Value of the train slot which is a function of the arrival and departure time of the train, the amount of time until the next train, and the amount of time since the previous train. Slots are most valuable during peak times and least valuable in overnight hours. Slots are also most valuable when waiting time is minimized.

The overall Service Factor for the station pair is estimated from the individual train utilities as follows:

$$ServiceFactor = \left(\frac{\sum TrainUtility_{CoachellaCorridor}}{\sum TrainUtility_{SurrogateCorridor}} \right)^{0.70}$$

$$ServiceFactor = \left(\frac{0.000551}{0.000246} \right)^{0.70}$$

$$ServiceFactor = 1.7566$$

Step 6. Compute Total Ridership

Total Ridership is computed as the product of surrogate station pair ridership, the market factor, growth factor, and service factor. Using the same Indio to Los Angeles example, riders between Indio and Los Angeles ("corridor riders) are estimated as follows:

$$CorridorRiders = SurrogateRiders \times MarketFactor \times MarketGrowth \times ServiceFactor$$

$$CorridorRiders = 2{,}677 \times 2.0623 \times 1.8297 \times 1.7566$$

$$CorridorRiders = 17{,}744$$

This process is repeated for each station pair to generate the total estimated ridership for the train.

ALTERNATIVE DEFINITION

Six Coachella Valley service alternatives were developed by the service planning team and are shown in Figure 1. The alternatives follow a common alignment from Indio through San Gorgonio Pass to a point near San Bernardino. Further west, the alternatives diverge north and south to use five different rail lines to reach Los Angeles Union Station. Alternative 4 has two variants in the San Bernardino area (A serves the Rialto Metrolink station and B serves the San Bernardino Amtrak/Metrolink Station). Model runs were prepared for Alternatives 1, 2, 3, 4A, and 4B. Alternative 5 is sufficiently similar to Alternative 4B that separate ridership forecasts were not prepared.

Table 8 presents the assumed schedule for each modeled alternative.

Figure 1. Coachella Valley Alternative Definition

Table 8. Alternative Coachella Valley Schedules

Alternative 1

BNSF San Bernardino Subdivision

Westbound		
Indio	9:50 AM	3:20 PM
Rancho Mirage	10:05 AM	3:35 PM
Palm Springs	10:15 AM	3:45 PM
Cabazon	10:30 AM	4:00 PM
Loma Linda	11:05 AM	4:35 PM
Riverside- Downtown	11:38 AM	5:08 PM
Fullerton	12:20 PM	5:50 PM
LA Union Station	1:00 PM	6:30 PM
Total schedule time	**3:10**	**3:10**

Eastbound		
LA Union Station	10:20 AM	3:25 PM
Fullerton	10:52 AM	3:57 PM
Riverside- Downtown	11:36 AM	4:41 PM
Loma Linda	12:06 PM	5:11 PM
Cabazon	12:41 PM	5:46 PM
Palm Springs	12:56 PM	6:01 PM
Rancho Mirage	1:11 PM	6:16 PM
Indio	1:36 PM	6:41 PM
Total schedule time	**3:16**	**3:16**

Alternative 2

Union Pacific Los Angeles Subdivision

Westbound		
Indio	9:50 AM	3:20 PM
Rancho Mirage	10:05 AM	3:35 PM
Palm Springs	10:15 AM	3:45 PM
Cabazon	10:30 AM	4:00 PM
Loma Linda	11:05 AM	4:35 PM
Riverside- Downtown	11:38 AM	5:08 PM
Pomona	12:08 PM	5:38 PM
LA Union Station	1:00 PM	6:30 PM
Total schedule time	**3:10**	**3:10**

Eastbound		
LA Union Station	10:20 AM	3:25 PM
Pomona	11:03 AM	4:08 PM
Riverside- Downtown	11:34 AM	4:39 PM
Loma Linda	12:04 PM	5:09 PM
Cabazon	12:39 PM	5:44 PM
Palm Springs	12:54 PM	5:59 PM
Rancho Mirage	1:09 PM	6:14 PM
Indio	1:34 PM	6:39 PM
Total schedule time	**3:14**	**3:14**

continued

Table 8. Alternative Coachella Valley Schedules (continued)

Alternative 3

Union Pacific Alhambra Subdivision

Westbound		
Indio	9:50 AM	3:20 PM
Rancho Mirage	10:05 AM	3:35 PM
Palm Springs	10:15 AM	3:45 PM
Cabazon	10:30 AM	4:00 PM
Loma Linda	11:05 AM	4:35 PM
Ontario (Airport)	12:08 PM	5:38 PM
Pomona	12:24 PM	5:54 PM
LA Union Station	1:13 PM	6:43 PM
Total schedule time	**3:23**	**3:23**

Eastbound		
LA Union Station	10:20 AM	3:25 PM
Pomona	11:01 AM	4:06 PM
Ontario (Airport)	11:17 AM	4:22 PM
Loma Linda	12:18 PM	5:23 PM
Cabazon	12:53 PM	5:58 PM
Palm Springs	1:08 PM	6:13 PM
Rancho Mirage	1:23 PM	6:28 PM
Indio	1:48 PM	6:53 PM
Total schedule time	**3:28**	**3:28**

Alternative 4A

SCRRA San Gabriel Subdivision

(Bypass San Bernardino)

Westbound		
Indio	9:50 AM	3:20 PM
Rancho Mirage	10:05 AM	3:35 PM
Palm Springs	10:15 AM	3:45 PM
Cabazon	10:30 AM	4:00 PM
Loma Linda	11:05 AM	4:35 PM
Rialto	11:31 AM	5:01 PM
Montclair	12:01 PM	5:31 PM
LA Union Station	12:55 PM	6:25 PM
Total schedule time	**3:05**	**3:05**

Eastbound		
LA Union Station	10:20 AM	3:25 PM
Montclair	11:07 AM	4:12 PM
Rialto	11:38 AM	4:43 PM
Loma Linda	12:03 PM	5:08 PM
Cabazon	12:38 PM	5:43 PM
Palm Springs	12:53 PM	5:58 PM
Rancho Mirage	1:08 PM	6:13 PM
Indio	1:33 PM	6:38 PM
Total schedule time	**3:13**	**3:13**

continued

Table 8. Alternative Coachella Valley Schedules (continued)

Alternative 4B

SCRRA San Gabriel Subdivision

(San Bernardino Stop)

Westbound		
Indio	9:50 AM	3:20 PM
Rancho Mirage	10:05 AM	3:35 PM
Palm Springs	10:15 AM	3:45 PM
Cabazon	10:30 AM	4:00 PM
Loma Linda	11:05 AM	4:35 PM
San Bernardino	11:50 AM	5:20 PM
Montclair	12:17 PM	5:47 PM
LA Union Station	1:11 PM	6:41 PM
Total schedule time	**3:21**	**3:21**

Eastbound		
LA Union Station	10:20 AM	3:25 PM
Montclair	11:09 AM	4:14 PM
San Bernardino	11:54 AM	4:59 PM
Loma Linda	12:19 PM	5:24 PM
Cabazon	12:54 PM	5:59 PM
Palm Springs	1:09 PM	6:14 PM
Rancho Mirage	1:24 PM	6:29 PM
Indio	1:49 PM	6:54 PM
Total schedule time	**3:29**	**3:29**

FORECASTED RIDERSHIP

Tables 9 and 10 present summaries of the key ridership indicators for each alternative for the Year 2022 and 2040, respectively. In general, all alternative generate similar levels of ridership and revenue. Alternatives 1 and 2 provides the highest level of ridership, largely due to the fact that these alternatives have shorter travel times between Indio and Los Angeles while also serving high-volume intermediate stations including Riverside and either Pomona or Fullerton.

Alternative 3 has an end-to-end travel time approximately 10 minutes longer than Alternative 1 or 2 and only serves one of the high-volume intermediate stations— Pomona. Together, these factors result in lower ridership.

Alternative 4A offers the fastest end-to-end trip but does not serve any of the highest volume intermediate stations. The resulting ridership is higher than Alternative 3 but lower than Alternatives 1 and 2. Alternative 4B offers a slower travel time (approximately equal to Alternative 3) and does not serve any of the high-volume intermediate stations. As a result of these two factors, this alternative has the lowest ridership.

Please note that all forecasts presented in this report were prepared by Amtrak and Caltrans based solely on information available as of 6/15/2015. RSG has reviewed these forecasts for overall reasonableness and believe that they are useful to support planning decisions. As stated in Amtrak's transmittal, these forecasts are provided for the sole use of Caltrans and Amtrak and are not intended for disclosure in a financial offering statement.

Table 9. Year 2022 Coachella Valley Ridership and Revenue Projections

Statistic	Alternative 1	Alternative 2	Alternative 3	Alternative 4A	Alternative 4B
Annual Ridership					
Direct Markets	179,100	176,900	143,900	148,500	135,700
Connecting Markets	10,000	17,100	15,500	13,100	12,500
Total	189,100	194,000	159,400	161,600	148,200
Annual Revenue					
Direct Markets	$ 2,953,000	$ 2,739,000	$ 2,206,000	$ 2,506,000	$ 2,230,000
Connecting Markets	$ 293,000	$ 425,000	$ 392,000	$ 335,000	$ 319,000
Indio-Los Angeles Share	$ 165,000	$ 252,000	$ 196,000	$ 204,000	$ 195,000
Pacific Surfliner Share	$ 128,000	$ 173,000	$ 196,000	$ 131,000	$ 124,000
Total	$ 3,245,000	$ 3,163,000	$ 2,598,000	$ 2,842,000	$ 2,549,000
Passenger Miles					
Direct Markets	14,760,000	14,440,000	9,780,000	12,110,000	11,220,000
Connecting Markets	1,460,000	2,630,000	2,260,000	2,050,000	1,940,000
Indio-Los Angeles Share	820,000	1,640,000	1,180,000	1,280,000	1,250,000
Pacific Surfliner Share	640,000	990,000	1,080,000	770,000	690,000
Total	16,230,000	17,070,000	12,030,000	14,170,000	13,160,000
Station Boardings and Alightings (ons+offs)					
Indio	39,474	36,511	32,187	36,548	34,111
Rancho Mirage	27,066	24,223	20,004	24,693	22,539
Palm Springs	87,521	78,184	57,340	66,501	59,874
Cabazon	9,056	8,079	6,589	8,235	7,873
Loma Linda	29,921	27,313	24,827	27,378	24,555
Rialto	-	-	-	20,758	-
San Bernardino	-	-	-	-	20,437
Montclair	-	-	-	17,573	17,816
Riverside- Downtown	41,365	40,919	-	-	-
Ontario (Airport)	-	-	25,731	-	-
Pomona	-	33,119	26,284	-	-
Fullerton*	35,530	-	-	-	-
LA Union Station*	108,267	139,652	125,838	121,514	109,195
Total	378,200	388,000	318,800	323,200	296,400

*** includes transfers to/from Pacific Surfliner**

These forecasts are based solely upon information available to Amtrak as of 6/15/15
These forecasts are provided for the sole use of Caltrans and Amtrak. They are not intended for disclosure in a financial offering statement.

Table 10. Year 2040 Coachella Valley Ridership and Revenue Projections

Statistic	Alternative 1	Alternative 2	Alternative 3	Alternative 4A	Alternative 4B
Annual Ridership					
Direct Markets	257,800	253,400	215,000	211,100	192,900
Connecting Markets	14,600	24,400	24,400	18,500	17,600
Total	272,300	277,900	239,400	229,600	210,600
Annual Revenue					
Direct Markets	$ 4,229,000	$ 3,913,000	$ 3,236,000	$ 3,557,000	$ 3,164,000
Connecting Markets	$ 428,000	$ 610,000	$ 585,000	$ 478,000	$ 454,000
Indio-Los Angeles Share	$ 241,000	$ 362,000	$ 302,000	$ 292,000	$ 280,000
Pacific Surfliner Share	$ 187,000	$ 248,000	$ 283,000	$ 186,000	$ 174,000
Total	$ 4,656,000	$ 4,523,000	$ 3,822,000	$ 4,035,000	$ 3,618,000
Passenger Miles					
Direct Markets	21,140,000	20,620,000	14,340,000	17,200,000	15,920,000
Connecting Markets	2,140,000	3,770,000	3,420,000	2,920,000	2,750,000
Indio-Los Angeles Share	1,200,000	2,350,000	1,820,000	1,840,000	1,770,000
Pacific Surfliner Share	940,000	1,420,000	1,600,000	1,080,000	980,000
Total	23,280,000	24,390,000	17,760,000	20,120,000	18,670,000
Station Boardings and Alightings (ons+offs)					
Indio	58,472	54,210	47,759	54,052	50,518
Rancho Mirage	39,503	35,415	29,388	35,877	32,778
Palm Springs	127,916	114,562	84,300	96,612	87,109
Cabazon	13,204	11,828	9,620	11,919	11,403
Loma Linda	41,541	37,990	34,988	38,002	34,153
Rialto	-	-	-	28,483	-
San Bernardino	-	-	-	-	28,046
Montclair	-	-	-	23,916	24,216
Riverside- Downtown	60,867	60,220	-	-	-
Ontario (Airport)	-	-	36,312	-	-
Pomona	-	45,138	46,598	-	-
Fullerton*	50,114	-	-	-	-
LA Union Station*	152,983	196,437	189,835	170,339	152,977
Total	544,600	555,800	478,800	459,200	421,200

*** includes transfers to/from Pacific Surfliner**

These forecasts are based solely upon information available to Amtrak as of 6/15/15
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APPENDIX G TRIP OPTIMIZATION SUMMARY

Coachella Valley-San Gorgonio Pass Rail Corridor Study
Trip Optimization Summary

In February 2015, Caltrans Division of Rail and Mass Transportation completed a trip optimization analysis for the Coachella Valley-San Gorgonio Pass Rail Corridor Service Study. This appendix summarizes the analysis results.

General Results

- The previous ridership analysis done in August 2014, for two round trips without Phoenix buses, showed 130,000-150,000 riders per year. The current ridership results for two round trips (three scenarios were studied) show between 150,000 and 163,000 annual riders. The ridership increase is probably due to optimization.
- Generally the ridership productivity of each round trip is highest at one roundtrip and reduces as the number of round trips increase. A rough average is as follows: one round trip, 100,000 per round trip; two round trips, 80,000 per round trip; three round trips, 69,000 per round trip; and four round trips, 61,000 per round trip.
- Generally the ridership looks fairly promising with between about 140 riders per train per day to about 80 riders per train per day (riders per train decreasing as the number of round-trips increases).
- Ridership for each scenario with the same number of round-trips did not differ greatly.
- The results were optimized for 1, 2, 3 and 4 roundtrips. Caltrans staff reviewed and discussed the initial results and included additional scenarios to ensure that some scenarios allow a day trip of a six hour stay in Los Angeles and to optimize equipment turns.
- Attached are a total of 9 scenarios.

One Round Trip

Two scenarios are presented from Indio-Los Angeles: optimization, and with a 6 hour lay-over in Los Angeles. The reverse pattern of starting the trip in the a.m. from Los Angeles showed markedly reduced results, so this scenario isn't presented.

- The optimized schedule (leaving Indio at 9:50 am and returning at 3:25 pm), shows ridership annual ridership of 103,000, but allowed only 2 hours in L.A., not allowing a day trip.
- Therefore, another schedule was analyzed that allowed six hours in L.A. (leaving Indio at 7:40 am and returning at 5:15 pm) with annual ridership of 95,000.
- The model can't fully account for the impact the availability of a day-trip will have on ridership.
- Both scenarios can be done with one set of equipment terminating in Indio.

Two Round Trips

Three scenarios are presented.

- The optimized schedule has one trip starting in Indio in the am and one trip starting in L.A. in the a.m. Both trips only have about a 2 hour layover at their destination. Annual ridership for both round trips is 163,000.
- The next schedule also has one trip starting in Indio in the am and one trip starting in L.A. in the a.m., but there is a 6 hour layover at L.A. and a 1.5 hour layover at Indio. The annual ridership for both trips is 158,000.
- The third schedule has two round trips, both with L.A. as the destination. A 6 hour day trip can be made in L.A. The annual ridership for both trips is 150,000.
- All scenarios can be done with two sets of equipment.

Three Round Trips

Two scenarios are presented.

- Optimized schedule would require more than three sets of equipment. There is a morning, mid-day and late afternoon departure from both L.A. and Indio. Annual ridership on all three trains was 206,000.
- A schedule which provided more efficient use of equipment (three sets) and earlier morning departures from both LA and Indio. Annual ridership on all three trains was 200,000.

Four Round Trips

Two scenarios are presented.

- The optimized schedule has trains more closely spaced than the other schedule with later initial am departures from Indio or L.A., and earlier last train terminations in either L.A. or Indio. Annual ridership on all four trains was 242,000.
- The second schedule which allows a minimum of one hour equipment turns has earlier initial departures and later last train arrivals. The Annual ridership on all four trains was 222,400.

One Round Trip

Table 1: Optimum Coachella Valley Rail Schedules, 1 Round Trip, Model Maximum Productivity

To Los Angeles	
Indio	9:50 AM
Rancho Mirage	10:08 AM
Palm Springs	10:21 AM
(Cabazon)	10:39 AM
Loma Linda	11:17 AM
Riverside- Downtown	11:47 AM
Fullerton	12:42 PM
LA Union Station	1:22 PM
Total schedule time	**3:32**
To Indio	
LA Union Station	3:25 PM
Fullerton	4:05 PM
Riverside- Downtown	5:00 PM
Loma Linda	5:30 PM
(Cabazon)	6:08 PM
Palm Springs	6:26 PM
Rancho Mirage	6:39 PM
Indio	6:57 PM
Total schedule time	**3:32**
2020 Ridership	***103,200***
2020 Ticket Revenue	***$1,760,300***

Table 2: Optimum Coachella Valley Rail Schedules, 1 Round Trip, with 6-Hour LAX Day Trip

To Los Angeles	
Indio	7:40 AM
Rancho Mirage	7:58 AM
Palm Springs	8:11 AM
(Cabazon)	8:29 AM
Loma Linda	9:07 AM
Riverside- Downtown	9:37 AM
Fullerton	10:32 AM
LA Union Station	11:12 AM
Total schedule time	**3:32**
To Indio	
LA Union Station	5:15 PM
Fullerton	5:55 PM
Riverside- Downtown	6:50 PM
Loma Linda	7:20 PM
(Cabazon)	7:58 PM
Palm Springs	8:16 PM
Rancho Mirage	8:29 PM
Indio	8:47 PM
Total schedule time	**3:32**
2020 Ridership	***95,000***
2020 Ticket Revenue	***$1,616,700***

Two Round Trips

Table 3: Optimum Coachella Valley Rail Schedules, 2 Round Trips, Model Maximum

To Los Angeles		
Indio	9:50 AM	3:20 PM
Rancho Mirage	10:08 AM	3:38 PM
Palm Springs	10:21 AM	3:51 PM
(Cabazon)	10:39 AM	4:09 PM
Loma Linda	11:17 AM	4:47 PM
Riverside- Downtown	11:47 AM	5:17 PM
Fullerton	12:42 PM	6:12 PM
LA Union Station	1:22 PM	6:52 PM
Total schedule time	**3:32**	**3:32**
To Indio		
LA Union Station	10:20 AM	3:25 PM
Fullerton	11:00 AM	4:05 PM
Riverside- Downtown	11:55 AM	5:00 PM
Loma Linda	12:25 PM	5:30 PM
(Cabazon)	1:03 PM	6:08 PM
Palm Springs	1:21 PM	6:26 PM
Rancho Mirage	1:34 PM	6:39 PM
Indio	1:52 PM	6:57 PM
Total schedule time	**3:32**	**3:32**
2020 Ridership		***163,200***
2020 Ticket Revenue		***$2,768,400***

Table 4: Optimum Coachella Valley Rail Schedules, 2 Round Trips, with 6-Hour LAX Day Trip

To Los Angeles		
Indio	7:40 AM	3:20 PM
Rancho Mirage	7:58 AM	3:38 PM
Palm Springs	8:11 AM	3:51 PM
(Cabazon)	8:29 AM	4:09 PM
Loma Linda	9:07 AM	4:47 PM
Riverside- Downtown	9:37 AM	5:17 PM
Fullerton	10:32 AM	6:12 PM
LA Union Station	11:12 AM	6:52 PM
Total schedule time	**3:32**	**3:32**
To Indio		
LA Union Station	10:20 AM	5:15 PM
Fullerton	11:00 AM	5:55 PM
Riverside- Downtown	11:55 AM	6:50 PM
Loma Linda	12:25 PM	7:20 PM
(Cabazon)	1:03 PM	7:58 PM
Palm Springs	1:21 PM	8:16 PM
Rancho Mirage	1:34 PM	8:29 PM
Indio	1:52 PM	8:47 PM
Total schedule time	**3:32**	**3:32**
2020 Ridership		***158,100***
2020 Ticket Revenue		***$2,673,900***

Two Round Trips (Continued)

Table 5: Optimum Coachella Valley Rail Schedules, 2 Round Trips, both for LA Destination

To Los Angeles		
Indio	7:40 AM	9:50 AM
Rancho Mirage	7:58 AM	10:08 AM
Palm Springs	8:11 AM	10:21 AM
(Cabazon)	8:29 AM	10:39 AM
Loma Linda	9:07 AM	11:17 AM
Riverside- Downtown	9:37 AM	11:47 AM
Fullerton	10:32 AM	12:42 PM
LA Union Station	11:12 AM	1:22 PM
Total schedule time	**3:32**	**3:32**
To Indio		
LA Union Station	2:25 PM	5:15 PM
Fullerton	3:05 PM	5:55 PM
Riverside- Downtown	4:00 PM	6:50 PM
Loma Linda	4:30 PM	7:20 PM
(Cabazon)	5:08 PM	7:58 PM
Palm Springs	5:26 PM	8:16 PM
Rancho Mirage	5:39 PM	8:29 PM
Indio	5:57 PM	8:47 PM
Total schedule time	**3:32**	**3:32**
2020 Ridership		***150,200***
2020 Ticket Revenue		***$2,548,400***

Three Round Trips

Table 6: Optimum Coachella Valley Rail Schedules, 3 Round Trips with 6-Hour LAX Day Trip

To Los Angeles			
Indio	7:40 AM	11:10 AM	4:15 PM
Rancho Mirage	7:58 AM	11:28 AM	4:33 PM
Palm Springs	8:11 AM	11:41 AM	4:46 PM
(Cabazon)	8:29 AM	11:59 AM	5:04 PM
Loma Linda	9:07 AM	12:37 PM	5:42 PM
Riverside- Downtown	9:37 AM	1:07 PM	6:12 PM
Fullerton	10:32 AM	2:02 PM	7:07 PM
LA Union Station	11:12 AM	2:42 PM	7:47 PM
Total schedule time	**3:32**	**3:32**	**3:32**
To Indio			
LA Union Station	8:30 AM	1:45 PM	5:15 PM
Fullerton	9:10 AM	2:25 PM	5:55 PM
Riverside- Downtown	10:05 AM	3:20 PM	6:50 PM
Loma Linda	10:35 AM	3:50 PM	7:20 PM
(Cabazon)	11:13 AM	4:28 PM	7:58 PM
Palm Springs	11:31 AM	4:46 PM	8:16 PM
Rancho Mirage	11:44 AM	4:59 PM	8:29 PM
Indio	12:02 PM	5:17 PM	8:47 PM
Total schedule time	**3:32**	**3:32**	**3:32**
2020 Ridership		***204,200***	
2020 Ticket Revenue		***$3,420,900***	

Table 7: Optimum Coachella Valley Rail Schedules, 3 Round Trips with 1 hour Minimum Equipment Turns

To Los Angeles			
Indio	7:40 AM	12:40 PM	5:15 PM
Rancho Mirage	7:58 AM	12:58 PM	5:33 PM
Palm Springs	8:11 AM	1:11 PM	5:46 PM
(Cabazon)	8:29 AM	1:29 PM	6:04 PM
Loma Linda	9:07 AM	2:07 PM	6:42 PM
Riverside- Downtown	9:37 AM	2:37 PM	7:12 PM
Fullerton	10:32 AM	3:32 PM	8:07 PM
LA Union Station	11:12 AM	4:12 PM	8:47 PM
Total schedule time	**3:32**	**3:32**	**3:32**
To Indio			
LA Union Station	8:00 AM	12:40 PM	5:15 PM
Fullerton	8:40 AM	1:20 PM	5:55 PM
Riverside- Downtown	9:35 AM	2:15 PM	6:50 PM
Loma Linda	10:05 AM	2:45 PM	7:20 PM
(Cabazon)	10:43 AM	3:23 PM	7:58 PM
Palm Springs	11:01 AM	3:41 PM	8:16 PM
Rancho Mirage	11:14 AM	3:54 PM	8:29 PM
Indio	11:32 AM	4:12 PM	8:47 PM
Total schedule time	**3:32**	**3:32**	**3:32**
2020 Ridership		***200,000***	
2020 Ticket Revenue		***$3,328,600***	

Four Round Trips

Table 8: Optimum Coachella Valley Rail Schedules, 4 Round Trips, with 6-Hour LAX day trip

To Los Angeles				
Indio	7:40 AM	11:10 AM	2:20 PM	4:50 PM
Rancho Mirage	7:58 AM	11:28 AM	2:38 PM	5:08 PM
Palm Springs	8:11 AM	11:41 AM	2:51 PM	5:21 PM
(Cabazon)	8:29 AM	11:59 AM	3:09 PM	5:39 PM
Loma Linda	9:07 AM	12:37 PM	3:47 PM	6:17 PM
Riverside- Downtown	9:37 AM	1:07 PM	4:17 PM	6:47 PM
Fullerton	10:32 AM	2:02 PM	5:12 PM	7:42 PM
LA Union Station	11:12 AM	2:42 PM	5:52 PM	8:22 PM
Total schedule time	**3:32**	**3:32**	**3:32**	**3:32**
To Indio				
LA Union Station	8:30 AM	11:15 AM	2:25 PM	5:15 PM
Fullerton	9:10 AM	11:55 AM	3:05 PM	5:55 PM
Riverside- Downtown	10:05 AM	12:50 PM	4:00 PM	6:50 PM
Loma Linda	10:35 AM	1:20 PM	4:30 PM	7:20 PM
(Cabazon)	11:13 AM	1:58 PM	5:08 PM	7:58 PM
Palm Springs	11:31 AM	2:16 PM	5:26 PM	8:16 PM
Rancho Mirage	11:44 AM	2:29 PM	5:39 PM	8:29 PM
Indio	12:02 PM	2:47 PM	5:57 PM	8:47 PM
Total schedule time	**3:32**	**3:32**	**3:32**	**3:32**
2020 Ridership		242,000		
2020 Ticket Revenue		$4,039,000		

Table 9: Optimum Coachella Valley Rail Schedules, 4 Round Trips, with 1 hour Minimum Equipment Turns

To Los Angeles				
Indio	6:40 AM	10:50 AM	3:50 PM	8:00 PM
Rancho Mirage	6:58 AM	11:08 AM	4:08 PM	8:18 PM
Palm Springs	7:11 AM	11:21 AM	4:21 PM	8:31 PM
(Cabazon)	7:29 AM	11:39 AM	4:39 PM	8:49 PM
Loma Linda	8:07 AM	12:17 PM	5:17 PM	9:27 PM
Riverside- Downtown	8:37 AM	12:47 PM	5:47 PM	9:57 PM
Fullerton	9:32 AM	1:42 PM	6:42 PM	10:52 PM
LA Union Station	10:12 AM	2:22 PM	7:22 PM	11:32 PM
Total schedule time	**3:32**	**3:32**	**3:32**	**3:32**
To Indio				
LA Union Station	6:15 AM	11:15 AM	3:25 PM	8:25 PM
Fullerton	6:55 AM	11:55 AM	4:05 PM	9:05 PM
Riverside- Downtown	7:50 AM	12:50 PM	5:00 PM	10:00 PM
Loma Linda	8:20 AM	1:20 PM	5:30 PM	10:30 PM
(Cabazon)	8:58 AM	1:58 PM	6:08 PM	11:08 PM
Palm Springs	9:16 AM	2:16 PM	6:26 PM	11:26 PM
Rancho Mirage	9:29 AM	2:29 PM	6:39 PM	11:39 PM
Indio	9:47 AM	2:47 PM	6:57 PM	11:57 PM
Total schedule time	**3:32**	**3:32**	**3:32**	**3:32**
2020 Ridership		222,400		
2020 Ticket Revenue		$3,683,800		