



BOARD OF DIRECTORS AGENDA PACKET

**Monday, June 13, 2016
2:30 p.m.**

**Sonoma County
Permit & Resource Management Department
2550 Ventura Avenue
Santa Rosa, California**

BOARD OF DIRECTORS AGENDA

June 13, 2016 – 2:30 p.m.

Sonoma County Permit & Resource Management Department
Planning Commission Hearing Room – 2550 Ventura Avenue, Santa Rosa, CA

1. **Call to order the meeting of the Sonoma County Transportation Authority (SCTA) and the Sonoma County Regional Climate Protection Authority (RCPA)**
2. **Public comment on items not on the regular agenda**
3. **Consent Calendar**
 - A. **SCTA Items**
 - 3.1. **Measure M** – Hwy 101 North B, amendments to Caltrans cooperative agreement 4-2373-A3 and to County of Sonoma cooperative agreement SCTA10015-A3 (ACTION)*
 - 3.2. **Measure M** – SR116/121 amendment to agreement with Parsons SCTA15001-A1 (ACTION)*
 - 3.3. **Transit** – amendment to FY16/17 State Transit Assistance Coordinated Claim (ACTION)*
 - B. **SCTA/RCPA Concurrent Items**
 - 3.4. **Admin** – Minutes of the May 9, 2016 meeting (ACTION)*
4. **Regular Calendar**
 - A. **SCTA/RCPA Joint Items**
 - 4.1. **Shift** – status of Shift Sonoma County project (REPORT)*
 - B. **SCTA Items**
 - 4.2. SCTA Projects and Programming
 - 4.2.1. **Highways** – update on State Highway projects (ACTION)
 - 4.3. SCTA Planning
 - 4.3.1. **Plan Bay Area** – proposed project list (ACTION)*
 - A. **RCPA Items**
 - 4.4. RCPA Projects
 - 4.4.1. RCPA Activities Report (REPORT)*
 - 4.4.2. **Resiliency** – Climate Ready North Bay (REPORT)*
5. **Reports and Announcements**
 - 5.1. Executive Committee report
 - 5.2. Regional agency reports*
 - 5.3. Advisory Committee agendas*
 - 5.4. SCTA/RCPA staff report
 - 5.5. Announcements
6. **Adjourn**

*Materials attached.

The next **SCTA/RCPA** meetings will be held **July 11, 2016**

Copies of the full Agenda Packet are available at <http://scta.ca.gov/meetings-and-events/board-meetings/>

DISABLED ACCOMMODATION: If you have a disability that requires the agenda materials to be in an alternate format or that requires an interpreter or other person to assist you while attending this meeting, please contact SCTA/RCPA at least 72 hours prior to the meeting to ensure arrangements for accommodation.

SB 343 DOCUMENTS RELATED TO OPEN SESSION AGENDAS: Materials related to an item on this agenda submitted to the SCTA/RCPA after distribution of the agenda packet are available for public inspection in the SCTA/RCPA office at 490 Mendocino Ave., Suite 206, during normal business hours.

Pagers, cellular telephones and all other communication devices should be turned off during the committee meeting to avoid electrical interference with the sound recording system.

TO REDUCE GHG EMISSIONS: Please consider carpooling or taking transit to this meeting. For more information check www.511.org, www.srcity.org/citybus, www.sctransit.com or <https://carmacarpool.com/sfbay>

Staff Report

To: Sonoma County Transportation Authority

From: James R. Cameron, Director of Projects and Programming

Item: 3.1 – Measure M – Hwy 101 North B, amendments to Caltrans cooperative agreement 4-2373-A3 and to County of Sonoma cooperative agreement SCTA10015-A3

Date: June 13, 2016

Issue:

Shall SCTA amend the Agreements for the Measure M – Highway 101 North-B (Airport Interchange and Windsor Sound walls) in order to transfer \$550,000 from Local Construction Capital funds to Local Construction Support funds to pay for long term mitigation monitoring and reporting and closeout activities? The agreements to be amended include:

- Caltrans Cooperative Agreement 04-2373-A3
- County cooperative funding agreement SCTA10015-A3 to amend the funding summary to correspond with the proposed Caltrans construction cooperative funding agreement amendment

Background:

Over the course of the North B project, funding agreements were executed between SCTA and Caltrans, and SCTA and the County, in order to develop project delivery and funding plans for the project, including combining the SCTA Highway 101 North B and County Airport Area Project Phase 4 into one project. Over the course of the project, the project funding agreements were amended several times in order to reflect changes to the funding plans.

This project included the replacement of the Airport Boulevard Overcrossing with a new 5 lane structure, reconfiguring the ramps at Airport Boulevard and closing the ramps at Fulton Road, and the construction of soundwalls in Windsor between Shiloh Road and Windsor River Road. At this time, the project is complete with only final project closeout activities and continued mitigation and monitoring for the long term mitigation requirements remaining. One component of the long term mitigation includes the construction of an onsite mitigation channel and the planting of 236 trees and 667 shrubs within the North B project limits. Per the project Mitigation and Monitoring Plan (MMP), the trees and shrubs need to be monitored and annual reporting is required for five years after the completion of the tree planting. The trees and shrubs were planted as part of the project and the project is currently nearing two years into the monitoring and reporting with three years remaining. In addition, per the MMP, SCTA is responsible for funding all compensatory mitigation activities and Caltrans is responsible for complying with all permits, agreements, and conditions that are relevant to the mitigation activities. The current funding plan does not include funds for the mitigation and monitoring support costs in order to perform the required monitoring and reporting. Caltrans has agreed to perform the monitoring and reporting activities and SCTA will fund the support cost. The proposed amendment to Caltrans Cooperative

Agreement 04-2373-A3 will transfer Local surplus funds from Construction Capital to Construction Support in order to fund the MMP monitoring and reporting and closeout activities.

In order to transfer the Local surplus Construction Capital funds to Construction Support, a further amendment is needed to Agreement SCTA10015 between SCTA and the County which designate how Measure M LSP and Bond State Local Partnership (SLPP) funds are used on the North B and Airport Area Projects. The proposed amendment will make the funding adjustments required to correspond with the proposed Caltrans construction cooperative funding agreement amendment.

A history of the funding agreements and a description of the proposed amendments are as follows:

Agreement 04-2373

On September 23, 2011, SCTA entered into Caltrans Cooperative Funding Agreement 04-2373 for the construction of the Airport Boulevard Interchange and Windsor Sound Wall Project. The funding agreement was consistent with previous actions for two programs associated with State Proposition 1B, Corridor Mobility Improvement Account (CMIA) and State and Local Partnership Program (SLPP). In addition to the funding provided by these two sources, SCTA provided \$500K in Measure M LSP funding and \$2.1M in Measure M 101 funding for construction. The County provided \$7.792M in County funds.

On September 21, 2012 SCTA entered into Caltrans Cooperative Funding Agreement 04-2373-A1 to increase the amount of Bond State Local Partnership (SLPP) funding by \$1,827,000 and to also increase the amount of Local funding by \$1,573,000 for an overall increase of \$3,400,000 for Construction Capital.

On November 21, 2012 SCTA entered into Caltrans Cooperative Funding Agreement 04-2373-A2 to increase the amount of Local funding by \$413,000 for Construction Capital from \$11,965,000 to \$12,378,000.

Amendment 3 to Caltrans Cooperative Funding Agreement 04-2373 is needed in order to transfer \$550,000 from Local Construction Capital funds to Local Construction Support funds to fund the long term MMP monitoring and reporting and closeout activities. The agreement will also recognize an additional \$78,000 in Local Construction Capital Savings.

Agreement SCTA10015-A3

On October 22, 2010, SCTA and County entered into Agreement SCTA10015. The Measure M expenditure plan LSP program provides a total of \$15M in 2004 dollars for the Airport area project. The County has since divided the Airport project into the following phases:

- Phase 1: Widen Airport Blvd between Route 101 and Aviation Road (Constructed)
- Phase 1A: Widen Airport Blvd between Aviation Road and Ordinance Road
- Phase 2: Extend Brickway Boulevard over Mark West Creek and connect to Laughlin Road
- Phase 3: Airport Boulevard / Fulton Road Interchange Improvements
- Phase 4: Airport Boulevard / Highway 101 Overcrossing and Interchange
- Phase 4A: Landscape: Airport Boulevard / Highway 101 Overcrossing and Interchange
- Phase 5: Widen Laughlin Road from Brickway Boulevard (Phase 2) to River Road. Improve Laughlin Road Intersections at River Road and Woolsey Road

Agreement SCTA10015 combined the SCTA Highway 101 North B and Airport Boulevard/Highway 101 Overcrossing and Interchange Project – Phase 4 and included a partial funding plan for the combined project.

On November 1, 2011, SCTA and County entered into Agreement SCTA10015-A1 which provided additional funding in order to fully fund the delivery of the combined SCTA Highway 101 North B and Phase IV of the Airport Boulevard Improvement project covered by the original agreement. At the same time, SCTA also executed Agreement M30210-05-A2 to further reduce the funding amount for the Phase IV project in order to fund the right of way and construction phases of the project.

On January 29, 2013, SCTA and County entered into Agreement SCTA 10015-A2 which provided a funding swap of County Match and Proposition 1B- SLPP funds, and provided additional funding to complete the combined SCTA Highway 101 North B and Phase IV of the Airport Boulevard Improvement project covered by the original agreement.

Amendment 3 to Agreement SCTA10015 is needed in order to transfer \$490,000 savings in Measure M LSP funds and \$60,000 savings in Measure M 101 funds from Construction Capital to Construction Support to correspond with the proposed Caltrans construction cooperative funding agreement amendment.

It should be noted that on November 8, 2005, SCTA and the County also executed M30210-05 to provide a funding plan for the County's Airport Improvement projects. Subsequent amendments to this agreement were executed to develop a cost sharing plan to deliver the County's Phase 4 project, Airport Boulevard/Highway101 Overcrossing and Interchange which was combined with the SCTA Highway 101 North B Project. The latest amendment 4 to agreement M30210-05 will remain in effect and does not require any changes.

Policy Impacts:

There are no policy impacts associated with the recommendations.

Fiscal Impacts:

Proposed Amendment 3 to Caltrans Cooperative Funding Agreement 04-2373 would recognize \$628,000 in Local Construction Capital Savings and fund an additional \$550,000 in Local Construction Support for the long term MMP monitoring and reporting and closeout activities, resulting in a net savings of \$78,000.

Proposed Amendment 3 to Agreement SCTA10015 would recognize a \$378,000 savings Local County Match and \$387,000 savings in Measure M Highway 101 fund. The amendment also transfer \$490,000 savings in Measure M LSP funds and \$60,000 savings in Measure M 101 funds to Construction Support to correspond with the proposed Caltrans construction cooperative funding agreement amendment.

Staff Recommendation:

Staff recommends that the Board authorize staff to negotiate and the Chair to execute proposed Cooperative Agreement Amendment 4-2373-A3 with Caltrans to transfer \$550,000 from Local Construction Capital funds to Local Construction Support and recognized \$78,000 in Construction Capital Savings, in substantially similar form as provided for in the attachment, subject to final review and approval by legal counsel.

Staff recommends that the Board authorize staff to negotiate and the Chair to execute proposed Cooperative Agreement SCTA10015-A3 with the County of Sonoma to update the funding plans to correspond with the proposed Caltrans construction cooperative funding agreement, in substantially similar form as provided for in the attachment, subject to final review and approval by legal counsel.

Resolution No. 2016-010

Sonoma County Transportation Authority
Santa Rosa, California
June 13, 2016

RESOLUTION OF THE BOARD OF DIRECTORS OF THE SONOMA COUNTY TRANSPORTATION AUTHORITY, COUNTY OF SONOMA, STATE OF CALIFORNIA, AUTHORIZING STAFF TO NEGOTIATE AND FOR THE CHAIR TO EXECUTE COOPERATIVE AGREEMENT 04-2373-A3 WITH THE CALIFORNIA DEPARTMENT OF TRANSPORTATION TO REDUCE THE CONSTRUCTION CAPITAL FUNDS BY \$628,000 AND INCREASE CONSTRUCTION SUPPORT FUNDS BY \$550,000 TO FUND THE LONG TERM MITIGATION MONITORING PLAN (MMP) MONITORING AND REPORTING AND CLOSEOUT ACTIVITIES FOR THE HIGHWAY 101 - NORTH B (AIRPORT INTERCHANGE AND WINDSOR SOUNDWALL PROJECT) PENDING REVIEW AND COMMENT BY LEGAL COUNSEL.

WHEREAS, on September 23, 2011, SCTA entered into Caltrans Cooperative Funding Agreement 04-2373 for the construction of the Highway 101 North B (Airport Boulevard Interchange and Windsor Sound Wall Project) for \$10,392,000 in LOCAL funds and \$1,866,000 in Proposition 1B - SLPP funds for the construction of the Highway 101 – North B Project.

WHEREAS, on September 21, 2012 SCTA entered into Caltrans Cooperative Funding Agreement 04-2373-A1 to increase the amount of Bond State Local Partnership (SLPP) funding by \$1,827,000 and to also increase the amount of Local funding by \$1,573,000 for an overall increase of \$3,400,000 for Construction Capital.

WHEREAS, on November 21, 2012 SCTA entered into Caltrans Cooperative Funding Agreement 04-2373-A2 to increase the amount of Local funding by \$413,000 for Construction Capital from \$11,965,000 to \$12,378,000.

WHEREAS, the project is nearing completion with long term project mitigation monitoring and closeout activities remaining to complete the project.

WHEREAS, the long term mitigation requirements set forth in the project Mitigation Monitoring Plan (MMP) requires the monitoring and reporting of 236 trees and 667 shrubs that were planted within the North B project limits.

WHEREAS, the project is nearing two years into the monitoring and reporting with three years remaining (June 2014-June 2019), and remaining project close-out activities are needed to complete the project.

WHEREAS, the project funding plan does not include funds for the mitigation and monitoring support costs in order to perform the required monitoring and reporting or for final project close out activities.

Resolution No. 2016-010

Sonoma County Transportation Authority
Santa Rosa, California
June 13, 2016

WHEREAS Caltrans has agreed to perform the monitoring and reporting activities and project closeout activities and SCTA will fund the support cost by the transfer of Local surplus funds from Construction Capital to Construction Support in order to fund the MMP monitoring and reporting and closeout activities.

WHEREAS, Amendment 3 to Caltrans Cooperative Funding Agreement 04-2373 is needed in order to transfer \$550,000 from Local Construction Capital funds to Local Construction Support funds to fund the long term MMP monitoring and reporting and closeout activities and recognize \$78,000 savings in Construction Capital.

NOW, THEREFORE, BE IT RESOLVED, that the Board of Directors hereby authorizes staff to negotiate and for the Chair to execute cooperative funding agreement 4-2373-A3 with the California Department of Transportation to reduce the Construction Capital funds by \$628,000 and increase Construction Support funds by \$550,000 to fund the long term Mitigation Monitoring Plan (MMP) monitoring and reporting and closeout activities for The Highway 101 - North B (Airport Interchange and Windsor Soundwall Project) pending review and comment by legal counsel.

BE IT FURTHER RESOLVED, that the Board of Directors hereby authorizes the Chair to execute future amendment to cooperative agreement 4-2373 with the California Department of Transportation to recognized additional savings in local funds.

THE FOREGOING RESOLUTION, was moved by Director, seconded by Director, and approved by the following vote:

Director Chambers	_____	Director Mackenzie	_____
Director Coursey	_____	Director Miller	_____
Director Gallian	_____	Director Rabbitt	_____
Director Gorin	_____	Director Russell	_____
Director Gurney	_____	Director Salmon	_____
Director Landman	_____	Director Zane	_____

Ayes:

Noes:

Absent:

Abstain:

SO ORDERED

I, the undersigned, certify that the foregoing resolution was duly adopted at a regular meeting of the Board of Directors of the Sonoma County Transportation Authority held on December 14, 2015.

Suzanne Smith, Executive Director
Clerk, Sonoma County Transportation Authority

AMENDMENT NO. 3 TO COOPERATIVE AGREEMENT

This AMENDMENT NO. 3 (AMENDMENT), entered into and effective on _____, is between the State of California, acting through its Department of Transportation, referred to as CALTRANS, and

Sonoma County Transportation Authority, a public corporation of the State of California, referred to as SCTA.

RECITALS

1. CALTRANS and SCTA, collectively referred to as PARTNERS, entered into Cooperative Agreement No. 04-2373 (AGREEMENT) on September 21, 2011, defining the terms and conditions for performing and completing the construction component of a PROJECT to reconstruct the interchange at Airport Boulevard, replace the existing Airport Boulevard Overcrossing at Route 101, and construct soundwalls located in the Town of Windsor, Sonoma County.
2. PARTNERS entered into Amendment No.1 to AGREEMENT (District Agreement No. 04-2373-A1) on September 21, 2012 to increase the amount of Bond-State-Local Partnership (SLPP) funding by \$1,827,000 and to also increase the amount of Local funding by \$1,573,000 for an overall increase of \$3,400,000 for Construction Capital.
3. PARTNERS entered into Amendment No. 2 to amend AGREEMENT (District Agreement No. 04-2373-A2) on November 21, 2012 to increase the amount of Local funding by \$413,000 for Construction Capital from \$11,965,000 to \$12,378,000 by revising the FUNDING SUMMARY and SPENDING SUMMARY.
4. PARTNERS now seek to enter into Amendment No. 3 to AGREEMENT (District Agreement No. 04-2373-A3) to reduce the Construction Capital funds by \$628,000 and increase Construction Support funds by \$550,000 to address the projected Construction Support cost overrun for long term mitigation and monitoring of the mitigation activities, and close-out activities.

IT IS THEREFORE MUTUALLY AGREED:

5. Article 81 of AGREEMENT is hereby revised in its entirety to read as follows:

The following PARTNERS will submit invoices for CONSTRUCTION Support:

- *SCTA will invoice CALTRANS*
- *CALTRANS will invoice SCTA*

- *PARTNERS will exchange funds for actual costs.*

6. A new Article 82A is added to AGREEMENT to read as follows:

82A. CALTRANS will invoice SCTA for a \$55,000 initial deposit upon execution of this Amendment. This deposit represents ten percent of the estimated Local support costs.

7. A new Article 82B is added to AGREEMENT to read as follows:

82B. Thereafter, CALTRANS will submit to SCTA monthly invoices for estimated monthly costs based on the prior month's actual expenditures.

After PARTNERS agree that all WORK is complete, CALTRANS will submit a final accounting for all OBLIGATIONS COSTS. Based on the final accounting, PARTNERS will refund or invoice as necessary in order to satisfy the financial commitments of this agreement.

8. The attached FUNDING SUMMARY A3 will replace the FUNDING SUMMARY A2 of AGREEMENT, as amended under Amendment No. 2 to AGREEMENT, in its entirety. Any reference to the FUNDING SUMMARY in AGREEMENT is now deemed to be a reference to FUNDING SUMMARY A3.

9. The attached SPENDING SUMMARY A3 will replace the SPENDING SUMMARY A2 of AGREEMENT, as amended under Amendment No. 2 to AGREEMENT, in its entirety. Any reference to the SPENDING SUMMARY in AGREEMENT is now deemed to be a reference to SPENDING SUMMARY A3.

10. All other terms and conditions of AGREEMENT shall remain in full force and effect.

11. AMENDMENT is deemed to be included in, and made a part of, AGREEMENT.

CONTACT INFORMATION

The information provided below indicates the primary contact data for each partner to this agreement. PARTNERS will notify each other in writing of any personnel or location changes. These changes do not require an amendment to this agreement.

The primary agreement contact person for CALTRANS is:

Betsy Joseph, Project Manager
111 Grand Avenue
Oakland, California 94612
Office Phone: (510) 286-5097

Email: betsy_joseph@dot.ca.gov

The primary agreement contact person for SCTA is:

James Cameron, Deputy Director of Projects and Programming
490 Mendocino Avenue, Suite 206
Santa Rosa, California 95401
Office Phone: (707) 565-5377
Email: jcameron@sctainfo.org

SIGNATURES

PARTNERS declare that:

1. Each partner is an authorized legal entity under California state law.
2. Each partner has the authority to enter into AMENDMENT.
3. The people signing AMENDMENT have the authority to do so on behalf of their public agencies.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

SONOMA COUNTY TRANSPORTATION
AUTHORITY

By: _____
Helena(Lenka) Culik-Caro
Deputy District Director - Design

By: _____
SCTA Chair

CERTIFIED AS TO FUNDS:

By: _____
Jeffrey Armstrong
District Budget Manager

By: _____
Suzanne Smith
Executive Director

APPROVED AS TO FORM AND
PROCEDURE

By: _____
SCTA Counsel

FUNDING SUMMARY A-3

Funding Source	Funding Partner	Fund Type	CON Capital	CON Support	Subtotal Support	Subtotal Capital	Subtotal Funds Type
STATE	CALTRANS	Bond - Corridor Mobility Improvement	\$17,742,000	\$4,500,000	\$4,500,000	\$17,742,000	\$22,242,000
STATE	CALTRANS	Bond - State-Local Partnership (SLPP)	\$3,693,000	\$0	\$0	\$3,693,000	\$3,693,000
LOCAL	SCTA	Local	\$11,750,000	\$550,000	\$550,000	\$11,750,000	\$12,300,000
		Subtotals by Component	\$33,185,000	\$5,050,000	\$5,050,000	\$33,185,000	\$38,235,000

SPENDING SUMMARY A-3

Fund Source	Fund Type	Construction Support		Construction Capital		Total
		CALTRANS	SCTA	CALTRANS	SCTA	
STATE	Bond – Corridor Mobility Improvement	\$4,350,000	\$150,000*	\$17,742,000	\$0	\$22,242,000
STATE	Bond - State-Local Partnership (SLPP)	\$0	\$0	\$3,693,000	\$0	\$3,693,000
LOCAL	Local	\$550,000	\$0	\$11,750,000	\$0	\$12,300,000
	TOTAL	\$5,050,000		\$33,185,000		\$38,235,000

* \$150,000 is for SCTA to provide project management support and design services for SCWA waterline relocation, during construction.

**AMENDMENT 3 TO
COOPERATIVE FUNDING AGREEMENT NO. SCTA10015
(North B/Airport and Soundwall Project)
BETWEEN
THE SONOMA COUNTY TRANSPORTATION AUTHORITY
AND
COUNTY OF SONOMA**

This Amendment 3 to SCTA Contract Number SCTA10015 is made and entered into as of _____, (“Effective Date”) by and between the COUNTY OF SONOMA hereinafter referred to as “COUNTY” and the SONOMA COUNTY TRANSPORTATION AUTHORITY hereinafter referred to as “AUTHORITY.”

RECITALS

1. Consistent with Measure M and the Strategic Plan, AUTHORITY and COUNTY previously entered into SCTA Contract Number SCTA10015, and Amendments 1 and 2 to Contract SCTA10015, to provide \$8,959,000 of the \$15,000,000 of Measure M-LSP funds for Phase IV of the Airport Boulevard Improvement project indentified in the Measure M Expenditure Plan.

2. Consistent with Measure M and the Strategic Plan, AUTHORITY and COUNTY previously entered into Funding Agreement No. M30210-05, and Amendments 1 through 4 to Funding Agreement No. M30210-05, to provide \$6,041,000 of the \$15,000,000 of Measure M LSP funds for the remaining phases of the Airport Boulevard Improvements that were not included in SCTA Contract Number SCTA10015.

3. COUNTY and AUTHORITY have determined actual final expenditures for Project Approval Environmental Document (PAED), Plans, Specifications and Estimate (PS&E), and updated estimates for Right of Way (RW) and Construction (CON).

4. COUNTY and AUTHORITY desire for the \$490,000 savings in Measure M LSP funds and \$60,000 savings in Measure M 101 funds to be used to fund the \$550,000 deficit in Construction Support.

5. COUNTY and AUTHORITY desire to reduce the County Match in Construction Capital by \$378,000 and the Measure M Highway 101 commitment by \$387,000.

4. COUNTY and AUTHORITY desire to amend the financial plan and schedule reflecting the changed contributions

NOW, THEREFORE, in consideration of the foregoing, AUTHORITY and COUNTY do hereby agree as follows:

AGREEMENT

I. AMENDMENTS.

Paragraph 1 of Section I shall be amended to read as follows

1. Total COUNTY Contribution: COUNTY agrees to provide up to \$ 7,434,000 in local funds towards the North-B/Airport and Soundwall Project, in accordance with the financial plan (Exhibit B) and schedule (Exhibit C). The cost of COUNTY’s own administration, independent quality assurance, oversight, and project management is not considered a Project cost that is covered by this Agreement and is not included in the Project Plan.

Paragraph 1 of Section II is amended to read as follows:

1. Total AUTHORITY Contribution. AUTHORITY agrees to provide up to \$8,959,000 in Measure M - Local Street Project (LSP) program funding and \$ 10,159,000 in Measure M - Highway 101 Program funding towards the North-B/Airport and Soundwall Project, in accordance with the Project Plan. The cost of AUTHORITY’s own administration, independent quality assurance, oversight, and project management is not considered a Project cost that is covered by this Agreement and is not included in the Project Plan.

Exhibits. The following Exhibits in the Original Agreement are replaced by the Exhibits attached hereto:

Exhibit B is replaced with Amendment 3 to SCTA10015 - Exhibit B
Exhibit C is replaced with Amendment 3 to SCTA10015 - Exhibit C

II. Remainder of Agreement Unchanged.

Except to the extent the Agreement is specifically amended or supplemented hereby, the Agreement and all previous Amendments, together with exhibits and schedules is, and shall continue to be, in full force and effect as originally executed, and nothing contained herein shall be construed to modify, invalidate or otherwise affect any provision of the Agreement or any right of AUTHORITY or COUNTY arising there under.

IN WITNESS WHEREOF, the parties have executed this Agreement as of the Effective Date.

COUNTY OF SONOMA

SONOMA COUNTY
TRANSPORTATION AUTHORITY

By: _____
Director of Public Works

By: _____
SCTA Chair

ATTEST:

APPROVED AS TO SUBSTANCE:

By: _____

By: _____
Executive Director

APPROVED AS TO LEGAL FORM
FOR COUNTY:

By: _____
Deputy County Counsel

By: _____
Legal Counsel
Authority

EXHIBIT B

**AMENDMENT 3 TO
COOPERATIVE FUNDING AGREEMENT NO. SCTA10015
(North B/Airport and Soundwall Project)
BETWEEN
THE SONOMA COUNTY TRANSPORTATION AUTHORITY
AND
COUNTY OF SONOMA**

PROJECT FINANCIAL PLAN

Table B-1: North-B/Airport Funding Plan by Fund Source and Development Phase (Funds in Thousands)

FUND SOURCE	PAED	PS&E	ROW SUP	ROW CAP	CON SUP	CON CAP	TOTAL by TYPE
COUNTY MATCH	\$261 42.79%	\$1,216 21.30%	\$235 21.15%	\$0 \$0	\$0 0%	\$5,722 19.54%	\$7,434 15.4%
Measure M (LSP)	\$261 42.79%	\$3,245 56.83%	\$235 21.15%	\$0 0.0%	\$490 10.65%	\$4,728 16.14%	\$8,959 18.6%
Measure M (101)	\$88 14.42%	\$1,249 21.87%	\$641 57.70%	\$6,821 100%	\$60 1.30%	\$1,300 4.44%	\$10,159 21.1%
Prop 1B SLPP	\$0 0%	\$0 0%	\$0 0%	\$0 0%	\$0 0%	\$3,693 12.61%	\$3,693 7.7%
Prop 1B CMIA	\$0 0%	\$0 0%	\$0 0%	\$0 0%	\$4,050 88.05%	\$13,842 47.27%	\$17,892 37.2%
TOTAL	\$610 100%	\$5,710 100%	\$1,111 100%	\$6,821 100%	\$4,600 100%	\$29,285 100%	\$48,137 100%

Table B-2: North-B/Soundwall Funding Plan by Fund Source and Development Phase (Funds in Thousands)

FUND SOURCE	PAED	PS&E	ROW SUP	ROW CAP	CON SUP	CON CAP	TOTAL by TYPE
Measure M (101)	\$0 0.0%	\$1,391 100.0%	\$200 100.0%	\$50 100.0%	\$0 0.0%	\$0 0.0%	\$1,641 27.4%
Prop 1B CMIA	\$0 0.0%	\$0 0.0%	\$0 0.0%	\$0 0.0%	\$450 100.0%	\$3,900 100.0%	\$4,350 72.6%
TOTAL	\$0 0.0%	\$1,391 100.0%	\$200 100.0%	\$50 100.0%	\$450 100.0%	\$3,900 100.0%	\$5,991 100.0%

Note: Funding for soundwalls shall be tracked separate from other improvements. Soundwalls represent 10% of Construction Capital and 10% of Construction Support of combined North-B/Airport and Soundwall project. COUNTY has no responsibility to fund soundwalls.

EXHIBIT C

**AMENDMENT 3 TO
COOPERATIVE FUNDING AGREEMENT NO. SCTA10015
(North B/Airport and Soundwall Project)
BETWEEN
THE SONOMA COUNTY TRANSPORTATION AUTHORITY
AND
COUNTY OF SONOMA**

PROJECT SCHEDULE

Potential Project Schedule:

Project Development Phase	Begin	End
Environmental (Re-evaluation)	May 2009	May 2010
Design	May 2009	Apr 2012
Right of Way (ROW)	Dec 2009	Dec 2017*
Advertise, Award, Approve (AAA)	May 2012	Oct 2012
Construction (CON)	Dec 2012	Dec 2019**

* Final Right of Way Mapping and Survey monumentation remain as well as final settlement with the County regarding the parcel adjoining Mark West Creek.

** Construction Contract Accepted on August 3, 2015 with mitigation monitoring and mitigation maintenance to continue through 2019.

Staff Report

To: Sonoma County Transportation Authority

From: Seana L. S. Gause, Senior – Programming and Projects

Item: 3.2 - SON116/121 – Intersection Improvement Project Amendment No. 1 to Parsons Agreement

Date: June 13, 2016

Issue:

Shall the SCTA amend Contract SCTA15001 with Parsons Transportation to extend the term of the Project Approval/Environmental Document (PAED) contract through August 31, 2017, for the Highway 116/121 intersection Improvement Project?

Background:

At the July 14, 2014, meeting, the Board approved the selection of Parsons Transportation Inc to perform services for completion of an environmental document and project approval (PAED) on the Highway 116/121 Intersection Improvement project and authorized executing an agreement with Parsons in an amount not to exceed \$1,760,000. An agreement in the amount of \$1,599,996 has been executed with Parsons and the draft environmental document is nearing release to the public.

The current contract is set to expire in August of this year. The project schedule anticipates an approved environmental document and project approval in early November of this year. Given the lack of access to two parcels in the project area, further documentation will be needed after completion of the environmental document. The proposed contract extension is for time only.

Policy Impacts:

None

Fiscal Impacts:

None

Staff Recommendation:

SCTA staff requests that the Board authorize staff to negotiate and for the Chair to execute proposed contract SCTA15001-A1 with Parsons to extend the contract term through August 31, 2017, in substantially similar form as provided for in the attachment, subject to final review and approval by legal counsel.

AMENDMENT NO. 1 TO AGREEMENT FOR PAED CONSULTANT SERVICES

This Amendment No. 1 to Agreement No.SCTA15001 is made by and between Parsons Transportation Inc (hereinafter referred to as “CONSULTANT”), and the Sonoma County Transportation Authority (hereinafter referred to as “SCTA”).

RECITALS

WHEREAS, the California Department of Transportation (hereinafter “Caltrans”) and SCTA have determined to undertake a project to construct operational improvements at the intersection of State Route 116 and Route 121 (04-SON-116-PM 46.0/46.7 and 04-SON-121-PM 5.8/R7.4) in Sonoma County (hereinafter “116 / 121 Interchange Project”); and

WHEREAS, by agreement with Caltrans an environmental document will be prepared for the 116/121 Intersection Improvement Project, and,

WHEREAS, by agreement will Caltrans, SCTA is responsible for the preparation of the Project Approval/ Environmental Document (PA/ED) for the Project; and,

WHEREAS, the PA/ED must be prepared in accordance with applicable Federal and State laws, rules, regulations, policies, procedures, manuals, standard plans and specifications, and other standards, including, but not limited to, compliance with Caltrans and FHWA requirements; and

WHEREAS, by agreement, Caltrans will provide quality assurance on the work products and CONSULTANT is expected to work closely with appropriate Caltrans staff to ensure appropriate standards are met; and,

WHEREAS, CONSULTANT is a duly qualified environmental and engineering firm directed by and employing persons having appropriate certifications, licenses and experience in the preparation of Environmental Documents and Preliminary Engineering; applicable federal, state, and local laws, rules, and regulations; design, engineering and related analysis; and the preparation of legally and technically acceptable engineering plans, specifications, and estimates; and

WHEREAS, SCTA and CONSULTANT have entered into Agreement No.SCTA10015 to prepare the PA/ED for the 116/121 Intersection Improvement Project;

WHEREAS, in the judgment of SCTA’s Board of Directors it is necessary and desirable for SCTA to increase the term of the contract to August 31, 2017 to complete environmental and preliminary design services;

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties hereto mutually agree as follows:

1. Paragraph 3.0 of the Agreement is deleted in its entirety and replaced with the following language:

3.TERM OF AGREEMENT: The term of this Agreement shall end on August 31, 2017 unless terminated earlier in accordance with the provisions of paragraph 4 below.

2. Except to the extent the Agreement is specifically amended or supplemented hereby, together with exhibits and schedules is, and shall continue to be, in full force and effect as originally executed, and nothing contained herein shall be construed to modify, invalidate or otherwise affect any provision of the Agreement or any right of SCTA arising there under.

3. CONSULTANT warrants the person affixing his or her signature hereto is authorized to execute this agreement on behalf of CONSULTANT.

SCTA AND CONSULTANT HAVE CAREFULLY READ AND REVIEWED THIS AMENDMENT AND EACH TERM AND PROVISION CONTAINED HEREIN AND, BY EXECUTION OF THIS AMENDMENT, SHOW THEIR INFORMED AND VOLUNTARY CONSENT THERETO.

IN WITNESS WHEREOF, the parties hereto have executed this Amendment No. 5 as set forth below.

CONSULTANT

DATED: By: _____
Consultant

SONOMA COUNTY TRANSPORTATION AUTHORITY

DATED: By: _____
Chair, SCTA

CERTIFICATES OF INSURANCE ON FILE WITH AND APPROVED AS TO SUBSTANCE BY SCTA:

DATED: By: _____
Suzanne Smith, Executive Director, SCTA

APPROVED AS TO FORM:

DATED: By: _____
SCTA Counsel

Staff Report

To: Sonoma County Transportation Authority
From: Dana Turréy, Transportation Planner
Item: 3.3 - Amendment to FY 2016-17 State Transit Assistance Coordinated Claim
Date: June 13, 2016

Issue:

Shall the Sonoma County Transportation Authority (SCTA) approve the revisions to the FY 2016-17 State Transit Assistance (STA) Coordinated Claim for per the Governor’s revised proposed budget and the Metropolitan Transportation Commission’s (MTC) revised fund estimate?

Background:

In April 2016, the SCTA Board approved the FY 2016-17 Coordinated Claim for transit funding. A revised Coordinated Claim has been prepared due to changes to STA revenue estimates in the governor’s revised budget and to MTC’s inclusion of Revenue-Based STA funds in their revised fund estimate.

The Coordinated Claim documents existing inter-jurisdictional funding agreements for transit services in Sonoma County as they relate to the distribution of Transportation Development Act (TDA), STA and Measure M funds. TDA and Measure M estimates in the Coordinated Claim are not impacted by this update.

STA funds are derived from a portion of sales tax revenues collected from the sale of vehicle fuels. They are allocated from three subcategories:

- i) Population Formula Funds go to local operators for transit projects.
- ii) Regional Paratransit Funds are available from MTC for paratransit services by Sonoma County Transit, Santa Rosa CityBus, Petaluma Transit, and Golden Gate Transit.
- iii) Revenue Based Funds are allocated to operators eligible for TDA Article 4: Sonoma County Transit, Santa Rosa CityBus, and Petaluma Transit.

On May 13, 2016 Governor Brown released his revised budget proposal for FY 2016-17 (May Revise) which included updated projections for STA funding for the remainder of FY 2015-16 and for FY 2016-17. Governor Brown’s original proposed budget released in January 2016 identified \$315 million in STA funding statewide. Of this statewide amount, \$121.8 million was expected to flow to the Bay Area. The governor’s May Revise budget projected \$267 million in STA funding statewide.

The attached revised FY 2016-17 Coordinated Claim includes the following changes to STA estimates:

- 1) **Reduction in STA Population-Based and Regional Paratransit funds per the governor’s May Revise** - The January 2016 proposed governor’s budget estimate of STA revenues was used for the Population-Based and Regional Paratransit Funds in MTC’s FY 2016-17 Fund Estimate from February 2016 and for SCTA’s original FY 2016-17 Coordinated Claim. The revised STA projections result in a

reduction of total Population-Based funds from \$1,734,924 to \$1,469,867, and in a reduction of total Regional Paratransit funds from \$385,496 to \$348,692.

- 2) **Inclusion of STA Revenue-Based funds** – STA Revenue-Based Funds were not included in MTC’s February Fund Estimate due to outstanding questions regarding recent changes made by the State Controller’s Office (SCO) to this program, and were therefore not included in SCTA’s April Coordinated Claim. Since the Coordinated Claim was adopted in April, MTC has allocated FY 2016-17 Revenue-Based STA funds to operators and made the estimates available to include in the Coordinated Claim.

MTC staff has requested that SCTA provide a revised STA Coordinated Claim for FY 2016-17 that incorporates the changes to the fund estimate described above.

Policy Impacts:

None.

Fiscal Impacts:

The revised FY 2016-17 Coordinated Claim reduces the combined STA Population-Based and Regional Paratransit funding by \$301,861, approximately 14 percent, from the original Coordinated Claim adopted in April 2016. The revised FY 2016-17 Coordinated Claim now includes a total of \$386,165 in STA Revenue-Based funds, which were not shown in the original Coordinated Claim.

Staff Recommendation:

Staff recommends that the SCTA Board accept the revisions to the FY 2016-17 STA Coordinated Claim.

Attachment:

Revised FY 2016-17 STA Coordinated Claim

FY 2016-17 TDA / STA / Measure M - Fund Summary

1.6

	TDA		STA		MEASURE M		Total TDA / STA / MEASURE M	
Forecasted Revenue:	\$22,800,000	100.00%	\$2,204,724		\$2,280,000	100.00%	\$27,284,724	100.00%
MTC Contributions:	798,000	3.50%	-----		-----		798,000	2.92%
County Administration (Auditor)	40,000	0.18%	-----		-----		40,000	0.15%
Article 3 - Bicycle & Pedestrian Projects	439,240	1.93%	-----		-----		439,240	1.61%
FY 2016-17 Funds to Transit Operators	\$21,522,760	94.40%	\$2,204,724	100.00%	\$2,280,000	100.00%	\$26,007,484	95.32%
Petaluma Transit	1,597,872	7.42%	188,678	8.56%	273,552	12.00%	2,060,102	7.92%
Santa Rosa CityBus	5,719,852	26.58%	840,120	38.11%	795,163	34.88%	7,355,135	28.28%
Sonoma County Transit*	8,824,346	41.00%	1,141,057	51.76%	1,211,285	53.13%	11,176,688	42.97%
Golden Gate Transit	5,380,690	25.00%	34,869	1.58%	-----	-----	5,415,559	20.82%
Totals by Funding Source	\$21,522,760	100.00%	\$2,204,724	100.00%	\$2,280,000	100.00%	\$26,007,484	100.00%
% by Funding Source	82.76%		8.48%		8.77%		100.00%	

STA Coordinated Claim

Per Governor's May Budget Revision (MTC revised 5-25-16)

per MTC Regional Fund Estimate dated 05-25-16

Updated 05-31-16

STA

Projected FY 2017 STA Funds Available for Allocation - By Operator

1.6

Entity	Distribution				Total FY 2016 Funds Available for Allocation
	Population-Based	Regional Paratransit	Revenue-Based		
Petaluma Transit	\$141,083	\$37,652	\$9,943		\$188,678
Santa Rosa CityBus	512,624	109,447	\$218,048		840,120
Sonoma County Transit	816,160	166,723	\$158,174		1,141,057
Golden Gate Transit	---	34,869	---		34,869
Total	\$1,469,867	\$348,692	\$386,165		\$2,204,724

* awaiting direction from MTC on FY 2017 STA Revenue-based fund amounts

Projected FY 2017 STA Revenue Estimate

1.6

Operator	Population*	% Population	Distribution			
			Population-Based	Regional Paratransit	Revenue-Based	Total
Petaluma Transit	59,540	11.9979%	\$176,353	\$41,836	\$9,943	\$228,132
Santa Rosa CityBus	173,071	34.8756%	512,624	121,608	\$218,048	852,281
Sonoma County Transit	263,642	53.1265%	780,889	185,248	\$158,174	1,124,311
Golden Gate Transit	---	---	---	---	---	---
Total	496,253	100.0000%	\$1,469,867	\$348,692	\$386,165	\$2,204,724

STA Population-Based Fund Summary

		Total	Distribution by Operator		
			Petaluma Transit	Santa Rosa CityBus	Sonoma County Transit
FY 17	Funds Available	\$1,469,867	\$176,353	\$512,624	\$780,889
FY 17	Allocation to Sonoma County Transit		(35,271)	---	35,271
FY 17	Total Funds Available	\$1,469,867	\$141,083	\$512,624	\$816,160

FY 2017 Multi-Jurisdictional STA Project List (Population-Based Funds)

Claimant			Total	Distribution by Operator		
				Petaluma Transit	Santa Rosa CityBus	Sonoma County Transit
ADA Implementation	SCT	\$35,271	\$35,271	---	\$35,271	
Total		\$35,271	\$35,271	---	\$35,271	

STA Regional Paratransit Fund Summary

Claimant		Total	Distribution by Operator		
			Petaluma Transit	Santa Rosa CityBus	Sonoma County Transit
FY 17	Funds Available	\$348,692	\$41,836	\$121,608	\$185,248
FY 17	Regional ADA Support	(34,869)	(4,184)	(12,161)	(18,525)
FY 17	Total Funds Available	\$313,823	\$37,652	\$109,447	\$166,723

BOARD OF DIRECTORS MEETING

Meeting Minutes of May 9, 2016

ITEM

1. Call to order the meeting of the Sonoma County Transportation Authority (SCTA) and the Sonoma County Regional Climate Protection Authority (RCPA)

Meeting called to order at 2:36 by Chair David Rabbitt.

Directors Present: Director Rabbitt, Supervisor, Second District, Chair; Director Russell, City of Cloverdale, Vice Chair; Director Coursey, City of Santa Rosa; Director Gallian, City of Sonoma; Director Gorin, Supervisor, First District; Director Gurney, City of Sebastopol; Director Landman, City of Cotati; Director Mackenzie, City of Rohnert Park; Director Miller, City of Petaluma; Director Salmon, Town of Windsor.

Directors Absent: Director Chambers, City of Healdsburg; Director Zane, Supervisor, Third District.

2. Public comment on items not on the regular agenda

Duane DeWitt of Roseland reported that in April the Dept. of Transportation sent a representative to Copenhagen to learn their methods of reducing auto use and encourage bicycling. This resulted in a Memorandum of Understanding and the City of Copenhagen's procedures and standards in handling transportation and lowering their carbon footprint. He referred to materials he has that are available for further information.

Bob Anderson of United Winegrowers spoke to the Climate Action 2020 Plan and summarized an

outline of various data on which there is general agreement. He noted that he added the City of Santa Rosa. He explained the source of various GHG reductions (the major reductions). He also explained the emissions remaining. Mr. Anderson noted a correction made in data for the City of Sebastopol.

Steve Birdlebough of the Transportation and Land Use Coalition expressed the probability of further cuts that would likely be needed in order to meet CA2020 goals. He identified parking as a significant issue.

3. Consent Calendar

A. SCTA Items

- 3.1. **Shift** – amendment to consultant services agreement with Nelson Nygaard for Shift Sonoma County planning efforts (ACTION)*
- 3.2. **Measure M** – Hwy 101 Marin Sonoma Narrows URS contract SCTA08014-A9 (ACTION)*
- 3.3. **Measure M** – appropriation request from Department of Health Services for Safe Route to Schools (ACTION)*

B. RCPA Items

- 3.4. **CA2020** – amendment to consultant service agreement with Pete Parkinson (ACTION)*

C. SCTA/RCPA Concurrent Items

- 3.5. **Admin** – Minutes of the April 11, 2016 meeting (ACTION)*

Motion by Director Mackenzie, seconded by Director Miller, to approve the Consent Calendar. Motion passed unanimously with the exception of Director Gallian who abstained from approval of Item 3.5, meeting minutes, not being present at this meeting.

4. Regular Calendar

A. RCPA Items

4.1. RCPA Projects

4.1.1. **Funding** – carbon reduction fund concept paper (ACTION)*

Lauren Casey addressed the potential of a revenue stream for carbon reduction. She summarized activities regarding projects and the market demand for this concept. She cited various possible sources of demand and opportunities for voluntary reduction of carbon emissions. She referred to a draft. She expressed the wish for staff to investigate the model in use by the City of San Francisco as to results and progress in their carbon reduction program.

Board comments included interest in learning how they may participate in this process on an individual basis. In response to Board questions, Ms. Casey explained that staff had not surveyed local agencies to learn of other possible similar programs in place. The Board recommended looking further into this matter and that this may increase efficiency if this is already in place elsewhere. The matter of diversity of participants was also raised and the sources of revenue. Further investigation and exploration was requested by the Board. Board comment included the recommendation to pursue this at the local level. The Board encouraged close monitoring of this issue and further exploration.

B. SCTA Items

4.2. SCTA Projects and Programming

4.2.1. **Bike/Ped** – update from Department of Health Services on Safe Routes to School program (REPORT)*

Seana Gause explained that the MTC has requested that the Board be kept informed on this program and introduced Anthony Taylor, Health Program Manager of the Sonoma County Department of Health Services, who presented a slide show including a program overview (education, encouragement, enforcement, engineering, evaluation, and equity), and funding sources. He recognized local contractors that have worked with staff in this program (WTrans). He provided a summary of funding and progress made in overall mode shift. He also noted the contribution of the Sonoma County Bicycle Coalition in this effort.

Further data was presented showing vehicle emission reductions and improved school infrastructure. Mr. Taylor referred to Sheppard Elementary School as an example of these improvements, with the installation of a crosswalk and other pedestrian safety improvements.

Mr. Taylor showed projected costs for the current cycle of Safe Routes to School (SRTS). He summarized current activities and programs in place, such as Youth Leadership for high schools.

Mr. Taylor next reported on the success of Walk and Roll to School Day, enforcement activities working with local law enforcement, engineering activities in conducting walking audits, and evaluation by analyzing data and measuring the quality of these efforts. Current and future funding was summarized. He noted a funding gap from October 2017-September 2019.

Mr. Taylor introduced Andrea Pickett, the new Safe Routes to School Program Coordinator.

Discussion followed regarding various approaches to implementing and maintaining this program in schools (e.g., through the Physical Education teachers or having staff come to the school) that staff is examining.

A presentation is being developed to be made to various school boards this summer to show the progress made by individual schools in the SRTS program. Board requests included having this information available to City Council.

Director Coursey agreed to get SRTS information to Director Russell, who expressed the need to be apprised of local SRTS activity in Cloverdale.

Mr. Taylor explained that an application will be released shortly for adding schools. He agreed to send the list of current and future participants in SRTS for the City of Petaluma. Chair Rabbitt explained that Petaluma's lack of participation in SRTS is due to liability issues.

Director Gallian noted both concerns and progress made at local schools in the City of Sonoma, and the need for greater safety/infrastructure for students.

Director Gurney observed success in implementing an adult walk educational program, and noted that it takes time for the car culture perception to change to walking and bicycling.

Mr. DeWitt noted that no change in mode shift to bicycling was identified in SRTS and that this is because of bicycle theft. He suggested a coordinated effort is needed to try to get funding for bicycle racks and also to publicize the implementation of increased protection and security of bicycles.

Mr. Birdlebough cited steps taken by Stanford to encourage mode shift (a \$3.00 parking charge and using these funds for bicycle and pedestrian infrastructure).

Director Mackenzie confirmed with Mr. Taylor that the funding gap he referred to is between OBAG 1 and OBAG 2.

Additional Board comments included closer examination of the cost effectiveness of SRTS.

4.2.2. **Bike/Ped** – FY16/17
Transportation
Development Act, Article
3 program of projects
(ACTION)*

Dana Turréy explained that these funds are based on population. \$423,842 is the total funding leveraged for six projects for which applications were received. Staff is requesting approval to forward this to the MTC.

Motion by Director Miller, seconded by Director Mackenzie, to approve the FY16/17 TDA3 Program of Projects. Motion passed unanimously (10-0-2-0).

4.2.3. **Alternative modes** –
FY16/17 Transportation
Fund for Clean Air
program of projects
(ACTION)*

Ms. Turréy summarized the eight proposed projects under this funding program. These projects were reviewed for compliance with BAAQMD standards and were reviewed by the Technical Advisory Committee. Staff is requesting approval to forward this to the BAAQMD.

Motion by Director Miller, seconded by Director Mackenzie, to approve the FY16/17 TFCA Program of Projects. Motion carried unanimously (10-0-2-0).

4.2.4. **OBAG2** – One Bay Area Grant Cycle 2 (OBAG2) draft application & process (ACTION)*

Ms. Gause reported that this is scheduled to be finalized at the end of May. The call for projects will be brought to the Board following approval of the application. She noted its similarity to the previous application for Cycle 1. She summarized where changes/edits have been made for greater ease in completing the application. She referred to the schedule and timeline.

In response to Board questions, Ms. Gause explained the content of the constrained project list and how ranking is determined. Ms. Smith referred to the RTP identification number shown on specific projects and how to find further information on the project. Ms. Smith also confirmed that some projects may proceed and some may not.

Further Board comments addressed the additional \$72 million in funds from MTC and the best plan allocation of these funds, including traffic condition improvements and housing. It was suggested that this also be brought to the attention of City Managers.

Chair Rabbitt announced the open house to be held Monday, June 13.

Motion by Director Miller, seconded by Director Gallian, to approve the OBAG2 draft application and process. Motion passed unanimously (10-0-2-0).

4.2.5. **Highways** – update on State Highway projects (ACTION)

Ms. Gause announced the closing of the Laguna de Santa Rosa Bridge Friday night, May 13, for a traffic switch.

The Highway 116/121 Intersection Improvements may face a delay in design due to the delay in the environmental document and the need for a Biological Assessment.

James Cameron reported the MSN B-2 project (the Petaluma River Bridge and Petaluma Boulevard South interchange) had a major traffic switch take place on April 11. Direct access to the Kastania Road service station has been closed, but the service station continues to be open for business.

Demolition has begun for two residences on Stewart Drive, two more residences will be demolished on Arlington Drive later this summer, for the MSN C-2 project (Central Petaluma HOV Lanes).

A Highway 37 Policy Committee meeting took place. Staff will be conducting a recruitment for a financial consultant. The next Policy Committee meeting is scheduled for July 7.

In response to a Board request, Mr. Cameron confirmed that staff will work with Caltrans on executing a change order regarding paving Petaluma Blvd South.

Chair Rabbitt led a discussion regarding the need for the existing \$8 million in funding to be allocated for Highway 101 widening. Director Mackenzie reported that he would call for a meeting of the agencies involved to resolve this issue. He also identified a short-term resolution of \$3.5 million as a transitional effort until the longer-term solution is implemented.

Additional Board comments concurred on the need to advocate for allocation of this funding for Highway 101 widening, and the need for further

discussion and involvement between SCTA, jurisdictions, and the Board of Supervisors regarding Highway 37. The current impact of sea level rise along Highway 37 was also addressed.

4.3. SCTA Planning

4.3.1. **Data** – overview of disadvantaged communities data (REPORT)

Chris Barney presented and demonstrated an interactive map of disadvantaged communities, showing criteria as identified by MTC, SCTA, Caltrans, CalEPA, and the Sonoma County Department of Health Services. He noted where some communities overlap, and differences in communities according to the different criteria determined by these agencies. Additional criteria includes disadvantaged schools. Data from *Portrait of Sonoma County* was pointed out, comparing demographics between disadvantaged communities and other populations. The map is available on the SCTA website or via the provided web location to review and utilize.

Board comments included the public perception of specific areas and danger of “labeling” areas by census tract.

C. SCTA/RCPA Joint Items

4.4. **Admin** – FY16/17 Preliminary Budgets

4.4.1. Measure M (ACTION)*

Ms. Smith explained that this is made up of several budgets. Board questions included the source of the forecast of 3% in revenues. Mr. Cameron added that this is based on historic data and studies by KNN, the financial consultant. Ms. Smith explained further how estimates have been within marginal differences.

Motion by Director Mackenzie, seconded by Director Miller, to approve the FY16/17 Measure M Preliminary Budget. Motion passed unanimously (10-0-2-0).

4.4.2. Transportation Fund for Clean Air (TFCA) (ACTION)*

Ms. Smith reviewed the budget funding, which includes revenue from the Bay Area Air Quality Management District and funds available to each jurisdiction. She noted that the projects included in the budget are those projects that were approved under Item 4.3.2 of this agenda on this date. A total of \$614,040 in new funding is to be made available for projects in Sonoma County and an additional \$29,535 will be allocated to SCTA for program administration.

Motion by Director Coursey, seconded by Director Landman, to approve the FY16/17 TFCA Preliminary Budget. Motion carried unanimously (10-0-2-0).

4.4.3. RCPA operations (ACTION)*

Ms. Smith noted that this year’s budget does not include the STC grant, as this will expire this year, and other changes from the previous fiscal year budget.

Motion by Director Gallian, seconded by Director Miller, to approve the FY16/17 RCPA Preliminary Budget. Motion passed unanimously (10-0-2-0).

4.4.4. SCTA operations (ACTION)*

Ms. Smith cited revenue included in the budget from the following State funding sources: State Transportation Improvement Program (STIP), which is expected to decrease next fiscal year by

approximately \$75,000 due to lack of STIP funding statewide; Strategic Growth Council (SGC) grant for Shift Sonoma County; HOV violation fines, and TFCA funds.

Federal funding includes Surface Transportation funds from MTC, and local funding includes Measure M, City and County partner contributions, RCPA, and interested on pooled cash.

Ms. Smith summarized expenses, including staff salaries and benefits; outside contracts and services; and operational expenses.

This budget proposes a 3% increase in local contributions (an increase of \$10,000).

Ms. Smith noted that revenues are down by nearly 5% and expenditures are down 1.5% compared to the previous fiscal year budget.

Motion by Director Miller, seconded by Director Gorin, to approve the FY16/17 SCTA Operations Preliminary Budget. Motion passed unanimously (10-0-2-0).

5. Reports and Announcements

5.1. Executive Committee report

N/A

5.2. Regional agency reports*

MTC: Director Mackenzie announced that a general assembly will be held to address the merging of MTC and ABAG and that the issue of governance and leadership will be addressed.

Sonoma Clean Power: Director Landman announced that a minimum of \$3.5 million has been earmarked. He also announced that rates have been reduced.

SMART: Director Russell had nothing new to report.

GGBHTD: Chair Rabbitt announced that he is now Chair of the Suicide Prevention Committee and spoke of the remarkable engineering design for the suicide barrier that is under construction.

5.3. Advisory Committee agendas*

Included in the agenda.

5.4. SCTA/RCPA staff report

Ms. Smith reported on a presentation from MTC regarding support for a gas tax increase. This is estimated to generate \$150 million in revenues. This has not gone to the Commission yet for approval but staff is moving forward for placing this on the November ballot. Polls show support for using these funds in road/pothole repair. Sonoma County polled at 65% in support of a 5¢ per gallon tax. She explained that this would have to pass by an aggregate of two-thirds of all counties in order to be placed on the ballot.

5.5. Announcements

N/A

6. Adjourn

5:05 p.m.

Staff Report

To: SCTA/RCPA Board of Directors
From: Lauren Casey, Director of Climate Programs
Item: 4.1 – Shift Sonoma County – Low Carbon Transportation Planning Update
Date: June 13, 2016

Issue:

Information only.

Background:

In 2014, the SCTA and RCPA applied for and were awarded a Strategic Growth Council Planning Grant to develop Shift Sonoma County – a strategic action plan to promote a shift in both the mode and fuel used for personal transportation in Sonoma County. Through this project the agencies are working together with consultants and stakeholders to better define the role of local government in accelerating the transition to low carbon transportation.

This planning effort was identified as the crucial next step towards implementation of the SCTA Comprehensive Transportation Plan, Climate Action 2020, and the regional Plan Bay Area. In order to implement these plans, more information is needed about the state of low carbon transportation, barriers to use, strategies for local government to address those barriers, and the details needed in order to move forward with implementation of those strategies. The emphasis of the planning project is on developing tools and recommendations that can inform future grant applications and investments in programs, policies, government operations, and infrastructure.

Staff from the SCTA and RCPA will jointly provide the attached presentation. It offers an overview of the Shift Sonoma County project, a status update, and an introduction to two interim project deliverables:

- The Draft Bike Share Feasibility Study is posted at: <http://bit.ly/bikesharestudy>.
- Draft Electric Vehicle Infrastructure Siting Framework will be posted at: <http://scta.ca.gov/shift>.

Policy Impacts:

Shift Sonoma County is providing tools for the SCTA, RCPA, and partners to implement measures included in the Comprehensive Transportation Plan and Climate Action 2020.

Fiscal Impacts:

The project was funded by a planning grant of \$868,463 from the Strategic Growth Council that includes budget for SCTA and RCPA personnel and consulting services.

Staff Recommendation:

Information only.



Shift Sonoma County

A Low Carbon Transportation Action Plan

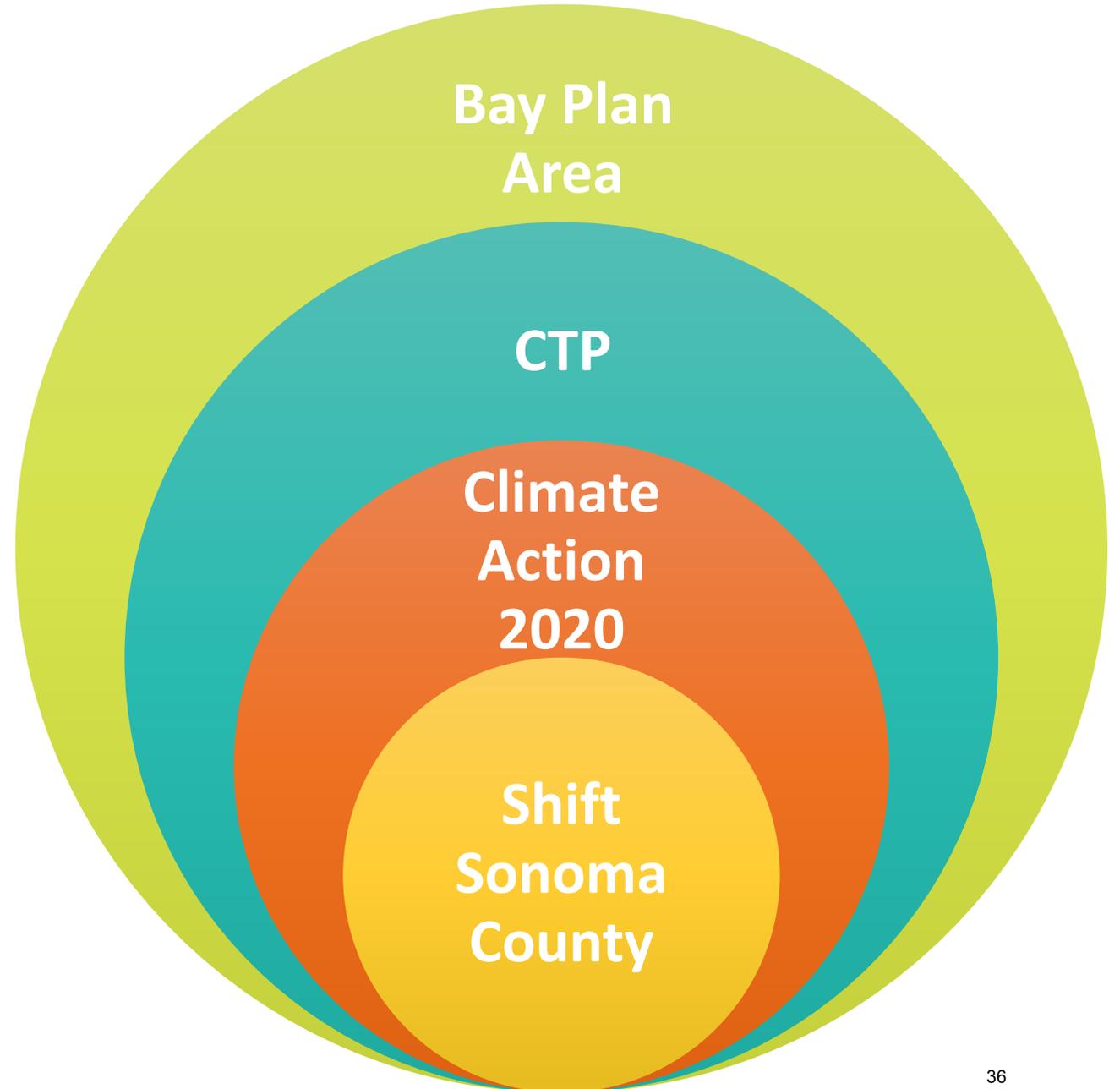
Project Update

SCTA/RCPA Board – June 13, 2016

Why Shift?

Put regional and local plans into action to:

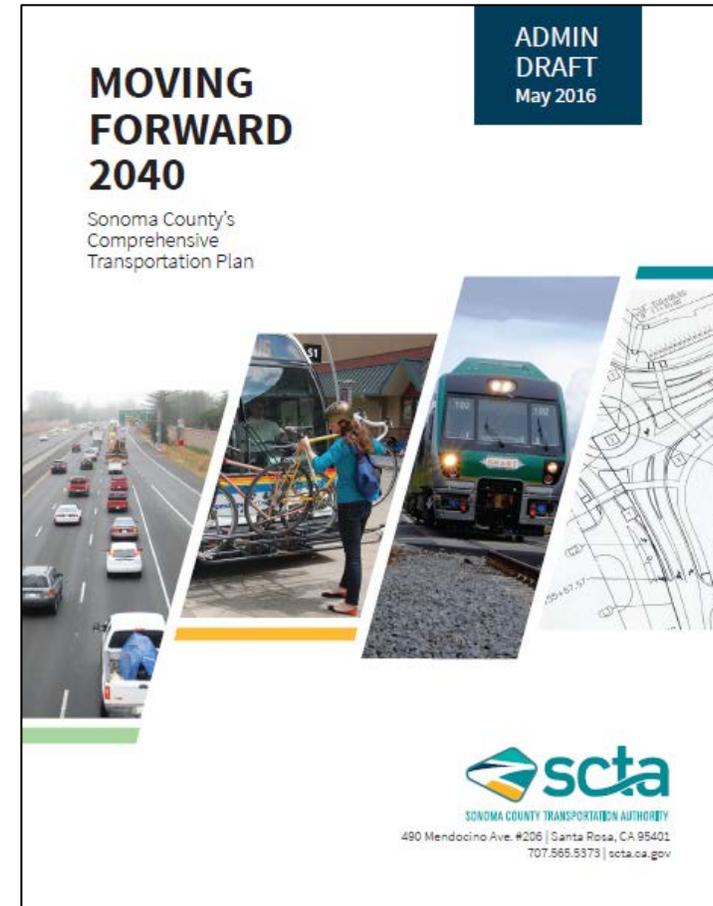
- Reduce vehicle miles traveled (VMT)
- Accelerate use of plug-in electric vehicles (EVs)
- Reduce greenhouse gas emissions (GHGs)



Comprehensive Transportation Plan

Goals

1. Maintain the System
2. *Relieve Congestion*
3. *Reduce Greenhouse Gas Emissions*
4. *Plan for Safety and Health*
5. *Promote Economic Vitality*



Moving Forward 2040: Vision Scenario

Success depends on:

- **Fuel Economy**

- 55 mpg average by 2040
- *Total EVs over 139,000*

- **Mode Shift**

- SOV trips down by 4%
- Per capita VMT down by 32%
- Maximize our transit system



Population and Employment Growth through 2040 located in UGBs and centered on PDAs, maintain current jobs-housing balance with neighboring counties.



Construct Selected CTP Vision Large Road and Highway Projects. Examples include HWY 101 HOV lane completion, SMART Pathway, and other highway and large local road projects.

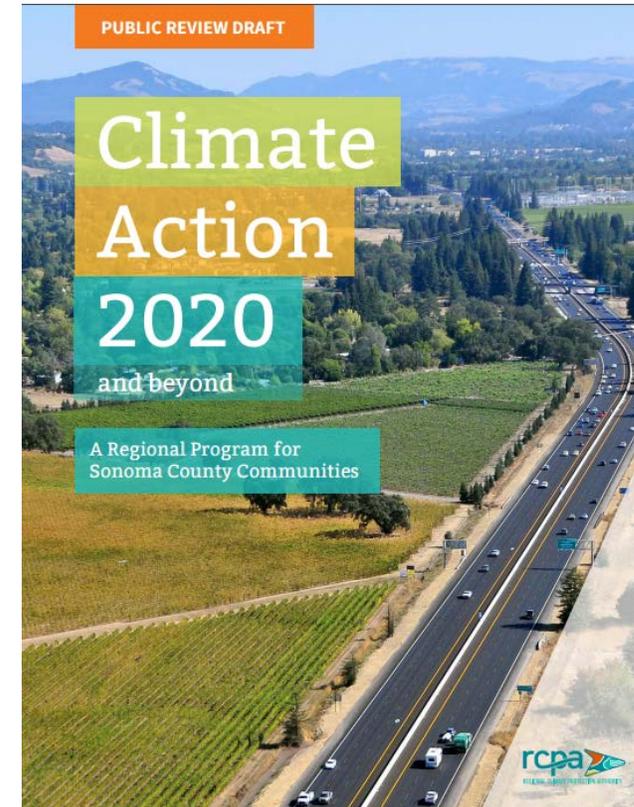


Implement all CTP **Vision Transit Improvements** including headway improvements, rapid bus service, and extended service.

Climate Action 2020

Goals

1. Reduce travel demand through focused growth
2. *Shift to low carbon transportation options*
3. *Increase fuel efficiency*
4. *Shift to low carbon transportation fuels*
5. Reduce idling

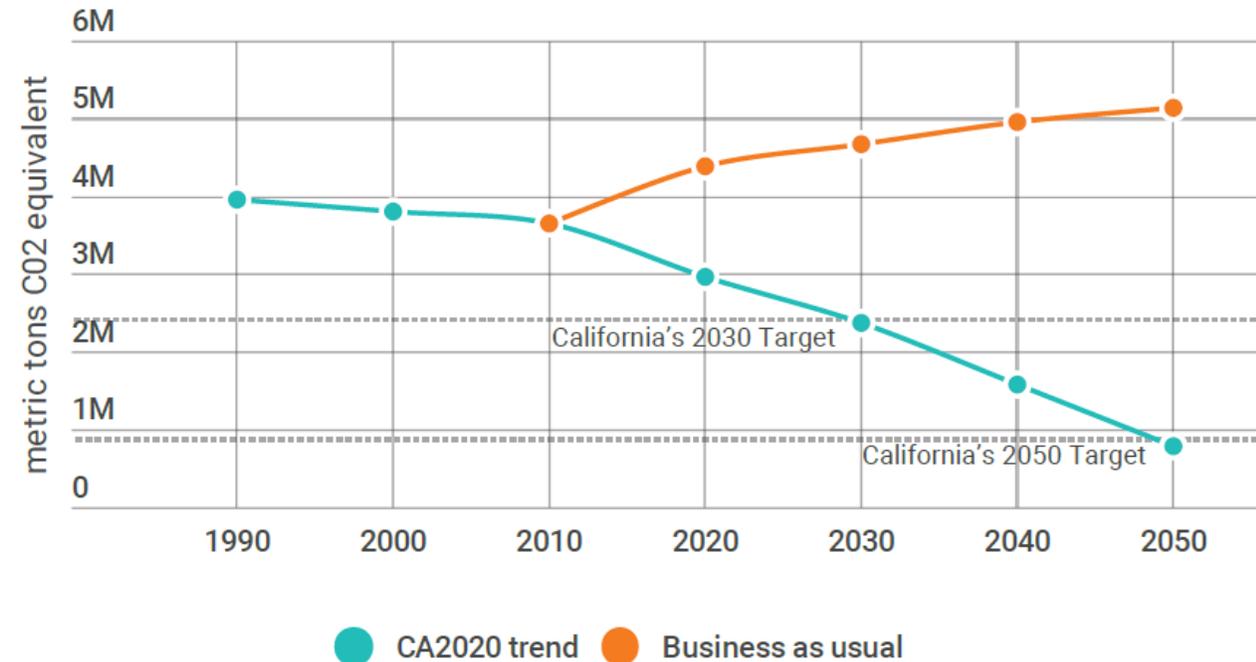


Climate Action 2020 Strategies

Success depends on:

- **Focused growth**
 - ~25% of new residential is mixed use, transit oriented
- **Mode Shift**
 - Expansion of: ride-share, bike share, car share, guaranteed ride home, active transportation infrastructure, transit
- **Fuel Shift**
 - Charging stations double
 - EVs up to 10,000

Business as usual vs. CA2020 trend

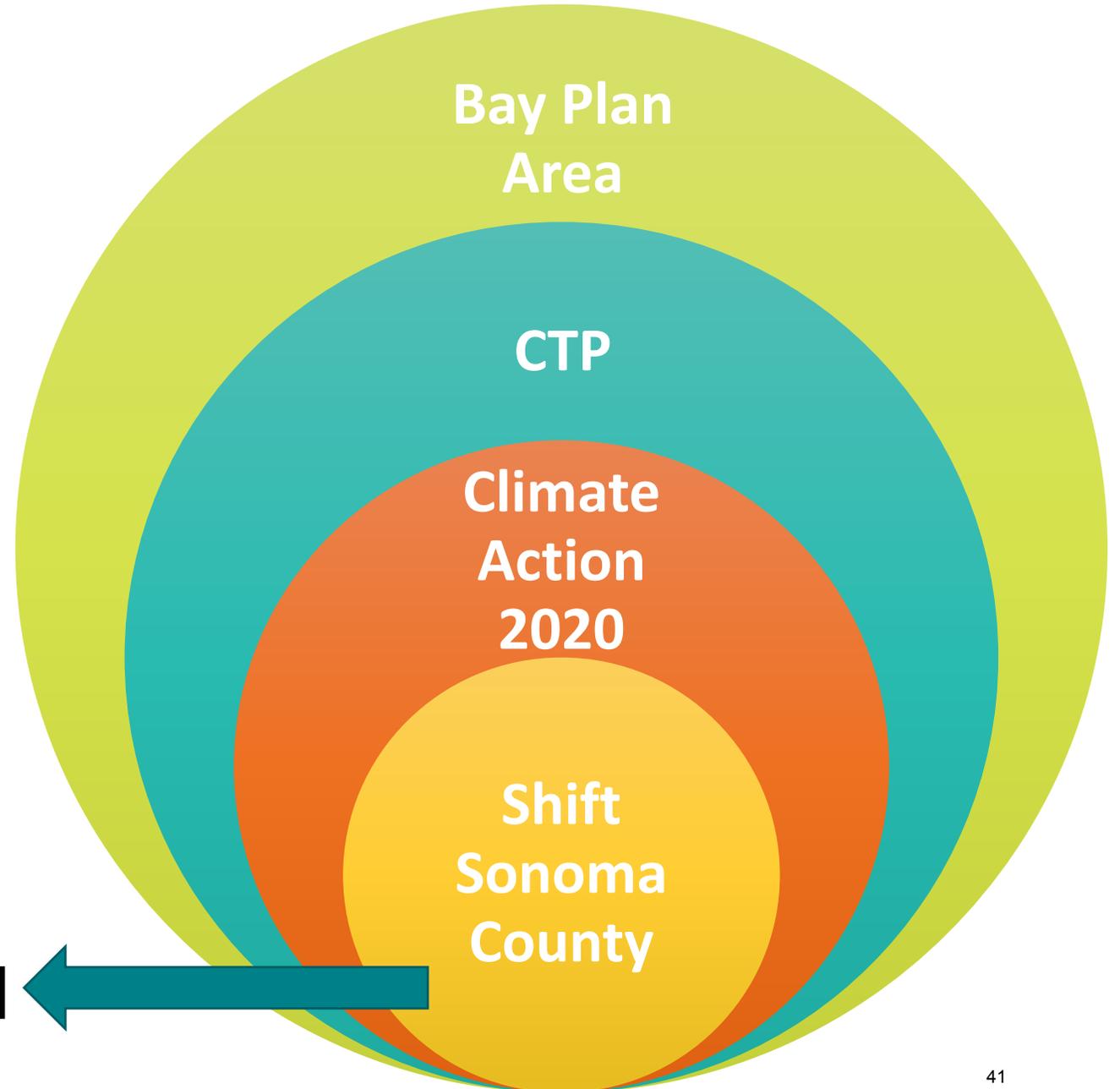


Why Shift?

Put regional and local plans into action to:

- Reduce vehicle miles traveled (VMT)
- Accelerate use of plug-in electric vehicles (EVs)
- Reduce greenhouse gas emissions (GHGs)

TOOLS FOR ACTION



Shift Sonoma County Objectives

Identify:

- Infrastructure and service gaps for low-carbon transportation
- Locations, models, and implementation strategies for car share, bike share, and EV charging infrastructure
- Policy and program gaps and key implementation strategies
- Tools needed to support local actions

Process

Assess needs and gaps



```
graph TD; A[Assess needs and gaps] --> B[Engage experts and community members]; B --> C[Define opportunities]; C --> D[Develop implementation tools];
```

Engage experts and community members

Define opportunities

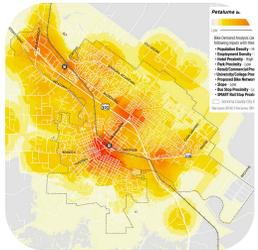
Develop implementation tools

Work Products

Mode Shift



Bike Share Feasibility Study

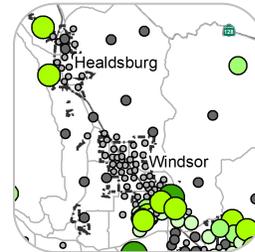


Car Share Feasibility Study



Transportation Demand Management Program Plan

Fuel Shift



EV Charging Infrastructure Siting Framework



Local EV Readiness Policy Toolkit



Updated Guidance for Workplace Charging & EV Fleets

Community Input

- Website updates
- Transportation survey
- Community meetings
- Committees:
 - SCTA Committees
 - RCPA Coordination Committee
 - Local Government EV Partnership
 - EV Stakeholder Advisory Group



Preliminary Mode Shift Findings

Mode Shift Goals: Reduce VMT

- Reduce single occupancy vehicles (SOVs) mode share
- Increase average vehicle occupancy
- Increase transit mode share
- Increase walk and bike commute mode share
- Increase overall walk and bike mode share
- Increase share of children walking and biking to school
- Reduce transportation costs by improving access to alternative modes
- Incent job growth and economic vitality in PDAs through mobility options

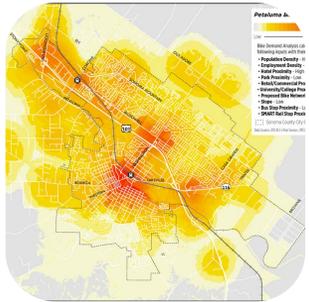
Barriers to Use of Alternative Transportation

- Suburban and rural **land use** is not conducive
- **Bicycle network** is incomplete – dedicated space for bicyclists (Class I, II, and IV bikeways) is essential for safety and new riders
- **Transit viability** is low without supportive programs, frequent connections, and wide coverage
- **Consumer preference** based on convenience and price keep single occupancy vehicle use high

High Priority Tools



Bike Share Feasibility Study



Car Share Feasibility Study



TDM Program Plan

Mode Shift Status and Next Steps

Task	Status
Needs Assessment	Mostly complete, prioritization under review
Bike Share Feasibility Study	Draft available
Car Share Feasibility Study	Under development
Transportation Demand Management Program Plan	To be developed
Mode Shift Action Plan	To be developed

Draft Bike Share Feasibility Study

What is bike sharing?

- Innovative and flexible public service that provides on-demand access to a network of publicly-rentable bicycles.
- Bike share can provide a solution to the last mile from bus and train
- Bike share systems may allow people to pick up a bicycle from point “A” and drop it off at point “B” stations, or may be stationed at any approved bike rack.
- Bike share systems allow various payment options, including per-minute or hour rental and subscriptions.



Market Analysis

POTENTIAL USER MARKETS

Employment centers near dense residential areas and locations immediately surrounding high-volume transit stops such as:

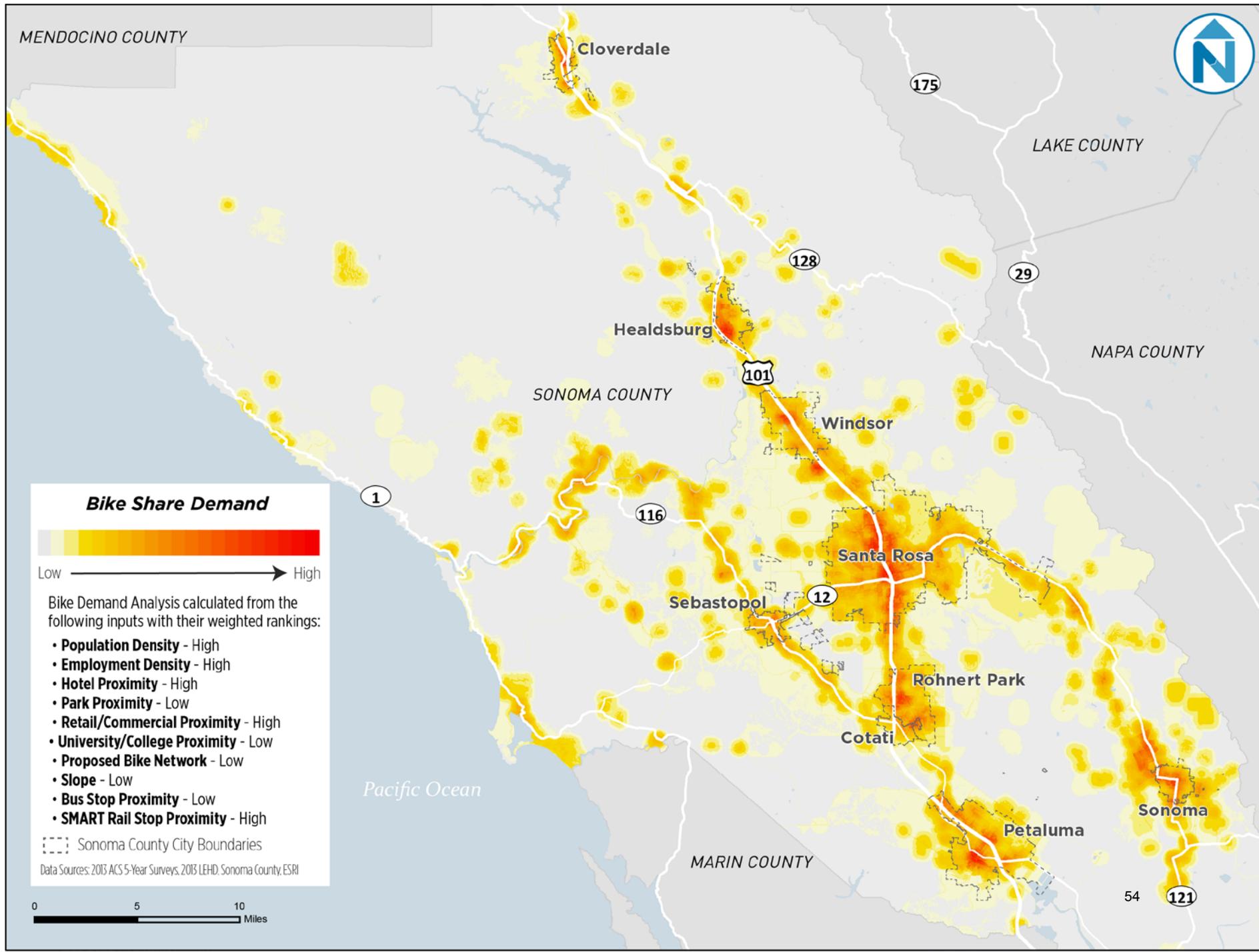
- The Santa Rosa Transit Mall
- SMART Stations, such as in Santa Rosa and Airport Boulevard
- Petaluma River Walk
- Santa Rosa Junior College and Sonoma State University

DEMAND ANALYSIS CONSIDERATIONS

- Trip patterns
- Trip length
- Disadvantaged communities
- Planned Development Areas
- Population density
- Employment density
- Hotels
- Parks
- Retail/commercial hubs
- Slopes
- Proximity to bus/rail stop
- Universities/Colleges

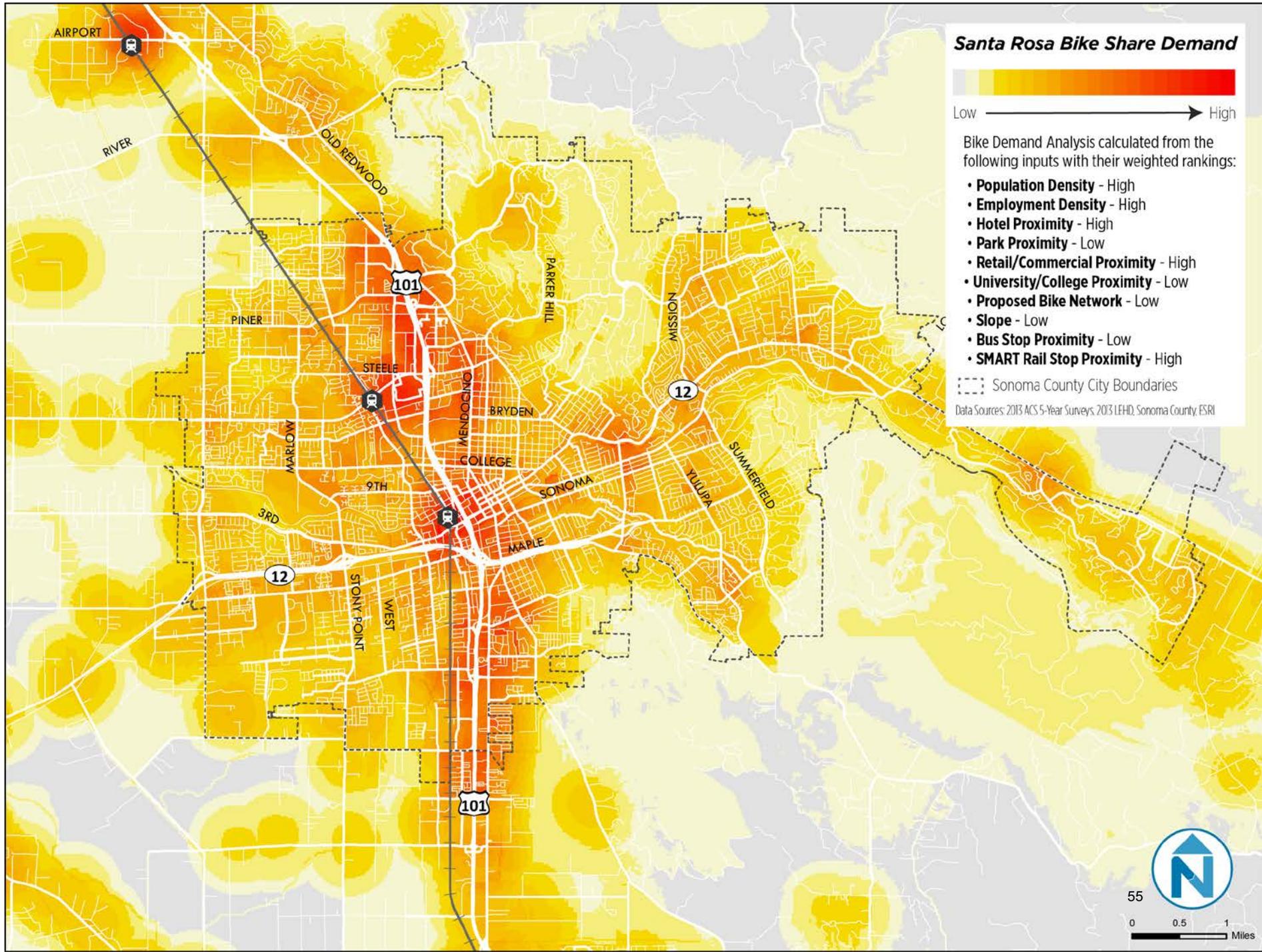
Countywide Demand

Hotspots concentrated in city centers along Highway 101



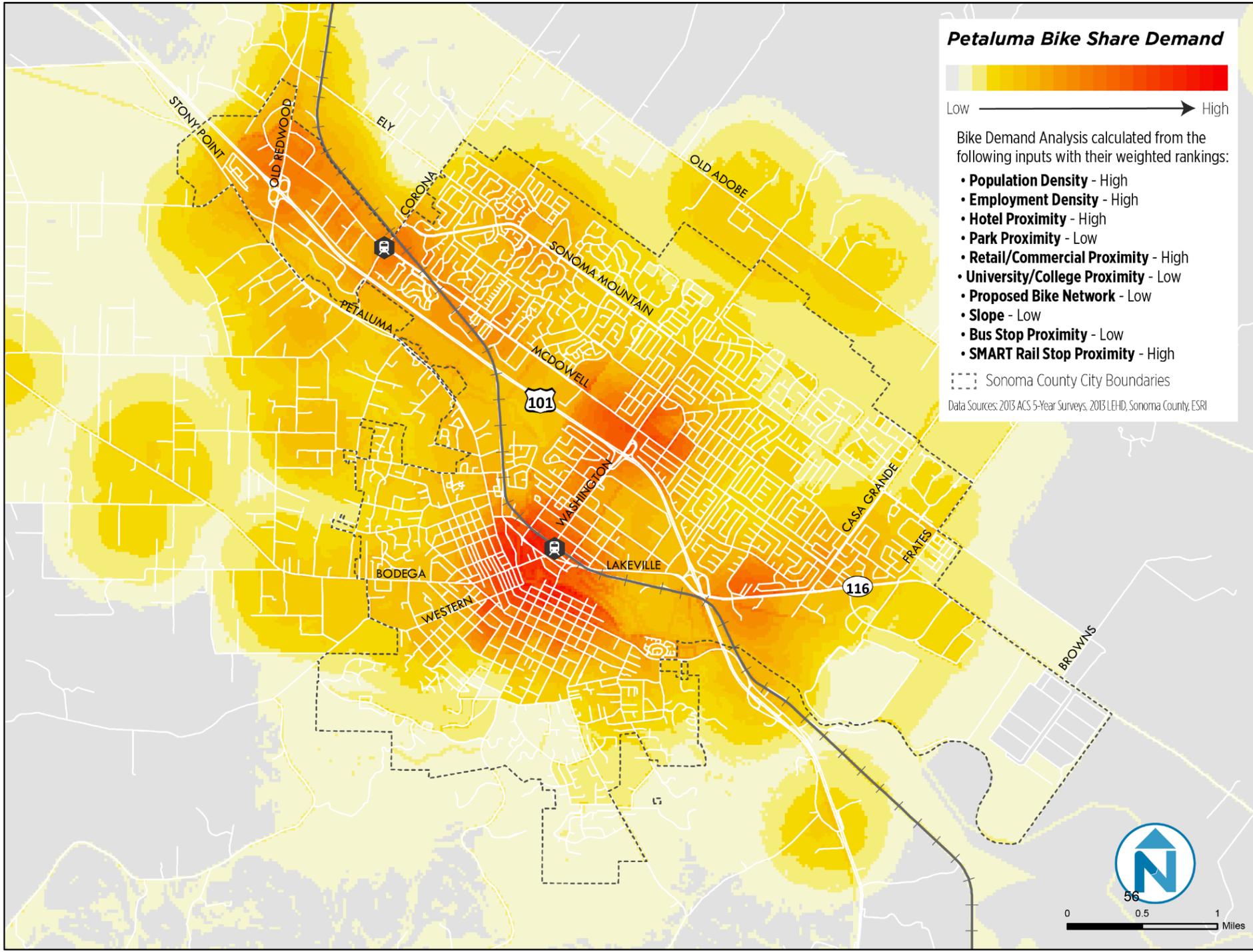
Santa Rosa Demand

Hot spots in Downtown, Railroad Square, Santa Rosa Junior College, North Santa Rosa SMART Station area, Airport SMART Station area



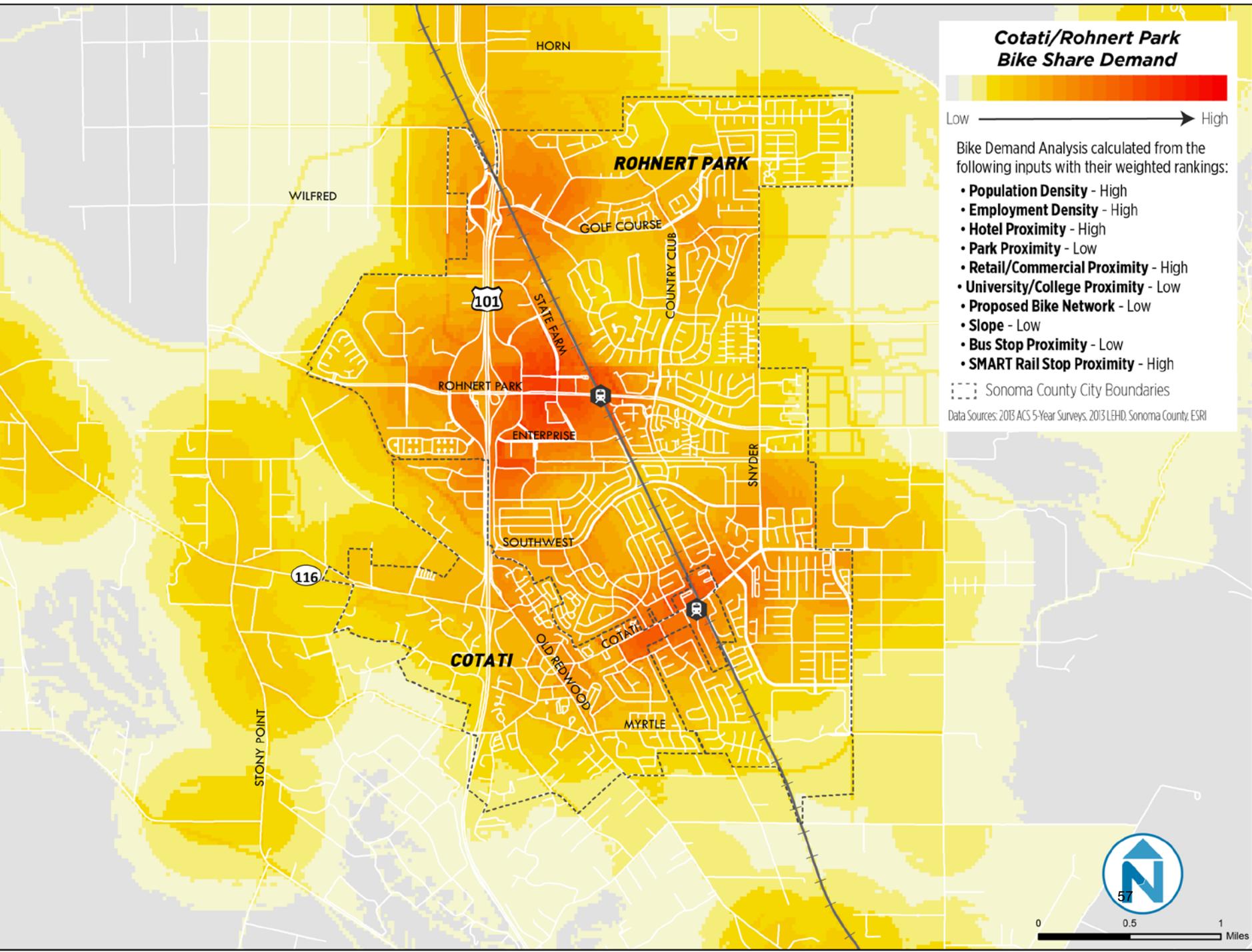
Petaluma Demand

Hot spot in Downtown areas including Riverwalk, marina, SMART Station, and surrounding residential district



Cotati / Rohnert Park Demand

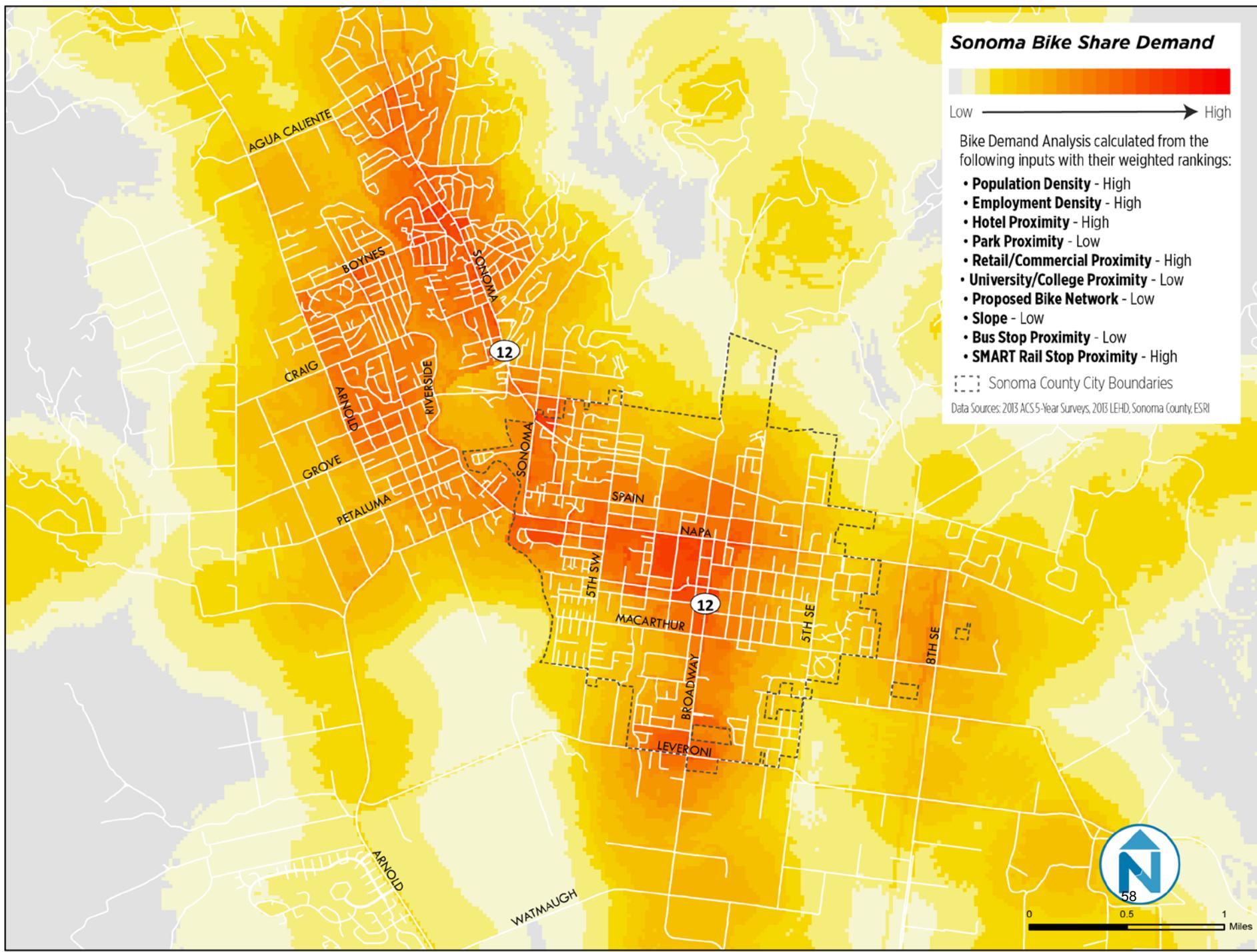
Hot spots around SMART Stations, Sonoma State University



Sonoma Demand

Example of potential demand in smaller city

Hot spots near downtown, higher-density residential districts, wineries and hotels



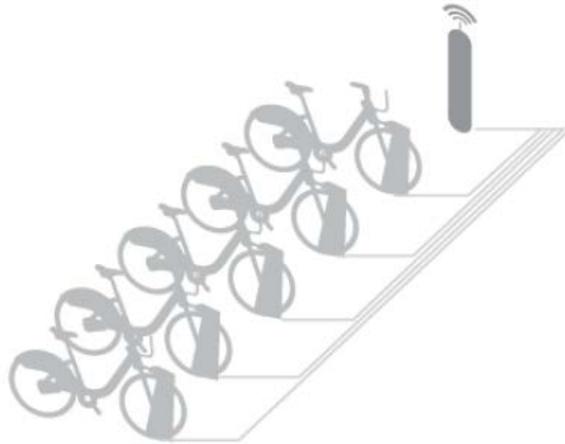
Site Identification Interactive Map

- <https://goo.gl/SzzJzZ>

Operating Models

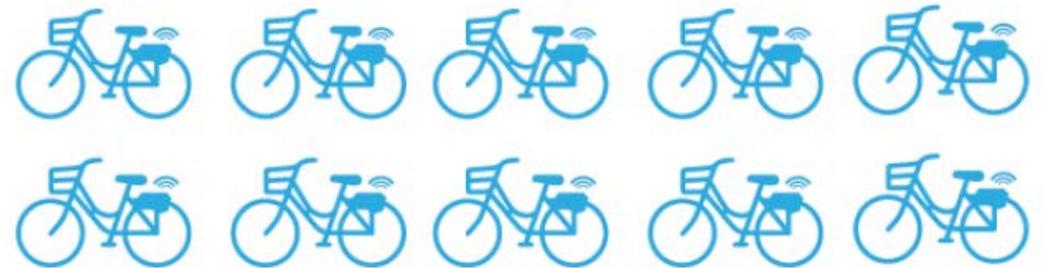
Dock-based

- Traditional fixed dock system with technology built into the docking station



Flexible

- Emerging flexible hub system with technology built into the bicycles themselves

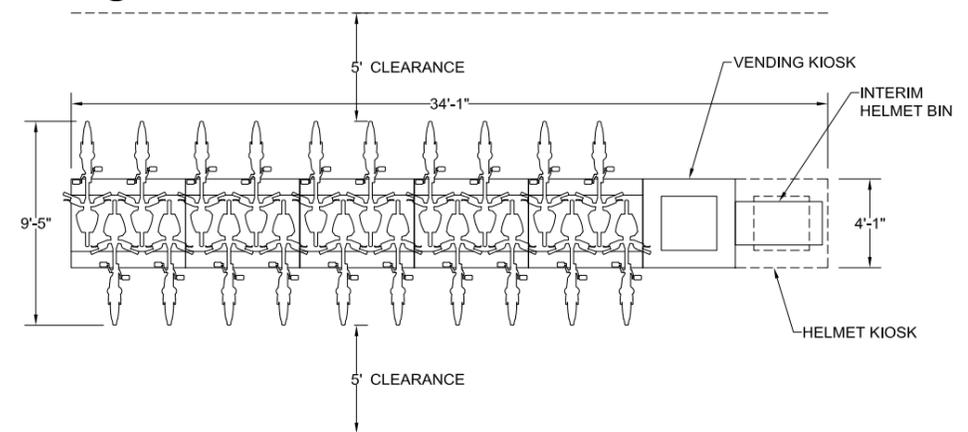


Station Siting Considerations

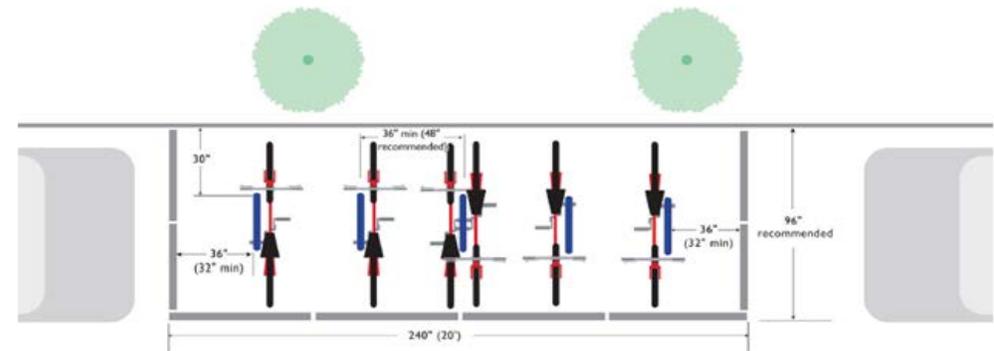
GENERAL REQUIREMENTS

- Unrestricted access
- Highly visible and well-lit at nighttime
- Must not impede through-travelers on other modes, or other amenities
- Located on relatively flat surface
- Provide adequate clearance from driveways (about 5 feet)

Small Docking Station – 10-20 bikes



Standard Bike Corral for Flexible System – 10 bikes

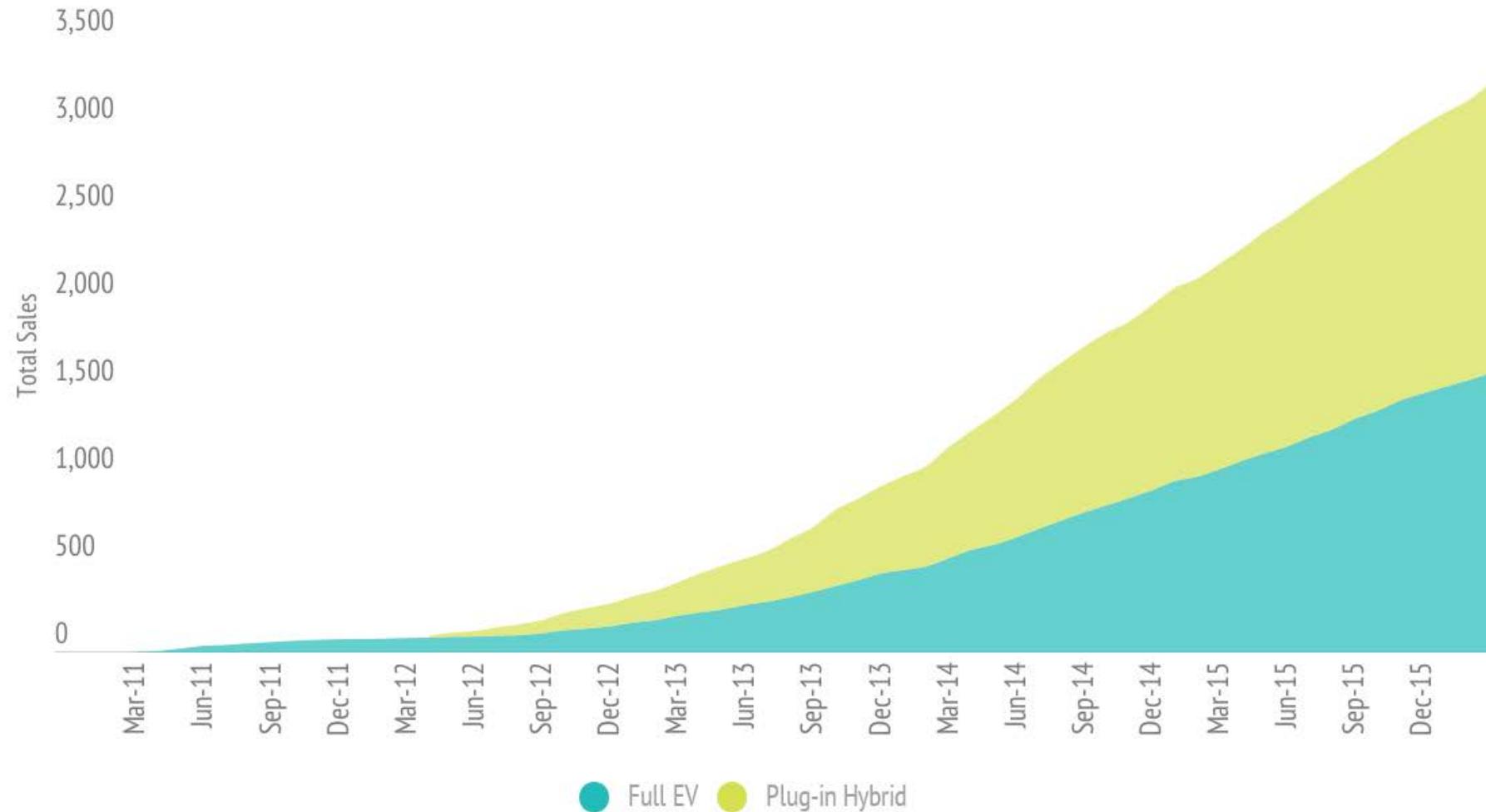


Recommendations and Next Steps

- Recommend flexible bike share system
- Identify funding, partnership/sponsorship
- Gauge interest from bike share vendors
- Provide incentives for local developers to purchase stations or fund operations (reduced parking requirements)
- Consider mobility hubs at transit centers and in peripheral neighborhoods
- Combine bike share system with other improvements and/or programs
- Consider next steps for vendor and operator solicitation, marketing, siting, costs, etc.

Preliminary Fuel Shift Findings

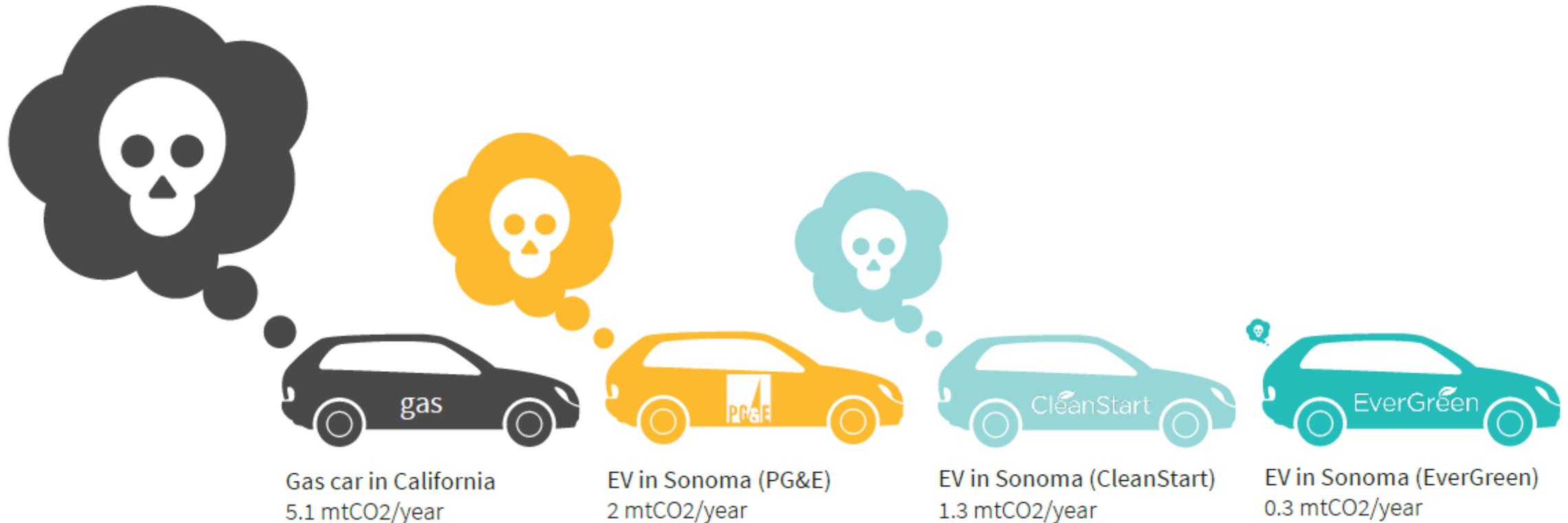
Goal: 10,000 EVs by 2020



EVs have BIG GHG impacts

Annual CO2 emissions from average Sonoma County vehicles

Gas vs. electric vehicle using different power options



Barriers to Growth in EVs

- **Vehicle cost** is still prohibitive for many drivers
- **Charging infrastructure** availability – at work, home, and along corridors
- Lack of **local government readiness** – supportive plans, policies, processes
- Lack of **consumer awareness** – of technology, benefits, and real vs. perceived risks
- Unmet potential in **fleets**
- Complexities associated with **installing and managing charging stations**



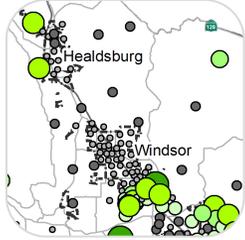
Drive EverGreen

Sonoma County Collaboration to:

- Put **10,000 EVs** on the road by 2020
- **Reduce petroleum use by 50%** by 2030
- Make EVs more convenient, visible, and available to all drivers
- Integrate vehicles with the grid



Shift focus on local: High Priority Tools



Charging Infrastructure Siting Framework



Local Government Readiness Toolkit



Local Guidance for Electrifying Fleets



Local Guidance for Workplace Charging

Fuel Shift Status and Next Steps

Task	Status
Needs Assessment – stakeholder surveys	Mostly complete; a few interviews outstanding
Local opportunity identification	Complete
Communitywide Infrastructure Framework	Draft available, under partner review
Local Government Readiness Toolkit	Status update and recommendations under development
Local Guidance for Electrifying Fleets	Under development
Local Guidance for Workplace Charging	Under development
Fuel Shift Action Plan	To be developed

Draft EV Infrastructure Siting Framework

Types of charging

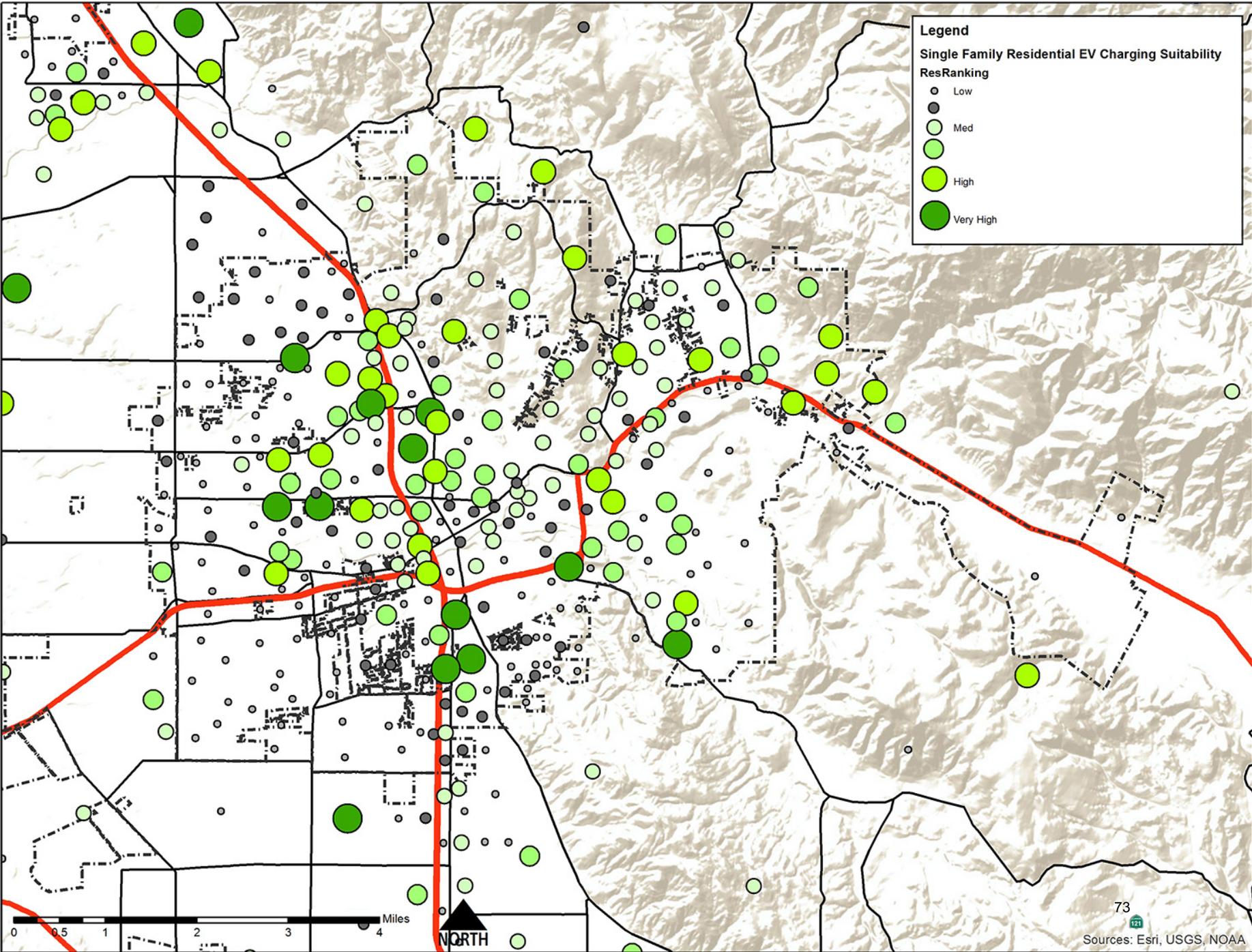
Level 1: EVs come with a cordset that plugs into a standard 110/120-volt AC three-prong wall outlet. It's often good enough for EVs that are parked at home or work for 8 hours/day.

Level 2: Uses 240-volt AC current and should be installed on a dedicated circuit by an electrician. Often used for EVs with larger batteries or plug-in hybrids that need a quick charge.

DC Fast Charge: Uses 440-volt or 480-volt devices with direct current (DC). Provides 50-64 miles of range for 30 minutes of charge. No PHEVs on the market use DC Fast Chargers and many BEVs come without this option.

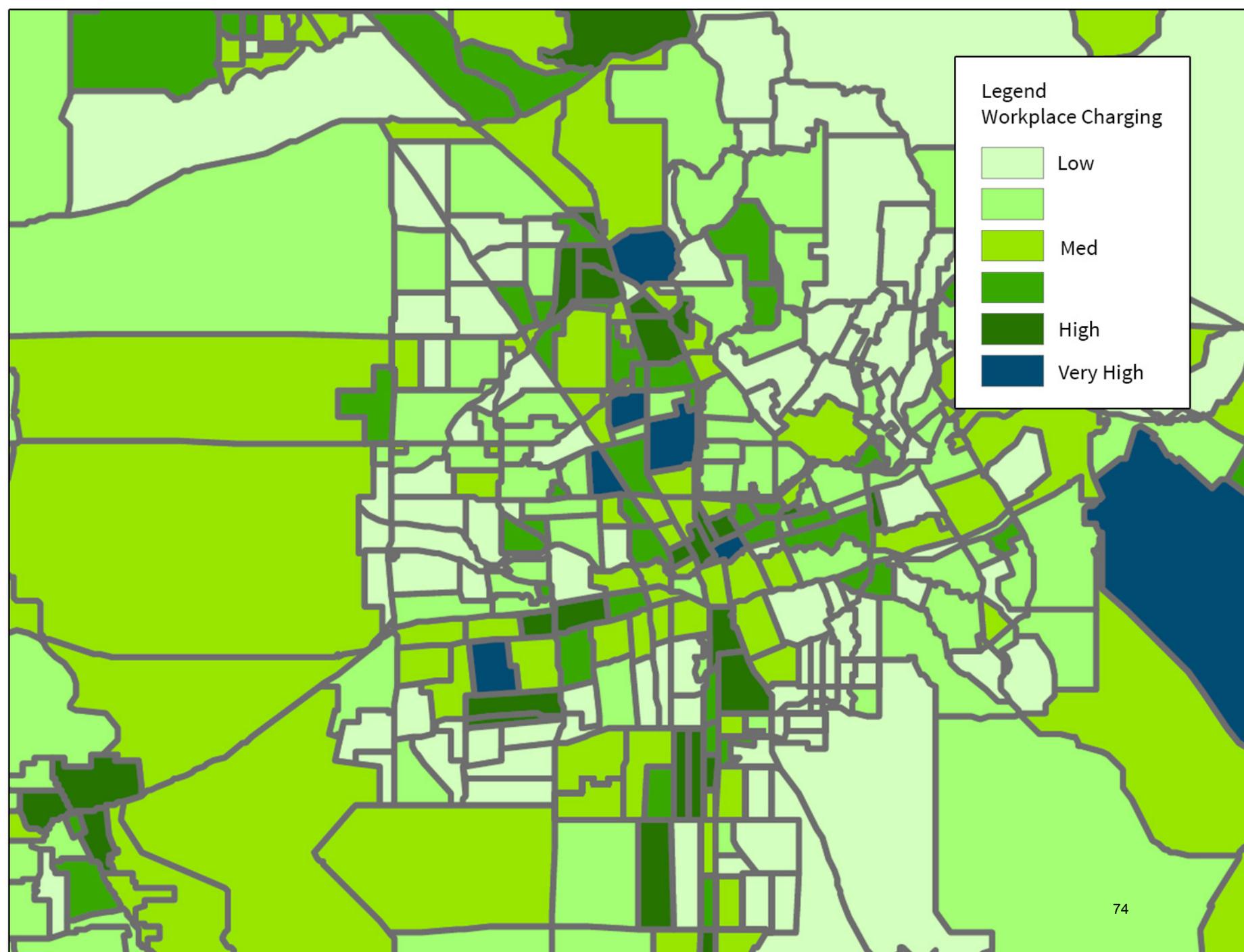
Residential Charging

This map shows the likelihood of single family households acquiring an EV and needing home charging based on income, hybrid ownership, property ownership and housing type.



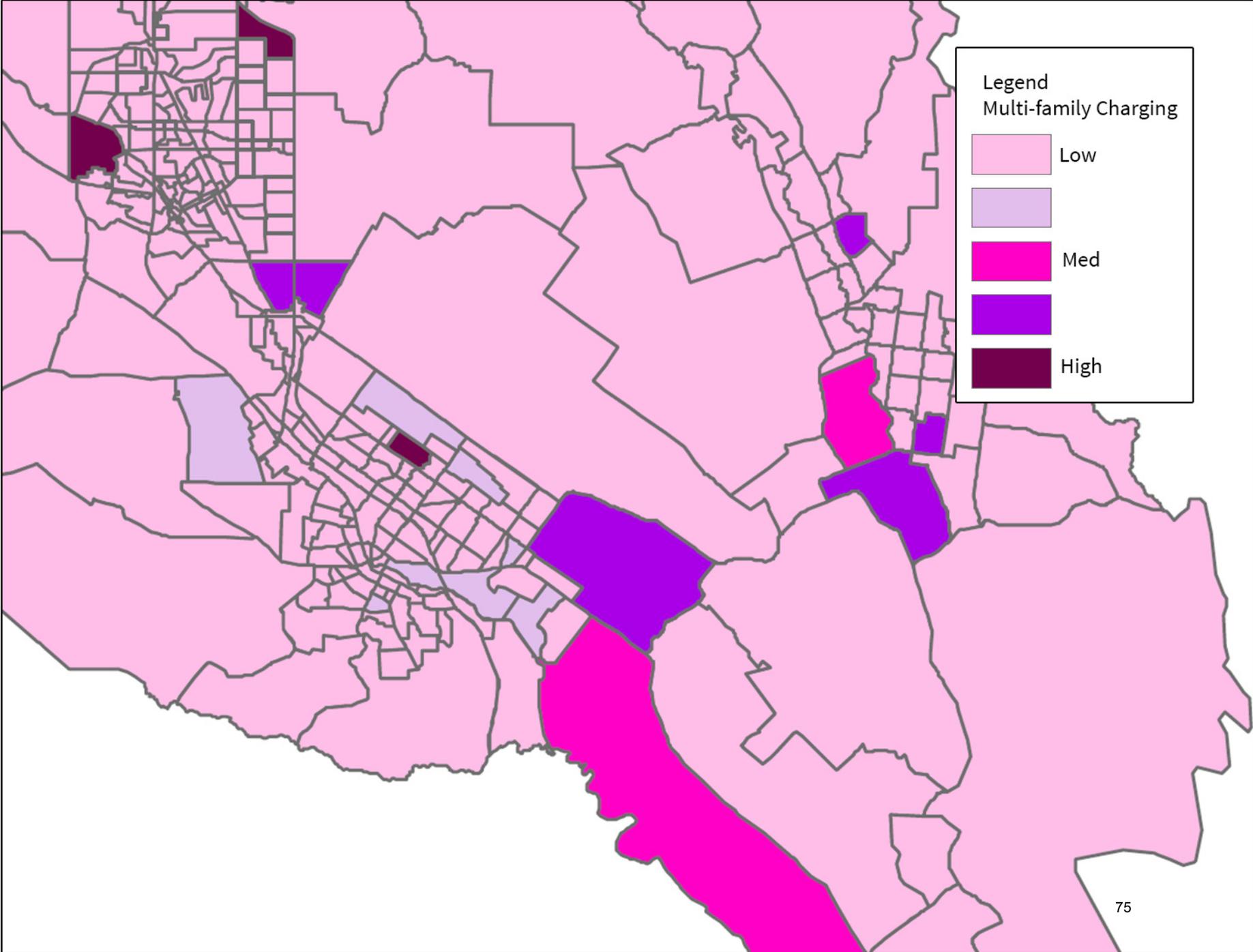
Workplace Charging

This map starts with the data for residential charging and looks at corresponding work trips from the travel model. This shows areas with the most likely workplace charging needs.



Multi-family Charging

This map filters for areas with high multi-family ownership and highlights areas with above median income, above median hybrid ownership, and a high share of multi-family dwellings (instead of a higher rate of single family units).



Thank you

Questions?

Staff Report

To: SCTA Board of Directors
From: Suzanne Smith, Executive Director
Item: 4.3.1 – Plan Bay Area proposed project list
Date: June 13, 2016

Issue:

What is the status of the project list submitted to MTC by SCTA for inclusion in Plan Bay Area? How should the SCTA amend the list to meet the available funding level predicted in the Plan?

Background:

Plan Bay Area is the San Francisco Bay Area's regional transportation plan (RTP), a federally required, long range planning document that includes policies, funding estimates and proposed projects that are anticipated to be implemented over 25 years. It is the regional complement to the SCTA's Comprehensive Transportation Plan.

The RTP is updated every 4 years. As part of the update local agencies like the SCTA are asked to provide their lists of likely projects and MTC provides each county with a budget of anticipated transportation funding that is anticipated to be available over the 25-year life of the plan.

In 2015 the SCTA did a call for projects and then submitted a list of projects to MTC. At that time the budget available for SCTA was ambiguous so we submitted a robust project list that totaled nearly \$2B. MTC has now asked that we tailor our list to meet a budget of \$1.5B. In order to meet this request some projects, primarily those anticipated to be deliverable in 2035 or later, will need to be deferred to a future RTP.

Staff has been working with project sponsors on prioritizing the projects they submitted and talking with MTC about how best to squeeze in the maximum number of viable projects within budget. The projects included in the list do not include bicycle and pedestrian projects, maintaining existing transit operations, local road maintenance or other exempt projects that do not increase capacity.

The result of these discussions has led to the attached proposal for the Board to consider, though it is pending SMART discussions with MTC about the scope of the project extension north to Cloverdale.

The opportunity to be included in the next RTP will be made available in 4 years.

Policy Impacts:

Inclusion in the RTP does not guarantee actual funding for a project. The RTP is meant to serve as a realistic planning tool with assumptions about transportation funding that will be available over a 25-year period and what projects would be of highest priority to use those funds.

Fiscal Impacts:

There are no direct fiscal impacts to this item however, a project must be in the RTP in order to be eligible for federal or State funding.

Staff Recommendation:

Consider approving the proposed project list for Plan Bay Area.

Plan Bay Area - Projects within Sonoma County

Capacity Increasing Non-Exempt

Sponsor Agency	Project Title	Construction Start Year UPDATE	Cost YOE UPDATE	Fund Comm Prior-2017	Fund Comm Post-2017	Fund Disc Regional UPDATED
Cotati	Cotati Highway 116 Cotati Corridor Improvements	2025	\$20.0	\$0.0	\$20.0	\$0.0
	Cotati US 101/Railroad Avenue Improvements (incl. Penngrove)	2030	\$56.0	\$0.0	\$56.0	\$0.0
Petaluma	Petaluma Crosstown Connector and Rainier Interchange	2019	\$123.0	\$0.0	\$123.0	\$0.0
	Road Diet Extension - Petaluma Boulevard South	2018	\$3.0	\$0.0	\$0.0	\$0.0
	Southern Crossing at Caulfield	2020	\$80.0	\$0.0	\$80.0	\$0.0
Rohnert Park	Bodway Parkway Extension	2020	\$2.0	\$0.0	\$2.0	\$0.0
	Dowdell Avenue Extension	2017	\$2.0	\$0.0	\$2.0	\$0.0
	Snyder Lane Widening - South of G Section to San Francisco Way	2022	\$8.0	\$0.0	\$8.0	\$0.0
Santa Rosa	Corby Avenue between Baker Ave and Hearn Ave	2040	\$14.0	\$0.0	\$14.0	\$0.0
	Farmers Lane extension between Bennett Valley Rd and Yolanda Avenue	2025	\$67.0	\$5.0	\$67.0	\$0.0
	Fulton Road improvements between Guerneville Rd and Piner Rd	2018	\$10.0	\$0.0	\$10.0	\$0.0
	Hearn Avenue Interchange	2020	\$36.0	\$0.0	\$36.0	\$0.0
Sonoma County	Airport Boulevard Widening Ordiance Road and Aviation Boulevard	2030	\$7.0	\$0.0	\$7.0	\$0.0
	Brickway/Laughlin Corridor Improvements	2016	\$20.0	\$18.5	\$20.0	\$0.0
	River Road Widening - Fulton To Old Redwood Hwy	2026	\$9.0	\$0.0	\$9.0	\$0.0
Sonoma County	Enhance bus service frequencies in Sonoma County	2017	\$409.0	\$0.0	\$150.0	\$150.0

Transportation	Implement Marin Sonoma Narrows Phase 2 (Sonoma County)	2018	\$223.0	\$0.0	\$100.0	\$123.0
	SMART Petaluma Infill Station	2018	\$11.0	\$0.0	\$11.0	\$0.0
	SMART Rail Extension to Windsor - Healdsburg - Cloverdale	2018	\$465.0	\$0.0	\$188.0	\$277.0
	SMART Rail Freight Improvements	2018	\$43.0	\$0.0	\$20.0	\$0.0
Windsor	Arata Lane Interchange	2020	\$4.0	\$0.0	\$4.0	\$0.0
	Jaguar Way	2020	\$5.0	\$0.0	\$5.0	\$0.0
	Old Redwood Highway: Widen from Arata Lane to North Town Limits	2023	\$5.0	\$0.0	\$5.0	\$0.0
	Old Redwood Highway: Windsor Road to Arata Lane	2025	\$16.0	\$0.0	\$16.0	\$0.0
	Shiloh Road Interchange Reconstruction	2020	\$27.0	\$0.0	\$27.0	\$0.0
Caltrans	State Route 37 Corridor Protection and Enhancement - Env.	2020	\$15.0	\$0.0	\$10.0	\$0.0
	Total		\$1,680	\$24	\$990	\$550

Non-Capacity Increasing Exempt

Sponsor Agency	Project Title		Cost 2017 UPDATE	Cost YOE UPDATE	Fund Comm Post-2017	Fund Disc Regional UPDATED
County of Sonoma	Improve channelization and traffic signalization at Route 116/Route 121 intersection (includes Arnold Drive improvements)		\$23.0	\$0.0	\$5.0	\$13.0
County of Sonoma	Install traffic signal system on Route 121 and improve channelization at 8th Street		\$41.0	\$0.0	\$0.0	\$0.0
County of Sonoma	Intersection Control on Hwy 116 at 2 locations in Sebastopol		\$4.0	\$0.0	\$0.0	\$2.0
County of Sonoma	Intersection Improvements at SR12 Broadway and SR12 West Napa St.		\$4.0	\$0.0	\$0.0	\$2.0
City of Sonoma	Improve channelization and traffic signalization on Mirabel Road and Route 116		\$8.0	\$0.0	\$3.0	\$0.0
City of Sonoma	Intersection Improvements at Fifth St. West and West MacArthur St.		\$2.0	\$0.0	\$0.0	\$1.0
County of Sonoma	Intersection Improvements at West Spain St. and Fifth St. West		\$2.0	\$0.0	\$0.0	\$1.0
County of Sonoma	Impr local circulation at var. loci in Penngrove (incl imprvs to Main St, Petaluma Hill Rd, Adobe Rd, Old Redwood Hwy and U.S. 101/Railroad Avenue)		\$42.0	\$0.0	\$19.0	\$10.0
Windsor	Conde Lane: Oakfield Lane to Mitchell Lane		\$5.0	\$0.0	\$0.0	\$1.0
SCTA	Implement landscaping along the HOV lanes on U.S. 101 between Steele Lane and Windsor River Road		\$7.0	\$0.0	\$2.0	\$0.0
SCTA	Implement bicycle and pedestrian improvements countywide		\$519.0	\$0.0	\$0.0	\$517.0
SMART	SMART Pathway		\$150.0	\$0.0	\$10.0	\$140.0
SCTA	Local streets and roads operations and maintenance		\$3,520.0	\$8.0	\$0.0	\$3,508.0
Windsor	Shiloh Road and Windsor Road Pavement Rehabilitation		\$1.0	\$0.0	\$0.0	\$0.5
	Median Safety Barrier Improvements at Fifth St. West		\$3.0	\$0.0	\$0.0	\$1.5
Petaluma	Road Diet Extension - Petaluma Boulevard South		\$3.2	\$3.0	\$3.0	\$0.0
Santa Rosa	Santa Rosa Corridor Plan between Sonoma Avenue and Maple Street		\$5.4	\$9.0	\$9.0	\$0.0
Santa Rosa	Sebastopol Road Corridor Plan between Olive St and Dutton Avenue		\$8.2	\$14.0	\$14.0	\$0.0

SCTA	Improve bridges countywide		\$86.0	\$112.0	\$112.0	\$0.0
Santa Rosa	Santa Rosa Corridor Plan between Sonoma Avenue and Maple Street		\$9.0	\$0.0	\$9.0	\$0.0
Santa Rosa	Sebastopol Road Corridor Plan between Olive St and Dutton Avenue		\$14.0	\$0.0	\$14.0	\$0.0
	Total		\$4,457	\$146	\$200	\$4,197

Staff Report

To: RCPA Board of Directors
From: Lauren Casey, Director of Climate Programs
Item: 4.4.1 – RCPA Activities Report
Date: June 13, 2016

Issue:

Information only.

Background:

Legislation

RCPA Sunset Removal – SB 1030 (McGuire)

Senate Bill 1030 was referred out of the Senate Transportation & Housing, Environmental Quality, and Appropriations Committees and passed the floor vote in the Senate on May 9 (27 ayes, 8 noes). The bill will be considered by the Assembly Committee on Local Government on June 15.

Water Bill Savings Act – SB 1233 (McGuire)

Senate Bill 1233 was referred out of the Senate Governance and Finance Committee with several Amendments added to clarify consumer protections. Senator Hertzberg has joined as a co-author and the bill passed the floor vote in the Senate on May 26 (34 ayes, 2 noes).

Climate Action Planning

Climate Action 2020

RCPA Staff have presented the Draft CAP to all Councils around Sonoma County. The purpose of these presentations was to introduce the proposed draft, explain the framework as developed by the Staff Working Group under the direction of the RCPA Board over the first two years of project effort, and seek feedback on how well the proposal specific to each community reflects the unique priorities and opportunities in each local government's jurisdiction.

The period for comments on the Draft EIR closed on May 6th and the deadline for comments on the Draft CAP was May 31st. Staff held a public meeting on April 20th.

Staff also convened a meeting of the RCPA Staff Working Group on June 2 to discuss the Draft CAP. Community presentations have also made to the North Bay Association of Realtors, Sonoma County Alliance, Sonoma County Winegrowers and the Water Advisory Committee.

Input collected through all of these channels is being collated and considered for edits to be included in a Final Draft CAP and Associated EIR to return to the RCPA Board for adoption and EIR certification. After RCPA Board consideration, the Final CAP and EIR will be brought back to the Board of Supervisors and Councils.

Coordination Committee

The May 19 Coordination Committee meeting featured Amy Dryden, from Build It Green, who presented on opportunities for above code ordinances. Build It Green, a non-profit, is working with BayREN, PG&E and the California Public Utilities Commission to engage with local governments to support attainment of local goals and adoption of above code ordinances. They have identified 12 measures that exceed 2016 code and Build It Green is available to help local governments adopt and implement these measures. Several measures such as outdoor lighting, electric vehicle charging readiness, and solar photovoltaic, fit very well with the CAP. Draft adoption documents will be ready in July 2016, with final adoption documents ready in August 2016. Implementation support would follow in August-December 2016.

Staff from RCPA members and partners were on hand to ask questions and provide feedback on the proposed measures and priorities. For those RCPA members who were unable to attend, staff will be following up and surveying opportunities to continue working on above code ordinances.

Department of Energy Grant Application

RCPA Staff submitted a concept paper for the Department of Energy's Cities Leading Through Energy Analysis and Planning (CITIES-LEAP) funding opportunity. Staff submitted a concept to establish a Regional Climate Action Dashboard for collaboration across the local governments of Sonoma County on the implementation of the Sonoma County Regional Climate Action Plan. This concept was accepted on May 24, and RCPA staff and partners are working on a full submittal, due June 17.

More information about the Cities-LEAP program and FOA can be found at: <http://energy.gov/eere/cities-leading-through-energy-analysis-and-planning>.

Energy Efficiency

Bay Area Regional Energy Network

Staff continue to coordinate on the implementation of regional Codes and Standards trainings and forums, single family and multifamily retrofit incentives, and a regional standard PACE operator agreement that leverages lessons learned in the Sonoma County PACE Financing Marketplace.

Staff also continue to work with the Town of Windsor to improve on the model for Windsor Efficiency PAYS and to increase participation by single family properties. A highlight from Windsor PAYS in May was a series of meetings with representatives from the real estate, land title, and mortgage industries to promote the program and solicit feedback on the best process for disclosure of the efficiency measures and efficiency charge established on PAYS participating property accounts. The disclosure process will improve the ability of single family properties to participate in the program, including rental properties.

Public Outreach and Events

RCPA Website

Staff will be making continuous improvements to the RCPA website, specifically to make sure that opportunities to participate in current programs and planning efforts are clear and current and to ensure that historic resources developed by the RCPA are accessible to partners and the public.

Local Government Sustainable Energy Coalition (LGSEC) Quarterly Meeting

Staff attended the LGSEC's Quarterly Meeting on May 20 which included an in-depth energy and climate regulatory and legislative update, a discussion of energy storage opportunities and roadblocks to

implementation, an opportunities for community scale renewables, and an update on PACE standardization efforts.

Climate Action Summit

The Director of Climate Programs attended Climate Action 2016, a mid-year summit focused on the implementation of the Paris Climate Agreement and U.N. Sustainable Development Goals, on May 5 and 6. The particular focus of the conference was to strengthen coalitions across government, business, finance, philanthropy, academic leaders, and civic society. The agenda was full of sessions on how to deliver on climate commitments using data, financing, and storytelling.

Highlights relevant to the work of the RCPA:

- The next Assessments from the Intergovernmental Panel on Climate Change will be very focused on cities
- Exponential declines in the cost of low carbon technologies have created significant optimism about the economic drivers of climate solutions
- Climate Resilient investing is becoming standard fiduciary practice
- Participation in global networks like the Compact of Mayors, the Compact of States and Regions, the Under 2 MOU, and the Carbon Disclosure Project may help increase the visibility of Sonoma County projects for the purposes of attracting investors and philanthropy

The next meeting of the Conference of the Parties (COP 22) in Marakesh, Morrocco in November will be very focused on social innovation, recruiting participation from more engineers, architects, planners, bankers, and other leaders responsible for implementation rather than the traditional emphasis on diplomats.

Policy Impacts:

None.

Fiscal Impacts:

None.

Staff Recommendation:

Information only.

Staff Report

To: RCPA Board of Directors
From: Lauren Casey, Director of Climate Programs
Item: 4.4.2 – Adaptation: Climate Ready North Bay Project Results
Date: June 13, 2016

Issue:

Information only.

Background:

Climate Ready North Bay Project Background

The Climate Ready North Bay (CRNB) project was developed to delve deeper into local climate risks to support decision makers in using projections rather than past patterns in the planning, design, and operation of infrastructure, utilities, natural resource management, and human services.

Detailed scenarios for key climate indicators such as temperature, precipitation, runoff, groundwater recharge, fire risk, soil moisture, and other indicators can change how local government does many things, including operate reservoirs, build storm water systems, manage forests, zone the wild urban interface, fund emergency services, etc.

The goal of Climate Ready North Bay is to engage natural resource agencies, including water agencies, parks, and open space districts, and other municipal users to collaboratively design climate vulnerability information products specific to their jurisdictions, mandates, and management priorities.

With agency input guiding the development of the vulnerability assessments, spatially-explicit data products are now available to help local governments and agency staff implement informed and effective climate adaptation strategies.

These products include customized maps, graphs, and summary technical reports tailored to site-specific resource management challenges, located within the watersheds of the North Bay Area.

All project results are housed on the California Climate Commons:

<http://climate.calcommons.org/crn/home>.

The attached Regional Technical Memo summarizes outcomes of the CRNB project, and the core regional data sets used by the collaboration as a starting point for understanding potential climate stressors facing North Bay open spaces and watersheds in the decades to come. It summarizes the stakeholder engagement process and the basic regional data sets. Data sets are grouped into three resource areas: 1) water resources (including rainfall, water supply, and drought) 2) native vegetation response and 3) fire risks. Appendices include a glossary, details on climate models and summary tables, and a list of regional data products generated.

The take home messages from the project include:

- Rising temperatures across the region will generate unprecedented warm conditions for both summer and winter seasons.
- Rainfall is likely to be more variable in the future.
- The North Bay region is becoming more arid (subject to drier autumn soil conditions) due to rising temperatures.
- Runoff may be increasingly flashy, with rates of groundwater recharge relatively less variable over time.
- Protecting available recharge areas will be critical to water supply sustainability.
- Water demand for agriculture may increase on the order of 10%.
- Fire frequencies are projected to increase on the order of 20%, requiring additional readiness planning and more aggressive fuels management.
- Vegetation may be in transition, meriting additional monitoring and consideration of a more drought-tolerant planting palette.

Presentation

Dr. Lisa Micheli of Pepperwood will provide a presentation to the RCPA Board as an overview of the process and results from the Climate Ready North Bay Project.

Next Steps

Climate Ready North Bay work products are available on the California Climate Commons. The RCPA will work with the NBCAI team to train RCPA members on the data products and work with them to integrate reports into future planning efforts as appropriate and determined by each community. The Planning Advisory Committee and Technical Advisory Committee will be used to present data products to planning and public works staff.

Agency-specific applications are summarized in companion technical memorandum generated for each user group. Immediate applications of *Climate Ready* data underway include the following pilots:

- MMWD is exploring the use of Climate Ready North Bay hydrology projections as part of an Urban Water Management Plan update to assess supply reliability for the next 40 years.
- Sonoma County Water Agency is using Climate Ready North Bay Russian River flow projections as the foundation of their Climate Adaptation Plan for storage and delivery system operations.
- Napa County is using Climate Ready North Bay recharge maps as an input to its Groundwater Management planning efforts underway.
- Sonoma County Regional Parks is using Climate Ready North Bay vegetation and fire analyses to prioritize the development of forthcoming parcel-specific management plans.

Additionally, there are a number of current or future planning processes throughout the North Bay region that integration of this climate vulnerability assessment data could benefit that include the following:

- Environmental impact reports
- Local hazard mitigation plans
- Safety elements of general plans
- Reservoir operations and urban water sustainability planning
- Parks, trails, and open space parcel master plans
- Open space acquisition plans
- Stormwater, urban water, and flood management plans and ordinances
- Groundwater sustainability plans
- Public health monitoring procedures
- Street tree and water efficient landscaping ordinances
- Zoning, building, and fire codes
- Climate action plans
- Agency-specific climate adaptation plans
- Parcel or jurisdiction-specific stewardship plans

The RCPA and NBCAI partners are exploring additional resources that may be able to support scenario planning and policy assistance for use of CRNB data products within the project and planning efforts listed above.

Policy Impacts:

The CRNB Vulnerability Assessment helps advance the climate readiness goals established in Climate Action 2020.

Fiscal Impacts:

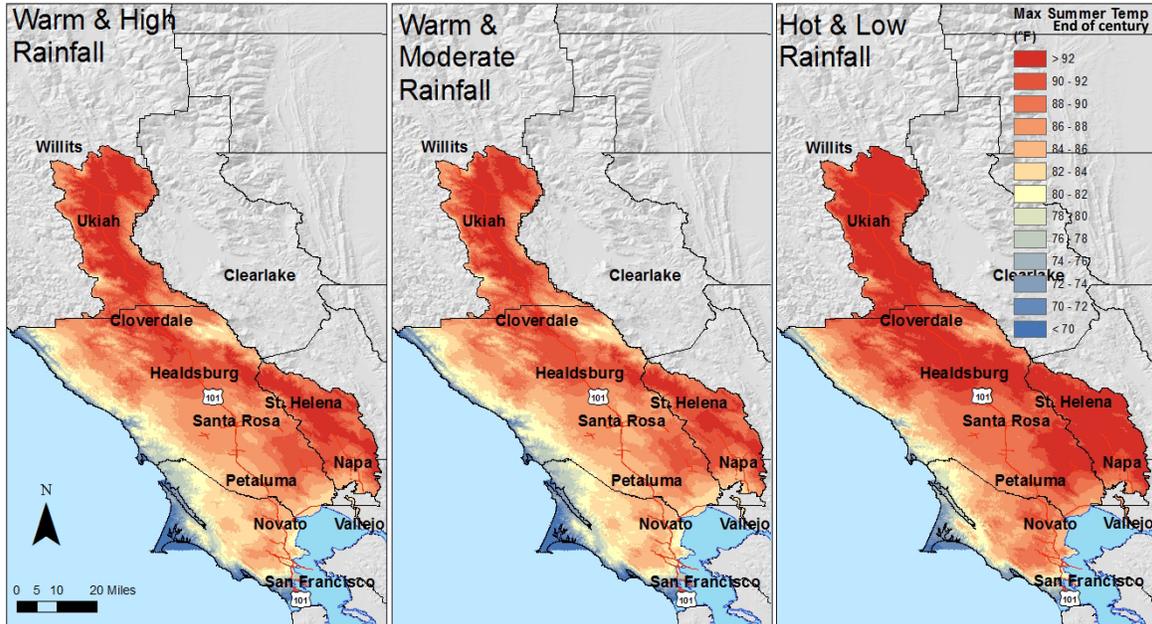
The California State Coastal Conservancy’s (SCC) Climate Ready Grant Program provided \$100,000 to the RCPA and NBCAI team, which leveraged over \$300,000 of funds from project partners including the North Bay Watershed Association, the Sonoma County Water Agency, and several municipal utilities in Napa and Marin Counties.

Staff Recommendation:

That the Board Chair participate in a symbolic Ribbon Cutting associated with the release of the Climate Ready North Bay data products.

Climate Ready North Bay Vulnerability Assessment Data Products

North Bay Region Summary
January 2016



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A Dwight Center for
Conservation Science

Technical Memorandum

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Introduction

What is Climate Ready North Bay?

To create a framework for adapting to climate change, decision-makers working in Northern California's watersheds need to define climate vulnerabilities in the context of site-specific opportunities and constraints relative to water supply, land use suitability, wildfire risks, ecosystem services, biodiversity, and quality of life (e.g. Mastreanda 2010, Ackerly et al. 2012). Working in partnership with the Sonoma County Regional Climate Protection Authority (RCPA) and the North Bay Climate Adaptation Initiative (NBCAI), Pepperwood's Terrestrial Biodiversity Climate Change Collaborative (see Chornesky et al. 2013, TBC3.org) has developed customized climate vulnerability assessments with select natural resource agencies of California's Sonoma, Marin, Napa and Mendocino counties via *Climate Ready North Bay*, a public-private partnership funded by the California Coastal Conservancy's Climate Ready program.

The goal of *Climate Ready North Bay* is to engage natural resource agencies, including water agencies, parks, open space districts, and other municipal users to collaboratively design climate vulnerability information products specific to their jurisdictions, mandates, and management priorities. With agency input guiding the development of the vulnerability assessments, spatially-explicit data products are now available to help local governments and agency staff implement informed and effective climate adaptation strategies. These products include customized maps, graphs, and summary technical reports tailored to site-specific resource management challenges, located within the watersheds illustrated in Figure 1.

Project Partners

Climate Ready North Bay is made up of a coalition of conservation leaders, land managers, decision-makers, and scientists all working together to better understand and address climate vulnerabilities to North Bay watersheds. Participating entities include: California Coastal Conservancy (funder); North Bay Climate Adaptation Initiative (partner); Sonoma County's Regional Climate Protection Authority (lead applicant); Sonoma County's Water Agency, Regional Parks, and Agricultural Preservation and Open Space District (users); multiple Napa County departments (users); Marin Municipal Water District (user); and Mendocino Flood Protection and Water Conservation District (user). The core vulnerability assessment technical team consisted of Drs. Lisa Micheli (project manager) and Nicole Heller (Dwight Center for Conservation Science at Pepperwood), Dr. Lorraine Flint (USGS), and Dr. Sam Veloz (Point Blue Conservation Science). The project

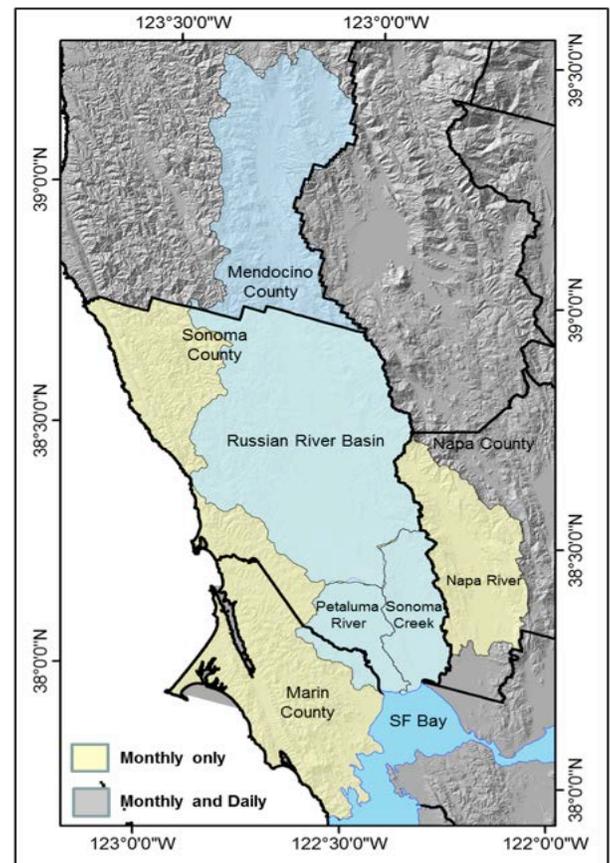


Figure 1. Map of study region, including regions where daily data is available (blue) and where monthly data is available (yellow)

management team consisted of Lauren Casey (Regional Climate Protection Authority), Caitlin Cornwall (NBCAI /Sonoma Ecology Center), Lisa Micheli, and Jay Jasperse and Chris Delaney (Sonoma County Water Agency).

Technical Memorandum Overview

This technical memorandum summarizes the core regional data sets used by *Climate Ready North Bay* collaboration as a starting point for understanding potential climate stressors facing North Bay open spaces and watersheds in the decades to come. This memo summarizes the stakeholder engagement process and the basic regional data sets. Data sets are grouped into three resource areas: 1) water resources (including rainfall, water supply, and drought) 2) native vegetation response and 3) fire risks. Appendices include a glossary, details on climate models and summary tables, and a list of regional data products generated. A PowerPoint deck is also provided that showcases sample data products and take home messages for the region (see *CRNB North Bay Region deck.ppt*). Companion technical memoranda and supporting materials for each engaged agency respond to their specific management questions (for companion user-group Technical Memoranda citations, see Micheli et al. 2016 Parts 2-6 in References Cited). The North Bay Region data sets described here are the foundation of vulnerability assessment products co-created with user groups comprised of engaged Marin, Sonoma, and Napa resource agencies.

Stakeholder Engagement

Stakeholder engagement was a key component of the *Climate Ready North Bay* project. User groups included North Bay natural resource management agencies from the counties of Marin, Sonoma and Napa, and a group of staff from the cities and County of Sonoma charged with land use and infrastructure planning facilitated by Sonoma County's Regional Climate Protection Authority's Climate Action 2020 process. The vulnerability assessment team worked closely with these stakeholders through a series of in-person meetings, complemented by a survey prior to the first meeting, and additional correspondence and webinars between meetings.

A central goal throughout the process was to maintain an applied science focus by defining key management questions for each jurisdiction at the onset of the project, and then refining those questions throughout the project duration. Stakeholder meetings were held to jointly engage key managers and key vulnerability assessment analysts in an open dialogue that was facilitated by a project manager with training and experience in both arenas. The overall stakeholder engagement process included the steps listed below, with many allowances for feedback throughout.

- As part of the project kick-off and prior to the first meeting, administer a *Questionnaire for Managers* to start a dialogue about how current weather variability impacts agency operations and what their concerns about future change are (see Appendix C of the *Regional Vulnerability Assessment Summary Technical Memorandum*).

- At the first half-day meeting of all users, present the available range of climate futures (see *Selection of Future Climate Scenarios* below for more information on the 18 potential futures) and select one set of climate futures based on shared regional management concerns and jointly-defined criteria across user groups.
- At follow-up agency-specific scoping meetings (two hours minimum), showcase potential products in depth, answer questions in detail, and review results of the managers' questionnaire to start collectively matching questions to data.
- As a follow up to the scoping meetings, draft an agency-specific scope of work for vulnerability data products that defines specific vulnerability metrics from the TBC3 knowledgebase of interest. Examples include: maximum and minimum temperatures, changes in water supply, degree of groundwater recharge, peak runoff and/or river discharge magnitude and frequency, drought frequency and intensity, drought stress (water deficit), changes in vegetation, and wildfire risk.
- Refine the scope based on refined management questions through iterative exchanges with users. Refinements may include time scale of data queries, revised jurisdictional boundaries, or comparisons of sites or time periods.
- Upon completion of the draft scope, the vulnerability assessment team generates products using computer models via a parallel process of in-person meetings, online coordination, and webinars.
- Present preliminary data products to user groups at a half-day meeting to review, discuss and refine through facilitated dialogue. Repeat if necessary.
- Finalize products for distribution, including production of technical memoranda and PowerPoint presentation materials.
- Scope opportunities for applications in the context of agency planning processes.

Climate Ready North Bay's extensive and iterative stakeholder engagement process can inform technical groups in other regions working with local government and natural resource management agencies, providing a model of how to generate relevant information on climate change vulnerabilities in the context of land and water management. The North Bay approach was specifically commended in Deas (2015) as providing "...an opportunity for joint learning" as well as increasing functional access to what would have otherwise been a complicated data set by facilitating conversations between scientists and managers. A primary benefit of this project to managers was having direct access to the scientists who created the models, and therefore know the limitations of the data. In turn, the scientists learned about new dimensions of projected change that would not have been discovered without this collaborative exploration.

Slides 1-11 illustrate the project overview in the companion *CRNB North Bay Region.ppt*.

Vulnerability Assessment Methods

Selection of Future Climate Scenarios

The first *Climate Ready North Bay* regional stakeholder kick-off meeting was convened to select a consistent set of climate-hydrology “futures” based on regional management concerns. User groups were first introduced to a series of 18 Basin Characterization Model (BCM) downscaled future climate scenarios developed by the Terrestrial Biodiversity Climate Change Collaborative (TBC3) for the San Francisco Bay Area (Weiss et al. *in prep*). The climate futures included seasonal and annual climate and hydrology variables downscaled to 270-m grid cell resolution, derived from 18 of the approximately 100 Global Circulation Model (GCM) projections run under alternative future greenhouse gas emissions scenarios for both the 4th and 5th Assessment Reports of the Intergovernmental Panel on Climate Change (IPCC) (Meehl et al. 2007 Taylor et al. 2011). These 18 scenarios were selected via a statistical cluster analysis approach to find the minimum number of futures capable of capturing the full range of 100 peer-reviewed by the Intergovernmental Panel on Climate Change, IPCC (Weiss et al. *in prep*). See Appendix B for details on the 18 GCMs selected by TBC3 for downscaling.

Users representing all North Bay User Groups were provided a detailed introduction to the data using data visualizations (including a “climate space plot” showing each model’s deviation from a common historic temperature and rainfall baseline) and explanatory tools. The users were then asked to help define a set of criteria (listed below) for selection of a final subset of climate futures.

- Is it a representative range of projected change that covers the full range of IPCC global scenarios and TBC3 Bay Area scenarios? The managers expressed a desire to focus on capturing the full range of temperature and rainfall scenarios for “business as usual” scenarios, and in particular wanted to capture the highest (Scenario 5) and lowest (Scenario 4) rainfall scenarios, in addition to the scenario that landed closest to the center (ensemble mean) of the full set of climate projections in terms of both rainfall and temperature change (Scenario 3). These three scenarios were intended to help bound the range of extreme conditions and capture “worst case scenarios.” Capturing “mitigated” (significantly reduced emissions) scenarios was a lower priority than having a range of “business as usual” cases.
- Is the total number of scenarios reasonable to analyze? Since comparing and contrasting model outputs is labor intensive, a range of three to six scenarios was decided upon as reasonable for detailed comparative analyses. In combination with the other criteria, managers came to a consensus to analyze six scenarios total, with more emphasis placed on three that defined rainfall extremes plus a “central tendency” for the original set of 18 futures.

- Are scenarios realistic, do they have an equal likelihood of occurring? This discussion focused primarily on the reality of emissions scenarios, with the “super-mitigated” scenarios being judged less likely based on empirical emissions data. Managers agreed that they wanted multiple “business as usual” scenarios to compare, but also wanted to include at least one “mitigated” scenario to demonstrate the benefits of climate mitigation.
- Is it consistent with the State modeling efforts? The California Climate Change Technical Advisory Group was on a parallel track to select a set of IPCC models for statewide precipitation patterns for California’s 4th Climate Assessment. To the extent feasible given that these projects were advancing in tandem, an effort to maximize the overlap between future state data products and *Climate Ready North Bay* products was made.

Through this facilitated dialogue, the user groups selected, by consensus, a subset of six future scenarios from which customized reports for the vulnerability assessments in Sonoma, Napa, Mendocino, and Marin counties would be developed (See below for a summarized list and *Appendix B: Selected Future Climate Scenarios*, see slides 12-16 of *CRNB North Bay Region.ppt*).

Scenario 1: Low warming, low rainfall (mitigated emissions scenario) (GFDL-B1)

Scenario 2: Low warming, moderate rainfall (PCM A2)

Scenario 3: Warm, moderate rainfall (CCSM-4)

Scenario 4: Warm, low rainfall (GFDL-A2)

Scenario 5: Warm, high rainfall (CRNM-CM5)

Scenario 6: Hot, low rainfall (MIROC-ESM)

Basin Characterization Model

The climate vulnerability analyses were grounded in a watershed-based approach to assessing “landscape vulnerability,” with a focus on climate-driven impacts to the hydrologic cycle. The vulnerability data products are based on the six future climate projections derived from a global set of projections peer-reviewed by the IPCC (Meehl et al. 2007; Taylor et al. 2011) described above. These global models were “downscaled” to increase their spatial resolution via a California statewide downscaling effort (Flint and Flint 2012). The USGS partners on this project analyzed the downscaled historic and projected temperature and precipitation data using the U.S. Geological Survey California Basin Characterization Model (BCM) (Flint et al. 2013; Flint and Flint 2014). The BCM models the interactions of climate (rainfall and temperature) with empirically-measured landscape attributes including topography, soils, and underlying geology. It is a deterministic grid-based model that calculates the physical water balance for each 18-acre cell (270m resolution) in a given watershed in set time steps for the entire area.

This approach enables a process-based translation of how climate interacts with physical geography to estimate local watershed response in terms of microclimate, runoff, recharge, soil moisture, and evapotranspiration. The BCM is capable of producing fine scale maps of climate trends as well as tabular time series data for a place of interest. For a detailed description of the BCM inputs, methods, and resulting datasets please see: [California Basin Characterization](#)

[Model: A Dataset of Historical and Future Hydrologic Response to Climate Change: U.S. Geological Survey Data Release](#). For a summary of BCM inputs, outputs and a glossary of terms, see Appendix C.

The *Climate Ready North Bay* project developed a customized BCM database for the North Bay region (Figure 1) extracted from the monthly California BCM and daily Russian River BCM (http://ca.water.usgs.gov/projects/reg_hydro/projects/russian_river.html). The California BCM uses a minimum time step of monthly results at the scale of a 270m grid, allowing the generation of scenarios at annual, seasonal, or monthly time steps. For *Climate Ready North Bay*, data was also extracted from a daily model for the Russian River to provide higher temporal resolution for evaluating potential extreme conditions within that geographic domain.

The monthly historic climate input data is downscaled from PRISM (Daly et al. 2008), and the daily data set includes historic data measured at weather stations from 1920-2010. The daily BCM model is extrapolated throughout the Russian River Basin using a method that is modified from that described in Flint and Flint (2012) in order to incorporate daily station data (Flint et al. *in prep*). Managers selected six future climate scenarios (described below) that provided a set of projections for the next 90 years (2010-2099). Data products derived include 30-year averages to delineate potential long-term trends in adherence with USGS recommendations. This allows comparison of three historic periods (1921-1950, 1951-1980—often referenced as a pre-climate change baseline, and 1981-2010—a period of assumed observed change) with three projected periods (2010-2039, 2040-2069, and 2070-2099). See Appendix D for a regional BCM output summary in 30-year time steps.

It is important to emphasize when describing BCM data products at a finer temporal resolution than the 30-y averages (such as decades, years, months or days), that unlike a weather forecast, the model does not generate *predictions* of precisely when climatic events will occur, but rather generates a physically-based time series of conditions for each scenario that is considered physically possible given the state of the science. By comparing results from a range of models, statistics can be used to describe a potential range of outcomes, but presently it cannot be determined which outcome is more likely to occur.

Navigating the necessarily *probabilistic* nature of climate data projections is perhaps one of the greatest challenges in applying these kinds of data products to real-world management issues. While managers wish we could simply provide the *most likely* outcome, for inland climate conditions, due to the uncertainty in how climate change will impact rainfall in our region, we need to facilitate consideration of multiple scenarios. Presently, in general all of the scenarios need to be considered as equally likely. In the literature this has been labeled a “scenario neutral” approach (Brown et al. 2012). This is why, moving forward, real-time climate-hydrology-ecosystem monitoring, akin to the Sentinel Site at Pepperwood’s Preserve, will be critical to understanding how climate impacts will unfold in the North Bay landscape (Micheli and DiPietro 2013, Ackerly et al. 2013).

In terms of spatial scale, the 18-acre resolution of BCM model pixels allows for aggregation of model results at spatial scales ranging from the North Bay region as a whole (the scale of this technical memorandum), to county boundaries and sub-regions (including watersheds, landscape units, service areas, and large parcels like parks). The vulnerability assessment team recommends that the model not be used to facilitate pixel-by-pixel comparisons, but rather be applied to minimum units ideally at the scale of sub-watershed planning units, or no smaller than parcels on the order of hundreds of acres.

The BCM's direct outputs include potential changes in air temperature, precipitation (snow and rainfall, but for the North Bay only rainfall is significant), runoff, recharge, potential and actual evapotranspiration, and soil moisture storage. From these direct outputs, with additional analysis, derivative products can be generated that include climatic water deficit (the difference between potential and actual evapotranspiration—an indicator of drought stress and environmental water demand), water supply, and stream flow.

Climatic water deficit projections, including where deficits are projected to exceed the historic range of variability, estimate the combined effects of rainfall, temperature, energy loading and topography, and soil properties on water availability in the landscape. This is a useful indicator of landscape stress due to potential drought. The combination of runoff and recharge values together provide an indicator of variability in water supply (surface water and groundwater combined). Stream flow estimates require an additional step of accumulating flow and calibrating it to historic gage records. Projected stream flow time-series can be used to consider impacts on water supply, flooding risks, and aquatic and riparian resources.

As a result of the TBC3 initiative, climatic water deficit has been determined to be an excellent indicator of forest health, species composition, and fire risk. The secondary models described below for estimating trends in native vegetation composition and fire risks use this BCM output as a critical input in combination with soils, land cover, and other landscape metrics.

Slides 17-23 in the companion *CRNB North Bay Region.ppt* illustrate the Basin Characterization Model methods.

Climate Ready North Bay Projected Vegetation Model (PVM)

Projected transitions in dominant vegetation types in response to future climates were modeled based on movement of the 'climate envelopes' occupied by each vegetation type. This analysis compares current vegetation cover that projected under mid- and end-century conditions for each of the six future climate scenarios. The model projects the equilibrium response of vegetation in response to future climates, assuming vegetation maintains currently observed distributions in relation to climate gradients, but is not able to predict how long it will take for these changes to unfold (i.e. decades vs. centuries) (Ackerly et al. 2015). Model results are summarized for the entire region and in selected "landscape units" (as defined by the Bay Area Open Space Council's Conservation Lands Network), and are presented in companion North Bay Climate Ready Vegetation reports.

Fire Risk Model

Statistical models of recent historic burning across the State, at a spatial resolution of 1080-m landscapes and a temporal resolution of 30 years (1971-2000) were combined with the BCM outputs (temperature, precipitation, potential evapo-transpiration, actual evapo-transpiration, and climatic water deficit) to determine how fire activity might change over time. North Bay Climate Ready futures used for this analysis include Scenarios 1, 2, and 4. Fire risk was modeled as the probability of burning occurring at least once within a given 30-year interval (2040-2069 and 2070-2099) or conversely, an estimated burn return interval. A metric of distance to human development is included in the model in order to estimate the additional influence of human access on fire risks (Krawchuk and Moritz 2012).

Key Vulnerability Assessment Findings

- *Rising temperatures across the region will generate unprecedented warm conditions for both summer and winter seasons*
- *Rainfall is likely to be more variable in the future in term of both low and high annual extreme*
- *The North Bay region is becoming more arid (subject to drier soil conditions) due to rising temperatures*
- *Runoff may be increasingly flashy, with rates of groundwater recharge relatively less variable over time*
- *Protecting available recharge areas will be critical to water supply sustainability*
- *Water demand for agriculture may increase on the order of 10%*
- *Fire frequencies are projected to increase on the order of 20%, requiring additional readiness planning and more aggressive fuels management*
- *Vegetation may be in transition, meriting additional monitoring and consideration of a more drought-tolerant planting palette for restoration*

Key findings for the North Bay region include a unidirectional trend, regardless of total rainfall, towards increasing climatic water deficits across model scenarios. Therefore, managers will be facing an increasingly arid environment. Water supply indicators generally increase in variability across all scenarios, with the extreme scenarios ranging from approximately 25% greater to 25% less total rainfall, with direct implications for runoff, recharge, stream-flow and soil moisture. The climate suitability for vegetation types in the North Bay will favor drought-tolerant species, while fire risks are projected to double in especially fire prone regions. The combination of potential drought stress on water supplies and vegetation, with an approximate doubling of fire risks, should inform long-term adaptive management of natural resources. Working with agencies on potential Climate Ready North Bay product applications, strategies should build watershed resilience to drought with a focus on protecting groundwater recharge. Drought tolerance also needs to be promoted in forest, rangeland, and agricultural

systems. More aggressive approaches to the reduction of forest fuel loads should be considered.

Summary of Regional Vulnerability Assessment Data

Introduction

This section summarizes the vulnerability assessment data products available for temperature, rainfall, runoff, groundwater recharge, climatic water deficit, vegetation transitions, and fire risk for long-term average trends at the scale of the entire Climate Ready North Bay Region (Figure 1). Appendices include a list of data products, summary data tables and a companion PowerPoint "deck" with slides highlighting these data products (illustrations including maps, tables, and talking points). Corresponding slide numbers are referenced for figures supporting the data summaries below, which include slides 23-60 in the companion *CRNB North Bay Region.ppt*.

Rainfall is the most variable input value to the BCM for the North Bay region as a whole and for Sonoma County, and drives the majority of variability in primary hydrologic response outputs and secondary outputs for potential vegetation transitions and fire risks. Table 1 summarizes BCM projected long-term trends in 30-year time steps from 2010-2099 for temperature, rainfall, runoff, recharge, and climatic water deficit in comparison to current conditions averaged over 1981-2010, (see Appendix C also references the North Bay region summary data table). Three "business as usual" emissions scenarios are included: Scenario 5: Warm, high rainfall (the highest rainfall model in TBC3's Bay Area BCM), Scenario 6: Hot, low rainfall (the lowest rainfall model in the TBC3's Bay Area BCM), and Scenario 3: Warm, moderate rainfall (the closest future to the mean of all rainfall projections for TBC3's Bay Area BCM). These three scenarios can be considered to "bookend" high and low rainfall extremes (Scenarios 5 and 6 respectively) and a "middle of the road" future (Scenario 3).

This wide variation between model rainfall projections is the greatest source of uncertainty in projected future conditions. With values ranging from approximately *21% less or 35% greater* rainfall by end century at the scale of 30-year average values, managers need to determine how to plan in the face of this magnitude of uncertainty. Climate Ready North Bay products allow managers to consider the range of physical and ecological impacts caused by variable rainfall, and to "unpack" the annual and seasonal variability underlying these long-term average values.

It is important to point out that, despite this broad range of projected increases or decreases in rainfall, estimated climatic water deficit (which is quantified as the amount of evaporative demand exceeding available soil moisture) is expected to increase across all futures. This provides managers with a key landscape condition and water demand indicator that varies in intensity but not direction. Changes in water deficit are a critical driver of agricultural sustainability, native vegetation response, and fire risk as described in more detail below.

Increasing Temperatures

Throughout the North Bay region, 30-year averages for summer and winter air temperatures are projected to increase. Maximum monthly summer air temperatures are projected to

increase by as much as 11°F and minimum monthly winter air temperature to increase by as much as 7.6°F by the end of century for the “worst case” hot and low rainfall Scenario 6

Table 1: Basin Characterization Model Outputs, North Bay Region, 1951-2099

Variable	Units	Historical	Current	Moderate Warming, High Rainfall		Moderate Warming, Moderate Rainfall		Hot, Low Rainfall	
		1951-1980	1981-2010	2040-2069	2070-2099	2040-2069	2070-2099	2040-2069	2070-2099
Ppt	in	42.6	43.0	53.6	57.9	42.1	45.6	34.8	33.9
Tmn	Deg F	44.8	45.8	49.2	52.0	48.5	51.3	50.6	54.3
Tmx	Deg F	71.2	71.2	75.0	77.7	74.4	77.1	76.8	80.7
CWD	in	28.0	54.9	57.4	60.1	58.3	60.3	61.5	66.7
Rch	in	11.0	10.2	12.8	13.2	10.7	10.8	8.2	8.5
Run	in	14.0	14.2	22.8	26.9	14.0	17.3	9.7	9.3

Variable	Units	Current 1981-2010	Percent Change from Current or Change in Temperature					
			Moderate Warming, High Rainfall		Moderate Warming, Moderate Rainfall		Hot, Low Rainfall	
			2040-2069	2070-2099	2040-2069	2070-2099	2040-2069	2070-2099
Ppt	in	43.0	25%	35%	-2%	6%	-19%	-21%
Tmn	Deg F	45.8	3.4	6.2	2.7	5.5	4.8	8.4
Tmx	Deg F	71.2	3.8	6.5	3.2	5.9	5.6	9.5
CWD	in	54.9	5%	10%	6%	10%	12%	22%
Rch	in	10.2	25%	29%	4%	6%	-20%	-17%
Run	in	14.2	61%	90%	-1%	22%	-32%	-34%

Variables: Ppt=precipitation, Tmn=minimum winter temperature (monthly), Tmx=maximum summer temperature (monthly), CWD=climatic water deficit, Rch=recharge, Run=runoff

For the 30-year average representing 1981-2010, defined as “current conditions,” the average maximum monthly average summer air temperature was 82.2°F. For the mid-century period 2040-2069, under “business as usual” scenarios, potential 30-year averages for monthly maximum summer air temperatures are estimated to span the range below.

Scenario 3: Warm, moderate rainfall - 86.0°F, equivalent to an increase of 3.8°F

Scenario 5: Warm, high rainfall - 86.4°F, equivalent to an increase of 4.2°F

Scenario 6: Hot, low rainfall - 89.2°F, equivalent to an increase of 7.0°F

For 2070-2099, under “business as usual” scenarios, potential changes in maximum monthly average summer air temperature by end-century are estimated to span the range below.

Scenario 3: Warm, moderate rainfall - 88.5°F, equivalent to an increase of 6.3°F

Scenario 5: Warm, high rainfall - 89.4°F, equivalent to an increase of 7.2 °F

Scenario 6: Hot, low rainfall - 93.4°F, equivalent to an increase of 11.2°F

From 1981-2010, the 30-year average for minimum monthly winter air temperatures was 39.7°F. For 2040-2069, under “business as usual” scenarios, potential changes in minimum monthly average winter air temperatures by mid-century are estimated to span the range below.

- Scenario 3: Warm, moderate rainfall - 43.0°F, resulting in an increase of 3.3°F
- Scenario 5: Warm, high rainfall - 43.0°F, resulting in an increase of 3.3°F
- Scenario 6: Hot, low rainfall - 44.1°F, resulting in an increase of 4.4°F

Figure 2. Maximum summer temperature, North Bay Region, 1981-2100, 30-year averages, warm and moderate rainfall scenario

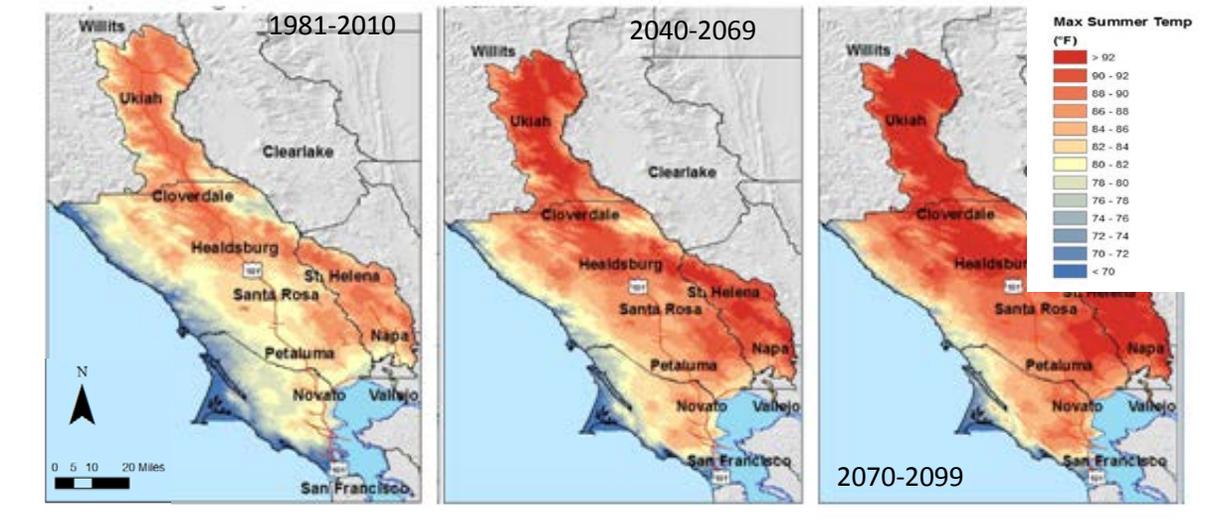
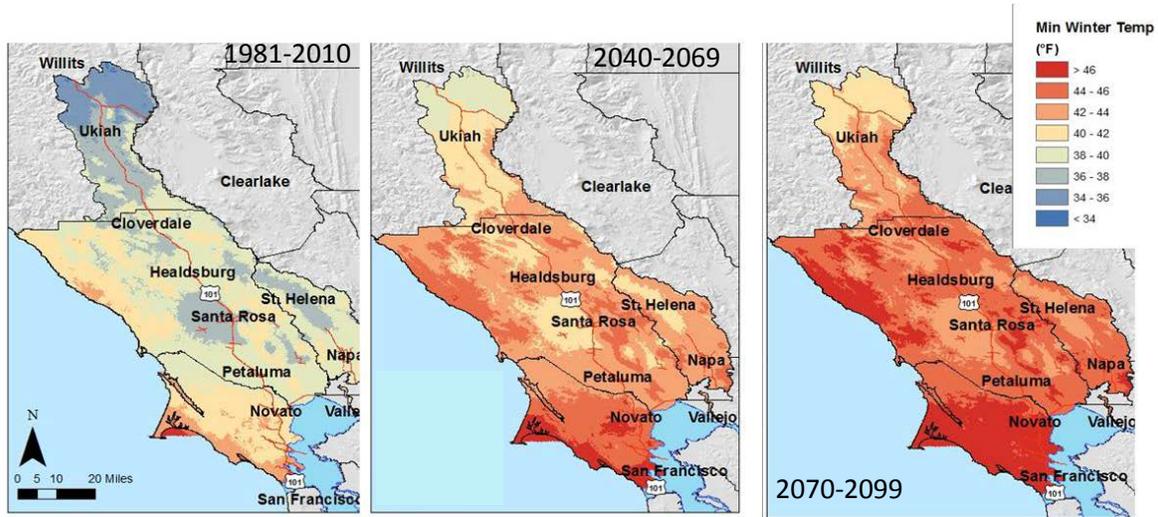


Figure 3. Minimum winter temperature, North Bay Region, 30-year averages, 1981-2099, warm and moderate rainfall scenario



For 2070-2099, under “business as usual” scenarios, potential changes in minimum monthly average winter air temperatures are estimated to span the range below by end-century.

- Scenario 3: Warm, moderate rainfall - 44.8°F, resulting in an increase of 5.1°F
- Scenario 5: Warm, high rainfall - 45.9°F, resulting in an increase of 6.1°F
- Scenario 6: Hot, low rainfall - 47.3°F, resulting in an increase of 7.6°F (2.5°F greater than the moderate warming scenario)

Increases in monthly maximum and minimum temperatures estimated for 30-year time periods represent underlying significant increases in the frequency and intensity of warmer conditions at the monthly and daily time scales. For example, for the Santa Rosa Plain, there is up to a five-fold projected increase in the total number of days exceeding 95°F, with an average of 26 per year measured over 1981-2010, compared to 146 per year projected by the end of the century. In the Alexander Valley, averaged across four future scenarios, there is an overall decrease in the number of springtime (February, March, April) days that are at or below freezing by both mid- and end-century. By the end of the century, on average, the number of days that are at or below freezing are projected to decrease on the order of 50% in February (from 52 to 27), over 60% in March (from 8 to 5), and 100% in April (from 5 to 0). (Please refer to slides 68-70 in the companion *CRNB North Bay Region.ppt* for illustration.)

Projected increases in temperature result in increased rates of evapo-transpiration that, in turn, drive changes throughout the hydrologic cycle, which are explored in the following sections. Warmer temperatures effectively generate dryer soil conditions, which then creates more room for storing moisture subsurface in soils and aquifers, potentially reducing the total amount of available surface water.

Slides 41-46 in the companion *CRNB North Bay Region.ppt* illustrate the data findings above.

Increasing Variability in Rainfall

The future of rainfall quantity and variability for the North Bay region over the next century is perhaps the greatest uncertainty in efforts to project future conditions. Global models vary widely in their estimates of how climate change will impact rainfall patterns. This is because the potential effect of increased temperatures on the dynamic circulation of the oceans and atmosphere, which produces local rainfall, is not well understood in terms of mechanics. Therefore, some models estimate that for the North Bay region global warming will result in a major increase in available rainfall (Scenario 5), while others project little change (Scenarios 1, 2, 3), or moderate to major reductions (Scenario 4 and Scenario 6). Interestingly, for both mid-century and end-century values, projected changes in precipitation in the negative and positive directions essentially cancel each other out in the ensemble average, with no net average change in precipitation when the six models are averaged together. However, an examination of annual values underlying these long-term averages does show, in most projections, a trend of increasing variability in rainfall from year to year.

For 1951-1980 and 1981-2010, both the historic and current regional average rainfall was approximately 43 inches per year. For 2040-2069, average annual rainfall is projected to span the range below.

Scenario 3: Warm, moderate rainfall - 42.1 in/y, 2% less than the current average

Scenario 5: Warm, high rainfall - 53.6 in/y, 25% greater than the current average

Scenario 6: Hot, low rainfall - 34.8 in/y, 19% less than the current average

For 2070-2099, potential changes in average annual rainfall are projected to span the range below.

- Scenario 3: Warm, moderate rainfall - 44.8 in/y, 6% greater than the current average
- Scenario 5: Warm, high rainfall - 57.9 in/y, 35% greater than the historic/current average
- Scenario 6: Hot, low rainfall - 33.9 in/y, 21% less than the historic/current average

Figure 4. Precipitation, 30-year averages, current (1981-2010), and projected (2040-2069) hot and low rainfall and warm and high rainfall scenarios

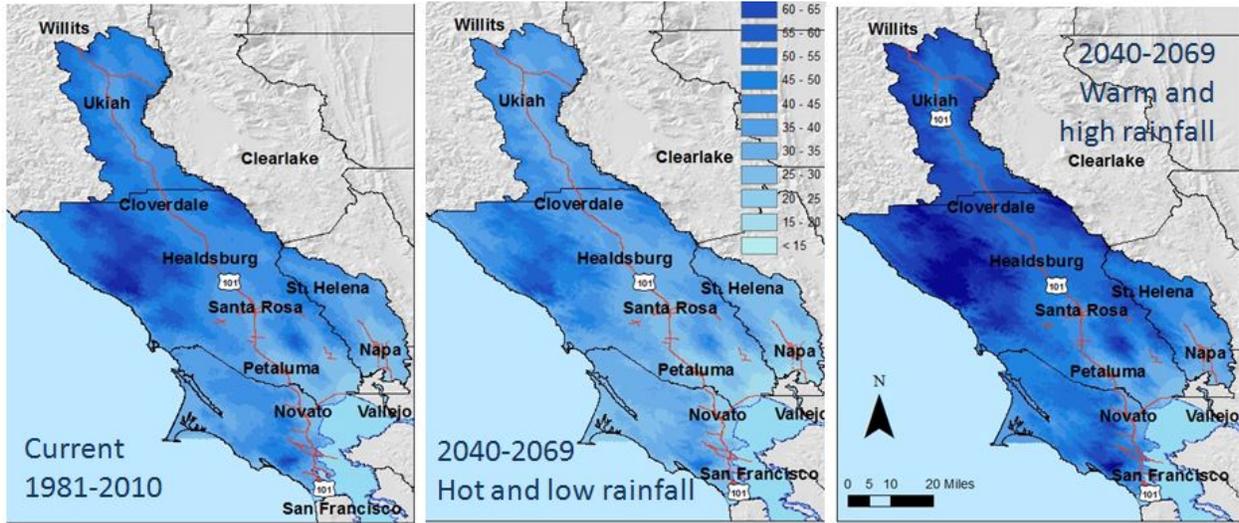
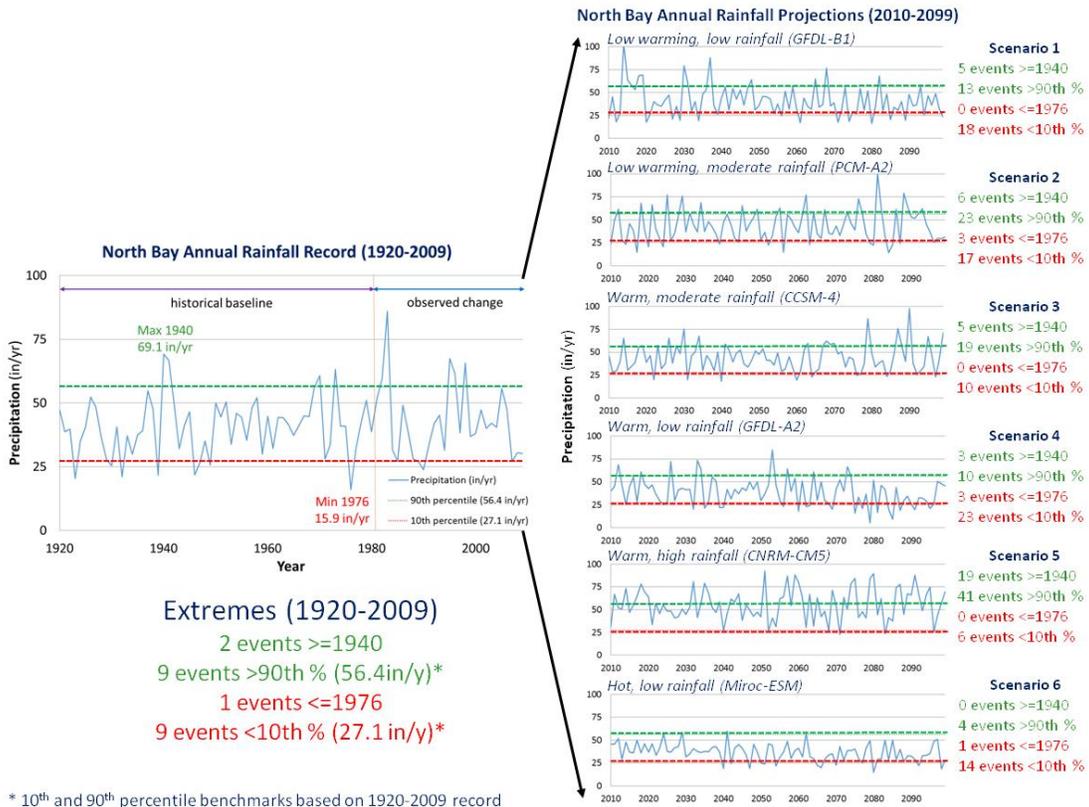


Figure 5. North Bay Region annual rainfall, comparison historic and projected 90-year periods, six scenarios



A comparison of extreme rainfall years can be made using annual rainfall totals for the historic period of 1920-2009, including both high rainfall years likely to correspond with flood risks, and low rainfall years likely to correspond with drought risks (Table 2). This comparison shows that if an average is taken across the six projected futures, annual peak rainfall years (defined as exceeding the 90th percentile value of the 1920-2009 period) and low rainfall years (defined as less than the 10th percentile value of the 1920-2009 period) are projected to both increase on the order of 200% and 160%, respectively. However “worst case scenarios” in terms of high and low rainfall over 30-year periods correspond to more drastic increases in extreme events. For example, under the warm and high rainfall scenario, an approximate five-fold increase in high flood risk years is projected, while under low rainfall scenarios an approximate three-fold increase in potential drought years is projected.

Table 2. Changes in frequency of annual rainfall extremes per decade, historic/current conditions (1920-2009) and six climate ready scenarios (2010-2099)

<i>Exceedances per decade</i>				Annual Peaks (floods)		Annual Lows (droughts)	
Scenario #	Model	Time Period	Name	>=1940 (69.1 in/yr)	>90th % (56.4 in/yr)	<10th % (27.1 in/yr)	<=1976 (15.9 in/yr)
	Historic & Observed Change	1920-2009		0.22	1.00	1.00	0.11
1	GFDL_B1	2010-2099	Low warming, Low rainfall	0.56	1.44	2.00	0.00
2	PCM_A2	2010-2099	Low warming, Mod rainfall	0.67	2.56	1.89	0.33
3	CCSM4_rcp85	2010-2099	Warm, Mod rainfall	0.56	2.11	1.11	0.00
4	GFDL_A2	2010-2099	Warm, Low rainfall	0.33	1.11	2.56	0.33
5	CNRM_rcp85	2010-2099	Warm, High rainfall	2.11	4.56	0.67	0.00
6	MIROC_rcp85	2010-2099	Hot, Low rainfall	0.00	0.44	1.56	0.11

<i>Percent increase or decrease per decade</i>				Annual Peaks (floods)		Annual Lows (droughts)	
Scenario #	Model	Time Period	Name	>=1940 (69.1 in/yr)	>90th % (56.4 in/yr)	<10th % (27.1 in/yr)	<=1976 (15.9 in/yr)
	Historic & Observed Change	1920-2009					
1	GFDL_B1	2010-2099	Low warming, Low rainfall	150%	44%	100%	-100%
2	PCM_A2	2010-2099	Low warming, Mod rainfall	200%	156%	89%	200%
3	CCSM4_rcp85	2010-2099	Warm, Mod rainfall	150%	111%	11%	-100%
4	GFDL_A2	2010-2099	Warm, Low rainfall	50%	11%	156%	200%
5	CNRM_rcp85	2010-2099	Warm, High rainfall	850%	356%	-33%	-100%
6	MIROC_rcp85	2010-2099	Hot, Low rainfall	-100%	-56%	56%	0%
Average				217%	104%	63%	17%

We recommend that at this point natural resource managers plan for both high rainfall and low fall rainfall scenarios. For Climate Ready North Bay partners, this has meant taking the worst case drought scenarios and analyzing whether or not current infrastructure would still allow agencies to meet projected demand. It is also suggested for flooding, and with more certainty fire, increased resources may need to be dedicated to hazard mitigation.

Slides 29-35 in the companion *CRNB North Bay Region.ppt* illustrate the data findings above.

Impacts on Watershed Functions: Runoff, Recharge, and Climatic Water Deficit

The benefit of utilizing the Basin Characterization Model is that it takes projected values for rainfall and temperature and tests how these climatic patterns would interact with local

topography, soils, and underlying geology. The model achieves this by calculating a water balance for every 18-acre unit in the North Bay domain. This memorandum summarizes results at the scale of the entire region, while companion memoranda developed for partner agencies isolate results for source watersheds and other regions of interest. These variables are critical to shaping climate smart strategies focused on maintaining water yields and sustainable patterns for future urbanization.

Recharge and runoff both vary with projected precipitation, yet recharge proves more resilient (less variable) than runoff in response to major fluctuations in rainfall, as described below. The spatial variability of high and low groundwater recharge zones can be estimated using the model, a valuable input for sustainable groundwater management. Climatic water deficit projections show what portions of the landscape are vulnerable to drought stress, and also serve as an indicator of irrigation demand. Taken together, this integrated water balance approach to estimating the impacts of future climate change on the local hydrology is a potent tool for determining vulnerabilities and potential adaptation strategies.

Runoff

The amount of runoff is estimated on the amount of incoming rainfall combined with how pervious the watershed is given local soils and bedrock. Climate Ready North Bay data products are capable of estimating the relative variable “flashiness” of watersheds in the study area. Runoff can be used to estimate yield into reservoirs or streams, as well as to provide an indicator of flooding risks.

From 1981-2010, the average amount of runoff for the North Bay region was 14.2 inches per year, per unit area. From 2040-2069, the range of potential change in average amount of annual runoff is projected as follows.

Scenario 3: Warm, moderate rainfall - 14.0 in/y, 1% less than the current average

Scenario 5: Warm, high rainfall - 22.8 in/y, 61% greater than the current average

Scenario 6: Hot, low rainfall - 9.7 in/y, 32% less than the current average

For 2070-2099, the range of potential change in average amount of annual runoff is projected as follows.

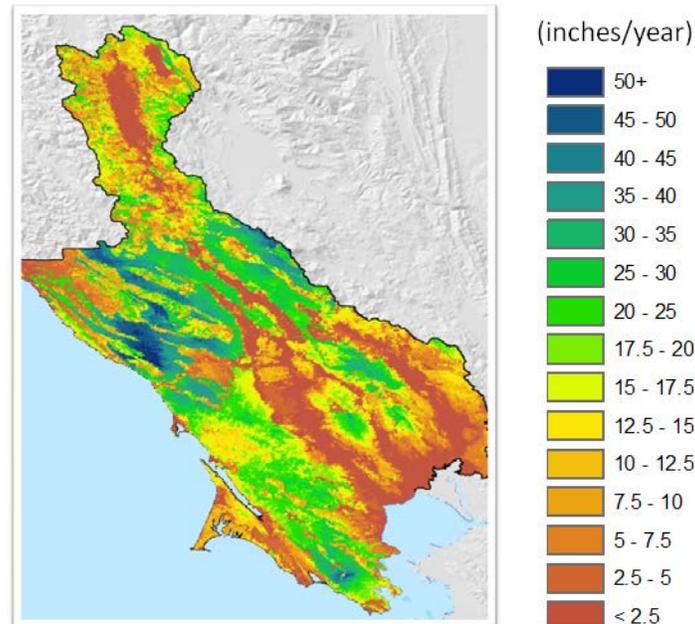
Scenario 3: Warm, moderate rainfall - 17.3 in/y, 22% greater than the current average

Scenario 5: Warm, high rainfall - 26.9 in/y, 90% greater than the current average

Scenario 6: Hot, low rainfall - 9.3 in/y, 34% less than the current average

Slides 29-33 in the companion *CRNB North Bay Region.ppt* illustrate the data findings below.

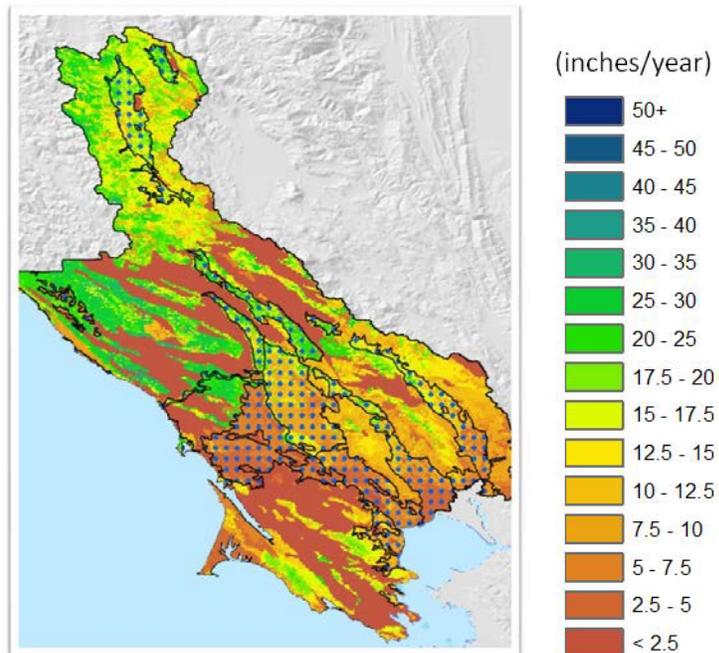
Figure 6. Estimated runoff, North Bay Region, 30-year average, 1981-2010



Groundwater Recharge

The Basin Characterization Model was specifically designed to estimate subsurface recharge using empirical watershed characteristics. Summaries of historic and projected recharge across the North Bay as a whole are summarized below.

Figure 7. Estimated groundwater recharge, North Bay Region, 30-year average, 1981-2010



For 1981-2010, the average amount of groundwater recharge was 10.2 inches per year per unit area. For 2040-2069, the range of potential change in average amount of annual recharge is projected as follows.

Scenario 3: Warm, moderate rainfall - 10.7 in/y, 4% greater than the current average

Scenario 5: Warm, high rainfall - 12.8 in/y, 25% greater than the current average

Scenario 6: Hot, low rainfall - 8.2 in/y, 20% less than the current average

For 2070-2099, the range of potential change in average amount of annual recharge is projected as follows.

Scenario 3: Warm, moderate rainfall - 10.8 in/y, 6% greater than the current average

Scenario 5: Warm, high rainfall - 13.2 in/y, 29% greater than the current average

Scenario 6: Hot, low rainfall - 8.5 in/y, 17% less than the current average

Slides 36-40 in the companion *CRNB North Bay Region.ppt* illustrate the data findings above.

Relationship of Runoff to Recharge

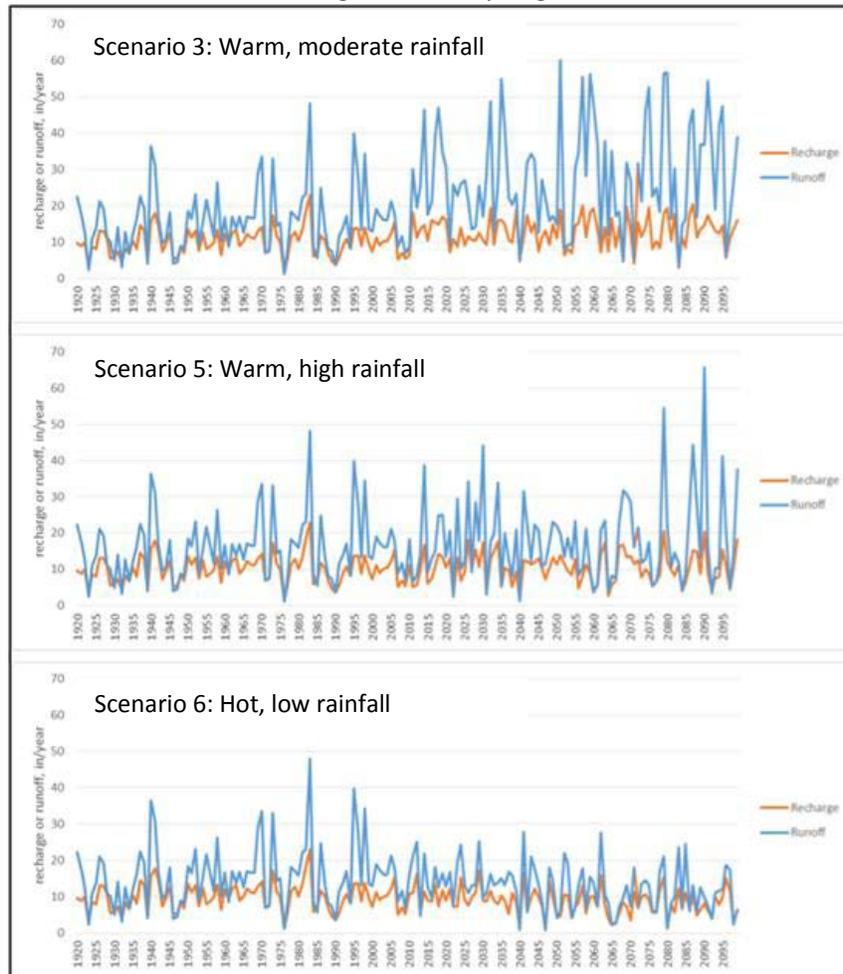
The North Bay Climate Ready project area is highly variable in terms of the spatial distribution of potential surface runoff and recharge. While Sonoma, Mendocino, and Napa counties include significant groundwater recharge basins, the geology of Marin provides for very little ground water and therefore its supply is runoff-dominated. However, for regions with significant recharge storage potential there is also high variability in potential groundwater recharge within a particular basin, such as the Sonoma and Napa Valleys and the groundwater basin of the Russian River Basin.

Figure 8 demonstrates the relatively variability of runoff compared to recharge for a given rainfall quantity. The plot compares total runoff and recharge estimated for the entire area of Sonoma County using Scenarios 3, 5, and 6. The average historic values are 14.2 inches per year for runoff and 10.2 inches per year for recharge. The three future scenarios range from a minimum of 9.3 inches per year to a maximum of 26.9 inches per year for runoff (corresponding to -34% to +90% compared to current). Corresponding recharge values range from only 8.2 to 130.2 inches per year (-17% to +29% compared to current). Based on this analysis, recharge is shown to be a more consistent component of water yield over time relative to runoff. This is not to discount, however, the importance of big runoff years in supplying critical supply to reservoirs, streams, and aquifers. However the relative consistency of groundwater recharge even in low rainfall years suggests where groundwater is available, that sustainable groundwater management is a good investment in water security.

A simple metric that facilitates categorizing watersheds by their relative flashiness is the ratio of recharge to runoff for the North Bay—this value ranged from 0.79-.072 for the historic to current time periods, respectively. The concept of “conjunctive use” in water resources planning refers to looking at the relationship of surface and groundwater supplies as one resource that requires coordinated management. Climate Ready North Bay products may help facilitate conjunctive use approaches where feasible, including groundwater recharge protection and passive or active recharge of aquifers. In terms of watershed mechanics climatic

water deficits, addressed below, interface with runoff and recharge by increasing more subsurface storage potential and thus creating more “room” in the soils for subsurface storage.

Figure 8: Estimated annual runoff and recharge, North Bay Region, 1920–2100, three future scenarios



Climatic Water Deficit

Climatic water deficit is an attribute of the landscape that integrates the combined effects of available rainfall, temperature, and watershed structure. It takes into account available water, heat exposure, and soil/geology water storage potential to estimate where and by how much potential evapotranspiration exceeds actual evapotranspiration. This term can be thought of a measure of drought stress, or an estimate of how much more water the landscape would have used had it been available. It captures the effect of limited soil storage to meet evapotranspiration demand. As discussed below, it turns out to be an excellent indicator of native vegetation cover or agricultural irrigation demand and fire risks.

An important aspect of climatic water deficits is that, in comparison to rainfall for example, all of the future scenarios project a uni-directional trend in water deficits into the future. From 1981-2010 the average climatic water deficit over the study area was 28.4 inches per year. By

the mid century, water deficits are projected to increase from 5-12%, with an average 8% increase across scenarios. By the end of the century, a range of 10-22% greater water deficit is projected, with an average of 14% across all scenarios, as is described below.

From 2040-2069, the range of potential change in climatic water deficit is projected as follows.

Scenario 3: Warm, moderate rainfall - 30.3 in/year, 7% greater than the current average

Scenario 5: Warm, high rainfall - 29.8 in/year, 5% greater than the current average

Scenario 6: Hot, low rainfall - 32.0 in/year, 12% greater than the current average

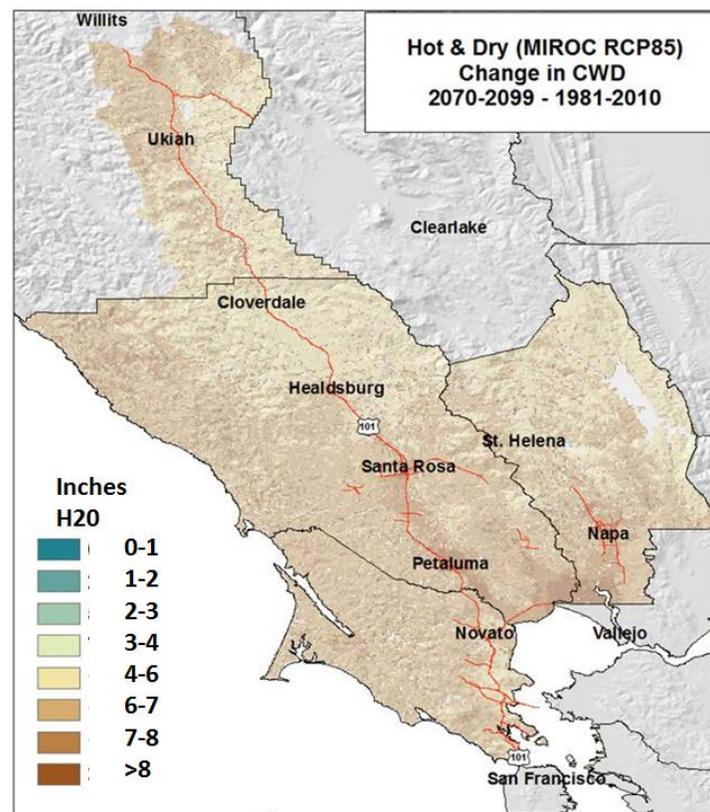
For 2070-2099, the range of potential change in climatic water deficit is projected as follows (Figure 3).

Scenario 3: Warm, moderate rainfall - 31.4 in/year, 11% greater than the current average

Scenario 5: Warm, high rainfall - 31.3 in/year, 10% greater than the current average

Scenario 6: Hot, low rainfall - 34.6 in/year, 22% greater than the current average

Figure 9. Projected change in 30-year averages for climatic water deficit, 1981-2010 v. 2070-2099, hot and low rainfall scenario



The magnitude of projected change in climatic water deficit is limited by the total subsurface soil storage potential in a given area. In other words, deeper soils with high soil moisture storage potential may be subject to larger changes than landscapes with thinner soils since they

hold relatively more soil moisture. In addition, the impact of increased water deficit needs to be considered in the context of site-specific temporal variability. Regions that have historically been exposed to large variability in water deficits may be more resilient to future deficit increases than regions with historically low variability. The Climate Ready North Bay hypothesizes that small increase in water deficits in traditionally cooler and moister coastal areas this may pose a more significant impact than similar magnitudes of change inland, where watershed and ecosystem have adapted to high variability.

Slides 41-46 in the companion *CRNB North Bay Region.ppt* illustrate the data findings above.

Native Vegetation Response

For 22 dominant vegetation types, the probabilities for each vegetation type to occur in a given location within the study region under the six future climate scenarios were modeled. Overall, the sensitivity of vegetation to climate change was found to be highly heterogeneous across the region, though the sensitivity to climate change was somewhat higher under warm winter conditions (i.e., closer to the coast), on north-facing slopes and in areas of historic higher precipitation. While cool or moist sites may serve as refugia for species adapted to cool and moist conditions, the model suggests these sites will still be highly dynamic and relatively sensitive to climate-driven vegetation transitions (Ackerly et al. 2015). Model results have been summarized for each of the Conservation Lands Network landscape units, and can be accessed (BAOSC 2011).

Across the North Bay counties we observe the following trends, with the caveat that these trends represent the long-term equilibrium response that may be expected in response to varying magnitude of climate change. The modeling does not address the mechanisms of vegetation change (e.g., drought, fire, etc.), and does not incorporate the potential effects of dispersal limitation (i.e. absence of mature populations nearby producing seeds that can disperse to new locations). While we don't know how quickly changes may occur, the fossil record since the last Ice Age in California and elsewhere demonstrates that periods of major climate change result in significant shifts in vegetation over time.

For Marin County significant reductions in suitable conditions for Redwood and Douglas-fir forests, and Montane Hardwood woodlands, are projected, especially for more than 4-5 °F warming. Grassland conditions may also decline, but the extent of grassland is heavily dependent on management actions (fire, grazing, etc.). Suitable climate for chamise chaparral and other shrublands, coast live oak woodlands, and knobcone pine are projected to expand. Establishment of knobcone pine and some chaparral species are promoted by fire; the extent and severity of wildfire in coming decades will likely have a strong impact on future vegetation.

In Sonoma County, similar reductions in suitable conditions for Redwood and Douglas-fir forests and Montane Hardwoods are projected. Oregon oak woodlands and montane chaparral are also projected to decline. Conditions suitable for coast live oak woodlands, chamise chaparral and other shrublands increase substantially, especially for scenarios above +4°F warming.

In Napa County, conditions suitable for Montane Hardwoods decline at higher temperatures, and montane chaparral also shrinks considerably. Conditions suitable for Chamise Chaparral, other shrublands, Coast Live Oak, and Interior Live Oak all increase in extent. The area suitable for blue oak varies, declining under higher rainfall scenarios, and otherwise remaining stable.

Slides 49-56 in the companion *CRNB North Bay Region.ppt* illustrate the data findings above.

Increasing Fire Frequency

The fire frequency model used in Climate Ready North Bay expresses potential increases in fire risk as a function of probability of a burn or fire return estimated in years. Maps of future climate scenarios are shown for business-as-usual scenarios for end-century projections, and individual parcels and parks are illustrated for mid-century projections. In the attached CRNB North Bay deck.ppt results for the North Bay region as a whole are summarized below.

From 1971-2000, the average historic fire return interval was every 172 years. By the end of the century, fire return intervals are projected to be reduced by approximately 30% throughout the region.

Scenario 3: Warm, moderate rainfall - 120 yr average projected return interval

Scenario 6: Hot, low rainfall - 117 yr average projected return interval

From 1971-2000, the average historic probability of burning with a 30 year period was 17%. From 2070-2099, the probability of burning occurring one or more times within 30 years doubles in some locations, with the probability throughout the region projected to increase to 23% under both the warm, moderate rainfall and hot, low rainfall scenarios.

Figure 10. Historic and projected fire return intervals, 1971-2000 versus 2070-2099, two future scenarios

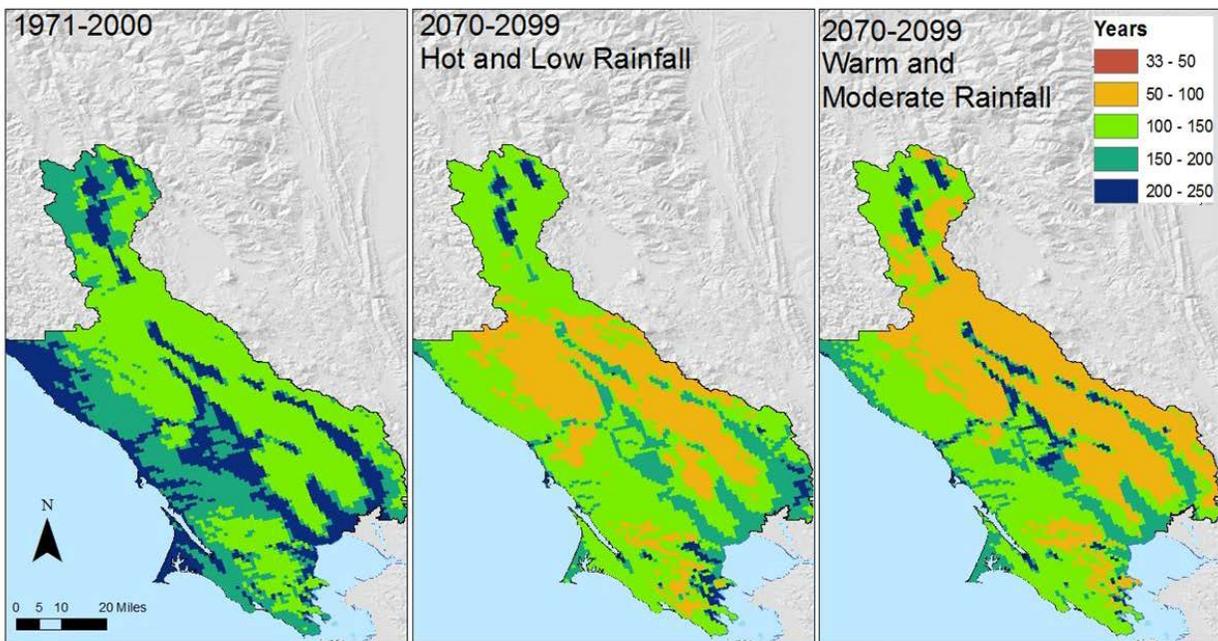
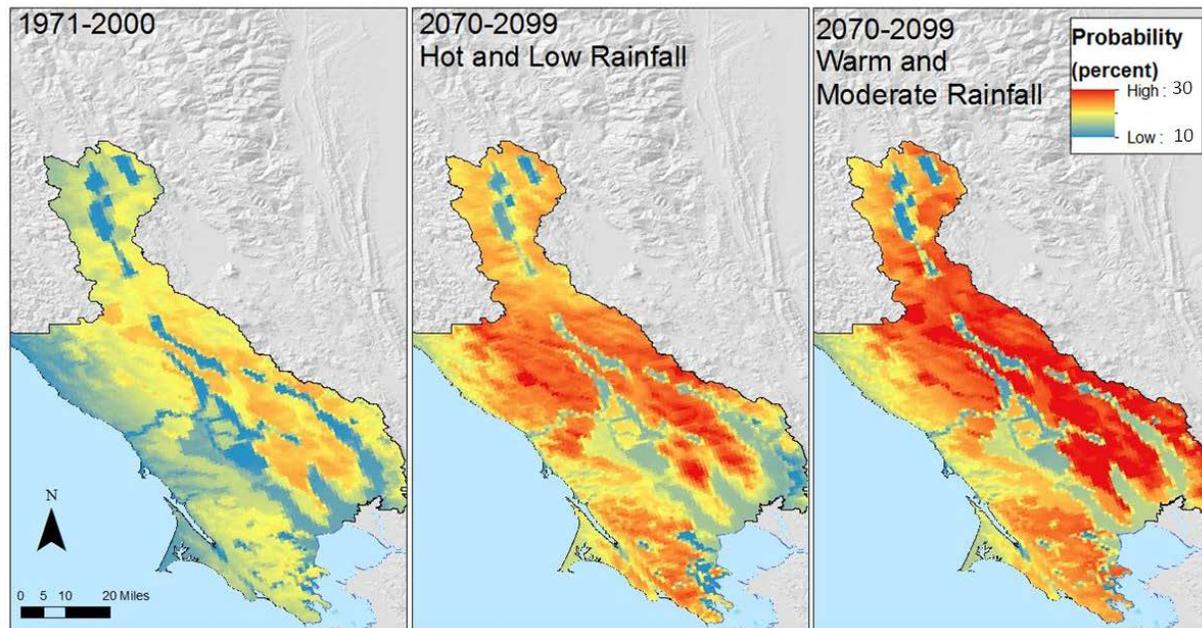


Figure 11. Probability of a burn within a 30-year period, 1971-2000 versus 2070-2099, two future scenarios



Slides 57-60 in the companion *CRNB North Bay Region.ppt* illustrate the data findings above.

Bridging Science and Management

Lessons Learned

Meaningfully translating global change models to local management applications is an emerging practice. We provide the observations below to help inform other climate adaptation planning efforts applying high-resolution climate data at a regional scale for specific management applications.

- Co-creation of data products and tools by scientists working with managers requires an extended dialog (12+ months) and multiple in-person exchanges.
- A critical member of the team is an “information broker” who understands both “science” and “management” perspectives to facilitate discussions.
- Framing resource-specific management questions at project kickoff is a good way to guide the process.
- Managers need to participate in scenario selection to ensure relevancy, and to learn why consideration of multiple scenarios (an ensemble approach) is needed in order to capture model uncertainties. Regional data sets capable of servicing multiple agencies and resource issues increase the potential for coordinated or at least consistent adaptation planning.

- Managers who have the skill set to actually manipulate the data, for example to generate plots for a given time period of interest, gain significant understanding from completing this kind of exercise.
- Consistent trends across multiple scenarios are important to identify, but the temptation should be resisted to average model results. Physical watershed processes are only accurately characterized within a single scenario.
- Once results are available, many managers needed additional support in scoping how to translate results to specific planning applications and requested follow up meetings to transfer the approval to perform agencies and consultants.
- Agencies see the value of using Climate Ready North Bay results to raise public awareness of resource challenges and conflicts that may lie ahead for communities as a whole.
- More resources are needed to craft effective outreach tools and trainings that are tailored towards diverse audiences.

In the context of the literature on scenario-based climate adaptation planning, we believe our results reflect what Prudhomme (2010) termed a *scenario neutral* approach by not classifying any particular scenario(s) as more likely than another, but rather defining the broadest range possible of viable models. This allowed engaged managers to start to assess the vulnerabilities of their systems.

We had originally hoped in some cases participating agencies might have already defined climate thresholds above or below which their service delivery would be compromised, what Brown and Wilby (2012) and Brown et al. (2012) termed a *climate response function*. However, using our managers' survey and follow up communications, we confirmed that, for the majority of agencies, critical environmental thresholds or climate response functions were unknown. For this reason we focused on primarily a historic analog approach to define thresholds (for example the lowest rainfall year or peak flood of record) in concert with managers.

The value of this project is therefore to provide a relatively simple framework for managers to start to explore what kind of future climate, and which climate variables in particular, could trigger critical sensitivities in their systems. Examples could include rainfall thresholds that compromise watershed services such as water supply or flooding attenuation or increases in climatic water deficit that cause ecosystems to transition in terms of vegetation community or fire regime. Under this Climate Ready framework, managers can compare and contrast additional existing or new models as they come on line, with a growing understanding of the specifics of their systems' vulnerabilities as the planning assessments proceed listed in the *Applications* session below.

While the literature also compares what is termed *top-down* versus *bottom up* approaches to vulnerability assessments, with the former driven by climate model selection on the part of scientists, and the latter driven by vulnerabilities defined at the ground level by managers, our experience may be best described as a hybrid of the two. We believe that by engaging managers from the outset in selecting climate futures based on management needs, while our technical team did narrow the options from an original 100 scenarios to 18 that captured essentially a comparable range, from that point on ground-based management considerations drove the process. We look forward to tracking the evolution of partner agencies' *climate response functions* as they proceed to the next stages of adaptation planning. We also remain strong advocates of getting effective real time hydrology-ecosystem monitoring in place, as is currently being piloted at Pepperwood, to refine our understanding of key mechanisms linking climate, water, and ecosystem response.

Potential Climate Ready Applications

There are a number of current or future planning processes throughout the North Bay region that integration of this climate vulnerability assessment data could benefit that include the following.

- Environmental impact reports
- Local hazard mitigation plans
- Safety elements of general plans
- Reservoir operations and urban water sustainability planning
- Parks, trails, and open space parcel master plans
- Open space acquisition plans
- Stormwater, urban water, and flood management plans and ordinances
- Groundwater sustainability plans
- Public health monitoring procedures
- Street tree and water efficient landscaping ordinances
- Zoning, building, and fire codes
- Climate action plans
- Agency-specific climate adaptation plans
- Parcel or jurisdiction-specific stewardship plans

Agency-specific applications are summarized in companion technical memorandum generated for each user group. Immediate applications of *Climate Ready* data underway include the following pilots.

- MMWD is exploring the use of Climate Ready North Bay hydrology projections as part of an Urban Water Management Plan update to assess supply reliability for the next 40 years.

- Sonoma County Water Agency is using Climate Ready North Bay Russian River flow projections as the foundation of their Climate Adaptation Plan for storage and delivery system operations.
- Napa County is using Climate Ready North Bay recharge maps as an input to its Groundwater Management planning efforts underway.
- Sonoma County Regional Parks is using Climate Ready North Bay vegetation and fire analyses to prioritize the development of forthcoming parcel-specific management plans.

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APPENDICES

Appendix A: List of Climate Ready Analyses Conducted for the North Bay Region

REGIONAL HYDROLOGY GIS DATABASE

Data Product: TBC3 Bay Area Basin Characterization Model Database

An ESRI Geographical Information System (GIS) raster database. This database includes 18-acre monthly resolution data for Sonoma County, including historical data for 1920-2010 and 18 climate future projections selected to cover the full range of internationally peer-reviewed Global Climate Circulation Models (Flint and Flint 2013). This database is the source of all map products and BCM time series represented in the technical memo and PowerPoint slide deck. It may be queried for future analyses by partner agencies.

Filename: *CRNB TBC3 Bay Area BCM 1920-2099.gdb*

NORTH BAY RAINFALL DATABASE

Data Product: Regional Rainfall Analysis

Spreadsheet of annual rainfall totals for North Bay study region and frequency analysis of exceedence of high and low rainfall relative to benchmarks, including minimum and maximum of historical record and 10th and 90th percentiles of assumed “pre-climate change” conditions. Source data is the California BCM (Flint and Flint 2013).

Filename: *CRNB annual regional rainfall.xls*

NORTH BAY CLIMATE-HYDROLOGY VARIABLES

Data Product: Basin Characterization Model Outputs—North Bay Averages

Spreadsheet table of downscaled climate input values (temperature and precipitation) and BCM outputs including runoff, recharge, climatic water deficit, and evapotranspiration averaged over Sonoma County in 30-y time steps for two historic time periods and three projected periods for three “bounding” business-as-usual scenarios (with respect to emissions), including maximum, moderate, and minimum rainfall estimates for the region.

Filename: *CRNB North Bay BCM summary.xls*

IMPACTS OF CLIMATE CHANGE ON VEGETATION-NORTH BAY REGION

Data Product: Standardized 4-page landscape unit vegetation reports

Based on a vegetation transition model (Ackerly et al. 2015) for all Conservation Lands Networklandscape units included in the project area.

Filename: *CRNB North Bay Regional Vegetation Reports.pdf*

NORTH BAY FIRE MODELING

Data Product: North Bay Region Summaries of Fire Risks

This spreadsheet includes a summary of the risk of a burn within 30 years and an estimated fire return interval from the Krawchuk and Moritz 2012 model.

Filename: *CRNB fire probability and return intervals.xls*

Appendix B: Selected Future Climate Scenarios for Detailed Analysis

Table 1. Six Selected Futures for North Bay Regional Vulnerability Assessment (in yellow) in context of original 18 TBC3 scenarios

Graph Label	Model	Emissions Scenario	Assessment Report Vintage	Time Period	Summer Tmax °C	Summer Tmax Increase	Winter Tmin °C	Winter Tmin Increase °C	Annual Precipitation (mm)	% Change Precipitation	% Change Water Deficit
	historic (hst)	N/A	N/A	1951-1980	27.9		3.9		1087		
	current	N/A	N/A	1981-2010	27.9		4.3	0.4	1095	1%	1%
	<i>Assumption: Business as Usual</i>										
6	miroc-esm	rcp85	AR5	2070-2099	34.0	6.1	8.4	4.6	865	-20%	24%
	miroc3_2_mr	A2	AR4	2070-2099	33.0	5.1	7.1	3.2	887	-18%	20%
	ipsl-cm5a-lr	rcp85	AR5	2070-2099	33.0	5.0	9.6	5.7	1325	22%	16%
	fgoals-g2	rcp85	AR5	2070-2099	32.3	4.3	7.1	3.2	1099	1%	22%
5	cnrm-cm5	rcp85	AR5	2070-2099	31.9	4.0	7.7	3.9	1477	36%	12%
4	GFDL	A2	AR4	2070-2099	31.7	3.8	7.7	3.9	861	-21%	21%
3	ccsm4	rcp85	AR5	2070-2099	31.4	3.5	7.1	3.2	1163	7%	12%
2	PCM	A2	AR4	2070-2099	30.6	2.6	6.3	2.4	1159	7%	11%
			<i>Business as Usual Average</i>		32.2	4.3	7.6	3.7	1104	2%	17%
	<i>Assumption: Mitigated</i>										
	miroc-esm	rcp60	AR5	2070-2099	32.6	4.7	7.1	3.2	922	-15%	14%
	giss_aom	A1B	AR4	2070-2099	30.9	3.0	6.4	2.5	1104	2%	11%
	csiro_mk3_5	A1B	AR4	2070-2099	30.8	2.8	6.5	2.6	1506	38%	4%
			<i>Mitigated Average</i>		31.4	3.5	6.6	2.8	1177	8%	10%
	<i>Assumption: Highly Mitigated</i>										
	mpi-esm-lr	rcp45	AR5	2070-2099	30.1	2.2	5.8	1.9	1148	6%	5%
	miroc-esm	rcp45	AR5	2070-2099	30.1	2.2	6.9	3.0	949	-13%	14%
1	GFDL	B1	AR4	2070-2099	30.1	2.2	6.1	2.2	923	-15%	10%
	PCM	B1	AR4	2070-2099	29.5	1.6	5.5	1.7	1197	10%	5%
			<i>Highly Mitigated Average</i>		30.0	2.1	6.1	2.2	1055	-3%	8%
	<i>Assumption: Super Mitigated</i>										
	miroc5	rcp26	AR5	2070-2099	29.8	1.9	5.2	1.3	953	-12%	9%
	mri-cgcm3	rcp26	AR5	2070-2099	29.2	1.3	4.8	0.9	1315	21%	2%
	giss-e2-r	rcp26	AR5	2070-2099	28.4	0.4	4.6	0.7	1344	24%	-4%
			<i>Super Mitigated Average</i>		29.1	1.2	4.8	1.0	1204	11%	2%
			<i>ALL Scenarios Average</i>		31.1	3.2	6.7	2.8	1122	3%	11%

Table 2. Six Selected Futures for North Bay Regional Analysis: Mid-Century Values.

	Model	Emissions Scenario	IPCC Assessment	Short-hand name	Time Period	Summer Tmax °F	Summer Tmax Increase °F	Winter Tmin °F	Winter Tmin Increase °F	Annual Precipitation (in)	% Change Precipitation	% Change Water Deficit
Observed	historical baseline	N/A	N/A		1951-1980	82.2		39.0		42.8		
	current	N/A	N/A		1981-2010	82.2		39.7	0.7	43.1	1%	1%
Projections												
1	GFDL	B1	AR4	low warming-low rainfall	2040-2069	85.2	2.9	42.7	3.7	42.6	-1%	6%
2	PCM	A2	AR4	low warming-mod rainfall	2040-2069	85.0	2.7	41.1	2.1	43.8	2%	7%
3	CCSM-4	rcp85	AR5	warm-mod rainfall	2040-2069	86.0	3.7	42.0	3.0	42.2	-1%	8%
4	GFDL	A2	AR4	warm-low rainfall	2040-2069	86.3	4.0	43.2	4.2	39.8	-7%	12%
5	CNRM-CM5	rcp85	AR5	warm-high rainfall	2040-2069	86.5	4.2	43.0	4.0	53.8	26%	6%
6	MIROC-ESM	rcp85	AR5	hot-low rainfall	2040-2069	89.2	6.9	41.4	2.4	35.0	-18%	14%
Average						86.3	4.1	42.2	3.2	42.9	0%	9%

Table 3. Six Selected Futures for North Bay Regional Analysis: End-Century Values.

	Model	Emissions Scenario	IPCC Assessment	Short-hand name	Time Period	Summer Tmax °F	Summer Tmax Increase °F	Winter Tmin °F	Winter Tmin Increase °F	Annual Precipitation (in)	% Change Precipitation	% Change Water Deficit
Observed	historical baseline	N/A	N/A		1951-1980	82.2		3.9		42.8		
	current	N/A	N/A		1981-2010	82.2		4.3	0.4	43.1	1%	1%
Projections												
1	GFDL	B1	AR4	low warming-low rainfall	2070-2099	86.2	4.0	6.1	2.2	36.3	-15%	10%
2	PCM	A2	AR4	low warming-mod rainfall	2070-2099	87.0	4.7	6.3	2.4	45.6	7%	11%
3	CCSM-4	rcp85	AR5	warm-mod rainfall	2070-2099	88.5	6.2	7.1	3.2	45.8	7%	12%
4	GFDL	A2	AR4	warm-low rainfall	2070-2099	89.1	6.9	7.7	3.9	33.9	-21%	21%
5	CNRM-CM5	rcp85	AR5	warm-high rainfall	2070-2099	89.5	7.2	7.7	3.9	58.1	36%	12%
6	MIROC-ESM	rcp85	AR5	hot-low rainfall	2070-2099	93.3	11.0	8.4	4.6	34.0	-20%	24%
Average						88.9	6.7	7.2	3.3	42	0.0	15%

Appendix C: Climate Models Used in the Basin Characterization Model and Glossary of Terms

Table 1. Global Circulation Models used in the California Basin Characterization Model calculation of hydrologic response to future climate projections.

Originating Group(s)	Country	Model Abbreviation	IPCC Assessment Report	Emissions scenario or representative concentration pathway	Downscaling method
National Center for Atmospheric Research	USA	CCSM_4	5	RCP 8.5	BCSD*
Centre National de Recherches Météorologiques / Centre Européen de Recherche et Formation Avancée en Calcul Scientifique	France	CNRM-CM5	5	RCP 8.5	BCSD
LASG, Institute of Atmospheric Physics, Chinese Academy of Sciences and CESS, Tsinghua University	China	FGOALS-G2	5	RCP 8.5	BCSD
NASA / Goddard Institute for Space Studies	USA	GISS-E2	5	RCP 2.6	BCSD
Institut Pierre Simon Laplace	France	IPLS-CM5A-LR	5	RCP 8.5	BCSD
Center for Climate System Research (The University of Tokyo), National Institute for Environmental Studies, and Frontier Research Center for Global Change (JAMSTEC)	Japan	MIROC-ESM	5	RCP 4.5	BCSD
Japan Agency for Marine-Earth Science and Technology, Atmosphere and Ocean Research Institute (The University of Tokyo), and National Institute for Environmental Studies	Japan	MIROC-ESM	5	RCP 6.0	BCSD
Japan Agency for Marine-Earth Science and Technology, Atmosphere and Ocean Research Institute (The University of Tokyo), and National Institute for Environmental Studies	Japan	MIROC-ESM	5	RCP 8.5	BCSD
Atmosphere and Ocean Research Institute (The University of Tokyo), National Institute for Environmental Studies, and Japan Agency for Marine-Earth Science and Technology	Japan	MIROC5	5	RCP 2.6	BCSD
Max-Planck-Institut für		MPI-ESM-LR	5	RCP 4.5	BCSD

Originating Group(s)	Country	Model Abbreviation	IPCC Assessment Report	Emissions scenario or representative concentration pathway	Downscaling method
Meteorologie (Max Planck Institute for Meteorology)					
Meteorological Research Institute	Japan	MRI-CGCM3	5	RCP 2.6	BCSD
CSIRO Atmospheric Research	Australia	CSIRO_MK3_5	4	A1B	BCSD
NASA / Goddard Institute for Space Studies	USA	GISS_AOM	4	A1B	BCSD
Center for Climate System Research (The University of Tokyo), National Institute for Environmental Studies, and Frontier Research Center for Global Change (JAMSTEC)	Japan	MIROC3_2_MEDRES	4	A2	BCSD
US Dept. of Commerce / NOAA / Geophysical Fluid Dynamics Laboratory	USA	GFDL	4	A2	CA**
US Dept. of Commerce / NOAA / Geophysical Fluid Dynamics Laboratory	USA	GFDL	4	B1	CA
National Center for Atmospheric Research	USA	PCM	4	A2	CA
National Center for Atmospheric Research	USA	PCM	4	B1	CA

* Bias correction/spatial downscaling (Wood and others, 2004)

** Constructed analogues (Hidalgo and others, 2008)

Table 2. Downscaled climate model input and hydrologic model output variables used in the California Basin Characterization Model.

Variable	Code	Creation Method	Units	Equation/model	Description
Maximum air temperature	tmx	downscaled	degree C	Model input	The maximum monthly temperature averaged annually
Minimum air temperature	tmn	downscaled	degree C	Model input	The minimum monthly temperature averaged annually
Precipitation	ppt	downscaled	mm	Model input	Total monthly precipitation (rain or snow) summed annually
Potential evapotranspiration	pet	Modeled/ pre-processing input for BCM	mm	Modeled* on an hourly basis from solar radiation that is modeled using topographic shading, corrected for cloudiness, and partitioned on the basis of vegetation cover to represent bare-soil evaporation and evapotranspiration due to vegetation	Total amount of water that can evaporate from the ground surface or be transpired by plants summed annually
Runoff	run	BCM	mm	Amount of water that exceeds total soil storage + rejected recharge	Amount of water that becomes stream flow, summed annually
Recharge	rch	BCM	mm	Amount of water exceeding field capacity that enters bedrock, occurs at a rate determined by the hydraulic conductivity of the underlying materials, excess water (rejected recharge) is added to runoff	Amount of water that penetrates below the root zone, summed annually
Climatic water deficit	cwd	BCM	mm	pet-aet	Annual evaporative demand that exceeds available water, summed annually
Actual evapotranspiration	aet	BCM	mm	pet calculated* when soil water content is above wilting point	Amount of water that evaporates from the surface and is transpired by plants if the total amount of water is not limited, summed annually
Sublimation	subl	BCM	mm	Calculated*, applied to pck	Amount of snow lost to sublimation (snow to water vapor) summed annually
Soil water storage	stor	BCM	mm	ppt + melt - aet - rch - run	Average amount of water stored in the soil annually
Snowfall	snow	BCM	mm	precipitation if air temperature below 1.5 degrees C (calibrated)	Amount of snow that fell summed annually

Variable	Code	Creation Method	Units	Equation/model	Description
Snowpack	pck	BCM	mm	Prior month pck + snow - subl -melt	Amount of snow as a water equivalent that is accumulated per month summed annually (if divided by 12 would be average monthly snowpack)
Snowmelt	melt	BCM	mm	Calculated*, applied to pck	Amount of snow that melted summed annually (snow to liquid water)
Excess water	exc	BCM	mm	ppt - pet	Amount of water that remains in the system, assuming evapotranspiration consumes the maximum possible amount of water, summed annually for positive months only

Source: Flint, L.E., A.L. Flint, and J.H. Thorne. 2013. *California Basin Characterization Model: A Dataset of Historical and Future Hydrologic Response to Climate Change: U.S. Geological Survey Data Set*, <http://calcommons.org>; <http://cida.usgs.gov/climate/gdp>.

Table 3: Glossary of Basin Characterization Model Terms

AET: Actual Evapotranspiration (mm or in H2O per month or per year)
AET is the amount of water transferred from the soil to the atmosphere through vegetation transpiration and direct surface evaporation. Decreased AET means less vegetation productivity. Increased AET means more vegetation productivity.
CWD: Climatic Water Deficit (mm or in H2O per year)
CWD is an integrated measure of seasonal water stress and aridity. It is the additional amount of water that could have been evaporated had it been freely available. It is calculated as a cumulative sum over the dry season. Increased CWD means higher water stress for vegetation, and greater risk of fire. Greatly increased CWD (50-100+ mm/year over 30 years) can lead to death of existing vegetation through drought stress. Decreased CWD means less water stress and potentially lower fire risk.
PET: Potential Evapotranspiration (mm or in H2O per month or per year)
PET is the amount of water that could be evaporated if it were freely available (or, provided an unlimited supply of water). Increased PET means higher evaporative demand. Decreased PET means less evaporative demand.
DJF Tmin: Average Winter (December-February) daily minimum temperature °C or °F
The average minimum temperature over the coldest months of the year (December- February). DJF Tmin is a prime determinant of frost and freeze frequency, and chilling hours for winter dormant plants.
JJA Tmax: Average Summer (June-August) daily maximum temperature °C or °F
The average summer maximum temperature in the three warmest months of the year (June-August). JJA Tmax is a prime determinant of heat wave extremes, and is an important contributor to PET and aridity.
PPT: Precipitation (mm or in H2O per month or per year)
PPT is the total annual precipitation in mm (25.4 mm = 1"). Increased PPT directly increases runoff, may increase recharge if distributed through the rainy season, and can ameliorate aridity if it falls in March-May (higher AET and lower CWD). Decreased PPT directly decreases runoff and recharge, and increases aridity (lower AET and higher CWD).
Recharge: Recharge (mm or in H2O per month or per year)
Recharge is water that percolates below the rooting zone and becomes groundwater for more than a month. Recharge is affected greatly by bedrock permeability and soil depth. Recharge is a precious resource. Recharge provides natural subsurface storage that is the source of stream baseflow in the dry season, and many Bay Area communities depend on well water. Conservation of high recharge areas is a high priority. Increases in recharge results in greater groundwater aquifer storage and maintenance of baseflow (stream flows during periods absent precipitation), especially during multi-year droughts. Decreases in recharge results in less groundwater storage and loss of baseflow, especially during multi-year droughts.
Runoff: Runoff (mm or in H2O per month or per year)
Runoff is the water that feeds surface water stream flow, and generally occurs during storms when the soil is fully saturated with water. Runoff occurs on shallower soils more rapidly than on deeper soils.

Appendix D: North Bay Regional Basin Characterization Model Summary Data Tables

Table 1: Basin Characterization Model, North Bay Regional: Three “business as usual” models used for map products, 1951-2099, average values.

Variable	Units	Historic	Current	Moderate Warming, High Rainfall		Moderate Warming, Moderate Rainfall		Hot, Low Rainfall	
		1951-1980	1981-2010	2040-2069	2070-2099	2040-2069	2070-2099	2040-2069	2070-2099
Ppt	in	42.6	43.0	53.6	57.9	42.1	45.6	34.8	33.9
Tmn	Deg F	44.8	45.8	49.2	52.0	48.5	51.3	50.6	54.3
Tmx	Deg F	71.2	71.2	75.0	77.7	74.4	77.1	76.8	80.7
CWD	in	28.0	54.9	57.4	60.1	58.3	60.3	61.5	66.7
Rch	in	11.0	10.2	12.8	13.2	10.7	10.8	8.2	8.5
Run	in	14.0	14.2	22.8	26.9	14.0	17.3	9.7	9.3

Table 2: Basin Characterization Model, North Bay Regional: Three “business as usual” models used for map products, 1951-2099, percent change from current.

Variable	Units	Historic	Current	Moderate Warming, High Rainfall		Moderate Warming, Moderate Rainfall		Hot, Low Rainfall	
		1951-1980	1981-2010	2040-2069	2070-2099	2040-2069	2070-2099	2040-2069	2070-2099
Ppt	in	42.6	43.0	25%	35%	-2%	6%	-19%	-21%
Tmn	Deg F	44.8	45.8	3.4	6.2	2.7	5.5	4.8	8.4
Tmx	Deg F	71.2	71.2	3.8	6.5	3.2	5.9	5.6	9.5
CWD	in	28.0	54.9	5%	10%	6%	10%	12%	22%
Rch	in	11.0	10.2	25%	29%	4%	6%	-20%	-17%
Run	in	14.0	14.2	61%	90%	-1%	22%	-32%	-34%

Variables: Ppt=precipitation, Tmn=minimum winter temperature (monthly), Tmx=maximum summer temperature (monthly), CWD=climatic water deficit, Rch=recharge, Run=runoff

Staff Report

To: SCTA Board of Directors

From: Suzanne Smith

Item: 5.2 – Regional Agency Reports

Date: June 13, 2016

Issue:

Recent updates from:

- Sonoma Clean Power (SCP)
- Sonoma/Marin Area Rail Transit (SMART)
- Golden Gate Bridge, Highway and Transportation District (GGBHTD)
- Metropolitan Transportation Commission (MTC)
- Association of Bay Area Governments (ABAG)
- Bay Area Air Quality Management District (BAAQMD)
- Bay Conservation and Development Commission (BCDC)
- California Councils of Governments (CALCOG)
- Self Help Counties Coalition

Background:

The following links provide information regarding various regional agencies and issues:

- MTC Executive Director's Report
 - <http://www.mtc.ca.gov/whats-happening/news/executive-directors-report>
 - Memorandum RE: Regional Gas Tax Update: Request for Input for Possible Expenditure Plan (see attached)
- SMART
 - http://www2.sonomamarintrain.org/userfiles/file/GM_Report_-_May_2016_Final.pdf

Staff Recommendation:

This is an informational item only.



Memorandum

TO: Partnership Board

DATE: May 27, 2016

FR: Rebecca Long, Legislation and Public Affairs

RE: Regional Gas Tax Update: Request for Input for Possible Expenditure Plan

Background

Recent polling in the nine Bay Area counties found that almost two-thirds of Bay Area likely voters support a 5-cent per gallon regional gas tax to fund local street and road repairs (including bicycle and pedestrian improvements). Regionwide, the response was 65 percent support, with support only varying considerably in Solano County at 50%. This matter was discussed at the Commission Workshop in April and MTC's Legislation Committee meeting in May. Excerpts from the presentations at those meetings is included as Attachment A.

To better inform the Commission's decision about whether to place a measure on the November ballot, MTC staff is seeking your input on an expenditure plan that would primarily fund local street and road repairs, while also providing eligibility for bicycle and pedestrian improvements, consistent with the way in which the measure was described in the poll.

The statute requires that revenue be returned to the counties based on population, but does not specify how the funds are distributed within each county. Given the concept is a program focused on local streets and roads, staff believes a formula program makes the most sense. Attachment B details a number of options, including:

1. A population-based distribution;
2. A 50/50 county/city split, with the city share further distributed based on population;
3. A combination formula that takes into account population, road miles and pavement needs with each factor counting 33%. MTC used a similar distribution method for a portion of federal Surface Transportation Funds prior to the One Bay Area Grant Program based on the recommendation of Bay Area Public Works Directors.

The remainder of this memo provides an overview of the regional gas tax statute with respect to project eligibility and development of the expenditure plan, provides a rough timeline for placement on the ballot, and highlights the competing statewide and local measures that are confirmed or likely to be on the November 2016 ballot.

Key Provisions of the Bay Area’s Regional Gas Tax Statute

MTC has the authority to request that Bay Area counties place a regional gas tax on the ballot in any amount *up to* 10 cents per gallon for up to 20 years. The statute authorizing this tax specifies the exact wording of the ballot question, as shown in Attachment C. Staff estimates a 5-cent per gallon tax would raise approximately \$140 million annually region wide. The statute requires that each county receive at least 95 percent of its population share in proceeds from the tax. While the statute provides for broad eligibility, MTC proposes to pursue a “pennies for potholes” program focused on local road repairs. With respect to process, the statute requires that MTC adopt a Regional Transportation Expenditure Plan (RTEP) in consultation with “cities, counties, transit operators, congestion management agencies, and other interested groups.”

Election Process: Timeline & Other Key Requirements

- To place the measure on the ballot, MTC must make a request of the Board of Supervisors in each of the nine counties. A county can opt out of the regional measure if it submits another countywide transportation funding measure to the voters at the same election.
- Election costs are to be paid out of proceeds from tax or other MTC funds if the measure fails.
- Election law requires MTC to submit a measure to each Board of Supervisors 88 days prior to the election — by August 12, 2016 if it is to be on the November 2016 ballot.

Competing Funding Measures

An important consideration about whether or not to pursue a regional gas tax this fall is the potential for the measure to negatively affect (and be affected by) other local transportation and affordable housing measures, as well as statewide revenue measures. A number of Bay Area jurisdictions, including the BART, AC Transit, Contra Costa Transportation Authority, SFCTA, and the Santa Clara Valley Transportation Authority, are expected to place revenue measures before the voters this November.

Next Steps

Staff is seeking input through various key stakeholder meetings over the next several weeks. We look forward to hearing your feedback at the June Partnership Board meeting.

Attachments

J:\COMMITTEE\Partnership\BOARD\2016 Partnership Board\3_June 2016\5_regional gas tax.docx

Bay Area Gas Tax

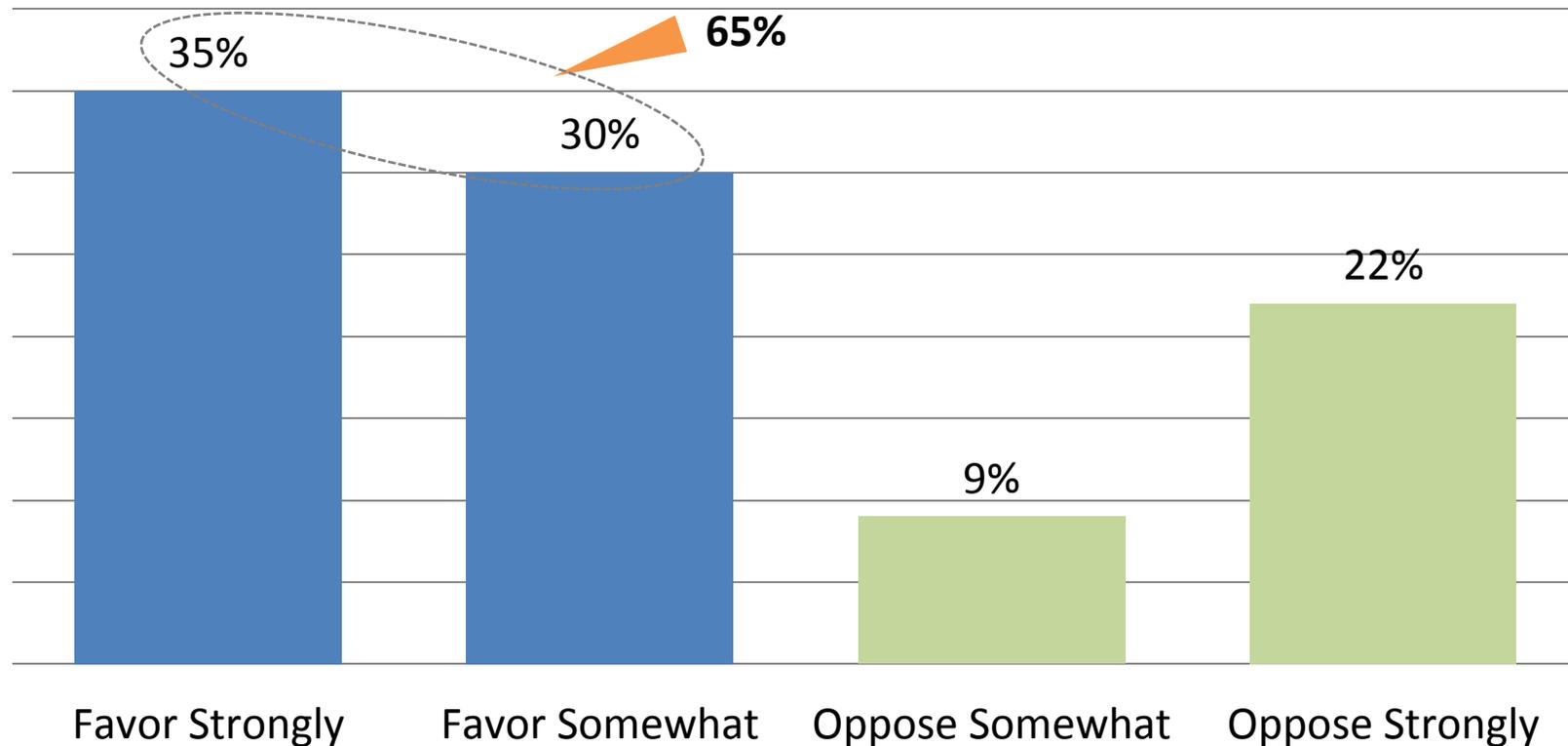
A ballot measure is being proposed to establish a gas tax which would increase the cost of gasoline by _____* per gallon in all Bay Area counties. The revenue would directly fund local road repairs, as well as improvements for bicycle and pedestrian routes.

- **Overall, do you favor or oppose this measure? Is that strongly or somewhat?**

*question was asked at 5 cents and 10 cents per gallon

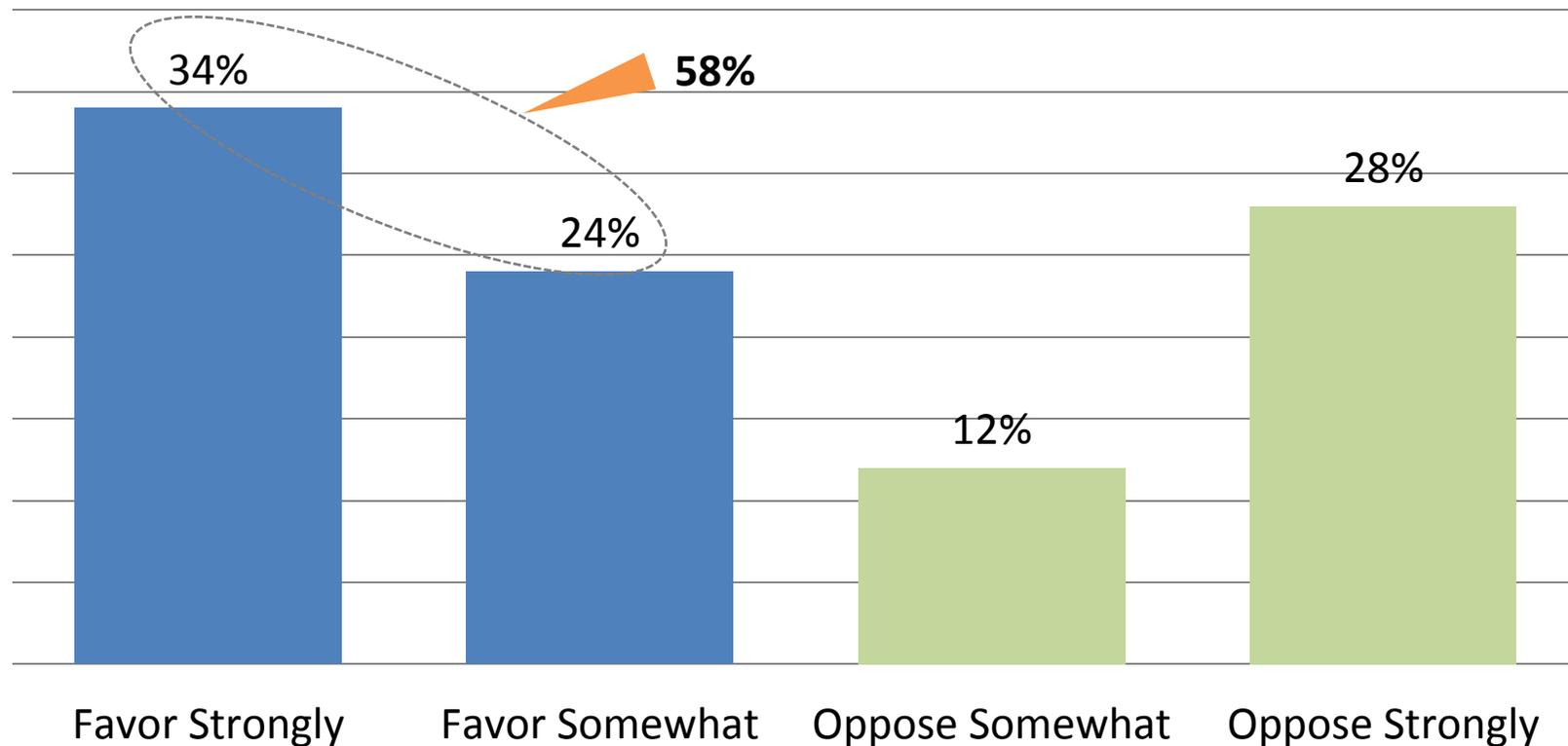
Bay Area Gas Tax – 5 cents/gallon

If this tax increased the cost of gasoline by 5 cents per gallon, rather than 10 cents, would you favor or oppose this measure?



Bay Area Gas Tax – 10 cents/gallon

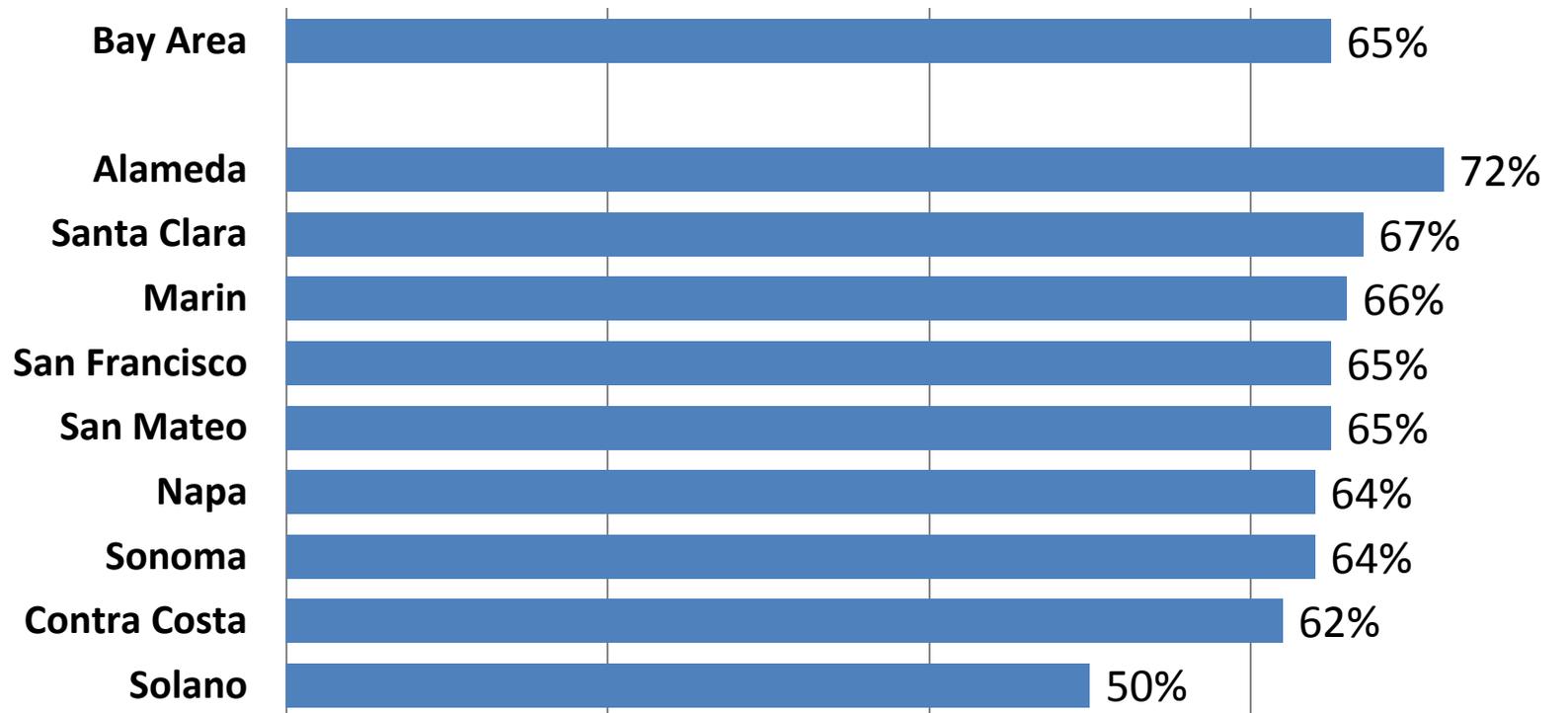
Overall, do you favor or oppose this measure?...Is that strongly or somewhat?



Percentages above do not include don't know responses (2% of total)

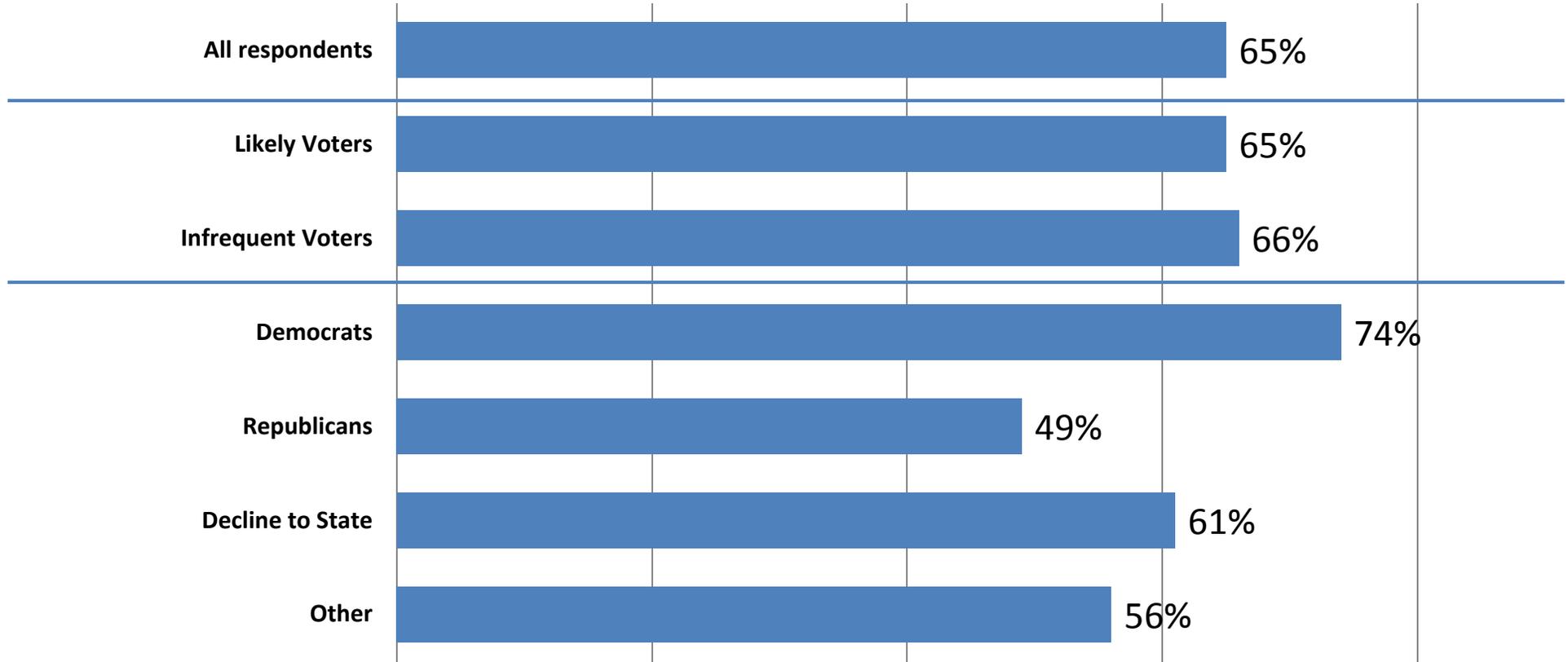
Support by County – 5 cents/gal

Share who support gas tax strongly or somewhat...



Support for Gas Tax – 5 cents/gal

Share who favor strongly or somewhat ...



Statements and Impact

- Following initial gas tax question (at 10 cents), voters were read statements in favor and opposed to measure.
- Some statements resonated more than others with voters.
- However, there was no change in overall support for measure when voters were re-asked the measure (at 10 cents) after hearing statements.
- Support DID increase when asked about a 5 cent gas tax

Annual Regional Gas Tax Revenue (2017) Distribution Scenarios

Regional Gas Tax (5 cents/gallon)	
Total	\$ 141,975,208
BOE 1% Takedown	\$ 1,419,752
Net after BOE	\$ 140,555,456
MTC 1% Admin Takedown	\$ 1,405,555
Net after MTC	\$ 139,149,901
5% Regional Discretionary Funding	\$ 6,957,495
Net 95% for County Distribution	\$ 132,192,406

Total Bay Area Revenue (2017 Estimate)	County Shares
Alameda	\$ 28,064,378
Contra Costa	\$ 19,410,504
Marin	\$ 4,557,901
Napa	\$ 2,470,368
San Francisco	\$ 14,882,576
San Mateo	\$ 13,254,947
Santa Clara	\$ 33,257,585
Solano	\$ 7,560,105
Sonoma	\$ 8,734,041
Bay Area Subtotal	\$ 132,192,406

Local Jurisdiction	Population	Gas Tax Subvention (50% County, 50% Pop) *	DIFFERENCE: Gas Tax Subvention vs. Pop. Distribution	Combo Formula: (1/3 Pop., 1/3 Miles, 1/3 Road Maint. Need)**	DIFFERENCE: Combo Formula vs. Pop Distribution
Alameda County (Unincorporated)	\$ 2,583,448	\$ 14,032,189	\$ 11,448,741	\$ 3,055,211	\$ 471,763
Alameda	\$ 1,348,827	\$ 742,791	\$ (606,036)	\$ 1,137,958	\$ (210,869)
Albany	\$ 326,744	\$ 179,936	\$ (146,808)	\$ 272,177	\$ (54,567)
Berkeley	\$ 2,090,525	\$ 1,151,239	\$ (939,286)	\$ 1,923,869	\$ (166,656)
Dublin	\$ 982,853	\$ 541,251	\$ (441,602)	\$ 767,703	\$ (215,150)
Emeryville	\$ 186,032	\$ 102,447	\$ (83,585)	\$ 151,366	\$ (34,666)
Fremont	\$ 3,987,292	\$ 2,195,777	\$ (1,791,515)	\$ 4,037,948	\$ 50,655
Hayward	\$ 2,690,843	\$ 1,481,830	\$ (1,209,013)	\$ 2,451,846	\$ (238,997)
Livermore	\$ 1,513,422	\$ 833,432	\$ (679,990)	\$ 1,997,800	\$ 484,378
Newark	\$ 777,989	\$ 428,434	\$ (349,555)	\$ 792,679	\$ 14,689
Oakland	\$ 7,226,603	\$ 3,979,645	\$ (3,246,958)	\$ 7,152,609	\$ (73,994)
Piedmont	\$ 195,589	\$ 107,709	\$ (87,879)	\$ 238,937	\$ 43,348
Pleasanton	\$ 1,317,358	\$ 725,461	\$ (591,897)	\$ 1,435,262	\$ 117,904
San Leandro	\$ 1,556,560	\$ 857,188	\$ (699,372)	\$ 1,629,059	\$ 72,499
Union City	\$ 1,280,293	\$ 705,049	\$ (575,244)	\$ 1,019,954	\$ (260,339)
Alameda County Total	\$ 28,064,378	\$ 28,064,378	\$ -	\$ 28,064,378	\$ -

Local Jurisdiction	Population	Gas Tax Subvention (50% County, 50% Pop)	Gas Tax Subvention vs. Pop. Distribution	Combo Formula: (1/3 Pop., 1/3 Miles, 1/3 Road Maint. Need)	Combo Formula vs. Pop Distribution
Contra Costa County (Unincorporated)	\$ 2,962,481	\$ 9,705,252	\$ 6,742,771	\$ 3,268,403	\$ 305,922
Antioch	\$ 1,906,042	\$ 1,124,671	\$ (781,371)	\$ 1,902,537	\$ (3,505)
Brentwood	\$ 994,275	\$ 586,678	\$ (407,597)	\$ 888,770	\$ (105,506)
Clayton	\$ 198,669	\$ 117,226	\$ (81,443)	\$ 202,227	\$ 3,558
Concord	\$ 2,218,811	\$ 1,309,223	\$ (909,589)	\$ 2,161,980	\$ (56,832)
Danville	\$ 768,961	\$ 453,730	\$ (315,231)	\$ 819,752	\$ 50,791
El Cerrito	\$ 427,468	\$ 252,230	\$ (175,238)	\$ 321,931	\$ (105,537)
Hercules	\$ 436,039	\$ 257,288	\$ (178,752)	\$ 354,611	\$ (81,428)
Lafayette	\$ 442,710	\$ 261,224	\$ (181,486)	\$ 432,740	\$ (9,970)
Martinez	\$ 657,958	\$ 388,232	\$ (269,726)	\$ 809,347	\$ 151,390
Moraga	\$ 289,801	\$ 170,999	\$ (118,802)	\$ 338,425	\$ 48,624
Oakley	\$ 682,686	\$ 402,823	\$ (279,863)	\$ 700,261	\$ 17,576
Orinda	\$ 327,571	\$ 193,285	\$ (134,286)	\$ 488,070	\$ 160,499
Pinole	\$ 333,449	\$ 196,754	\$ (136,696)	\$ 334,496	\$ 1,047
Pittsburg	\$ 1,190,251	\$ 702,315	\$ (487,937)	\$ 1,046,401	\$ (143,850)
Pleasant Hill	\$ 601,250	\$ 354,771	\$ (246,479)	\$ 638,357	\$ 37,107
Richmond	\$ 1,889,287	\$ 1,114,785	\$ (774,502)	\$ 1,833,450	\$ (55,838)
San Pablo	\$ 523,247	\$ 308,745	\$ (214,502)	\$ 329,236	\$ (194,012)
San Ramon	\$ 1,382,672	\$ 815,854	\$ (566,818)	\$ 1,201,042	\$ (181,629)
Walnut Creek	\$ 1,176,875	\$ 694,422	\$ (482,453)	\$ 1,338,468	\$ 161,593
Contra Costa County Total	\$ 19,410,504	\$ 19,410,504	\$ -	\$ 19,410,504	\$ -
Marin County (Unincorporated)	\$ 1,205,387	\$ 2,278,951	\$ 1,073,563	\$ 1,737,274	\$ 531,887
Belvedere	\$ 37,330	\$ 25,376	\$ (11,954)	\$ 34,974	\$ (2,356)
Corte Madera	\$ 167,041	\$ 113,550	\$ (53,491)	\$ 147,226	\$ (19,815)
Fairfax	\$ 134,358	\$ 91,333	\$ (43,025)	\$ 115,527	\$ (18,831)
Larkspur	\$ 217,307	\$ 147,720	\$ (69,587)	\$ 205,032	\$ (12,275)
Mill Valley	\$ 254,126	\$ 172,748	\$ (81,378)	\$ 260,472	\$ 6,346
Novato	\$ 942,919	\$ 640,971	\$ (301,947)	\$ 768,154	\$ (174,765)
Ross	\$ 43,877	\$ 29,826	\$ (14,050)	\$ 39,866	\$ (4,011)
San Anselmo	\$ 222,992	\$ 151,584	\$ (71,408)	\$ 184,646	\$ (38,345)
San Rafael	\$ 1,042,165	\$ 708,436	\$ (333,729)	\$ 820,385	\$ (221,780)
Sausalito	\$ 128,480	\$ 87,337	\$ (41,143)	\$ 112,380	\$ (16,099)
Tiburon	\$ 161,920	\$ 110,069	\$ (51,851)	\$ 131,964	\$ (29,956)
Marin County Total	\$ 4,557,901	\$ 4,557,901	\$ -	\$ 4,557,901	\$ -
Napa County (Unincorporated)	\$ 473,422	\$ 1,235,184	\$ 761,762	\$ 1,071,102	\$ 597,680
American Canyon	\$ 354,622	\$ 219,347	\$ (135,275)	\$ 240,115	\$ (114,507)
Calistoga	\$ 92,593	\$ 57,272	\$ (35,321)	\$ 68,251	\$ (24,343)
Napa	\$ 1,389,888	\$ 859,696	\$ (530,192)	\$ 962,182	\$ (427,706)
St Helena	\$ 106,744	\$ 66,025	\$ (40,719)	\$ 95,639	\$ (11,105)
Yountville	\$ 53,099	\$ 32,844	\$ (20,255)	\$ 33,079	\$ (20,021)
Napa County Total	\$ 2,470,368	\$ 2,470,368	\$ -	\$ 2,470,368	\$ -
San Francisco	\$ 14,882,576	\$ 14,882,576	\$ -	\$ 14,882,576	\$ -
San Francisco Total	\$ 14,882,576	\$ 14,882,576	\$ -	\$ 14,882,576	\$ -

Local Jurisdiction	Population	Gas Tax Subvention (50% County, 50% Pop.)	Gas Tax Subvention vs. Pop. Distribution	Combo Formula: (1/3 Pop., 1/3 Miles, 1/3 Road Maint. Need)	Combo Formula vs. Pop Distribution
San Mateo County (Unincorporated)	\$ 1,137,223	\$ 6,627,474	\$ 5,490,251	\$ 2,025,594	\$ 888,372
Atherton	\$ 122,056	\$ 66,755	\$ (55,301)	\$ 333,057	\$ 211,001
Belmont	\$ 470,764	\$ 257,472	\$ (213,292)	\$ 549,142	\$ 78,378
Brisbane	\$ 79,921	\$ 43,711	\$ (36,211)	\$ 159,463	\$ 79,542
Burlingame	\$ 526,063	\$ 287,717	\$ (238,347)	\$ 567,270	\$ 41,207
Colma	\$ 26,048	\$ 14,246	\$ (11,802)	\$ 65,387	\$ 39,339
Daly City	\$ 1,862,254	\$ 1,018,511	\$ (843,743)	\$ 836,455	\$ (1,025,798)
East Palo Alto	\$ 512,811	\$ 280,468	\$ (232,342)	\$ 359,989	\$ (152,822)
Foster City	\$ 570,063	\$ 311,781	\$ (258,282)	\$ 341,751	\$ (228,312)
Half Moon Bay	\$ 212,097	\$ 116,001	\$ (96,096)	\$ 204,177	\$ (7,921)
Hillsborough	\$ 200,992	\$ 109,927	\$ (91,065)	\$ 530,670	\$ 329,679
Menlo Park	\$ 585,604	\$ 320,281	\$ (265,323)	\$ 650,861	\$ 65,257
Millbrae	\$ 403,004	\$ 220,413	\$ (182,592)	\$ 480,290	\$ 77,286
Pacifica	\$ 678,497	\$ 371,086	\$ (307,411)	\$ 794,450	\$ 115,953
Portola Valley	\$ 79,675	\$ 43,576	\$ (36,099)	\$ 221,859	\$ 142,184
Redwood City	\$ 1,440,347	\$ 787,760	\$ (652,587)	\$ 1,066,240	\$ (374,107)
San Bruno	\$ 781,597	\$ 427,474	\$ (354,123)	\$ 729,300	\$ (52,298)
San Carlos	\$ 518,302	\$ 283,472	\$ (234,830)	\$ 696,991	\$ 178,690
San Mateo	\$ 1,785,148	\$ 976,340	\$ (808,808)	\$ 1,295,051	\$ (490,097)
South San Francisco	\$ 1,164,995	\$ 637,164	\$ (527,831)	\$ 1,030,555	\$ (134,440)
Woodside	\$ 97,486	\$ 53,318	\$ (44,169)	\$ 316,394	\$ 218,908
San Mateo County Total	\$ 13,254,947	\$ 13,254,947	\$ -	\$ 13,254,947	\$ -
Santa Clara County (Unincorporated)	\$ 1,534,401	\$ 16,628,793	\$ 15,094,391	\$ 3,862,892	\$ 2,328,491
Campbell	\$ 736,682	\$ 386,157	\$ (350,525)	\$ 681,800	\$ (54,882)
Cupertino	\$ 1,051,704	\$ 551,287	\$ (500,417)	\$ 1,021,476	\$ (30,228)
Gilroy	\$ 932,799	\$ 488,958	\$ (443,840)	\$ 924,307	\$ (8,491)
Los Altos	\$ 528,633	\$ 277,101	\$ (251,532)	\$ 573,500	\$ 44,867
Los Altos Hills	\$ 146,801	\$ 76,951	\$ (69,850)	\$ 262,006	\$ 115,204
Los Gatos	\$ 536,887	\$ 281,428	\$ (255,459)	\$ 656,461	\$ 119,573
Milpitas	\$ 1,277,864	\$ 669,836	\$ (608,028)	\$ 1,080,982	\$ (196,882)
Monte Sereno	\$ 60,738	\$ 31,838	\$ (28,900)	\$ 77,665	\$ 16,928
Morgan Hill	\$ 735,309	\$ 385,438	\$ (349,872)	\$ 819,724	\$ 84,414
Mountain View	\$ 1,371,285	\$ 718,806	\$ (652,479)	\$ 1,125,796	\$ (245,489)
Palo Alto	\$ 1,178,002	\$ 617,490	\$ (560,512)	\$ 1,314,751	\$ 136,750
San Jose	\$ 17,890,007	\$ 9,377,659	\$ (8,512,348)	\$ 16,121,123	\$ (1,768,884)
Santa Clara	\$ 2,129,122	\$ 1,116,052	\$ (1,013,070)	\$ 1,876,117	\$ (253,005)
Saratoga	\$ 542,062	\$ 284,140	\$ (257,922)	\$ 811,507	\$ 269,445
Sunnyvale	\$ 2,605,289	\$ 1,365,652	\$ (1,239,638)	\$ 2,047,479	\$ (557,810)
Santa Clara County Total	\$ 33,257,585	\$ 33,257,585	\$ -	\$ 33,257,585	\$ -
Solano County (Unincorporated)	\$ 340,524	\$ 3,780,053	\$ 3,439,528	\$ 1,148,124	\$ 807,599
Benicia	\$ 487,326	\$ 255,156	\$ (232,170)	\$ 498,687	\$ 11,361
Dixon	\$ 337,180	\$ 176,542	\$ (160,638)	\$ 301,436	\$ (35,744)
Fairfield	\$ 1,969,279	\$ 1,031,082	\$ (938,197)	\$ 1,625,452	\$ (343,827)
Rio Vista	\$ 144,197	\$ 75,499	\$ (68,698)	\$ 122,405	\$ (21,792)
Suisun City	\$ 508,428	\$ 266,205	\$ (242,224)	\$ 444,449	\$ (63,979)
Vacaville	\$ 1,666,753	\$ 872,684	\$ (794,069)	\$ 1,414,404	\$ (252,349)
Vallejo	\$ 2,106,418	\$ 1,102,885	\$ (1,003,533)	\$ 2,005,148	\$ (101,270)
Solano County Total	\$ 7,560,105	\$ 7,560,105	\$ -	\$ 7,560,105	\$ -

Local Jurisdiction	Population	Gas Tax Subvention (50% County, 50% Pop.)	Gas Tax Subvention vs. Pop. Distribution	Combo Formula: (1/3 Pop., 1/3 Miles, 1/3 Road Maint. Need)	Combo Formula vs. Pop Distribution
Sonoma County (Unincorporated)	\$ 2,623,259	\$ 4,367,021	\$ 1,743,762	\$ 4,154,412	\$ 1,531,153
Cloverdale	\$ 153,261	\$ 109,526	\$ (43,734)	\$ 124,360	\$ (28,900)
Cotati	\$ 129,289	\$ 92,396	\$ (36,894)	\$ 104,951	\$ (24,339)
Healdsburg	\$ 205,691	\$ 146,995	\$ (58,696)	\$ 183,715	\$ (21,975)
Petaluma	\$ 1,047,903	\$ 748,875	\$ (299,028)	\$ 879,643	\$ (168,259)
Rohnert Park	\$ 722,954	\$ 516,653	\$ (206,301)	\$ 485,129	\$ (237,826)
Santa Rosa	\$ 3,046,046	\$ 2,176,832	\$ (869,214)	\$ 2,232,215	\$ (813,830)
Sebastopol	\$ 132,123	\$ 94,421	\$ (37,702)	\$ 99,676	\$ (32,448)
Sonoma	\$ 192,421	\$ 137,512	\$ (54,909)	\$ 138,326	\$ (54,095)
Windsor	\$ 481,095	\$ 343,811	\$ (137,284)	\$ 331,615	\$ (149,480)
Sonoma County Total	\$ 8,734,041	\$ 8,734,041	\$ -	\$ 8,734,041	\$ -

Notes:

* **Gas Tax Subvention (50% County, 50% Pop).** This distribution method apportions the funds by population to each county first (as required by statute) and then splits the funds 50/50 with 50% apportioned to the county for county-owned roads and the remainder split between cities based on population. This is the same formula used in the state's gas tax subvention formula for local streets and roads.

** **Combo Formula: (1/3 Pop., 1/3 Miles, 1/3 Road Maint. Need).** This version distributes the funds using a combination formula that incorporates population, road miles and pavement needs with each factor counting 33%. MTC used a similar distribution method to this for federal Surface Transportation Funds prior to OBAG based on the recommendation of Bay Area Public Works directors. The best approach (and the one we used prior to OBAG) would add a fourth "performance" factor to reward jurisdictions that spend their local road funds in the most cost-effective manner - prioritizing an appropriate share for preventive maintenance based on StreetSaver data unique to each jurisdiction. In a four-part formula, each criteria would be worth 25%.

Regional Gas Tax Ballot Question

Revenue & Taxation Code 8504

(a) Following the adoption by the commission of a regional transportation expenditure plan, the board of supervisors of each county and city and county in the region shall, upon the request of the commission, submit to the voters at a local election consolidated with a statewide primary or general election specified by the commission, a measure, adopted by the commission, authorizing the commission to impose the tax throughout the region.

(b) The measure may not be grouped with state or local measures on the ballot, but shall be set forth in a separate category and shall be identified as Regional Measure 2.

(c) Regardless of the system of voting used, the wording of the measure shall read as follows:
“Shall The Metropolitan Transportation Commission be authorized to impose a tax of ____ per gallon on the sale of gasoline to build and operate transportation projects identified in the expenditure plan adopted by the commission?”

(d) The commission shall reimburse each county and city and county in the region for the cost of submitting the measure to the voters. These costs shall be reimbursed from revenues derived from the tax if the measure is approved by the voters or, if the measure is not approved, from any funds of the commission that are available for general transportation planning.

(e) The board of supervisors of a county or city and county may elect not to submit the measure adopted by the commission to the voters if it submits an alternative countywide transportation funding measure to the voters at the same election.

(Amended by Stats. 1999, Ch. 724, Sec. 13. Effective January 1, 2000.)

Technical Advisory Committee

MEETING AGENDA

May 26, 2016 – 1:30 p.m.

Sonoma County Transportation Authority
SCTA Large Conference Room
490 Mendocino Avenue, Suite 206
Santa Rosa, California 95401

ITEM

1. Introductions
2. Public Comment
3. Approval of Minutes, April 28, 2016*
4. Measure M **DISCUSSION / ACTION**
 - 4.1. Measure M Invoicing Status*
 - 4.2. Measure M 2017 Strategic Plan Proposed Programming*
 - 4.3. Measure M Strategic Plan Development Schedule *
5. Regional Information Update - **DISCUSSION**
 - 5.1. Federal Aid Project Delivery – Delivery Plan status, Inactive obligations*
 - 5.2. Pavement Technical Assistance Program (PTAP) 17: *The Metropolitan Transportation Commission will hold a PTAP 17 Workshop on Thursday, June 2nd at 10AM. The duration is expected to be 1 hour.*
 - 5.3. New Caltrans Webpage: *Caltrans announced the new Consultant Selection Webpage <http://www.dot.ca.gov/hq/LocalPrograms/AE/index.htm>. The page contains important information and guidance on the consultant procurement process related to federal –aid highway program funded projects. Consultant Services contracts funded in whole or in part, with federal-aid program funds must be procured in accordance with federal requirements of the Uniform Administrative Requirements, Cost Principles and Audit Requirements for Federal Awards in 2 CFR Part 200. A&E consultant contracts must also comply with requirements 23 USC Part 112, 40 USC Section 1101-1104, and 23 CFRR Part 172.*
 - 5.4. Proposed Obligation Plan Requirements: *The partnership working groups are asked to review the proposed requirements and provide comment or approve at the next meeting of the LSRWG. Please see attached and provide comments to MTC by May 27, 2016**
6. Rail Update **DISCUSSION**
7. Comprehensive Transportation Plan Update
8. Draft SCTA Board Meeting Agenda for June 13, 2016 **DISCUSSION**
9. Other Business / Comments / Announcements **DISCUSSION**

Citizens Advisory Committee MEETING AGENDA

May 23, 2016 at 4:00 p.m.

Sonoma County Transportation Authority
SCTA Large Conference Room
490 Mendocino Avenue, Suite 206
Santa Rosa, California 95401

ITEM

1. Introductions
2. Public Comment
3. Administrative - Approval of Notes April 25, 2016* - ACTION
4. Measure M – DISCUSSION/ACTION
 - a. Measure M Financial Reports*
5. Comprehensive Transportation Plan update*
6. CA 2020 update
 - 6.1 Transportation Connection
7. Highway Updates – DISCUSSION
8. Announcements
9. Adjourn

*Materials attached.

The next **SCTA** meeting will be held **June 13, 2016**
The next **CAC** meeting will be held **June 27, 2016**

Copies of the full Agenda Packet are available at www.sctainfo.org

DISABLED ACCOMMODATION: If you have a disability that requires the agenda materials to be in an alternate format or that requires an interpreter or other person to assist you while attending this meeting, please contact SCTA at least 72 hours prior to the meeting to ensure arrangements for accommodation.

SB 343 DOCUMENTS RELATED TO OPEN SESSION AGENDAS: Materials related to an item on this agenda submitted to the **Citizens Advisory Committee** after distribution of the agenda packet are available for public inspection in the Sonoma County Transportation Authority office at 490 Mendocino Ave., Suite 206, during normal business hours.

Pagers, cellular telephones and all other communication devices should be turned off during the committee meeting to avoid electrical interference with the sound recording system.

Countywide Bicycle & Pedestrian Advisory Committee

MEETING AGENDA

May 24, 2016 – 1:30 p.m.

Sonoma County Transportation Authority
SCTA Large Conference Room
490 Mendocino Avenue, Suite 206
Santa Rosa, California 95401

ITEM

1. Introductions
2. Approval of Meeting Notes: April 26, 2016 - **DISCUSSION / ACTION***
3. Public Comment
4. Roundtable updates - Discussion
5. FY 2017 TDA3 update and schedule – Discussion
6. ATP Cycle 3 information sharing – Discussion
7. BAAQMD Bicycle Parking programs accepting applications through June 22, 2016 - Informaiton
 - 7.1. Bicycle Rack Voucher Program <http://www.baaqmd.gov/grant-funding/public-agencies/brvp>
 - 7.2. Electronic Bicycle Lockers Program <http://www.baaqmd.gov/grant-funding/public-agencies/bike-racks-and-lockers>
8. Next Meeting – Scheduled for September 27, 2016
9. Other Business / Comments / Announcements
10. Adjourn - **ACTION**
 - *Materials attached
 - **Materials to be handed out

The next **SCTA/RCPA** meeting will be held June 13, 2016
The next **CBPAC** meeting will be held September 27, 2016

Copies of the full Agenda Packet are available at www.scta.ca.gov

DISABLED ACCOMMODATION: If you have a disability that requires the agenda materials to be in an alternate format or that requires an interpreter or other person to assist you while attending this meeting, please contact SCTA/RCPA at least 72 hours prior to the meeting to ensure arrangements for accommodation. SB 343 DOCUMENTS RELATED TO OPEN SESSION AGENDAS: Materials related to an item on this agenda submitted to the COUNTYWIDE BICYCLE & PEDESTRIAN ADVISORY COMMITTEE after distribution of the agenda packet are available for public inspection in the Sonoma County Transportation Authority office at 490 Mendocino Ave., Suite 206, during normal business hours.

Pagers, cellular telephones and all other communication devices should be turned off during the committee meeting to avoid electrical interference with the sound recording system. TO REDUCE GHG EMISSIONS: Please consider carpooling or taking transit to this meeting. For more information check www.511.org, www.srcity.org/citybus, www.sctransit.com or <https://carmacarpool.com/sfbay>

Transit Paratransit Coordinating Committee

MEETING AGENDA

May 17, 2016 – 1:30 p.m.

Sonoma County Transportation Authority
SCTA Large Conference Room
490 Mendocino Avenue, Suite 206
Santa Rosa, California 95401

ITEM

1. Introductions
2. Approval of Meeting Notes: March 15, 2016 - **DISCUSSION / ACTION***
3. Roundtable Updates
 - 3.1. Transit / Paratransit Operators
 - 3.2. Other Entities
4. Paratransit Fare Structure – Updated Staff Report – INFORMATION*
5. STA Coordinated Claim - **DISCUSSION / ACTION***
6. Public Comment
7. Articles and Events of Interest - Information
 - 7.1. Rolling on the Creek, May 14, 2016 outing geared towards folks in wheelchairs and their families/caregivers - www.landpaths.org/eventdetails.aspx?EventId=28210
8. Other Business / Comments / Announcements
9. Adjourn - **ACTION**

*Materials attached

**Materials to be handed out

The next **SCTA/RCPA** meeting will be held June 13, 2016

The next **TPCC** meeting will be held July 19, 2016

Copies of the full Agenda Packet are available at www.sctainfo.org

DISABLED ACCOMMODATION: If you have a disability that requires the agenda materials to be in an alternate format or that requires an interpreter or other person to assist you while attending this meeting, please contact SCTA at least 72 hours prior to the meeting to ensure arrangements for accommodation.

SB 343 DOCUMENTS RELATED TO OPEN SESSION AGENDAS: Materials related to an item on this agenda submitted to the **Transit Paratransit Coordinating Committee** after distribution of the agenda packet are available for public inspection in the Sonoma County Transportation Authority office at 490 Mendocino Ave., Suite 206, during normal business hours.

Pagers, cellular telephones and all other communication devices should be turned off during the committee meeting to avoid electrical interference with the sound recording system.

Transit – Technical Advisory Committee

MEETING AGENDA

May 11, 2016 – 10:00 a.m.

Sonoma County Transportation Authority
SCTA Large Conference Room
490 Mendocino Avenue, Suite 206
Santa Rosa, California 95401

ITEM

1. Introductions
2. Approval of Meeting Notes: April 13, 2016 – **DISCUSSION/ACTION***
3. Clipper Retail Network - Jennifer Largaespada, MTC – Discussion
4. Transit Operator Updates
5. Comprehensive Transportation Plan, Transit Project List - Discussion
6. Other Business / Comments / Announcements
7. Adjourn - **ACTION**

*Materials attached

**Materials to be handed out

The next **SCTA/RCPA** meeting will be held June 13, 2016

The next **T-TAC** meeting will be held June 8, 2016

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