

I-70 Traffic & Revenue Study

LEVEL 1 SUMMARY COST ESTIMATES

Draft 2/17/2014

Prepared by Parsons Transportation Group

Background

The I-70 Traffic and Revenue Study Team has completed schematic designs and Level 1 cost estimates for all alternatives and options developed by the Project Leadership Team (PLT). This report, **Level 1 Summary Cost Estimates** contains summaries of costs for those alternatives. A second report, entitled **Level 1 Base Cost Estimates** includes detailed, itemized cost breakdowns of all options.

Cost Estimating Methodology

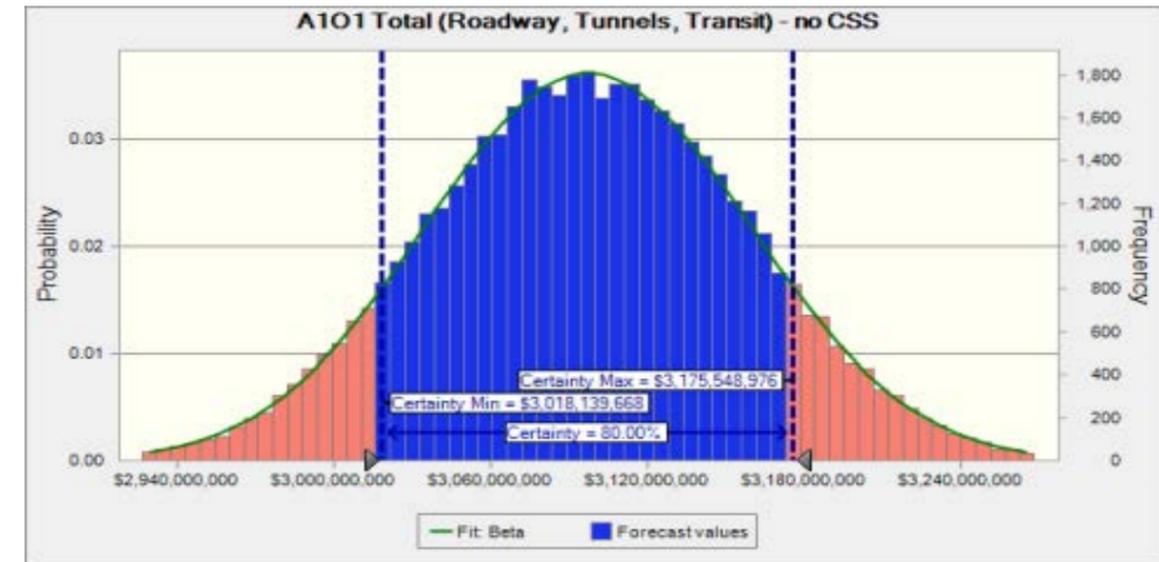
All alternatives and options developed by the PLT were carried to a schematic design level by the project team. Estimating included known and quantifiable costs, known but not quantifiable costs, and unknown costs. At this level of study, the ultimate cost of project alternatives cannot be predicted with 100% certainty, because a number of variables can affect plans and estimates. These variables include:

- Technical issues (design unknowns such as uncertainty over foundation conditions)
- Regulatory, political, and policy issues (such as changes in regulations & CDOT/FHWA policy during the design process)
- Stakeholder concerns (such as roadway width, roadside treatments, and access to communities)
- Limited design information (at this time designs are at a 5% or less level).

To assess these circumstances, the project team used the **Transportation Risk and Uncertainty Estimating (TRUE)** cost estimating process. The TRUE process provides a method for quantifying uncertainties, risks, and opportunities in costs through a systematic analysis.

The first step of the process is to generate **base costs** through the engineering estimating application of 2014 unit prices and quantity takeoffs. Unit costs and quantities do not include any contingencies to cover risks, opportunities, and uncertainties.

The next step is to review the base costs in a **Cost/Risk Workshop**. In the Cost/Risk workshop, a collaborative team of subject matter experts assesses each item, assigning both minimum and maximum costs and probabilities for achieving the minimum, base, and maximum cost. This information is input into a statistical model. This model is developed using software called Crystal Ball™. This software is a predictive analysis tool that uses a "Monte Carlo Simulation". A Monte Carlo Simulation is a computerized mathematical technique that relies on repeated calculations of tens of thousands of scenarios to obtain possible cost outcomes and the probabilities the costs will occur for any choice of action.



The scenarios are plotted on a cost distribution curve. This curve develops the possible range of costs, based on the risks and opportunities assigned to the base cost items. An example curve is shown above. Cost distribution curves have been generated for each alternative & option, as well as each capital cost line item. For each alternative & option, the **Cost Ranges** are reported in the summary spreadsheets.

For the Level 1 cost estimates, CDOT picked an 80% confidence level for the estimates. That means that we are 80% confident that the reported range of costs for each alternative will be attained. There is only a 20% confidence that the total cost for each alternative will fall outside that range.

All cost elements were taken through this Cost/Risk analysis except for:

- AGS Capital & Operating & Maintenance (O&M) costs (applied directly from the 2014 AGS study).
- Roadway, Structures, Tunnels & Bus Rapid Transit (BRT) O&M (directly from individual O&M cost worksheets).
- Design and Construction Engineering Costs are calculated as percentages of the Capital Cost range.
- Context Sensitive Solutions Factors are applied directly to Capital Cost (15%) and Design Costs (19%).

This package includes the summary of cost ranges based on the cost/risk workshop and the original base cost estimates for each alternative.

I-70 Traffic & Revenue Study Level 1 Summary of Alternatives & Options

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Alternative Number	Alternative Description	Total Capital Costs		Total Design & Construction Engineering Costs		Total Costs without AGS		Total Costs with AGS	
		Cost Range		Cost Range		Cost Range		Cost Range	
Alt01_Opt01	2 tolled reversible managed lanes designed at 65 mph. The reversible managed lanes are on a separate viaduct structure from East Idaho Springs to Floyd Hill in order to maintain 65 mph design speed. General Purpose lanes designed at 55 mph except from East Idaho Springs to Floyd Hill, where existing design speeds and lanes will remain. Bus Rapid Transit.	\$ 3,470,870,000	\$ 3,651,890,000	\$ 644,290,000	\$ 677,890,000	\$ 4,116,000,000	\$ 4,330,000,000	\$ 4,116,000,000	\$ 4,330,000,000
Alt01_Opt02	2 tolled reversible managed lanes and I-70 designed at 65 mph. This option matches Alt01_Opt01 except from East Idaho Springs to Floyd Hill, where the reversible managed lanes and I-70 will be reconstructed to meet a 65 mph design speed. Bus Rapid Transit.	\$ 3,789,740,000	\$ 3,991,490,000	\$ 703,480,000	\$ 740,930,000	\$ 4,494,000,000	\$ 4,733,000,000	\$ 4,494,000,000	\$ 4,733,000,000
Alt02_Opt01	3 tolled reversible managed lanes designed at 65 mph. The reversible managed lanes are on a separate viaduct from East Idaho Springs to Floyd Hill in order to maintain 65 mph design speed. General Purpose lanes designed at 55 mph except from East Idaho Springs to Floyd Hill, where existing design speeds and lanes will remain. Bus Rapid Transit.	\$ 4,287,970,000	\$ 4,512,750,000	\$ 795,960,000	\$ 837,690,000	\$ 5,084,000,000	\$ 5,351,000,000	\$ 5,084,000,000	\$ 5,351,000,000
Alt02_Opt02	3 tolled reversible managed lanes designed at 65 mph. This option matches Alt02_Opt01 except from East Idaho Springs to Floyd Hill, where the reversible managed lanes and I-70 General Purpose lanes will be reconstructed to meet a 65 mph design speed. Bus Rapid Transit.	\$ 4,503,030,000	\$ 4,742,410,000	\$ 835,880,000	\$ 880,320,000	\$ 5,339,000,000	\$ 5,623,000,000	\$ 5,339,000,000	\$ 5,623,000,000
Alt02_Opt03	3 tolled reversible managed lanes designed at 65 mph. The reversible managed lanes are on a viaduct structure from West Idaho Springs to Floyd Hill to minimize impacts. General Purpose lanes designed at 65 mph except from West Idaho Springs to Floyd Hill where existing design speeds & lanes will remain. This option matches Alt02_Opt01 except viaduct extends to West Idaho Springs. Bus Rapid Transit.	\$ 4,347,980,000	\$ 4,569,190,000	\$ 807,100,000	\$ 848,160,000	\$ 5,156,000,000	\$ 5,418,000,000	\$ 5,156,000,000	\$ 5,418,000,000
Alt03_Opt01	Minimum program per PEIS with 55 mph design speed including a 3rd bore at EJMT. Minimum program is generally localized auxillary lane improvements. AGS.	\$ 7,482,310,000	\$ 7,608,600,000	\$ 1,267,370,000	\$ 1,288,390,000	\$ 1,948,000,000	\$ 2,096,000,000	\$ 8,750,000,000	\$ 8,897,000,000
Alt03_Opt02	Minimum program per PEIS with 65 mph design speed including a 3rd bore at EJMT. Minimum program is generally localized auxillary lane improvements. AGS.	\$ 7,784,100,000	\$ 7,919,310,000	\$ 1,317,610,000	\$ 1,340,110,000	\$ 2,300,000,000	\$ 2,458,000,000	\$ 9,102,000,000	\$ 9,260,000,000
Alt03_Opt03	Minimum program per PEIS with 55 mph design speed without a 3rd bore at EJMT. Minimum program is generally localized auxillary lane improvements. Option is similar to Alt03_Opt01 without 3rd bore at EJMT. AGS.	\$ 6,262,900,000	\$ 6,294,990,000	\$ 1,064,390,000	\$ 1,069,730,000	\$ 526,000,000	\$ 563,000,000	\$ 7,328,000,000	\$ 7,365,000,000
Alt03_Opt04	Minimum program per PEIS with 65 mph design speed without a 3rd bore at EJMT. Minimum program is generally localized auxillary lane improvements. Option is similar to Alt03_Opt02 without 3rd bore at EJMT. AGS.	\$ 6,571,860,000	\$ 6,620,560,000	\$ 1,115,820,000	\$ 1,123,920,000	\$ 886,000,000	\$ 943,000,000	\$ 7,688,000,000	\$ 7,745,000,000
Alt04_Opt01	Maximum program per PEIS with 55 mph design speed including a 3rd bore at EJMT. Maximum program includes one additional non-reversible tolled lane (EB & WB) between EJMT and Floyd Hill. AGS.	\$ 8,062,790,000	\$ 8,212,060,000	\$ 1,364,000,000	\$ 1,388,850,000	\$ 2,625,000,000	\$ 2,800,000,000	\$ 9,427,000,000	\$ 9,601,000,000
Alt04_Opt02	Maximum program per PEIS with 65 mph design speed including a 3rd bore at EJMT. Maximum program includes one additional non-reversible tolled lane (EB & WB) between EJMT and Floyd Hill. AGS.	\$ 8,408,290,000	\$ 8,570,890,000	\$ 1,421,510,000	\$ 1,448,580,000	\$ 3,028,000,000	\$ 3,218,000,000	\$ 9,830,000,000	\$ 10,020,000,000
Alt05_Opt01	Permanent Peak Period Shoulder Lane EB and WB. Widen the existing roadway to accommodate one additional left side managed lane (EB & WB) for use during peak times; during non-peak times operates as a standard shoulder. Provide full width shoulder on right side. AGS.	\$ 7,472,750,000	\$ 7,573,010,000	\$ 1,265,780,000	\$ 1,282,470,000	\$ 1,937,000,000	\$ 2,054,000,000	\$ 8,739,000,000	\$ 8,856,000,000
Alt06_Opt01	Temporary Peak Period Shoulder Lane. Using the existing roadway, accommodate one additional WB left side managed lane for use during peak times; during non-peak times operates as a standard shoulder. No 12 foot wide shoulders are available during peak periods. Construction of WB peak period lane is from Empire to Floyd Hill only. (Assumes EB peak period lane from Empire to Floyd Hill is constructed.) AGS.	\$ 5,898,080,000	\$ 5,904,610,000	\$ 1,003,660,000	\$ 1,004,750,000	\$ 100,000,000	\$ 108,000,000	\$ 6,902,000,000	\$ 6,910,000,000

I-70 Traffic & Revenue Study Level 1 Summary of Alternatives & Options

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Alternative Number	Alternative Description	Capital Costs			Capital Costs CSS Factor (15%)		Capital Costs plus CSS Factor		AGS Capital Costs	Total Capital Costs	
		Estimated Base Cost	Cost Range		Cost Range		Cost Range			Cost Range	
Alt01_Opt01	2 tolled reversible managed lanes designed at 65 mph. The reversible managed lanes are on a separate viaduct structure from East Idaho Springs to Floyd Hill in order to maintain 65 mph design speed. General Purpose lanes designed at 55 mph except from East Idaho Springs to Floyd Hill, where existing design speeds and lanes will remain. Bus Rapid Transit.	\$ 2,937,026,269	\$ 3,018,139,668	\$ 3,175,548,976	\$ 452,720,950	\$ 476,332,346	\$ 3,470,860,618	\$ 3,651,881,322	Not included in Alternative	\$ 3,470,870,000	\$ 3,651,890,000
Alt01_Opt02	2 tolled reversible managed lanes and I-70 designed at 65 mph. This option matches Alt01_Opt01 except from East Idaho Springs to Floyd Hill, where the reversible managed lanes and I-70 will be reconstructed to meet a 65 mph design speed. Bus Rapid Transit.	\$ 3,195,652,172	\$ 3,295,419,959	\$ 3,470,860,103	\$ 494,312,994	\$ 520,629,015	\$ 3,789,732,953	\$ 3,991,489,118	Not included in Alternative	\$ 3,789,740,000	\$ 3,991,490,000
Alt02_Opt01	3 tolled reversible managed lanes designed at 65 mph. The reversible managed lanes are on a separate viaduct from East Idaho Springs to Floyd Hill in order to maintain 65 mph design speed. General Purpose lanes designed at 55 mph except from East Idaho Springs to Floyd Hill, where existing design speeds and lanes will remain. Bus Rapid Transit.	\$ 3,634,648,890	\$ 3,728,664,222	\$ 3,924,123,041	\$ 559,299,633	\$ 588,618,456	\$ 4,287,963,855	\$ 4,512,741,497	Not included in Alternative	\$ 4,287,970,000	\$ 4,512,750,000
Alt02_Opt02	3 tolled reversible managed lanes designed at 65 mph. This option matches Alt02_Opt01 except from East Idaho Springs to Floyd Hill, where the reversible managed lanes and I-70 General Purpose lanes will be reconstructed to meet a 65 mph design speed. Bus Rapid Transit.	\$ 3,847,973,416	\$ 3,915,670,892	\$ 4,123,831,490	\$ 587,350,634	\$ 618,574,724	\$ 4,503,021,526	\$ 4,742,406,214	Not included in Alternative	\$ 4,503,030,000	\$ 4,742,410,000
Alt02_Opt03	3 tolled reversible managed lanes designed at 65 mph. The reversible managed lanes are on a viaduct structure from West Idaho Springs to Floyd Hill to minimize impacts. General Purpose lanes designed at 65 mph except from West Idaho Springs to Floyd Hill where existing design speeds & lanes will remain. This option matches Alt02_Opt01 except viaduct extends to West Idaho Springs. Bus Rapid Transit.	\$ 3,677,755,753	\$ 3,780,847,836	\$ 3,973,202,712	\$ 567,127,175	\$ 595,980,407	\$ 4,347,975,011	\$ 4,569,183,119	Not included in Alternative	\$ 4,347,980,000	\$ 4,569,190,000
Alt03_Opt01	Minimum program per PEIS with 55 mph design speed including a 3rd bore at EJMT. Minimum program is generally localized auxillary lane improvements. AGS.	\$ 1,442,300,478	\$ 1,452,058,238	\$ 1,561,874,004	\$ 217,808,736	\$ 234,281,101	\$ 1,669,866,974	\$ 1,796,155,105	\$ 5,812,440,000	\$ 7,482,310,000	\$ 7,608,600,000
Alt03_Opt02	Minimum program per PEIS with 65 mph design speed including a 3rd bore at EJMT. Minimum program is generally localized auxillary lane improvements. AGS.	\$ 1,716,951,849	\$ 1,714,483,236	\$ 1,832,053,399	\$ 257,172,485	\$ 274,808,010	\$ 1,971,655,721	\$ 2,106,861,409	\$ 5,812,440,000	\$ 7,784,100,000	\$ 7,919,310,000
Alt03_Opt03	Minimum program per PEIS with 55 mph design speed without a 3rd bore at EJMT. Minimum program is generally localized auxillary lane improvements. Option is similar to Alt03_Opt01 without 3rd bore at EJMT. AGS.	\$ 386,591,506	\$ 391,698,459	\$ 419,605,088	\$ 58,754,769	\$ 62,940,763	\$ 450,453,228	\$ 482,545,851	\$ 5,812,440,000	\$ 6,262,900,000	\$ 6,294,990,000
Alt03_Opt04	Minimum program per PEIS with 65 mph design speed without a 3rd bore at EJMT. Minimum program is generally localized auxillary lane improvements. Option is similar to Alt03_Opt02 without 3rd bore at EJMT. AGS.	\$ 672,583,261	\$ 660,362,773	\$ 702,709,473	\$ 99,054,416	\$ 105,406,421	\$ 759,417,189	\$ 808,115,894	\$ 5,812,440,000	\$ 6,571,860,000	\$ 6,620,560,000
Alt04_Opt01	Maximum program per PEIS with 55 mph design speed including a 3rd bore at EJMT. Maximum program includes one additional non-reversible tolled lane (EB & WB) between EJMT and Floyd Hill. AGS.	\$ 1,942,279,735	\$ 1,956,825,211	\$ 2,086,620,036	\$ 293,523,782	\$ 312,993,005	\$ 2,250,348,993	\$ 2,399,613,041	\$ 5,812,440,000	\$ 8,062,790,000	\$ 8,212,060,000
Alt04_Opt02	Maximum program per PEIS with 65 mph design speed including a 3rd bore at EJMT. Maximum program includes one additional non-reversible tolled lane (EB & WB) between EJMT and Floyd Hill. AGS.	\$ 2,257,579,186	\$ 2,257,259,885	\$ 2,398,649,426	\$ 338,588,983	\$ 359,797,414	\$ 2,595,848,868	\$ 2,758,446,840	\$ 5,812,440,000	\$ 8,408,290,000	\$ 8,570,890,000
Alt05_Opt01	Permanent Peak Period Shoulder Lane EB and WB. Widen the existing roadway to accommodate one additional left side managed lane (EB & WB) for use during peak times; during non-peak times operates as a standard shoulder. Provide full width shoulder on right side. AGS.	\$ 1,398,549,467	\$ 1,443,745,710	\$ 1,530,924,043	\$ 216,561,857	\$ 229,638,606	\$ 1,660,307,567	\$ 1,760,562,649	\$ 5,812,440,000	\$ 7,472,750,000	\$ 7,573,010,000
Alt06_Opt01	Temporary Peak Period Shoulder Lane. Using the existing roadway, accommodate one additional WB left side managed lane for use during peak times; during non-peak times operates as a standard shoulder. No 12 foot wide shoulders are available during peak periods. Construction of WB peak period lane is from Empire to Floyd Hill only. (Assumes EB peak period lane from Empire to Floyd Hill is constructed.) AGS.	\$ 66,326,953	\$ 74,464,610	\$ 80,139,620	\$ 11,169,692	\$ 12,020,943	\$ 85,634,302	\$ 92,160,563	\$ 5,812,440,000	\$ 5,898,080,000	\$ 5,904,610,000

I-70 Traffic & Revenue Study Level 1 Summary of Alternatives & Options

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Alternative Number	Alternative Description	Design Costs		Design Cost CSS Factor (19%)		AGS Design Cost	Total Design Costs plus CSS Factor		Construction Engineering Costs		AGS Construction Engineering Cost	Total Design & Construction Engineering Costs	
		Cost Range	Cost Range	Cost Range	Cost Range		Cost Range	Cost Range	Cost Range	Cost Range			
Alt01_Opt01	2 tolled reversible managed lanes designed at 65 mph. The reversible managed lanes are on a separate viaduct structure from East Idaho Springs to Floyd Hill in order to maintain 65 mph design speed. General Purpose lanes designed at 55 mph except from East Idaho Springs to Floyd Hill, where existing design speeds and lanes will remain. Bus Rapid Transit.	\$ 341,049,782	\$ 358,837,034	\$ 64,799,459	\$ 68,179,037	Not included in Alternative	\$ 405,849,241	\$ 427,016,071	\$ 238,433,034	\$ 250,868,369	Not included in Alternative	\$ 644,290,000	\$ 677,890,000
Alt01_Opt02	2 tolled reversible managed lanes and I-70 designed at 65 mph. This option matches Alt01_Opt01 except from East Idaho Springs to Floyd Hill, where the reversible managed lanes and I-70 will be reconstructed to meet a 65 mph design speed. Bus Rapid Transit.	\$ 372,382,455	\$ 392,207,192	\$ 70,752,667	\$ 74,519,366	Not included in Alternative	\$ 443,135,122	\$ 466,726,558	\$ 260,338,177	\$ 274,197,948	Not included in Alternative	\$ 703,480,000	\$ 740,930,000
Alt02_Opt01	3 tolled reversible managed lanes designed at 65 mph. The reversible managed lanes are on a separate viaduct from East Idaho Springs to Floyd Hill in order to maintain 65 mph design speed. General Purpose lanes designed at 55 mph except from East Idaho Springs to Floyd Hill, where existing design speeds and lanes will remain. Bus Rapid Transit.	\$ 421,339,057	\$ 443,425,904	\$ 80,054,421	\$ 84,250,922	Not included in Alternative	\$ 501,393,478	\$ 527,676,825	\$ 294,564,474	\$ 310,005,720	Not included in Alternative	\$ 795,960,000	\$ 837,690,000
Alt02_Opt02	3 tolled reversible managed lanes designed at 65 mph. This option matches Alt02_Opt01 except from East Idaho Springs to Floyd Hill, where the reversible managed lanes and I-70 General Purpose lanes will be reconstructed to meet a 65 mph design speed. Bus Rapid Transit.	\$ 442,470,811	\$ 465,992,958	\$ 84,069,454	\$ 88,538,662	Not included in Alternative	\$ 526,540,265	\$ 554,531,620	\$ 309,338,000	\$ 325,782,688	Not included in Alternative	\$ 835,880,000	\$ 880,320,000
Alt02_Opt03	3 tolled reversible managed lanes designed at 65 mph. The reversible managed lanes are on a viaduct structure from West Idaho Springs to Floyd Hill to minimize impacts. General Purpose lanes designed at 65 mph except from West Idaho Springs to Floyd Hill where existing design speeds & lanes will remain. This option matches Alt02_Opt01 except viaduct extends to West Idaho Springs. Bus Rapid Transit.	\$ 427,235,805	\$ 448,971,906	\$ 81,174,803	\$ 85,304,662	Not included in Alternative	\$ 508,410,609	\$ 534,276,569	\$ 298,686,979	\$ 313,883,014	Not included in Alternative	\$ 807,100,000	\$ 848,160,000
Alt03_Opt01	Minimum program per PEIS with 55 mph design speed including a 3rd bore at EJMT. Minimum program is generally localized auxillary lane improvements. AGS.	\$ 140,849,649	\$ 151,501,778	\$ 26,761,433	\$ 28,785,338	\$ 552,181,800	\$ 719,792,882	\$ 732,468,916	\$ 110,356,426	\$ 118,702,424	\$ 437,218,200	\$ 1,267,370,000	\$ 1,288,390,000
Alt03_Opt02	Minimum program per PEIS with 65 mph design speed including a 3rd bore at EJMT. Minimum program is generally localized auxillary lane improvements. AGS.	\$ 166,304,874	\$ 177,709,180	\$ 31,597,926	\$ 33,764,744	\$ 552,181,800	\$ 750,084,600	\$ 763,655,724	\$ 130,300,726	\$ 139,236,058	\$ 437,218,200	\$ 1,317,610,000	\$ 1,340,110,000
Alt03_Opt03	Minimum program per PEIS with 55 mph design speed without a 3rd bore at EJMT. Minimum program is generally localized auxillary lane improvements. Option is similar to Alt03_Opt01 without 3rd bore at EJMT. AGS.	\$ 37,994,751	\$ 40,701,694	\$ 7,219,003	\$ 7,733,322	\$ 552,181,800	\$ 597,395,553	\$ 600,616,815	\$ 29,769,083	\$ 31,889,987	\$ 437,218,200	\$ 1,064,390,000	\$ 1,069,730,000
Alt03_Opt04	Minimum program per PEIS with 65 mph design speed without a 3rd bore at EJMT. Minimum program is generally localized auxillary lane improvements. Option is similar to Alt03_Opt02 without 3rd bore at EJMT. AGS.	\$ 64,055,189	\$ 68,162,819	\$ 12,170,486	\$ 12,950,936	\$ 552,181,800	\$ 628,407,475	\$ 633,295,554	\$ 50,187,571	\$ 53,405,920	\$ 437,218,200	\$ 1,115,820,000	\$ 1,123,920,000
Alt04_Opt01	Maximum program per PEIS with 55 mph design speed including a 3rd bore at EJMT. Maximum program includes one additional non-reversible tolled lane (EB & WB) between EJMT and Floyd Hill. AGS.	\$ 189,812,045	\$ 202,402,143	\$ 36,064,289	\$ 38,456,407	\$ 552,181,800	\$ 778,058,134	\$ 793,040,351	\$ 148,718,716	\$ 158,583,123	\$ 437,218,200	\$ 1,364,000,000	\$ 1,388,850,000
Alt04_Opt02	Maximum program per PEIS with 65 mph design speed including a 3rd bore at EJMT. Maximum program includes one additional non-reversible tolled lane (EB & WB) between EJMT and Floyd Hill. AGS.	\$ 218,954,209	\$ 232,668,994	\$ 41,601,300	\$ 44,207,109	\$ 552,181,800	\$ 812,737,309	\$ 829,057,903	\$ 171,551,751	\$ 182,297,356	\$ 437,218,200	\$ 1,421,510,000	\$ 1,448,580,000
Alt05_Opt01	Permanent Peak Period Shoulder Lane EB and WB. Widen the existing roadway to accommodate one additional left side managed lane (EB & WB) for use during peak times; during non-peak times operates as a standard shoulder. Provide full width shoulder on right side. AGS.	\$ 140,043,334	\$ 148,499,632	\$ 26,608,233	\$ 28,214,930	\$ 552,181,800	\$ 718,833,367	\$ 728,896,362	\$ 109,724,674	\$ 116,350,227	\$ 437,218,200	\$ 1,265,780,000	\$ 1,282,470,000
Alt06_Opt01	Temporary Peak Period Shoulder Lane. Using the existing roadway, accommodate one additional WB left side managed lane for use during peak times; during non-peak times operates as a standard shoulder. No 12 foot wide shoulders are available during peak periods. Construction of WB peak period lane is from Empire to Floyd Hill only. (Assumes EB peak period lane from Empire to Floyd Hill is constructed.) AGS.	\$ 7,223,067	\$ 7,773,543	\$ 1,372,383	\$ 1,476,973	\$ 552,181,800	\$ 560,777,250	\$ 561,432,316	\$ 5,659,310	\$ 6,090,611	\$ 437,218,200	\$ 1,003,660,000	\$ 1,004,750,000

I-70 Traffic & Revenue Study Level 1 Summary of Alternatives & Options

Operating & Maintenance Costs

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Alternative Number	Alternative Description	Roadway & Structures	Tunnels	Bus Rapid Transit	Advanced Guideway System	Total Operating & Maintenance Costs per Year
Alt01_Opt01	2 tolled reversible managed lanes designed at 65 mph. The reversible managed lanes are on a separate viaduct structure from East Idaho Springs to Floyd Hill in order to maintain 65 mph design speed. General Purpose lanes designed at 55 mph except from East Idaho Springs to Floyd Hill, where existing design speeds and lanes will remain.	\$ 16,516,343	\$ 3,209,941	\$ 29,921,470	Not included in Alternative	\$ 49,650,000
Alt01_Opt02	2 tolled reversible managed lanes and I-70 designed at 65 mph. This option matches Alt01_Opt01 except from East Idaho Springs to Floyd Hill, where the reversible managed lanes and I-70 will be reconstructed to meet a 65 mph design speed.	\$ 16,639,434	\$ 3,209,941	\$ 29,921,470	Not included in Alternative	\$ 49,780,000
Alt02_Opt01	3 tolled reversible managed lanes designed at 65 mph. The reversible managed lanes are on a separate viaduct from East Idaho Springs to Floyd Hill in order to maintain 65 mph design speed. General Purpose lanes designed at 55 mph except from East Idaho Springs to Floyd Hill, where existing design speeds and lanes will remain.	\$ 19,099,298	\$ 4,841,044	\$ 29,921,470	Not included in Alternative	\$ 53,870,000
Alt02_Opt02	3 tolled reversible managed lanes designed at 65 mph. This option matches Alt02_Opt01 except from East Idaho Springs to Floyd Hill, where the reversible managed lanes and I-70 General Purpose lanes will be reconstructed to meet a 65 mph design speed.	\$ 19,370,647	\$ 4,841,044	\$ 29,921,470	Not included in Alternative	\$ 54,140,000
Alt02_Opt03	3 tolled reversible managed lanes designed at 65 mph. The reversible managed lanes are on a separate viaduct structure from West Idaho Springs to Floyd Hill to minimize impacts. General Purpose lanes designed at 65 mph except from West Idaho Springs to Floyd Hill where existing design speeds and lanes will remain. This option matches Alt02_Opt01 except viaduct extends to West Idaho Springs.	\$ 19,307,581	\$ 4,841,044	\$ 29,921,470	Not included in Alternative	\$ 54,080,000
Alt03_Opt01	Minimum program per PEIS with 55 mph design speed including a 3rd bore at EJMT. Minimum program is generally localized auxillary lane improvements.	\$ 5,977,871	\$ 4,739,127	Not included in Alternative	\$ 59,245,212	\$ 69,970,000
Alt03_Opt02	Minimum program per PEIS with 65 mph design speed including a 3rd bore at EJMT. Minimum program is generally localized auxillary lane improvements.	\$ 5,977,871	\$ 4,972,640	Not included in Alternative	\$ 59,245,212	\$ 70,200,000
Alt03_Opt03	Minimum program per PEIS with 55 mph design speed without a 3rd bore at EJMT. Minimum program is generally localized auxillary lane improvements. Option is similar to Alt03_Opt01 without 3rd bore at EJMT.	\$ 5,450,691	Not included in Alternative	Not included in Alternative	\$ 59,245,212	\$ 64,700,000
Alt03_Opt04	Minimum program per PEIS with 65 mph design speed without a 3rd bore at EJMT. Minimum program is generally localized auxillary lane improvements. Option is similar to Alt03_Opt02 without 3rd bore at EJMT.	\$ 5,459,132	\$ 232,399	Not included in Alternative	\$ 59,245,212	\$ 64,940,000
Alt04_Opt01	Maximum program per PEIS with 55 mph design speed including a 3rd bore at EJMT. Maximum program includes one additional non-reversible tolled lane (EB & WB) between EJMT and Floyd Hill.	\$ 9,497,232	\$ 4,739,127	Not included in Alternative	\$ 59,245,212	\$ 73,490,000
Alt04_Opt02	Maximum program per PEIS with 65 mph design speed including a 3rd bore at EJMT. Maximum program includes one additional non-reversible tolled lane (EB & WB) between EJMT and Floyd Hill.	\$ 9,499,632	\$ 4,972,640	Not included in Alternative	\$ 59,245,212	\$ 73,720,000
Alt05_Opt01	Permanent Peak Period Shoulder Lane EB and WB. Widen the existing roadway to accommodate one additional left side managed lane (EB & WB) for use during peak times; during non-peak times operates as a standard shoulder. Provide full width shoulder on right side.	\$ 10,651,029	\$ 3,159,418	Not included in Alternative	\$ 59,245,212	\$ 73,060,000
Alt06_Opt01	Temporary Peak Period Shoulder Lane. Using the existing roadway, accommodate one additional WB left side managed lane for use during peak times; during non-peak times operates as a standard shoulder. No twelve foot wide shoulders are available during peak periods. Construction of WB peak period lane is from Empire to Floyd Hill only. (Assumes EB peak period lane from Empire to Floyd Hill is constructed.)	\$ 3,463,832	Not included in Alternative	Not included in Alternative	\$ 59,245,212	\$ 62,710,000

I-70 Cost Estimate: Level 1 Assumptions

Roadway Calculated Quantities Include:

- Walls Cut (SF cost – includes all concrete, reinforcement, facing panels with plain smooth texture, etc to construct wall)
- Walls Fill (SF cost – includes all concrete, reinforcement, backfill, facing panels with plain smooth texture, etc to construct wall)
- Excavation – Rock Cut
- Embankment
- Pavement Resurfacing (Ton cost includes mill and 3.5” HMA overlay depth)
- Pavement – Full Depth (Ton cost is average for 7.5” HMA depth)
- Base Course (CY cost is for 8” ABC)
- Barrier – Type 7
- Barrier – Retaining (the model does not differentiate retaining vs type 7. Used a percentage of overall barrier based on length of split profiles applied)
- Guardrail – Type 3
- Interchange – The interchanges are not modeled, estimate based on plan view disturbance area. Estimate roughly includes walls, embankment, pavement, barrier, guardrail, curb and gutter and bridge cost. All other items are assumed to be covered as part of the allowances/contingencies.

Structures Calculated Quantities Include:

- Bridge area (in square feet, edge of deck to edge of deck, back face of abutment to back face of abutment)
- Standard approach slab (20-ft length x abutment width) at each bridge end

Structures Unit Costs Include:

- Concrete and reinforcing for deck, abutments, piers (varies by bridge type)
- Girders (varies by bridge type)
- Foundations (varies by bridge type)
- Standard structural concrete coating
- Type 7 or Type 10 bridge rail, measured to end back face of abutments
- Deck waterproofing
- Hot Mix Asphalt on bridge area

CSS Contingency, Assume Includes:

- Slope rounding
- Rock cut shaping and staining
- Wall texture, formliners, colors and other aesthetics
- Barrier painting
- Changes in roadway template to fit better in the terrain (wider median or reduction to smaller footprint)
- Landscape Walls
- Landscaping
- Tiered/stepped walls
- Additional bridge length needed to address CSS Guidelines
- Form liners, colors, or other aesthetic qualities for substructure elements and retaining wall faces
- Special coatings/paint
- Special lighting in rail or under bridge
- Trail systems
- Local context phasing
- Historic mitigation (avoid historic area, minimize impacts if avoidance is not possible)

Specific items not included in quantity estimate, to be covered in allowances (unallocated items):

- Clearing and Grubbing
- Removals and Resets
- Bridge demolition and removal
- Structure backfill/excavation (includes reinforced backfill at bridge abutments)
- Impact attenuators, end anchorages, transitions, etc for guardrail
- Shoring
- Lighting
- Fencing
- Avalanche protection
- Soundwalls

Seeding, Wetlands, Stream and Site Impacts

- Basic landscaping and seeding
- Wetland mitigation
- Stream mitigation
- Site impacts (trail, parking lots, ball fields, etc)

NEPA costs, Assumptions Include:

Labor costs only, at burdened rate

Costs were calculated by looking at the number of days to complete the NEPA process (including any necessary reevaluations)

Every calendar day was equivalent to 88 hours (11 FTE's working 8 hours a day)

The final cost included the number of hours to complete multiplied by a burdened labor rate of \$135.00

This generally covers the necessary labor needed for agency and stakeholder coordination, scoping, project management, data collection and analysis.

Items **NOT** included in the estimate would be Other Direct Costs:

Travel costs, Reproduction Costs, Meals and Postage

Other:

Field offices, sanitary facilities, etc. assumed to be covered in mobilization

Signing & Striping allowance does not include signage specific to managed lanes, such as lane use signs, VMS, etc. Only for regular highway signage.

I-70 Cost Estimate Build-Up

Alt01_Opt01

2 tolled reversible managed lanes designed at 65 mph. The reversible managed lanes are on a separate viaduct structure from East Idaho Springs to Floyd Hill in order to maintain 65 mph design speed. General Purpose lanes designed at 55 mph except from East Idaho Springs to Floyd Hill, where existing design speeds and lanes will remain.

CAPITAL COSTS

Roadway & Structures	Units	Quantity	Unit Cost	Cost
Structures - Basic	SF	1,038,825	\$ 150	\$ 155,823,750
Special Structures - Complex	SF	439,625	\$ 200	\$ 87,925,000
Special Structures - Fly-Over	SF	212,625	\$ 225	\$ 47,840,625
Special Structures - Viaduct	SF	964,650	\$ 225	\$ 217,046,250
Interchanges	LS	1	\$ 207,116,990	\$ 207,116,990
Wildlife Crossings - Structures	LS	1	\$ 172,025,000	\$ 172,025,000
Wildlife Crossings - Pipes, Fencing, Miscellaneous	LS	1	\$ 10,696,000	\$ 10,696,000
Walls - Cut	SF	586,220	\$ 75	\$ 43,966,500
Walls - Fill	SF	1,682,140	\$ 50	\$ 84,107,000
Excavation - Rock Cut	CY	5,153,580	\$ 50	\$ 257,679,000
Embankment	CY	3,328,210	\$ 6	\$ 19,969,260
Pavement Resurfacing	Ton	188,750	\$ 80	\$ 15,100,000
Pavement - Full Depth	Ton	1,423,800	\$ 70	\$ 99,666,000
Base Course	CY	807,090	\$ 25	\$ 20,177,250
Barrier - Type 7	LF	655,590	\$ 50	\$ 32,779,500
Barrier - Retaining	LF	280,970	\$ 125	\$ 35,121,250
Guardrail - Type 3	LF	77,450	\$ 20	\$ 1,549,000
ITS	LS	1	\$ 55,100,000	\$ 55,100,000
Transportation & Operation Center	LS	1	\$ 24,600,000	\$ 24,600,000
Tolling, Gates, & Controls	LS	1	\$ 33,500,000	\$ 33,500,000
Maintenance Equipment (Special)	LS	1	\$ 1,650,000	\$ 1,650,000
<i>Roadway & Structures Subtotal</i>				\$ 1,623,438,375
Roadway & Structures Allowances		% Range or Units	% Cost or Cost	Cost
Allowances (Unallocated Items)		1% - 10%	5%	\$ 81,171,919
Seeding, Wetlands, Stream and Site Impacts	LS		\$ 10,167,100	\$ 10,167,100
Utilities	LS		\$ 10,300,000	\$ 10,300,000
Drainage & Water Quality (Permanent)	LS		\$ 44,282,670	\$ 44,282,670
Water Quality (Construction)	LS		\$ 7,932,500	\$ 7,932,500
Signing & Striping (General)		1% - 5%	1.5%	\$ 24,351,576
Traffic Control (Construction) excluding Viaduct		5% - 25%	3%	\$ 42,191,764
Mobilization & Staging		4% - 10%	10%	\$ 162,343,838
Right-of-Way	LS		\$ 5,000,000	\$ 5,000,000
CSS Contingency		0	15%	\$ 243,515,756
<i>Total of Roadway & Structures Allowances</i>				\$ 631,257,122
<i>of Roadway & Structures Items & Allowances</i>				\$ 2,254,695,497

Tunnel Components	Units	Quantity	Unit Cost	Cost
Twin Tunnels - New Bore	LF	1,300	\$ 35,833	\$ 46,582,900
Twin Tunnels Cross Passages	LS	1	\$ 1,316,890	\$ 1,316,890
Twin Tunnels - New Bore Systems	LS	1	\$ 6,601,000	\$ 6,601,000
Hidden Valley Tunnels (1) (EB)	LF	-	\$ -	\$ -
Hidden Valley Tunnels (1) (WB)	LF	-	\$ -	\$ -
Hidden Valley Tunnels (1) Cross Passages	LS	-	\$ -	\$ -
Hidden Valley Tunnels (1) Systems	LS	-	\$ -	\$ -
Hidden Valley Tunnel (2) (WB)	LF	-	\$ -	\$ -
Hidden Valley Tunnel (2) Cross Passage	LS	-	\$ -	\$ -
Hidden Valley Tunnel (2) Systems	LS	-	\$ -	\$ -
EJMT Approaches	LF	5,200	\$ 25,000	\$ 130,000,000
EJMT North Bore	LF	8,700	\$ 57,446	\$ 499,780,200
EJMT Cross Passages	LS	1	\$ 24,189,190	\$ 24,189,190
EJMT Systems	LS	1	\$ 55,025,500	\$ 55,025,500
<i>Tunnel Components Subtotal</i>				\$ 763,495,680
Tunnel Allowances		% Range or Units	% Cost or Cost	Cost
Allowances (Unallocated Items)		1% - 10%	4%	\$ 30,539,827
Seeding, Wetlands, Stream and Site Impacts	LS		\$ 22,350	\$ 22,350
Utilities	LS		\$ 15,000,000	\$ 15,000,000
Drainage & Water Quality (Permanent)	LS		\$ 9,887,000	\$ 9,887,000
Water Quality (Construction)	LS		\$ 191,500	\$ 191,500
Signing & Striping (General)		1% - 2%	0.5%	\$ 3,817,478
Traffic Control (Construction)		1% - 2%	1.0%	\$ 7,634,957
Mobilization & Staging		5% - 15%	10%	\$ 76,349,568
Right-of-Way	LS		\$ -	\$ -
CSS Contingency		0	15%	\$ 114,524,352
<i>Total of Tunnel Allowances</i>				\$ 257,967,032
<i>Total of Tunnel Components & Allowances</i>				\$ 1,021,462,712

I-70 Cost Estimate Build-Up

Alt01_Opt01

2 tolled reversible managed lanes designed at 65 mph. The reversible managed lanes are on a separate viaduct structure from East Idaho Springs to Floyd Hill in order to maintain 65 mph design speed. General Purpose lanes designed at 55 mph except from East Idaho Springs to Floyd Hill, where existing design speeds and lanes will remain.

CAPITAL COSTS

Transit Components	Units	Quantity	Unit Cost	Cost
Vehicles	EA	22	\$ 600,000	\$ 13,200,000
Infrastructure	LS	1	\$	-
Stations - Basic	EA	11	\$ 1,850,000	\$ 20,350,000
Stations - Major	EA	1	\$ 8,000,000	\$ 8,000,000
Maintenance Barn	EA	1	\$ 15,000,000	\$ 15,000,000
<i>Transit Components Subtotal</i>				\$ 56,550,000
Transit Allowances		% Range or Units	% Cost or Cost	Cost
Allowances (Unallocated Items)		1% - 10%	20%	\$ 11,310,000
Seeding, Wetlands, Stream and Site Impacts		LS	\$ 10,000,000	\$ 10,000,000
Utilities		LS	\$ 2,167,500	\$ 2,167,500
Drainage & Water Quality (Permanent)		LS	\$ 4,335,000	\$ 4,335,000
Water Quality (Construction)		LS	\$ 433,500	\$ 433,500
Signing & Striping (General)		1% - 5%		\$ -
Traffic Control (Construction)	LS	4% - 10%	5%	\$ 2,827,500
Mobilization & Staging		4% - 10%	4%	\$ 2,262,000
Right-of-Way		LS	\$ 3,054,000	\$ 3,054,000
CSS Contingency		0	15%	\$ 8,482,500
<i>Transit Allowance Total</i>				\$ 44,872,000
<i>Transit Components & Allowance Total</i>				\$ 101,422,000

SUMMARY OF CAPITAL COSTS	Cost
Roadway & Structures & Allowances	\$ 2,254,695,497
Tunnel Components & Allowances	\$ 1,021,462,712
Transit Components & Allowances	\$ 101,422,000
<i>Roadway, Structures, Tunnels, Transit Construction Total</i>	\$ 3,377,580,209

DESIGN & CONSTRUCTION ENGINEERING	% Range or Units	% Cost or Cost	Cost
NEPA	LS	\$ -	\$ 19,506,960
Roadway & Structures Preliminary & Final Design	8% - 12%	12%	\$ 270,563,460
Tunnels Preliminary & Final Design	8% - 12%	10%	\$ 102,146,271
Transit Preliminary & Final Design	8% - 12%	8%	\$ 8,113,760
CSS Design Contingency	19%	19%	\$ 72,356,463
<i>Preliminary & Final Design Total</i>			\$ 472,686,914
Roadway & Structures Construction Engineering	6% - 10%	8%	\$ 180,375,640
Tunnels Construction Engineering	6% - 10%	8%	\$ 81,717,017
Transit Construction Engineering	4% - 10%	4%	\$ 4,056,880
<i>Construction Engineering Total</i>			\$ 266,149,537
<i>Final Design & Construction Engineering Total</i>			\$ 738,836,451

<i>Design, & Construction Engineering Total</i>	\$ 4,116,416,660
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I-70 Cost Estimate Build-Up

Alt01_Opt01

2 tolled reversible managed lanes designed at 65 mph. The reversible managed lanes are on a separate viaduct structure from East Idaho Springs to Floyd Hill in order to maintain 65 mph design speed. General Purpose lanes designed at 55 mph except from East Idaho Springs to Floyd Hill, where existing design speeds and lanes will remain.

OPERATIONS & MAINTENANCE

Roadway & Structures O&M Costs	Unit	Quantity	Unit Cost		Total
Snow Removal	LM	107	\$	10,030	\$ 1,077,237
Routine Maintenance	LM	107	\$	9,754	\$ 1,047,610
Pavement Rehabilitation	LM	107	\$	14,132	\$ 1,517,734
ITS Operations	LS	1	\$	4,400,000	\$ 4,400,000
Tolling Operations	LS	1	\$	2,700,000	\$ 2,700,000
Long Term Capital Replacement	LS	1	\$	5,773,762	\$ 5,773,762
<i>Roadway, Structures O&M Total Cost per Year</i>					\$ 16,516,343

Tunnel O&M	Unit	Quantity	Unit Cost		Total
Routine Maintenance	LM	4	\$	812,826	\$ 3,161,893
Pavement Rehabilitation	LM	3	\$	14,132	\$ 48,047
Tunnel Systems	LS	1			\$ -
Long Term Capital Replacement	LS	1			\$ -
<i>Tunnel O&M Total Cost per Year</i>					\$ 3,209,941

Transit O&M Costs	Unit	Quantity	Unit Cost		Total
Vehicle Operations	LS	1	\$	11,994,813	\$ 11,994,813
Vehicle Maintenance	LS	1	\$	3,271,313	\$ 3,271,313
Infrastructure Maintenance	LS	1	\$	2,617,050	\$ 2,617,050
Long Term Capital Replacement	LS	1	\$	8,112,719	\$ 8,112,719
General & Administrative	LS	1	\$	3,925,575	\$ 3,925,575
<i>Transit O&M Total Costs per Year</i>					\$ 29,921,470

ct Operations & Maintenance Total per year					\$ 49,647,753
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I-70 Cost Estimate Build-Up

Alt01_Opt02

2 tolled reversible managed lanes and I-70 designed at 65 mph. This option matches Alt01_Opt01 except from East Idaho Springs to Floyd Hill, where the reversible managed lanes and I-70 will be reconstructed to meet a 65 mph design speed.

CAPITAL COSTS

Roadway & Structures	Units	Quantity	Unit Cost	Cost
Structures - Basic	SF	976025	\$ 150	\$ 146,403,750
Special Structures - Complex	SF	1075000	\$ 200	\$ 215,000,000
Special Structures - Fly-Over	SF	212650	\$ 225	\$ 47,846,250
Special Structures - Viaduct	SF	494975	\$ 225	\$ 111,369,375
Interchanges	LS	1	\$ 325,097,600	\$ 325,097,600
Wildlife Crossings - Structures	LS	1	\$ 174,250,000	\$ 174,250,000
Wildlife Crossings - Pipes, Fencing, Miscellaneous	LS	1	\$ 10,696,000	\$ 10,696,000
Walls - Cut	SF	599160	\$ 75	\$ 44,937,000
Walls - Fill	SF	1838500	\$ 50	\$ 91,925,000
Excavation - Rock Cut	CY	6323780	\$ 50	\$ 316,189,000
Embankment	CY	3824760	\$ 6	\$ 22,948,560
Pavement Resurfacing	Ton	188750	\$ 80	\$ 15,100,000
Pavement - Full Depth	Ton	1460530	\$ 70	\$ 102,237,100
Base Course	CY	827800	\$ 25	\$ 20,695,000
Barrier - Type 7	LF	613900	\$ 50	\$ 30,695,000
Barrier - Retaining	LF	263100	\$ 125	\$ 32,887,500
Guardrail - Type 3	LF	79700	\$ 20	\$ 1,594,000
ITS	LS	1	\$ 55,100,000	\$ 55,100,000
Transportation & Operation Center	LS	1	\$ 24,600,000	\$ 24,600,000
Tolling, Gates, & Controls	LS	1	\$ 33,500,000	\$ 33,500,000
Maintenance Equipment (Special)	LS	1	\$ 1,650,000	\$ 1,650,000
<i>Roadway & Structures Subtotal</i>				\$ 1,824,721,135
Roadway & Structures Allowances		% Range or Units	% Cost or Cost	Cost
Allowances (Unallocated Items)		1% - 10%	5%	\$ 91,236,057
Seeding, Wetlands, Stream and Site Impacts	LS		\$ 10,167,100	\$ 10,167,100
Utilities	LS		\$ 10,500,000	\$ 10,500,000
Drainage & Water Quality (Permanent)	LS		\$ 46,018,626	\$ 46,018,626
Water Quality (Construction)	LS		\$ 7,932,500	\$ 7,932,500
Signing & Striping (General)		1% - 5%	1.5%	\$ 27,370,817
Traffic Control (Construction)		5% - 25%	4%	\$ 72,988,845
Mobilization & Staging		4% - 10%	10%	\$ 182,472,114
Right-of-Way	LS		\$ 5,000,000	\$ 5,000,000
CSS Contingency		15%	15%	\$ 273,708,170
<i>Total of Roadway & Structures Allowances</i>				\$ 727,394,229
<i>Total of Roadway & Structures Items & Allowances</i>				\$ 2,552,115,364

Tunnel Components	Units	Quantity	Unit Cost	Cost
Twin Tunnels - New Bore	LF	1300	\$ 35,833	\$ 46,582,900
Twin Tunnels Cross Passages	LS	1	\$ 1,316,890	\$ 1,316,890
Twin Tunnels - New Bore Systems	LS	1	\$ 6,601,000	\$ 6,601,000
Hidden Valley Tunnels (1) (EB)	LF	0	\$ -	\$ -
Hidden Valley Tunnels (1) (WB)	LF	0	\$ -	\$ -
Hidden Valley Tunnels (1) Cross Passages	LS	0	\$ -	\$ -
Hidden Valley Tunnels (1) Systems	LS	0	\$ -	\$ -
Hidden Valley Tunnel (2) (WB)	LF	0	\$ -	\$ -
Hidden Valley Tunnel (2) Cross Passage	LS	0	\$ -	\$ -
Hidden Valley Tunnel (2) Systems	LS	0	\$ -	\$ -
EJMT Approaches	LF	5,200	\$ 25,000	\$ 130,000,000
EJMT North Bore	LF	8700	\$ 57,446	\$ 499,780,200
EJMT Cross Passages	LS	1	\$ 24,189,130	\$ 24,189,130
EJMT Systems	LS	1	\$ 55,025,500	\$ 55,025,500
<i>Tunnel Components Subtotal</i>				\$ 763,495,620
Tunnel Allowances		% Range or Units	% Cost or Cost	Cost
Allowances (Unallocated Items)		1% - 10%	4%	\$ 30,539,825
Seeding, Wetlands, Stream and Site Impacts	LS		\$ 22,350	\$ 22,350
Utilities	LS		\$ 15,000,000	\$ 15,000,000
Drainage & Water Quality (Permanent)	LS		\$ 9,887,000	\$ 9,887,000
Water Quality (Construction)	LS		\$ 191,500	\$ 191,500
Signing & Striping (General)		1% - 2%	0.5%	\$ 3,817,478
Traffic Control (Construction)		1% - 2%	1.0%	\$ 7,634,956
Mobilization & Staging		5% - 15%	10%	\$ 76,349,562
Right-of-Way	LS		\$ -	\$ -
CSS Contingency		15%	15%	\$ 114,524,343
<i>Total of Tunnel Allowances</i>				\$ 257,967,014
<i>Total of Tunnel Components & Allowances</i>				\$ 1,021,462,634

I-70 Cost Estimate Build-Up

Alt01_Opt02

2 tolled reversible managed lanes and I-70 designed at 65 mph. This option matches Alt01_Opt01 except from East Idaho Springs to Floyd Hill, where the reversible managed lanes and I-70 will be reconstructed to meet a 65 mph design speed.

CAPITAL COSTS

Transit Components	Units	Quantity	Unit Cost	Cost
Vehicles	EA	22	\$ 600,000	\$ 13,200,000
Infrastructure	LS	1	\$	-
Stations - Basic	EA	11	\$ 1,850,000	\$ 20,350,000
Stations - Major	EA	1	\$ 8,000,000	\$ 8,000,000
Maintenance Barn	EA	1	\$ 15,000,000	\$ 15,000,000
<i>Transit Components Subtotal</i>				\$ 56,550,000
Transit Allowances		% Range or Units	% Cost or Cost	Cost
Allowances (Unallocated Items)		1% - 10%	20%	\$ 11,310,000
Seeding, Wetlands, Stream and Site Impacts		LS	\$ 10,000,000	\$ 10,000,000
Utilities		LS	\$ 2,167,500	\$ 2,167,500
Drainage & Water Quality (Permanent)		LS	\$ 4,335,000	\$ 4,335,000
Water Quality (Construction)		LS	\$ 433,500	\$ 433,500
Signing & Striping (General)		1% - 5%		-
Traffic Control (Construction)		5% - 25%	5%	\$ 2,827,500
Mobilization & Staging		4% - 10%	4%	\$ 2,262,000
Right-of-Way		LS	\$ 3,054,000	\$ 3,054,000
CSS Contingency		15%	15%	\$ 8,482,500
<i>Transit Allowance Total</i>				\$ 44,872,000
<i>Transit Components & Allowance Total</i>				\$ 101,422,000

SUMMARY OF CAPITAL COSTS	Cost
Roadway & Structures & Allowances	\$ 2,552,115,364
Tunnel Components & Allowances	\$ 1,021,462,634
Transit Components & Allowances	\$ 101,422,000
<i>Roadway, Structures, Tunnels, Transit Construction Total</i>	\$ 3,674,999,998

DESIGN & CONSTRUCTION ENGINEERING	% Range or Units	% Cost or Cost	Cost
NEPA	LS	\$ -	\$ 19,506,960
Roadway & Structures Preliminary & Final Design	8% - 12%	12%	\$ 306,253,844
Tunnels Preliminary & Final Design	8% - 12%	10%	\$ 102,146,263
Transit Preliminary & Final Design	8% - 12%	8%	\$ 8,113,760
CSS Design Contingency	19%	19%	\$ 79,137,635
<i>Preliminary & Final Design Total</i>			\$ 515,158,462
Roadway & Structures Construction Engineering	6% - 10%	8%	\$ 204,169,229
Tunnels Construction Engineering	6% - 10%	8%	\$ 81,717,011
Transit Construction Engineering	4% - 10%	4%	\$ 4,056,880
<i>Construction Engineering Total</i>			\$ 289,943,120
<i>Preliminary & Final Design & Construction Engineering Total</i>			\$ 805,101,582

<i>Project Capital, Design, & Construction Engineering Total</i>	\$ 4,480,101,580
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I-70 Cost Estimate Build-Up

Alt01_Opt02

2 tolled reversible managed lanes and I-70 designed at 65 mph. This option matches Alt01_Opt01 except from East Idaho Springs to Floyd Hill, where the reversible managed lanes and I-70 will be reconstructed to meet a 65 mph design speed.

OPERATIONS & MAINTENANCE

Roadway & Structures O&M Costs	Unit	Quantity	Unit Cost	Total
Snow Removal	LM	107.4	\$ 10,030	\$ 1,077,237
Routine Maintenance	LM	107.4	\$ 9,754	\$ 1,047,610
Pavement Rehabilitation	LM	107.4	\$ 14,132	\$ 1,517,734
ITS Operations	LS	1	\$ 4,400,000	\$ 4,400,000
Tolling Operations	LS	1	\$ 2,700,000	\$ 2,700,000
Long Term Capital Replacement	LS	1	\$ 5,896,853	\$ 5,896,853
<i>Roadway, Structures O&M Total Cost per Year</i>				\$ 16,639,434

Tunnel O&M	Unit	Quantity	Unit Cost	Total
Routine Maintenance	LM	3.89	\$ 812,826	\$ 3,161,893
Pavement Rehabilitation	LM	3.4	\$ 14,132	\$ 48,047
Tunnel Systems	LS	1	\$ -	\$ -
Long Term Capital Replacement	LS	1	\$ -	\$ -
<i>Tunnel O&M Total Cost per Year</i>				\$ 3,209,941

Transit O&M Costs	Unit	Quantity	Unit Cost	Total
Vehicle Operations	LS	1	\$ 11,994,813	\$ 11,994,813
Vehicle Maintenance	LS	1	\$ 3,271,313	\$ 3,271,313
Infrastructure Maintenance	LS	1	\$ 2,617,050	\$ 2,617,050
Long Term Capital Replacement	LS	1	\$ 8,112,719	\$ 8,112,719
General & Administrative	LS	1	\$ 3,925,575	\$ 3,925,575
<i>Transit O&M Total Costs per Year</i>				\$ 29,921,470

<i>Project Operations & Maintenance Total per year</i>				\$ 49,770,844
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I-70 Cost Estimate Build-Up

Alt02_Opt01

3 tolled reversible managed lanes designed at 65 mph. The reversible managed lanes are on a separate viaduct from East Idaho Springs to Floyd Hill in order to maintain 65 mph design speed. General Purpose lanes designed at 55 mph except from East Idaho Springs to Floyd Hill, where existing design speeds and lanes will remain.

CAPITAL COSTS

Roadway & Structures	Units	Quantity	Unit Cost	Cost
Structures - Basic	SF	2543800	\$ 150	\$ 381,570,000
Special Structures - Complex	SF	519750	\$ 200	\$ 103,950,000
Special Structures - Fly-Over	SF	396000	\$ 225	\$ 89,100,000
Special Structures - Viaduct	SF	51050	\$ 225	\$ 11,486,250
Interchanges	LS	1	\$ 457,755,880	\$ 457,755,880
Wildlife Crossings - Structures	LS	1	\$ 181,900,000	\$ 181,900,000
Wildlife Crossings - Pipes, Fencing, Miscellaneous	LS	1	\$ 10,812,000	\$ 10,812,000
Walls - Cut	SF	831260	\$ 75	\$ 62,344,500
Walls - Fill	SF	2114440	\$ 50	\$ 105,722,000
Excavation - Rock Cut	CY	5633500	\$ 50	\$ 281,675,000
Embankment	CY	3603020	\$ 6	\$ 21,618,120
Pavement Resurfacing	Ton	138500	\$ 80	\$ 11,080,000
Pavement - Full Depth	Ton	1598460	\$ 70	\$ 111,892,200
Base Course	CY	890190	\$ 25	\$ 22,254,750
Barrier - Type 7	LF	759280	\$ 50	\$ 37,964,000
Barrier - Retaining	LF	325410	\$ 125	\$ 40,676,250
Guardrail - Type 3	LF	56020	\$ 20	\$ 1,120,400
ITS	LS	1	\$ 55,700,000	\$ 55,700,000
Transportation & Operation Center	LS	1	\$ 25,000,000	\$ 25,000,000
Tolling, Gates, & Controls	LS	1	\$ 36,300,000	\$ 36,300,000
Maintenance Equipment (Special)	LS	1	\$ 1,650,000	\$ 1,650,000
<i>Roadway & Structures Subtotal</i>				\$ 2,051,571,350
Roadway & Structures Allowances		% Range or Units	% Cost or Cost	Cost
Allowances (Unallocated Items)		1% - 10%	5%	\$ 102,578,568
Seeding, Wetlands, Stream and Site Impacts	LS		\$ 11,251,387	\$ 11,251,387
Utilities	LS		\$ 10,500,000	\$ 10,500,000
Drainage & Water Quality (Permanent)	LS		\$ 44,555,924	\$ 44,555,924
Water Quality (Construction)	LS		\$ 8,627,500	\$ 8,627,500
Signing & Striping (General)		1% - 5%	1.5%	\$ 30,773,570
Traffic Control (Construction) Excluding Viaduct		5% - 25%	3%	\$ 61,202,553
Mobilization & Staging		4% - 10%	10%	\$ 205,157,135
Right-of-Way	LS		\$ 10,000,000	\$ 10,000,000
CSS Contingency		15%	15%	\$ 307,735,703
<i>Total of Roadway & Structures Allowances</i>				\$ 792,382,339
<i>Total of Roadway & Structures Items & Allowances</i>				\$ 2,843,953,689

Tunnel Components	Units	Quantity	Unit Cost	Cost
Twin Tunnels - New Bore	LF	1650	\$ 44,752	\$ 73,840,800
Twin Tunnels Cross Passages	LS	1	\$ 1,663,440	\$ 1,663,440
Twin Tunnels - New Bore Systems	LS	1	\$ 7,750,000	\$ 7,750,000
Hidden Valley Tunnels (1) (EB)	LF	0	\$ -	\$ -
Hidden Valley Tunnels (1) (WB)	LF	0	\$ -	\$ -
Hidden Valley Tunnels (1) Cross Passages	LS	0	\$ -	\$ -
Hidden Valley Tunnels (1) Systems	LS	0	\$ -	\$ -
Hidden Valley Tunnel (2) (WB)	LF	0	\$ -	\$ -
Hidden Valley Tunnel (2) Cross Passage	LS	0	\$ -	\$ -
Hidden Valley Tunnel (2) Systems	LS	0	\$ -	\$ -
EJMT Approaches	LF	5,200	\$ 25,000	\$ 130,000,000
EJMT North Bore	LF	8700	\$ 72,363	\$ 629,558,100
EJMT Cross Passages	LS	1	\$ 24,119,880	\$ 24,119,880
EJMT Systems	LS	1	\$ 59,247,500	\$ 59,247,500
<i>Tunnel Components Subtotal</i>				\$ 926,179,720
Tunnel Allowances		% Range or Units	% Cost or Cost	Cost
Allowances (Unallocated Items)		1% - 10%	4%	\$ 37,047,189
Seeding, Wetlands, Stream and Site Impacts	LS		\$ 22,500	\$ 22,500
Utilities	LS		\$ 15,000,000	\$ 15,000,000
Drainage & Water Quality (Permanent)	LS		\$ 10,592,000	\$ 10,592,000
Water Quality (Construction)	LS		\$ 191,500	\$ 191,500
Signing & Striping (General)		1% - 2%	0.5%	\$ 4,630,899
Traffic Control (Construction)		1% - 2%	1.0%	\$ 9,261,797
Mobilization & Staging		5% - 15%	10%	\$ 92,617,972
Right-of-Way	LS		\$ -	\$ -
CSS Contingency		15%	15%	\$ 138,926,958
<i>Total of Tunnel Allowances</i>				\$ 308,290,815
<i>Total of Tunnel Components & Allowances</i>				\$ 1,234,470,535

I-70 Cost Estimate Build-Up

Alt02_Opt01

3 tolled reversible managed lanes designed at 65 mph. The reversible managed lanes are on a separate viaduct from East Idaho Springs to Floyd Hill in order to maintain 65 mph design speed. General Purpose lanes designed at 55 mph except from East Idaho Springs to Floyd Hill, where existing design speeds and lanes will remain.

CAPITAL COSTS

Transit Components	Units	Quantity	Unit Cost	Cost
Vehicles	EA	22	\$ 600,000	\$ 13,200,000
Infrastructure	LS	1		\$ -
Stations - Basic	EA	11	\$ 1,850,000	\$ 20,350,000
Stations - Major	EA	1	\$ 8,000,000	\$ 8,000,000
Maintenance Barn	EA	1	\$ 15,000,000	\$ 15,000,000
<i>Transit Components Subtotal</i>				\$ 56,550,000
Transit Allowances				
		% Range or Units	% Cost or Cost	Cost
Allowances (Unallocated Items)		1% - 10%	20%	\$ 11,310,000
Seeding, Wetlands, Stream and Site Impacts	LS		\$ 10,000,000	\$ 10,000,000
Utilities	LS		\$ 2,167,500	\$ 2,167,500
Drainage & Water Quality (Permanent)	LS		\$ 4,335,000	\$ 4,335,000
Water Quality (Construction)	LS		\$ 433,500	\$ 433,500
Signing & Striping (General)		1% - 5%		\$ -
Traffic Control (Construction)		5% - 25%	5%	\$ 2,827,500
Mobilization & Staging		4% - 10%	4%	\$ 2,262,000
Right-of-Way	LS		\$ 3,054,000	\$ 3,054,000
CSS Contingency		15%	15%	\$ 8,482,500
<i>Transit Allowance Total</i>				\$ 44,872,000
<i>Transit Components & Allowance Total</i>				\$ 101,422,000

SUMMARY OF CAPITAL COSTS	Cost
Roadway & Structures & Allowances	\$ 2,843,953,689
Tunnel Components & Allowances	\$ 1,234,470,535
Transit Components & Allowances	\$ 101,422,000
<i>Roadway, Structures, Tunnels, Transit Construction Total</i>	\$ 4,179,846,224

DESIGN & CONSTRUCTION ENGINEERING	% Range or Units	% Cost or Cost	Cost
NEPA	LS	\$ -	\$ 19,506,960
Roadway & Structures Preliminary & Final Design	8% - 12%	12%	\$ 341,274,443
Tunnels Preliminary & Final Design	8% - 12%	10%	\$ 123,447,053
Transit Preliminary & Final Design	8% - 12%	8%	\$ 8,113,760
CSS Design Contingency	19%	19%	\$ 89,838,699
<i>Preliminary & Final Design Total</i>			\$ 582,180,915
Roadway & Structures Construction Engineering	6% - 10%	8%	\$ 227,516,295
Tunnels Construction Engineering	6% - 10%	8%	\$ 98,757,643
Transit Construction Engineering	4% - 10%	4%	\$ 4,056,880
<i>Construction Engineering Total</i>			\$ 330,330,818
<i>Preliminary & Final Design & Construction Engineering Total</i>			\$ 912,511,733

Project Capital, Design, & Construction Engineering Total	\$ 5,092,357,957
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I-70 Cost Estimate Build-Up

Alt02_Opt01

3 tolled reversible managed lanes designed at 65 mph. The reversible managed lanes are on a separate viaduct from East Idaho Springs to Floyd Hill in order to maintain 65 mph design speed. General Purpose lanes designed at 55 mph except from East Idaho Springs to Floyd Hill, where existing design speeds and lanes will remain.

OPERATIONS & MAINTENANCE

Roadway & Structures O&M Costs	Unit	Quantity	Unit Cost		Total
Snow Removal	LM	161.1	\$	8,758	\$ 1,410,854
Routine Maintenance	LM	161.1	\$	9,364	\$ 1,508,584
Pavement Rehabilitation	LM	161.1	\$	14,132	\$ 2,276,601
ITS Operations	LS	1	\$	4,500,000	\$ 4,500,000
Tolling Operations	LS	1	\$	2,900,000	\$ 2,900,000
Long Term Capital Replacement	LS	1	\$	6,503,259	\$ 6,503,259
<i>Roadway, Structures O&M Total Cost per Year</i>					\$ 19,099,298

Tunnel O&M	Unit	Quantity	Unit Cost		Total
Routine Maintenance	LM	6.04	\$	789,565	\$ 4,768,973
Pavement Rehabilitation	LM	5.1	\$	14,132	\$ 72,071
Tunnel Systems	LS	1		\$	-
Long Term Capital Replacement	LS	1		\$	-
<i>Tunnel O&M Total Cost per Year</i>					\$ 4,841,044

Transit O&M Costs	Unit	Quantity	Unit Cost		Total
Vehicle Operations	LS	1	\$	11,994,813	\$ 11,994,813
Vehicle Maintenance	LS	1	\$	3,271,313	\$ 3,271,313
Infrastructure Maintenance	LS	1	\$	2,617,050	\$ 2,617,050
Long Term Capital Replacement	LS	1	\$	8,112,719	\$ 8,112,719
General & Administrative	LS	1	\$	3,925,575	\$ 3,925,575
<i>Transit O&M Total Costs per Year</i>					\$ 29,921,470

<i>Project Operations & Maintenance Total per year</i>					\$ 53,861,812
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I-70 Cost Estimate Build-Up

Alt02_Opt02

3 tolled reversible managed lanes designed at 65 mph. This option matches Alt02_Opt01 except from East Idaho Springs to Floyd Hill, where the reversible managed lanes and I-70 General Purpose lanes will be reconstructed to meet a 65 mph design speed.

CAPITAL COSTS

Roadway & Structures	Units	Quantity	Unit Cost	Cost
Structures - Basic	SF	1907550	\$ 150	\$ 286,132,500
Special Structures - Complex	SF	1299400	\$ 200	\$ 259,880,000
Special Structures - Fly-Over	SF	394000	\$ 225	\$ 88,650,000
Special Structures - Viaduct	SF	599250	\$ 225	\$ 134,831,250
Interchanges	LS	1	\$ 341,145,390	\$ 341,145,390
Wildlife Crossings - Structures	LS	1	\$ 204,000,000	\$ 204,000,000
Wildlife Crossings - Pipes, Fencing, Miscellaneous	LS	1	\$ 10,812,000	\$ 10,812,000
Walls - Cut	SF	855450	\$ 75	\$ 64,158,750
Walls - Fill	SF	2260240	\$ 50	\$ 113,012,000
Excavation - Rock Cut	CY	6874090	\$ 50	\$ 343,704,500
Embankment	CY	4240540	\$ 6	\$ 25,443,240
Pavement Resurfacing	Ton	138120	\$ 80	\$ 11,049,600
Pavement - Full Depth	Ton	1657490	\$ 70	\$ 116,024,300
Base Course	CY	924230	\$ 25	\$ 23,105,750
Barrier - Type 7	LF	710640	\$ 50	\$ 35,532,000
Barrier - Retaining	LF	304560	\$ 125	\$ 38,070,000
Guardrail - Type 3	LF	59920	\$ 20	\$ 1,198,400
ITS	LS	1	\$ 55,700,000	\$ 55,700,000
Transportation & Operation Center	LS	1	\$ 25,000,000	\$ 25,000,000
Tolling, Gates, & Controls	LS	1	\$ 36,300,000	\$ 36,300,000
Maintenance Equipment (Special)	LS	1	\$ 1,650,000	\$ 1,650,000
<i>Roadway & Structures Subtotal</i>				\$ 2,215,399,680
Roadway & Structures Allowances		% Range or Units	% Cost or Cost	Cost
Allowances (Unallocated Items)		1% - 10%	5%	\$ 110,769,984
Seeding, Wetlands, Stream and Site Impacts	LS		\$ 11,251,387	\$ 11,251,387
Utilities	LS		\$ 11,100,000	\$ 11,100,000
Drainage & Water Quality (Permanent)	LS		\$ 46,431,440	\$ 46,431,440
Water Quality (Construction)	LS		\$ 8,627,500	\$ 8,627,500
Signing & Striping (General)		1% - 5%	1.5%	\$ 33,230,995
Traffic Control (Construction)		5% - 25%	4%	\$ 88,615,987
Mobilization & Staging		4% - 10%	10%	\$ 221,539,968
Right-of-Way	LS		\$ 10,000,000	\$ 10,000,000
CSS Contingency		15%	15%	\$ 332,309,952
<i>Total of Roadway & Structures Allowances</i>				\$ 873,877,213
<i>Total of Roadway & Structures Items & Allowances</i>				\$ 3,089,276,893

Tunnel Components	Units	Quantity	Unit Cost	Cost
Twin Tunnels - New Bore	LF	1650	\$ 44,752	\$ 73,840,800
Twin Tunnels Cross Passages	LS	1	\$ 1,663,440	\$ 1,663,440
Twin Tunnels - New Bore Systems	LS	1	\$ 7,750,000	\$ 7,750,000
Hidden Valley Tunnels (1) (EB)	LF	0	\$ -	\$ -
Hidden Valley Tunnels (1) (WB)	LF	0	\$ -	\$ -
Hidden Valley Tunnels (1) Cross Passages	LS	0	\$ -	\$ -
Hidden Valley Tunnels (1) Systems	LS	0	\$ -	\$ -
Hidden Valley Tunnel (2) (WB)	LF	0	\$ -	\$ -
Hidden Valley Tunnel (2) Cross Passage	LS	0	\$ -	\$ -
Hidden Valley Tunnel (2) Systems	LS	0	\$ -	\$ -
EJMT Approaches	LF	5,200	\$ 25,000	\$ 130,000,000
EJMT North Bore	LF	8700	\$ 72,363	\$ 629,558,100
EJMT Cross Passages	LS	1	\$ 24,119,880	\$ 24,119,880
EJMT Systems	LS	1	\$ 59,247,500	\$ 59,247,500
<i>Tunnel Components Subtotal</i>				\$ 926,179,720
Tunnel Allowances		% Range or Units	% Cost or Cost	Cost
Allowances (Unallocated Items)		1% - 10%	4%	\$ 37,047,189
Seeding, Wetlands, Stream and Site Impacts	LS		\$ 22,500	\$ 22,500
Utilities	LS		\$ 15,000,000	\$ 15,000,000
Drainage & Water Quality (Permanent)	LS		\$ 10,592,000	\$ 10,592,000
Water Quality (Construction)	LS		\$ 191,500	\$ 191,500
Signing & Striping (General)		1% - 2%	0.5%	\$ 4,630,899
Traffic Control (Construction)		1% - 2%	1.0%	\$ 9,261,797
Mobilization & Staging		5% - 15%	10%	\$ 92,617,972
Right-of-Way	LS		\$ -	\$ -
CSS Contingency		15%	15%	\$ 138,926,958
<i>Total of Tunnel Allowances</i>				\$ 308,290,815
<i>Total of Tunnel Components & Allowances</i>				\$ 1,234,470,535

I-70 Cost Estimate Build-Up

Alt02_Opt02

3 tolled reversible managed lanes designed at 65 mph. This option matches Alt02_Opt01 except from East Idaho Springs to Floyd Hill, where the reversible managed lanes and I-70 General Purpose lanes will be reconstructed to meet a 65 mph design speed.

CAPITAL COSTS

Transit Components	Units	Quantity	Unit Cost	Cost
Vehicles	EA	22	\$ 600,000	\$ 13,200,000
Infrastructure	LS	1		\$ -
Stations - Basic	EA	11	\$ 1,850,000	\$ 20,350,000
Stations - Major	EA	1	\$ 8,000,000	\$ 8,000,000
Maintenance Barn	EA	1	\$ 15,000,000	\$ 15,000,000
<i>Transit Components Subtotal</i>				\$ 56,550,000
Transit Allowances		% Range or Units	% Cost or Cost	Cost
Allowances (Unallocated Items)		1% - 10%	20%	\$ 11,310,000
Seeding, Wetlands, Stream and Site Impacts	LS		\$ 10,000,000	\$ 10,000,000
Utilities	LS		\$ 2,167,500	\$ 2,167,500
Drainage & Water Quality (Permanent)	LS		\$ 4,335,000	\$ 4,335,000
Water Quality (Construction)	LS		\$ 433,500	\$ 433,500
Signing & Striping (General)		1% - 5%		\$ -
Traffic Control (Construction)		5% - 25%	5%	\$ 2,827,500
Mobilization & Staging		4% - 10%	4%	\$ 2,262,000
Right-of-Way	LS		\$ 3,054,000	\$ 3,054,000
CSS Contingency		15%	15%	\$ 8,482,500
<i>Transit Allowance Total</i>				\$ 44,872,000
<i>Transit Components & Allowance Total</i>				\$ 101,422,000

SUMMARY OF CAPITAL COSTS	Cost
Roadway & Structures & Allowances	\$ 3,089,276,893
Tunnel Components & Allowances	\$ 1,234,470,535
Transit Components & Allowances	\$ 101,422,000
<i>Roadway, Structures, Tunnels, Transit Construction Total</i>	\$ 4,425,169,428

DESIGN & CONSTRUCTION ENGINEERING	% Range or Units	% Cost or Cost	Cost
NEPA	LS	\$ -	\$ 19,506,960
Roadway & Structures Preliminary & Final Design	8% - 12%	12%	\$ 370,713,227
Tunnels Preliminary & Final Design	8% - 12%	10%	\$ 123,447,053
Transit Preliminary & Final Design	8% - 12%	8%	\$ 8,113,760
CSS Design Contingency		19%	\$ 95,432,068
<i>Preliminary & Final Design Total</i>			\$ 617,213,068
Roadway & Structures Construction Engineering	6% - 10%	8%	\$ 247,142,151
Tunnels Construction Engineering	6% - 10%	8%	\$ 98,757,643
Transit Construction Engineering	4% - 10%	4%	\$ 4,056,880
<i>Construction Engineering Total</i>			\$ 349,956,674
<i>Preliminary & Final Design & Construction Engineering Total</i>			\$ 967,169,743

Project Capital, Design, & Construction Engineering Total	\$ 5,392,339,171
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I-70 Cost Estimate Build-Up

Alt02_Opt02

3 tolled reversible managed lanes designed at 65 mph. This option matches Alt02_Opt01 except from East Idaho Springs to Floyd Hill, where the reversible managed lanes and I-70 General Purpose lanes will be reconstructed to meet a 65 mph design speed.

OPERATIONS & MAINTENANCE

Roadway & Structures O&M Costs	Unit	Quantity	Unit Cost		Total
Snow Removal	LM	161.1	\$	8,758	\$ 1,410,854
Routine Maintenance	LM	161.1	\$	9,364	\$ 1,508,584
Pavement Rehabilitation	LM	161.1	\$	14,132	\$ 2,276,601
ITS Operations	LS	1	\$	4,500,000	\$ 4,500,000
Tolling Operations	LS	1	\$	2,900,000	\$ 2,900,000
Long Term Capital Replacement	LS	1	\$	6,774,608	\$ 6,774,608
<i>Roadway, Structures O&M Total Cost per Year</i>					\$ 19,370,647

Tunnel O&M	Unit	Quantity	Unit Cost		Total
Routine Maintenance	LM	6.04	\$	789,565	\$ 4,768,973
Pavement Rehabilitation	LM	5.1	\$	14,132	\$ 72,071
Tunnel Systems	LS	1	\$		\$ -
Long Term Capital Replacement	LS	1	\$		\$ -
<i>Tunnel O&M Total Cost per Year</i>					\$ 4,841,044

Transit O&M Costs	Unit	Quantity	Unit Cost		Total
Vehicle Operations	LS	1	\$	11,994,813	\$ 11,994,813
Vehicle Maintenance	LS	1	\$	3,271,313	\$ 3,271,313
Infrastructure Maintenance	LS	1	\$	2,617,050	\$ 2,617,050
Long Term Capital Replacement	LS	1	\$	8,112,719	\$ 8,112,719
General & Administrative	LS	1	\$	3,925,575	\$ 3,925,575
<i>Transit O&M Total Costs per Year</i>					\$ 29,921,470

<i>Project Operations & Maintenance Total per year</i>					\$ 54,133,161
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I-70 Cost Estimate Build-Up

Alt02_Opt03

3 tolled reversible managed lanes designed at 65 mph. The reversible managed lanes are on a separate viaduct structure from West Idaho Springs to Floyd Hill to minimize impacts. General Purpose lanes designed at 65 mph except from West Idaho Springs to Floyd Hill where existing design speeds and lanes will remain. This option matches Alt02_Opt01 except viaduct extends to West Idaho Springs.

CAPITAL COSTS

Roadway & Structures	Units	Quantity	Unit Cost	Cost
Structures - Basic	SF	3188500	\$ 150	\$ 478,275,000
Special Structures - Complex	SF	435175	\$ 200	\$ 87,035,000
Special Structures - Fly-Over	SF	365225	\$ 225	\$ 82,175,625
Special Structures - Viaduct	SF	51025	\$ 225	\$ 11,480,625
Interchanges	LS	1	\$ 453,252,100	\$ 453,252,100
Wildlife Crossings - Structures	LS	1	\$ 181,900,000	\$ 181,900,000
Wildlife Crossings - Pipes, Fencing, Miscellaneous	LS	1	\$ 10,812,000	\$ 10,812,000
Walls - Cut	SF	697480	\$ 75	\$ 52,311,000
Walls - Fill	SF	2043650	\$ 50	\$ 102,182,500
Excavation - Rock Cut	CY	5193120	\$ 50	\$ 259,656,000
Embankment	CY	3467220	\$ 6	\$ 20,803,320
Pavement Resurfacing	Ton	143230	\$ 80	\$ 11,458,400
Pavement - Full Depth	Ton	1503850	\$ 70	\$ 105,269,500
Base Course	CY	833840	\$ 25	\$ 20,846,000
Barrier - Type 7	LF	738220	\$ 50	\$ 36,911,000
Barrier - Retaining	LF	316380	\$ 125	\$ 39,547,500
Guardrail - Type 3	LF	48880	\$ 20	\$ 977,600
ITS	LS	1	\$ 55,700,000	\$ 55,700,000
Transportation & Operation Center	LS	1	\$ 25,000,000	\$ 25,000,000
Tolling, Gates, & Controls	LS	1	\$ 36,300,000	\$ 36,300,000
Maintenance Equipment (Special)	LS	1	\$ 1,650,000	\$ 1,650,000
<i>Roadway & Structures Subtotal</i>				\$ 2,073,543,170
Roadway & Structures Allowances		% Range or Units	% Cost or Cost	Cost
Allowances (Unallocated Items)		1% - 10%	5%	\$ 103,677,159
Seeding, Wetlands, Stream and Site Impacts	LS		\$ 11,251,387	\$ 11,251,387
Utilities	LS		\$ 9,900,000	\$ 9,900,000
Drainage & Water Quality (Permanent)	LS		\$ 44,555,924	\$ 44,555,924
Water Quality (Construction)	LS		\$ 8,627,500	\$ 8,627,500
Signing & Striping (General)		1% - 5%	1.5%	\$ 31,103,148
Traffic Control (Construction) Excluding Viaduct		5% - 25%	4%	\$ 82,482,502
Mobilization & Staging		4% - 10%	10%	\$ 207,354,317
Right-of-Way	LS		\$ 10,000,000	\$ 10,000,000
CSS Contingency		15%	15%	\$ 311,031,476
<i>Total of Roadway & Structures Allowances</i>				\$ 819,983,411
<i>Total of Roadway & Structures Items & Allowances</i>				\$ 2,893,526,581

Tunnel Components	Units	Quantity	Unit Cost	Cost
Twin Tunnels - New Bore	LF	1650	\$ 44,752	\$ 73,840,800
Twin Tunnels Cross Passages	LS	1	\$ 1,663,440	\$ 1,663,440
Twin Tunnels - New Bore Systems	LS	1	\$ 7,750,000	\$ 7,750,000
Hidden Valley Tunnels (1) (EB)	LF	0	\$ -	\$ -
Hidden Valley Tunnels (1) (WB)	LF	0	\$ -	\$ -
Hidden Valley Tunnels (1) Cross Passages	LS	0	\$ -	\$ -
Hidden Valley Tunnels (1) Systems	LS	0	\$ -	\$ -
Hidden Valley Tunnel (2) (WB)	LF	0	\$ -	\$ -
Hidden Valley Tunnel (2) Cross Passage	LS	0	\$ -	\$ -
Hidden Valley Tunnel (2) Systems	LS	0	\$ -	\$ -
EJMT Approaches	LF	5,200	\$ 25,000	\$ 130,000,000
EJMT North Bore	LF	8700	\$ 72,363	\$ 629,558,100
EJMT Cross Passages	LS	1	\$ 24,119,880	\$ 24,119,880
EJMT Systems	LS	1	\$ 59,247,500	\$ 59,247,500
<i>Tunnel Components Subtotal</i>				\$ 926,179,720
Tunnel Allowances		% Range or Units	% Cost or Cost	Cost
Allowances (Unallocated Items)		1% - 10%	4%	\$ 37,047,189
Seeding, Wetlands, Stream and Site Impacts	LS		\$ 22,500	\$ 22,500
Utilities	LS		\$ 15,000,000	\$ 15,000,000
Drainage & Water Quality (Permanent)	LS		\$ 10,592,000	\$ 10,592,000
Water Quality (Construction)	LS		\$ 191,500	\$ 191,500
Signing & Striping (General)		1% - 2%	0.5%	\$ 4,630,899
Traffic Control (Construction)		1% - 2%	1.0%	\$ 9,261,797
Mobilization & Staging		5% - 15%	10%	\$ 92,617,972
Right-of-Way	LS		\$ -	\$ -
CSS Contingency		15%	15%	\$ 138,926,958
<i>Total of Tunnel Allowances</i>				\$ 308,290,815
<i>Total of Tunnel Components & Allowances</i>				\$ 1,234,470,535

I-70 Cost Estimate Build-Up

Alt02_Opt03

3 tolled reversible managed lanes designed at 65 mph. The reversible managed lanes are on a separate viaduct structure from West Idaho Springs to Floyd Hill to minimize impacts. General Purpose lanes designed at 65 mph except from West Idaho Springs to Floyd Hill where existing design speeds and lanes will remain. This option matches Alt02_Opt01 except viaduct extends to West Idaho Springs.

CAPITAL COSTS

Transit Components	Units	Quantity	Unit Cost	Cost
Vehicles	EA	22	\$ 600,000	\$ 13,200,000
Infrastructure	LS	1	\$	-
Stations - Basic	EA	11	\$ 1,850,000	\$ 20,350,000
Stations - Major	EA	1	\$ 8,000,000	\$ 8,000,000
Maintenance Barn	EA	1	\$ 15,000,000	\$ 15,000,000
<i>Transit Components Subtotal</i>				\$ 56,550,000
Transit Allowances		% Range or Units	% Cost or Cost	Cost
Allowances (Unallocated Items)		1% - 10%	20%	\$ 11,310,000
Seeding, Wetlands, Stream and Site Impacts		LS	\$ 10,000,000	\$ 10,000,000
Utilities		LS	\$ 2,167,500	\$ 2,167,500
Drainage & Water Quality (Permanent)		LS	\$ 4,335,000	\$ 4,335,000
Water Quality (Construction)		LS	\$ 433,500	\$ 433,500
Signing & Striping (General)		1% - 5%		\$ -
Traffic Control (Construction)		5% - 25%	5%	\$ 2,827,500
Mobilization & Staging		4% - 10%	4%	\$ 2,262,000
Right-of-Way		LS	\$ 3,054,000	\$ 3,054,000
CSS Contingency		15%	15%	\$ 8,482,500
<i>Transit Allowance Total</i>				\$ 44,872,000
<i>Transit Components & Allowance Total</i>				\$ 101,422,000

SUMMARY OF CAPITAL COSTS	Cost
Roadway & Structures & Allowances	\$ 2,893,526,581
Tunnel Components & Allowances	\$ 1,234,470,535
Transit Components & Allowances	\$ 101,422,000
<i>Roadway, Structures, Tunnels, Transit Construction Total</i>	\$ 4,229,419,116

DESIGN & CONSTRUCTION ENGINEERING	% Range or Units	% Cost or Cost	Cost
NEPA	LS	\$ -	\$ 19,506,960
Roadway & Structures Preliminary & Final Design	8% - 12%	12%	\$ 347,223,190
Tunnels Preliminary & Final Design	8% - 12%	10%	\$ 123,447,053
Transit Preliminary & Final Design	8% - 12%	8%	\$ 8,113,760
CSS Design Contingency	19%	19%	\$ 90,968,961
<i>Preliminary & Final Design Total</i>			\$ 589,259,924
Roadway & Structures Construction Engineering	6% - 10%	8%	\$ 231,482,127
Tunnels Construction Engineering	6% - 10%	8%	\$ 98,757,643
Transit Construction Engineering	4% - 10%	4%	\$ 4,056,880
<i>Construction Engineering Total</i>			\$ 334,296,649
<i>Preliminary & Final Design & Construction Engineering Total</i>			\$ 923,556,573

Project Capital, Design, & Construction Engineering Total	\$ 5,152,975,689
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I-70 Cost Estimate Build-Up

Alt02_Opt03

3 tolled reversible managed lanes designed at 65 mph. The reversible managed lanes are on a separate viaduct structure from West Idaho Springs to Floyd Hill to minimize impacts. General Purpose lanes designed at 65 mph except from West Idaho Springs to Floyd Hill where existing design speeds and lanes will remain. This option matches Alt02_Opt01 except viaduct extends to West Idaho Springs.

OPERATIONS & MAINTENANCE

Roadway & Structures O&M Costs	Unit	Quantity	Unit Cost		Total
Snow Removal	LM	161.1	\$	8,758	\$ 1,410,854
Routine Maintenance	LM	161.1	\$	9,364	\$ 1,508,584
Pavement Rehabilitation	LM	161.1	\$	14,132	\$ 2,276,601
ITS Operations	LS	1	\$	4,500,000	\$ 4,500,000
Tolling Operations	LS	1	\$	2,900,000	\$ 2,900,000
Long Term Capital Replacement	LS	1	\$	6,711,542	\$ 6,711,542
<i>Roadway, Structures O&M Total Cost per Year</i>					\$ 19,307,581

Tunnel O&M	Unit	Quantity	Unit Cost		Total
Routine Maintenance	LM	6.04	\$	789,565	\$ 4,768,973
Pavement Rehabilitation	LM	5.1	\$	14,132	\$ 72,071
Tunnel Systems	LS	1		\$	-
Long Term Capital Replacement	LS	1		\$	-
<i>Tunnel O&M Total Cost per Year</i>					\$ 4,841,044

Transit O&M Costs	Unit	Quantity	Unit Cost		Total
Vehicle Operations	LS	1	\$	11,994,813	\$ 11,994,813
Vehicle Maintenance	LS	1	\$	3,271,313	\$ 3,271,313
Infrastructure Maintenance	LS	1	\$	2,617,050	\$ 2,617,050
Long Term Capital Replacement	LS	1	\$	8,112,719	\$ 8,112,719
General & Administrative	LS	1	\$	3,925,575	\$ 3,925,575
<i>Transit O&M Total Costs per Year</i>					\$ 29,921,470

<i>Project Operations & Maintenance Total per year</i>					\$ 54,070,095
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I-70 Cost Estimate Build-Up

Alt03_Opt01

Minimum program per PEIS with 55 mph design speed including a 3rd bore at EJMT. Minimum program is generally localized auxiliary lane improvements.

CAPITAL COSTS

Roadway & Structures	Units	Quantity	Unit Cost	Cost
Structures - Basic	SF	118,975	\$ 150	\$ 17,846,250
Special Structures - Complex	SF	137,725	\$ 200	\$ 27,545,000
Special Structures - Fly-Over	SF	-	\$ 225	-
Special Structures - Viaduct	SF	-	\$ 225	-
Interchanges	LS	1	\$ 38,053,600	\$ 38,053,600
Wildlife Crossings - Structures	LS	1	\$ 43,825,000	\$ 43,825,000
Wildlife Crossings - Pipes, Fencing, Miscellaneous	LS	1	\$ 4,685,000	\$ 4,685,000
Walls - Cut	SF	130,930	\$ 75	\$ 9,819,750
Walls - Fill	SF	231,550	\$ 50	\$ 11,577,500
Excavation - Rock Cut	CY	1,292,100	\$ 50	\$ 64,605,000
Embankment	CY	469,630	\$ 6	\$ 2,817,780
Pavement Resurfacing	Ton	82,500	\$ 80	\$ 6,600,000
Pavement - Full Depth	Ton	286,860	\$ 70	\$ 20,080,200
Base Course	CY	167,400	\$ 25	\$ 4,185,000
Barrier - Type 7	LF	73,580	\$ 50	\$ 3,679,000
Barrier - Retaining	LF	-	\$ 125	-
Guardrail - Type 3	LF	34,780	\$ 20	\$ 695,600
ITS	LS	1	\$ 30,700,000	\$ 30,700,000
Transportation & Operation Center	LS	1	\$ 15,200,000	\$ 15,200,000
Tolling, Gates, & Controls	LS	1	\$ 3,400,000	\$ 3,400,000
Maintenance Equipment (Special)	LS	1	\$ 650,000	\$ 650,000
<i>Roadway & Structures Subtotal</i>				\$ 305,964,680
Roadway & Structures Allowances		% Range or Units	% Cost or Cost	Cost
Allowances (Unallocated Items)		1% - 10%	5%	\$ 15,298,234
Seeding, Wetlands, Stream and Site Impacts	LS	\$	\$ 1,612,997	\$ 1,612,997
Utilities	LS	\$	\$ 4,200,000	\$ 4,200,000
Drainage & Water Quality (Permanent)	LS	\$	\$ 20,373,662	\$ 20,373,662
Water Quality (Construction)	LS	\$	\$ 2,818,000	\$ 2,818,000
Signing & Striping (General)		1% - 5%	1.5%	\$ 4,589,470
Traffic Control (Construction)		5% - 25%	7%	\$ 21,417,528
Mobilization & Staging		4% - 10%	10%	\$ 30,596,468
Right-of-Way	LS	\$	\$ 650,000	\$ 650,000
CSS Contingency		15%	15%	\$ 45,894,702
<i>Total of Roadway & Structures Allowances</i>				\$ 147,451,061
<i>Total of Roadway & Structures Items & Allowances</i>				\$ 453,415,741

Tunnel Components	Units	Quantity	Unit Cost	Cost
Twin Tunnels - New Bore	LF	-	\$ -	-
Twin Tunnels Cross Passages	LS	-	\$ -	-
Twin Tunnels - New Bore Systems	LS	-	\$ -	-
Hidden Valley Tunnels (1) (EB)	LF	-	\$ -	-
Hidden Valley Tunnels (1) (WB)	LF	-	\$ -	-
Hidden Valley Tunnels (1) Cross Passages	LS	-	\$ -	-
Hidden Valley Tunnels (1) Systems	LS	-	\$ -	-
Hidden Valley Tunnel (2) (WB)	LF	-	\$ -	-
Hidden Valley Tunnel (2) Cross Passage	LS	-	\$ -	-
Hidden Valley Tunnel (2) Systems	LS	-	\$ -	-
EJMT Approaches	LF	5,200	\$ 25,000	\$ 130,000,000
EJMT North Bore	LF	8,700	\$ 79,628	\$ 692,763,600
EJMT Cross Passages	LS	1	\$ 24,119,880	\$ 24,119,880
EJMT Systems	LS	1	\$ 58,093,500	\$ 58,093,500
<i>Tunnel Components Subtotal</i>				\$ 904,976,980
Tunnel Allowances		% Range or Units	% Cost or Cost	Cost
Allowances (Unallocated Items)		1% - 10%	4%	\$ 36,199,079
Seeding, Wetlands, Stream and Site Impacts	LS	\$	\$ 22,350	\$ 22,350
Utilities	LS	\$	\$ 15,000,000	\$ 15,000,000
Drainage & Water Quality (Permanent)	LS	\$	\$ 9,021,000	\$ 9,021,000
Water Quality (Construction)	LS	\$	\$ 191,500	\$ 191,500
Signing & Striping (General)		1% - 2%	0.5%	\$ 4,524,885
Traffic Control (Construction)		1% - 2%	1.0%	\$ 9,049,770
Mobilization & Staging		5% - 15%	10%	\$ 90,497,698
Right-of-Way	LS	\$	\$ -	-
CSS Contingency		15%	15%	\$ 135,746,547
<i>Total of Tunnel Allowances</i>				\$ 300,252,829
<i>Total of Tunnel Components & Allowances</i>				\$ 1,205,229,809

Minimum program per PEIS with 55 mph design speed including a 3rd bore at EJMT. Minimum program is generally localized auxillary lane improvements.

CAPITAL COSTS

Transit Components	Units	Quantity	Unit Cost	Cost
Vehicles	EA	15		
Infrastructure	LS	1		
Stations - Basic	EA	2		
Stations - Major	EA	2		
Maintenance Barn	EA	1		
<i>Transit Components Subtotal</i>				
Transit Allowances		% Range or Units		
Allowances (Unallocated Items)		1% - 10%		
Seeding, Wetlands, Stream and Site Impacts		LS		
Utilities		LS		
Drainage & Water Quality (Permanent)		LS		
Water Quality (Construction)		LS		
Signing & Striping (General)		1% - 5%		
Traffic Control (Construction)		5% - 25%		
Mobilization & Staging		4% - 10%		
Right-of-Way		LS		
CSS Contingency		15%		
<i>Transit Allowance Total</i>				
<i>Transit Components & Allowance Total</i>				\$ 5,812,440,000

SUMMARY OF CAPITAL COSTS	Cost
Roadway & Structures & Allowances	\$ 453,415,741
Tunnel Components & Allowances	\$ 1,205,229,809
Transit Components & Allowances (from AGS Study)	\$ 5,812,440,000
<i>Roadway, Structures, Tunnels, Transit Construction Total</i>	\$ 7,471,085,550

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DESIGN & CONSTRUCTION ENGINEERING	% Range or Units	% Cost or Cost	Cost
NEPA	LS	\$ -	\$ 13,008,600
Roadway & Structures Preliminary & Final Design	8% - 12%	12%	\$ 54,409,889
Tunnels Preliminary & Final Design	8% - 12%	10%	\$ 120,522,981
Transit Preliminary & Final Design (Included in AGS Study)	LS		\$ 552,181,800
CSS Design Contingency	19%	19%	\$ 33,237,245
<i>Preliminary & Final Design Total</i>			\$ 773,360,515
Roadway & Structures Construction Engineering	6% - 10%	8%	\$ 36,273,259
Tunnels Construction Engineering	6% - 10%	8%	\$ 96,418,385
Transit Construction Engineering (Included in AGS Study)	LS		\$ 437,218,200
<i>Construction Engineering Total</i>			\$ 569,909,844
<i>Preliminary & Final Design & Construction Engineering Total</i>			\$ 1,343,270,359

Project Capital, Design, & Construction Engineering Total	\$ 8,814,355,909
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I-70 Cost Estimate Build-Up

Alt03_Opt01

Minimum program per PEIS with 55 mph design speed including a 3rd bore at EJMT. Minimum program is generally localized auxiliary lane improvements.

OPERATIONS & MAINTENANCE

Roadway & Structures O&M Costs	Unit	Quantity	Unit Cost	Total
Snow Removal	LM	32	\$ 6,213	\$ 195,698
Routine Maintenance	LM	32	\$ 12,573	\$ 396,064
Pavement Rehabilitation	LM	32	\$ 14,132	\$ 445,145
ITS Operations	LS	1	\$ 2,500,000	\$ 2,500,000
Tolling Operations	LS	1	\$ 275,000	\$ 275,000
Long Term Capital Replacement	LS	1	\$ 2,165,964	\$ 2,165,964
<i>Roadway, Structures O&M Total Cost per Year</i>				\$ 5,977,871

Tunnel O&M	Unit	Quantity	Unit Cost	Total
Routine Maintenance	LM	5	\$ 915,109	\$ 4,667,056
Pavement Rehabilitation	LM	5	\$ 14,132	\$ 72,071
Tunnel Systems	LS	1	\$	-
Long Term Capital Replacement	LS	1	\$	-
<i>Tunnel O&M Total Cost per Year</i>				\$ 4,739,127

Transit O&M Costs	Unit	Quantity	Unit Cost	Total
Vehicle Operations	LS	1	\$ 10,358,040	\$ 10,358,040
Vehicle Maintenance	LS	1	\$ 3,816,120	\$ 3,816,120
Infrastructure Maintenance	LS	1	\$ 7,087,080	\$ 7,087,080
Long Term Capital Replacement - annualized	LS	1	\$ 31,987,212	\$ 31,987,212
General & Administrative	LS	1	\$ 5,996,760	\$ 5,996,760
<i>Transit O&M Total Costs per Year</i>				\$ 59,245,212

<i>Project Operations & Maintenance Total per year</i>				\$ 69,962,210
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Minimum program per PEIS with 65 mph design speed including a 3rd bore at EJMT. Minimum program is generally localized auxillary lane improvements.

CAPITAL COSTS

Roadway & Structures	Units	Quantity	Unit Cost	Cost
Structures - Basic	SF	118975	\$ 150	\$ 17,846,250
Special Structures - Complex	SF	137725	\$ 200	\$ 27,545,000
Special Structures - Fly-Over	SF	0	\$ 225	\$ -
Special Structures - Viaduct	SF	0	\$ 225	\$ -
Interchanges	LS	1	\$ 38,725,930	\$ 38,725,930
Wildlife Crossings - Structures	LS	1	\$ 57,575,000	\$ 57,575,000
Wildlife Crossings - Pipes, Fencing, Miscellaneous	LS	1	\$ 4,685,000	\$ 4,685,000
Walls - Cut	SF	145650	\$ 75	\$ 10,923,750
Walls - Fill	SF	211220	\$ 50	\$ 10,561,000
Excavation - Rock Cut	CY	1184360	\$ 50	\$ 59,218,000
Embankment	CY	485610	\$ 6	\$ 2,913,660
Pavement Resurfacing	Ton	79420	\$ 80	\$ 6,353,600
Pavement - Full Depth	Ton	267900	\$ 70	\$ 18,753,000
Base Course	CY	156900	\$ 25	\$ 3,922,500
Barrier - Type 7	LF	73900	\$ 50	\$ 3,695,000
Barrier - Retaining	LF	0	\$ 125	\$ -
Guardrail - Type 3	LF	29960	\$ 20	\$ 599,200
ITS	LS	1	\$ 30,700,000	\$ 30,700,000
Transportation & Operation Center	LS	1	\$ 15,200,000	\$ 15,200,000
Tolling, Gates, & Controls	LS	1	\$ 3,400,000	\$ 3,400,000
Maintenance Equipment (Special)	LS	1	\$ 650,000	\$ 650,000
<i>Roadway & Structures Subtotal</i>				\$ 313,266,890
Roadway & Structures Allowances		% Range or Units	% Cost or Cost	Cost
Allowances (Unallocated Items)		1% - 10%	5%	\$ 15,663,345
Seeding, Wetlands, Stream and Site Impacts	LS		\$ 1,603,991	\$ 1,603,991
Utilities	LS		\$ 3,700,000	\$ 3,700,000
Drainage & Water Quality (Permanent)	LS		\$ 5,879,000	\$ 20,373,662
Water Quality (Construction)	LS		\$ 2,818,000	\$ 2,818,000
Signing & Striping (General)		1% - 5%	1.5%	\$ 4,699,003
Traffic Control (Construction)		5% - 25%	8%	\$ 25,061,351
Mobilization & Staging		4% - 10%	10%	\$ 31,326,689
Right-of-Way	LS		\$ 650,000	\$ 650,000
CSS Contingency		15%	15%	\$ 46,990,034
<i>Total of Roadway & Structures Allowances</i>				\$ 152,886,075
<i>Total of Roadway & Structures Items & Allowances</i>				\$ 466,152,965

Tunnel Components	Units	Quantity	Unit Cost	Cost
Twin Tunnels - New Bore	LF	0	\$ -	\$ -
Twin Tunnels Cross Passages	LS	0	\$ -	\$ -
Twin Tunnels - New Bore Systems	LS	0	\$ -	\$ -
Hidden Valley Tunnels (1) (EB)	LF	980	\$ 49,113	\$ 48,130,740
Hidden Valley Tunnels (1) (WB)	LF	1070	\$ 56,838	\$ 60,816,660
Hidden Valley Tunnels (1) Cross Passages	LS	1	\$ 69,310	\$ 69,310
Hidden Valley Tunnels (1) Systems	LS	1	\$ 13,427,000	\$ 13,427,000
Hidden Valley Tunnel (2) (WB)	LF	1650	\$ 57,127	\$ 94,259,550
Hidden Valley Tunnel (2) Cross Passage	LS	1	\$ 3,950,370	\$ 3,950,370
Hidden Valley Tunnel (2) Systems	LS	1	\$ 8,508,250	\$ 8,508,250
EJMT Approaches	LF	5,200	\$ 25,000	\$ 130,000,000
EJMT North Bore	LF	8700	\$ 79,628	\$ 692,763,600
EJMT Cross Passages	LS	1	\$ 24,119,880	\$ 24,119,880
EJMT Systems	LS	1	\$ 58,093,500	\$ 58,093,500
<i>Tunnel Components Subtotal</i>				\$ 1,134,138,860
Tunnel Allowances		% Range or Units	% Cost or Cost	Cost
Allowances (Unallocated Items)		1% - 10%	4%	\$ 45,365,554
Seeding, Wetlands, Stream and Site Impacts	LS		\$ 22,350	\$ 22,350
Utilities	LS		\$ 15,000,000	\$ 15,000,000
Drainage & Water Quality (Permanent)	LS		\$ 13,000,000	\$ 13,000,000
Water Quality (Construction)	LS		\$ 268,100	\$ 268,100
Signing & Striping (General)		1% - 2%	0.5%	\$ 5,670,694
Traffic Control (Construction)		1% - 2%	1.0%	\$ 11,341,389
Mobilization & Staging		5% - 15%	10%	\$ 113,413,886
Right-of-Way	LS		\$ -	\$ -
CSS Contingency		15%	15%	\$ 170,120,829
<i>Total of Tunnel Allowances</i>				\$ 374,202,802
<i>Total of Tunnel Components & Allowances</i>				\$ 1,508,341,662

I-70 Cost Estimate Build-Up

Alt03_Opt02

Minimum program per PEIS with 65 mph design speed including a 3rd bore at EJMT. Minimum program is generally localized auxiliary lane improvements.

CAPITAL COSTS

Transit Components	Units	Quantity	Unit Cost	Cost
Vehicles	EA	15		
Infrastructure	LS	1		
Stations - Basic	EA	2		
Stations - Major	EA	2		
Maintenance Barn	EA	1		
<i>Transit Components Subtotal</i>				
Transit Allowances		% Range or Units		
Allowances (Unallocated Items)		1% - 10%		
Seeding, Wetlands, Stream and Site Impacts		LS		
Utilities		LS		
Drainage & Water Quality (Permanent)		LS		
Water Quality (Construction)		LS		
Signing & Striping (General)		1% - 5%		
Traffic Control (Construction)		5% - 25%		
Mobilization & Staging		4% - 10%		
Right-of-Way		LS		
CSS Contingency		15%		
<i>Transit Allowance Total</i>				
<i>Transit Components & Allowance Total</i>				\$ 5,812,440,000

SUMMARY OF CAPITAL COSTS	Cost
Roadway & Structures & Allowances	\$ 466,152,965
Tunnel Components & Allowances	\$ 1,508,341,662
Transit Components & Allowances (from AGS Study)	\$ 5,812,440,000
<i>Roadway, Structures, Tunnels, Transit Construction Total</i>	\$ 7,786,934,627

DESIGN & CONSTRUCTION ENGINEERING	% Range or Units	% Cost or Cost	Cost
NEPA	LS	\$ -	\$13,008,600.00
Roadway & Structures Preliminary & Final Design	8% - 12%	12%	\$ 55,938,356
Tunnels Preliminary & Final Design	8% - 12%	10%	\$ 150,834,166
Transit Preliminary & Final Design (Included in AGS Study)	LS		\$ 552,181,800
CSS Design Contingency	19%	19%	\$ 39,286,779
<i>Preliminary & Final Design Total</i>			\$ 811,249,701
Roadway & Structures Construction Engineering	6% - 10%	8%	\$ 37,292,237
Tunnels Construction Engineering	6% - 10%	8%	\$ 120,667,333
Transit Construction Engineering (Included in AGS Study)	LS		\$ 437,218,200
<i>Construction Engineering Total</i>			\$ 595,177,770
<i>Preliminary & Final Design & Construction Engineering Total</i>			\$ 1,406,427,471

Project Capital, Design, & Construction Engineering Total	\$ 9,193,362,098
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Minimum program per PEIS with 65 mph design speed including a 3rd bore at EJMT. Minimum program is generally localized auxillary lane improvements.

OPERATIONS & MAINTENANCE

Roadway & Structures O&M Costs	Unit	Quantity	Unit Cost		Total
Snow Removal	LM	31.5	\$	6,213	\$ 195,698
Routine Maintenance	LM	31.5	\$	12,573	\$ 396,064
Pavement Rehabilitation	LM	31.5	\$	14,132	\$ 445,145
ITS Operations	LS	1	\$	2,500,000	\$ 2,500,000
Tolling Operations	LS	1	\$	275,000	\$ 275,000
Long Term Capital Replacement	LS	1	\$	2,165,964	\$ 2,165,964
<i>Roadway, Structures O&M Total Cost per Year</i>					\$ 5,977,871

Tunnel O&M	Unit	Quantity	Unit Cost		Total
Routine Maintenance	LM	7.28	\$	673,155	\$ 4,900,568
Pavement Rehabilitation	LM	5.1	\$	14,132	\$ 72,071
Tunnel Systems	LS	1			\$ -
Long Term Capital Replacement	LS	1			\$ -
<i>Tunnel O&M Total Cost per Year</i>					\$ 4,972,640

Transit O&M Costs	Unit	Quantity	Unit Cost		Total
Vehicle Operations	LS	1	\$	10,358,040	\$ 10,358,040
Vehicle Maintenance	LS	1	\$	3,816,120	\$ 3,816,120
Infrastructure Maintenance	LS	1	\$	7,087,080	\$ 7,087,080
Long Term Capital Replacement	LS	1	\$	31,987,212	\$ 31,987,212
General & Administrative	LS	1	\$	5,996,760	\$ 5,996,760
<i>Transit O&M Total Costs per Year</i>					\$ 59,245,212

<i>Project Operations & Maintenance Total per year</i>					\$ 70,195,723
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I-70 Cost Estimate Build-Up

Alt03_Opt03

Minimum program per PEIS with 55 mph design speed without a 3rd bore at EJMT. Minimum program is generally localized auxillary lane improvements. Option is similar to Alt03_Opt01 without 3rd bore at EJMT.

CAPITAL COSTS

Roadway & Structures	Units	Quantity	Unit Cost	Cost
Structures - Basic	SF	110725	\$ 150	\$ 16,608,750
Special Structures - Complex	SF	137725	\$ 200	\$ 27,545,000
Special Structures - Fly-Over	SF	0	\$ 225	\$ -
Special Structures - Viaduct	SF	0	\$ 225	\$ -
Interchanges	LS	1	\$ 36,853,600	\$ 36,853,600
Wildlife Crossings - Structures	LS	1	\$ 43,825,000	\$ 43,825,000
Wildlife Crossings - Pipes, Fencing, Miscellaneous	LS	1	\$ 4,685,000	\$ 4,685,000
Walls - Cut	SF	92390	\$ 75	\$ 6,929,250
Walls - Fill	SF	231550	\$ 50	\$ 11,577,500
Excavation - Rock Cut	CY	1175320	\$ 50	\$ 58,766,000
Embankment	CY	425500	\$ 6	\$ 2,553,000
Pavement Resurfacing	Ton	148170	\$ 80	\$ 11,853,600
Pavement - Full Depth	Ton	282270	\$ 70	\$ 19,758,900
Base Course	CY	163840	\$ 25	\$ 4,096,000
Barrier - Type 7	LF	66000	\$ 50	\$ 3,300,000
Barrier - Retaining	LF	0	\$ 125	\$ -
Guardrail - Type 3	LF	33550	\$ 20	\$ 671,000
ITS	LS	1	\$ 28,300,000	\$ 28,300,000
Transportation & Operation Center	LS	1	\$ 15,000,000	\$ 15,000,000
Tolling, Gates, & Controls	LS	1	\$ 1,800,000	\$ 1,800,000
Maintenance Equipment (Special)	LS	1	\$ 650,000	\$ 650,000
<i>Roadway & Structures Subtotal</i>				\$ 294,772,600
Roadway & Structures Allowances		% Range or Units	% Cost or Cost	Cost
Allowances (Unallocated Items)		1% - 10%	5%	\$ 14,738,630
Seeding, Wetlands, Stream and Site Impacts	LS		\$ 1,635,341	\$ 1,635,341
Utilities	LS		\$ 2,000,000	\$ 2,000,000
Drainage & Water Quality (Permanent)	LS			\$ 20,373,662
Water Quality (Construction)	LS		\$ 2,818,000	\$ 2,818,000
Signing & Striping (General)		1% - 5%	1.5%	\$ 4,421,589
Traffic Control (Construction)		5% - 25%	10%	\$ 29,477,260
Mobilization & Staging		4% - 10%	10%	\$ 29,477,260
Right-of-Way	LS		\$ 650,000	\$ 650,000
CSS Contingency		15%	15%	\$ 44,215,890
<i>Total of Roadway & Structures Allowances</i>				\$ 149,807,632
<i>Total of Roadway & Structures Items & Allowances</i>				\$ 444,580,232

Tunnel Components	Units	Quantity	Unit Cost	Cost
Twin Tunnels - New Bore	LF	0	\$	\$ -
Twin Tunnels Cross Passages	LS	0	\$	\$ -
Twin Tunnels - New Bore Systems	LS	0	\$	\$ -
Hidden Valley Tunnels (1) (EB)	LF	0	\$	\$ -
Hidden Valley Tunnels (1) (WB)	LF	0	\$	\$ -
Hidden Valley Tunnels (1) Cross Passages	LS	0	\$	\$ -
Hidden Valley Tunnels (1) Systems	LS	0	\$	\$ -
Hidden Valley Tunnel (2) (WB)	LF	0	\$	\$ -
Hidden Valley Tunnel (2) Cross Passage	LS	0	\$	\$ -
Hidden Valley Tunnel (2) Systems	LS	0	\$	\$ -
EJMT Approaches	LF	0	\$	\$ -
EJMT North Bore	LF	0	\$	\$ -
EJMT Cross Passages	LS	0	\$	\$ -
EJMT Systems	LS	0	\$	\$ -
<i>Tunnel Components Subtotal</i>				\$ -
Tunnel Allowances		% Range or Units	% Cost or Cost	Cost
Allowances (Unallocated Items)		1% - 10%		\$ -
Seeding, Wetlands, Stream and Site Impacts	LS		\$	\$ -
Utilities	LS		\$	\$ -
Drainage & Water Quality (Permanent)	LS		\$	\$ -
Water Quality (Construction)	LS		\$	\$ -
Signing & Striping (General)		1% - 2%		\$ -
Traffic Control (Construction)		1% - 2%		\$ -
Mobilization & Staging		5% - 15%		\$ -
Right-of-Way	LS		\$	\$ -
CSS Contingency		15%	15%	\$ -
<i>Total of Tunnel Allowances</i>				\$ -
<i>Total of Tunnel Components & Allowances</i>				\$ -

I-70 Cost Estimate Build-Up

Alt03_Opt03

Minimum program per PEIS with 55 mph design speed without a 3rd bore at EJMT. Minimum program is generally localized auxiliary lane improvements. Option is similar to Alt03_Opt01 without 3rd bore at EJMT.

CAPITAL COSTS

Transit Components	Units	Quantity	Unit Cost	Cost
Vehicles	EA	15		
Infrastructure	LS	1		
Stations - Basic	EA	2		
Stations - Major	EA	2		
Maintenance Barn	EA	1		
<i>Transit Components Subtotal</i>				
Transit Allowances		% Range or Units		
Allowances (Unallocated Items)		1% - 10%		
Seeding, Wetlands, Stream and Site Impacts		LS		
Utilities		LS		
Drainage & Water Quality (Permanent)		LS		
Water Quality (Construction)		LS		
Signing & Striping (General)		1% - 5%		
Traffic Control (Construction)		5% - 25%		
Mobilization & Staging		4% - 10%		
Right-of-Way		LS		
CSS Contingency		15%		
<i>Transit Allowance Total</i>				
<i>Transit Components & Allowance Total</i>				\$ 5,812,440,000

SUMMARY OF CAPITAL COSTS	Cost
Roadway & Structures & Allowances	\$ 444,580,232
Tunnel Components & Allowances	\$ -
Transit Components & Allowances (from AGS Study)	\$ 5,812,440,000
<i>Roadway, Structures, Tunnels, Transit Construction Total</i>	\$ 6,257,020,232

DESIGN & CONSTRUCTION ENGINEERING	% Range or Units	% Cost or Cost	Cost
NEPA	LS	\$ -	\$ 13,008,600
Roadway & Structures Preliminary & Final Design	8% - 12%	12%	\$ 53,349,628
Tunnels Preliminary & Final Design	8% - 12%	10%	\$ -
Transit Preliminary & Final Design (Included in AGS Study)	LS		\$ 552,181,800
CSS Design Contingency	19%	19%	\$ 10,136,429
<i>Preliminary & Final Design Total</i>			\$ 628,676,457
Roadway & Structures Construction Engineering	6% - 10%	8%	\$ 35,566,419
Tunnels Construction Engineering	6% - 10%	8%	\$ -
Transit Construction Engineering (Included in AGS Study)	LS		\$ 437,218,200
<i>Construction Engineering Total</i>			\$ 472,784,619
<i>Preliminary & Final Design & Construction Engineering Total</i>			\$ 1,101,461,076

<i>Project Capital, Design, & Construction Engineering Total</i>	\$ 7,358,481,308
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I-70 Cost Estimate Build-Up

Alt03_Opt03

Minimum program per PEIS with 55 mph design speed without a 3rd bore at EJMT. Minimum program is generally localized auxiliary lane improvements. Option is similar to Alt03_Opt01 without 3rd bore at EJMT.

OPERATIONS & MAINTENANCE

Roadway & Structures O&M Costs	Unit	Quantity	Unit Cost		Total
Snow Removal	LM	31.5	\$	6,213	\$ 195,698
Routine Maintenance	LM	31.5	\$	12,573	\$ 396,064
Pavement Rehabilitation	LM	31.5	\$	14,132	\$ 445,145
ITS Operations	LS	1	\$	2,300,000	\$ 2,300,000
Tolling Operations	LS	1	\$	145,000	\$ 145,000
Long Term Capital Replacement	LS	1	\$	1,968,784	\$ 1,968,784
<i>Roadway, Structures O&M Total Cost per Year</i>					\$ 5,450,691

Tunnel O&M	Unit	Quantity	Unit Cost		Total
Routine Maintenance	LM	0	\$	-	\$ -
Pavement Rehabilitation	LM	0	\$	-	\$ -
Tunnel Systems	LS	1			\$ -
Long Term Capital Replacement	LS	1			\$ -
<i>Tunnel O&M Total Cost per Year</i>					\$ -

Transit O&M Costs	Unit	Quantity	Unit Cost		Total
Vehicle Operations	LS	1	\$	10,358,040	\$ 10,358,040
Vehicle Maintenance	LS	1	\$	3,816,120	\$ 3,816,120
Infrastructure Maintenance	LS	1	\$	7,087,080	\$ 7,087,080
Long Term Capital Replacement - annualized	LS	1	\$	31,987,212	\$ 31,987,212
General & Administrative	LS	1	\$	5,996,760	\$ 5,996,760
<i>Transit O&M Total Costs per Year</i>					\$ 59,245,212

<i>Project Operations & Maintenance Total per year</i>					\$ 64,695,903
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I-70 Cost Estimate Build-Up

Alt03_Opt04

Minimum program per PEIS with 65 mph design speed without a 3rd bore at EJMT. Minimum program is generally localized auxiliary lane improvements. Option is similar to Alt03_Opt02 without 3rd bore at EJMT.

CAPITAL COSTS

Roadway & Structures	Units	Quantity	Unit Cost	Cost
Structures - Basic	SF	174300	\$ 150	\$ 26,145,000
Special Structures - Complex	SF	95600	\$ 200	\$ 19,120,000
Special Structures - Fly-Over	SF	0	\$ 225	\$ -
Special Structures - Viaduct	SF	0	\$ 225	\$ -
Interchanges	LS	1	\$ 30,525,930	\$ 30,525,930
Wildlife Crossings - Structures	LS	1	\$ 57,575,000	\$ 57,575,000
Wildlife Crossings - Pipes, Fencing, Miscellaneous	LS	1	\$ 4,685,000	\$ 4,685,000
Walls - Cut	SF	125540	\$ 75	\$ 9,415,500
Walls - Fill	SF	211220	\$ 50	\$ 10,561,000
Excavation - Rock Cut	CY	1057690	\$ 50	\$ 52,884,500
Embankment	CY	505510	\$ 6	\$ 3,033,060
Pavement Resurfacing	Ton	178360	\$ 80	\$ 14,268,800
Pavement - Full Depth	Ton	396430	\$ 70	\$ 27,750,100
Base Course	CY	70630	\$ 25	\$ 1,765,750
Barrier - Type 7	LF	66320	\$ 50	\$ 3,316,000
Barrier - Retaining	LF	0	\$ 125	\$ -
Guardrail - Type 3	LF	28730	\$ 20	\$ 574,600
ITS	LS	1	\$ 28,300,000	\$ 28,300,000
Transportation & Operation Center	LS	1	\$ 15,000,000	\$ 15,000,000
Tolling, Gates, & Controls	LS	1	\$ 1,800,000	\$ 1,800,000
Maintenance Equipment (Special)	LS	1	\$ 650,000	\$ 650,000
<i>Roadway & Structures Subtotal</i>				\$ 307,370,240
Roadway & Structures Allowances		% Range or Units	% Cost or Cost	Cost
Allowances (Unallocated Items)		1% - 10%	5%	\$ 15,368,512
Seeding, Wetlands, Stream and Site Impacts	LS		\$ 1,603,122	\$ 1,603,122
Utilities	LS		\$ 1,500,000	\$ 1,500,000
Drainage & Water Quality (Permanent)	LS		\$ 20,373,662	\$ 20,373,662
Water Quality (Construction)	LS		\$ 2,818,000	\$ 2,818,000
Signing & Striping (General)		1% - 5%	1.5%	\$ 4,610,554
Traffic Control (Construction)		5% - 25%	12%	\$ 36,884,429
Mobilization & Staging		4% - 10%	10%	\$ 30,737,024
Right-of-Way	LS		\$ 650,000	\$ 650,000
CSS Contingency		15%	15%	\$ 46,105,536
<i>Total of Roadway & Structures Allowances</i>				\$ 160,650,838
<i>Total of Roadway & Structures Items & Allowances</i>				\$ 468,021,078

Tunnel Components	Units	Quantity	Unit Cost	Cost
Twin Tunnels - New Bore	LF	0	\$ -	\$ -
Twin Tunnels Cross Passages	LS	0	\$ -	\$ -
Twin Tunnels - New Bore Systems	LS	0	\$ -	\$ -
Hidden Valley Tunnels (1) (EB)	LF	980	\$ 49,113	\$ 48,130,740
Hidden Valley Tunnels (1) (WB)	LF	1070	\$ 56,838	\$ 60,816,660
Hidden Valley Tunnels (1) Cross Passages	LS	1	\$ 69,310	\$ 69,310
Hidden Valley Tunnels (1) Systems	LS	1	\$ 13,427,000	\$ 13,427,000
Hidden Valley Tunnel (2) (WB)	LF	1650	\$ 57,127	\$ 94,259,550
Hidden Valley Tunnel (2) Cross Passage	LS	1	\$ 3,950,670	\$ 3,950,670
Hidden Valley Tunnel (2) Systems	LS	1	\$ 8,505,250	\$ 8,505,250
EJMT Approaches	LF	0	\$ -	\$ -
EJMT North Bore	LF	0	\$ -	\$ -
EJMT Cross Passages	LS	0	\$ -	\$ -
EJMT Systems	LS	0	\$ -	\$ -
<i>Tunnel Components Subtotal</i>				\$ 229,159,180
Tunnel Allowances		% Range or Units	% Cost or Cost	Cost
Allowances (Unallocated Items)		1% - 10%	5%	\$ 11,457,959
Seeding, Wetlands, Stream and Site Impacts	LS		\$ 22,350	\$ 22,350
Utilities	LS		\$ -	\$ -
Drainage & Water Quality (Permanent)	LS		\$ 3,983,000	\$ 3,983,000
Water Quality (Construction)	LS		\$ 100,000	\$ 100,000
Signing & Striping (General)		1% - 2%	0.5%	\$ 1,145,796
Traffic Control (Construction)		1% - 2%	1.0%	\$ 2,291,592
Mobilization & Staging		5% - 15%	10%	\$ 22,915,918
Right-of-Way	LS		\$ -	\$ -
CSS Contingency		15%	15%	\$ 34,373,877
<i>Total of Tunnel Allowances</i>				\$ 76,290,492
<i>Total of Tunnel Components & Allowances</i>				\$ 305,449,672

I-70 Cost Estimate Build-Up

Alt03_Opt04

Minimum program per PEIS with 65 mph design speed without a 3rd bore at EJMT. Minimum program is generally localized auxiliary lane improvements. Option is similar to Alt03_Opt02 without 3rd bore at EJMT.

CAPITAL COSTS

Transit Components	Units	Quantity	Unit Cost	Cost
Vehicles	EA	15		
Infrastructure	LS	1		
Stations - Basic	EA	2		
Stations - Major	EA	2		
Maintenance Barn	EA	1		
<i>Transit Components Subtotal</i>				
Transit Allowances		% Range or Units		
Allowances (Unallocated Items)		1% - 10%		
Seeding, Wetlands, Stream and Site Impacts		LS		
Utilities		LS		
Drainage & Water Quality (Permanent)		LS		
Water Quality (Construction)		LS		
Signing & Striping (General)		1% - 5%		
Traffic Control (Construction)		5% - 25%		
Mobilization & Staging		4% - 10%		
Right-of-Way		LS		
CSS Contingency		15%		
<i>Transit Allowance Total</i>				
<i>Transit Components & Allowance Total</i>				\$ 5,812,440,000

SUMMARY OF CAPITAL COSTS	Cost
Roadway & Structures & Allowances	\$ 468,021,078
Tunnel Components & Allowances	\$ 305,449,672
Transit Components & Allowances (from AGS Study)	\$ 5,812,440,000
<i>Roadway, Structures, Tunnels, Transit Construction Total</i>	\$ 6,585,910,750

DESIGN & CONSTRUCTION ENGINEERING	% Range or Units	% Cost or Cost	Cost
NEPA	LS	\$ -	\$ 13,008,600
Roadway & Structures Preliminary & Final Design	8% - 12%	12%	\$ 56,162,529
Tunnels Preliminary & Final Design	8% - 12%	10%	\$ 30,544,967
Transit Preliminary & Final Design (Included in AGS Study)	LS		\$ 552,181,800
CSS Design Contingency	19%	19%	\$ 16,474,424
<i>Preliminary & Final Design Total</i>			\$ 668,372,321
Roadway & Structures Construction Engineering	6% - 10%	8%	\$ 37,441,686
Tunnels Construction Engineering	6% - 10%	8%	\$ 24,435,974
Transit Construction Engineering (Included in AGS Study)	LS		\$ 437,218,200
<i>Construction Engineering Total</i>			\$ 499,095,860
<i>Preliminary & Final Design & Construction Engineering Total</i>			\$ 1,167,468,181

<i>Project Capital, Design, & Construction Engineering Total</i>	\$ 7,753,378,931
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I-70 Cost Estimate Build-Up

Alt03_Opt04

Minimum program per PEIS with 65 mph design speed without a 3rd bore at EJMT. Minimum program is generally localized auxiliary lane improvements. Option is similar to Alt03_Opt02 without 3rd bore at EJMT.

OPERATIONS & MAINTENANCE

Roadway & Structures O&M Costs	Unit	Quantity	Unit Cost		Total
Snow Removal	LM	31.5	\$	6,213	\$ 195,698
Routine Maintenance	LM	31.5	\$	12,573	\$ 396,064
Pavement Rehabilitation	LM	31.5	\$	14,132	\$ 445,145
ITS Operations	LS	1	\$	2,300,000	\$ 2,300,000
Tolling Operations	LS	1	\$	145,000	\$ 145,000
Long Term Capital Replacement	LS	1	\$	1,977,225	\$ 1,977,225
<i>Roadway, Structures O&M Total Cost per Year</i>					\$ 5,459,132

Tunnel O&M	Unit	Quantity	Unit Cost		Total
Routine Maintenance	LM	2.18	\$	106,605	\$ 232,399
Pavement Rehabilitation	LM	0	\$	-	\$ -
Tunnel Systems	LS	1	\$		\$ -
Long Term Capital Replacement	LS	1	\$		\$ -
<i>Tunnel O&M Total Cost per Year</i>					\$ 232,399

Transit O&M Costs	Unit	Quantity	Unit Cost		Total
Vehicle Operations	LS	1	\$	10,358,040	\$ 10,358,040
Vehicle Maintenance	LS	1	\$	3,816,120	\$ 3,816,120
Infrastructure Maintenance	LS	1	\$	7,087,080	\$ 7,087,080
Long Term Capital Replacement	LS	1	\$	31,987,212	\$ 31,987,212
General & Administrative	LS	1	\$	5,996,760	\$ 5,996,760
<i>Transit O&M Total Costs per Year</i>					\$ 59,245,212

<i>Project Operations & Maintenance Total per year</i>					\$ 64,936,743
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I-70 Cost Estimate Build-Up

Alt04_Opt01

Maximum program per PEIS with 55 mph design speed including a 3rd bore at EJMT. Maximum program includes one additional non-reversible tolled lane (EB & WB) between EJMT and Floyd Hill.

CAPITAL COSTS

Roadway & Structures	Units	Quantity	Unit Cost	Cost
Structures - Basic	SF	436475	\$ 150	\$ 65,471,250
Special Structures - Complex	SF	125525	\$ 200	\$ 25,105,000
Special Structures - Fly-Over	SF	0	\$ 225	\$ -
Special Structures - Viaduct	SF	0	\$ 225	\$ -
Interchanges	LS	1	\$ 66,405,170	\$ 66,405,170
Wildlife Crossings - Structures	LS	1	\$ 88,775,000	\$ 88,775,000
Wildlife Crossings - Pipes, Fencing, Miscellaneous	LS	1	\$ 7,787,000	\$ 7,787,000
Walls - Cut	SF	326280	\$ 75	\$ 24,471,000
Walls - Fill	SF	1117890	\$ 50	\$ 55,894,500
Excavation - Rock Cut	CY	3690050	\$ 50	\$ 184,502,500
Embankment	CY	1857360	\$ 6	\$ 11,144,160
Pavement Resurfacing	Ton	176970	\$ 80	\$ 14,157,600
Pavement - Full Depth	Ton	631770	\$ 70	\$ 44,223,900
Base Course	CY	369730	\$ 25	\$ 9,243,250
Barrier - Type 7	LF	212880	\$ 50	\$ 10,644,000
Barrier - Retaining	LF	37570	\$ 125	\$ 4,696,250
Guardrail - Type 3	LF	141880	\$ 20	\$ 2,837,600
ITS	LS	1	\$ 39,800,000	\$ 39,800,000
Transportation & Operation Center	LS	1	\$ 16,800,000	\$ 16,800,000
Tolling, Gates, & Controls	LS	1	\$ 13,600,000	\$ 13,600,000
Maintenance Equipment (Special)	LS	1	\$ 650,000	\$ 650,000
<i>Roadway & Structures Subtotal</i>				\$ 686,208,180
Roadway & Structures Allowances		% Range or Units	% Cost or Cost	Cost
Allowances (Unallocated Items)		1% - 10%	5%	\$ 34,310,409
Seeding, Wetlands, Stream and Site Impacts	LS		\$ 15,493,562	\$ 15,493,562
Utilities	LS		\$ 8,100,000	\$ 8,100,000
Drainage & Water Quality (Permanent)	LS		\$ 46,491,995	\$ 46,491,995
Water Quality (Construction)	LS		\$ 5,408,000	\$ 5,408,000
Signing & Striping (General)		1% - 5%	1.5%	\$ 10,293,123
Traffic Control (Construction)		5% - 25%	7%	\$ 48,034,573
Mobilization & Staging		4% - 10%	10%	\$ 68,620,818
Right-of-Way	LS		\$ 2,500,000	\$ 2,500,000
CSS Contingency		15%	15%	\$ 102,931,227
<i>Total of Roadway & Structures Allowances</i>				\$ 342,183,706
<i>Total of Roadway & Structures Items & Allowances</i>				\$ 1,028,391,886

Tunnel Components	Units	Quantity	Unit Cost	Cost
Twin Tunnels - New Bore	LF	0	\$	\$ -
Twin Tunnels Cross Passages	LS	0	\$	\$ -
Twin Tunnels - New Bore Systems	LS	0	\$	\$ -
Hidden Valley Tunnels (1) (EB)	LF	0	\$	\$ -
Hidden Valley Tunnels (1) (WB)	LF	0	\$	\$ -
Hidden Valley Tunnels (1) Cross Passages	LS	0	\$	\$ -
Hidden Valley Tunnels (1) Systems	LS	0	\$	\$ -
Hidden Valley Tunnel (2) (WB)	LF	0	\$	\$ -
Hidden Valley Tunnel (2) Cross Passage	LS	0	\$	\$ -
Hidden Valley Tunnel (2) Systems	LS	0	\$	\$ -
EJMT Approaches	LF	5,200	\$ 25,000	\$ 130,000,000
EJMT North Bore	LF	8700	\$ 79,628	\$ 692,763,600
EJMT Cross Passages	LS	1	\$ 24,119,880	\$ 24,119,880
EJMT Systems	LS	1	\$ 58,093,500	\$ 58,093,500
<i>Tunnel Components Subtotal</i>				\$ 904,976,980
Tunnel Allowances		% Range or Units	% Cost or Cost	Cost
Allowances (Unallocated Items)		1% - 10%	4%	\$ 36,199,079
Seeding, Wetlands, Stream and Site Impacts	LS		\$ 22,350	\$ 22,350
Utilities	LS		\$ 15,000,000	\$ 15,000,000
Drainage & Water Quality (Permanent)	LS		\$ 9,021,000	\$ 9,021,000
Water Quality (Construction)	LS		\$ 191,500	\$ 191,500
Signing & Striping (General)		1% - 2%	0.5%	\$ 4,524,885
Traffic Control (Construction)		1% - 2%	1.0%	\$ 9,049,770
Mobilization & Staging		5% - 15%	10%	\$ 90,497,698
Right-of-Way	LS		\$ -	\$ -
CSS Contingency		15%	15%	\$ 135,746,547
<i>Total of Tunnel Allowances</i>				\$ 300,252,829
<i>Total of Tunnel Components & Allowances</i>				\$ 1,205,229,809

I-70 Cost Estimate Build-Up

Alt04_Opt01

Maximum program per PEIS with 55 mph design speed including a 3rd bore at EJMT. Maximum program includes one additional non-reversible tolled lane (EB & WB) between EJMT and Floyd Hill.

CAPITAL COSTS

Transit Components	Units	Quantity	Unit Cost	Cost
Vehicles	EA	15		
Infrastructure	LS	1		
Stations - Basic	EA	2		
Stations - Major	EA	2		
Maintenance Barn	EA	1		
<i>Transit Components Subtotal</i>				
Transit Allowances		% Range or Units		
Allowances (Unallocated Items)		1% - 10%		
Seeding, Wetlands, Stream and Site Impacts		LS		
Utilities		LS		
Drainage & Water Quality (Permanent)		LS		
Water Quality (Construction)		LS		
Signing & Striping (General)		1% - 5%		
Traffic Control (Construction)		5% - 25%		
Mobilization & Staging		4% - 10%		
Right-of-Way		LS		
CSS Contingency		15%		
<i>Transit Allowance Total</i>				
<i>Transit Components & Allowance Total</i>				\$ 5,812,440,000

SUMMARY OF CAPITAL COSTS	Cost
Roadway & Structures & Allowances	\$ 1,028,391,886
Tunnel Components & Allowances	\$ 1,205,229,809
Transit Components & Allowances (from AGS Study)	\$ 5,812,440,000
<i>Roadway, Structures, Tunnels, Transit Construction Total</i>	\$ 8,046,061,695

DESIGN & CONSTRUCTION ENGINEERING	% Range or Units	% Cost or Cost	Cost
NEPA	LS	\$ -	13,008,600
Roadway & Structures Preliminary & Final Design	8% - 12%	12%	\$ 123,407,026
Tunnels Preliminary & Final Design	8% - 12%	10%	\$ 120,522,981
Transit Preliminary & Final Design (Included in AGS Study)	LS		\$ 552,181,800
CSS Design Contingency	19%	19%	\$ 46,346,701
<i>Preliminary & Final Design Total</i>			\$ 855,467,109
Roadway & Structures Construction Engineering	6% - 10%	8%	\$ 82,271,351
Tunnels Construction Engineering	6% - 10%	8%	\$ 96,418,385
Transit Construction Engineering (Included in AGS Study)	LS		\$ 437,218,200
<i>Construction Engineering Total</i>			\$ 615,907,936
<i>Preliminary & Final Design & Construction Engineering Total</i>			\$ 1,471,375,044

<i>Project Capital, Design, & Construction Engineering Total</i>	\$ 9,517,436,739
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I-70 Cost Estimate Build-Up

Alt04_Opt01

Maximum program per PEIS with 55 mph design speed including a 3rd bore at EJMT. Maximum program includes one additional non-reversible tolled lane (EB & WB) between EJMT and Floyd Hill.

OPERATIONS & MAINTENANCE

Roadway & Structures O&M Costs	Unit	Quantity	Unit Cost		Total
Snow Removal	LM	70.7	\$	6,213	\$ 439,233
Routine Maintenance	LM	70.7	\$	10,362	\$ 732,567
Pavement Rehabilitation	LM	70.7	\$	14,132	\$ 999,104
ITS Operations	LS	1	\$	3,200,000	\$ 3,200,000
Tolling Operations	LS	1	\$	1,100,000	\$ 1,100,000
Long Term Capital Replacement	LS	1	\$	3,026,328	\$ 3,026,328
<i>Roadway, Structures O&M Total Cost per Year</i>					\$ 9,497,232

Tunnel O&M	Unit	Quantity	Unit Cost		Total
Routine Maintenance	LM	5.1	\$	915,109	\$ 4,667,056
Pavement Rehabilitation	LM	5.1	\$	14,132	\$ 72,071
Tunnel Systems	LS	1			\$ -
Long Term Capital Replacement	LS	1			\$ -
<i>Tunnel O&M Total Cost per Year</i>					\$ 4,739,127

Transit O&M Costs	Unit	Quantity	Unit Cost		Total
Vehicle Operations	LS	1	\$	10,358,040	\$ 10,358,040
Vehicle Maintenance	LS	1	\$	3,816,120	\$ 3,816,120
Infrastructure Maintenance	LS	1	\$	7,087,080	\$ 7,087,080
Long Term Capital Replacement	LS	1	\$	31,987,212	\$ 31,987,212
General & Administrative	LS	1	\$	5,996,760	\$ 5,996,760
<i>Transit O&M Total Costs per Year</i>					\$ 59,245,212

<i>Project Operations & Maintenance Total per year</i>					\$ 73,481,571
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I-70 Cost Estimate Build-Up

Alt04_Opt02

Maximum program per PEIS with 65 mph design speed including a 3rd bore at EJMT. Maximum program includes one additional non-reversible tolled lane (EB & WB) between EJMT and Floyd Hill.

CAPITAL COSTS

Roadway & Structures	Units	Quantity	Unit Cost	Cost
Structures - Basic	SF	469975	\$ 150	\$ 70,496,250
Special Structures - Complex	SF	98125	\$ 200	\$ 19,625,000
Special Structures - Fly-Over	SF	0	\$ 225	\$ -
Special Structures - Viaduct	SF	0	\$ 225	\$ -
Interchanges	LS	1	\$ 71,097,140	\$ 71,097,140
Wildlife Crossings - Structures	LS	1	\$ 102,525,000	\$ 102,525,000
Wildlife Crossings - Pipes, Fencing, Miscellaneous	LS	1	\$ 7,787,000	\$ 7,787,000
Walls - Cut	SF	327530	\$ 75	\$ 24,564,750
Walls - Fill	SF	998260	\$ 50	\$ 49,913,000
Excavation - Rock Cut	CY	4075820	\$ 50	\$ 203,791,000
Embankment	CY	1936400	\$ 6	\$ 11,618,400
Pavement Resurfacing	Ton	188030	\$ 80	\$ 15,042,400
Pavement - Full Depth	Ton	705530	\$ 70	\$ 49,387,100
Base Course	CY	410420	\$ 25	\$ 10,260,500
Barrier - Type 7	LF	204360	\$ 50	\$ 10,218,000
Barrier - Retaining	LF	36070	\$ 125	\$ 4,508,750
Guardrail - Type 3	LF	135780	\$ 20	\$ 2,715,600
ITS	LS	1	\$ 39,800,000	\$ 39,800,000
Transportation & Operation Center	LS	1	\$ 16,800,000	\$ 16,800,000
Tolling, Gates, & Controls	LS	1	\$ 13,600,000	\$ 13,600,000
Maintenance Equipment (Special)	LS	1	\$ 650,000	\$ 650,000
<i>Roadway & Structures Subtotal</i>				\$ 724,399,890
Roadway & Structures Allowances		% Range or Units	% Cost or Cost	Cost
Allowances (Unallocated Items)		1% - 15%	5%	\$ 36,219,995
Seeding, Wetlands, Stream and Site Impacts	LS		\$ 15,540,123	\$ 15,540,123
Utilities	LS		\$ 7,400,000	\$ 7,400,000
Drainage & Water Quality (Permanent)	LS		\$ 46,491,955	\$ 46,491,955
Water Quality (Construction)	LS		\$ 5,408,000	\$ 5,408,000
Signing & Striping (General)		1% - 5%	1.5%	\$ 10,865,998
Traffic Control (Construction)		5% - 25%	8%	\$ 57,951,991
Mobilization & Staging		4% - 10%	10%	\$ 72,439,989
Right-of-Way	LS		\$ 2,500,000	\$ 2,500,000
CSS Contingency		15%	15%	\$ 108,659,984
<i>Total of Roadway & Structures Allowances</i>				\$ 363,478,035
<i>Total of Roadway & Structures Items & Allowances</i>				\$ 1,087,877,925

Tunnel Components	Units	Quantity	Unit Cost	Cost
Twin Tunnels - New Bore	LF	0	\$	\$ -
Twin Tunnels Cross Passages	LS	0	\$	\$ -
Twin Tunnels - New Bore Systems	LS	0	\$	\$ -
Hidden Valley Tunnels (1) (EB)	LF	980	\$ 49,113	\$ 48,130,740
Hidden Valley Tunnels (1) (WB)	LF	1070	\$ 56,838	\$ 60,816,660
Hidden Valley Tunnels (1) Cross Passages	LS	1	\$ 69,310	\$ 69,310
Hidden Valley Tunnels (1) Systems	LS	1	\$ 13,427,000	\$ 13,427,000
Hidden Valley Tunnel (2) (WB)	LF	1650	\$ 57,127	\$ 94,259,550
Hidden Valley Tunnel (2) Cross Passage	LS	1	\$ 3,950,670	\$ 3,950,670
Hidden Valley Tunnel (2) Systems	LS	1	\$ 8,505,250	\$ 8,505,250
EJMT Approaches	LF	5,200	\$ 25,000	\$ 130,000,000
EJMT North Bore	LF	8700	\$ 79,628	\$ 692,763,600
EJMT Cross Passages	LS	1	\$ 24,119,880	\$ 24,119,880
EJMT Systems	LS	1	\$ 58,093,500	\$ 58,093,500
<i>Tunnel Components Subtotal</i>				\$ 1,134,136,160
Tunnel Allowances		% Range or Units	% Cost or Cost	Cost
Allowances (Unallocated Items)		1% - 10%	4%	\$ 45,365,446
Seeding, Wetlands, Stream and Site Impacts	LS		\$ 22,350	\$ 22,350
Utilities	LS		\$ 15,000,000	\$ 15,000,000
Drainage & Water Quality (Permanent)	LS		\$ 13,000,000	\$ 13,000,000
Water Quality (Construction)	LS		\$ 268,100	\$ 268,100
Signing & Striping (General)		1% - 2%	0.5%	\$ 5,670,681
Traffic Control (Construction)		1% - 2%	1.0%	\$ 11,341,362
Mobilization & Staging		5% - 15%	10%	\$ 113,413,616
Right-of-Way	LS		\$ -	\$ -
CSS Contingency		15%	15%	\$ 170,120,424
<i>Total of Tunnel Allowances</i>				\$ 374,201,979
<i>Total of Tunnel Components & Allowances</i>				\$ 1,508,338,139

I-70 Cost Estimate Build-Up

Alt04_Opt02

Maximum program per PEIS with 65 mph design speed including a 3rd bore at EJMT. Maximum program includes one additional non-reversible tolled lane (EB & WB) between EJMT and Floyd Hill.

CAPITAL COSTS

Transit Components	Units	Quantity	Unit Cost	Cost
Vehicles	EA	15		
Infrastructure	LS	1		
Stations - Basic	EA	2		
Stations - Major	EA	2		
Maintenance Barn	EA	1		
<i>Transit Components Subtotal</i>				
Transit Allowances		% Range or Units		
Allowances (Unallocated Items)		1% - 10%		
Seeding, Wetlands, Stream and Site Impacts		LS		
Utilities		LS		
Drainage & Water Quality (Permanent)		LS		
Water Quality (Construction)		LS		
Signing & Striping (General)		1% - 5%		
Traffic Control (Construction)		5% - 25%		
Mobilization & Staging		4% - 10%		
Right-of-Way		LS		
CSS Contingency		15%		
<i>Transit Allowance Total</i>				
<i>Transit Components & Allowance Total</i>				\$ 5,812,440,000

SUMMARY OF CAPITAL COSTS	Cost
Roadway & Structures & Allowances	\$ 1,087,877,925
Tunnel Components & Allowances	\$ 1,508,338,139
Transit Components & Allowances (from AGS Study)	\$ 5,812,440,000
<i>Roadway, Structures, Tunnels, Transit Construction Total</i>	\$ 8,408,656,063

DESIGN & CONSTRUCTION ENGINEERING	% Range or Units	% Cost or Cost	Cost
NEPA	LS	\$ -	\$ 13,008,600
Roadway & Structures Preliminary & Final Design	8% - 12%	12%	\$ 130,545,351
Tunnels Preliminary & Final Design	8% - 12%	10%	\$ 150,833,814
Transit Preliminary & Final Design (Included in AGS Study)	LS		\$ 552,181,800
CSS Design Contingency	19%	19%	\$ 53,462,041
<i>Preliminary & Final Design Total</i>			\$ 900,031,606
Roadway & Structures Construction Engineering	6% - 10%	8%	\$ 87,030,234
Tunnels Construction Engineering	6% - 10%	8%	\$ 120,667,051
Transit Construction Engineering (Included in AGS Study)	LS		\$ 437,218,200
<i>Construction Engineering Total</i>			\$ 644,915,485
<i>Preliminary & Final Design & Construction Engineering Total</i>			\$ 1,544,947,091

<i>Project Capital, Design, & Construction Engineering Total</i>	\$ 9,953,603,155
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I-70 Cost Estimate Build-Up

Alt04_Opt02

Maximum program per PEIS with 65 mph design speed including a 3rd bore at EJMT. Maximum program includes one additional non-reversible tolled lane (EB & WB) between EJMT and Floyd Hill.

OPERATIONS & MAINTENANCE

Roadway & Structures O&M Costs	Unit	Quantity	Unit Cost		Total
Snow Removal	LM	70.7	\$	6,213	\$ 439,233
Routine Maintenance	LM	70.7	\$	10,362	\$ 732,567
Pavement Rehabilitation	LM	70.7	\$	14,132	\$ 999,104
ITS Operations	LS	1	\$	3,200,000	\$ 3,200,000
Tolling Operations	LS	1	\$	1,100,000	\$ 1,100,000
Long Term Capital Replacement	LS	1	\$	3,028,728	\$ 3,028,728
<i>Roadway, Structures O&M Total Cost per Year</i>					\$ 9,499,632

Tunnel O&M	Unit	Quantity	Unit Cost		Total
Routine Maintenance	LM	7.28	\$	673,155	\$ 4,900,568
Pavement Rehabilitation	LM	5.1	\$	14,132	\$ 72,071
Tunnel Systems	LS	1		\$	-
Long Term Capital Replacement	LS	1		\$	-
<i>Tunnel O&M Total Cost per Year</i>					\$ 4,972,640

Transit O&M Costs	Unit	Quantity	Unit Cost		Total
Vehicle Operations	LS	1	\$	10,358,040	\$ 10,358,040
Vehicle Maintenance	LS	1	\$	3,816,120	\$ 3,816,120
Infrastructure Maintenance	LS	1	\$	7,087,080	\$ 7,087,080
Long Term Capital Replacement - annualized	LS	1	\$	31,987,212	\$ 31,987,212
General & Administrative	LS	1	\$	5,996,760	\$ 5,996,760
<i>Transit O&M Total Costs per Year</i>					\$ 59,245,212

<i>Project Operations & Maintenance Total per year</i>					\$ 73,717,484
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I-70 Cost Estimate Build-Up

Alt05_Opt01

Permanent Peak Period Shoulder Lane EB and WB. Widen the existing roadway to accommodate one additional left side managed lane (EB & WB) for use during peak times; during non-peak times operates as a standard shoulder. Provide full width shoulder on right side.

CAPITAL COSTS

Roadway & Structures	Units	Quantity	Unit Cost	Cost
Structures - Basic	SF	219175	\$ 150	\$ 32,876,250
Special Structures - Complex	SF	70150	\$ 200	\$ 14,030,000
Special Structures - Fly-Over	SF	0	\$ 225	\$ -
Special Structures - Viaduct	SF	0	\$ 225	\$ -
Interchanges	LS	1	\$ 39,209,130	\$ 39,209,130
Wildlife Crossings - Structures	LS	1	\$ 44,700,000	\$ 44,700,000
Wildlife Crossings - Pipes, Fencing, Miscellaneous	LS	1	\$ 5,892,000	\$ 5,892,000
Walls - Cut	SF	144450	\$ 75	\$ 10,833,750
Walls - Fill	SF	409590	\$ 50	\$ 20,479,500
Excavation - Rock Cut	CY	1141120	\$ 50	\$ 57,056,000
Embankment	CY	485160	\$ 6	\$ 2,910,960
Pavement Resurfacing	Ton	286880	\$ 80	\$ 22,950,400
Pavement - Full Depth	Ton	198380	\$ 70	\$ 13,886,600
Base Course	CY	144090	\$ 25	\$ 3,602,250
Barrier - Type 7	LF	77540	\$ 50	\$ 3,877,000
Barrier - Retaining	LF	13690	\$ 125	\$ 1,711,250
Guardrail - Type 3	LF	58970	\$ 20	\$ 1,179,400
ITS	LS	1	\$ 50,000,000	\$ 50,000,000
Transportation & Operation Center	LS	1	\$ 16,800,000	\$ 16,800,000
Tolling, Gates, & Controls	LS	1	\$ 13,600,000	\$ 13,600,000
Maintenance Equipment (Special)	LS	1	\$ 650,000	\$ 650,000
<i>Roadway & Structures Subtotal</i>				\$ 356,244,490
Roadway & Structures Allowances		% Range or Units	% Cost or Cost	Cost
Allowances (Unallocated Items)		1% - 10%	5%	\$ 17,812,225
Seeding, Wetlands, Stream and Site Impacts	LS		\$ 15,540,123	\$ 15,540,123
Utilities	LS		\$ 6,100,000	\$ 6,100,000
Drainage & Water Quality (Permanent)	LS		\$ 26,757,658	\$ 26,757,658
Water Quality (Construction)	LS		\$ 4,188,500	\$ 4,188,500
Signing & Striping (General)		1% - 5%	1.5%	\$ 5,343,667
Traffic Control (Construction)		5% - 25%	12%	\$ 42,749,339
Mobilization & Staging		4% - 10%	10%	\$ 35,624,449
Right-of-Way	LS		\$ 700,000	\$ 700,000
CSS Contingency		15%	15%	\$ 53,436,674
<i>Total of Roadway & Structures Allowances</i>				\$ 208,252,634
<i>Total of Roadway & Structures Items & Allowances</i>				\$ 564,497,124

Tunnel Components	Units	Quantity	Unit Cost	Cost
Twin Tunnels - New Bore	LF	0	\$ -	\$ -
Twin Tunnels Cross Passages	LS	0	\$ -	\$ -
Twin Tunnels - New Bore Systems	LS	0	\$ -	\$ -
Hidden Valley Tunnels (1) (EB)	LF	0	\$ -	\$ -
Hidden Valley Tunnels (1) (WB)	LF	0	\$ -	\$ -
Hidden Valley Tunnels (1) Cross Passages	LS	0	\$ -	\$ -
Hidden Valley Tunnels (1) Systems	LS	0	\$ -	\$ -
Hidden Valley Tunnel (2) (WB)	LF	0	\$ -	\$ -
Hidden Valley Tunnel (2) Cross Passage	LS	0	\$ -	\$ -
Hidden Valley Tunnel (2) Systems	LS	0	\$ -	\$ -
EJMT Approaches	LF	5,200	\$ 25,000	\$ 130,000,000
EJMT North Bore	LF	8700	\$ 65,604	\$ 570,754,800
EJMT Cross Passages	LS	1	\$ 24,189,190	\$ 24,189,190
EJMT Systems	LS	1	\$ 56,585,500	\$ 56,585,500
<i>Tunnel Components Subtotal</i>				\$ 781,529,490
Tunnel Allowances		% Range or Units	% Cost or Cost	Cost
Allowances (Unallocated Items)		1% - 10%	4%	\$ 31,261,180
Seeding, Wetlands, Stream and Site Impacts	LS		\$ 22,350	\$ 22,350
Utilities	LS		\$ 15,000,000	\$ 15,000,000
Drainage & Water Quality (Permanent)	LS		\$ 8,816,429	\$ 8,816,429
Water Quality (Construction)	LS		\$ 100,000	\$ 100,000
Signing & Striping (General)		1% - 2%	0.5%	\$ 3,907,647
Traffic Control (Construction)		1% - 2%	1.0%	\$ 7,815,295
Mobilization & Staging		5% - 15%	10%	\$ 78,152,949
Right-of-Way	LS		\$ -	\$ -
CSS Contingency		15%	15%	\$ 117,229,424
<i>Total of Tunnel Allowances</i>				\$ 262,305,273
<i>Total of Tunnel Components & Allowances</i>				\$ 1,043,834,763

I-70 Cost Estimate Build-Up

Alt05_Opt01

Permanent Peak Period Shoulder Lane EB and WB. Widen the existing roadway to accommodate one additional left side managed lane (EB & WB) for use during peak times; during non-peak times operates as a standard shoulder. Provide full width shoulder on right side.

CAPITAL COSTS

Transit Components	Units	Quantity	Unit Cost	Cost
Vehicles	EA	15		
Infrastructure	LS	1		
Stations - Basic	EA	2		
Stations - Major	EA	2		
Maintenance Barn	EA	1		
<i>Transit Components Subtotal</i>				
Transit Allowances		% Range or Units		
Allowances (Unallocated Items)		1% - 10%		
Seeding, Wetlands, Stream and Site Impacts		LS		
Utilities		LS		
Drainage & Water Quality (Permanent)		LS		
Water Quality (Construction)		LS		
Signing & Striping (General)		1% - 5%		
Traffic Control (Construction)		5% - 25%		
Mobilization & Staging		4% - 10%		
Right-of-Way		LS		
CSS Contingency		15%		
<i>Transit Allowance Total</i>				
<i>Transit Components & Allowance Total</i>				\$ 5,812,440,000

SUMMARY OF CAPITAL COSTS	Cost
Roadway & Structures & Allowances	\$ 564,497,124
Tunnel Components & Allowances	\$ 1,043,834,763
Transit Components & Allowances (from AGS Study)	\$ 5,812,440,000
<i>Roadway, Structures, Tunnels, Transit Construction Total</i>	\$ 7,420,771,888

DESIGN & CONSTRUCTION ENGINEERING	% Range or Units	% Cost or Cost	Cost
NEPA	LS	\$ -	\$ 17,344,800
Roadway & Structures Preliminary & Final Design	8% - 12%	12%	\$ 67,739,655
Tunnels Preliminary & Final Design	8% - 12%	10%	\$ 104,383,476
Transit Preliminary & Final Design (Included in AGS Study)	LS		\$ 552,181,800
CSS Design Contingency	19%	19%	\$ 32,703,395
<i>Preliminary & Final Design Total</i>			\$ 774,353,126
Roadway & Structures Construction Engineering	6% - 10%	8%	\$ 45,159,770
Tunnels Construction Engineering	6% - 10%	8%	\$ 83,506,781
Transit Construction Engineering (Included in AGS Study)	LS		\$ 437,218,200
<i>Construction Engineering Total</i>			\$ 565,884,751
<i>Preliminary & Final Design & Construction Engineering Total</i>			\$ 1,340,237,877

Project Capital, Design, & Construction Engineering Total	\$ 8,761,009,765
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I-70 Cost Estimate Build-Up

Alt05_Opt01

Permanent Peak Period Shoulder Lane EB and WB. Widen the existing roadway to accommodate one additional left side managed lane (EB & WB) for use during peak times; during non-peak times operates as a standard shoulder. Provide full width shoulder on right side.

OPERATIONS & MAINTENANCE

Roadway & Structures O&M Costs	Unit	Quantity	Unit Cost		Total
Snow Removal	LM	62.7	\$	6,213	\$ 389,532
Routine Maintenance	LM	62.7	\$	10,588	\$ 663,893
Pavement Rehabilitation	LM	62.7	\$	14,132	\$ 886,051
ITS Operations	LS	1	\$	4,000,000	\$ 4,000,000
Tolling Operations	LS	1	\$	1,100,000	\$ 1,100,000
Long Term Capital Replacement	LS	1	\$	3,611,553	\$ 3,611,553
<i>Roadway, Structures O&M Total Cost per Year</i>					\$ 10,651,029

Tunnel O&M	Unit	Quantity	Unit Cost		Total
Routine Maintenance	LM	3.4	\$	915,109	\$ 3,111,371
Pavement Rehabilitation	LM	3.4	\$	14,132	\$ 48,047
Tunnel Systems	LS	1			\$ -
Long Term Capital Replacement	LS	1			\$ -
<i>Tunnel O&M Total Cost per Year</i>					\$ 3,159,418

Transit O&M Costs	Unit	Quantity	Unit Cost		Total
Vehicle Operations	LS	1	\$	10,358,040	\$ 10,358,040
Vehicle Maintenance	LS	1	\$	3,816,120	\$ 3,816,120
Infrastructure Maintenance	LS	1	\$	7,087,080	\$ 7,087,080
Long Term Capital Replacement - annualized	LS	1	\$	31,987,212	\$ 31,987,212
General & Administrative	LS	1	\$	5,996,760	\$ 5,996,760
<i>Transit O&M Total Costs per Year</i>					\$ 59,245,212

<i>Project Operations & Maintenance Total per year</i>					\$ 73,055,659
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I-70 Cost Estimate Build-Up

Alt05_Opt01 w/ 2' buffer

Permanent Peak Period Shoulder Lane EB and WB. Widen the existing roadway to accommodate one additional left side managed lane (EB & WB) for use during peak times; during non-peak times operates as a standard shoulder. Provide full width shoulder on right side.

CAPITAL COSTS

Roadway & Structures	Units	Quantity	Unit Cost	Cost
Structures - Basic	SF	231975	\$ 150	\$ 34,796,250
Special Structures - Complex	SF	76075	\$ 200	\$ 15,215,000
Special Structures - Fly-Over	SF	0	\$ 225	\$ -
Special Structures - Viaduct	SF	0	\$ 225	\$ -
Interchanges	LS	1	\$ 40,470,000	\$ 40,470,000
Wildlife Crossings - Structures	LS	1	\$ 46,025,000	\$ 46,025,000
Wildlife Crossings - Pipes, Fencing, Miscellaneous	LS	1	\$ 5,892,000	\$ 5,892,000
Walls - Cut	SF	150220	\$ 75	\$ 11,266,500
Walls - Fill	SF	425980	\$ 50	\$ 21,299,000
Excavation - Rock Cut	CY	1204170	\$ 50	\$ 60,208,500
Embankment	CY	515050	\$ 6	\$ 3,090,300
Pavement Resurfacing	Ton	286880	\$ 80	\$ 22,950,400
Pavement - Full Depth	Ton	244440	\$ 70	\$ 17,110,800
Base Course	CY	168900	\$ 25	\$ 4,222,500
Barrier - Type 7	LF	77540	\$ 50	\$ 3,877,000
Barrier - Retaining	LF	13690	\$ 125	\$ 1,711,250
Guardrail - Type 3	LF	58970	\$ 20	\$ 1,179,400
ITS	LS	1	\$ 50,000,000	\$ 50,000,000
Transportation & Operation Center	LS	1	\$ 16,800,000	\$ 16,800,000
Tolling, Gates, & Controls	LS	1	\$ 13,600,000	\$ 13,600,000
Maintenance Equipment (Special)	LS	1	\$ 650,000	\$ 650,000
<i>Roadway & Structures Subtotal</i>				\$ 370,363,900
Roadway & Structures Allowances		% Range or Units	% Cost or Cost	Cost
Allowances (Unallocated Items)		1% - 10%	5%	\$ 18,518,195
Seeding, Wetlands, Stream and Site Impacts	LS		\$ 15,540,123	\$ 15,540,123
Utilities	LS		\$ 6,100,000	\$ 6,100,000
Drainage & Water Quality (Permanent)	LS		\$ 26,757,658	\$ 26,757,658
Water Quality (Construction)	LS		\$ 4,188,500	\$ 4,188,500
Signing & Striping (General)		1% - 5%	1.5%	\$ 5,555,459
Traffic Control (Construction)		5% - 25%	12%	\$ 44,443,668
Mobilization & Staging		4% - 10%	10%	\$ 37,036,390
Right-of-Way	LS		\$ 700,000	\$ 700,000
CSS Contingency		15%	15%	\$ 55,554,585
<i>Total of Roadway & Structures Allowances</i>				\$ 214,394,578
<i>Total of Roadway & Structures Items & Allowances</i>				\$ 584,758,478

Tunnel Components	Units	Quantity	Unit Cost	Cost
Twin Tunnels - New Bore	LF	0	\$ -	\$ -
Twin Tunnels Cross Passages	LS	0	\$ -	\$ -
Twin Tunnels - New Bore Systems	LS	0	\$ -	\$ -
Hidden Valley Tunnels (1) (EB)	LF	0	\$ -	\$ -
Hidden Valley Tunnels (1) (WB)	LF	0	\$ -	\$ -
Hidden Valley Tunnels (1) Cross Passages	LS	0	\$ -	\$ -
Hidden Valley Tunnels (1) Systems	LS	0	\$ -	\$ -
Hidden Valley Tunnel (2) (WB)	LF	0	\$ -	\$ -
Hidden Valley Tunnel (2) Cross Passage	LS	0	\$ -	\$ -
Hidden Valley Tunnel (2) Systems	LS	0	\$ -	\$ -
EJMT Approaches	LF	5,200	\$ 25,000	\$ 130,000,000
EJMT North Bore	LF	8700	\$ 65,604	\$ 570,754,800
EJMT Cross Passages	LS	1	\$ 24,189,190	\$ 24,189,190
EJMT Systems	LS	1	\$ 56,585,500	\$ 56,585,500
<i>Tunnel Components Subtotal</i>				\$ 781,529,490
Tunnel Allowances		% Range or Units	% Cost or Cost	Cost
Allowances (Unallocated Items)		1% - 10%	4%	\$ 31,261,180
Seeding, Wetlands, Stream and Site Impacts	LS		\$ 22,350	\$ 22,350
Utilities	LS		\$ 15,000,000	\$ 15,000,000
Drainage & Water Quality (Permanent)	LS		\$ 8,816,429	\$ 8,816,429
Water Quality (Construction)	LS		\$ 100,000	\$ 100,000
Signing & Striping (General)		1% - 2%	0.5%	\$ 3,907,647
Traffic Control (Construction)		1% - 2%	1.0%	\$ 7,815,295
Mobilization & Staging		5% - 15%	10%	\$ 78,152,949
Right-of-Way	LS		\$ -	\$ -
CSS Contingency		15%	15%	\$ 117,229,424
<i>Total of Tunnel Allowances</i>				\$ 262,305,273
<i>Total of Tunnel Components & Allowances</i>				\$ 1,043,834,763

I-70 Cost Estimate Build-Up

Alt05_Opt01 w/2' buffer

Permanent Peak Period Shoulder Lane EB and WB. Widen the existing roadway to accommodate one additional left side managed lane (EB & WB) for use during peak times; during non-peak times operates as a standard shoulder. Provide full width shoulder on right side.

CAPITAL COSTS

Transit Components	Units	Quantity	Unit Cost	Cost
Vehicles	EA	15		
Infrastructure	LS	1		
Stations - Basic	EA	2		
Stations - Major	EA	2		
Maintenance Barn	EA	1		
<i>Transit Components Subtotal</i>				
Transit Allowances		% Range or Units		
Allowances (Unallocated Items)		1% - 10%		
Seeding, Wetlands, Stream and Site Impacts		LS		
Utilities		LS		
Drainage & Water Quality (Permanent)		LS		
Water Quality (Construction)		LS		
Signing & Striping (General)		1% - 5%		
Traffic Control (Construction)		5% - 25%		
Mobilization & Staging		4% - 10%		
Right-of-Way		LS		
CSS Contingency		15%		
<i>Transit Allowance Total</i>				
<i>Transit Components & Allowance Total</i>				\$ 5,812,440,000

SUMMARY OF CAPITAL COSTS		Cost
Roadway & Structures & Allowances		\$ 584,758,478
Tunnel Components & Allowances		\$ 1,043,834,763
Transit Components & Allowances (from AGS Study)		\$ 5,812,440,000
<i>Roadway, Structures, Tunnels, Transit Construction Total</i>		\$ 7,441,033,241

DESIGN & CONSTRUCTION ENGINEERING	% Range or Units	% Cost or Cost	Cost
NEPA	LS	\$ -	\$ 17,344,800
Roadway & Structures Preliminary & Final Design	8% - 12%	12%	\$ 70,171,017
Tunnels Preliminary & Final Design	8% - 12%	10%	\$ 104,383,476
Transit Preliminary & Final Design (Included in AGS Study)	LS		\$ 552,181,800
CSS Design Contingency	19%	19%	\$ 33,165,354
<i>Preliminary & Final Design Total</i>			\$ 777,246,447
Roadway & Structures Construction Engineering	6% - 10%	8%	\$ 46,780,678
Tunnels Construction Engineering	6% - 10%	8%	\$ 83,506,781
Transit Construction Engineering (Included in AGS Study)	LS		\$ 437,218,200
<i>Construction Engineering Total</i>			\$ 567,505,659
<i>Preliminary & Final Design & Construction Engineering Total</i>			\$ 1,344,752,107

<i>Project Capital, Design, & Construction Engineering Total</i>		\$ 8,785,785,348
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I-70 Cost Estimate Build-Up

Alt05_Opt01 w/ 2' buffer

Permanent Peak Period Shoulder Lane EB and WB. Widen the existing roadway to accommodate one additional left side managed lane (EB & WB) for use during peak times; during non-peak times operates as a standard shoulder. Provide full width shoulder on right side.

OPERATIONS & MAINTENANCE

Roadway & Structures O&M Costs	Unit	Quantity	Unit Cost		Total
Snow Removal	LM	62.7	\$	6,213	\$ 389,532
Routine Maintenance	LM	62.7	\$	10,588	\$ 663,893
Pavement Rehabilitation	LM	62.7	\$	14,132	\$ 886,051
ITS Operations	LS	1	\$	4,000,000	\$ 4,000,000
Tolling Operations	LS	1	\$	1,100,000	\$ 1,100,000
Long Term Capital Replacement	LS	1	\$	3,611,553	\$ 3,611,553
<i>Roadway, Structures O&M Total Cost per Year</i>					\$ 10,651,029

Tunnel O&M	Unit	Quantity	Unit Cost		Total
Routine Maintenance	LM	3.4	\$	915,109	\$ 3,111,371
Pavement Rehabilitation	LM	3.4	\$	14,132	\$ 48,047
Tunnel Systems	LS	1			\$ -
Long Term Capital Replacement	LS	1			\$ -
<i>Tunnel O&M Total Cost per Year</i>					\$ 3,159,418

Transit O&M Costs	Unit	Quantity	Unit Cost		Total
Vehicle Operations	LS	1	\$	10,358,040	\$ 10,358,040
Vehicle Maintenance	LS	1	\$	3,816,120	\$ 3,816,120
Infrastructure Maintenance	LS	1	\$	7,087,080	\$ 7,087,080
Long Term Capital Replacement - annualized	LS	1	\$	31,987,212	\$ 31,987,212
General & Administrative	LS	1	\$	5,996,760	\$ 5,996,760
<i>Transit O&M Total Costs per Year</i>					\$ 59,245,212

<i>Project Operations & Maintenance Total per year</i>					\$ 73,055,659
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I-70 Cost Estimate Build-Up

Alt05_Opt02

Permanent Peak Period Shoulder Lane EB and WB. Widen the existing roadway to accommodate one additional left side managed lane (EB & WB) for use during peak times; during non-peak times operates as a standard shoulder. Provide full width shoulder on right side.

CAPITAL COSTS

Roadway & Structures	Units	Quantity	Unit Cost	Cost
Structures - Basic	SF	138570	\$ 150	\$ 20,785,500
Special Structures - Complex	SF	58970	\$ 200	\$ 11,794,000
Special Structures - Fly-Over	SF	0	\$ 225	\$ -
Special Structures - Viaduct	SF	0	\$ 225	\$ -
Interchanges	LS	1	\$ 25,170,000	\$ 25,170,000
Wildlife Crossings - Structures	LS	1	\$ 15,100,000	\$ 15,100,000
Wildlife Crossings - Pipes, Fencing, Miscellaneous	LS	1	\$ 5,892,000	\$ 5,892,000
Walls - Cut	SF	2900	\$ 75	\$ 217,500
Walls - Fill	SF	380000	\$ 50	\$ 19,000,000
Excavation - Rock Cut	CY	505100	\$ 50	\$ 25,255,000
Embankment	CY	179310	\$ 6	\$ 1,075,860
Pavement Resurfacing	Ton	286880	\$ 80	\$ 22,950,400
Pavement - Full Depth	Ton	71200	\$ 70	\$ 4,984,000
Base Course	CY	50100	\$ 25	\$ 1,252,500
Barrier - Type 7	LF	40800	\$ 50	\$ 2,040,000
Barrier - Retaining	LF	7200	\$ 125	\$ 900,000
Guardrail - Type 3	LF	30620	\$ 20	\$ 612,400
ITS	LS	1	\$ 25,000,000	\$ 25,000,000
Transportation & Operation Center	LS	1	\$ 16,000,000	\$ 16,000,000
Tolling, Gates, & Controls	LS	1	\$ 10,000,000	\$ 10,000,000
Maintenance Equipment (Special)	LS	1	\$ 650,000	\$ 650,000
<i>Roadway & Structures Subtotal</i>				\$ 208,679,160
Roadway & Structures Allowances		% Range or Units	% Cost or Cost	Cost
Allowances (Unallocated Items)		1% - 10%	5%	\$ 10,433,958
Seeding, Wetlands, Stream and Site Impacts	LS		\$ 4,213,417	\$ 4,213,417
Utilities	LS		\$ 5,000,000	\$ 5,000,000
Drainage & Water Quality (Permanent)	LS		\$ 20,000,000	\$ 20,000,000
Water Quality (Construction)	LS		\$ 2,300,000	\$ 2,300,000
Signing & Striping (General)		1% - 5%	1.5%	\$ 3,130,187
Traffic Control (Construction)		5% - 25%	12%	\$ 25,041,499
Mobilization & Staging		4% - 10%	10%	\$ 20,867,916
Right-of-Way	LS		\$ 400,000	\$ 400,000
CSS Contingency		15%	15%	\$ 31,301,874
<i>Total of Roadway & Structures Allowances</i>				\$ 122,688,852
<i>Total of Roadway & Structures Items & Allowances</i>				\$ 331,368,012

Tunnel Components	Units	Quantity	Unit Cost	Cost
Twin Tunnels - New Bore	LF	0	\$ -	\$ -
Twin Tunnels Cross Passages	LS	0	\$ -	\$ -
Twin Tunnels - New Bore Systems	LS	0	\$ -	\$ -
Hidden Valley Tunnels (1) (EB)	LF	0	\$ -	\$ -
Hidden Valley Tunnels (1) (WB)	LF	0	\$ -	\$ -
Hidden Valley Tunnels (1) Cross Passages	LS	0	\$ -	\$ -
Hidden Valley Tunnels (1) Systems	LS	0	\$ -	\$ -
Hidden Valley Tunnel (2) (WB)	LF	0	\$ -	\$ -
Hidden Valley Tunnel (2) Cross Passage	LS	0	\$ -	\$ -
Hidden Valley Tunnel (2) Systems	LS	0	\$ -	\$ -
EJMT Approaches	LF	-	\$ -	\$ -
EJMT North Bore	LF	0	\$ -	\$ -
EJMT Cross Passages	LS	0	\$ -	\$ -
EJMT Systems	LS	0	\$ -	\$ -
<i>Tunnel Components Subtotal</i>				\$ -
Tunnel Allowances		% Range or Units	% Cost or Cost	Cost
Allowances (Unallocated Items)		1% - 10%	4%	\$ -
Seeding, Wetlands, Stream and Site Impacts	LS		\$ -	\$ -
Utilities	LS		\$ -	\$ -
Drainage & Water Quality (Permanent)	LS		\$ -	\$ -
Water Quality (Construction)	LS		\$ -	\$ -
Signing & Striping (General)		1% - 2%	0.0%	\$ -
Traffic Control (Construction)		1% - 2%	0.0%	\$ -
Mobilization & Staging		5% - 15%	0%	\$ -
Right-of-Way	LS		\$ -	\$ -
CSS Contingency		15%	0%	\$ -
<i>Total of Tunnel Allowances</i>				\$ -
<i>Total of Tunnel Components & Allowances</i>				\$ -

I-70 Cost Estimate Build-Up

Alt05_Opt02

Permanent Peak Period Shoulder Lane EB and WB. Widen the existing roadway to accommodate one additional left side managed lane (EB & WB) for use during peak times; during non-peak times operates as a standard shoulder. Provide full width shoulder on right side.

CAPITAL COSTS

Transit Components	Units	Quantity	Unit Cost	Cost
Vehicles	EA	15		
Infrastructure	LS	1		
Stations - Basic	EA	2		
Stations - Major	EA	2		
Maintenance Barn	EA	1		
<i>Transit Components Subtotal</i>				
Transit Allowances		% Range or Units		
Allowances (Unallocated Items)		1% - 10%		
Seeding, Wetlands, Stream and Site Impacts		LS		
Utilities		LS		
Drainage & Water Quality (Permanent)		LS		
Water Quality (Construction)		LS		
Signing & Striping (General)		1% - 5%		
Traffic Control (Construction)		5% - 25%		
Mobilization & Staging		4% - 10%		
Right-of-Way		LS		
CSS Contingency		15%		
<i>Transit Allowance Total</i>				
<i>Transit Components & Allowance Total</i>				\$ 5,812,440,000

SUMMARY OF CAPITAL COSTS		Cost
Roadway & Structures & Allowances		\$ 331,368,012
Tunnel Components & Allowances		\$ -
Transit Components & Allowances (from AGS Study)		\$ 5,812,440,000
<i>Roadway, Structures, Tunnels, Transit Construction Total</i>		\$ 6,143,808,012

DESIGN & CONSTRUCTION ENGINEERING	% Range or Units	% Cost or Cost	Cost
NEPA	LS	\$ -	\$ 17,344,800
Roadway & Structures Preliminary & Final Design	8% - 12%	12%	\$ 39,764,161
Tunnels Preliminary & Final Design	8% - 12%	10%	\$ -
Transit Preliminary & Final Design (Included in AGS Study)	LS		\$ 552,181,800
CSS Design Contingency	19%	19%	\$ 7,555,191
<i>Preliminary & Final Design Total</i>			\$ 616,845,952
Roadway & Structures Construction Engineering	6% - 10%	8%	\$ 26,509,441
Tunnels Construction Engineering	6% - 10%	8%	\$ -
Transit Construction Engineering (Included in AGS Study)	LS		\$ 437,218,200
<i>Construction Engineering Total</i>			\$ 463,727,641
<i>Preliminary & Final Design & Construction Engineering Total</i>			\$ 1,080,573,593

<i>Project Capital, Design, & Construction Engineering Total</i>		\$ 7,224,381,605
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I-70 Cost Estimate Build-Up

Alt05_Opt02

Permanent Peak Period Shoulder Lane EB and WB. Widen the existing roadway to accommodate one additional left side managed lane (EB & WB) for use during peak times; during non-peak times operates as a standard shoulder. Provide full width shoulder on right side.

OPERATIONS & MAINTENANCE

Roadway & Structures O&M Costs	Unit	Quantity	Unit Cost		Total
Snow Removal	LM	29.4	\$	6,213	\$ 182,651
Routine Maintenance	LM	29.4	\$	12,858	\$ 378,037
Pavement Rehabilitation	LM	29.4	\$	14,132	\$ 415,469
ITS Operations	LS	1	\$	1,000,000	\$ 1,000,000
Tolling Operations	LS	1	\$	400,000	\$ 400,000
Long Term Capital Replacement	LS	1	\$	1,087,674	\$ 1,087,674
<i>Roadway, Structures O&M Total Cost per Year</i>					\$ 3,463,832

Tunnel O&M	Unit	Quantity	Unit Cost		Total
Routine Maintenance	LM	0	\$	-	\$ -
Pavement Rehabilitation	LM	0	\$	-	\$ -
Tunnel Systems	LS	1			\$ -
Long Term Capital Replacement	LS	1			\$ -
<i>Tunnel O&M Total Cost per Year</i>					\$ -

Transit O&M Costs	Unit	Quantity	Unit Cost		Total
Vehicle Operations	LS	1	\$	10,358,040	\$ 10,358,040
Vehicle Maintenance	LS	1	\$	3,816,120	\$ 3,816,120
Infrastructure Maintenance	LS	1	\$	7,087,080	\$ 7,087,080
Long Term Capital Replacement - annualized	LS	1	\$	31,987,212	\$ 31,987,212
General & Administrative	LS	1	\$	5,996,760	\$ 5,996,760
<i>Transit O&M Total Costs per Year</i>					\$ 59,245,212

<i>Project Operations & Maintenance Total per year</i>					\$ 62,709,044
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I-70 Cost Estimate Build-Up

Alt06_Opt01

Temporary Peak Period Shoulder Lane. Using the existing roadway, accommodate one additional WB left side managed lane for use during peak times; during non-peak times operates as a standard shoulder. No twelve foot wide shoulders are available during peak periods. Construction of WB peak period lane is from Empire to Floyd Hill only. (Assumes EB peak period lane from Empire to Floyd Hill is constructed.)

CAPITAL COSTS

Roadway & Structures	Units	Quantity	Unit Cost	Cost
Structures - Basic	SF	0	\$ 150	\$ -
Special Structures - Complex	SF	0	\$ 200	\$ -
Special Structures - Fly-Over	SF	0	\$ 225	\$ -
Special Structures - Viaduct	SF	0	\$ 225	\$ -
Interchanges	LS	1	\$ 442,780	\$ 442,780
Wildlife Crossings - Structures	LS	1	\$ -	\$ -
Wildlife Crossings - Pipes, Fencing, Miscellaneous	LS	1	\$ 2,095,000	\$ 2,095,000
Walls - Cut	SF	0	\$ 75	\$ -
Walls - Fill	SF	1000	\$ 50	\$ 50,000
Excavation - Rock Cut	CY	64000	\$ 50	\$ 3,200,000
Embankment	CY	13780	\$ 6	\$ 82,680
Pavement Resurfacing	Ton	65920	\$ 80	\$ 5,273,600
Pavement - Full Depth	Ton	4320	\$ 70	\$ 302,400
Base Course	CY	5200	\$ 25	\$ 130,000
Barrier - Type 7	LF	1700	\$ 50	\$ 85,000
Barrier - Retaining	LF	0	\$ 125	\$ -
Guardrail - Type 3	LF	5360	\$ 20	\$ 107,200
ITS	LS	1	\$ 12,100,000	\$ 12,100,000
Transportation & Operation Center	LS	1	\$ 15,500,000	\$ 15,500,000
Tolling, Gates, & Controls	LS	1	\$ 5,000,000	\$ 5,000,000
Maintenance Equipment (Special)	LS	1	\$ 650,000	\$ 650,000
<i>Roadway & Structures Subtotal</i>				\$ 45,018,660
Roadway & Structures Allowances		% Range or Units	% Cost or Cost	Cost
Allowances (Unallocated Items)		1% - 10%	5%	\$ 2,250,933
Seeding, Wetlands, Stream and Site Impacts	LS		\$ 424,399	\$ 424,399
Utilities	LS		\$ 400,000	\$ 400,000
Drainage & Water Quality (Permanent)	LS		\$ 10,260,193	\$ 10,260,193
Water Quality (Construction)	LS		\$ 1,390,000	\$ 1,390,000
Signing & Striping (General)		1% - 5%	1.5%	\$ 675,280
Traffic Control (Construction)		5% - 25%	10%	\$ 4,501,866
Mobilization & Staging		4% - 10%	10%	\$ 4,501,866
Right-of-Way	LS		\$ 100,000	\$ 100,000
CSS Contingency		15%	15%	\$ 6,752,799
<i>Total of Roadway & Structures Allowances</i>				\$ 31,257,336
<i>Total of Roadway & Structures Items & Allowances</i>				\$ 76,275,996

Tunnel Components	Units	Quantity	Unit Cost	Cost
Twin Tunnels - New Bore	LF	0	\$ -	\$ -
Twin Tunnels Cross Passages	LS	0	\$ -	\$ -
Twin Tunnels - New Bore Systems	LS	0	\$ -	\$ -
Hidden Valley Tunnels (1) (EB)	LF	0	\$ -	\$ -
Hidden Valley Tunnels (1) (WB)	LF	0	\$ -	\$ -
Hidden Valley Tunnels (1) Cross Passages	LS	0	\$ -	\$ -
Hidden Valley Tunnels (1) Systems	LS	0	\$ -	\$ -
Hidden Valley Tunnel (2) (WB)	LF	0	\$ -	\$ -
Hidden Valley Tunnel (2) Cross Passage	LS	0	\$ -	\$ -
Hidden Valley Tunnel (2) Systems	LS	0	\$ -	\$ -
EJMT Approaches	LF	0	\$ -	\$ -
EJMT North Bore	LF	0	\$ -	\$ -
EJMT Cross Passages	LS	0	\$ -	\$ -
EJMT Systems	LS	0	\$ -	\$ -
<i>Tunnel Components Subtotal</i>				\$ -
Tunnel Allowances		% Range or Units	% Cost or Cost	Cost
Allowances (Unallocated Items)		1% - 10%	0%	\$ -
Seeding, Wetlands, Stream and Site Impacts	LS		\$ -	\$ -
Utilities	LS		\$ -	\$ -
Drainage & Water Quality (Permanent)	LS		\$ -	\$ -
Water Quality (Construction)	LS		\$ -	\$ -
Signing & Striping (General)		1% - 2%	0%	\$ -
Traffic Control (Construction)		1% - 2%	0%	\$ -
Mobilization & Staging		5% - 15%	0%	\$ -
Right-of-Way	LS		\$ -	\$ -
CSS Contingency		15%	15%	\$ -
<i>Total of Tunnel Allowances</i>				\$ -
<i>Total of Tunnel Components & Allowances</i>				\$ -

I-70 Cost Estimate Build-Up

Alt06_Opt01

Temporary Peak Period Shoulder Lane. Using the existing roadway, accommodate one additional WB left side managed lane for use during peak times; during non-peak times operates as a standard shoulder. No twelve foot wide shoulders are available during peak periods. Construction of WB peak period lane is from Empire to Floyd Hill only. (Assumes EB peak period lane from Empire to Floyd Hill is constructed.)

CAPITAL COSTS

Transit Components	Units	Quantity	Unit Cost	Cost
Vehicles	EA	15		
Infrastructure	LS	1		
Stations - Basic	EA	2		
Stations - Major	EA	2		
Maintenance Barn	EA	1		
<i>Transit Components Subtotal</i>				
Transit Allowances		% Range or Units		
Allowances (Unallocated Items)		1% - 10%		
Seeding, Wetlands, Stream and Site Impacts		LS		
Utilities		LS		
Drainage & Water Quality (Permanent)		LS		
Water Quality (Construction)		LS		
Signing & Striping (General)		1% - 5%		
Traffic Control (Construction)		5% - 25%		
Mobilization & Staging		4% - 10%		
Right-of-Way		LS		
CSS Contingency		15%		
<i>Transit Allowance Total</i>				
<i>Transit Components & Allowance Total</i>				\$ 5,812,440,000

SUMMARY OF CAPITAL COSTS	Cost
Roadway & Structures & Allowances	\$ 76,275,996
Tunnel Components & Allowances	\$ -
Transit Components & Allowances (from AGS Study)	\$ 5,812,440,000
<i>Roadway, Structures, Tunnels, Transit Construction Total</i>	\$ 5,888,715,996

DESIGN & CONSTRUCTION ENGINEERING	% Range or Units	% Cost or Cost	Cost
NEPA	LS	\$ -	\$ 6,498,360
Roadway & Structures Preliminary & Final Design	8% - 12%	12%	\$ 9,153,120
Tunnels Preliminary & Final Design	8% - 12%	10%	\$ -
Transit Preliminary & Final Design (Included in AGS Study)	LS		\$ 552,181,800
CSS Design Contingency	19%	19%	\$ 1,739,093
<i>Preliminary & Final Design Total</i>			\$ 569,572,372
Roadway & Structures Construction Engineering	6% - 10%	8%	\$ 6,102,080
Tunnels Construction Engineering	6% - 10%	8%	\$ -
Transit Construction Engineering (Included in AGS Study)	LS		\$ 437,218,200
<i>Construction Engineering Total</i>			\$ 443,320,280
<i>Preliminary & Final Design & Construction Engineering Total</i>			\$ 1,012,892,652

Project Capital, Design, & Construction Engineering Total	\$ 6,901,608,648
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I-70 Cost Estimate Build-Up**Alt06_Opt01**

Temporary Peak Period Shoulder Lane. Using the existing roadway, accommodate one additional WB left side managed lane for use during peak times; during non-peak times operates as a standard shoulder. No twelve foot wide shoulders are available during peak periods. Construction of WB peak period lane is from Empire to Floyd Hill only. (Assumes EB peak period lane from Empire to Floyd Hill is constructed.)

OPERATIONS & MAINTENANCE

Roadway & Structures O&M Costs	Unit	Quantity	Unit Cost		Total
Snow Removal	LM	29.4	\$	6,213	\$ 182,651
Routine Maintenance	LM	29.4	\$	12,858	\$ 378,037
Pavement Rehabilitation	LM	29.4	\$	14,132	\$ 415,469
ITS Operations	LS	1	\$	1,000,000	\$ 1,000,000
Tolling Operations	LS	1	\$	400,000	\$ 400,000
Long Term Capital Replacement	LS	1	\$	1,087,674	\$ 1,087,674
<i>Roadway, Structures O&M Total Cost per Year</i>					\$ 3,463,832

Tunnel O&M	Unit	Quantity	Unit Cost		Total
Routine Maintenance	LM	0	\$	-	\$ -
Pavement Rehabilitation	LM	0	\$	-	\$ -
Tunnel Systems	LS	1			\$ -
Long Term Capital Replacement	LS	1			\$ -
<i>Tunnel O&M Total Cost per Year</i>					\$ -

Transit O&M Costs	Unit	Quantity	Unit Cost		Total
Vehicle Operations	LS	1	\$	10,358,040	\$ 10,358,040
Vehicle Maintenance	LS	1	\$	3,816,120	\$ 3,816,120
Infrastructure Maintenance	LS	1	\$	7,087,080	\$ 7,087,080
Long Term Capital Replacement - annualized	LS	1	\$	31,987,212	\$ 31,987,212
General & Administrative	LS	1	\$	5,996,760	\$ 5,996,760
<i>Transit O&M Total Costs per Year</i>					\$ 59,245,212

<i>Project Operations & Maintenance Total per year</i>					\$ 62,709,044
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