From: KEN T ATWELL <kenatwell@bendbroadband.com>
Sent: Wednesday, November 14, 2018 2:30 PM
To: Karen Swirsky <kswirsky@bendoregon.gov>
Subject: Add tom CTAC meeting record

If you still can, could you include the attached in the record for yesterday's meeting. I shared this with Dean Wise and he thought it was "interesting" and "comprehensive" with respect to SE Bend. At least he didn't think it was laughable. Considering the exhaustive list of CTAC Scenarios, the recent ODOT Parkway Memorandum, and the potential for immediate development within City limits of over 1,000 housing unit I tough I would point out some options rather than problems.

Read it and distribute it if you think it could at least point to some less costly and thus near term options.

From: Ken Atwell, SE Bend resident

RE: US 97 Parkway Plan and Bend CTAC Scenarios

When I experience what people in Bend refer to as a traffic problem I do get uptight - for a moment. Then I laugh at how it compares to years driving in the San Francisco, Portland, and Seattle areas. But given the recent ODOT "memorandum to describe 'No Build' transportation conditions by the year 2040" for US 97 I wonder just how close are we to the congestion of those metro areas? When there are already "capacity failures" at the Reed Market interchange and another 9 of the 15 interchanges are expected to fail by 2040, it seems like we are close.

Having spent considerable time behind the wheel of short-haul and local delivery trucks to pay for college I gained vantage point which made it abundantly clear that a driver using "right in and right out only" access to or from a major arterial faces losing odds. The above report states "the Parkway volume south of Reed Market is 40% of that between Empire and Reed Market yet this section has a fatal/injury accident rate higher than state average due to short or non-existent acceleration and deceleration lanes". When "all right-in right-out intersections que extensively" by 2040 it will only add to the driver's impatience and reduces their odds of success even more. As access improvements are made elsewhere in any section of the Parkway these dangerous intersections should be eliminated, if not before.

Again from this report, "by 2040 the east and southeast traffic as a percent of all local trips on US 97 increases dramatically (21% to 41%) due to future growth in the southeast UGB expansion area". In the short run the east and southeast demands on Reed Market have to be reduced through all available immediate improvements at Murphy Road and Powers Road where all near term improvements seem to be a choice from the least worse options. (review 2007 Murphy Interchange IAMP, Figures 5 & 6 or newer)

POWERS ROAD*

First, the only way to attract traffic bound for housing on Brosterhouse to Powers Rd. is to extend Chase to Brosterhouse (see map on page 2). Without this Powers east, ending at Parrell, either leads back to the Reed Market/Third Street traffic or Murphy which many might consider to be the long route.

Second, the access ramp to 97s from Powers, with its left turn access from the east and its nonexistent acceleration lane, should be eliminated since any anyone using it just came from Third Street or Brookswood where a multimillion dollar on-ramp was just a mile farther south. Any attempt to extend this 97s on-ramp to an appropriate length for Powers east traffic would preclude a 97s off-ramp and holding lane of appropriate length (item 7 on map) for Powers east using Blakely as a return to Powers.

Third, replace the same access design as above used for the ramp to 97n from Powers by providing that 97n access with acceleration lane from Badger. Just a short trip around the block then provides, with modest ROW purchase, the safe 960 foot acceleration lane that ODOT prefers. At the same time of course the 97n right turn off option at Badger would be eliminated. This would also allow closure of Pinebrook because those seeking 97n access have it a block away and those seeking safe Third Street access from 97n ignored it only three quarter of a mile earlier. With proper development control of the one block of Badger prior to this on-ramp there would be the potential for a two 450 foot lanes for holding and metering access to 97n. Despite the fact that using this access involves dealing with a stoplight, it could replace the planned, and possibly more expensive, 97n access planned south of the Murphy/Third circle.

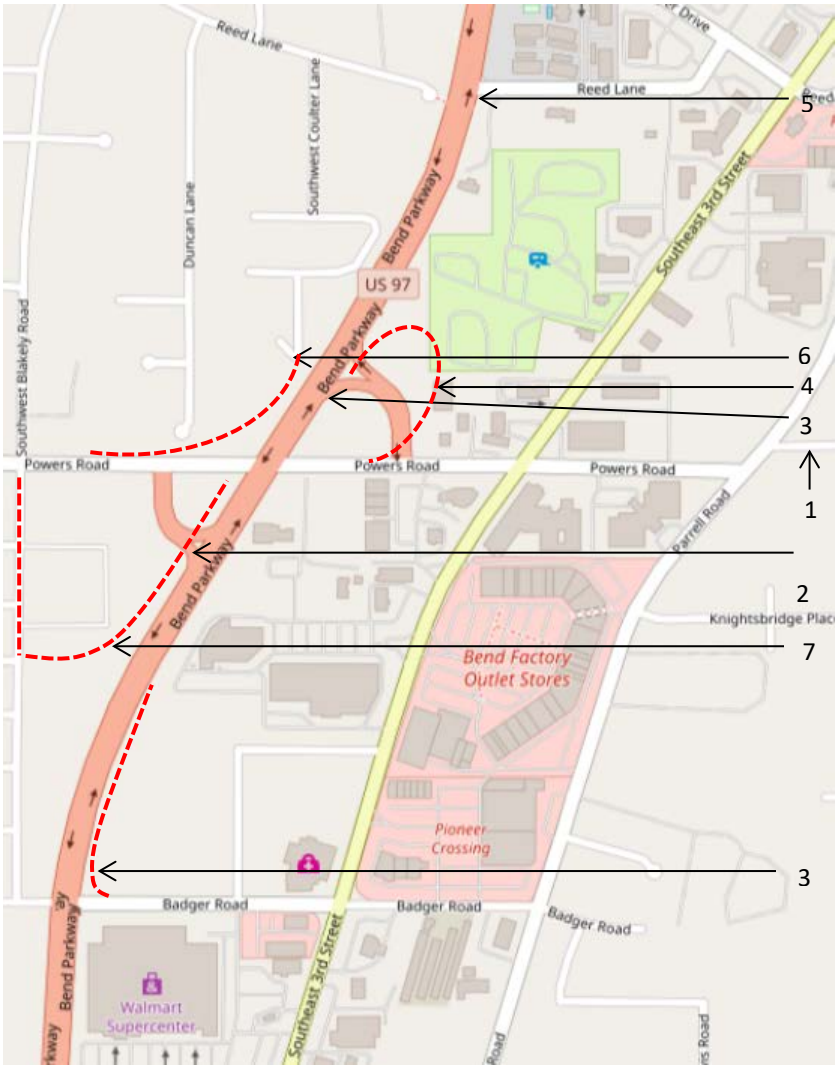
*Based largely on the traffic counts from 2007 Murphy Interchange IAMP, Figure 5, and best fit for ODOT standard length accel. and decel. lanes

Fourth, with a future Powers overpass in mind and the 97n access now eliminated from Powers west, full use of the available ODOT ROW here allows a 900 foot off-ramp from 97n starting immediately after crossing Powers. This would be for access to Powers west only, again eliminating the dangerous cross traffic option of exiting to Powers east.

Fifth, with the 97n access from Powers now eliminated, the Reed Lane 600 foot off-ramp ROW becomes an option for 97n traffic to exit to Third Street and Powers west which is again just around the block. This would require Reed Lane to become one way east and take advantage of an existing four-way stoplight at Third Street while still providing the required "second way out" for the apartment complex to the north. This could possibly replace the 97n off-ramp at Reed Market east with its cross-traffic left turn option and traffic slowed by the one block available to negotiate a left turn onto Third Street.

Sixth, some of the traffic that now waits on 97s to turn onto Powers west could be contained in a deceleration lane constructed on the existing ODOT ROW. An even more effective turn lane would include the ROW purchase of the three properties located east of Blakely and currently accessed from Powers west. This ROW purchase would eventually be required for an overpass to cure the real safety problem here which is the stoplight, so now may be as good a time as any. While another option would be to use the ODOT ROW at Reed on 97s to access Blakely north of Powers, this would be very disruptive to a developed neighborhood.

Seventh, while there is existing ODOT ROW at Badger from 97s, using this to access Blakely for a return to Powers east would result in three sources of backup - a deceleration lane of only 300 feet with existing ROW, a sharp turn onto Blakely where homes access to/from that street, and traffic using a narrow Badger Rd. with on-street parking to access homes and Brookswood. With the purchase of property at 61308 Blakely and possibly two other minor property line adjustments, Powers east could be accessed with a 1,000 foot decel./holding lane and only three access driveways disrupting flow on Blakely. This would also allow access to Badger and the homes there so that the right-turn only access to/from 97s could be closed.



MURPHY ROAD

It is my understanding that the 97s exits for Murphy Road east and west have already been given high priority, as well as access to 97n, but I wonder if some money could be saved there as follows:

1. Given the rock that will be encountered at the proposed 97n access site adjacent to the Third Street on-ramp to 97s, would the Badger access to 97n proposed above provide a more cost effective location?

2. If the 97s access to Powers east suggested above were accepted would the long frontage road often suggested from Badger to Murphy west be needed? Instead, could the Murphy west off-ramp start after Pinebrook, rather than the frontage from Badger, and extend 800 feet to Murphy west with a local road intersecting before it reaches Murphy for a connection to and that development's required second way out and thus close the right turn only access at Pinebrook?

4. The Murphy Crossing Refinement Plan (2007) indicates a traffic circle at the west terminus of the Murphy/97 overpass and south terminus of the access road described above. Considering the Murphy Interchange as built it appears to have insufficient ROW for this circle which may have been designed as the access point to Murphy east. However, both the above study and the Murphy Interchange IAMP (2007) show a 97s off-ramp immediately south of the overpass as the start of both a road returning to Murphy at a traffic circle and a frontage road extending south to Ponderosa. This presents two options for delaying investment. The circle planned west of the overpass for access to Murphy Crossing could be used as a return to Murphy east for traffic on Murphy west that used the 97s exit at Pinebrook, or the 97s exit planed south of the overpass could be constructed for a road returning to Murphy east and the traffic circle delayed. This decision could hinge on how urgent the need is to correct the China Hat, Ponderosa, and Baker Road access issues.

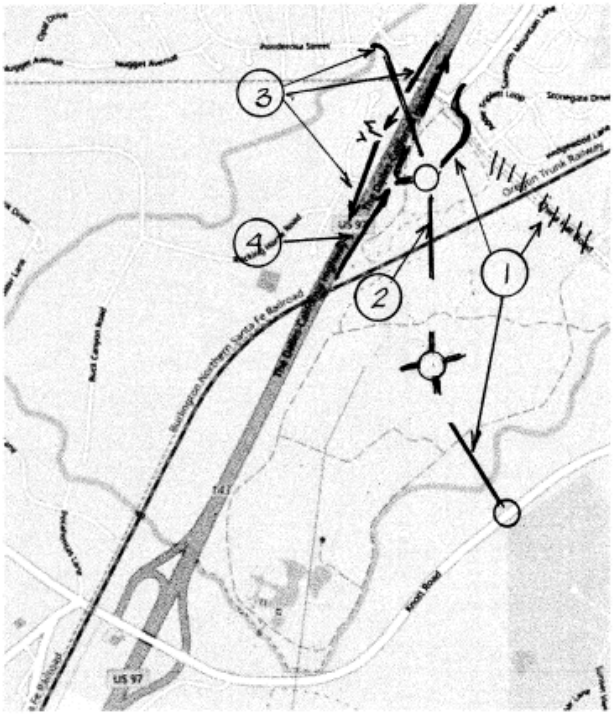
CHINA HAT/PONDEROSA

Any discussion of a China Hat/Ponderosa overpass starts with an understanding of the Baker/Knott Road interchange, which will necessarily be impacted by an increase of 2,300 households and 4,600 jobs in Southeast Bend. This interchange was one of the high priority, and the highest cost, rail crossing improvements needed according to the 2009 Central Oregon Rail Plan report. The solution proposed in that study was (in 2009) estimated to cost $36 million, would require destroying the existing interchange, raising the entire facility 24 feet above current grade, and still leave all stops and cross traffic turns unresolved. A traffic circle might be the ideal way to sort out this dilema but a circle with the appropriate radius for the truck volume here will hardly fit between the highway and tracks, and certainly not at 24 feet above grade while accomodating a southbound on-ramp to Hwy 97. Without a working interchange here the success of a nearby 70 to 80 acre business/commercial complex that could reduce traveled miles out of Southeast and Southwest Bend would be questionable.

The more affordable option is to close the Baker Rd. railroad crossing and construct a China Hat and Ponderosa interchange that could access Baker Road without a rail crossing and open customer access to this business/commercial complex. Development as suggested by the UGB plan could foreclose this option unless the City's transportation plan adequately addresses the unique characteristics of the infrastructure needed here. To adequately turn China Hat and Ponderosa into the major collector as planned, and do it economically, the existing topography and ROWs need to be considered. Again looking at the 2009 Rail Plan, following the current China Hat ROW would make it impossible to bridge both the railroad and US 97 while connecting to local streets.

To avoid excessive abutment expenses and to follow a line that places the railroad a little below grade at the crossing, Parrell (which now replaces China Hat in name) starts at a traffic circle intersection with Knott Rd. that could someday extend access to over 400 acres of privately owned land between Knott

Rd. and the National Forest. Parrell then extends across currently undeveloped property that is anticipated for commercial and industrial use and crosses the railroad approximately 800 feet south of the current China Hat crossing. Based on bridge approach length requirements found in the Rail Plan, it might be generalized that any bridge approach at grade will need to be 650 to 700 feet. Using this approach length a slightly above grade traffic circle can be constructed north of the rail crossing to sort out traffic from Parrell, Ponderosa, and 97n off-ramp and on-ramp traffic. Ponderosa traffic is then carried on an overpass that bridges both an on-ramp to 97n and US 97. Constructed on a northwesterly line from this circle, the west terminus of this overpass would need be at the intersection of Emigrant and Ponderosa to achieve the height needed to allow the exit or frontage road traffic from 97s to pass under the bridging and onto the adjacent property where it can be sorted out. From here Ponderosa and Buck Canyon can be developed as arterials and access to Baker Rd. becomes available with a few ROW issues but no railroad crossing needed.



CHINA HAT / PONDEROSA

Based on the 2009 rail crossing study and the Evans conclusion included there, and due to the substantial commercial zone included in the Thumb portion of the UGB expansion plan:

1. Replace China Hat with an extension of Parrell from its current terminus to the intersection of Knott Rd and the UGB extension boundary to accommodate both rail and 97 overcrossing

2. Cross rail on this line to reduce or eliminate the abutment cost ($8k of $19k total)found in Evans estimate and provide space for a traffic circle to sort out traffic from the following sources

3. Use the existing 97s decel row at Ponderosa to direct exiting traffic under a overpass and connecting to:
    a. an overpass on ramp for Ponderosa east
    b. local connection to Ponderosa west and local connection/row to Buck Canyon and possibly Baker
    c. an accel lane for 97s traffic

4. Provide accel and decel access to 97n connecting to the above circle

One might ask why do US 97 and the railroad need to be bridged here and Murphy. The answer is not only the need to reduce traveled miles with a successful business commercial complex here but also the fact that the badly needed Reed Market/Third Street intersection and Reed Market rail overpass will never be completed without Murphy and Parrell overpasses to absorb the diverted traffic.

DAVID EVANS AND ASSOCIATES, INC.

SUMMARY COST ESTIMATE

PROJECT: ODOT0000608 Central Oregon Rail Plan	**Terry Shike/503-361-8635**
CROSSING NO:	**China Hat Road (USFS Road 18)**
RAIL SEGMENT IDENTIFICATION:	**RAIL SEGMENT LENGTH:**

NO.	ITEM	UNIT	QUANTITY	UNIT COST	TOTAL
	Bridge 106' x 75'	ft2	7950	$165	$1,311,750
	MSE Retaining Walls	ft2	78077	$100	$7,807,700
	Embankment	yd3	67247	$15	$1,008,705
	Paving	ft2	165900	$10	$1,659,000
	Sidewalks	ft2	29550	$10	$295,500
	Cul de sacs	each	0	$25,000	$0
			SUBTOTAL		$12,082,655

ADDITIONAL COSTS	
Utility Allowance	$100,000
Design/Surveying (10%)	$1,208,266
Constr.Engr./Contingency (50%)	$6,041,328
Special Costs (Unique to crossing or segment)	
SUBTOTAL	$7,349,593
TOTAL CONSTRUCTION COST	
RIGHT-OF-WAY COSTS (Supplied by ODOT)	
TOTAL CROSSING/SEGMENT COST	$19,432,248

Assumptions/Notes:
Four lanes with 6 ft bike/shoulder and 6 ft sidewalks.
Retaining walls each side to reduce ROW costs.
Raise access road located about 600 ft NW 18.8 ft, - 40 ft width.
See note next page for impact of grade change along China Hat Road

DAVID EVANS AND ASSOCIATES, INC.

SUMMARY COST ESTIMATE

PROJECT: ODOT0000608 Central Oregon Rail Plan	**Terry Shike/503-361-8635**
CROSSING NO:	**Baker Rd, Oxing of BNSF, US97**
RAIL SEGMENT IDENTIFICATION:	**RAIL SEGMENT LENGTH:**

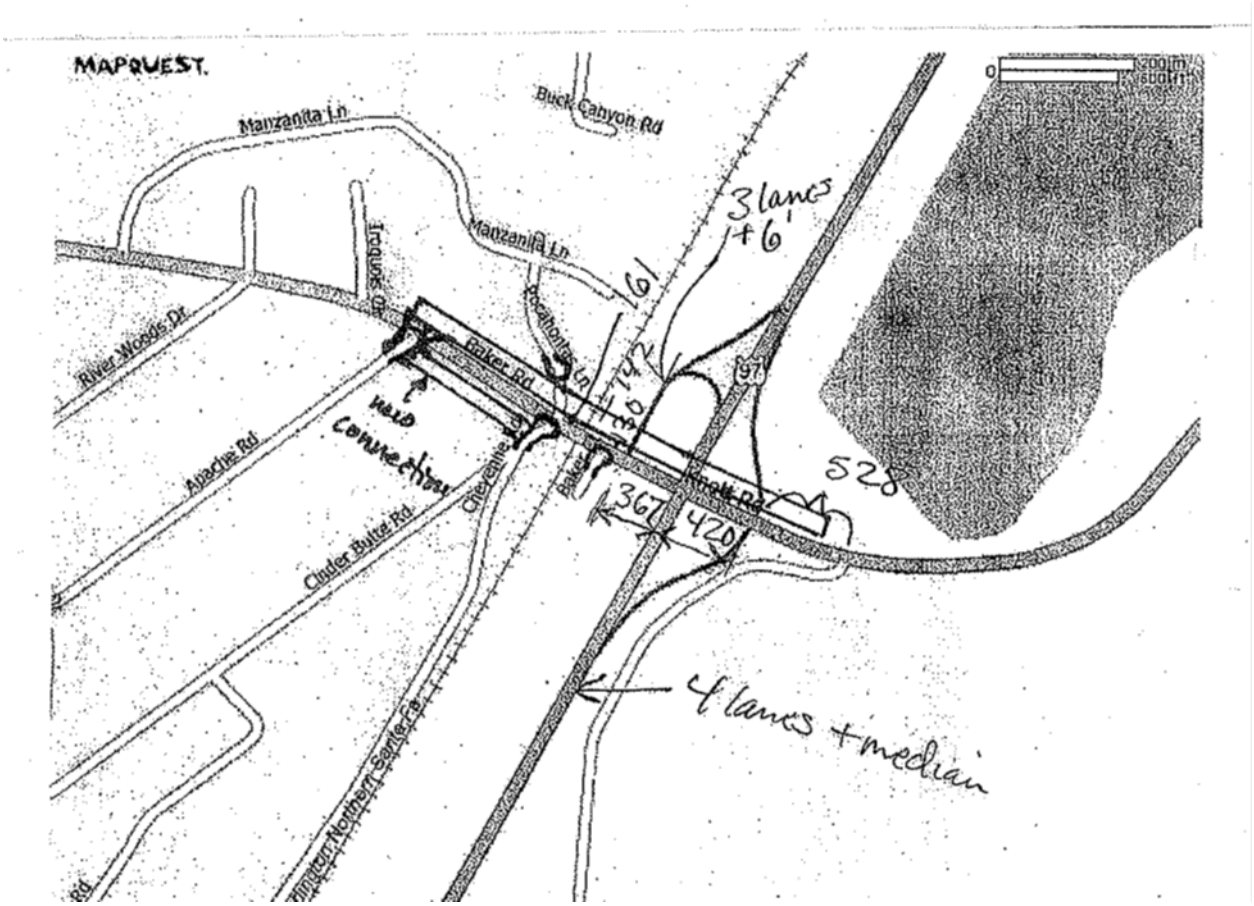
NO.	ITEM	UNIT	QUANTITY	UNIT COST	TOTAL
	RR Bridge 100' x 86'	ft2	8600	$165	$1,419,000
	US 97 Bridge, 200' x 86'	ft2	17200	$165	$2,838,000
	MSE Retaining Walls	ft2	115,000	$100	$11,500,000
	Embankment	yd3	100000	$15	$1,500,000
	Paving	ft2	287,000	$10	$2,870,000
	Sidewalks	ft2	26000	$10	$260,000
	Cul de sacs	each	3	$25,000	$75,000
			SUBTOTAL		$20,462,000

ADDITIONAL COSTS	
Utility Allowance	$100,000
Design/Surveying (10%)	$2,046,200
Constr.Engr./Contingency (50%)	$10,231,000
Special Costs (Unique to crossing or segment)	
SUBTOTAL	$12,377,200
TOTAL CONSTRUCTION COST	
RIGHT-OF-WAY COSTS (Supplied by ODOT)	
TOTAL CROSSING/SEGMENT COST	$32,839,200

Assumptions/Notes:
Four lanes, median with 6 ft bike/shoulder and 6 ft sidewalks.
Retaining walls each side to reduce ROW costs. May be less cost to use embankment.
Span across RR and US 97 - remove existing US97 bridge to match new gradeline.
Raise existing on/off ramps - west ramps raise 24 feet - east ramps 4 ft - MSE walls each side.
Cul de sac intersecting local streets - maybe reconnect these streets toward the west.
Estimate based on rough lengths between features from attached sketch.
Profile is an estimate - assuming 0% grade along the existing ground.

Crossing 10A-005.60 Baker Rd., Bend -- Overcrossing

RATIONALE: Baker Rd intersects US97 approximately 600 feet to the east of the RR and is carried over US97 on a structure. The profile of this bridge will not match the needed profile over RR, therefore the bridge must be replaced. Assume the new overcrossing would be adjacent and to the north of the existing one. There are on/off ramps to US 97 that will need to be raised to match the profile of the overcrossing. There are approach streets to Baker Rd on the west side, which also must be raised to meet the new profile, rerouted or access stopped with a cul de sac.



With this approach the stopped and crossing right and left turn issues are not addressed, and the potential for Hwy. 97 off-ramp backup persists.

DAVID EVANS AND ASSOCIATES INC.

JOB DESCRIPTION Baker Rd.

CALCULATION FOR

JN.

BY TBH DATE 5/15/08

SHEET OF SHEETS

CHECKED BY DATE