

# CenterLine Debundle Analysis

Jack Mallinckrodt  
AJM Engineering  
(714) 544 3200  
8/23/04

The "CenterLine Project" as documented and analyzed in the 2003 OCTA Environmental Impact Report ("EIR")[1] is not just a light rail system. It now consists of a bundle of three elements of so called "independent utility":

- CenterLine Light Rail ("LR")
- CenterLine Bristol Street Widening [1, p.S-15] ("BSW")
- CenterLine OCTA Bus 12% service expansion. [1, p. 2-26], ("BUS")

How much does each element contribute to the overall project benefit? Conspicuously, the EIR does not address this important question. Its findings pertain solely to the bundle as a whole.

The best way to estimate this would be for OCTA to perform comparative OCTAM modeling studies of each of the independent utility elements. AJM has been trying for the past year to persuade OCTA to do so, but they have so far declined to do so. Lacking such separate modeling studies, the fully source referenced data in the attached analysis summary, gleaned from a number of OCTA and primary national sources, are believed to provide the basis of a next best, debundled estimate of the mobility benefits of each independent utility element.

Congestion and all its important consequences, travel-time delay, accidents, energy consumption, and excess air quality emissions are functions of the Regional System Capacity,  $C^1$ . For a congested region like Orange County, improvements in congestion, travel-time, emissions and energy consumption due to transportation system enhancements, are roughly proportional to the increase in system capacity irrespective of mode: road, bus, or rail. System capacity is thus key to the comparison of the transportation benefits of transportation alternatives. This estimate, detailed in the spreadsheets following is based on System Capacity analysis.

The mostly street-level, exclusive Right-Of-Way Light Rail (LR) element would provide some congestion benefit by diverting some riders from automobiles and roads. But at the same time, and inseparably, it would cause traffic disruption due to taking street lanes and blocking some, and partially preempting other existing traffic crossings. The results of the 1999 and 2000 EIRs did analyze the LR element by itself and found that the LR build alternatives were uniformly worse than no-build, in terms of congestion and travel-time, [Ref. 2]. This is ample reason for concern that Light Rail may take *more street capacity* than it returns in *rail capacity*, and that its net capacity and mobility contribution may well be *negative*.

The subsystem capacity contributions of the several elements can be estimated from their descriptions in the EIR as detailed in the attached spreadsheet. The bottom line of

---

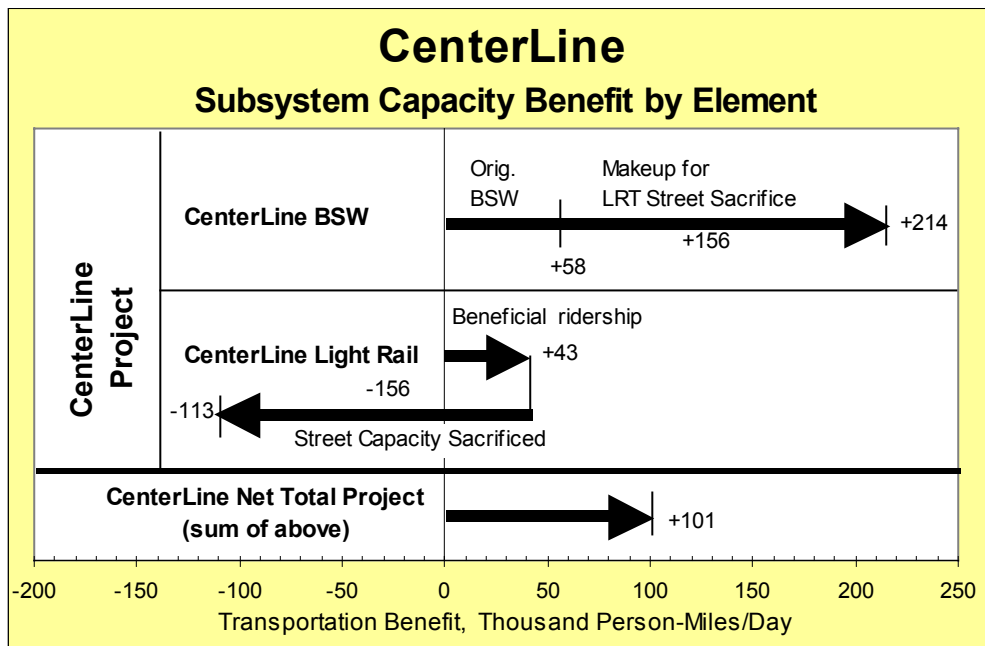
<sup>1</sup> "Regional System Capacity is the maximum volume of traffic, person-miles/day a regional transportation system could reasonably be expected to carry at a given, acceptable level of congestion. SubSystem capacity is the marginal change in System Capacity due to the addition or removal of one of that subsystem, e.g. a road, a bus line, or a rail subsystem.

this analysis is a quantitative estimate of the transportation benefit (congestion improving sub-system capacity), measured in commensurate terms of person-miles/day, for each of the three elements of the CenterLine bundle, BSW, BUS and LR. The following graphic summarizes those estimates:

**TABLE 1**

Element		Transp. Benefit thousand pers-mi/day	NPV Total Cost millions, 2003\$
BSW		214	185
BUS		85	544
LR	Ridership	43	1043
	St. Cap. Loss	(113)	
CenterLine Project		186	1772
CL Without Light Rail		299	729

Or, graphically,



Among the important implications, IF these estimates are substantially correct:

- **Even disregarding their much smaller cost, the two add-ins, BUS and BSW, are each considerably more beneficial than LR.**
- **The net benefit of LR itself is negative, it sacrifices more street capacity than it returns in beneficial ridership.**
- **A No-LR alternative (leaving only BUS and BSW) would yield approximately 60% greater transportation benefit, at less than half the total project cost.**

The objective findings of the 2003 EIR cannot in any way refute these estimates. They are simply, and conspicuously, silent on this vital issue of individual element performance.

Thus, the best available evidence is that including fixed guideway Light Rail in the CenterLine project is a terribly expensive, counterproductive mistake. In order to make an informed decision on the project, directors should insist that OCTA carry out and document the comparative modeling analysis of the "no-Light-Rail" alternative to confirm or refute these estimates; to establish conclusively how much the light rail element, independently, adds — or detracts — in terms of capacity, travel-time saving, and air quality benefits.

The fully annotated and source referenced derivation summary of these results follows.

#### **January 2005 Update Addendum.**

OCTA board and staff have now had these results for 6 months. In July 2004, staff was directed by the board to review and affirm or refute them. Three coordination meetings and numerous written interchanges have supported this effort. Bottom line: there has been *no correction or refutation of any of these analytic results*. The sole rebuttal has been the disingenuous claim, verified here, that the bundled CenterLine **Project** with its significant bus and street elements has an overall positive net impact.

It now seems evident that this very cloaking of light rail counterproductivity was the main, if not sole rationale for the bundling of the bus expansion and Bristol Street widening elements.

---

#### **References**

1. "Supplemental Draft Environmental Impact Statement/Revised Draft Environmental Impact Report for the Orange County CenterLine Project", p. S-15, .OCTA, August 2003. p.S-15.
2. "Critique of the 2003 CenterLine DEIR", AJM Engineering, March 4, 2004. On line at [www.urbantransport.org/cl2003critique.pdf](http://www.urbantransport.org/cl2003critique.pdf)

Analysis summary follows.

## Net Marginal Transportation Benefit of Light Rail in CenterLine Project -- Summary Analysis

Configuration per IOS alternative of 2003      2/5/2005      j:\CenterLine2004\CL Data Sheet.xls

Line	Item	Units	Value	Reference	Comment
------	------	-------	-------	-----------	---------

### LR Gross Beneficial Impact on Road Traffic (Neglecting traffic disruption)

5	Auto VMT Reduction	veh-mi/day	26,120	FTA3 T.6	LR Gross Effective Cong redcng cap, veh
6	Auto Avg Veh Occupancy (AVO)	ps/veh	1.63	NHTS 2001	For Los Angeles MTA, All purposes
7	Auto PMT (Person Mi Trav) Reduction	ps-mi/day	42,576	=(5)*(6)	= Gross LR Effective Congestion Reducing capacity

### Lt Rail Net Impact on Overall Capacity and Congestion (Including Traffic Disruption) Note A

9	Street Lane-Mi taken for LR ROW	ln-mi	13.4	EIR99, Figs 2.2, 2.5, 2.11	Taken for ROW.
10	Bristol Street Current ADT/ln	veh/day/ln	7142	EIR3 T. 3.2-1, 3.2-2	
11	St. Cap. Loss due to ROW Taking	ps-mi/day	155,996	= (6)*(9)*(10)	
12	Net LR Congestion Reducing Benefit Capacity	ps-mi/day	<b>(113,420)</b>	=(7)-(11)	Net loss

### Effective Capacity Contribution of Centerline Project Elements Other Than Light Rail

14	CenterLine Add'l Bus Service	veh-hr/day	617	EIR3 p. 2-26	185,060 Addl Bus Service Hrs/yr / 300 day/yr
15	OCTA ps-mi/veh-srv-c-hr experience	ps-mi/veh-hr	138	NTDB 2001	OCTA Actual
16	Projected CL Add'l Bus Service Ridership	ps-mi/day	<b>85,128</b>	=(14)*(15)	
17	Widen Bristol to 6 ln	ln-mi	5.0	EIR3 Figs 2.5, 2.6, 2.7	
18	Mitigation for LR Taking	ln-mi	13.4	=(9)	
19	Total CL Bristol Street Widening	ln-mi	18.4	=(17) + (18)	
20	CL BSW projected Usage	ps-mi/day	<b>214,203</b>	= (6)*(10)*(19)	Usage is a lower limit estimate of capacity
21	CL Lt Rail Net Effective Capacity	ps-mi/day	<b>(113,420)</b>	= (12)	<b>Net Loss</b> of capacity attributable to LR
22	CenterLine Project Net Capacity	ps-mi/day	<b>185,911</b>	=(16)+(20)+(21)	BUS + BSW + LR

### CenterLine Project Costs

24	Light Rail Element	2003\$	\$ 1,043	See PV Worksheet	Total Net Present Value, 2003\$
25	Bus Expansion Element	2003\$	\$ 544		
26	Bristol Street Element	2003\$	\$ 185		
27	CenterLine Project Total	2003\$	\$ 1,772		

### Estimated Marginal Impact of DELETING Light Rail from the OCTA proposed bundle of

#### "CenterLine Project" = {Light Rail + Bristol Street Widening + Bus service expansion}

30	Enviromental Impacts Improved thereby		42	EIR3 Sec. 4	
31	Enviromental Impacts Unchanged		41		
32	Enviromental Impacts Worsened		1		
33	Net Regional Effective Capacity Increase	ps-mi/day	113,420	= - (21)	
34	% MORE capacity benefit		<b>61%</b>	=[(16)+(20)]/(22) -1	61% greater benefit
36	% LESS Cost		<b>59%</b>	=(24)/((27)	at 59% less cost

### References

EIR3 = CenterLine Supplemental Draft Environmental Impact Report, OCTA Oct 2003  
 FTA3 = Centerline FY2005 Section 5309 FTA New Starts Report, August 29, 2003  
 NHTS = National Household Travel Survey, 2001, for Los Angeles MSA  
 NTDB = National Transit DataBase, 2001, Orange County Reported data

### Questions or Comments:

Jack Mallinckrodt  
 714 544 3200

**Note A.** The terms "volume" and "capacity" as used herein mean person-miles/day summed over an entire system or subsystem.