I-70 Mountain Corridor PEIS Cost Estimating Technical Report

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Section 1. Introduction

This Estimating Methodology Report was developed by the J.F. Sato & Associates team, the project consultant, as a guide for preparing capital cost estimates for the I-70 Mountain Corridor project during the development of the I-70 Mountain Corridor Programmatic Environmental Impact Statement (PEIS) prepared in 2004. This has become a working document as the project progressed from the Draft PEIS to the Final PEIS being published in 2010. The document has been modified to account for: 1) modifications in the project alternatives and 2) changes in escalation and other unit price considerations between 2004 and 2010.

1.1 Future Costs are Uncertain

The analysis assumes a 2010 capital cost for the Preferred Alternative Maximum Program of Improvements at $11.2 million, which is considered the best-case estimate. The ultimate cost of the alternative will be a function of the year of construction and the actual extent and effects of numerous project risks. Project risks run the gamut of political, managerial, engineering, and environmental issues. These risks as well as increases in inflation can potentially result in a doubling of project costs at implementation. For example, escalation alone (assuming an increase of 4% per year) would result in an 80% increase in costs after 15 years, or a 2025 date of delivery. Examples of possible risks are given in **Table 1** below:

Table 1. Categories and Examples of Project Risk

Category	Generic Examples of Project Risk
Political Risk	• Loss of corridor governance • Loss of community support for the Programmatic Agreement • Change in administration(s) • Perception of inequity of service or impacts • Inability to gain support for increases in local taxes or user fees
Managerial Risk	• Procurement risks • Availability of funding • Uncertainities of funding • Project delay • Inability to raise a local match
Engineering Risk	• Increase in materials cost • Acquisition of technology • Unknown conditions • Lack of design information at planning • Under-estimated quantities
Environmental Risk	• Delay in receiving a Record of Decision • Changes in regulations • Increase in mitigation costs

On large complicated construction projects, it is common to perform quantitative risk assessment studies to evaluate the probabilistic cost at the predicted year of expenditure (YOE) (YOE is typically measured at the mid-point of construction). These studies work by having a team of experts look at the best case versus worst case of each line item cost in the estimate. Similar best case – worst case estimates are prepared for each line item duration (measured in number of days) in the project schedule. These range estimates are then placed in a Monte Carlo model to develop a series of probable outcomes, or levels of confidence. The higher the level of confidence (LOC) the better the change that the budget (or the

schedule) will not be over-run. However, with the higher LOC, the budgets get higher and the schedules longer.

A Colorado Department of Transportation (CDOT) sponsored *Cost Validation and Risk Assessment (CVRA) – I-70 Mountain Corridor Mileposts 116 to 260* (CDOT, February, 2007) suggests on page 5 that the Highway and Advanced Guideway System elements would, assuming an 80 % level of confidence, range from $7 to $9 billion and $18 to $20 billion in YOE dollars, respectively (this document is a draft report that was never finalized based on the most recent Federal Highway Administration guidance that does not require quantitative risk based cost estimate for a Tier 1 project). This results in a cost for the Preferred Alternative from $25 to $29 billion in YOE dollars, which according to the CVRA, is 2032 for the highway element and 2037 for the Advanced Guideway System element. The study cites that these estimates are considered to be in the most "most likely range". An 80% level of confidence means that there is a 20% chance that the predicted cost would be exceeded, but an 80% chance that cost would be lower for the Preferred Alternative.

There is also a measure called the "mid-80% confidence interval" which is defined by a reasonable lower bound (the 10th percentile) and a reasonable upper bound (the 90th percentile). Thus, there is only a 20% chance that the total cost will fall outside this range. Using this assumption, the CVRA states that the total cost of the highway element will be between $5.4 and $12.0 billion in YOE dollars. The respective numbers for the Advanced Guideway System alternative would be between $13.8 and $30.7 billion. Because the spread in values is so great using this measure, the "most likely range" defined above is considered more reasonable.

Any of the alternatives evaluated in the PEIS would be subject to uncertainty and escalation. All of the Action Alternatives would be Mega-Projects if implemented at one time, involving complicated environmental, procurement, and constructability challenges. At the PEIS level of analysis, engineering, schedule, and market conditions are not well defined. Cost risk and escalation for the highway element of the Preferred Alternative was estimated at 191% at a 90% level of confidence; the respective values for the Advanced Guideway System element were 246%, meaning that it likely that any of the Action Alternatives evaluated in the PEIS would be about twice the 2010 cost. Assuming just escalation project costs can be expected to double every 18 years assuming an inflation rate of 4%.

It is also probable that government revenues will track fairly close to increases in the consumer price index (CPI), somewhat mitigating the effects of construction cost escalation. Historically, construction inflation has been slightly higher than increases in the CPI.

1.2 Requirements for Financing

Assuming the lower $11.2 billion estimate in (2010 dollars) annual capital commitments would range from $571.4 million to $687.6 million per year assuming a cost of money of 3.0 to 4.5% per year and a 30 year bond, should CDOT finance the project. Statewide, CDOT's current budget for all programs is approximately $1 billion, with much of funds committed to maintaining system quality and the safety of the traveling public. Looking into the future, CDOT has about 50% of the funds required to fulfill the requirements of the *2035 Statewide Transportation Plan* (Plan). The CVRA predicts that the highway and Advanced Guideway System elements would be constructed in 2032 and 2037, respectively – thus the impact of escalation is predicted to have the greatest affect to cost increases.

Section 2. Estimating Methodology

2.1 Level of Accuracy

Table 2 presents the definition and accuracy of project cost estimates at different points in the project cycle. For Alternatives Analysis and National Environmental Policy Act (NEPA) documents, the engineering team used what the American Association of Cost Engineers (AACE) define as a Class 4, or Conceptual Estimate. A Conceptual Estimate is used when the project definitions of the alternatives are incomplete due to a lack of engineering design. For a Conceptual Estimate, Engineering is assumed to be from 1% to 15% complete. For the I-70 Mountain Corridor the engineering differed geographically depending on the availability of data. In general, the level of engineering was assumed to be 5% to 10% complete. However, a Conceptual Estimate is appropriate for the screening of project alternatives in a NEPA application. Because the estimates, can be anywhere from a -30% to a +50% level of accuracy, AACE cautions that it is inappropriate to use the Conceptual Estimate for budgetary purposes.

Table 2. Classifications of Cost Estimates

	Primary Characteristic	*Secondary Characteristic*			
ESTIMATE CLASS	**LEVEL OF PROJECT DEFINITION** Expressed as % of complete definition	**END USAGE** Typical purpose of estimate	**METHODOLOGY** Typical estimating method	**EXPECTED ACCURACY RANGE** Typical variation in low and high ranges [a]	**PREPARATION EFFORT** Typical degree of effort relative to least cost index of 1 [b]
Class 5	0% to 2%	Concept Screening	Capacity Factored, Parametric Models, Judgment, or Analogy	L: -20% to -50% H: +30% to +100%	1
Class 4	1% to 15%	Study or Feasibility	Equipment Factored or Parametric Models	L: -15% to -30% H: +20% to +50%	2 to 4
Class 3	10% to 40%	Budget, Authorization, or Control	Semi-Detailed Unit Costs with Assembly Level Line Items	L: -10% to -20% H: +10% to +30%	3 to 10
Class 2	30% to 70%	Control or Bid/ Tender	Detailed Unit Cost with Forced Detailed Take-Off	L: -5% to -15% H: +5% to +20%	4 to 20
Class 1	50% to 100%	Check Estimate or Bid/Tender	Detailed Unit Cost with Detailed Take-Off	L: -3% to -10% H: +3% to +15%	5 to 100

2.2 Project Contingency

Project contingencies are used to help mitigate against uncertainty at difference phases of project estimating. There is a general agreement that project contingencies should be from 30 to 40% at Conceptual Estimate, 30% at Preliminary Engineering (30% design), 20% at Final Design (90% design), and 10% at the time the project is bid for construction. For the purposes of the I-70 Mountain Corridor, a contingency of 30% has been assumed based on industry standards for a conceptual estimate.

2.3 Approach to Estimating

The construction cost for the alternatives and their sub-parts are tabulated on excels spreadsheets. There are six main items that were determined through the use of AutoCAD and Eaglepoint (a roadway modeling software):

- Structures (paid for in units of square feet)
- Walls (paid for in units of square feet)
- Earthwork (paid for in units of cubic yards)
- Pavement (paid for in units of Tons)
- Base Course (paid for in units of cubic yards)
- Barrier (paid for in units of lineal feet)
- Special Structures (namely the structured lanes in Idaho Springs) (paid for in units of square feet)

Earthwork quantities (cuts and fills) are obtained by running a template (typical section) through the existing topography along the I-70 Mountain Corridor. Pavement and Base Course quantities are calculated through the topographic model using their assumed length and width. A model run through the project topography using typical cross-section determines the barrier length. This process was used only for the portions of alternatives that are within Clear Creek County and Summit County east of Copper Mountain. For areas within Jefferson County and West of Copper Mountain (since accurate topography is not available) a rough estimate, along with knowledge of the I-70 Mountain Corridor and engineering judgments were made to determine the quantities.

Approximate quantities were then placed into CDOT-Department of Transportation Development's standard construction cost estimate spreadsheets to calculate for the total estimated construction cost for the studied alternatives. This standard spreadsheet has the following "add-ons" or "mark-ups":

- Contingencies on project construction bid items (30%)
- Intelligent Transportation System (6-10%)
- Drainage/Utilities (3-10%)
- Signing and Striping (1-5%)
- Construction Signing & Traffic Control (5-25%)
- Mobilization (4-10%)
- Force Account – Utilities (1-2%)
- Force Account – Misc. (10-15%)
- Total Preliminary Engineering (17%)
- Total Construction Engineering (15%)
- Right-of-way (2%)

2.4 Unit Costs

2.4.1 Sources of Unit Costs

Through an expert panel comprised of CDOT Program Engineer, Project Manager, Project Engineer, and consultants' Project Manager and senior engineers, it was determined that the factors for each studied alternatives shown in **Table 3** were to be used for the construction cost estimate calculations.

Yeh & Associates, in consultation with an expert panel recommended by CDOT project management, provided tunnel construction cost estimates. These costs per linear foot shown in the spreadsheets were all-inclusive, which included the cost of all action items for planning, designing, and construction management along with the construction of the tunnel. Therefore, the above-mentioned add-on factors were not applied to the tunnel unit cost.

The unit costs were developed from the CDOT 2003 cost data book. However, a constructability meeting was held to determine the appropriate units cost that should be used for the PEIS. The meeting attendees included a panel of experts from CDOT with specific experience in construction cost estimating and the understanding of the potential challenges existed in the I-70 Mountain Corridor. In many cases, the panel raised the unit costs from 2003 CDOT cost data book as follows:

Table 3. Expert Panel Unit Cost Recommendations

Transportation Element	Unit	2003 unit cost (CDOT cost data book)	Adjusted unit cost
Highway			
Structures	Square feet	$120.00	$150.00
Walls	Square feet	$45.00+	$90.00
Earthwork	Cubic yard	$4.00-$8.00	$20.00
Pavement (HBP SX)	Ton	$25.00-$40.00	$70.00
Base course (class 6)	Cubic yard	$6.00-$17.00	$40.00
Barrier (Type 7 CA)	Linear feet	$27.00-$60.00	$60.00
Special structures	Square feet	Not Applicable	$200.00

2.4.2 Unit Costs

The unit costs assumed for the I-70 Mountain Corridor are presented in **Table 4**. These costs are in 2003 dollars and have not been escalated. Updating the 2003 costs to 2010 was achieved as a single line item for escalation at the bottom of the estimate as shown in **Appendix A** (that is, the entire project cost was escalated instead of escalating each unit cost).

Table 4. I-70 Mountain Corridor Unit Costs

Element	Unit	Unit Cost	Reference or Comment
Earthwork			
Earthwork	CY	$ 20	Using CDOT 2003 Cost Data and adjusted by Expert Panel
Structures			
AGS-Maglev Structure	LF	$ 2,376	FTA's Colorado Maglev Project using T.Y. Lin's cost estimate
AGS-Maglev Guideway	LF	$ 500	FTA's Colorado Maglev Project
Rail Track Structures	SF	$ 150	Cost developed by Transystem
Special Structures	SF	$ 200	By Expert Panel
Heavy Rail Structure	SF	$ 200	Cost developed by Transystem
Bus-Guideway Structure	LF	$ 3,200	Cost developed by Transystem
Bus-Guided Busway Track	LF	$ 315	Cost developed by Transystem
Bus-Ramps for Busses	LS	$ 2,000,000	Cost developed by Transystem
Highway Structure	SF	$ 150	Using CDOT 2003 Cost Data and adjusted by Expert Panel
Interchanges (EACH)	LS	Varies	Seem to vary from $6 to $20 M
Pavement			
Pavement	Ton	$ 70	Using CDOT 2003 Cost Data and adjusted by Expert Panel
Base Course	CY	$ 40	Using CDOT 2003 Cost Data and adjusted by Expert Panel
Walls			
All Retaining Walls	SF	$ 90	Using CDOT 2003 Cost Data and adjusted by Expert Panel
Barrier (Type 7)	LF	$ 60	Using CDOT 2003 Cost Data and adjusted by Expert Panel
Tunneling			
Rail Tunnel (Twin Tunnels)	LF	$ 15,000	Cost developed by Yeh and adjusted by Expert Panel
Rail Tunnel (North Bore EJMT Tunnels)	LF	$ 20,500	Cost developed by Yeh and adjusted by Expert Panel
AGS Tunnel (Twin Tunnels)	LF	$ 15,000	Cost developed by Yeh and adjusted by Expert Panel
AGS Tunnel (North Bore EJMT Tunnels)	LF	$ 20,000	Cost developed by Yeh and adjusted by Expert Panel
DMB/DB Tunnel (Twin Tunnel)	LF	$ 15,000	Cost developed by Yeh and adjusted by Expert Panel
DMB/DB Tunnel (North Bore EJMT)	LF	$ 33,000	Cost developed by Yeh and adjusted by Expert Panel
Highway Tunnel (Twin Tunnel)	LF	$ 15,000	Cost developed by Yeh and adjusted by Expert Panel
Highway Tunnel (North Bore EJMT)	LF	$ 33,000	Cost developed by Yeh and adjusted by Expert Panel
Highway Tunnel (S-Curve Hidden Valley)	LF	$ 18,000	Cost developed by Yeh and adjusted by Expert Panel
Highway Tunnel (Floyd Hill)	LF	$ 17,000	Cost developed by Yeh and adjusted by Expert Panel
Highway and AGS/Rail Tunnel (North Bore EJMT)	LF	$ 48,000	Cost developed by Yeh and adjusted by Expert Panel
AGS/Rail Tunnel Extension (North Bore EJMT)	LF	$ 20,500	Cost developed by Yeh and adjusted by Expert Panel
Highway and DMB/DB Tunnel (North Bore EJMT)	LF	$ 48,000	Cost developed by Yeh and adjusted by Expert Panel
DMB/DB Tunnel Extension (North Bore EJMT)	LF	$ 20,500	Cost developed by Yeh and adjusted by Expert Panel

Table 5. I-70 Mountain Corridor Unit Costs (conintued)

Element	*Unit*	*Unit Cost*	*Reference or Comment*
Track Work			
Rail - Heavy Rail Trackwork	LF	$ 150	Cost developed by Transystem
Rail - Interlockings	Ea.	$ 1,000,000	Cost developed by Transystem
Maglev Guideaway	LF	$ 500	Cost developed by Transystem
Rail Interlocking	Ea.	$ 1,000,000	Cost developed by Transystem
DB/DMB Guideway	LF	$ 315	Cost developed by Transystem
Stations			
AGS-Stations/Parking (Large)	Ea.	$ 10,000,000	Cost developed by Transystem
AGS-Stations/Parking (Medium)	Ea.	$ 6,000,000	Cost developed by Transystem
AGS-Station/Parking (Small)	Ea.	$ 3,000,000	Cost developed by Transystem
Bus-Stations/Parking (Large)	Ea.	$ 10,000,000	Cost developed by Transystem
Bus-Stations/Parking (Medium)	Ea.	$ 6,000,000	Cost developed by Transystem
Bus-Station (Small)	Ea.	$ 3,000,000	Cost developed by Transystem
Rail - Stations/Parking (Large)	Ea.	$ 10,000,000	Cost developed by Transystem
Rail - Stations/Parking (Medium)	Ea.	$ 6,000,000	Cost developed by Transystem
Rail - Stations/Parking (Small)	Ea.	$ 3,000,000	Cost developed by Transystem
Rolling Stock			
IMC - Passenger Rolling Stock	LS	$ 24,000,000	For the portion on IMC. Cost developed by Transystem
AGS Passenger Rolling Stock	Ea.	$ 16,000,000	Cost developed by Transystem
Rail Passenger Rolling Stock	Ea.	$ 2,600,000	Cost developed by Transystem
Dual Mode Bus	Ea.	$ 900,000	Cost developed by Transystem
Diesel Bus	Ea.	$ 325,000	Cost developed by Transystem
Systems			
Rail Fare Collection	Ea.	$ 38,000	Cost developed by Transystem
AGS/DMB/DB Fare Collection	Ea.	$ 37,000	Cost developed by Transystem
Rail Electrification	LS	$ 255,000,000	Cost developed by Transystem
AGS Electrification	LS	$ 309,000,000	Cost developed by Transystem
DMB Electrification	LS	$ 144,968,182	Cost developed by Transystem
Rail Signals and Controls	LS	$ 96,000,000	Cost developed by Transystem
AGS Signals and Controls	LS	$ 111,600,000	Cost developed by Transystem
DB Automated Vehicle Location System	LS	$ 3,048,000	Cost developed by Transystem
DMB Automated Vehicle Location System	LS	$ 2,928,000	Cost developed by Transystem
Maintenance Facilities			
Rail Maintenance Facilities	LS	Variable	Cost developed by Transystem
AGS Maintenance Facilities	LS	Variable	Cost developed by Transystem
DMB Maintenance Facilities	LS	Variable	Cost developed by Transystem
DB Maintenance Facilities	LS	Variable	Cost developed by Transystem
Rail Mobile Maintenance Equipment	LS	9,264,000	Cost developed by Transystem
AGS Mobile Maintenance Equipment	LS	$ 11,100,000	Cost developed by Transystem
DMB/DB Mobile Maintenance Equipment	LS	$ 2,000,000	Cost developed by Transystem

2.4.3 Project Markups

Table 6 presents the markups used to address the following:

- Contingencies
- Drainage and Utilities
- Signing and Striping
- Traffic Control
- Mobilization
- Force Account
- Construction Engineering
- Preliminary Engineering
- Right-of-Way

Mark-ups such as those listed above cannot be quantified until at least Preliminary Engineering. Therefore, for Conceptual Estimate it is common practice to use factors for each item based on past history with similar projects.

Table 6. Project Markups

Alternatives	Contingencies	Drainage and Utilities	Signing and Striping	Construction Signing & Traffic Control	Mobilization	Force Account-Utility	Force Account-Misc.	Construction Engineering	Preliminary Engineering	Right-of-Way
Rail with IMC	30%	4%	1%	7%	7%	2%	6%	7%	10%	2%
AGS Only	30%	4%	1%	5%	7%	2%	6%	7%	10%	2%
Dual Mode Bus	30%	6%	5%	15%	7%	2%	6%	12%	10%	2%
Diesel Bus	30%	6%	5%	15%	7%	2%	6%	12%	10%	2%
6-Lane 55 mph	30%	6%	5%	15%	7%	2%	6%	12%	10%	2%
6-Lane 65 mph	30%	6%	5%	15%	7%	2%	6%	12%	10%	2%
Reversible Lane	30%	6%	5%	15%	7%	2%	6%	12%	10%	2%
6-Lane/Rail IMC	30%	5%	4%	10%	7%	2%	6%	10%	10%	2%
Rail/6-Lane Preservation	30%	5%	4%	10%	7%	2%	6%	10%	10%	2%
6-Lane/Rail Preservation	30%	5%	4%	10%	7%	2%	6%	10%	10%	2%
6-Lane/AGS	30%	5%	4%	10%	7%	2%	6%	10%	10%	2%
AGS/6-Lane Preservation	30%	5%	4%	10%	7%	2%	6%	10%	10%	2%
6-Lane/AGS Preservation	30%	5%	4%	10%	7%	2%	6%	10%	10%	2%
6-Lane/Dual Mode Bus	30%	5%	4%	10%	7%	2%	6%	10%	10%	2%
Dual Mode Bus/6-Lane Preservation	30%	5%	4%	10%	7%	2%	6%	10%	10%	2%
6-Lane/Dual Mode Bus Preservation	30%	5%	4%	10%	7%	2%	6%	10%	10%	2%
6-Lane/Diesel Bus	30%	5%	4%	10%	7%	2%	6%	10%	10%	2%
Diesel Bus/6-Lane Preservation	30%	5%	4%	10%	7%	2%	6%	10%	10%	2%
6-Lane/Diesel Bus Preservation	30%	5%	4%	10%	7%	2%	6%	10%	10%	2%

2.4.4 Inflation

The inflation used to update the construction cost estimate from 2003 to 2010 was a total increase of 28%, which is equivalent to an annual inflation rate of 3.5-4%. This annual inflation is consistent with the federal standard. For calculating the YOE estimates, 4% was used. The YOE was assumed to be 2025, which is the mid-point of the planning period. As discussed above, the CVRA study was more

conservative, assuming that the Highway and Advanced Guideway System elements of the Preferred Alternative would be completed in 2032 and 2037, respectively.

2.5 Results of Conceptual Estimating

Table 7 presents the results of Conceptual Estimating. To demonstrate the predicted affect of escalation, both 2010 and 2025 YOE cost estimates are included. In current day dollars, the project cost ranges from approximately $1.3 billion to $11.2 billion for the Preferred Alternative Maximum Program of Improvements. The per mile estimates are included to show the possible effect of truncating the alternative. For example, if a Minimum Operable Segment (MOS) of 25 miles was implemented as a first phase of the Advanced Guideway System, the cost could be expected to be about $1.7 billion in 2010 dollars.

Table 7. Results of Conceptual Estimating

No.	ALTERNATIVE DESCRIPTION	2010	Length (Miles)	$/Mile (2010)	YOE - 2025
1	Minimal Action	$1,308,000,000	NA		$1,949,000,000
2	Rail with IMC	$6,292,000,000	87	$72,322,000	$11,325,000,000
3	Advanced Guideway System	$7,871,000,000	118	$66,703,000	$14,168,000,000
4	Dual -Mode Bus in Guideway	$5,853,000,000	118	$49,602,000	$10,543,000,000
5	Diesel Bus in Guideway	$5,929,000,000	118	$50,246,000	$10,673,000,000
6	6-Lane - 55 mph	$3,209,000,000	38	$85,573,000	$5,777,000,000
7	6-Lane - 65 mph	$3,520,000,000	38	$92,632,000	$6,336,000,000
8	Reversible Lanes / HOV/HOT	$3,356,000,000	38	$88,316,000	$6,041,000,000
9	6-Lane with Rail & IMC	$8,505,000,000	118	$72,076,000	$15,310,000,000
9a	Rail with 6-Lane preservation	$8,040,000,000	118	$68,136,000	$14,472,000,000
9b	6-Lane with Rail preservation	$4,059,000,000	118	$34,398,000	$7,306,000,000
10	PA Maximum Program of Improvements	$11,202,000,000	118	$94,932,000	$20,163,000,000
	PA Minimum Program of Improvements	$9,179,000,000	118	$77,788,000	$16,117,000,000
10a	AGS with 6-Lane preservation	$10,771,000,000	118	$91,280,000	$19,388,000,000
10b	6-Lane with AGS preservation	$3,805,000,000	118	$32,246,000	$6,849,000,000
11	6-Lane with Dual-Mode Bus in Guideway	$7,448,000,000	122	$61,049,000	$13,406,000,000
11a	Dual -Mode Bus with 6-Lane preservation	$6,968,000,000	122	$57,115,000	$12,542,000,000
11b	6-Lane with Dual-Mode Bus preservation	$3,855,000,000	122	$31,598,000	$6,938,000,000
12	6-Lane with Diesel Bus in Guideway	$7,087,000,000	122	$58,090,000	$12,757,000,000
12a	Diesel Bus with 6-Lane preservation	$6,607,000,000	122	$54,156,000	$11,893,000,000
12b	6-Lane with Diesel Bus preservation	$3,855,000,000	122	$31,598,000	$6,938,000,000

Appendix A.
Cost Estimate Summary

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TIER 1 - PEIS COST ESTIMATE SUMMARY [1]

ALTERNATIVE NUMBER	ALTERNATIVE DESCRIPTION	TOTAL COST (2010)	Length	$/ Mile (2010)	YOE (Mid-Point of Construction	YOE Cost	YOE $/mile
1	**Minimal Action**	$1,308,000,000			2020	**$1,948,920,000**	NA
2	**Rail with IMC**	$6,291,593,329	87	$72.3	2025	**$11,324,867,992**	$130,170,896
3	**Advanced Guideway System**	$7,871,323,625	118	$66.7	2025	**$14,168,382,525**	$120,071,038
4	**Dual -Mode Bus in Guideway**	$5,852,563,052	118	$49.6	2025	**$10,534,613,494**	$89,276,386
5	**Diesel Bus in Guideway**	$5,929,218,158	118	$50.3	2025	**$10,672,592,684**	$90,445,701
6	**6-Lane - 55 mph**	$3,209,250,592	38	$85.6	2025	**$5,776,651,065**	$154,044,028
7	**6-Lane - 65 mph**	$3,520,028,275	38	$112.0	2025	**$6,336,050,896**	$166,738,181
8	**Reversible Lanes / HOV/HOT**	$3,355,881,760	38	$89.5	2025	**$6,040,587,169**	$158,962,820
9	**6-Lane with Rail & IMC**	$8,505,300,464	118	$72.0	2025	**$15,309,540,836**	$129,741,871
9a	**Rail with 6-Lane preservation**	$8,040,366,457	118	$68.1	2025	**$14,472,659,622**	$122,649,658
9b	**6-Lane with Rail preservation**	$4,058,707,792	118	$69.1	2025	**$7,305,674,026**	$61,912,492
10	**Preferred Alternative with Maximum Improvements**	$ 11,201,731,195	118	$ 95	2025	**$20,163,116,152**	$170,873,866
	Preferred Alternative with Minimum Improvements	$ 9,179,323,625	118	$ 78	2025	**$16,522,782,525**	$140,023,581
10a	**AGS with 6-Lane preservation**	$10,771,163,696	118	$96.0	2025	**$19,388,094,652**	$164,305,887
10b	**6-Lane with AGS preservation**	$3,805,044,049	118	$97.0	2025	**$6,849,079,288**	$58,043,045
11	**6-Lane with Dual-Mode Bus in Guideway**	$7,447,860,764	122	$98.0	2025	**$13,406,149,376**	$109,886,470
11a	**Dual -Mode Bus with 6-Lane preservation**	$6,967,788,304	122	$99.0	2025	**$12,542,018,947**	$102,803,434
11b	**6-Lane with Dual-Mode Bus preservation**	$3,854,549,010	122	$100.0	2025	**$6,938,188,217**	$56,870,395
12	**6-Lane with Diesel Bus in Guideway**	$7,087,031,092	122	$101.0	2025	**$12,756,655,965**	$104,562,754
12a	**Diesel Bus with 6-Lane preservation**	$6,606,958,631	122	$102.0	2025	**$11,892,525,536**	$97,479,718
12b	**6-Lane with Diesel Bus preservation**	$3,854,549,010	122	$103.0	2025	**$6,938,188,217**	$56,870,395

[1] YOE Cost = J.F. Sato and Associates cost x inflation at 4 percent escalated to a mid-point of construction of 2020 for the Minimal Action; all other alternatives assume mid-point of construction at 2025.

TIER 1 - PEIS COST ESTIMATE
2 - RAIL w/IMC

8/17/2010 14:29 **BID ITEMS**	**COST PER UNIT**	**QUANTITY**	**COST**			
Structures (SF)	150.00	1,089,042.00	163,356,300.00			
Walls (SF)	90.00	1,242,679.00	111,841,110.00			
Earthwork (CY)	20.00	777,006.00	15,540,120.00			
Base Course (CY)	40.00	116,342.00	4,653,680.00			
Barrier (Type 7)(LF)	60.00	277,168.00	16,630,080.00			
Rail - Walls (SF)	90.00	1,387,297.00	124,856,730.00			
Rail - Earthwork (CY)	20.00	725,116.00	14,502,320.00			
Rail - Base Course (CY)	40.00	309,417.00	12,376,680.00			
Rail - Heavy Rail Structure (SF)	200.00	3,235,560.00	647,112,000.00			
Rail - Heavy Rail Trackwork (TF)	150.00	769,696.00	115,454,400.00			
Rail - Maintenance Facilities	3	Variable	74,600,000.00			
Rail - Interlockings	1,000,000.00	16.00	16,000,000.00			
Rail - Stations/Parking (Large)	10,000,000.00	2.00	20,000,000.00			
Rail - Stations/Parking (Medium)	6,000,000.00	4.00	24,000,000.00			
Rail - Stations/Parking (Small)	3,000,000.00	4.00	12,000,000.00			
IMC - Track Improvements	1.00	7,300,000.00	7,300,000.00			
IMC - New Track	1.00	27,500,000.00	27,500,000.00			
IMC - Crossing Protection	1.00	3,700,000.00	3,700,000.00			
IMC - Stations	1.00	13,500,000.00	13,500,000.00			
IMC - Maintenance Facility	1.00	8,000,000.00	8,000,000.00			
Total			1,432,923,420.00			

	% Range		**% Used**	**Cost**	
Project Construction Bid Items	Project Dependent		N/A	$1,432,923,420.00	(A)
Contingencies* (Mitigation - 5%)	(15% - 30%) of (A)		30.00%	$429,877,026.00	(B)
ITS	(6-10%) of (A+B) Default = 6%		0.00%	$0.00	(C)
Drainage/Utilities	(3-10%)of (A+B) Default = 6%		4.00%	$74,512,017.84	(D)
Signing and Striping	(1-5%) of (A+B+C+D) Default = 5%		1.00%	$19,373,124.64	(E)
Construction Signing & Traffic Control	5 to 25% of (A+B+C+D+E) Default = 20%		7.00%	$136,967,991.19	(F)
Mobilization	(4 to 10%) of (A+B+C+D+E+F) Default = 7%		7.00%	$146,555,750.58	(G)
Total of Construction Bid Items	(A+B+C+D+E+F+G)			$2,240,209,330.25	(H)
Force Account - Utilities	(1 to 2%) of (H) Default = 2%		2.00%	$44,804,186.60	(I)
Force Account - Misc.	(10 to 15%) of (H) Default = 12%		6.00%	$134,412,559.81	(J)
Subtotal of Construction Cost	(H+I+J)			$2,419,426,076.67	(K)
Total Construction Engineering	17% of (K)		7.00%	$169,359,825.37	(L)
Total Preliminary Engineering**	15% of (K)		10.00%	$241,942,607.67	(M)
Right of Way	Project Dependent		2.00%	$44,804,186.60	(N)
Utilities	Project Dependent		N/A	$0.00	(O)

	COST	**QUANTITY**			
Tunnel (Twin Tunnels) (LF)	15,000.00	741.00		11,115,000.00	
Tunnel (North Bore EJMT) (LF)	20,500.00	16,675.00		341,837,500.00	
Electrification	1.00	255,000,000.00		255,000,000.00	
Mobile Maintenance Equipment	9,264,000.00	1.00		9,264,000.00	
Passenger Rolling Stock	2,600,000.00	285.00		741,000,000.00	
IMG - Passenger Rolling Stock	24,000,000.00	1.00		24,000,000.00	
Fare Collection	38,000.00	188.00		7,144,000.00	
Signals and Controls	96,000,000.00	96,000,000.00	+PE & CE	112,320,000.00	
Minimal Action	variable	1.00		532,000,000.00	
Interchanges (EACH)	1.00	6,094,092.00		6,094,092.00	
Inflation to 2010 dollars (assuming 4% per year)				$1,376,286,040.73	
Total Project Cost				$6,291,593,329.03	(P)
			Base cost of Alternative in Millions	$5,760	

*Contingencies includes environmental mitigation costs
**Total Preliminary Engineering includes cost of developing NEPA documents

TIER 1 - PEIS COST ESTIMATE
3 - AGS

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BID ITEMS	COST PER UNIT	QUANTITY	COST
AGS-Maglev Stucture (LF)	2,376.00	466,910.40	$1,109,379,110.40
AGS-Maglev Guideway	500.00	455,304.00	$227,652,000.00
AGS-Maintenance Facilities	variable	3.00	$104,150,000.00
AGS-Stations/Parking (Large)	3	10,000,000.00	$30,000,000.00
AGS-Stations/Parking (Medium)	3	6,000,000.00	$18,000,000.00
AGS-Station/Parking (Small)	4	3,000,000.00	$12,000,000.00
AGS-Extension - Vail to Eagle Airport	30	17,254,955.29	$517,648,658.70
Total			$2,018,829,769.10

	% Range	% Used	Cost	
Project Construction Bid Items	Project Dependent	N/A	$2,018,829,769.10	(A)
Contingencies* (Mitigation - 3%)	(15% - 30%) of (A)	30.00%	$605,648,930.73	(B)
ITS	(6-10%) of (A+B)	0.00%	$0.00	(C)
	Default = 6%			
Drainage/Utilities	(3-10%)of (A+B)	4.00%	$104,979,147.99	(D)
	Default = 6%			
Signing and Striping	(1-5%) of (A+B+C+D)	1.00%	$27,294,578.48	(E)
	Default = 5%			
Construction Signing & Traffic Control	5 to 25% of (A+B+C+D+E)	5.00%	$137,837,621.32	(F)
	Default = 20%			
Mobilization	(4 to 10%) of (A+B+C+D+E+F)	7.00%	$202,621,303.33	(G)
	Default = 7%			
Total of Construction Bid Items	(A+B+C+D+E+F+G)		$3,097,211,350.95	(H)
Force Account - Utilities	(1 to 2%) of (H)	2.00%	$61,944,227.02	(I)
	Default = 2%			
Force Account - Misc.	(10 to 15%) of (H)	6.00%	$185,832,681.06	(J)
	Default = 12%			
Subtotal of Construction Cost	(H+I+J)		$3,344,988,259.03	(K)
Total Construction Engineering	17% of (K)	7.00%	$234,149,178.13	(L)
Total Preliminary Engineering**	15% of (K)	10.00%	$334,498,825.90	(M)
Right of Way	Project Dependent	2.00%	$61,944,227.02	(N)
Utilities	Project Dependent	N/A	$0.00	(O)

	COST	QUANTITY			
Tunnel (Twin Tunnels) (LF)	15,000.00	741.00		11,115,000.00	
Tunnel (North Bore EJMT) (LF)	20,000.00	16,675.00		333,500,000.00	
Electrification	1.00	309,000,000.00		309,000,000.00	2618644.1
Mobile Maintenance Equipment	variable	1.00		11,100,000.00	
Passenger Rolling Stock	16,000,000.00	52.00		832,000,000.00	
Fare Collection	37,000.00	230.00		8,510,000.00	
Signals and Controls	111,600,000.00	111,600,000.00	+PE & CE	130,572,000.00	
Minimal Action	variable	1.00		532,000,000.00	
Interchanges (EACH)	1.00	6,094,092.00		6,094,092.00	
Inflation to 2010 dollars (assuming 4% per year)				$1,721,852,042.98	
Total Project Cost				$7,871,323,625.06	(P)
			Base cost of Alternative in Millions	$7,339	

*Contingencies includes environmental mitigation costs

**Total Preliminary Engineering includes cost of developing NEPA documents

TIER 1 - PEIS COST ESTIMATE
4 - DUAL MODE BUS IN GUIDEWAY

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BID ITEMS	COST PER UNIT	QUANTITY	COST
Structures (SF)	150.00	345,492.00	51,823,800.00
Walls (SF)	90.00	1,021,582.00	91,942,380.00
Earthwork (CY)	20.00	386,227.00	7,724,540.00
Pavement (TON)	70.00	169,244.00	11,847,080.00
Base Course (CY)	40.00	113,969.00	4,558,760.00
Barrier (Type 7)(LF)	60.00	329,696.00	19,781,760.00
Special Structures (SF)	200.00	958,487.00	191,697,400.00
Bus-Walls	90.00	484,108.00	43,569,720.00
Bus-Earthwork	20.00	203,036.00	4,060,720.00
Bus-Guideway Structure (LF)	3,200.00	71,000.00	227,200,000.00
Bus-Guided Busway Track	315.00	267,168.00	84,157,920.00
Bus-Maintenance Facilities	Variable	3.00	84,500,000.00
Bus-Ramps for Busses	2,000,000.00	12.00	24,000,000.00
Bus-Stations/Parking (Large)	10,000,000.00	3.00	30,000,000.00
Bus-Stations/Parking (Medium)	6,000,000.00	1.00	6,000,000.00
Bus-Station (Small)	3,000,000.00	9.00	27,000,000.00
Extension - Silverth. to Eagle Airport			
Bus-Extension-Walls	90.00	554,524.00	49,907,160.00
Bus-Extension-Earthwork	20.00	232,569.00	4,651,380.00
Bus-Extension-Guideway Structure (LF)	3,200.00	73,920.00	236,544,000.00
Bus-Extension-Guided Busway Track	315.00	332,640.00	104,781,600.00
Bus-Extension-Maintenance Facilities	Variable	3.00	84,500,000.00
Bus-Extension-Ramps for Busses	2,000,000.00	14.00	28,000,000.00
Bus-Extension-Stations/Parking (Large)	10,000,000.00	3.00	30,000,000.00
Bus-Extension-Stations/Parking (Medium)	6,000,000.00	1.00	6,000,000.00
Bus-Extension-Station (Small)	3,000,000.00	9.00	27,000,000.00
Total			1,481,248,220.00

	% Range		% Used	Cost	
Project Construction Bid Items	Project Dependent		N/A	$1,481,248,220.00	(A)
Contingencies* (Mitigation - 7%)	(15% - 30%) of (A)		30.00%	$444,374,466.00	(B)
ITS	(6-10%) of (A+B)		0.00%	$0.00	(C)
	Default = 6%				
Drainage/Utilities	(3-10%)of (A+B)		6.00%	$115,537,361.16	(D)
	Default = 6%				
Signing and Striping	(1-5%) of (A+B+C+D)		5.00%	$102,058,002.36	(E)
	Default = 5%				
Construction Signing & Traffic Control	5 to 25% of (A+B+C+D+E)		15.00%	$321,482,707.43	(F)
	Default = 20%				
Mobilization	(4 to 10%) of (A+B+C+D+E+F)		7.00%	$172,529,052.99	(G)
	Default = 7%				
Total of Construction Bid Items	(A+B+C+D+E+F+G)			$2,637,229,809.93	(H)
Force Account - Utilities	(1 to 2%) of (H)		2.00%	$52,744,596.20	(I)
	Default = 2%				
Force Account - Misc.	(10 to 15%) of (H)		6.00%	$158,233,788.60	(J)
	Default = 12%				
Subtotal of Construction Cost	(H+I+J)			$2,848,208,194.73	(K)
Total Construction Engineering	17% of (K)		12.00%	$341,784,983.37	(L)
Total Preliminary Engineering**	15% of (K)		10.00%	$284,820,819.47	(M)
Right of Way	Project Dependent		2.00%	$52,744,596.20	(N)
Utilities	Project Dependent		N/A	$0.00	(O)

	COST	QUANTITY			
Tunnel (Twin Tunnels) (LF)	16,000.00	741.00		11,115,000.00	
Tunnel (North Bore E.M.T) (LF)	33,000.00	13,725.00		452,925,000.00	
Electrification	1.00	144,968,182.00		144,968,182.00	
Mobile Maintenance Equipment	Variable	45.00		2,000,000.00	44444.444
Passenger Rolling Stock	900,000.00	244.00		219,600,000.00	
Automatic Vehicle Location System	2,928,000.00	1.00		2,928,000.00	
Fare Collection	37,000.00	403.00		14,911,000.00	
Minimal Action	variable	1.00		582,000,000.00	
Interchanges (EACH)	1.00	6,094,092.00		6,094,092.00	
Inflation to 2010 dollars (assuming 4% per year)				$1,280,248,167.63	
Total Project Cost				$5,852,563,052.03	(P)
			Base cost of Alternative in Millions	$5,321	

*Contingencies includes environmental mitigation costs
**Total Preliminary Engineering includes cost of developing NEPA documents

TIER 1 - PEIS COST ESTIMATE
5 - DIESEL BUS IN GUIDEWAY

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BID ITEMS	COST PER UNIT	QUANTITY	COST
Structures (SF)	150.00	345,492.00	51,823,800.00
Walls (SF)	90.00	1,021,582.00	91,942,380.00
Earthwork (CY)	20.00	386,227.00	7,724,540.00
Pavement (TON)	70.00	169,244.00	11,847,080.00
Base Course (CY)	40.00	113,969.00	4,558,760.00
Barrier (Type 7)(LF)	60.00	329,696.00	19,781,760.00
Special Structures (SF)	200.00	958,487.00	191,697,400.00
Bus-Walls	90.00	484,108.00	43,569,720.00
Bus-Earthwork	20.00	203,036.00	4,060,720.00
Bus-Guideway Structure (LF)	3,200.00	71,000.00	227,200,000.00
Bus-Guided Busway Track	315.00	267,168.00	84,157,920.00
Bus-Maintenance Facilities	Variable	3.00	84,500,000.00
Bus-Ramps for Busses	2,000,000.00	12.00	24,000,000.00
Bus-Stations/Parking (Large)	10,000,000.00	3.00	30,000,000.00
Bus-Stations/Parking (Medium)	6,000,000.00	1.00	6,000,000.00
Bus-Station (Small)	3,000,000.00	9.00	27,000,000.00
Extension - Silverth. to Eagle Airport			
Bus-Extension-Walls	90.00	554,524.00	49,907,160.00
Bus-Extension-Earthwork	20.00	232,569.00	4,651,380.00
Bus-Extension-Guideway Structure (LF)	3,200.00	73,920.00	236,544,000.00
Bus-Extension-Guided Busway Track	315.00	332,640.00	104,781,600.00
Bus-Extension-Maintenance Facilities	Variable	3.00	84,500,000.00
Bus-Extension-Ramps for Busses	2,000,000.00	14.00	28,000,000.00
Bus-Extension-Stations/Parking (Large)	10,000,000.00	3.00	30,000,000.00
Bus-Extension-Stations/Parking (Medium)	6,000,000.00	1.00	6,000,000.00
Bus-Extension-Station (Small)	3,000,000.00	9.00	27,000,000.00
Total			1,481,248,220.00

	% Range	% Used	Cost	
Project Construction Bid Items	Project Dependent	N/A	$1,481,248,220.00	(A)
Contingencies* (Mitigation - 7%)	(15% - 30%) of (A)	30.00%	$444,374,466.00	(B)
ITS	(6-10%) of (A+B)	0.00%	$0.00	(C)
	Default = 6%			
Drainage/Utilities	(3-10%)of (A+B)	6.00%	$115,537,361.16	(D)
	Default = 6%			
Signing and Striping	(1-5%) of (A+B+C+D)	5.00%	$102,058,002.36	(E)
	Default = 5%			
Construction Signing & Traffic Control	5 to 25% of (A+B+C+D+E)	15.00%	$321,482,707.43	(F)
	Default = 20%			
Mobilization	(4 to 10%) of (A+B+C+D+E+F)	7.00%	$172,529,052.99	(G)
	Default = 7%			
Total of Construction Bid Items	(A+B+C+D+E+F+G)		$2,637,229,809.93	(H)
Force Account - Utilities	(1 to 2%) of (H)	2.00%	$52,744,596.20	(I)
	Default = 2%			
Force Account - Misc.	(10 to 15%) of (H)	6.00%	$158,233,788.60	(J)
	Default = 12%			
Subtotal of Construction Cost	(H+I+J)		$2,848,208,194.73	(K)
Total Construction Engineering	17% of (K)	12.00%	$341,784,983.37	(L)
Total Preliminary Engineering**	15% of (K)	10.00%	$284,820,819.47	(M)
Right of Way	Project Dependent	2.00%	$52,744,596.20	(N)
Utilities	Project Dependent	N/A	$0.00	(O)

	COST	QUANTITY		
Tunnel (Twin Tunnels) (LF)	15,000.00	741.00	11,115,000.00	
Tunnel (North Bore EJMT) (LF)	33,000.00	13,725.00	452,925,000.00	
Mobile Maintenance Equipment	variable	45.00	2,000,000.00	
Passenger Rolling Stock	325,000.00	254.00	82,550,000.00	
Automatic Vehicle Location System	3,048,000.00	1.00	3,048,000.00	
Fare Collection	37,000.00	403.00	14,911,000.00	
Minimal Action	variable	1.00	592,000,000.00	
Interchanges (EACH)	1.00	6,094,092.00	6,094,092.00	
Inflation to 2010 dollars (assuming 4% per year)			$1,297,016,472.01	
Total Project Cost			$5,929,218,157.78	(P)
		Base cost of Alternative in Millions	$5,397	

*Contingencies includes environmental mitigation costs
**Total Preliminary Engineering includes cost of developing NEPA documents

TIER 1 - PEIS COST ESTIMATE
6 - 6-LANE 55mph

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BID ITEMS	COST PER UNIT	QUANTITY	COST
Structures (SF)	150.00	203,163.00	30,474,450.00
Walls (SF)	90.00	576,152.00	51,853,680.00
Earthwork (CY)	20.00	1,847,235.00	36,944,700.00
Pavement (TON)	70.00	635,092.00	44,456,440.00
Base Course (CY)	40.00	427,672.00	17,106,880.00
Barrier (Type 7)(LF)	60.00	292,657.00	17,559,420.00
Special Structures (SF)	200.00	958,487.00	191,697,400.00
Total			390,092,970.00

		% Range		% Used	Cost	
Project Construction Bid Items	Project Dependent			N/A	$390,092,970.00	(A)
Contingencies* (Mitigation - 10%)	(15% - 30%) of (A)			30.00%	$117,027,891.00	(B)
ITS	(6-10%) of (A+B)			0.00%	$0.00	(C)
	Default = 6%					
Drainage/Utilities	(3-10%)of (A+B)			6.00%	$30,427,251.66	(D)
	Default = 6%					
Signing and Striping	(1-5%) of (A+B+C+D)			5.00%	$26,877,405.63	(E)
	Default = 5%					
Construction Signing & Traffic Control	5 to 25% of (A+B+C+D+E)			15.00%	$84,663,827.74	(F)
	Default = 20%					
Mobilization	(4 to 10%) of (A+B+C+D+E+F)			7.00%	$45,436,254.22	(G)
	Default = 7%					
Total of Construction Bid Items	(A+B+C+D+E+F+G)				$694,525,600.26	(H)
Force Account - Utilities	(1 to 2%) of (H)			2.00%	$13,890,512.01	(I)
	Default = 2%					
Force Account - Misc.	(10 to 15%) of (H)			6.00%	$41,671,536.02	(J)
	Default = 12%					
Subtotal of Construction Cost	(H+I+J)				$750,087,648.28	(K)
Total Construction Engineering	17% of (K)			12.00%	$90,010,517.79	(L)
Total Preliminary Engineering**	15% of (K)			10.00%	$75,008,764.83	(M)
Right of Way	Project Dependent			2.00%	$13,890,512.01	(N)
Utilities	Project Dependent			N/A	$0.00	(O)

	COST	QUANTITY		
Tunnel (Twin Tunnels) (LF)	15,000.00	741.00	11,115,000.00	
Tunnel (North Bore EJMT) (LF)	33,000.00	13,725.00	452,925,000.00	
Silver Plume ramps	variable	1.00	4,427,794.49	
SH 103 reconfigure	variable	1.00	52,118,056.79	
Dowd alt. 1 - no Rail	variable	1.00	372,474,210.66	
Minimal Action	variable	1.00	678,000,000.00	
Interchanges (EACH)	1.00	7,169,520.00	7,169,520.00	
Inflation to 2010 dollars (assuming 4% per year)			$702,023,566.96	
Total Project Cost			$3,209,250,591.81	(P)
		Base cost of Alternative in Millions	$2,531	

*Contingencies includes environmental mitigation costs

**Total Preliminary Engineering includes cost of developing NEPA documents

TIER 1 - PEIS COST ESTIMATE
7 - 6-LANE 65 mph

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BID ITEMS	COST PER UNIT	QUANTITY	COST
6-lane - 55 mph	1.00	3,209,250,591.81	3,209,250,591.81
55mph Floyd Hill	-1.00	96,381,491.79	-96,381,491.79
55mph Fall River Rd.	-1.00	19,904,362.05	-19,904,362.05
55mph S curves at TT Hidden Valley	-1.00	61,732,034.79	-61,732,034.79
Dowd Alt. 1 - no FGT	-1.00	372,474,210.66	-372,474,210.66
65mph Floyd Hill	1.00	244,057,094.59	244,057,094.59
65mph Fall River Rd.	1.00	42,221,080.31	42,221,080.31
65mph S curves at TT Hidden Valley	1.00	109,533,097.09	109,533,097.09
Dowd Alt. 2a - no FGT	1.00	465,458,510.93	465,458,510.93
Total			3,520,028,275.43

	% Range	% Used	Cost	
Project Construction Bid Items	Project Dependent	N/A	$3,520,028,275.43	(A)
Contingencies* (Mitigation - 10%)	(15% - 30%) of (A)	30.00%	$0.00	(B)
ITS	(6-10%) of (A+B)	0.00%	$0.00	(C)
	Default = 6%			
Drainage/Utilities	(3-10%)of (A+B)	10.00%	$0.00	(D)
	Default = 6%			
Signing and Striping	(1-5%) of (A+B+C+D)	3.00%	$0.00	(E)
	Default = 5%			
Construction Signing & Traffic Control	5 to 25% of (A+B+C+D+E)	15.00%	$0.00	(F)
	Default = 20%			
Mobilization	(4 to 10%) of (A+B+C+D+E+F)	7.00%	$0.00	(G)
	Default = 7%			
Total of Construction Bid Items	(A+B+C+D+E+F+G)		$0.00	(H)
Force Account - Utilities	(1 to 2%) of (H)	2.00%	$0.00	(I)
	Default = 2%			
Force Account - Misc.	(10 to 15%) of (H)	12.00%	$0.00	(J)
	Default = 12%			
Subtotal of Construction Cost	(H+I+J)		$0.00	(K)
Total Construction Engineering	17% of (K)	17.00%	$0.00	(L)
Total Preliminary Engineering**	15% of (K)	15.00%	$0.00	(M)
Right of Way	Project Dependent	2.00%	$0.00	(N)
Utilities	Project Dependent	N/A	$0.00	(O)

	COST	QUANTITY		
	0.00	0.00	0.00	
	0.00	0.00	0.00	
	0.00	0.00	0.00	
	0.00	0.00	0.00	
	0.00	0.00	0.00	
Total Project Cost			$3,520,028,275.43	(P)
		Base cost of Alternative in Millions	$3,520	

*Contingencies includes environmental mitigation costs

**Total Preliminary Engineering includes cost of developing NEPA documents

TIER 1 - PEIS COST ESTIMATE
8 - REVERSIBLE LANES

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BID ITEMS	COST PER UNIT	QUANTITY	COST
Structures (SF)	150.00	224,464.00	33,669,600.00
Walls (SF)	90.00	933,039.00	83,973,510.00
Earthwork (CY)	20.00	4,221,304.00	84,426,080.00
Pavement (TON)	70.00	688,329.00	48,183,030.00
Base Course (CY)	40.00	463,521.00	18,540,840.00
Barrier (Type 7)(LF)	60.00	331,274.00	19,876,440.00
Special Structures (SF)	200.00	718,865.00	143,773,000.00
Total			432,442,500.00

	% Range	% Used	Cost	
Project Construction Bid Items	Project Dependent	N/A	$432,442,500.00	(A)
Contingencies* (Mitigation - 10%)	(15% - 30%) of (A)	30.00%	$129,732,750.00	(B)
ITS	(6-10%) of (A+B)	0.00%	$0.00	(C)
	Default = 6%			
Drainage/Utilities	(3-10%)of (A+B)	6.00%	$33,730,515.00	(D)
	Default = 6%			
Signing and Striping	(1-5%) of (A+B+C+D)	5.00%	$29,795,288.25	(E)
	Default = 5%			
Construction Signing & Traffic Control	5 to 25% of (A+B+C+D+E)	15.00%	$93,855,157.99	(F)
	Default = 20%			
Mobilization	(4 to 10%) of (A+B+C+D+E+F)	7.00%	$50,368,934.79	(G)
	Default = 7%			
Total of Construction Bid Items	(A+B+C+D+E+F+G)		$769,925,146.02	(H)
Force Account - Utilities	(1 to 2%) of (H)	2.00%	$15,398,502.92	(I)
	Default = 2%			
Force Account - Misc.	(10 to 15%) of (H)	6.00%	$46,195,508.76	(J)
	Default = 12%			
Subtotal of Construction Cost	(H+I+J)		$831,519,157.71	(K)
Total Construction Engineering	17% of (K)	12.00%	$99,782,298.92	(L)
Total Preliminary Engineering**	15% of (K)	10.00%	$83,151,915.77	(M)
Right of Way	Project Dependent	2.00%	$15,398,502.92	(N)
Utilities	Project Dependent	N/A	$0.00	(O)

	COST	QUANTITY	
Tunnel (Twin Tunnels) (LF)	15,000.00	741.00	11,115,000.00
Tunnel (North Bore EJMT) (LF)	33,000.00	13,725.00	452,925,000.00
Silver Plume ramps	variable	1.00	4,427,794.49
SH 103 reconfigure	variable	1.00	52,118,056.79
Dowd alt. 1 - no Rail	variable	1.00	372,474,210.66
Minimal Action	variable	1.00	678,000,000.00
Interchanges (EACH)	1.00	20,870,688.00	20,870,688.00
Inflation to 2010 dollars (assuming 4% per year)			$734,099,135.07

Total Project Cost	$3,355,881,760.34	(P)
Base cost of Alternative in Millions	$2,678	

*Contingencies includes environmental mitigation costs

**Total Preliminary Engineering includes cost of developing NEPA documents

TIER 1 - PEIS COST ESTIMATE
9 - 6-LANE w/RAIL IMC

8/17/2010 14:29

BID ITEMS	COST PER UNIT	QUANTITY	COST
Structures (SF)	150.00	267,796.00	40,169,400.00
Walls (SF)	90.00	1,349,782.00	121,480,380.00
Earthwork (CY)	20.00	3,195,854.00	63,917,080.00
Pavement (TON)	70.00	594,691.00	41,628,370.00
Base Course (CY)	40.00	536,821.00	21,472,840.00
Barrier (Type 7)(LF)	60.00	326,315.00	19,578,900.00
Special Structures (SF)	200.00	960,082.00	192,016,400.00
Rail - Walls (SF)	90.00	1,387,297.00	124,856,730.00
Rail - Earthwork (CY)	20.00	725,116.00	14,502,320.00
Rail - Base Course (CY)	40.00	309,417.00	12,376,680.00
Rail - Heavy Rail Structure (SF)	200.00	3,235,560.00	647,112,000.00
Rail - Heavy Rail Trackwork (TF)	150.00	769,696.00	115,454,400.00
Rail - Maintenance Facilities	3.00	Variable	74,600,000.00
Rail - Interlockings	1,000,000.00	16.00	16,000,000.00
Rail - Stations/Parking (Large)	10,000,000.00	2.00	20,000,000.00
Rail - Stations/Parking (Medium)	6,000,000.00	4.00	24,000,000.00
Rail - Stations/Parking (Small)	3,000,000.00	4.00	12,000,000.00
Total			1,561,165,500.00

	% Range	% Used	Cost	
Project Construction Bid Items	Project Dependent	N/A	$1,561,165,500.00	(A)
Contingencies* (Mitigation - 14%)	(15% - 30%) of (A)	30.00%	$468,349,650.00	(B)
ITS	(6-10%) of (A+B)	0.00%	$0.00	(C)
	Default = 6%			
Drainage/Utilities	(3-10%)of (A+B)	5.00%	$101,475,757.50	(D)
	Default = 6%			
Signing and Striping	(1-5%) of (A+B+C+D)	4.00%	$85,239,636.30	(E)
	Default = 5%			
Construction Signing & Traffic Control	5 to 25% of (A+B+C+D+E)	10.00%	$221,623,054.38	(F)
	Default = 20%			
Mobilization	(4 to 10%) of (A+B+C+D+E+F)	7.00%	$170,649,751.87	(G)
	Default = 7%			
Total of Construction Bid Items	(A+B+C+D+E+F+G)		$2,608,503,350.05	(H)
Force Account - Utilities	(1 to 2%) of (H)	2.00%	$52,170,067.00	(I)
	Default = 2%			
Force Account - Misc.	(10 to 15%) of (H)	6.00%	$156,510,201.00	(J)
	Default = 12%			
Subtotal of Construction Cost	(H+I+J)		$2,817,183,618.06	(K)
Total Construction Engineering	17% of (K)	10.00%	$281,718,361.81	(L)
Total Preliminary Engineering**	15% of (K)	10.00%	$281,718,361.81	(M)
Right of Way	Project Dependent	2.00%	$52,170,067.00	(N)
Utilities	Project Dependent	N/A	$0.00	(O)

	COST	QUANTITY	
Tunnel (Twin Tunnels) (LF)	15,000.00	741.00	11,115,000.00
Tunnel (North Bore EJMT) (LF)	48,000.00	13,725.00	658,800,000.00
Tunnel (North Bore extended EJMT) (LF)	20,900.00	4,252.00	87,166,000.00
Electrification	1.00	255,000,000.00	255,000,000.00
Mobile Maintenance Equipment	9,264,000.00	1.00	9,264,000.00
Passenger Rolling Stock	2,600,000.00	285.00	741,000,000.00
IMC	variable	1.00	184,339,130.16
Fare Collection	38,000.00	188.00	7,144,000.00
Signals and Controls	96,000,000.00	96,000,000.00	115,200,000.00
Silver Plume ramps	variable	1.00	4,427,794.49
SH 103 reconfigure	variable	1.00	52,118,056.79
Dowd alt. 1 - w Rail	variable	1.00	385,987,875.23
Minimal Action	variable	1.00	678,000,000.00
Interchanges (EACH)	1.00	21,914,222.40	21,914,222.40
Inflation to 2010 dollars (assuming 4% per year)			$1,860,534,476.57

Total Project Cost	$8,505,300,464.30	(P)
Base cost of Alternative in Millions	$7,827	

*Contingencies includes environmental mitigation costs

**Total Preliminary Engineering includes cost of developing NEPA documents

TIER 1 - PEIS COST ESTIMATE
9b - 6-LANE w/RAIL PRESERVATION

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BID ITEMS	COST PER UNIT	QUANTITY	COST			
Structures (SF)	150.00	267,796.00	40,169,400.00			
Walls (SF)	90.00	1,349,782.00	121,480,380.00			
Earthwork (CY)	20.00	3,195,854.00	63,917,080.00			
Pavement (TON)	70.00	594,691.00	41,628,370.00			
Base Course (CY)	40.00	536,821.00	21,472,840.00			
Barrier (Type 7)(LF)	60.00	326,315.00	19,578,900.00			
Special Structures (SF)	200.00	960,082.00	192,016,400.00			
Total			500,263,370.00			

	% Range		% Used	Cost	
Project Construction Bid Items	Project Dependent		N/A	$500,263,370.00	(A)
Contingencies* (Mitigation - 14%)	(15% - 30%) of (A)		30.00%	$150,079,011.00	(B)
ITS	(6-10%) of (A+B)		0.00%	$0.00	(C)
	Default = 6%				
Drainage/Utilities	(3-10%)of (A+B)		5.00%	$32,517,119.05	(D)
	Default = 6%				
Signing and Striping	(1-5%) of (A+B+C+D)		4.00%	$27,314,380.00	(E)
	Default = 5%				
Construction Signing & Traffic Control	5 to 25% of (A+B+C+D+E)		10.00%	$71,017,388.01	(F)
	Default = 20%				
Mobilization	(4 to 10%) of (A+B+C+D+E+F)		7.00%	$54,683,388.76	(G)
	Default = 7%				
Total of Construction Bid Items	(A+B+C+D+E+F+G)			$835,874,656.82	(H)
Force Account - Utilities	(1 to 2%) of (H)		2.00%	$16,717,493.14	(I)
	Default = 2%				
Force Account - Misc.	(10 to 15%) of (H)		6.00%	$50,152,479.41	(J)
	Default = 12%				
Subtotal of Construction Cost	(H+I+J)			$902,744,629.37	(K)
Total Construction Engineering	17% of (K)		10.00%	$90,274,462.94	(L)
Total Preliminary Engineering**	15% of (K)		10.00%	$90,274,462.94	(M)
Right of Way	Project Dependent		2.00%	$16,717,493.14	(N)
Utilities	Project Dependent		N/A	$0.00	(O)

	COST	QUANTITY		
Tunnel (Twin Tunnels) (LF)	15,000.00	741.00	11,115,000.00	
Tunnel (North Bore EJMT) (LF)	48,000.00	13,725.00	658,800,000.00	
Tunnel (North Bore extended EJMT) (LF)	20,500.00	4,252.00	87,166,000.00	
IMC	variable	1.00	184,839,130.16	
Silver Plume ramps	variable	1.00	4,427,794.49	
SH 103 reconfigure	variable	1.00	52,118,056.79	
Dowd alt. 1 - no Rail	variable	1.00	372,474,210.66	
Minimal Action	variable	1.00	678,000,000.00	
Interchanges (EACH)	1.00	21,914,222.40	21,914,222.40	
Inflation to 2010 dollars (assuming 4% per year)			$887,842,329.61	

Total Project Cost		$4,058,707,792.49	(P)
	Base cost of Alternative in Millions	$3,381	

*Contingencies includes environmental mitigation costs

**Total Preliminary Engineering includes cost of developing NEPA documents

TIER 1 - PEIS COST ESTIMATE
9a - RAIL w/6-LANE PRESERVATION

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BID ITEMS	COST PER UNIT	QUANTITY	COST
Structures (SF)	150.00	267,796.00	40,169,400.00
Walls (SF)	90.00	1,349,782.00	121,480,380.00
Earthwork (CY)	20.00	3,195,854.00	63,917,080.00
Special Structures (SF)	200.00	960,082.00	192,016,400.00
Rail - Walls (SF)	90.00	1,387,297.00	124,856,730.00
Rail - Earthwork (CY)	20.00	725,116.00	14,502,320.00
Rail - Base Course (CY)	40.00	309,417.00	12,376,680.00
Rail - Heavy Rail Structure (SF)	200.00	3,235,560.00	647,112,000.00
Rail - Heavy Rail Trackwork (TF)	150.00	769,696.00	115,454,400.00
Rail - Maintenance Facilities	3	Variable	74,600,000.00
Rail - Interlockings	1,000,000.00	16.00	16,000,000.00
Rail - Stations/Parking (Large)	10,000,000.00	2.00	20,000,000.00
Rail - Stations/Parking (Medium)	6,000,000.00	4.00	24,000,000.00
Rail - Stations/Parking (Small)	3,000,000.00	4.00	12,000,000.00
Total			1,478,485,390.00

	% Range	% Used	Cost	
Project Construction Bid Items	Project Dependent	N/A	$1,478,485,390.00	(A)
Contingencies* (Mitigation - 14%)	(15% - 30%) of (A)	30.00%	$443,545,617.00	(B)
ITS	(6-10%) of (A+B)	0.00%	$0.00	(C)
	Default = 6%			
Drainage/Utilities	(3-10%)of (A+B)	5.00%	$96,101,550.35	(D)
	Default = 6%			
Signing and Striping	(1-5%) of (A+B+C+D)	4.00%	$80,725,302.29	(E)
	Default = 5%			
Construction Signing & Traffic Control	5 to 25% of (A+B+C+D+E)	10.00%	$209,885,785.96	(F)
	Default = 20%			
Mobilization	(4 to 10%) of (A+B+C+D+E+F)	7.00%	$161,612,055.19	(G)
	Default = 7%			
Total of Construction Bid Items	(A+B+C+D+E+F+G)		$2,470,355,700.80	(H)
Force Account - Utilities	(1 to 2%) of (H)	2.00%	$49,407,114.02	(I)
	Default = 2%			
Force Account - Misc.	(10 to 15%) of (H)	6.00%	$148,221,342.05	(J)
	Default = 12%			
Subtotal of Construction Cost	(H+I+J)		$2,667,984,156.87	(K)
Total Construction Engineering	17% of (K)	10.00%	$266,798,415.69	(L)
Total Preliminary Engineering**	15% of (K)	10.00%	$266,798,415.69	(M)
Right of Way	Project Dependent	2.00%	$49,407,114.02	(N)
Utilities	Project Dependent	N/A	$0.00	(O)

	COST	QUANTITY	
Tunnel (Twin Tunnels) (LF)	15,000.00	741.00	11,115,000.00
Tunnel (North Bore EJMT) (LF)	48,000.00	13,725.00	658,800,000.00
Tunnel (North Bore extended EJMT) (LF)	20,500.00	4,252.00	87,166,000.00
Electrification	1.00	255,000,000.00	255,000,000.00
Mobile Maintenance Equipment	9,264,000.00	1.00	9,264,000.00
Passenger Rolling Stock	2,600,000.00	285.00	741,000,000.00
Fare Collection	38,000.00	188.00	7,144,000.00
Signals and Controls	96,000,000.00	96,000,000.00	115,200,000.00
IMC	variable	1.00	184,839,130.16
Silver Plume ramps	variable	1.00	4,327,794.49
SH 103 reconfigure	variable	1.00	52,118,056.79
Dowd alt. 1 - no Rail	variable	1.00	372,474,210.66
Minimal Action	variable	1.00	532,000,000.00
Inflation to 2010 dollars (assuming 4% per year)			$1,758,830,162.42

Total Project Cost			$8,040,366,456.78 (P)
		Base cost of Alternative in Millions	$7,508

*Contingencies includes environmental mitigation costs

**Total Preliminary Engineering includes cost of developing NEPA documents

TIER 1 - PEIS COST ESTIMATE
10 - 6-LANE w/AGS

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BID ITEMS	COST PER UNIT	QUANTITY	COST
Structures (SF)	150.00	267796.00	40,169,400.00
Walls (SF)	90.00	1349782.00	121,480,380.00
Earthwork (CY)	20.00	3195854.00	63,917,080.00
Pavement (TON)	70.00	594691.00	41,628,370.00
Base Course (CY)	40.00	400639.00	16,025,560.00
Barrier (Type 7)(LF)	60.00	316023.00	18,961,380.00
Special Structures (SF)	200.00	960082.00	192,016,400.00
AGS-Maglev Stucture (LF)	2376.00	466910.40	1,109,379,110.40
AGS-Maglev Guideway	500.00	455304.00	227,652,000.00
AGS-Maintenance Facilities	variable	3.00	104,150,000.00
AGS-Stations/Parking (Large)	3.00	10000000.00	30,000,000.00
AGS-Stations/Parking (Medium)	3	6000000	18,000,000.00
AGS-Station/Parking (Small)	4	3000000	12,000,000.00
AGS-Extension - Vail to Eagle Airport	30	17254955.29	517,648,658.70
Total			2,513,028,339.10

	% Range	% Used	Cost	
Project Construction Bid Items	Project Dependent	N/A	$2,513,028,339.10	(A)
Contingencies* (Mitigation - 12%)	(15% - 30%) of (A)	30.00%	$753,908,501.73	(B)
ITS	(6-10%) of (A+B)	0.00%	$0.00	(C)
	Default = 6%			
Drainage/Utilities	(3-10%)of (A+B)	5.00%	$163,346,842.04	(D)
	Default = 6%			
Signing and Striping	(1-5%) of (A+B+C+D)	4.00%	$137,211,347.31	(E)
	Default = 5%			
Construction Signing & Traffic Control	5 to 25% of (A+B+C+D+E)	10.00%	$356,749,503.02	(F)
	Default = 20%			
Mobilization	(4 to 10%) of (A+B+C+D+E+F)	7.00%	$274,697,117.32	(G)
	Default = 7%			
Total of Construction Bid Items	(A+B+C+D+E+F+G)		$4,198,941,650.53	(H)
Force Account - Utilities	(1 to 2%) of (H)	2.00%	$83,978,833.01	(I)
	Default = 2%			
Force Account - Misc.	(10 to 15%) of (H)	6.00%	$251,936,499.03	(J)
	Default = 12%			
Subtotal of Construction Cost	(H+I+J)		$4,534,856,982.57	(K)
Total Construction Engineering	17% of (K)	10.00%	$453,485,698.26	(L)
Total Preliminary Engineering**	15% of (K)	10.00%	$453,485,698.26	(M)
Right of Way	Project Dependent	2.00%	$83,978,833.01	(N)
Utilities	Project Dependent	N/A	$0.00	(O)

	COST	QUANTITY		
Tunnel (Twin Tunnels) (LF)	15,000.00	741.00	11,115,000.00	
Tunnel (North Bore EJMT) (LF)	48,000.00	13,725.00	658,800,000.00	
Tunnel (North Bore extended EJMT) (LF)	20,500.00	4,252.00	87,166,000.00	
Electrification	1.00	354,000,000.00	354,000,000.00	
Mobile Maintenance Equipment	11,100,000.00	1.00	11,100,000.00	
Passenger Rolling Stock	16,000,000.00	52.00	832,000,000.00	
Fare Collection	37,000.00	230.00	8,510,000.00	
Signals and Controls	111,600,000.00	111,600,000.00	133,920,000.00	
Silver Plume ramps	variable	1.00	4,427,794.49	
SH 103 reconfigure	variable	1.00	52,118,056.79	
Dowd alt. 1 - no Rail	variable	1.00	372,474,210.66	
Minimal Action	variable	1.00	678,000,000.00	
Interchanges (EACH)	1.00	21,914,222.40	21,914,222.40	
Inflation to 2010 dollars (assuming 4% per year)			$2,450,378,699.00	
Total Project Cost			$11,201,731,195.44	(P)
		Base cost of Alternative in Millions	$10,524	

*Contingencies includes environmental mitigation costs

**Total Preliminary Engineering includes cost of developing NEPA documents

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BID ITEMS	COST PER UNIT	QUANTITY	COST
AGS-Maglev Stucture (LF)	2,376.00	466,910.40	$1,109,379,110.40
AGS-Maglev Guideway	500.00	455,304.00	$227,652,000.00
AGS-Maintenance Facilities	variable	3.00	$104,150,000.00
AGS-Stations/Parking (Large)	3	10,000,000.00	$30,000,000.00
AGS-Stations/Parking (Medium)	3	6,000,000.00	$18,000,000.00
AGS-Station/Parking (Small)	4	3,000,000.00	$12,000,000.00
AGS-Extension - Vail to Eagle Airport	30	17,254,955.29	$517,648,658.70
Total			$2,018,829,769.10

	% Range	% Used	Cost	
Project Construction Bid Items	Project Dependent	N/A	$2,018,829,769.10	(A)
Contingencies* (Mitigation - 3%)	(15% - 30%) of (A)	30.00%	$605,648,930.73	(B)
ITS	(6-10%) of (A+B) Default = 6%	0.00%	$0.00	(C)
Drainage/Utilities	(3-10%)of (A+B) Default = 6%	4.00%	$104,979,147.99	(D)
Signing and Striping	(1-5%) of (A+B+C+D) Default = 5%	1.00%	$27,294,578.48	(E)
Construction Signing & Traffic Control	5 to 25% of (A+B+C+D+E) Default = 20%	5.00%	$137,837,621.32	(F)
Mobilization	(4 to 10%) of (A+B+C+D+E+F) Default = 7%	7.00%	$202,621,303.33	(G)
Total of Construction Bid Items	(A+B+C+D+E+F+G)		$3,097,211,350.95	(H)
Force Account - Utilities	(1 to 2%) of (H) Default = 2%	2.00%	$61,944,227.02	(I)
Force Account - Misc.	(10 to 15%) of (H) Default = 12%	6.00%	$185,832,681.06	(J)
Subtotal of Construction Cost	(H+I+J)		$3,344,988,259.03	(K)
Total Construction Engineering	17% of (K)	7.00%	$234,149,178.13	(L)
Total Preliminary Engineering**	15% of (K)	10.00%	$334,498,825.90	(M)
Right of Way	Project Dependent	2.00%	$61,944,227.02	(N)
Utilities	Project Dependent	N/A	$0.00	(O)

	COST	QUANTITY			
Tunnel (Twin Tunnels) (LF)	15,000.00	741.00		11,115,000.00	
Tunnel (North Bore EJMT) (LF)	20,000.00	16,675.00		333,500,000.00	
Electrification	1.00	309,000,000.00		309,000,000.00	2618644.1
Mobile Maintenance Equipment	variable	1.00		11,100,000.00	
Passenger Rolling Stock	16,000,000.00	52.00		832,000,000.00	
Fare Collection	37,000.00	230.00		8,510,000.00	
Signals and Controls	111,600,000.00	111,600,000.00	+PE & CE	130,572,000.00	
Minimal Action	variable	1.00		532,000,000.00	
Interchanges (EACH)	1.00	6,094,092.00		6,094,092.00	
Inflation to 2010 dollars (assuming 4% per year)				$1,721,852,042.98	

AGS		$7,871,323,625.06	(P)
Add Minimum Improvements		$1,308,000,000.00	
Total Project Cost	Base (	$9,179,323,625.06	

*Contingencies includes environmental mitigation costs

**Total Preliminary Engineering includes cost of developing NEPA documents

TIER 1 - PEIS COST ESTIMATE
10a - AGS w/6-LANE PRESERVATION

8/17/2010 14:29

BID ITEMS	COST PER UNIT	QUANTITY	COST
Structures (SF)	150.00	267,796.00	40,169,400.00
Walls (SF)	90.00	1,349,782.00	121,480,380.00
Earthwork (CY)	20.00	3,195,854.00	63,917,080.00
Special Structures (SF)	200.00	960,082.00	192,016,400.00
AGS-Maglev Stucture (LF)	2,376.00	466,910.40	$1,109,379,110.40
AGS-Maglev Guideway	500.00	455,304.00	$227,652,000.00
AGS-Maintenance Facilities	variable	3.00	$104,150,000.00
AGS-Stations/Parking (Large)	3	10,000,000.00	$30,000,000.00
AGS-Stations/Parking (Medium)	3	6,000,000.00	$18,000,000.00
AGS-Station/Parking (Small)	4	3,000,000.00	$12,000,000.00
AGS-Extension - Vail to Eagle Airport	30	17,254,955.29	$517,648,658.70
Total			2,436,413,029.10

	% Range		% Used	Cost	
Project Construction Bid Items	Project Dependent		N/A	$2,436,413,029.10	(A)
Contingencies* (Mitigation - 12%)	(15% - 30%) of (A)		30.00%	$730,923,908.73	(B)
ITS	(6-10%) of (A+B)		0.00%	$0.00	(C)
	Default = 6%				
Drainage/Utilities	(3-10%)of (A+B)		5.00%	$158,366,846.89	(D)
	Default = 6%				
Signing and Striping	(1-5%) of (A+B+C+D)		4.00%	$133,028,151.39	(E)
	Default = 5%				
Construction Signing & Traffic Control	5 to 25% of (A+B+C+D+E)		10.00%	$345,873,193.61	(F)
	Default = 20%				
Mobilization	(4 to 10%) of (A+B+C+D+E+F)		7.00%	$266,322,359.08	(G)
	Default = 7%				
Total of Construction Bid Items	(A+B+C+D+E+F+G)			$4,070,927,488.80	(H)
Force Account - Utilities	(1 to 2%) of (H)		2.00%	$81,418,549.78	(I)
	Default = 2%				
Force Account - Misc.	(10 to 15%) of (H)		6.00%	$244,255,649.33	(J)
	Default = 12%				
Subtotal of Construction Cost	(H+I+J)			$4,396,601,687.91	(K)
Total Construction Engineering	17% of (K)		10.00%	$439,660,168.79	(L)
Total Preliminary Engineering**	15% of (K)		10.00%	$439,660,168.79	(M)
Right of Way	Project Dependent		2.00%	$81,418,549.78	(N)
Utilities	Project Dependent		N/A	$0.00	(O)

	COST	QUANTITY	
Tunnel (Twin Tunnels) (LF)	15,000.00	741.00	11,115,000.00
Tunnel (North Bore EJMT) (LF)	48,000.00	13,725.00	658,800,000.00
Tunnel (North Bore extended EJMT) (LF)	20,500.00	4,252.00	87,166,000.00
Electrification	1.00	354,000,000.00	354,000,000.00
Mobile Maintenance Equipment	11,100,000.00	1.00	11,100,000.00
Passenger Rolling Stock	16,000,000.00	52.00	832,000,000.00
Fare Collection	37,000.00	230.00	8,510,000.00
Silver Plume ramps	variable	1.00	4,427,794.49
SH 103 reconfigure	variable	1.00	52,118,056.79
Dowd alt. 1 : no Rail	variable	1.00	372,474,210.66
Signals and Controls	111,600,000.00	111,600,000.00	138,920,000.00
Minimal Action	variable	1.00	532,000,000.00
Inflation to 2010 dollars (assuming 4% per year)			$2,356,192,058.42

Total Project Cost			$10,771,163,695.62 (P)
		Base cost of Alternative in Millions	$10,239

*Contingencies includes environmental mitigation costs

**Total Preliminary Engineering includes cost of developing NEPA documents

TIER 1 - PEIS COST ESTIMATE
10b - 6-LANE w/AGS PRESERVATION

8/17/2010 14:29

BID ITEMS	COST PER UNIT	QUANTITY	COST
Structures (SF)	150.00	267,796.00	40,169,400.00
Walls (SF)	90.00	1,349,782.00	121,480,380.00
Earthwork (CY)	20.00	3,195,854.00	63,917,080.00
Pavement (TON)	70.00	594,691.00	41,628,370.00
Base Course (CY)	40.00	400,639.00	16,025,560.00
Barrier (Type 7)(LF)	60.00	316,023.00	18,961,380.00
Special Structures (SF)	200.00	960,082.00	192,016,400.00
Total			494,198,570.00

	% Range		% Used	Cost	
Project Construction Bid Items	Project Dependent		N/A	$494,198,570.00	(A)
Contingencies* (Mitigation - 12%)	(15% - 30%) of (A)		30.00%	$148,259,571.00	(B)
ITS	(6-10%) of (A+B)		0.00%	$0.00	(C)
	Default = 6%				
Drainage/Utilities	(3-10%)of (A+B)		5.00%	$32,122,907.05	(D)
	Default = 6%				
Signing and Striping	(1-5%) of (A+B+C+D)		4.00%	$26,983,241.92	(E)
	Default = 5%				
Construction Signing & Traffic Control	5 to 25% of (A+B+C+D+E)		10.00%	$70,156,429.00	(F)
	Default = 20%				
Mobilization	(4 to 10%) of (A+B+C+D+E+F)		7.00%	$54,020,450.33	(G)
	Default = 7%				
Total of Construction Bid Items	(A+B+C+D+E+F+G)			$825,741,169.30	(H)
Force Account - Utilities	(1 to 2%) of (H)		2.00%	$16,514,823.39	(I)
	Default = 2%				
Force Account - Misc.	(10 to 15%) of (H)		6.00%	$49,544,470.16	(J)
	Default = 12%				
Subtotal of Construction Cost	(H+I+J)			$891,800,462.84	(K)
Total Construction Engineering	17% of (K)		10.00%	$89,180,046.28	(L)
Total Preliminary Engineering**	15% of (K)		10.00%	$89,180,046.28	(M)
Right of Way	Project Dependent		2.00%	$16,514,823.39	(N)
Utilities	Project Dependent		N/A	$0.00	(O)

	COST	QUANTITY		
Tunnel (Twin Tunnels) (LF)	15000.00	741.00		11,115,000.00
Tunnel (North Bore EJMT) (LF)	48000.00	13725.00		658,800,000.00
Tunnel (North Bore extended EJMT) (LF)	20500.00	4252.00		87,166,000.00
Silver Plume ramps	variable	1.00		4,427,794.49
SH 103 reconfigure	variable	1.00		52,118,056.79
Dowd alt. 1 - no Rail	variable	1.00		372,474,210.66
Minimal Action	variable	1.00		678,000,000.00
Interchanges (EACH)	1.00	21914222.40		21,914,222.40
Inflation to 2010 dollars (assuming 4% per year)				$832,353,385.68
Total Project Cost				$3,805,044,048.82 (P)
			Base cost of Alternative in Millions	$3,127

*Contingencies includes environmental mitigation costs

**Total Preliminary Engineering includes cost of developing NEPA documents

TIER 1 - PEIS COST ESTIMATE
11 - 6-LANE w/DUAL MODE BUS IN GUIDEWAY

8/17/2010 14:29

BID ITEMS	COST PER UNIT	QUANTITY	COST
Structures (SF)	150.00	267,796.00	40,169,400.00
Walls (SF)	90.00	1,349,782.00	121,480,380.00
Earthwork (CY)	20.00	3,195,854.00	63,917,080.00
Pavement (TON)	70.00	747,596.00	52,331,720.00
Base Course (CY)	40.00	503,433.00	20,137,320.00
Barrier (Type 7)(LF)	60.00	362,254.00	21,735,240.00
Special Structures (SF)	200.00	960,082.00	192,016,400.00
Bus-Walls	90.00	484,108.00	43,569,720.00
Bus-Earthwork	20.00	203,036.00	4,060,720.00
Bus-Guideway Structure (LF)	3200.00	71,000.00	227,200,000.00
Bus-Guided Busway Track	315.00	267,168.00	84,157,920.00
Bus-Maintenance Facilities	Variable	3.00	84,500,000.00
Bus-Ramps for Busses	2000000	12	24,000,000.00
Bus-Stations/Parking (Large)	10000000	3	30,000,000.00
Bus-Stations/Parking (Medium)	6000000	1	6,000,000.00
Bus-Station (Small)	3000000	9	27,000,000.00
Extension - Silverth. to Eagle Airport			
Bus-Extension-Walls	90.00	554,524.00	49,907,160.00
Bus-Extension-Earthwork	20.00	232,569.00	4,651,380.00
Bus-Extension-Guideway Structure (LF)	3,200.00	73,920.00	236,544,000.00
Bus-Extension-Guided Busway Track	315.00	332,640.00	104,781,600.00
Bus-Extension-Maintenance Facilities	Variable	3.00	84,500,000.00
Bus-Extension-Ramps for Busses	2,000,000.00	14.00	28,000,000.00
Bus-Extension-Stations/Parking (Large)	10,000,000.00	3.00	30,000,000.00
Bus-Extension-Stations/Parking (Medium)	6,000,000.00	1.00	6,000,000.00
Bus-Extension-Station (Small)	3,000,000.00	9.00	27,000,000.00
Total			1,613,660,040.00

	% Range	% Used	Cost	
Project Construction Bid Items	Project Dependent	N/A	$1,613,660,040.00	(A)
Contingencies* (Mitigation - 15%)	(15% - 30%) of (A)	30.00%	$484,098,012.00	(B)
ITS	(6-10%) of (A+B) Default = 6%	0.00%	$0.00	(C)
Drainage/Utilities	(3-10%)of (A+B) Default = 6%	5.00%	$104,887,902.60	(D)
Signing and Striping	(1-5%) of (A+B+C+D) Default = 5%	4.00%	$88,105,838.18	(E)
Construction Signing & Traffic Control	5 to 25% of (A+B+C+D+E) Default = 20%	10.00%	$229,075,179.28	(F)
Mobilization	(4 to 10%) of (A+B+C+D+E+F) Default = 7%	7.00%	$176,387,888.04	(G)
Total of Construction Bid Items	(A+B+C+D+E+F+G)		$2,696,214,860.11	(H)
Force Account - Utilities	(1 to 2%) of (H) Default = 2%	2.00%	$53,924,297.20	(I)
Force Account - Misc.	(10 to 15%) of (H) Default = 12%	6.00%	$161,772,891.61	(J)
Subtotal of Construction Cost	(H+I+J)		$2,911,912,048.92	(K)
Total Construction Engineering	17% of (K)	10.00%	$291,191,204.89	(L)
Total Preliminary Engineering**	15% of (K)	10.00%	$291,191,204.89	(M)
Right of Way	Project Dependent	2.00%	$53,924,297.20	(N)
Utilities	Project Dependent	N/A	$0.00	(O)

	COST	QUANTITY	
Tunnel (Twin Tunnels) (LF)	15,000.00	741.00	11,115,000.00
Tunnel (North Bore-EJMT) (LF)	48,000.00	13,725.00	658,800,000.00
Tunnel (North Bore extended-EJMT) (LF)	20,500.00	4,252.00	87,166,000.00
Electrification	1.00	144,968,182.00	144,968,182.00
Mobile Maintenance Equipment	variable	45.00	2,000,000.00
Passenger Rolling Stock	900,000.00	244.00	219,600,000.00
Automated Vehicle Location System	2,928,000.00	1.00	2,928,000.00
Fare Collection	37,000.00	403.00	14,911,000.00
Silver Plume ramps	variable	1.00	4,427,794.48
SH 103 reconfigure	variable	1.00	32,118,056.79
Dowd alt. 1 - no Rail	variable	1.00	372,474,210.66
Minimal Action	variable	1.00	678,000,000.00
Interchanges (EACH)	1.00	21,914,222.40	21,914,222.40
Inflation to 2010 dollars (assuming 4% per year)			$1,629,219,542.23
Total Project Cost			$7,447,860,764.47 (P)
		Base cost of Alternative in Millions	$6,770

*Contingencies includes environmental mitigation costs
**Total Preliminary Engineering includes cost of developing NEPA documents

TIER 1 - PEIS COST ESTIMATE
11a - DUAL MODE w/6-LANE PRESERVATION

8/17/2010 14:29 **BID ITEMS**	**COST PER UNIT**	**QUANTITY**	**COST**
Structures (SF)	150.00	267,796.00	40,169,400.00
Walls (SF)	90.00	1,349,782.00	121,480,380.00
Earthwork (CY)	20.00	3,195,854.00	63,917,080.00
Pavement (TON)	70.00	747,596.00	0.00
Base Course (CY)	40.00	503,433.00	0.00
Barrier (Type 7)(LF)	60.00	362,254.00	0.00
Special Structures (SF)	200.00	960,082.00	192,016,400.00
Bus-Walls	90.00	484,108.00	43,569,720.00
Bus-Earthwork	20.00	203,036.00	4,060,720.00
Bus-Guideway Structure (LF)	3,200.00	71,000.00	227,200,000.00
Bus-Guided Busway Track	315.00	267,168.00	84,157,920.00
Bus-Maintenance Facilities	Variable	3	84,500,000.00
Bus-Ramps for Busses	2,000,000.00	12	24,000,000.00
Bus-Stations/Parking (Large)	10,000,000.00	3	30,000,000.00
Bus-Stations/Parking (Medium)	6000000	1	6,000,000.00
Bus-Station (Small)	3000000	9	27,000,000.00
Extension - Silverth. to Eagle Airport			
Bus-Extension-Walls	90.00	554,524.00	49,907,160.00
Bus-Extension-Earthwork	20.00	232,569.00	4,651,380.00
Bus-Extension-Guideway Structure (LF)	3,200.00	73,920.00	236,544,000.00
Bus-Extension-Guided Busway Track	315.00	332,640.00	104,781,600.00
Bus-Extension-Maintenance Facilities	Variable	3.00	84,500,000.00
Bus-Extension-Ramps for Busses	2,000,000.00	14.00	28,000,000.00
Bus-Extension-Stations/Parking (Large)	10,000,000.00	3.00	30,000,000.00
Bus-Extension-Stations/Parking (Medium)	6,000,000.00	1.00	6,000,000.00
Bus-Extension-Station (Small)	3,000,000.00	9.00	27,000,000.00
Total			1,519,455,760.00

	% Range	**% Used**	**Cost**	
Project Construction Bid Items	Project Dependent	N/A	$1,519,455,760.00	(A)
Contingencies* (Mitigation - 15%)	(15% - 30%) of (A)	30.00%	$455,836,728.00	(B)
ITS	(6-10%) of (A+B) Default = 6%	0.00%	$0.00	(C)
Drainage/Utilities	(3-10%)of (A+B) Default = 6%	5.00%	$98,764,624.40	(D)
Signing and Striping	(1-5%) of (A+B+C+D) Default = 5%	4.00%	$82,962,284.50	(E)
Construction Signing & Traffic Control	5 to 25% of (A+B+C+D+E) Default = 20%	10.00%	$215,701,939.69	(F)
Mobilization	(4 to 10%) of (A+B+C+D+E+F) Default = 7%	7.00%	$166,090,493.56	(G)
Total of Construction Bid Items	(A+B+C+D+E+F+G)		$2,538,811,830.15	(H)
Force Account - Utilities	(1 to 2%) of (H) Default = 2%	2.00%	$50,776,236.60	(I)
Force Account - Misc.	(10 to 15%) of (H) Default = 12%	6.00%	$152,328,709.81	(J)
Subtotal of Construction Cost	(H+I+J)		$2,741,916,776.56	(K)
Total Construction Engineering	17% of (K)	10.00%	$274,191,677.66	(L)
Total Preliminary Engineering**	15% of (K)	10.00%	$274,191,677.66	(M)
Right of Way	Project Dependent	2.00%	$50,776,236.60	(N)
Utilities	Project Dependent	N/A	$0.00	(O)

	COST	**QUANTITY**	
Tunnel (Twin Tunnels) (LF)	15,000.00	741.00	11,115,000.00
Tunnel (North Bore-EJMT) (LF)	48,000.00	13,725.00	658,800,000.00
Tunnel (North Bore extended-EJMT) (LF)	20,500.00	4,252.00	87,166,000.00
Electrification	1.00	144,968,182.00	144,968,182.00
Mobile Maintenance Equipment	variable	45.00	2,000,000.00
Passenger Rolling Stock	900,000.00	244.00	219,600,000.00
Automated Vehicle Location System	2,928,000.00	1.00	2,928,000.00
Fare Collection	37,000.00	403.00	14,911,000.00
Silver Plume ramps	variable	1.00	4,427,794.49
SH 103 reconfigure	variable	1.00	32,118,056.79
Dowd alt. 1 - no Rail	variable	1.00	372,474,210.66
Minimal Action	variable	1.00	532,000,000.00
Inflation to 2010 dollars (assuming 4% per year)			$1,524,203,691.48
Total Project Cost			$6,967,788,303.89 (P)
		Base cost of Alternative in Millions	$6,436

*Contingencies includes environmental mitigation costs

**Total Preliminary Engineering includes cost of developing NEPA documents

TIER 1 - PEIS COST ESTIMATE
11b - 6-LANE w/DUAL MODE PRESERVATION

8/17/2010 14:29

BID ITEMS	COST PER UNIT	QUANTITY	COST
Structures (SF)	150.00	267,796.00	40,169,400.00
Walls (SF)	90.00	1,349,782.00	121,480,380.00
Earthwork (CY)	20.00	3,195,854.00	63,917,080.00
Pavement (TON)	70.00	747,596.00	52,331,720.00
Base Course (CY)	40.00	503,433.00	20,137,320.00
Barrier (Type 7)(LF)	60.00	362,254.00	21,735,240.00
Special Structures (SF)	200.00	960,082.00	192,016,400.00
Total			511,787,540.00

	% Range		% Used	Cost	
Project Construction Bid Items	Project Dependent		N/A	$511,787,540.00	(A)
Contingencies* (Mitigation - 15%)	(15% - 30%) of (A)		30.00%	$153,536,262.00	(B)
ITS	(6-10%) of (A+B)		0.00%	$0.00	(C)
	Default = 6%				
Drainage/Utilities	(3-10%)of (A+B)		5.00%	$33,266,190.10	(D)
	Default = 6%				
Signing and Striping	(1-5%) of (A+B+C+D)		4.00%	$27,943,599.68	(E)
	Default = 5%				
Construction Signing & Traffic Control	5 to 25% of (A+B+C+D+E)		10.00%	$72,653,359.18	(F)
	Default = 20%				
Mobilization	(4 to 10%) of (A+B+C+D+E+F)		7.00%	$55,943,086.57	(G)
	Default = 7%				
Total of Construction Bid Items	(A+B+C+D+E+F+G)			$855,130,037.53	(H)
Force Account - Utilities	(1 to 2%) of (H)		2.00%	$17,102,600.75	(I)
	Default = 2%				
Force Account - Misc.	(10 to 15%) of (H)		6.00%	$51,307,802.25	(J)
	Default = 12%				
Subtotal of Construction Cost	(H+I+J)			$923,540,440.53	(K)
Total Construction Engineering	17% of (K)		10.00%	$92,354,044.05	(L)
Total Preliminary Engineering**	15% of (K)		10.00%	$92,354,044.05	(M)
Right of Way	Project Dependent		2.00%	$17,102,600.75	(N)
Utilities	Project Dependent		N/A	$0.00	(O)

	COST	QUANTITY		
Tunnel (Twin Tunnels) (LF)	15,000.00	741.00		11,115,000.00
Tunnel (North Bore EJMT) (LF)	48,000.00	13,725.00		658,800,000.00
Tunnel (North Bore extended EJMT) (LF)	20,500.00	4,252.00		87,166,000.00
Silver Plume ramps	variable	1.00		4,427,794.49
SH 103 reconfigure	variable	1.00		52,118,056.79
Dowd alt. 1 - no Rail	variable	1.00		372,474,210.66
Interchanges (EACH)	1.00	21,914,222.40		21,914,222.40
Minimal Action	variable	1.00		678,000,000.00
Inflation to 2010 dollars (assuming 4% per year)				$843,182,595.84
Total Project Cost				$3,854,549,009.58 (P)
			Base cost of Alternative in Millions	$3,177

*Contingencies includes environmental mitigation costs

**Total Preliminary Engineering includes cost of developing NEPA documents

TIER 1 - PEIS COST ESTIMATE
12 - 6-LANE w/DIESEL BUS IN GUIDEWAY

8/17/2010 14:29 **BID ITEMS**	**COST PER UNIT**	**QUANTITY**	**COST**
Structures (SF)	150.00	267,796.00	40,169,400.00
Walls (SF)	90.00	1,349,782.00	121,480,380.00
Earthwork (CY)	20.00	3,195,854.00	63,917,080.00
Pavement (TON)	70.00	747,596.00	52,331,720.00
Base Course (CY)	40.00	503,433.00	20,137,320.00
Barrier (Type 7)(LF)	60.00	362,254.00	21,735,240.00
Special Structures (SF)	200.00	960,082.00	192,016,400.00
Bus-Walls	90.00	484,108.00	43,569,720.00
Bus-Earthwork	20.00	203,036.00	4,060,720.00
Bus-Guideway Structure (LF)	3,200.00	71,000.00	227,200,000.00
Bus-Guided Busway Track	315.00	267,168.00	84,157,920.00
Bus-Maintenance Facilities	Variable	3.00	84,500,000.00
Bus-Ramps for Busses	2,000,000.00	12.00	24,000,000.00
Bus-Stations/Parking (Large)	10,000,000.00	3.00	30,000,000.00
Bus-Stations/Parking (Medium)	6,000,000.00	1.00	6,000,000.00
Bus-Station (Small)	3,000,000.00	9.00	27,000,000.00
Extension - Silverth. to Eagle Airport			
Bus-Extension-Walls	90.00	554,524.00	49,907,160.00
Bus-Extension-Earthwork	20.00	232,569.00	4,651,380.00
Bus-Extension-Guideway Structure (LF)	3,200.00	73,920.00	236,544,000.00
Bus-Extension-Guided Busway Track	315.00	332,640.00	104,781,600.00
Bus-Extension-Maintenance Facilities	Variable	3.00	84,500,000.00
Bus-Extension-Ramps for Busses	2,000,000.00	14.00	28,000,000.00
Bus-Extension-Stations/Parking (Large)	10,000,000.00	3.00	30,000,000.00
Bus-Extension-Stations/Parking (Medium)	6,000,000.00	1.00	6,000,000.00
Bus-Extension-Station (Small)	3,000,000.00	9.00	27,000,000.00
Total			1,613,660,040.00

	% Range	**% Used**	**Cost**	
Project Construction Bid Items	Project Dependent	N/A	$1,613,660,040.00	(A)
Contingencies* (Mitigation - 15%)	(15% - 30%) of (A)	30.00%	$484,098,012.00	(B)
ITS	(6-10%) of (A+B) Default = 6%	0.00%	$0.00	(C)
Drainage/Utilities	(3-10%)of (A+B) Default = 6%	5.00%	$104,887,902.60	(D)
Signing and Striping	(1-5%) of (A+B+C+D) Default = 5%	4.00%	$88,105,838.18	(E)
Construction Signing & Traffic Control	5 to 25% of (A+B+C+D+E) Default = 20%	10.00%	$229,075,179.28	(F)
Mobilization	(4 to 10%) of (A+B+C+D+E+F) Default = 7%	7.00%	$176,387,888.04	(G)
Total of Construction Bid Items	(A+B+C+D+E+F+G)		$2,696,214,860.11	(H)
Force Account - Utilities	(1 to 2%) of (H) Default = 2%	2.00%	$53,924,297.20	(I)
Force Account - Misc.	(10 to 15%) of (H) Default = 12%	6.00%	$161,772,891.61	(J)
Subtotal of Construction Cost	(H+I+J)		$2,911,912,048.92	(K)
Total Construction Engineering	17% of (K)	10.00%	$291,191,204.89	(L)
Total Preliminary Engineering**	15% of (K)	10.00%	$291,191,204.89	(M)
Right of Way	Project Dependent	2.00%	$53,924,297.20	(N)
Utilities	Project Dependent	N/A	$0.00	(O)

	COST	**QUANTITY**	
Tunnel (Twin Tunnels) (LF)	15,000.00	741.00	11,115,000.00
Tunnel (North Bore-EJMT) (LF)	48,000.00	13,725.00	658,800,000.00
Tunnel (North Bore-extended-EJMT) (LF)	20,500.00	4,252.00	87,166,000.00
Mobile Maintenance Equipment	variable	45.00	2,000,000.00
Passenger Rolling Stock	325,000.00	254.00	82,550,000.00
Automated Vehicle Location System	3,048,000.00	1.00	3,048,000.00
Fare Collection	37,000.00	403.00	14,911,000.00
Silver Plume ramps	variable	1.00	4,427,794.49
SH 103 reconfigure	variable	1.00	52,118,056.79
Dowd alt. 1 - no Rail	variable	1.00	372,474,210.66
Minimal Action	variable	1.00	678,000,000.00
Interchanges (EACH)	1.00	21,914,222.40	21,914,222.40
Inflation to 2010 dollars (assuming 4% per year)			$1,550,288,051.27
Total Project Cost			$7,087,031,091.51 (P)
		Base cost of Alternative in Millions	$6,409

*Contingencies includes environmental mitigation costs

**Total Preliminary Engineering includes cost of developing NEPA documents

TIER 1 - PEIS COST ESTIMATE
12a - DIESEL BUS w/6-LANE PRESERVATION

8/17/2010 14:29						
BID ITEMS	**COST PER UNIT**	**QUANTITY**	**COST**			
Structures (SF)	150.00	267,796.00	40,169,400.00			
Walls (SF)	90.00	1,349,782.00	121,480,380.00			
Earthwork (CY)	20.00	3,195,854.00	63,917,080.00			
Pavement (TON)	70.00	747,596.00	0.00			
Base Course (CY)	40.00	503,433.00	0.00			
Barrier (Type 7)(LF)	60.00	362,254.00	0.00			
Special Structures (SF)	200.00	960,082.00	192,016,400.00			
Bus-Walls	90.00	484,108.00	43,569,720.00			
Bus-Earthwork	20.00	203,036.00	4,060,720.00			
Bus-Guideway Structure (LF)	3,200.00	71,000.00	227,200,000.00			
Bus-Guided Busway Track	315.00	267,168.00	84,157,920.00			
Bus-Maintenance Facilities	Variable	3.00	84,500,000.00			
Bus-Ramps for Busses	2,000,000.00	12.00	24,000,000.00			
Bus-Stations/Parking (Large)	10,000,000.00	3.00	30,000,000.00			
Bus-Stations/Parking (Medium)	6,000,000.00	1.00	6,000,000.00			
Bus-Station (Small)	3,000,000.00	9.00	27,000,000.00			
Extension - Silverth. to Eagle Airport						
Bus-Extension-Walls	90.00	554,524.00	49,907,160.00			
Bus-Extension-Earthwork	20.00	232,569.00	4,651,380.00			
Bus-Extension-Guideway Structure (LF)	3,200.00	73,920.00	236,544,000.00			
Bus-Extension-Guided Busway Track	315.00	332,640.00	104,781,600.00			
Bus-Extension-Maintenance Facilities	Variable	3.00	84,500,000.00			
Bus-Extension-Ramps for Busses	2,000,000.00	14.00	28,000,000.00			
Bus-Extension-Stations/Parking (Large)	10,000,000.00	3.00	30,000,000.00			
Bus-Extension-Stations/Parking (Medium)	6,000,000.00	1.00	6,000,000.00			
Bus-Extension-Station (Small)	3,000,000.00	9.00	27,000,000.00			
Total			1,519,455,760.00			

	% Range		**% Used**	**Cost**	
Project Construction Bid Items	Project Dependent		N/A	$1,519,455,760.00	(A)
Contingencies* (Mitigation - 15%)	(15% - 30%) of (A)		30.00%	$455,836,728.00	(B)
ITS	(6-10%) of (A+B)		0.00%	$0.00	(C)
	Default = 6%				
Drainage/Utilities	(3-10%)of (A+B)		5.00%	$98,764,624.40	(D)
	Default = 6%				
Signing and Striping	(1-5%) of (A+B+C+D)		4.00%	$82,962,284.50	(E)
	Default = 5%				
Construction Signing & Traffic Control	5 to 25% of (A+B+C+D+E)		10.00%	$215,701,939.69	(F)
	Default = 20%				
Mobilization	(4 to 10%) of (A+B+C+D+E+F)		7.00%	$166,090,493.56	(G)
	Default = 7%				
Total of Construction Bid Items	(A+B+C+D+E+F+G)			$2,538,811,830.15	(H)
Force Account - Utilities	(1 to 2%) of (H)		2.00%	$50,776,236.60	(I)
	Default = 2%				
Force Account - Misc.	(10 to 15%) of (H)		6.00%	$152,328,709.81	(J)
	Default = 12%				
Subtotal of Construction Cost	(H+I+J)			$2,741,916,776.56	(K)
Total Construction Engineering	17% of (K)		10.00%	$274,191,677.66	(L)
Total Preliminary Engineering**	15% of (K)		10.00%	$274,191,677.66	(M)
Right of Way	Project Dependent		2.00%	$50,776,236.60	(N)
Utilities	Project Dependent		N/A	$0.00	(O)

	COST	**QUANTITY**		
Tunnel (Twin Tunnels) (LF)	15,000.00	741.00	11,115,000.00	
Tunnel (North Bore EJMT) (LF)	48,000.00	13,725.00	658,800,000.00	
Tunnel (North Bore extended EJMT) (LF)	20,500.00	4,252.00	87,166,000.00	
Mobile Maintenance Equipment	variable	45.00	2,000,000.00	
Passenger Rolling Stock	325,000.00	254.00	82,550,000.00	
Automated Vehicle Location System	3,048,000.00	1.00	3,048,000.00	
Fare Collection	37,000.00	403.00	14,911,000.00	
Silver Plume ramps	variable	1.00	4,427,794.49	
SH 103 reconfigure	variable	1.00	52,118,036.79	
Dowd alt. 1 - no Rail	variable	1.00	372,474,210.66	
Minimal Action	variable	1.00	532,000,000.00	
Inflation to 2010 dollars (assuming 4% per year)			$1,445,272,200.52	
Total Project Cost			$6,606,958,630.93	(P)
		Base cost of Alternative in Millions	$6,075	

*Contingencies includes environmental mitigation costs
**Total Preliminary Engineering includes cost of developing NEPA documents

TIER 1 - PEIS COST ESTIMATE
12b - 6-LANE w/DIESEL BUS PRESERVATION

8/17/2010 14:29

BID ITEMS	COST PER UNIT	QUANTITY	COST
Structures (SF)	150.00	267,796.00	40,169,400.00
Walls (SF)	90.00	1,349,782.00	121,480,380.00
Earthwork (CY)	20.00	3,195,854.00	63,917,080.00
Pavement (TON)	70.00	747,596.00	52,331,720.00
Base Course (CY)	40.00	503,433.00	20,137,320.00
Barrier (Type 7)(LF)	60.00	362,254.00	21,735,240.00
Special Structures (SF)	200.00	960,082.00	192,016,400.00
Bus-Walls	90.00	484,108.00	0.00
Bus-Earthwork	20.00	203,036.00	0.00
Bus-Guideway Structure (LF)	3,200.00	71,000.00	0.00
Bus-Guided Busway Track	315.00	267,168.00	0.00
Bus-Maintenance Facilities	Variable	3.00	0.00
Bus-Ramps for Busses	2,000,000.00	12.00	0.00
Bus-Stations/Parking (Large)	10,000,000.00	3.00	0.00
Bus-Stations/Parking (Medium)	6,000,000.00	1.00	0.00
Bus-Station (Small)	3,000,000.00	9.00	0.00
Total			511,787,540.00

	% Range		% Used	Cost	
Project Construction Bid Items	Project Dependent		N/A	$511,787,540.00	(A)
Contingencies* (Mitigation - 15%)	(15% - 30%) of (A)		30.00%	$153,536,262.00	(B)
ITS	(6-10%) of (A+B)		0.00%	$0.00	(C)
	Default = 6%				
Drainage/Utilities	(3-10%)of (A+B)		5.00%	$33,266,190.10	(D)
	Default = 6%				
Signing and Striping	(1-5%) of (A+B+C+D)		4.00%	$27,943,599.68	(E)
	Default = 5%				
Construction Signing & Traffic Control	5 to 25% of (A+B+C+D+E)		10.00%	$72,653,359.18	(F)
	Default = 20%				
Mobilization	(4 to 10%) of (A+B+C+D+E+F)		7.00%	$55,943,086.57	(G)
	Default = 7%				
Total of Construction Bid Items	(A+B+C+D+E+F+G)			$855,130,037.53	(H)
Force Account - Utilities	(1 to 2%) of (H)		2.00%	$17,102,600.75	(I)
	Default = 2%				
Force Account - Misc.	(10 to 15%) of (H)		6.00%	$51,307,802.25	(J)
	Default = 12%				
Subtotal of Construction Cost	(H+I+J)			$923,540,440.53	(K)
Total Construction Engineering	17% of (K)		10.00%	$92,354,044.05	(L)
Total Preliminary Engineering**	15% of (K)		10.00%	$92,354,044.05	(M)
Right of Way	Project Dependent		2.00%	$17,102,600.75	(N)
Utilities	Project Dependent		N/A	$0.00	(O)

	COST	QUANTITY		
Tunnel (Twin Tunnels) (LF)	15,000.00	741.00	11,115,000.00	
Tunnel (North Bore EJMT) (LF)	48,000.00	13,725.00	658,800,000.00	
Tunnel (North Bore extended EJMT) (LF)	20,500.00	4,252.00	87,166,000.00	
Silver Plume ramps	Variable	1.00	4,427,794.49	
SH 103 reconfigure	Variable	1.00	52,118,056.79	
Dowd alt. 1 - no Rail	Variable	1.00	372,474,210.66	
Minimal Action	Variable	1.00	678,000,000.00	
Interchanges (EACH)	1.00	21,914,222.40	21,914,222.40	
Inflation to 2010 dollars (assuming 4% per year)			$843,182,595.84	
Total Project Cost			$3,854,549,009.58	(P)
		Base cost of Alternative in Millions	$3,177	

*Contingencies includes environmental mitigation costs

**Total Preliminary Engineering includes cost of developing NEPA documents

TIER 1 - PEIS COST ESTIMATE
13 - CONSENSUS RECOMMENDATION 55 MPH

8/17/2010 14:29

BID ITEMS	COST PER UNIT	QUANTITY	COST			
Structures (SF)	150.00	74349.00	11,152,350.00			
Walls (SF)	90.00	523831.00	47,144,790.00			
Earthwork (CY)	20.00	1816218.00	36,324,360.00			
Pavement (TON)	70.00	96728.00	6,770,960.00			
Base Course (CY)	40.00	65137.00	2,605,480.00			
Barrier (Type 7)(LF)	60.00	105522.00	6,331,320.00			
Special Structures (SF)	200.00	0.00	0.00			
AGS-Maglev Stucture (LF)	2376.00	466910.40	1,109,379,110.40			
AGS-Maglev Guideway	500.00	455304.00	227,652,000.00			
AGS-Maintenance Facilities	variable	3.00	104,150,000.00			
AGS-Stations/Parking (Large)	3.00	10000000.00	30,000,000.00			
AGS-Stations/Parking (Medium)	3	6000000	18,000,000.00			
AGS-Station/Parking (Small)	4	3000000	12,000,000.00			
AGS-Extension - Vail to Eagle Airport	30	17254955.29	517,648,658.70		$2,018,829,769.10	
Total			2,129,159,029.10			

	% Range		% Used	Cost	
Project Construction Bid Items	Project Dependent		N/A	$2,129,159,029.10	(A)
Contingencies* (Mitigation - 12%)	(15% - 30%) of (A)		30.00%	$638,747,708.73	(B)
ITS	(6-10%) of (A+B)		0.00%	$0.00	(C)
	Default = 6%				
Drainage/Utilities	(3-10%)of (A+B)		5.00%	$138,395,336.89	(D)
	Default = 6%				
Signing and Striping	(1-5%) of (A+B+C+D)		4.00%	$116,252,082.99	(E)
	Default = 5%				
Construction Signing & Traffic Control	5 to 25% of (A+B+C+D+E)		10.00%	$302,255,415.77	(F)
	Default = 20%				
Mobilization	(4 to 10%) of (A+B+C+D+E+F)		7.00%	$232,736,670.14	(G)
	Default = 7%				
Total of Construction Bid Items	(A+B+C+D+E+F+G)			$3,557,546,243.63	(H)
Force Account - Utilities	(1 to 2%) of (H)		2.00%	$71,150,924.87	(I)
	Default = 2%				
Force Account - Misc.	(10 to 15%) of (H)		6.00%	$213,452,774.62	(J)
	Default = 12%				
Subtotal of Construction Cost	(H+I+J)			$3,842,149,943.12	(K)
Total Construction Engineering	17% of (K)		10.00%	$384,214,994.31	(L)
Total Preliminary Engineering**	15% of (K)		10.00%	$384,214,994.31	(M)
Right of Way	Project Dependent		2.00%	$71,150,924.87	(N)
Utilities	Project Dependent		N/A	$0.00	(O)
	COST	**QUANTITY**			
Tunnel (Twin Tunnels) (LF)	15,000.00	741.00		11,115,000.00	
Tunnel (North Bore EJMT) (LF)	48,000.00	13,725.00		658,800,000.00	
Tunnel (North Bore extended EJMT) (LF)	20,500.00	4,252.00		87,166,000.00	
Electrification	1.00	354,000,000.00		354,000,000.00	
Mobile Maintenance Equipment	11,100,000.00	1.00		11,100,000.00	
Passenger Rolling Stock	16,000,000.00	52.00		832,000,000.00	
Fare Collection	37,000.00	230.00		8,510,000.00	
Signals and Controls	111,600,000.00	111,600,000.00		133,920,000.00	
	variable	0.00			
	variable	0.00			
Dowd alt. 1 - no Rail	variable	1.00		372,474,210.66	
Minimal Action	variable	1.00		782,000,000.00	
Interchanges (EACH)	1.00	21,914,222.40		21,914,222.40	
Inflation to 2010 dollars (assuming 4% per year)				$2,227,324,481.11	
Total Project Cost				$10,182,054,770.78	(P)
		Base cost of Alternative in Millions		$9,400	

*Contingencies includes environmental mitigation costs

**Total Preliminary Engineering includes cost of developing NEPA documents

TIER 1 - PEIS COST ESTIMATE
INTERMOUNTAIN CONNECTION

8/17/2010 14:29						
BID ITEMS	**COST PER UNIT**	**QUANTITY**	**COST**			
Track Improvements	1.00	7,300,000.00	7,300,000.00			
New Track	1.00	27,500,000.00	27,500,000.00			
Crossing Protection	1.00	3,700,000.00	3,700,000.00			
Stations	1.00	13,500,000.00	13,500,000.00			
Maintenance Facility	1.00	8,000,000.00	8,000,000.00			
Total			60,000,000.00			
	% Range		**% Used**		**Cost**	
Project Construction Bid Items	Project Dependent		N/A		$60,000,000.00	(A)
Contingencies*	(15% - 30%) of (A)		30.00%		$18,000,000.00	(B)
ITS	(6-10%) of (A+B)		0.00%		$0.00	(C)
	Default = 6%					
Drainage/Utilities	(3-10%)of (A+B)		4.00%		$3,120,000.00	(D)
	Default = 6%					
Signing and Striping	(1-5%) of (A+B+C+D)		1.00%		$811,200.00	(E)
	Default = 5%					
Construction Signing & Traffic Control	5 to 25% of (A+B+C+D+E)		7.00%		$5,735,184.00	(F)
	Default = 20%					
Mobilization	(4 to 10%) of (A+B+C+D+E+F)		7.00%		$6,136,646.88	(G)
	Default = 7%					
Total of Construction Bid Items	(A+B+C+D+E+F+G)				$93,803,030.88	(H)
Force Account - Utilities	(1 to 2%) of (H)		2.00%		$1,876,060.62	(I)
	Default = 2%					
Force Account - Misc.	(10 to 15%) of (H)		6.00%		$5,628,181.85	(J)
	Default = 12%					
Subtotal of Construction Cost	(H+I+J)				$101,307,273.35	(K)
Total Construction Engineering	17% of (K)		7.00%		$7,091,509.13	(L)
Total Preliminary Engineering**	15% of (K)		10.00%		$10,130,727.34	(M)
Right of Way	Project Dependent		2.00%		$1,876,060.62	(N)
Utilities	Project Dependent		N/A		$0.00	(O)
	COST	**QUANTITY**				
Rolling Stock	24,000,000.00	1.00			24,000,000.00	
Inflation to 2010 dollars (assuming 4% per year)					$40,433,559.72	
Total Project Cost					$184,839,130.16	(P)

*Contingencies includes environmental mitigation costs

**Total Preliminary Engineering includes cost of developing NEPA documents

TIER 1 - PEIS COST ESTIMATE
SILVER PLUME RAMPS

8/17/2010 14:29						
BID ITEMS	**COST PER UNIT**	**QUANTITY**	**COST**			
Structures (SF)	150.00	0.00	0.00			
Walls (SF)	90.00	6,050.00	544,500.00			
Earthwork (CY)	20.00	13,739.00	274,780.00			
Pavement (TON)	70.00	4,475.00	313,250.00			
Base Course (CY)	40.00	3,013.00	120,520.00			
Barrier (Type 7)(LF)	60.00	3,325.00	199,500.00			
Total			1,452,550.00			
	% Range		**% Used**		**Cost**	
Project Construction Bid Items	Project Dependent		N/A		$1,452,550.00	(A)
Contingencies*	(15% - 30%) of (A)		30.00%		$435,765.00	(B)
ITS	(6-10%) of (A+B)		0.00%		$0.00	(C)
	Default = 6%					
Drainage/Utilities	(3-10%)of (A+B)		6.00%		$113,298.90	(D)
	Default = 6%					
Signing and Striping	(1-5%) of (A+B+C+D)		5.00%		$100,080.70	(E)
	Default = 5%					
Construction Signing & Traffic Control	5 to 25% of (A+B+C+D+E)		15.00%		$315,254.19	(F)
	Default = 20%					
Mobilization	(4 to 10%) of (A+B+C+D+E+F)		7.00%		$169,186.41	(G)
	Default = 7%					
Total of Construction Bid Items	(A+B+C+D+E+F+G)				$2,586,135.20	(H)
Force Account - Utilities	(1 to 2%) of (H)		2.00%		$51,722.70	(I)
	Default = 2%					
Force Account - Misc.	(10 to 15%) of (H)		6.00%		$155,168.11	(J)
	Default = 12%					
Subtotal of Construction Cost	(H+I+J)				$2,793,026.02	(K)
Total Construction Engineering	17% of (K)		12.00%		$335,163.12	(L)
Total Preliminary Engineering**	15% of (K)		10.00%		$279,302.60	(M)
Right of Way	Project Dependent		2.00%		$51,722.70	(N)
Utilities	Project Dependent		N/A		$0.00	(O)
	COST	**QUANTITY**				
	0.00	0.00			0.00	
	0.00	0.00			0.00	
	0.00	0.00			0.00	
	0.00	0.00			0.00	
	0.00	0.00			0.00	
Inflation to 2010 dollars (assuming 4% per year)					$968,580.04	
Total Project Cost					$4,427,794.49	(P)

*Contingencies includes environmental mitigation costs

**Total Preliminary Engineering includes cost of developing NEPA documents

Date Prepared: 1/5/05

Prepared By: ATH

TIER 1 - PEIS COST ESTIMATE
SH 103 RECONFIGURE

8/17/2010 14:29						
BID ITEMS	**COST PER UNIT**	**QUANTITY**	**COST**			
Structures (SF)	150.00	65,038.00	9,755,700.00			
Walls (SF)	90.00	24,911.00	2,241,990.00			
Earthwork (CY)	20.00	191,761.00	3,835,220.00			
Pavement (TON)	70.00	6,196.00	433,720.00			
Base Course (CY)	40.00	4,172.00	166,880.00			
Barrier (Type 7)(LF)	60.00	11,066.00	663,960.00			
Total			17,097,470.00			
	% Range		**% Used**		**Cost**	
Project Construction Bid Items	Project Dependent		N/A		$17,097,470.00	(A)
Contingencies*	(15% - 30%) of (A)		30.00%		$5,129,241.00	(B)
ITS	(6-10%) of (A+B)		0.00%		$0.00	(C)
	Default = 6%					
Drainage/Utilities	(3-10%)of (A+B)		6.00%		$1,333,602.66	(D)
	Default = 6%					
Signing and Striping	(1-5%) of (A+B+C+D)		5.00%		$1,178,015.68	(E)
	Default = 5%					
Construction Signing & Traffic Control	5 to 25% of (A+B+C+D+E)		15.00%		$3,710,749.40	(F)
	Default = 20%					
Mobilization	(4 to 10%) of (A+B+C+D+E+F)		7.00%		$1,991,435.51	(G)
	Default = 7%					
Total of Construction Bid Items	(A+B+C+D+E+F+G)				$30,440,514.26	(H)
Force Account - Utilities	(1 to 2%) of (H)		2.00%		$608,810.29	(I)
	Default = 2%					
Force Account - Misc.	(10 to 15%) of (H)		6.00%		$1,826,430.86	(J)
	Default = 12%					
Subtotal of Construction Cost	(H+I+J)				$32,875,755.40	(K)
Total Construction Engineering	17% of (K)		12.00%		$3,945,090.65	(L)
Total Preliminary Engineering**	15% of (K)		10.00%		$3,287,575.54	(M)
Right of Way	Project Dependent		2.00%		$608,810.29	(N)
Utilities	Project Dependent		N/A		$0.00	(O)
	COST	**QUANTITY**				
	0.00	0.00			0.00	
	0.00	0.00			0.00	
	0.00	0.00			0.00	
	0.00	0.00			0.00	
	0.00	0.00			0.00	
Inflation to 2010 dollars (assuming 4% per year)					$11,400,824.92	
Total Project Cost					$52,118,056.79	(P)

*Contingencies includes environmental mitigation costs

**Total Preliminary Engineering includes cost of developing NEPA documents

Date Prepared: 1/5/05

Prepared By: ATH

TIER 1 - PEIS COST ESTIMATE
DOWD ALT. 1 - w RAIL

BID ITEMS	COST PER UNIT	QUANTITY	COST			
Embankment (CIP)	8	249,865	1,998,920.00			
HBP	65	117,255	7,621,545.07			
Retaining Wall	90	235,451	21,190,545.00			
Roadway Bridge	150	371,252	55,687,813.50			
FGT Bridge	225	46,073	10,366,348.50			
FGT Track & Ballast	240	10,608	2,545,920.00			
Concrete Bikeway (6 INCH)	35	5,089	178,115.00			
Guardrail Type 7	80	62,268	4,981,440.00			
Sound Walls	30	86,400	2,592,000.00			
					$107,162,647.07	
	% Range		**% Used**		**Cost**	
Project Construction Bid Items	Project Dependent		N/A		$107,162,647.07	(A)
Contingencies*	(15% - 30%) of (A)		30.00%		$32,148,794.12	(B)
ITS	(6-10%) of (A+B)		0.00%		$0.00	(C)
	Default = 6%					
Drainage/Utilities	(3-10%)of (A+B)		5.00%		$6,965,572.06	(D)
	Default = 6%					
Signing and Striping	(1-5%) of (A+B+C+D)		4.00%		$5,851,080.53	(E)
	Default = 5%					
Construction Signing & Traffic Control	5 to 25% of (A+B+C+D+E)		10.00%		$11,997,929.97	(F)
	Default = 20%					
Mobilization	(4 to 10%) of (A+B+C+D+E+F)		7.00%		$9,238,406.07	(G)
	Default = 7%					
Total of Construction Bid Items	(A+B+C+D+E+F+G)				$173,364,429.83	(H)
Force Account - Utilities	(1 to 2%) of (H)		2.00%		$3,467,288.60	(I)
	Default = 2%					
Force Account - Misc.	(10 to 15%) of (H)		6.00%		$10,401,865.79	(J)
	Default = 12%					
Subtotal of Construction Cost	(H+I+J)				$187,233,584.21	(K)
Total Construction Engineering	17% of (K)		10.00%		$18,723,358.42	(L)
Total Preliminary Engineering**	15% of (K)		9.00%		$16,851,022.58	(M)
Right of Way	Project Dependent		2.00%		$3,744,671.68	(N)
Utilities	Project Dependent		N/A		$0.00	(O)
	COST	**QUANTITY**				
Geohazard Mitigation (LS) + 30% cont.	75,000,000.00	1			$75,000,000.00	
Inflation to 2010 dollars (assuming 4% per year)					$84,434,738.33	
Total Project Cost					$385,987,375.23	(P)
*Contingencies includes environmental mitigation costs						
**Total Preliminary Engineering includes cost of developing NEPA documents						

Date Prepared: 1/5/05

Prepared By: ATH

TIER 1 - PEIS COST ESTIMATE
DOWD ALT. 1 - NO RAIL

BID ITEMS	COST PER UNIT	QUANTITY	COST
Embankment (CIP)	8	249,865	1,998,920.00
HBP	65	117,255	7,621,545.07
Retaining Wall	90	235,451	21,190,545.00
Roadway Bridge	150	371,252	55,687,813.50
FGT Bridge	225	0	0.00
FGT Track & Ballast	240	0	0.00
Concrete Bikeway (6 INCH)	35	5,089	178,115.00
Guardrail Type 7	80	62,268	4,981,440.00
Sound Walls	30	86,400	2,592,000.00
Total			94,250,378.57

	% Range	% Used	Cost	
Project Construction Bid Items	Project Dependent	N/A	$94,250,378.57	(A)
Contingencies*	(15% - 30%) of (A)	30.00%	$28,275,113.57	(B)
ITS	(6-10%) of (A+B)	0.00%	$0.00	(C)
	Default = 6%			
Drainage/Utilities	(3-10%)of (A+B)	6.00%	$7,351,529.53	(D)
	Default = 6%			
Signing and Striping	(1-5%) of (A+B+C+D)	5.00%	$6,493,851.08	(E)
	Default = 5%			
Construction Signing & Traffic Control	5 to 25% of (A+B+C+D+E)	15.00%	$16,214,363.88	(F)
	Default = 20%			
Mobilization	(4 to 10%) of (A+B+C+D+E+F)	7.00%	$8,701,708.61	(G)
	Default = 7%			
Total of Construction Bid Items	(A+B+C+D+E+F+G)		$161,286,945.25	(H)
Force Account - Utilities	(1 to 2%) of (H)	2.00%	$3,225,738.91	(I)
	Default = 2%			
Force Account - Misc.	(10 to 15%) of (H)	6.00%	$9,677,216.72	(J)
	Default = 12%			
Subtotal of Construction Cost	(H+I+J)		$174,189,900.87	(K)
Total Construction Engineering	17% of (K)	12.00%	$20,902,788.10	(L)
Total Preliminary Engineering**	15% of (K)	10.00%	$17,418,990.09	(M)
Right of Way	Project Dependent	2.00%	$3,483,798.02	(N)
Utilities	Project Dependent	N/A	$0.00	(O)

	COST	QUANTITY		
Seqhazard Mitigation (LS) + 30% cont	75,000,000.00	1	$75,000,000.00	
Inflation to 2010 dollars (assuming 4% per year)			$81,478,733.58	
Total Project Cost			$372,474,210.66	(P)

*Contingencies includes environmental mitigation costs

**Total Preliminary Engineering includes cost of developing NEPA documents

Date Prepared: 1/5/05

Prepared By: ATH

TIER 1 - PEIS COST ESTIMATE
DOWD ALT. 1 w/AGS

BID ITEMS	COST PER UNIT	QUANTITY	COST			
Embankment (CIP)	8	249,865	1,998,920.00			
HBP	65	117,255	7,621,545.07			
Retaining Wall	90	235,451	21,190,545.00			
Roadway Bridge	150	371,252	55,687,813.50			
FGT Bridge	225	0	0.00			
FGT related	1	204,210,196.45	204,210,196.45			
Concrete Bikeway (6 INCH)	35	5,089	178,115.00			
Guardrail Type 7	80	62,268	4,981,440.00			
Sound Walls	30	86,400	2,592,000.00			
					$298,460,575.02	
	% Range		**% Used**		**Cost**	
Project Construction Bid Items	Project Dependent		N/A		$298,460,575.02	(A)
Contingencies*	(15% - 30%) of (A)		30.00%		$89,538,172.51	(B)
ITS	(6-10%) of (A+B)		0.00%		$0.00	(C)
	Default = 6%					
Drainage/Utilities	(3-10%)of (A+B)		5.00%		$19,399,937.38	(D)
	Default = 6%					
Signing and Striping	(1-5%) of (A+B+C+D)		4.00%		$16,295,947.40	(E)
	Default = 5%					
Construction Signing & Traffic Control	5 to 25% of (A+B+C+D+E)		10.00%		$33,415,645.98	(F)
	Default = 20%					
Mobilization	(4 to 10%) of (A+B+C+D+E+F)		7.00%		$25,730,047.40	(G)
	Default = 7%					
Total of Construction Bid Items	(A+B+C+D+E+F+G)				$482,840,325.69	(H)
Force Account - Utilities	(1 to 2%) of (H)		2.00%		$9,656,806.51	(I)
	Default = 2%					
Force Account - Misc.	(10 to 15%) of (H)		6.00%		$28,970,419.54	(J)
	Default = 12%					
Subtotal of Construction Cost	(H+I+J)				$521,467,551.74	(K)
Total Construction Engineering	17% of (K)		10.00%		$52,146,755.17	(L)
Total Preliminary Engineering**	15% of (K)		10.00%		$52,146,755.17	(M)
Right of Way	Project Dependent		2.00%		$10,429,351.03	(N)
Utilities	Project Dependent		N/A		$0.00	(O)
	COST	**QUANTITY**				
Geohazard Mitigation (LS) + 30% cont.	75,000,000.00	1			$75,000,000.00	
Total Project Cost					$711,190,413.13	(P)
*Contingencies includes environmental mitigation costs						
**Total Preliminary Engineering includes cost of developing NEPA documents						

Date Prepared: 1/5/05

Prepared By: ATH

BID ITEMS	COST PER UNIT	QUANTITY	COST			
Unclassified Excavation (CIP)	8	383,226	3,065,808.00			
HBP	65	53,814	3,497,923.00			
Retaining Wall	90	259,637	23,367,330.00			
Roadway Bridge	150	243,637	36,545,550.00			
Guardrail Type 7	80	48,062	3,844,960.00			
Sound Walls	30	69,600	2,088,000.00			
			72,409,571.00			
	% Range		% Used		Cost	
Project Construction Bid Items	Project Dependent		N/A		$72,409,571.00	(A)
Contingencies*	(15% - 30%) of (A)		30.00%		$21,722,871.30	(B)
ITS	(6-10%) of (A+B)		0.00%		$0.00	(C)
	Default = 6%					
Drainage/Utilities	(3-10%)of (A+B)		6.00%		$5,647,946.54	(D)
	Default = 6%					
Signing and Striping	(1-5%) of (A+B+C+D)		5.00%		$4,989,019.44	(E)
	Default = 5%					
Construction Signing & Traffic Control	5 to 25% of (A+B+C+D+E)		15.00%		$12,456,980.55	(F)
	Default = 20%					
Mobilization	(4 to 10%) of (A+B+C+D+E+F)		7.00%		$6,685,246.23	(G)
	Default = 7%					
Total of Construction Bid Items	(A+B+C+D+E+F+G)				$123,911,635.05	(H)
Force Account - Utilities	(1 to 2%) of (H)		2.00%		$2,478,232.70	(I)
	Default = 2%					
Force Account - Misc.	(10 to 15%) of (H)		6.00%		$7,434,698.10	(J)
	Default = 12%					
Subtotal of Construction Cost	(H+I+J)				$133,824,565.86	(K)
Total Construction Engineering	17% of (K)		12.00%		$16,058,947.90	(L)
Total Preliminary Engineering**	15% of (K)		10.00%		$13,382,456.59	(M)
Right of Way	Project Dependent		2.00%		$2,676,491.32	(N)
Utilities	Project Dependent		N/A		$0.00	(O)
	COST	**QUANTITY**				
GeoHazard Mitigation (LS) + 30% Cont.	10,000,000.00	1			$10,000,000.00	
Tunnel (LF) including 30% contingency	17,000.00	11,041.00			$187,697,000.00	
Inflation to 2010 dollars (assuming 4% per year)					$101,819,049.27	
Total Project Cost					$465,458,510.93	(P)
*Contingencies includes environmental mitigation costs						
**Total Preliminary Engineering includes cost of developing NEPA documents						

Date Prepared:8/17/2010

Prepared By:SRM

Minimal Action Components Associated with each Build Alternative - Page 1 of 2

				Transit Alternatives				Highway Alternatives		
			1	2	3	4	5	6	7	8
			Minimal Action Alternative	Rail with IMC	Advanced Guideway System	Dual-Mode Bus in Guideway	Diesel Bus in Guideway	6-Lane Highway 55 mph	6-Lane Highway 65 mph	Reversible/ HOV/HOT Lanes
			mp 116 to 260	mp 142 to 260	mp 142 to 260	mp 142 to 260	mp 142 to 260	mp 169 to 173 mp 213.5 to 247	mp 169 to 173 mp 213.5 to 247	mp 169 to 173 mp 213.5 to 247
			Glenwood Springs to C-470	Eagle Airport to C-470	Eagle Airport to C-470	Eagle Airport to C-470	Eagle Airport to C-470	Dowd Canyon EJMT to Floyd Hill	Dowd Canyon EJMT to Floyd Hill	Dowd Canyon EJMT to Floyd Hill
		Base Cost (Billions)	**$0.000**	**$5,760**	**$7,339**	**$5,321**	**$5,397**	**$2,531**	**$3,520**	**$2,678**
	Location	**MA Cost* (Millions)**								
Minimal Action Components	Interchange	Glenwood Springs (mp 116)	$15							
		Gypsum (mp 140)	$2							
		Eagle & Spur Road (mp 147)	$10							
		Edwards & Spur Road (mp 163)	$14							
		Avon (mp 167)	$4							
		Minturn (mp 171)	$15							
		Vail West (mp 173) / Simba Run	$5							
		Copper Mountain (mp 195)	$2							
		Frisco / Main St. (mp 201)	$2							
		Frisco / SH 9 (mp 203)	$10							
		Silverthorne (mp 205)	$15							
		Loveland Pass (mp 216)	$2							
		Silver Plume (mp 226)	$4							
		Georgetown (mp 228)	$8							
		Empire (mp 232)	$1							
		Downieville (mp 234)	$2							
		Fall River Road (mp 238)	$4							
		Idaho Springs West (mp 239)	$4							
		Idaho Springs / SH 103 (mp 240)	$6							
		Idaho Springs East (mp 240)	$5							
		Base of Floyd Hill / US 6 (mp 244)	$10							
		Hyland Hills / Beaver Brook (mp 247 / mp 248)	$2							
		Lookout Mountain (mp 256)	$10							
		Morrison (mp 259)	$1							
	Curve Safety	West of Wolcott (mp 155 - 156)	$18							
		Dowd Canyon (mp 170 - 173)	$245						***	
		Fall River Road (mp 237 - 238)	$10							
		East of Twin Tunnels (mp 242 - 245)	$137							
	Auxiliary Lane	Avon to Post, Uphill (EB) (mp 167 - 168)	$3							
		West side of Vail Pass, Downhill (WB) (mp 185 - 190)	$135							
		West side of Vail Pass, Uphill (EB) (mp 185 - 190)	$135							
		Frisco to Silverthorne (EB) (mp 202.7-205.1) **/****	$5							
		EJMT to Herman Gulch, Downhill (EB) (mp 215 - 218) ****	$5							
		Bakerville to EJMT, Uphill (WB) (mp 215 - 221) ****	$9							
		Georgetown to Silver Plume, Uphill (WB) (mp 226 - 228) ****	$6							
		Silver Plume to Georgetown, Downhill (EB) (mp 226 - 228) ****	$6							
		Downieville to Empire, Uphill (WB) (mp 232 - 234)	$17							
		Empire To Downieville, Downhill (EB) (mp 232 - 234)	$17							
		Black Hawk Tunnel Off-ramp to Hidden Valley Off-ramp, Uphill (WB) (mp 243 - 244)	$20							
		Morrison to Chief Hosa, Uphill (WB) (mp 253 - 259)	$100							
		Transportation Management	$104							
	Misc.	Other items in the Corridor	$64							
		Idaho Springs East to Hidden Valley (improve existing frontage road)	$4							
		Buses in Mixed Traffic	$100							
		Corridor Wide Sediment Control	$20							
		Total cost of Minimal Action Components (Billions)		**$1.313**	**$0.532**	**$0.532**	**$0.532**	**$0.532**	**$0.678**	**$0.678**
		Total cost of Alternative with Minimal Action Components (Billions)		**$1.313**	**$6,292**	**$7,871**	**$5,853**	**$5,929**	**$3,209**	**$4,198**

*Minimal Action Components were estimated as a package. Costs may vary if Minimal Action components were estimated to be constructed on a stand alone basis.

Alternative includes this Minimal Action Component

*** Tunnel at Dowd Canyon Achieves Minimal Action component of curve safety modification

Alternative includes this Minimal Action Component as part of the Base Cost

Alternative doesn't include this Minimal Action Component

Minimal Action Components Associated with each Build Alternative - Page 2 of 2

			Combination Transit/Highway Alternatives												Consensus Recommendation
			9			10			11			12			13
			6-Lane Highway with Rail and IMC			6-Lane Highway with AGS			6-Lane Highway with Dual-Mode Bus in Guideway			6-Lane Highway with Diesel Bus in Guideway			Consensus Recommendation 55 mph - Preferred Alternative - Short Term
			9 - Combination Built Simultaneously	*9a - Transit with Highway Preservation*	*9b - Highway with Transit Preservation*	*10 - Combination Built Simultaneously*	*10a - Transit with Highway Preservation*	*10b - Highway with Transit Preservation*	*11 - Combination Built Simultaneously*	*11a - Transit with Highway Preservation*	*11b - Highway with Transit Preservation*	*12 - Combination Built Simultaneously*	*12a - Transit with Highway Preservation*	*12b - Highway with Transit Preservation*	
			mp 142 to 260			mp 142 to 260			mp 169 to 173 mp 142 to 260			mp 169 to 173 mp 142 to 260			mp x to x mp x to x
			Eagle Airport to C-470			Eagle Airport to C-470			Dowd Canyon Eagle Airport to C-470			Dowd Canyon Eagle Airport to C-470			Eagle Airport to C-470
		Base Cost (Billions)	**$7,827**	**$7,508**	**$3,381**	**$10,524**	**$10,239**	**$3,127**	**$6,770**	**$6,436**	**$3,177**	**$6,409**	**$6,075**	**$3,177**	**$9,400**
	Location	**MA Cost* (Millions)**													
Minimal Action Components	Interchange	Glenwood Springs (mp 116)	$15												
		Gypsum (mp 140)	$2												
		Eagle & Spur Road (mp 147)	$10												
		Edwards & Spur Road (mp 163)	$14												
		Avon (mp 167)	$4												
		Minturn (mp 171)	$15												1
		Vail West (mp 173) / Simba Run	$5												
		Copper Mountain (mp 195)	$2												
		Frisco / Main St. (mp 201)	$2												
		Frisco / SH 9 (mp 203)	$10												
		Silverthorne (mp 205)	$15												
		Loveland Pass (mp 216)	$2												1
		Silver Plume (mp 226)	$4												
		Georgetown (mp 228)	$8												1
		Empire (mp 232)	$1												
		Downieville (mp 234)	$2												1
		Fall River Road (mp 238)	$4												1
		Idaho Springs West (mp 239)	$4												
		Idaho Springs / SH 103 (mp 240)	$6												
		Idaho Springs East (mp 240)	$5												
		Base of Floyd Hill / US 6 (mp 244)	$10												
		Hyland Hills / Beaver Brook (mp 247 / mp 248)	$2												1
		Lookout Mountain (mp 256)	$10												
		Morrison (mp 259)	$1												
	Curve Safety	West of Wolcott (mp 155 - 156)	$18												
		Dowd Canyon (mp 170 - 173)	$245												1
		Fall River Road (mp 237 - 238)	$10												
		East of Twin Tunnels (mp 242 - 245)	$137												
	Auxiliary Lane	Avon to Post, Uphill (EB) (mp 167 - 168)	$3												
		West side of Vail Pass, Downhill (WB) (mp 185 - 190)	$135												
		West side of Vail Pass, Uphill (EB) (mp 185 - 190)	$135												
		Frisco to Silverthorne (EB) (mp 202.7-205.1) **/****	$5												
		EJMT to Herman Gulch, Downhill (EB) (mp 215 - 218) ****	$5												
		Bakerville to EJMT, Uphill (WB) (mp 215 - 221) ****	$9												
		Georgetown to Silver Plume, Uphill (WB) (mp 226 - 228) ****	$6												
		Silver Plume to Georgetown, Downhill (EB) (mp 226 - 228) ****	$6												
		Downieville to Empire, Uphill (WB) (mp 232 - 234)	$17												
		Empire To Downieville, Downhill (EB) (mp 232 - 234)	$17												
		Black Hawk Tunnel Off-ramp to Hidden Valley Off-ramp, Uphill (WB) (mp 243 - 244)	$20												
		Morrison to Chief Hosa, Uphill (WB) (mp 253 - 259)	$100												
		Transportation Management	$104												
	Misc.	Other items in the Corridor	$64												
		Idaho Springs East to Hidden Valley (improve existing frontage road)	$4												
		Buses in Mixed Traffic	$100												
		Corridor Wide Sediment Control	$20												
		Total cost of Minimal Action Components (Billions)	**$0.678**	**$0.532**	**$0.678**	**$0.678**	**$0.532**	**$0.678**	**$0.678**	**$0.532**	**$0.678**	**$0.678**	**$0.532**	**$0.678**	**$0.782**
		Total cost of Alternative with Minimal Action Components (Billions)	**$8,505**	**$8,040**	**$4,059**	**$11,202**	**$10,771**	**$3,805**	**$7,448**	**$6,968**	**$3,855**	**$7,087**	**$6,607**	**$3,855**	**$10,182**

*Minimal Action Components were estimated as a package. Costs may vary if Minimal Action components were estimated to be constructed on a stand alone basis.

Alternative includes this Minimal Action Component

Tunnel at Dowd Canyon Achieves Minimal Action component of curve safety modification

Alternative includes this Minimal Action Component as part of the Base Cost

Alternative doesn't include this Minimal Action Component

8/17/2010 14:29						
BID ITEMS	**COST PER UNIT**	**QUANTITY**	**COST**			
Structures (SF)	150.00	45,053.00	6,757,950.00			
Walls (SF)	90.00	171,846.00	15,466,140.00			
Earthwork (CY)	20.00	180,608.00	3,612,160.00			
Pavement (TON)	70.00	46,106.00	3,227,420.00			
Base Course (CY)	40.00	31,048.00	1,241,920.00			
Barrier (Type 7)(LF)	60.00	21,877.00	1,312,620.00			
Total			31,618,210.00			
	% Range		**% Used**		**Cost**	
Project Construction Bid Items	Project Dependent		N/A		$31,618,210.00	(A)
Contingencies*	(15% - 30%) of (A)		30.00%		$9,485,463.00	(B)
ITS	(6-10%) of (A+B)		0.00%		$0.00	(C)
	Default = 6%					
Drainage/Utilities	(3-10%)of (A+B)		6.00%		$2,466,220.38	(D)
	Default = 6%					
Signing and Striping	(1-5%) of (A+B+C+D)		5.00%		$2,178,494.67	(E)
	Default = 5%					
Construction Signing & Traffic Control	5 to 25% of (A+B+C+D+E)		15.00%		$6,862,258.21	(F)
	Default = 20%					
Mobilization	(4 to 10%) of (A+B+C+D+E+F)		7.00%		$3,682,745.24	(G)
	Default = 7%					
Total of Construction Bid Items	(A+B+C+D+E+F+G)				$56,293,391.49	(H)
Force Account - Utilities	(1 to 2%) of (H)		2.00%		$1,125,867.83	(I)
	Default = 2%					
Force Account - Misc.	(10 to 15%) of (H)		6.00%		$3,377,603.49	(J)
	Default = 12%					
Subtotal of Construction Cost	(H+I+J)				$60,796,862.81	(K)
Total Construction Engineering	17% of (K)		12.00%		$7,295,623.54	(L)
Total Preliminary Engineering**	15% of (K)		10.00%		$6,079,686.28	(M)
Right of Way	Project Dependent		2.00%		$1,125,867.83	(N)
Utilities	Project Dependent		N/A		$0.00	(O)
Tunnel (3-lane Floyd) (LF)	17,000.00	0.00			$0.00	
Inflation to 2010 dollars (assuming 4% per year)					$21,083,451.33	
Total Project Cost					$96,381,491.79	(P)

*Contingencies includes environmental mitigation costs

**Total Preliminary Engineering includes cost of developing NEPA documents

Date Prepared: 9/11/02

Prepared By:ATH

2003 CDOT - 55 mph Fall River Rd.xls

8/17/2010 14:29						
BID ITEMS	**COST PER UNIT**	**QUANTITY**	**COST**			
Structures (SF)	150.00	0.00	0.00			
Walls (SF)	90.00	36,940.00	3,324,600.00			
Earthwork (CY)	20.00	31,392.00	627,840.00			
Pavement (TON)	70.00	22,440.00	1,570,800.00			
Base Course (CY)	40.00	15,111.00	604,440.00			
Barrier (Type 7)(LF)	60.00	6,700.00	402,000.00			
Total			6,529,680.00			

	% Range		**% Used**	**Cost**	
Project Construction Bid Items	Project Dependent		N/A	$6,529,680.00	(A)
Contingencies*	(15% - 30%) of (A)		30.00%	$1,958,904.00	(B)
ITS	(6-10%) of (A+B)		0.00%	$0.00	(C)
	Default = 6%				
Drainage/Utilities	(3-10%)of (A+B)		6.00%	$509,315.04	(D)
	Default = 6%				
Signing and Striping	(1-5%) of (A+B+C+D)		5.00%	$449,894.95	(E)
	Default = 5%				
Construction Signing & Traffic Control	5 to 25% of (A+B+C+D+E)		15.00%	$1,417,169.10	(F)
	Default = 20%				
Mobilization	(4 to 10%) of (A+B+C+D+E+F)		7.00%	$760,547.42	(G)
	Default = 7%				
Total of Construction Bid Items	(A+B+C+D+E+F+G)			$11,625,510.51	(H)
Force Account - Utilities	(1 to 2%) of (H)		2.00%	$232,510.21	(I)
	Default = 2%				
Force Account - Misc.	(10 to 15%) of (H)		6.00%	$697,530.63	(J)
	Default = 12%				
Subtotal of Construction Cost	(H+I+J)			$12,555,551.35	(K)
Total Construction Engineering	17% of (K)		12.00%	$1,506,666.16	(L)
Total Preliminary Engineering**	15% of (K)		10.00%	$1,255,555.13	(M)
Right of Way	Project Dependent		2.00%	$232,510.21	(N)
Utilities	Project Dependent		N/A	$0.00	(O)
Inflation to 2010 dollars (assuming 4% per year)				$4,354,079.20	
Total Project Cost				$19,904,362.05	(P)

*Contingencies includes environmental mitigation costs

**Total Preliminary Engineering includes cost of developing NEPA documents

Date Prepared: 9/11/02

Prepared By:ATH

2003 CDOT - 55 mph S Curves at TT Hidden Valley.xls

8/17/2010 14:29						
BID ITEMS	**COST PER UNIT**	**QUANTITY**	**COST**			
Structures (SF)	150.00	2,006.00	300,900.00			
Walls (SF)	90.00	93,569.00	8,421,210.00			
Earthwork (CY)	20.00	188,301.00	3,766,020.00			
Pavement (TON)	70.00	26,102.00	1,827,140.00			
Base Course (CY)	40.00	17,577.00	703,080.00			
Barrier (Type 7)(LF)	60.00	9,429.00	565,740.00			
Total			15,584,090.00			
	% Range		**% Used**		**Cost**	
Project Construction Bid Items	Project Dependent		N/A		$15,584,090.00	(A)
Contingencies*	(15% - 30%) of (A)		30.00%		$4,675,227.00	(B)
ITS	(6-10%) of (A+B)		0.00%		$0.00	(C)
	Default = 6%					
Drainage/Utilities	(3-10%)of (A+B)		6.00%		$1,215,559.02	(D)
	Default = 6%					
Signing and Striping	(1-5%) of (A+B+C+D)		5.00%		$1,073,743.80	(E)
	Default = 5%					
Construction Signing & Traffic Control	5 to 25% of (A+B+C+D+E)		15.00%		$3,382,292.97	(F)
	Default = 20%					
Mobilization	(4 to 10%) of (A+B+C+D+E+F)		7.00%		$1,815,163.90	(G)
	Default = 7%					
Total of Construction Bid Items	(A+B+C+D+E+F+G)				$27,746,076.69	(H)
Force Account - Utilities	(1 to 2%) of (H)		2.00%		$554,921.53	(I)
	Default = 2%					
Force Account - Misc.	(10 to 15%) of (H)		6.00%		$1,664,764.60	(J)
	Default = 12%					
Subtotal of Construction Cost	(H+I+J)				$29,965,762.82	(K)
Total Construction Engineering	17% of (K)		12.00%		$3,595,891.54	(L)
Total Preliminary Engineering**	15% of (K)		10.00%		$2,996,576.28	(M)
Right of Way	Project Dependent		2.00%		$554,921.53	(N)
Utilities	Project Dependent		N/A		$0.00	(O)
Tunnel (S at TT) (LF)	741.00	15,000.00			$11,115,000.00	
Inflation to 2010 dollars (assuming 4% per year)					$13,503,882.61	
Total Project Cost					$61,732,034.79	(P)

*Contingencies includes environmental mitigation costs

**Total Preliminary Engineering includes cost of developing NEPA documents

Date Prepared: 9/11/02

Prepared By:ATH

8/17/2010 14:29						
BID ITEMS	**COST PER UNIT**	**QUANTITY**	**COST**			
Structures (SF)	150.00	151,674.00	22,751,100.00			
Walls (SF)	90.00	111,689.00	10,052,010.00			
Earthwork (CY)	20.00	192,933.00	3,858,660.00			
Pavement (TON)	70.00	29,510.00	2,065,700.00			
Base Course (CY)	40.00	19,872.00	794,880.00			
Barrier (Type 7)(LF)	60.00	14,788.00	887,280.00			
Total			40,409,630.00			
	% Range		**% Used**		**Cost**	
Project Construction Bid Items	Project Dependent		N/A		$40,409,630.00	(A)
Contingencies*	(15% - 30%) of (A)		30.00%		$12,122,889.00	(B)
ITS	(6-10%) of (A+B)		0.00%		$0.00	(C)
	Default = 6%					
Drainage/Utilities	(3-10%)of (A+B)		6.00%		$3,151,951.14	(D)
	Default = 6%					
Signing and Striping	(1-5%) of (A+B+C+D)		5.00%		$2,784,223.51	(E)
	Default = 5%					
Construction Signing & Traffic Control	5 to 25% of (A+B+C+D+E)		15.00%		$8,770,304.05	(F)
	Default = 20%					
Mobilization	(4 to 10%) of (A+B+C+D+E+F)		7.00%		$4,706,729.84	(G)
	Default = 7%					
Total of Construction Bid Items	(A+B+C+D+E+F+G)				$71,945,727.53	(H)
Force Account - Utilities	(1 to 2%) of (H)		2.00%		$1,438,914.55	(I)
	Default = 2%					
Force Account - Misc.	(10 to 15%) of (H)		6.00%		$4,316,743.65	(J)
	Default = 12%					
Subtotal of Construction Cost	(H+I+J)				$77,701,385.74	(K)
Total Construction Engineering	17% of (K)		12.00%		$9,324,166.29	(L)
Total Preliminary Engineering**	15% of (K)		10.00%		$7,770,138.57	(M)
Right of Way	Project Dependent		2.00%		$1,438,914.55	(N)
Utilities	Project Dependent		N/A		$0.00	(O)
Tunnel (3-lane Floyd) (LF)	17,000.00	5,555.00			$94,435,000.00	
Inflation to 2010 dollars (assuming 4% per year)					$53,387,489.44	
Total Project Cost					$244,057,094.59	(P)

*Contingencies includes environmental mitigation costs

**Total Preliminary Engineering includes cost of developing NEPA documents

Date Prepared: 9/11/02

Prepared By:ATH

8/17/2010 14:29						
BID ITEMS	**COST PER UNIT**	**QUANTITY**	**COST**			
Structures (SF)	150.00	63319.00	9,497,850.00			
Walls (SF)	90.00	11362.00	1,022,580.00			
Earthwork (CY)	20.00	38587.00	771,740.00			
Pavement (TON)	70.00	21801.00	1,526,070.00			
Base Course (CY)	40.00	14681.00	587,240.00			
Barrier (Type 7)(LF)	60.00	7421.00	445,260.00			
Special Structures (SF)	200.00	0.00	0.00			
Tunnel (Twin Tunnels) (LF)	20000.00	0.00	0.00			
Tunnel (South Bore EJMT) (LF)	30000.00	0.00	0.00			
Interchanges (EACH)	1.00	0.00	0.00			
Total			13,850,740.00			
	% Range		**% Used**		**Cost**	
Project Construction Bid Items	Project Dependent		N/A		$13,850,740.00	(A)
Contingencies*	(15% - 30%) of (A)		30.00%		$4,155,222.00	(B)
ITS	(6-10%) of (A+B)		0.00%		$0.00	(C)
	Default = 6%					
Drainage/Utilities	(3-10%)of (A+B)		6.00%		$1,080,357.72	(D)
	Default = 6%					
Signing and Striping	(1-5%) of (A+B+C+D)		5.00%		$954,315.99	(E)
	Default = 5%					
Construction Signing & Traffic Control	5 to 25% of (A+B+C+D+E)		15.00%		$3,006,095.36	(F)
	Default = 20%					
Mobilization	(4 to 10%) of (A+B+C+D+E+F)		7.00%		$1,613,271.17	(G)
	Default = 7%					
Total of Construction Bid Items	(A+B+C+D+E+F+G)				$24,660,002.24	(H)
Force Account - Utilities	(1 to 2%) of (H)		2.00%		$493,200.04	(I)
	Default = 2%					
Force Account - Misc.	(10 to 15%) of (H)		6.00%		$1,479,600.13	(J)
	Default = 12%					
Subtotal of Construction Cost	(H+I+J)				$26,632,802.42	(K)
Total Construction Engineering	17% of (K)		12.00%		$3,195,936.29	(L)
Total Preliminary Engineering**	15% of (K)		10.00%		$2,663,280.24	(M)
Right of Way	Project Dependent		2.00%		$493,200.04	(N)
Utilities	Project Dependent		N/A		$0.00	(O)
Inflation to 2010 dollars (assuming 4% per year)					$9,235,861.32	
Total Project Cost					$42,221,080.31	(P)

*Contingencies includes environmental mitigation costs
**Total Preliminary Engineering includes cost of developing NEPA documents

Date Prepared: 9/11/02

Prepared By:ATH

65 mph S curves at TT Hidden Va

8/17/2010 14:29						
BID ITEMS	**COST PER UNIT**	**QUANTITY**	**COST**			
Structures (SF)	150.00	78,082.00	11,712,300.00			
Earthwork (CY)	20.00	23,967.00	479,340.00			
Pavement (TON)	70.00	15,207.00	1,064,490.00			
Base Course (CY)	40.00	10,240.00	409,600.00			
Barrier (Type 7)(LF)	60.00	3,500.00	210,000.00			
Total			13,875,730.00			
	% Range		**% Used**		**Cost**	
Project Construction Bid Items	Project Dependent		N/A		$13,875,730.00	(A)
Contingencies*	(15% - 30%) of (A)		30.00%		$4,162,719.00	(B)
		8/17/2010 14:29				
ITS	(6-10%) of (A+B)		0.00%		$0.00	(C)
	Default = 6%					
Drainage/Utilities	(3-10%)of (A+B)		6.00%		$1,082,306.94	(D)
	Default = 6%					
Signing and Striping	(1-5%) of (A+B+C+D)		5.00%		$956,037.80	(E)
	Default = 5%					
Construction Signing & Traffic Control	5 to 25% of (A+B+C+D+E)		15.00%		$3,011,519.06	(F)
	Default = 20%					
Mobilization	(4 to 10%) of (A+B+C+D+E+F)		7.00%		$1,616,181.90	(G)
	Default = 7%					
Total of Construction Bid Items	(A+B+C+D+E+F+G)				$24,704,494.69	(H)
Force Account - Utilities	(1 to 2%) of (H)		2.00%		$494,089.89	(I)
	Default = 2%					
Force Account - Misc.	(10 to 15%) of (H)		6.00%		$1,482,269.68	(J)
	Default = 12%					
Subtotal of Construction Cost	(H+I+J)				$26,680,854.27	(K)
Total Construction Engineering	17% of (K)		12.00%		$3,201,702.51	(L)
Total Preliminary Engineering**	15% of (K)		10.00%		$2,668,085.43	(M)
Right of Way	Project Dependent		2.00%		$494,089.89	(N)
Utilities	Project Dependent		N/A		$0.00	(O)
Tunnel (S at TT) (LF)	16000.00	3283.00			$52,528,000.00	
Inflation to 2010 dollars (assuming 4% per year)					$23,960,364.99	
Total Project Cost					$109,533,097.09	(P)

*Contingencies includes environmental mitigation costs

**Total Preliminary Engineering includes cost of developing NEPA documents

Date Prepared: 9/11/02

Prepared By:ATH