Santa Cruz County Regional Transportation Commission’s

BICYCLE COMMITTEE

AGENDA

Monday, September 23, 2013
6:00 pm to 8:30 pm

Note Special Date and Earlier Start Time

RTC Office
1523 Pacific Ave
Santa Cruz, CA 95060

1. Call to Order

2. Introductions

3. Announcements – RTC staff

4. Oral communications – members and public

   The Committee will receive oral communications during this time on items not on today’s agenda. Presentations must be within the jurisdiction of the Committee, and may be limited in time at the discretion of the Chair. Committee members will not take action or respond immediately to any Oral Communications presented, but may choose to follow up at a later time, either individually, or on a subsequent Committee agenda.

5. Additions or deletions to consent and regular agendas

   CONSENT AGENDA

   All items appearing on the consent agenda are considered to be minor or non-controversial and will be acted upon in one motion if no member of the Committee or public wishes an item be removed and discussed on the regular agenda. Members of the Committee may raise questions, seek clarification or add directions to Consent Agenda items without removing the item from the Consent Agenda as long as no other committee member objects to the change.

6. Approve draft minutes of the August 19, 2013 Bicycle Committee meeting (pages 3-5)

7. Accept Bicycle Committee roster (page 6)

8. Accept summary of Bicycle Hazard Reports (page 7)

9. Accept response letter from Caltrans regarding the Bicycle Committee’s request for Highway 1 shoulder and Wilder Ranch multi-use path pavement improvements and safety measures (pages 8-9)
10. Centerline and outside shoulder rumble strip project in Santa Cruz County on Route 1 from Shafter Road to Swanton Road – Presentation from Doug Hessing, Caltrans District 5 Project Manager (pages 10 – 32)

11. Member updates related to Committee functions

12. Adjourn

**NEXT MEETING:** The next Bicycle Committee meeting is scheduled for Monday, October 21st, from the special time of 6:00pm to 8:30pm at the RTC office, 1523 Pacific Ave, Santa Cruz, CA.

**HOW TO REACH US**
Santa Cruz County Regional Transportation Commission
1523 Pacific Avenue, Santa Cruz, CA 95060
phone: (831) 460-3200 / fax (831) 460-3215
email: info@sccrtc.org / website: www.sccrtc.org

**AGENDAS ONLINE:**
To receive email notification when the Bicycle Committee meeting agenda packets are posted on our website, please call (831) 460-3201 or email ccaletti@sccrtc.org to subscribe.

**ACCOMMODATIONS FOR PEOPLE WITH DISABILITIES**
The Santa Cruz County Regional Transportation Commission does not discriminate on the basis of disability and no person shall, by reason of a disability, be denied the benefits of its services, programs, or activities. This meeting location is an accessible facility. If you wish to attend this meeting and require special assistance in order to participate, please contact RTC staff at 460-3200 (CRS 800/735-2929) at least three working days in advance of this meeting to make arrangements. People with disabilities may request a copy of the agenda in an alternative format. As a courtesy to those person affected, Please attend the meeting smoke and scent-free.

**SERVICIOS DE TRADUCCIÓN/TRANSLATION SERVICES**
Si gusta estar presente o participar en esta junta de la Comisión Regional de Transporte del condado de Santa Cruz y necesita información o servicios de traducción al español por favor llame por lo menos con tres días laborables de anticipado al (831) 460-3200 para hacer los arreglos necesarios. (Spanish language translation is available on an as needed basis. Please make advance arrangements (at least three days in advance by calling (831) 460-3200.)
1. Call to Order

2. Introductions

**Members Present:**
Kem Akol, District 1  
David Casterson, District 2, Chair  
Peter Scott, District 3  
Amelia Conlen, District 4  
Rick Hyman, District 5  
Bill Fieberling, City of Santa Cruz  
Andy Ward, City of Capitola, Vice-Chair  
Lex Rau, City of Scotts Valley  
Rob Straka, Ecology Action/Bike to Work  
Jim Langley, CTSC (Alt.)

**Staff:**
Cory Caletti, Senior Transportation Planner  
Grace Blakeslee, Senior Transportation Planner

**Vacancies:**
District 4 – Alternate  
District 5 – Alternate  
City of Watsonville – Alternate

**Unexcused Absences:**

**Excused Absences:**
Eric Horton, District 2 (Alt.)  
Holly Tyler, District 1 (Alt.)  
Gary Milburn, City of Scotts Valley (Alt.)  
Will Menchine, District 3 (Alt.)  
Piet Canin, Ecology Action/Bike-to-Work (Alt)  
Daniel Kostelec, City of Capitola (Alt.)  
Leo Jed, CTSC  
Carlos Garza, City of Santa Cruz (Alt.)  
Myrna Sherman, City of Watsonville

**Guests:**
Theresia Rogerson and Becky Sox, County Health Services Agency  
Alex Page, City of Santa Cruz Planning Dept Intern  
Melissa Ott, UCSC IDEASS student  
Brenden Fant, UCSC IDEASS student

3. Announcements – Cory Caletti, RTC staff, announced that the RTC’s grant application to the Federal Lands Access Program for the Monterey Bay Sanctuary Scenic Trail Network project was not identified on the short list and is unlikely to be funded. She also updated members on the final stages of the MBSST Network master planning effort, Caltrans’ rumble strip project and upcoming committee review opportunity, as well as the list of projects approved by the RTC for the Regional Transportation Plan...
update. Also, she informed members that the RTC was awarded a $250,000 grant to produce a passenger train service study.

4. Oral communications – None

5. Additions or deletions to consent and regular agendas – None

CONSENT AGENDA

A motion (Fieberling/Ward) to approve the consent agenda as amended passed unanimously.

6. Approved draft minutes of the June 10, 2013 Bicycle Committee meeting
7. Accepted Bicycle Committee roster
8. Accepted summary of Bicycle Hazard Reports
9. Accepted updated FY 2013-2014 Bicycle Committee meeting schedule
10. Accepted letter to the County of Santa Cruz Public Works Department regarding recommendations for improvements to the East Cliff Drive Parkway
11. Accepted letter from the Bicycle Committee to the County of Santa Cruz Public Works Department with recommendations for changes to the County’s Capital Improvement Program
12. Accepted letter from the Bicycle Committee to Caltrans regarding Highway 1 shoulder and Wilder Ranch multi-use path pavement quality after overgrown vegetation cut-back, and the need for Bike May Use Full Lanes signs to the approach of the Scott Creek and Waddell Creek bridge construction where the shoulder is closed

REGULAR AGENDA

13. Draft Monterey Bay Area Complete Streets Guidelines – Grace Blakeslee, RTC Senior Transportation Planner, provided the third presentation on the Complete Streets Guidebook over the past few months and requested that the Committee recommend that the RTC adopt the document so that it may be used by local jurisdictions as a resource. A motion (Conlen/Scott) to recommend that the RTC adopt the Complete Streets Guidebook passed unanimously. A subsequent request was made to agendize a discussion of Caltrans’ Main Street Program, similar to complete streets, and its relationship to Mission Street improvements in the City of Santa Cruz.

14. Innovative Bicycle Facilities and Treatments in Current Regulatory Standard Manuals – Bicycle Committee member Amelia Conlen provided a PowerPoint presentation of recently introduced bicycle facility treatments including but not limited to bike boxes, cycle tracks, buffered bike lanes, etc. and their relationship to regulatory standards. The presentation was provided for information only.

15. 2011 Bicyclist Injuries and Fatalities for Santa Cruz County Report and 2013 Bicycle Safety Observation Study – Becky Sox, Health Education Intern with County of Santa Cruz Health Services Agency (HSA) and Theresia Rogerson, HSA Community Traffic Safety Coalition Program, summarized the staff report and reports and highlighted changes in the reporting format. Most notably, HSA staff reviewed historic observation data and concluded that Santa Cruz County has seen a 167% increase in bicycle ridership over the 2003-2013 time span.
16. UCSC and Westside Santa Cruz Bicycle Transit Planning Study – UCSC IDEASS and members Brenden Fant and Melissa Ott presented the Bicycle Transit Planning project that they produced focusing on routes to and from UCSC that are in need of infrastructure improvements to increase safety and connectivity. Members provided input and suggestions for additional research should the study be expanded in the next school year.

17. Member updates related to Committee functions – Amelia Conlen summarized the ad-hoc sub-committee’s recommendations for the hybrid scenarios developed as part of the 2014 Regional Transportation Plan. Lex Rau mentioned various bicycle traffic actuation deficiencies in the City of Scotts Valley and his efforts to identify improvements in coordination with City Public Works staff.

18. Adjourned: 8:45 p.m.

NEXT MEETING: The next Bicycle Committee meeting is scheduled for Monday, September 23, 2013, from the special time of 6:00pm to 8:30pm at the RTC office, 1523 Pacific Ave, Santa Cruz, CA.

Minutes respectfully prepared and submitted by:

Cory Caletti, Senior Transportation Planner

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<td>Soquel, Live Oak, part of Capitola</td>
<td>Kem Akol <a href="mailto:kemakol@msn.com">kemakol@msn.com</a> 247-2944</td>
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<td>Holly M. Tyler holly.m <a href="mailto:tyler@comcast.net">tyler@comcast.net</a> 818-2117</td>
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<td>Aptos, Corralitos, part of Capitola, Nisene Marks, Freedom, PajDunes</td>
<td>David Casterson, Chair <a href="mailto:dbcasterson@gmail.com">dbcasterson@gmail.com</a> 588-2068</td>
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<td>William Menchine (Will) <a href="mailto:menchine@cruzio.com">menchine@cruzio.com</a> 426-3528</td>
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<td>Rob Straka <a href="mailto:rob@ecoact.org">rob@ecoact.org</a> 909-967-0204</td>
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<td>Leo Jed <a href="mailto:leojed@gmail.com">leojed@gmail.com</a> 425-2650</td>
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All phone numbers have the (831) area code unless otherwise noted.
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<td>DePlume</td>
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<td>E Cliff Dr</td>
<td>Pleasure Pt</td>
<td>Santa Cruz</td>
<td>other</td>
<td>rider states cross walk and stop sign poles are in middle of access curb cuts on 32nd, 36th, 38th, 41st, making it a hazard of hitting them when accessing the bikeway.</td>
<td>General Dept of Co of Santa Cruz</td>
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<td>John</td>
<td>Coha</td>
<td><a href="mailto:coha@ucsc.edu">coha@ucsc.edu</a></td>
<td>San Lorenzo River Bike path</td>
<td>Highway 1</td>
<td>Santa Cruz</td>
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<td>Trician</td>
<td>Comings</td>
<td><a href="mailto:triciansc@mindspring.com">triciansc@mindspring.com</a></td>
<td>Riverside Bridge Underpass</td>
<td>San Lorenzo Blvd</td>
<td>Santa Cruz</td>
<td>plant overgrowth or interference, debris on shoulder or bikeway</td>
<td>rider states vegetation on the underpass on the north side of riverside bridge is dangerous to pedestrians and cyclists as it encroaches on the path.</td>
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<td>09/12/13</td>
<td>Eva</td>
<td>Nardell</td>
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<td>N Branciforte Dr</td>
<td>Goss Ave</td>
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<td>pavement cracks</td>
<td>rider states sidewalk (in front of 1350 is cracked and sinking away on sides, sidewalk in front of 1334 tilts between two sections creating a significant lip or step, these are hazards for wheelchairs, bikes (many kids use this sidewalk as their bike route to and from school, and pedestrians.</td>
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<td>Masoner</td>
<td><a href="mailto:mmasoner@gmail.com">mmasoner@gmail.com</a></td>
<td>Pk. Hermon Rd</td>
<td>Scotts Valley Dr</td>
<td>Scotts Valley</td>
<td>Other</td>
<td>rider states there is a large linear break in pavement, a rider's wheel could hit and cause cyclist to crash if wheel catches break in pavement.</td>
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<td>David</td>
<td>Kadotani</td>
<td><a href="mailto:dka@rhythm.com">dka@rhythm.com</a></td>
<td>Highway 152</td>
<td>Santa Cruz</td>
<td>County</td>
<td>rough pavement or potholes</td>
<td>rider states asphalt slipage problem town crosswalks shopping center and along parkway southbound. Areas near edge of road where crack are wide enough to catch bicycle tire and flip cyclist over handlebars. Two cracks several feet long run on the same direction.</td>
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<td>08/19/13</td>
<td>Colleen</td>
<td>Sands</td>
<td><a href="mailto:colleensands1945@gmail.com">colleensands1945@gmail.com</a></td>
<td>Merrill St</td>
<td>14th Ave</td>
<td>Santa Cruz</td>
<td>plant overgrowth or interference</td>
<td>rider states overgrowth of bushes on right hand side of road causes cars to park part way into street making street dangerous.</td>
<td>General Dept of Co of Santa Cruz</td>
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Bike Com - Sept 23, 2013: Page 7
September 11, 2013

David Casterson  
Bicycle Committee Chair  
Santa Cruz County Regional Transportation Commission  
1523 Pacific Avenue  
Santa Cruz, California 95060

Dear Mr. Casterson:

This is in response to your recent correspondence to the California Department of Transportation (Caltrans) regarding bicyclist concerns along Highway 1 in Santa Cruz County.

We would like to inform you that several of your concerns are located within the limits of an on-going construction project. The grinding of the pavement was not a result of vegetation removal methods but instead removed the existing dike in order to facilitate guardrail installation. Once the guardrail has been constructed, the dike will be restored. In addition, any over-grinding that may have occurred at the edge of the pavement will be remedied by the contractor at that time.

The guardrail project also includes locations adjacent to Scott and Waddell Creek Bridges. The work at these two locations has been completed and the temporary concrete barrier that restricted the pavement width is scheduled to be removed this week. As a result, the full pavement width will be restored to pre-construction conditions so it will not be necessary to install the Bikes May Use Full Lane (BMUFL) sign you requested.

In regards to the paved section of the Wilder Ranch multi-use path, we typically mow this location twice a year to control vegetation. Chemical spraying is avoided at this location due to the use of the path by citizens and animals, the close proximity to farmlands, and the known habitat of endangered species. Given our very limited personnel and equipment resources, we must utilize the most efficient method for maintaining these types of facilities. The path is inspected regularly and any damage that limits its use will be addressed as soon as possible.

"Caltrans improves mobility across California"
Thank your contacting us. I hope the above information adequately addresses your concerns.

Sincerely,

TIMOTHY M. GUBBINS
District Director

cc: Santa Cruz County Regional Transportation Commission
    Santa Cruz County Regional Transportation Commission's Bicycle Committee
    Doug Hessing, Caltrans Project Manager
TO: Bicycle Committee
FROM: Cory Caletti, Senior Transportation Planner
RE: Highway 1 Rumble Strips Project

RECOMMENDATION

Staff recommends that the Bicycle Committee receive a presentation from Caltrans and consider plans to install rumble strips on Highway 1 from Shaffer Road to Swanton Road past Davenport.

BACKGROUND

At the April 2012 meeting, the Bicycle Committee received a presentation on a project initiated by Caltrans to install rumble strips on Highway 1 from Shaffer Road in Santa Cruz to Swanton Road past Davenport in response to a high number of run-off-the-road collisions. Rumble strips are grooved indentations effective in preventing run-off-the-road collisions by alerting distracted drivers when they are veering off the travel way. Rumble strips, however, can also have negative impacts on bicyclists as they are uncomfortable to ride over and can cause cyclists to lose control of their bicycle and fall. They also limit a cyclist’s ability to maneuver within a shoulder or bike lane in response to debris or other hazard avoidance need.

The Bike Committee packet for the April 2012 meeting can be located here: http://sccrtc.org/wp-content/uploads/2012/04/04-09-2012-bike-agenda.pdf
The packet contains a staff report, Caltrans findings, as well as the Ad-Hoc Committee’s summary of conditions and concerns. Also included are approximately 90 letters opposing the project submitted from bicyclists all over the country, copies of online publications’ opposition as well as that of the League of American Cyclists and the American Cycling Association. Caltrans indicated having received a similar number of letters. Dozens were also sent to Governor Brown.

Following the presentation, Bicycle Committee member Leo Moll and RTC staff Cory Caletti were appointed to Caltrans Project Development Team. Since that time, Mr. Moll and RTC staff have been working with Caltrans to refine the project and address Bike Committee and public concerns.

In preparation for this meeting, the Bike Committee was made aware that a presentation was forthcoming, that the project was scaled back in response to the Bicycle Committee concerns, and requested that the Project Development Team work with Caltrans to bring additional information to the September meeting as summarized in Attachment 2.

DISCUSSION

Caltrans initiated a project to install shoulder or edge line rumble strips and centerline rumble strips on Highway 1 between Shaffer Road and Swanton Road, north of Davenport. The project received state-wide and national attention due to wide-spread concern about the potential negative impacts to the popular, state designated Pacific Coast Bicycle Route which draws many charity rides, races, touring cyclists and other local and visiting recreationalists.
Caltrans presented the project to the Bicycle Committee in April, 2012. Following that presentation, Caltrans made modifications, which will be outlined at the Sept 23rd meeting. Caltrans’ rumble strip project manager, Doug Hessing, and other Caltrans District 5 representatives, will provide a presentation regarding the crash analysis leading to the project’s initiation, address concerns regarding adverse impacts to bicycle ridership, outline changes from the original project made in response to Bike Committee concerns and provide a timeline.

A summary from Doug Hessing is provided here:

“The original scope of the project is to provide a centerline rumble strip for the full project limits with gaps at intersections and Davenport. In addition to the centerline rumble strip the project proposes to install right shoulder rumble strips where we can consistently provide at least 5’ of clear shoulder to accommodate bicycles.

Caltrans’ standard right shoulder rumble strip is 12” wide and 5/16” deep and placed such that it occupies 18” of the shoulder. In order to provide the full shoulder with for the bicycling community we are proposing an alternative right shoulder rumble strip that is 6” wide, 5/16” deep and is placed on top of the white line and does not occupy any of the shoulder.

The first four miles of the project limits from Shaffer road north meet the requirements of providing at least 5’ clear shoulder and would receive the alternative rumble strip detail. We are not proposing to install short sections of right shoulder rumble strips. The last 6 miles of the project does not consistently meet the requirements of providing at least 5’ clear shoulder so this project would not install the shoulder rumble strips on the last 6 miles.”

Construction is scheduled to being in December 2014. As with all RTC and advisory committee meetings, this meeting is open to the public.

SUMMARY

Staff recommends that the Bicycle Committee receive a presentation regarding Caltrans’ Highway 1 rumble strip project from Shaffer Road to Swanton Road, north of Davenport and provide input. The project is anticipated to go to construction in December, 2014.

Attachments:
1. Excerpt from April, 2012 Bicycle Committee meeting minutes
2. Summary of Bike Committee issues for Caltrans consideration (from June, 2013 meeting)
3. Caltrans’ PowerPoint presentation for September 23rd meeting and supplemental details
Attachment 1

Excerpt from Bicycle Committee Minutes from the April, 2012 Meeting

14. Rumble Strips – Cory Caletti summarized the staff report indicating that Caltrans is analyzing installation of shoulder and centerline rumble strips on Highway 1 between Shaffer Road in Santa Cruz and Swanton Road, north of Davenport, in response to high run off the road injury collisions. Over 90 comments from the public were received by the RTC expressing opposition to the project due to potentially detrimental impacts to bicyclists on a roadway with high bicycle ridership. An equally high number of comments were received by Caltrans and some were sent to Governor Brown.

Dario Senior, Caltrans Senior Principal Engineer, introduced the Caltrans project team in attendance including the Deputy Director of Planning and Maintenance Operations, the local planning liaison, the Highway 1 rumble strip project manager. He went on to present a PowerPoint presentation (available online at: http://www.dot.ca.gov/dist05/traffic/) summarizing the collision data analyzed, the timeframe for project implementation, the steps leading to project delivery, and ways to mitigate impacts to cyclists. After Mr. Senor responded to questions from the Bicycle Committee regarding project details, Chair Casterson opened the floor for the Committee to receive comments from the public.

Greg McPheeters, representing the California Bicycle Coalition, spoke expressing concern about the treatment's impact to the safety of the high number of bicyclists traveling on the nationally designated Pacific Coast Bicycle Route and on the bicyclist eco-tourism the scenic roadway attracts. Micah Posner from People Power addressed the need to focus on problem of distracted driving and asked that rumble strips not be select as a solution since it poses a hazard to the non-motoring public. He noted that this treatment is not appropriate in the context of a nationally revered cycling route. In addition, 13 members of the public spoke with the large majority expressing opposition to the project as presented. Some asked that Caltrans consider treatments that are less impactful to cyclists, such as centerline rumble strips only and the possibility of having the rumble strip place predominantly over the white edge line. Those speaking in favor noted the safety benefits to all road users that the project would provide. After some discussion among Bicycle Committee members and additional information from Caltrans, a motion was made (Akol/Scott) to write a letter to Caltrans expressing concerns with the application of centerline and shoulder rumble strips on Highway 1 between Shaffer and Swanton roads. The motion passed with one abstention.
Attachment 2

Rumble Strips - Summary of Bike Committee requests and Community input for PDT mtg on June 20, 2013

- Bike Com and the bike community that staff has heard from are concerned about negative effects on safe travel where rumble strips are installed. From the comments received, they’ve been almost universally opposed but there is an understanding that due to certain injury/fatality thresholds Caltrans believes some action is needed and compromises need to be reached.

- The Bike Com would still like to see only centerline and not shoulder rumble strips, if the current proposal is the basis of discussion.

- Crash statistics presented was for ~six year period, 2004 thru 2010. Please update these stats with best available data. Were the 77 crashes in the 10 mile section or 4 mile proposed alignment? If in the 10 mile section, please provide the crash states in the proposed 4 mile section, including the left, ROR, and cyclist involved percentages. How do the 77 collisions (~6 per year) compare to the number of collisions for previous periods?

- Average daily bicycle counts are needed. The concern is that bicyclists may be disproportionately impacted when you consider number of bike riders and bicyclist injuries/fatalities vs motor vehicles and number of motorist injuries/fatalities. This concern should be investigated by having accurate numbers of all users which are currently not factored in. The Ad-Hoc Committee did some initial analysis based on their estimates and believe this disproportional impact exists.

- Measures should be identified to enhance the safety of bicyclists rather than compromise it. Additional safety measures should be considered (rather than hazards) like reducing the speed limit. The Bike Com understands that a speed study might undermine this effort so are not requesting it.

- The Bike Com would like the alternative treatments to be used for the first 4 miles of shoulder rumble strips (if the distance can’t be further reduced) and would like to 10/15 foot gaps every 40/60 feet of rumble strip. Exact distance can be identified later.

- The Bike Com wants to test out the alternative treatment locally prior to any installation.

- The Bike Com would like to see the additional 2 inches beyond what will go on the white edge line extended into the motor vehicle side of the road way instead of the shoulder side, as depicted in “alternative rumble strip” photo sent for the PDT meeting.

- What is the experimental process so that this gap with alterative treatment can be pursued?

- Also, the Bike Com would like to see if there was ever any consideration given to installing rumble strip in each direction just to either side of the center in the travel lane in each
direction’s. This would be in order to replace a treatment where there’s centerline and one rumble strip on each shoulder which would require just 2 rumble strips rather than 3 and would not adversely impact anyone. The motor vehicle would straddle this center travel lane strip and offsetting just a tad from center would also not impact motorcyclist.

- Proposed Schedule – Caltrans to present on Sept 23 to Bike Com and on Oct 3rd to RTC
In Santa Cruz County on Route 1 from Shafter Road to Swanton Road
Centerline and Outside Shoulder Rumble Strip
Providing safe mobility for all users, including motorists, bicyclists, pedestrians and transit riders, contributes to the Department's mission/vision: "Improving Mobility Across California".

Centerline and Outside Shoulder Rumble strip in Santa Cruz County on Route 1 from Shafter Road to Swanton Road
April 9, 2012
Bicycle Committee Meeting
Caltrans attended to share plans and hear feedback

We Are Here
September 2013

December 2014
What are Rumble Strips?
• Rumble strips are a series of ground in indentations into the pavement.
• They alert inattentive or distracted drivers through vibration and noise.

Why are they used?
• To reduce run-off-the-road collisions.
• To reduce cross-median head-on collisions.
• To reduce cross-centerline head-on collisions.

What is our Goal?
• Safety – To provide the safest transportation system for all users including motorists, bicyclists, pedestrians, and workers.
• Mobility – To maximize transportation system performance and flexibility.
SAFETY FACTS

• Drivers spend much of their time behind the wheel engaged in distracted behavior.

• Eating, smoking, or adjusting music while driving can be just as dangerous as using the cell phone.

• Passengers are one of the most frequently reported causes of distraction.
SAFETY FACTS

• Run-off-road collisions account for 1 out of every 3 deaths and serious injuries each year (33%).
• Shoulder rumble strips provide reductions in single-vehicle run-off-road collisions from 26% to 46% on two-lane rural roads and 10% to 24% on rural freeways.
• Center-line rumble strips provide reductions in head-on and opposite directions sideswipe injury collisions of 38% to 50% on two-lane rural roads and 37% to 91% on urban two-lane roads.
• Caltrans study in 1989 regarding installations of rumble strips in both the median and right shoulder resulted in decreased drift-off-the-road collisions by approximately 49% on Interstate 5 and Interstate 40.
• Where rumble strips were installed on the right shoulder only, a 63% reduction was realized.
• 1997-1999 Caltrans study of fatal run-off road collisions involving 888 passenger vehicles, 54 fatalities were a result of drivers falling asleep.
• Rumble strips provide navigational aid in bad weather conditions such as rain, fog, and snow.
Rumble Strip History at Caltrans

- Research regarding run-off-road collisions began in the 1960’s.
- 1977 - Caltrans conducts rumble strip study on test strips.
- 1989 - Caltrans completes shoulder rumble strip study on Interstate 5 and 40.
- 1999 - Caltrans Office of Traffic Safety Research conducts study on rumble strips where bicycles are allowed and consults on design selections with:
  - California Bike Advisory Committee, American League of Bicyclists, Federal Highway Administration, American Association of State Highway and Transportation Officials, and the Caltrans Rumble Strip Task Force.
- Goal of the research was to test a variety of rumble strips and edge treatments to determine which applications were the most acceptable to bicyclist, and still provide sufficient audible and vibratory sensations to alert automobile drivers.
- Current guidelines for installation of rumble strips.
SCR Route 1, Post Mile 20.41 to 30.55

July 1, 2001 to June 30, 2011

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<th>FATAL</th>
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Post Mile Collision Locations: Run-Off-Road to the Right

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CENTERLINE RUMBLED STRIP

Two Lane Undivided Highways Between Opposing Direction of Travel

- Traveled Way
- Centerline Stripe (CL)
- 5/16" Rumble Strip
- Existing Surface

Not to Scale

Detail of rumble strip
Example of centerline rumble strip in a passing zone
LEFT SHOULDER RUMBLE STRIP

Multi-Lane Divided Highways Left of Direction of Travel in the Shoulder

Detail of rumble strip

Example of left shoulder rumble strip
Right of Direction of Travel in the Shoulder

Detail of rumble strip

Example of right shoulder rumble strip

Not to Scale
RIGHT SHOULDER RUMBLE STRIPE

Right of Direction of Travel Underneath White Edge-line Stripe

Detail of rumble stripe

Example of right shoulder rumble stripe
RUMBLE STRIP DETAILS

In Santa Cruz County on Route 1 from Shafter Road to Swanton Road

TYPICAL RUMBLE STRIP AT INTERSECTION AND DRIVeways WITHOUT CHANNELIZATION

TYPICAL RUMBLE STRIP AT BRIDGES

TYPICAL RUMBLE STRIP AT FARn ACCESS ROADS

TYPICAL RUMBLE STRIP AT INTERSECTION WITH LEFT TURN CHANNELIZATION
Conclusion

• Rumble strips are to prevent run-off road collisions due to inattentive or distracted drivers.
• A significant amount of research has been conducted nationwide including Caltrans on the application of rumble strips.
• Through research and testing, the Department has taken steps to make rumble strips more accommodating for bicyclists.
• Research has shown that shoulder and center-line rumble strips when installed separately or together improve safety.
• Shoulder rumble strips can reduce severe run-off road collisions in excess of 25%.
• Center-line rumble strips can reduce cross center-line collisions in excess of 25%.
• A combination of both shoulder and centerline rumble strips can reduce collisions even further.
• Rumble strips are a low cost safety feature for our highways.
Standard Rumble Strip

Right of Direction of Travel in the Shoulder
Alternate Rumble Strip

Right of Direction of Travel
Underneath White Edge-line Stripe
1. Depth of Ground-In Rumble Stripe is 1". 

**ROUTE 1**

PM 20.4 to PM 24.2

**TYPICAL CROSS SECTION**

**X-1**

NO SCALE
ROUTE 1

TYPICAL CROSS SECTION
X-2

PM 24.2 to PM 30.6

EXIST STRUCTURAL SECTION

PROPOSED RUMBLE TRAFFIC STRIPE

EDGE LINE STRIPE

1. Depth of ground-in rumble stripe is 1.5".

EDGE LINE STRIPE

PM 24.2 to PM 30.6

EXIST STRUCTURAL SECTION