AGENDA	
Rogue Valley Metropolitan Planning Organization	
Policy Committee	
Tuesday, July 22, 2014	
2:00 p.m.	

Location:	Jefferson Conference Room, RVCOG 155 N. 1 st Street, Central Point
	Transit: served by RVTD Route #40
Phone :	Sue Casavan, RVCOG, 541-423-1360
	RVMPO website : <u>www.rvmpo.org</u>

1.	Call to Order/Introductions/Review Agenda	Mike Quilty, Chair
2.	Review/Approve Minutes (Attachment #1)	Chair
3.	Public Comment, Items not on the Agenda	Chair
	(Comments on Agenda Items allowed during discussion of each item)	

Public Hearing:

Date:

Time:

4.	Regional Transp	portation Plan / TIP AmendmentAndrea Napoli
	Background:	ODOT is requesting to amend into the 2012-15 TIP & 2013-2038 RTP the OR 140: Exit 35 to Blackwell Road project. This project is currently in the Draft 2015-2018 STIP.
	Attachment:	#2 – Memo
A	ction Requested:	Approve RTP / TIP amendment.

Discussion Item:

- 5. Air Quality Conformity Determination CO (Carbon Monoxide) Budget IssueJonathan David
 - *Background:* Under contract to RVCOG, Sierra Research performed vehicle emissions modeling to support the regional conformity analysis for the Rogue Valley Metropolitan Planning Organization 2015-2018 Transportation Improvement Program (TIP) and 2013-2038 Regional Transportation Plan (RTP). For the first time, TIP emissions modeling was performed using EPA's new MOVES vehicle emissions model. The end result was that the region's CO was determined to be 2 to 3 times over the budget established by EPA. On 7/14/14 a conference call was conducted between RVMPO, DEQ, EPA, FHWA, ODOT, and the Governor's office.

Attachment: #3 – Memo and Sierra Research letter

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6.	RVMPO Planning Update	Jonathan David
	- Discuss Fleet Status of Jurisdictions	
7.	Public Comment	Chair
8.	Other Business / Local Business <i>Opportunity for RVMPO member jurisdictions to talk about transportation plan</i>	Chair nning projects.
9.	Adjournment	Chair

The next MPO Policy Committee meeting is scheduled for Tuesday, August 26 at 2:00 p.m. in the Jefferson Conference Room, RVCOG, Central Point.

- The next MPO PAC meeting is scheduled for Tuesday, September 16 at 5:30 p.m. in the Jefferson Conference Room, RVCOG, Central Point.
- The next MPO TAC meeting is scheduled for Wednesday, August 13 at 1:30 p.m. in the Jefferson Conference Room, RVCOG, Central Point.

IN COMPLIANCE WITH THE AMERICANS WITH DISABILITIES ACT, IF YOU NEED SPECIAL ASSISTANCE TO PARTICIPATE IN THIS MEETING, PLEASE CONTACT SUE CASAVAN, 541-423-1360. REASONABLE ADVANCE NOTICE OF THE NEED FOR ACCOMMODATION PRIOR TO THE MEETING (48 HOURS ADVANCE NOTICE IS PREFERABLE) WILL ENABLE US TO MAKE REASONABLE ARRANGEMENTS TO ENSURE ACCESSIBILITY TO THIS MEETING.

RVMPO

SUMMARY MINUTES ROGUE VALLEY MPO POLICY COMMITTEE JUNE 24, 2014



NAME	<u>REPRESENTING</u>	<u>PHONE</u>
Al Densmore, Vice Chairman	City of Medford	282-1415
Art Anderson	ODOT	774-6353
Bill Cecil	City of Talent	535-1566
Bruce Sophie	City of Phoenix	535-1634
Don Skundrick	Jackson County	774-6118
Jim Lewis	City of Jacksonville	899-7023
Julie Brown (Paige Townsend)	RVTD	608-2143
Mike Quilty, Chairman	City of Central Point	664-7907
Rich Rosenthal	City of Ashland	941-1494
Ruth Jenks	City of Eagle Point	
Staff		
Dan Moore	RVCOG	423-1361
Jonathan David	RVCOG	
Andrea Napoli	RVCOG	423-1369
Bunny Lincoln	RVCOG	944-2446
Others Present		

Mike Montero, Mike Faught, Alex Georgevitch, Matt Brinkley, John Vial, Mike Baker

UO Planning Workshop

Mike Howard, Erik Forsell, Dan Pearce

1. Call to Order / Introductions/ Review Agenda -

Chairman Mike Quilty called the meeting to order at 2:04 p.m. Introductions followed.

2. Review / Approve Minutes -

The Chairman asked if there were any additions or corrections to the May meeting minutes.

On a motion by Jim Lewis, seconded by Bruce Sophie, the minutes were unanimously approved as presented.

3. Public Comment -

None.

4. Transportation Growth Management (TGM) Letter of Support -

Jonathan David requested Committee approval of Support Letter on behalf of Phoenix's TGM grant application. A brief discussion ensued among Committee members regarding the benefits of a support letter. The discussion included Staff comments on the standard application process (typically including both affected jurisdiction resolutions and MPO Letters of Support),

On a motion by Jim Lewis, seconded by Al Densmore, the Committee approved a <u>Letter of</u> <u>Support</u> for the TGM grant application being submitted by Phoenix. Art Anderson abstained because of his ODOT affiliation. All others voted yes.

5. Transit Alternatives on the Highway 99 Corridor –

UO Planning Workshop students Erik Forsell and Dan Pearce shared a Power Point presentation covering results of a recently conducted (seven month) RVTD survey covering local, public perceptions and opinions on current and future provision of enhanced transit service on the Highway 99 corridor. Increased need for transit is anticipated, due to growing populations and employment centers within the Rogue Valley. Opinions on high capacity transit feasibility along the corridor were specifically solicited by the UO Planning Workshop students. Policy scans were undertaken to review plans, codes, policies and regulations of the involved jurisdictions. The UO survey/analysis purpose was to explore opinions of residents, decision makers, and affected stakeholders.

A 10 Year Long Range Plan (tiered) was provided by RVTD:

- Tier #1 Extended Hours and Minor Service Expansion
- Tier #2 Plus, additional routes, Express Routes and Peak Service
- Tier #3 Plus, additional routes and enhanced connectivity

Paige Townsend explained the need to start the long range planning process in 2014. Routes and additional service hours will be expanded in the short term, but planning for BRT service can take up to twenty (20 years).

The Planning Workshop conducted interviews, surveys and focus groups. The focus groups encompassed six (6) major groups (SOU, Twin Creeks, TAC, business community, PAC, Crater High School), and two (2) minor groups (RVTD core staff, Land Transit District managers).

Common themes showcased in the overall Findings included:

Needs -

Major:

- RVTD must build a strong case for future enhancement, with appropriate data collection
- Continual engagement, start to finish, is essential for building/maintaining community support
- Future plans must be integrated with Regional TSP, ODOT and Hwy. 99 corridor municipalities
- Certain stakeholders (SOU and Twin Creeks) could greatly benefit from improved transit
- Graphics and other educational materials are important for community marketing, and should be catered to specific, targeted groups

Minor:

- A group of supportive "champions" (influential individuals or businesses) should be established
- Business community involvement is essential

The surveys (3) were conducted on line (Business and Community), and as an RVTD Rider "Intercept".

The **Business Survey** highlighted the concepts of:

- Reliable service
- Enhanced bus stops
- Origins and destinations

The **<u>RVTD Intercept Survey Intercept Survey</u>** results included:

- Support for enhanced bus stops
- Riders not in favor of stop reductions
- A moderate response that current service is adequate

The online **<u>Community Survey</u>** showed:

• Majority support for enhanced transportation

Additionally, twenty two (22) <u>Key Person interviews</u> were conducted. Those results found that:

- Accurate data/facts are essential for building support
- There was an expressed concern regarding ability to maintain current services and operational budget
- Inter-agency collaboration is believed to be essential for the success of any current/future transit system

Dan Pearce explained the concept, types and relative costs of High Capacity Transit, and presented renderings of conceptual Bus Rapid Transit stops:

- ✤ Harry & David
- SOU *
- ✤ Twin Creeks

Paige Townsend spoke of the next steps to be taken. The BRT grant program is classified as a "New Start" project. After eventual completion of the current analysis RVTD will be placed into the FTA "pipeline" for consideration. The question of why BRT is not available now has provided some of the impetus for implementing the current area analysis at this time. The whole project will go slowly, as time and RVTD Staffing permit.

RVTD is currently focused on the (short range) ballot levy in November. Passage of the levy would allow for transit enhancement in White City and east Medford.

The BRT plan is back burner for the short term. More activity is anticipated in 2015-16. In the meantime, the District will collaborate with the FTA to determine the process for future funding options. Hwy. 99 enhancement is considered to be the highest priority. Hwy. 62 and W. Main, South Medford TOD are also considerations for future enhancements.

A discussion dialog was opened among Committee members:

Al Densmore expressed concern that Hwy. 99 must be looked at in conjunction with other, potential transportation corridors. Freight accommodation within cities is essential within all potential enhanced corridors. Eastside (Foothill) should also be considered as an enhanced corridor opportunity, especially in case of an emergency. Economic opportunities available within smaller communities must not be overlooked. Proper design concepts and interconnected planning are essential.

Paige Townsend said that enhanced transit is being found to work very well in situations with traditional traffic. Pedestrian safety is a continual, primary concern. Art Anderson stressed the importance of enhancing the Hwy. 62 corridor, and spoke about a phased approach. Ms. Townsend said that an Operational Analysis is being conducted by RVTD as another part of the overall assessment process. With supportive of the project, Mike Faught expressed difficulty comprehending whole concept and said more work needed to be done. In response to a question from Art Anderson, Ms. Townsend said an EA or EIS will eventually be required. Mike Quilty addressed the potential of utilizing the existing railroad rights of way as part of the enhanced transit concept.

Some local communities and developments have already been considering and/or planning for enhanced transit facilities and some have actually made additions to their Comp Plans and TSPs to reflect same.

6. MPO Planning Update –

- Jonathan David shared that information will be forthcoming on LCDC/ODOT studies being conducted in Corvallis.
- Mike Quilty expressed his frustration that requested procedural information has not been forthcoming in a timely manner from Corvallis
- Alternatives Measures continue to be a Staff focus
- The RVCOG hybrid vehicle price is within the adopted budget guidelines, and arrival is expected in mid-August.
- Creation of a PAC for RVACT is under internal discussion for specific makeup. The consensus by those currently involved is for a smaller group.

7. Public Comment

Alex Georgevitch shared that the Hwy. 62 adaptive timing (Coker Butte to Poplar) is in place. He will share specific study results in in 4-6 months. Minor timing issues at Poplar and the north Fred Meyer store are being addressed.

8. Other Business / Local Business

Al Densmore thanked Mike Quilty and Julie Brown for their efforts on Connect Oregon. Mike Quilty shared that Bike/Ped projects were a significant focus this year, and that better project application coordination will be vital in the future.

The next meeting will be held on July 22 @ 2:00 PM.

9. Adjournment

The meeting was adjourned at 3:25 p.m.



DATE:	June 4, 2014
TO:	RVMPO Policy Committee
FROM:	Andrea Napoli, Associate Planner
SUBJECT:	RTP and TIP Amendment

The Policy Committee is being asked to consider approval of the proposed RTP and TIP amendment described below. The Technical Advisory Committee had recommended approval at their June meeting.

<u>ODOT, OR 140 Exit 35 Blackwell Road</u> - *Add center turn lane, widen shoulders, add bike lanes*

This project is currently part of the Draft 2015-2018 STIP. ODOT is requesting this project be amended into the 2012-15 TIP & STIP and the 2013-2038 RTP project list.

Project Name	Key Number	PE Amount		
OR 140 Exit 35 Blackwell Road	18975	410,000		

Reason for request per ODOT

The OR 140: Exit 35 to Blackwell Road project is programmed for construction in 2017 in the 2015-2018 Draft STIP. OR 140 is a statewide level rural highway and a designated freight route that does not currently meet state highway standards. The existing highway has inconsistent highway widths, narrow shoulders in some locations, unprotected left turns and a section of the highway that does not meet highway geometric standards. In order to deliver the project for an early 2017 bid let date to enable the contractor to mobilize timely for the paving season, immediate approval of the PE phase is necessary.

2013-2038 RTP Amendment #2013-38_06 Add ODOT OR 140 Exit 35 Blackwell Road, KN18975

PROJECT NUMBER	LOCATION DESCRIPTION TIMING		COST	Conformity Status	
ODOT					
907	OR 140: Exit 35 Blackwell Road	Add center turn lane, widen shoulders, add bike lane	short	\$410,000	Exempt- Table 2

2013-15 TIP Amendment #12-15_53 Add ODOT OR 140 Exit 35 Blackwell Road, KN18975

Project Name	Project Description	RTP Project	Air Quality Status	Key # Fed	Key #	Key #	Key # Federal Fiscal	Federal Fiscal Year	l Phase		Federal		Federal		Federal Required Match			Total Fed+Req	
		Number						\$	Source		\$	Source		Match					
ODOT																			
						Planning							\$	-					
				18975	FY2014	Design	\$	367,893		\$ 42,107 ODOT	ODOT	\$	410,000						
OR 140:	Add center turn lane, widen shoulders, add bike lane	Add center turn lane, widen 907 shoulders	907 Exempt (Table 2)			Land Purchase							\$	-					
Exit 35 Blackwell						Utility Relocate							\$	-					
Road		add bike lane	add bike lane	dd bike lane				Construction							\$	-			
								Other											
					Total FFY12-15		\$	367,893		\$	42,107		\$	410,000					

OR 140 Exit 35 to Blackwell Road Intersection



COUNCIL DI COVIERMENTI	(Agenda Item 5 Rogue Valley Metropolitan Planning Organization Rogue Valley Council of Governments 155 N. 1st Street, P.O. Box 3275, Central Point, OR 97502 Office: 541.664.6674 – Fax: 541.664.7927 – Internet: www.rvcog.org
Date:	July 11, 2014
To:	David Collier, Oregon Department of Environmental Quality (ODEQ)
From:	Jonathan David, Rogue Valley Metropolitan Planning Organization (RVMPO)

Attachment #3

From:Jonathan David, Rogue Valley Metropolitan Planning Organization (RVMPO)Subject:Critical Issues with the RVMPO's Current Carbon Monoxide Budget

Attached is a memo prepared for RVCOG by Sierra Research, which is currently under contract to perform air quality modeling for the RVMPO. In the memo, Sierra Research presents a detailed discussion of results from the new MOVES2010b model showing CO emissions 2 to 3 times greater than what the RVMPO, DEQ, ODOT, FHWA, and FTA have understood our CO levels to be for well over a decade. These levels are also 2 to 3 times greater than our current CO budget would allow, which raises the very real near-term possibility that our region's air quality conformity could be threatened as a result. From what Sierra Research has been able to ascertain, this difference in CO levels is due to prior models (MOBILE5b and MOBIL6) not including, or significantly underestimating, CO emissions from cold starts (i.e., starting exhaust). In no way do these results indicate that the ambient CO air quality levels are worsening; in fact, the newly calculated CO levels continue to be well below the National Ambient Air Quality Standards.

What these newly calculated CO levels do indicate is an urgent need for the current CO budget to be adjusted to reflect a higher baseline share of vehicle emissions. Without this revision, we consider our current CO budget, based as it is on the flawed data, to be invalid. A determination of non-conformity for CO based on that invalid budget would therefore also, by extension, be invalid. In addition, should a determination of non-conformity based on a fundamentally inaccurate CO budget nonetheless be allowed to proceed, the region would see its ability to have the RVMPO's approved list of projects included in its entirety in the STIP severely compromised, which would significantly impact the federally mandated scope and nature of the RVMPO's responsibilities.

With this memo, we are formally requesting a revised CO budget for the RVMPO, and intend to immediately call for a meeting of the Air Quality Consultation Group to discuss this request as well as other options to preclude a determination of non-conformity. We will also be inviting representatives from ODOT and the Governor's office (which is being included due to its statutory responsibility to resolve intractable air quality conformity conflicts among state agencies or between state agencies and an MPO) to participate in that initial consultation.

Thank you for your attention to this matter.

Attachment #3 (Agenda Item 5)

July 8, 2014

Memo to: Dan Moore and Jonathan David, RVCOG

From: Tom Carlson

Subject: RVMPO 2015-2018 TIP Conformity Findings

Under contract to RVCOG, Sierra Research (Sierra) performed vehicle emissions modeling to support the regional conformity analysis for the Rogue Valley Metropolitan Planning Organization (RVMPO) 2015-2018 Transportation Improvement Program (TIP) and 2013-2038 Regional Transportation Plan (RTP). For the first time, TIP emissions modeling was performed using EPA's new MOVES vehicle emissions model. (Prior TIP and RTP conformity analyses were performed using EPA's MOBILE series of models, the predecessor to MOVES.) As explained in detail later, succession and use of different EPA emissions models over time plays a critical role in our findings.

The crux of this analysis consisted of generating estimates of on-road vehicle CO and PM_{10} emissions reflecting travel activity forecasted in the TIP using EPA's latest MOVES2010b model and comparing those TIP emissions to motor vehicle emission budgets established in the existing 2001 CO Maintenance Plan (MP)¹ and 2004 PM₁₀ SIP² for the pollutant-specific Medford planning areas.

Statement of Problem

Table 1 summarizes the results of this analysis, comparing TIP emissions by calendar year to the applicable CO and PM_{10} emission budgets established in the prior plans (budgets are shown in yellow-shaded **boldface** rows). As shown in the upper half of Table 1, CO emissions under both TIP transit scenarios were estimated to be 2-3 times higher than their applicable budgets, while PM_{10} emissions are comfortably below their applicable budgets for all years and TIP scenarios.

Two obvious questions arise from these findings: "Why are the CO emissions so much higher than their budgets when there isn't a problem for PM_{10} , especially since VMT (vehicle miles travel) forecasted in this TIP is not dramatically different from that in earlier TIPs or the MP/SIP?" and "Is there an error in the current analysis?"



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¹ "State Implementation Plan Revision for Carbon Monoxide in the Medford Urban Growth Boundary, A Plan for Maintaining the National Ambient Air Quality Standards for Carbon Monoxide," Oregon Department of Environmental Conservation, Air Quality Division, March 9, 2001.

² "State Implementation Plan Revision for Particulate Matter (PM₁₀) in the Medford-Ashland Air Quality Maintenance Area," Oregon Department of Environmental Conservation, Air Quality Division, December 10, 2004.

Table 1 Comparison of 2018 TIP Emissions to Vehicle Emission Budgets								
Calendar Year								
	2015	2020	2028	2038				
CO Emissions Budget (lb/day)	26,693	32,640	32,640	32,640				
TIP CO Emissions, Without Transit (lb/day)	83,820	65,999	62,673	62,654				
TIP CO Emissions, With Transit (lb/day)	83,763	65,946	62,630	62,600				
PM ₁₀ Emissions Budget (tons/year) 3,754 3,754 3,754 3,754								
TIP PM ₁₀ Emissions, Without Transit (tons/year)	1,622	1,706	1,853	2,049				
TIP PM ₁₀ Emissions, With Transit (tons/year)	1,621	1,618	1,643	1,709				

Note: PM10 emission budgets and TIP emissions include both exhaust and fugitive dust.

Upon completing the emissions modeling, Sierra then began an exhaustive process of examining its current analysis for inadvertent errors (none were found) and reviewing similar vehicle emissions modeling conducted under earlier TIP Air Quality Conformity Determinations (AQCDs) as well as the CO MP and PM₁₀ SIP from which the emission budgets were developed, to ascertain "how we got here."

The key findings from our detailed review of these historical analyses and results are summarized as follows:

- 1. CO emissions are much higher under this TIP primarily due to significant upward revisions of starting exhaust emission factors (i.e., grams per mile) in today's MOVES model compared to its MOBILE6 and MOBILE5b predecessors.
- 2. The effects of EPA releases of newer emission factor models over time (from the MOBILE5b Cold CO model used for the 2001 CO MP through MOBILE6 used for subsequent TIP/RTP conformity analyses until now) with successively higher CO starting emission factors has been masked by what we believe were errors in prior TIP/RTP CO emissions calculations that inadvertently omitted the starting exhaust component.
- 3. The budget exceedance issue does not affect PM_{10} because vehicle PM_{10} emissions in the planning area are dominated by fugitive road dust, rather than exhaust (and brake/tire wear) emissions. Though not shown in Table 1, fugitive dust emissions on paved on unpaved road represent over 90% of total on-road vehicle emissions, based on the latest AP-42 methods coupled with locally-estimated road silt loading factors. Thus upward revisions to exhaust (and brake/tire wear) emission factors between MOBILE and MOVES are masked or damped by their very small share of total on-road PM_{10} .

The findings that CO emissions are well above their Plan budgets because of upward revisions to the starting exhaust component of historically developed EPA vehicle emission models <u>do not</u> imply that ambient CO air quality levels are worsening. Since CO air quality levels forecast to 2015 in the 2001 Maintenance Plan were extrapolated

from baseline ambient measurements and emissions inventory projections using nowoutdated (and upwardly revised) vehicle emission factors, these Maintenance Plan forecasts simply need to be updated to reflect a higher baseline share of vehicle emissions that still decline over time (even with VMT growth) due to ever-tighter new vehicle emission standards.

Attachment #3

The following section provides a detailed description of the methods and sources Sierra used to reach these findings.

Review and Analysis Methodology

Three areas of review were performed to determine the reason(s) behind the CO budget exceedances using MOVES and to ensure the MOVES modeling was properly executed:

- 1. Prior TIP Conformity Analysis Review,
- 2. Maintenance Plan Emission Budgets Review, and
- 3. MOVES Modeling Review.

Each of these review elements is discussed separately below.

Prior TIP Conformity Analysis Review – The review process began by examining (where available) detailed modeling inputs, outputs and emission calculations from earlier TIP/RTP AQCD documents, beginning with the most recent document—the 2012-2015 TIP AQCD.³ Appendix C of that AQCD document contains detailed CO emissions calculations by roadway type (freeway, arterial, etc.) showing travel-model based vehicle activity (in VMT per day) as well as MOBILE6-based emission factors (in grams/mile) for each roadway type (based on average speed for each type) on pages C-2 (With Transit Service) and C-3 (Without Transit Service). Figure 1 is a copy of the "With Transit" calculations from Page C-2. (Without Transit calculations are very similar, using the same emission factors with nominally higher VMT.) As shown in Figure 1, MOBILE6.2-based emission factors by roadway type range from 6.35 g/mile (Local) to 9.29 g/mile (Ramps) for the calendar year 2015 fleet and decrease to a range from 4.61 g/mi (Arterial) to 6.37 g/mi (Ramps) for the 2038 fleet.

³ "Rogue Valley Metropolitan Planning Organization Air Quality Conformity Determination for 2013-2038 Regional Transportation Plan, 2012-2015 Metropolitan Transportation Improvement Program as Amended," Rouge Valley Council of Governments, March 26, 2013.

Emissions Estimated with Continuing Transit Service												
	-											
		VMT Es	timates	Emissions Estimates								
	Mobile6.2		local adjust									
2015	EF (g/VMT)	Model VMT	(+10%)	Grams CO/day	Lbs. CO/day							
Freeway	7.864	419,486.0		3,298,708.655	7,272							
Arterial	6.420	928,004.0	1,020,804.4	6,553,232.826	14,447							
Local	6.352	39,687.0	43,655.7	277,291.101	611							
Ramps	9.288	19,654.0		182,538.166	402							
Total Estimated	Total Estimated		1,503,600.1	10,311,770.747	22,734							
		VMT Estimates		Emissions Estimates								
	Mobile6.2		local adjust									
2020	EF (g/VMT)	Model VMT	(+10%)	Grams CO/day	Lbs. CO/day							
Freeway	6.727	442,587.0		2,977,157.684	6,564							
Arterial	5.461	1,009,655.0	1,110,620.5	6,065,119.848	13,371							
Local	5.613	47,612.0	52,373.2	293,984.344	648							
Ramps	7.677	19,813.0		152,107.449	335							
Total Estimated	Total Estimated		1,625,393.7	9,488,369.324	20,918							
		VMT Es	timates	Emissions Estimates								
	Mobile6.2		local adjust									
2028	EF (g/VMT)	Model VMT	(+10%)	Grams CO/day	Lbs. CO/day							
Freeway	5.369	503,130.0		2,701,492.231	5,956							
Arterial	4.300	1,120,920.0	1,233,012.0	5,302,381.921	11,690							
Local	4.553	46,304.0	50,934.4	231,896.504	511							
Ramps	5.985	24,734.0		148,042.091	326							
Total Estimated	1	1,695,088.0	1,811,810,4	8.383.812.748	18,483							
		, , ,		, ,	, , , , , , , , , , , , , , , , , , , ,							
		VMT Es	stimates	Emissions Estimates								
	Mobile6.2	local adjust										
2038	EF (g/VMT)	Model VM1	(+10%)	Grams CO/day	Lbs. CO/day							
Freeway	5.717	550,051.0		3,144,679.505	6,933							
Arterial	4.610	1,256,870.0	1,382,557.0	6,374,238.450	14,053							
Local	4.920	54,933.0	60,426.3	297,305.749	655							
Ramps	6.366	26,615.0		169,427.578	374							
Total Estimated		1,888,469.0	2,019,649.3	9,985,651.282	22,015							

Figure 1
2015 TIP AQCD CO Emission Calculations, With Transit
(Appendix C. Page C-2)

Attachment #3

Appendix C also contains a single set of MOBILE6.2 input and output files, for the calendar year 2038 fleet, spanning pages C-4 through C-10. The MOBILE6.2 inputs shown on pages C-4 to C-9 (age distributions, VMT mix, fuel and I/M properties, and ambient conditions) were examined and roughly compared to similar inputs developed for the current MOVES modeling and were found to be in general agreement. The MOBILE6.2 output shown on page C-10 was also examined. It is a MOBILE6.2 "composite" output, showing the composite average CO emission factor calculated by the model across all roadway types, but, more importantly, showing the breakdown of total exhaust CO emission by its two component processes:

1. Start exhaust – representing incremental emissions (in g/mile) resulting from catalyst and engine warm-up when a vehicle is started; and

Attachment #3 (Agenda Item 5)

-5-

2. Running exhaust – representing fully warmed-up or stabilized vehicle emissions (in g/mile).

Figure 2 contains an excerpt of this calendar year 2038 MOBILE6.2 composite output, showing CO emission factors by vehicle type and process (start and running exhaust). Although the output table "wraps" the columns for the Motorcycle (MC) and composite (All Veh) fleet emission factors on a new line, it can be seen that <u>running</u> exhaust factors for the light-duty gasoline vehicle types⁴ range from 5.27 to 6.28 g/mile, which are in good agreement with the range of 2038 exhaust emission factors by roadway type in Figure 1.

Figure 2 2015 TIP AQCD Calendar Year 2038 MOBILE6.2 Composite Output Excerpt (Appendix C. Page C-10)

(Appendix C, 1 age C-10)										
Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV		
MC All Veh										
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2840	0.4105	0.1573		0.0457	0.0003	0.0023	0.0952		
0.0047 1.0000										
Composite Emission Fa	ctors (g/m	ui):								
Composite CO :	13.66	13.37	14.02	13.55	7.19	0.695	0.400	0.215		
14.60 11.994										
Exhaust emissions (g/m	i):									
CO Start:	8.39	8.00	1.14	7.93		0.292	0.152			
5.200	5									
CO Running:	5.27	5.38	6.28	5.63		0.403	0.248			
9.399										
CO Total Exhaust:	13.66	13.37	14.02	13.55	7.19	0.695	0.400	0.215		
14.60 11.994										

The problem is that the <u>total</u> exhaust emission factors shown in Figure 2 are much higher, ranging from about 13-14 g/mile for light-duty gasoline vehicles and 11.99 g/mile for the "All Veh" fleet composite. As shown in Figure 2, this is because the starting exhaust component is roughly 7-8 g/mile for those vehicle types for which it is reported.

Based on a comparison of the process-specific 2038 emission factors shown in Figure 2 with those for 2038 in the emission calculation tables shown earlier in Figure 1, <u>Sierra</u> believes that the incremental starting exhaust component was inadvertently left out of the emission calculations by roadway type shown in Figure 1 and reflected on pages C-2 and C-3 of the AQCD. When run in "facility-specific" emission factor mode, as was done in the AQCD to generate emission factors by facility/roadway type, MOBILE6 also includes a "NONE" roadway category that, according to its Users Guide (pg. 77):

⁴ MOBILE6.2 reports process-specific factors only for light-duty gasoline vehicles and motorcycles since starting exhaust data did not exist or were believed to be small. In this output, light-duty gasoline vehicles represent over 80% of the fleet and thus roughly represent fleet-average starting emission factors.

"... represents emissions that occur independent of roadway type. These include <u>engine start emissions</u> and all evaporative emissions except running losses." (emphasis added)

Attachment #3

If performed properly, starting exhaust emission factors using the NONE category would have been incorporated as an additional row in the AQCD page C-2 and C-3 calculation tables and multiplied by total VMT (since the starting emissions factors output by MOBILE6 are averages over all miles traveled). If this had been done, TIP emissions would have been calculated to be more than twice as high at those shown apparently based only on warmed-up running exhaust emission factors and would have been found to exceed the MP-based budgets for most, if not all, calendar years.

Similar AQCD documentation provided by RVCOG for several earlier TIP and MTP analyses—dating back to that developed and approved in 2009 for the 2009-2034 RTP and Amended 2008-2011 MTIP—was also reviewed. It was found that the same CO emission calculation approach and inadvertent exclusion of the starting exhaust component was conducted in each of the earlier TIP/RTP AQCDs.

Sierra also acquired some of the MOBILE6 input files using in the most recent AQCD from RVCOG and was able to reproduce the output emission factors listed in Appendix C by independently executing the MOBILE6.2 model.

At this point, Sierra's review was independently confirmed by Wayne Elson, our subcontractor who was earlier employed by EPA Region 10 and performed transportation conformity review for MPOs within Region 10's jurisdiction. Upon reviewing these detailed appendix materials, Mr. Elson reached the same conclusion.

<u>Maintenance Plan Emission Budgets Review</u> – The next element of our review focused on trying to understand the vehicle CO emission calculations performed by the Oregon Department of Environmental Quality (ODEQ) in the 2001 CO Maintenance Plan that established the 1993 baseline and 2015 forecasted emission inventories, and specifically the vehicle emission budgets developed from them.

At the time the CO Plan was developed (circa 2001), MOBILE6 had not yet been released and EPA was in the process of extensively revising the current model— MOBILE5b—to, among other things, better account for starting emissions. A modified version of MOBILE5b originally developed by Air Improvement Resource (AIR) and further revised by Sierra Research to specifically model CO emissions under cold ambient temperatures and account for effects of then-new 20°F exhaust emission standards was approved by EPA as a transitional tool for modeling winter CO emissions until MOBILE6 was released (in early 2002). This transitional "MOBILE5b Cold CO" or Cold CO model was used to generate the CO emission factors upon which the vehicle emission inventories and budgets in the 2001 CO Plan were developed.

Sierra reviewed both the CO Plan document itself (as posted on ODEQ's web site), as well several hundred scanned pages of material encompassing Tables D-1 and D-2 in Appendix D that were not part of the main document but provided by RVCOG. Since

electronic versions of the input and output files listed in these scanned pages were not readily available, our review of the CO Plan calculations using the Cold CO model could not be performed as rigorously as those performed for the TIP/RTP AQCD review.

Attachment #3

It is unclear from this review whether the CO Plan calculations also inadvertently excluded the starting exhaust component because the starting component is not explicitly output by the Cold CO model as it is in the later MOBILE6 and MOVES models. The Cold CO modeling methodology uses "parallel" executions of the model to calculate what was then referred to as "off-cycle" emissions that accounts for effects of vehicles meeting or not meeting the 20°F exhaust standards. This off-cycle increment is then added to "standard" MOBILE5b-based emission factors reflecting local conditions but not explicitly separating starting from running exhaust as in MOBILE6 and MOVES.

At this point, we deemed further investigation to be of low value and simply concluded that the Cold CO emission factors upon which the vehicle emissions budgets were based appear to be significantly lower (on a fleet average gram per mile basis) that those contained in either MOBILE6 or MOVES for the same calendar year fleet.

<u>MOVES Modeling Review</u> – Finally, a detailed review of each of the MOVES modeling inputs as well as analysis of highly disaggregated outputs (by model year, vehicle type, and emission process) was performed to determine if inadvertent errors were made by Sierra in setting up the MOVES inputs and performing the model executions. In short, no errors were identified.

Sierra further reviewed what appear to be significantly higher per vehicle-mile CO emission factors in MOVES compared to its predecessor models by examining published MOVES-based vehicle emission inventories recently developed by county for the neighboring state of Washington.⁵ Calendar year 2011 county-by-county MOVES-based vehicle CO emissions published in this study were divided by county VMT levels that were also provided. Fleet CO emission factors in 2011 range from roughly 12 g/mile to 40 g/mile across several Washington counties for which emission factors were back-calculated as described. Given the effects of fleet age and composition variations by county as well as other factors (control programs, ambient conditions, etc.), these estimates are in the same range as that estimated for the 2015 Medford fleet (roughly 26 g/mile) in the 2018 TIP MOVES modeling.

We therefore conclude (as was independently verified from the Washington MOVESbased inventories) that our MOVES estimates are correct and reflect what appear to be higher CO emission factors in MOVES vs. MOBILE6 under cold wintertime ambient conditions.

Conclusions and Recommendations

Given the currently mandated use of EPA's latest MOVES emission factor model, the Cold CO-based emission factors and budgets appear to be outdated and will render

⁵ S. Otterson, et. al., "Washington State 2011 County Emissions Inventory," Washington State Department of Ecology, April 25, 2014.

budget-based conformity determinations highly problematic. As stated earlier, air quality in Medford is not being projected to worsen. Rather, the budget exceedances simply result from what have been upwardly revised CO emission factors in EPA's evolution of emission factors over the last decade and a half.

Attachment #3

Thus, it is recommended that ODEQ be engaged to pursue revising the existing CO Maintenance Plan, redeveloping the budget based on the current MOVES model, or better, developing a Limited Maintenance Plan (LMP) for CO since the ten-year planning horizon of the existing maintenance plan has been reached and ambient CO levels are still well below the National Ambient Air Quality Standards.