



ADVANCED GUIDEWAY SYSTEM (AGS) FEASIBILITY STUDY

CHAPTER 7 FUNDING AND FINANCIAL ANALYSIS

Chapter 7 Funding and Financial Analysis

The final step in assessing the feasibility of the Advanced Guideway System (AGS) is to determine if there is a way that the AGS can be funded and financed. The funding and financial analysis assessed the options for available funding streams, both those that currently exist and those that would require new funding sources. It then examined how an AGS might be financed publically with local, state, or federal funds; or as a public-private-partnership (P3).

7.1 Approach

The approach to the funding and financial analysis included the following:

- Development of capital cost requirements.
- Determination of debt service requirements.
- Identification of potential funding sources.
- Outreach to technology and financial industries.

7.2 Capital Cost Requirements

The funding and financial analysis initially focused on the lowest-cost \$5.5 billion Hybrid/120 mph Maglev Minimum Operating Segment (MOS). Ultimately, three sets of capital costs were developed (two variations on the MOS and one for the Full System). The costs (year 2013 dollars) by segment are shown in Table 7-1.

Table 7-1: AGS Capital Cost Requirements

Federal Funding	Breckenridge to I-70/C-470 Hybrid/120 mph Maglev	Breckenridge to I-70/C-470 Hybrid/High Speed Maglev	ECRA to I-70/C-470 – Hybrid/High Speed Maglev
0%	\$5,317,858,000	\$6,801,837,000	\$13,337,490,000
20%	\$4,254,286,400	\$5,441,469,600	\$10,669,992,000
50%	\$2,658,929,000	\$3,400,918,500	\$6,668,745,000
Capital Cost Estimates by Segment			
Capital Expenditures	\$5,317,858,000	\$6,801,837,000	\$13,337,490,000

MOS = Minimum Operable Segment.

7.3 Debt Service Requirements

If it is assumed that CDOT (or another governmental entity) directly finances the capital costs using debt-backed by sales tax revenues (and assumes construction cost and delay risk), a debt service coverage of at least 1.2x would be required, depending on ratings targets. It should be noted that RTD currently provides a “coverage” level on its regional FasTracks sales tax of 2.48x maximum annual debt service with a 2.00x additional debt test for an AA-category rating. This means that, on an annual basis, the RTD revenues that are pledged to the bonds are 2.48 times the required debt service payments. Lower ratings

commensurate with lower coverages and greater leverage would likely be targeted for the AGS because of the substantial capital need. The annual debt service numbers below are based on an investment grade rating (BBB) with an average interest rate of approximately 5.6 percent for the 30-year bonds and 5.8 percent for the 40-year bonds. Depending on the revenue source, the required debt service coverage ratios could range between 1.2 to 2.0x, meaning the required annual revenues would need to be at those multiples of the annual debt service requirements found in Table 7-2.

Based on a range of capital costs and federal funding options for the three alignment/technology pairs, one set of financial analysis was performed based on a 30-year debt term and another on a 40-year debt term. It is important to note that these numbers are based on the current year dollar estimates and do not take into consideration any escalation of capital costs. The results of the calculations are presented in Table 7-2.

Table 7-2: Annual Debt Service Requirements

Federal Funding	Average Annual Payment 30 Years	Average Annual Payment 40 Years
Breckenridge to I-70/C-470 – Hybrid/120 mph Maglev, \$5.5 Billion Principal		
0%	\$413,100,000	\$385,802,000
20%	\$330,480,000	\$308,641,000
50%	\$206,550,000	\$192,901,000
Breckenridge to I-70/C-470 – Hybrid/High Speed Maglev, \$6.8 Billion Principal		
0%	\$528,378,000	\$493,462,000
20%	\$422,703,000	\$394,770,000
50%	\$264,189,000	\$246,731,000
ECRA to I-70/C-470 – Hybrid/High Speed Maglev, \$13.3 Billion Principal		
0%	\$1,036,079,000	\$967,613,000
20%	\$828,863,000	\$774,090,000
50%	\$518,039,000	\$483,806,000

7.4 Potential Funding Sources

The AGS Study Team worked closely with a Funding and Financing Work Group to develop a list of possible funding sources for the AGS. The group was comprised of CDOT and representatives of the ICS Team, staff from CDOT's High Performance Transportation Enterprise, and representatives from the financing industry. Additional details on the work of this group can be found in Section 7.8.1.

From the list of potential sources, various preliminary, hypothetical assumptions were tested that showed the magnitude of funding that could be generated from each source. Revenue generation levels are based on a more realistic 25 percent capture rate of the preliminary revenues were calculated for comparison. This lower rate could represent a lower capture rate of the revenues or a lower tax or fee increase, i.e. a \$.0625 fuel tax increase instead of a \$.25 increase. In Table 7-3, that lower number is then extrapolated out for 10 years to

determine what revenues could be generated over that period. The 30-year number might be used to back a long-term financing commitment. It should be noted that since the capital costs were not escalated, no corresponding calculation was made as to how these revenue levels might change over time. Once candidate revenue/funding sources have been identified and decisions have been made about how to proceed with securing those sources, a more detailed future revenue stream calculation can be conducted.

Table 7-3: Analysis of Possible AGS Funding Sources

Source	Preliminary Assumption	1-Year Total (\$M)	25% Captured (\$M)	10-Year Total @ 25% (\$M)	30-Year Total @ 25% (\$M)	Advantages	Disadvantages
Motor Fuel Tax Increase	\$0.25 per gallon increase statewide	\$447	\$112	\$1,118	\$3,353	<ul style="list-style-type: none"> Existing revenue source 	<ul style="list-style-type: none"> More fuel efficient vehicles decreases potential funding, especially over the long-term so declining effectiveness, 30-year number likely much less Political acceptability
New Vehicle Miles Traveled Fee	\$0.01 per mile increase statewide	\$393	\$98	\$982	\$2,947	<ul style="list-style-type: none"> New revenue source 	<ul style="list-style-type: none"> Potential high collection costs Difficult to implement in near future Political acceptability
Vehicle Registration Fee Increase	\$100 per vehicle increase statewide	\$391	\$98	\$978	\$2,933	<ul style="list-style-type: none"> Stable revenue stream 	<ul style="list-style-type: none"> Dependent on vehicle sales Political acceptability
New Utility Fee	\$15 per household per month statewide	\$294	\$74	\$735	\$2,205	<ul style="list-style-type: none"> New revenue source Improved infrastructure 	<ul style="list-style-type: none"> Significant new systems required to collect Political acceptability Diversion of funds to streets and/or other sectors
Sales Tax Increase	1% increase in a 16-county study area	\$572	\$143	\$1,430	\$4,290	<ul style="list-style-type: none"> Has been accepted politically in the past, such as for 	<ul style="list-style-type: none"> Regressive Referendum may encounter opposition due to previous increases

Table 7-3: Analysis of Possible AGS Funding Sources

Source	Preliminary Assumption	1-Year Total (\$M)	25% Capture (\$M)	10-Year Total @ 25% (\$M)	30-Year Total @ 25% (\$M)	Advantages	Disadvantages
						FasTracks program	<ul style="list-style-type: none"> • Direct competition with FasTracks in Denver metropolitan area
Property Tax Increase	2 mills increase in 16-county area for cities and counties	\$200	\$50	\$500	\$1,500	<ul style="list-style-type: none"> • Existing revenue generation method 	<ul style="list-style-type: none"> • Significant legal hurdles
						<ul style="list-style-type: none"> • TIF financing 	<ul style="list-style-type: none"> • Significant competition with schools and local government initiatives
Income Tax	1% increase in 16-county study area	\$1,044	\$261	\$2,610	\$7,830	<ul style="list-style-type: none"> • Strong and stable revenue stream 	<ul style="list-style-type: none"> • Political acceptability very difficult • Significant competition from a wide array of other government needs
Lodging Tax	1% of current statewide lodging spending	\$26.50	\$6.63	\$66	\$199	<ul style="list-style-type: none"> • Mostly impacts out-of-state visitor • Non-obtrusive 	<ul style="list-style-type: none"> • Hotel and tourism industry may lobby against • Relatively small revenue source
Lottery	Reallocation of 10% of existing lottery program profits	\$11	\$2.75	\$28	\$83	<ul style="list-style-type: none"> • Voluntary • Election not required 	<ul style="list-style-type: none"> • Historically, lottery funds have been 100% committed to other expenditure categories
Developer Fee	\$10,000 per new residence & 1% fee on commercial development	\$169	\$42	\$423	\$1,268	<ul style="list-style-type: none"> • Politically acceptable • Election not required • Taxes future residents 	<ul style="list-style-type: none"> • Raises costs to new buyers • Construction and home building industry may lobby against • Very difficult to finance based on speculative future development

Other possible funding sources that were considered, but are not represented above, because they were considered to not generate sufficiently robust revenues or were politically infeasible include:

- **Lift ticket taxes** – This would not generate a significant amount of funding, and it is not likely to be considered acceptable to the ski area operators because it would make Colorado lift ticket prices less competitive with those in other states. Further, the fluctuations in numbers of ski area visitors may make this an inconsistent source of funding.
- **Airline ticket surcharges** – According to the Denver International Airport’s (DIA) 2012 Annual Financial Report¹, in 2012 about 53.2 million passengers were served at DIA. Of these, about 55.3 percent originated or terminated their air travel at DIA. This equates to about 29.4 million passengers. A \$1.00 per ticket charge would generate only \$882 million over a 30-year period, which is sizable, but insufficient as a stand-alone funding source for the AGS. Also, there is considerable competition for airport revenue sources.

As can be seen, relatively few funding sources have a significant ability to generate billions in revenue and provide the necessary funding levels needed for the AGS. Also, any increases in these taxes and fees would compete with other programs seeking increases in these same funding sources, and there is no assurance that they would be supported by elected officials or the public.

7.5 Local Funding Sources

There are several ways that local counties, cities, and towns could help fund the AGS. They include:

- **Capturing the value of the stations through tax-increment financing (TIF)** – TIF and similar value capture strategies are public financing methods used as a subsidy for redevelopment, infrastructure, and other community-improvement projects in many countries, including the United States (U.S.). TIF uses future gains in taxes to subsidize current improvements that are projected to create the conditions for the future gains. In the case of the AGS, completion of the stations would result in an increase in the value of surrounding real estate, which would then generate additional tax revenue. Sales tax revenue may also increase, and jobs may be added; however, these factors and their multipliers usually do not influence the structure of TIF.
- **Funding or paying for the stations** – The counties, cities, or towns could fund the construction of the stations out of existing sources of local funds. Including contingencies, stations average about \$220 million of the total cost of the various

¹ http://business.flydenver.com/stats/financials/reports/2012_finrpt.pdf.

alignment/technology pairs, or roughly in the range of \$23.6 to \$39.3 million per station.

- **New local sales taxes, property taxes, or fees** – These would be in addition to any other taxes specifically identified for the AGS.

7.6 State Funding

The total budget of the State of Colorado was \$24 billion in 2014. The annual CDOT budget is about \$1.1 billion². With a required debt service of between \$193 million and over \$1 billion, capital costs for a project of this size would seriously impact the capacity of CDOT to meet its major maintenance, capital investment, and operations responsibilities. Long-term debt service alone would consume between 18 and almost 100 percent of the total CDOT budget. In its most recent budget year, the CDOT budget is already fully allocated to existing operations, maintenance, and debt service needs leaving no capacity for system expansion capital projects. Going forward, there is a statement in the 2013-2014 budget that there is limited additional capital funding expected to be available in the future.³ While financing the AGS project with long-term bonds would ease near-term cash requirements, CDOT's budget does not have the capacity to pay the substantial required debt service for 30 to 40 years.

7.7 Federal Funding

Although the development of alternative transportation technologies, such as high-speed rail or maglev, has enjoyed federal policy support, funding has been sporadic and constrained. Over the near to medium term, federal funding is expected to be limited given the constraints facing the Highway Trust Fund (HTF), which is further constrained by deficit reduction initiatives. In recent years, the HTF has become dependent upon transfers from the General Fund to support funding for the federal highway and transit programs, and funding levels are not assured from year to year. Current prospects for raising the federal motor fuel tax are unlikely. Further constraints are placed by the increasing motor vehicle fuel efficiency, which while providing important environmental and energy independence benefits, will further contribute towards a flat or declining trend for motor fuel tax revenues. The United States Energy Information Administration projects in its 2013 Annual Energy Outlook⁴ that average fuel efficiency will increase 2 percent annually through 2040, with a corresponding gasoline fuel consumption decline by 0.9 percent annually over this period.

As mentioned, although motor fuel tax revenues have been impacted by challenging economic conditions and improving motor vehicle fuel efficiency, federal officials have taken actions to provide supplemental resources to support transportation funding. MAP-21 provides \$18 billion in General Fund transfers to the HTF. Although these efforts to provide

² Colorado Department of Transportation – Fiscal Year 2014 Final Budget.

³ Colorado Department of Transportation – Fiscal Year 2014 Narrative Budget.

⁴ <http://www.eia.gov/forecasts/aeo/er/index.cfm>.

additional resources demonstrate the importance of sustained transportation funding to policy makers and elected officials under a challenging financial environment, resource constraints are expected to continue. With sequestration, this presents an even greater challenge for securing federal funds.

The Congressional Budget Office estimates the HTF will require substantial external support just to maintain the existing Federal Highway Administration and Federal Transit Administration programs at current levels. This does not take into consideration new programs, such as for the Federal Railroad Administration (FRA), which would be necessary to expand the high-speed transit initiative and provide needed funding for such projects as AGS. As a result, federal spending priorities, without a significant increase in funding, will remain focused on state of good repair of the existing transportation network with selected system expansions.

Although this poses a challenge for the AGS, CDOT could potentially attract federal funding by a demonstrating strong state, regional, and local financial commitment to the project. A demonstrated commitment would provide the foundation for seeking federal and private funding/financing.

CDOT would likely be eligible to apply for certain federal loan programs, such as the Transportation Infrastructure Finance and Innovation Act (TIFIA) or the Railroad Rehabilitation and Improvement Financing (RRIF) loan, to finance a portion of the AGS capital costs at an attractive interest rate equivalent to long-term treasuries and flexible repayment terms. However, these are loans that must be repaid, not a grant. Given the magnitude of the AGS capital costs, it is highly unlikely CDOT would secure a loan amount equal to the 33 to 49 percent of project costs allowable under TIFIA. Based on the financing of other projects, a TIFIA loan would likely be in the magnitude of \$500 million to \$1 billion so long as the AGS meets TIFIA's project and creditworthiness requirements. Project readiness is a critical component for receiving TIFIA approval, so the AGS would need to have completed environmental approvals and have funding sources in place prior to submitting an application.

Given the lack of any federal programs that could provide 100 percent funding for the AGS, the starting point for discussion for an appropriate ratio of federal funding would be within the range of 0 to 50 percent. The reality of current federal budget debates could greatly impact the funds available for AGS. A reauthorization of the federal transportation budget with significant rail funding would be required for any federal sources to be potentially available.

7.7.1 Federal Funding Programs

New Starts Funding

Under current law, the Federal Transit Administration has funds available for major transit projects under the MAP-21 Fixed-Guideway Capital Investment Grants Program (5309), also known as New Starts/Small Starts. The program provides grants for new and expanded rail, bus rapid transit, and ferry systems that reflect local priorities to improve transportation options in key corridors.

Depending on its final design, alignment, and economic and environmental impacts, the AGS could be eligible for some funding under New Starts. To be successful in receiving New Starts funds, the AGS would need to meet the program criteria, including justifying the project through mobility improvements, environmental benefit, cost-effectiveness, operating efficiencies, transit-supportive land use/future patterns, and economic impacts. CDOT or a similar state-created entity would also need to demonstrate a strong local financial commitment to the AGS.

New Starts Program Positives

The New Starts program represents a source of federal project funding that would require no repayment by CDOT. The AGS meets the intent of New Starts because it originates from a regional multimodal transportation planning process. The congestion relief criterion could be beneficial for the AGS.

New Starts Program Negatives

Only \$1.9 billion in total funds were available for New Starts funding in 2013. The AGS would traditionally follow the three-phased project development requirements of New Starts—Alternatives Analysis, Preliminary Engineering, and Final Design. This is not consistent with a P3 concession approach (if that is the approach pursued) and would require special accommodations from FTA similar to what was received for the RTD FasTracks Eagle P3 project.

The FTA is currently reviewing new rules for the New Starts program. The new project funding criteria may work against the AGS being successful in receiving funding because of a new focus on 'fix-it-first,' or maintaining current systems before building new systems. The new criteria are also focused on new trips generated. Further, the non-urban portions of the AGS are unlikely to be candidates for FTA funding. Finally, there would be a significant burden of proof placed on CDOT or similar state-created entity to substantiate the need for infrastructure that duplicates some of the Eagle P3 project's service.

FRA High-Speed Rail

The FRA supports the development of passenger rail and high-speed passenger rail throughout the U.S. While the FRA has had programs in the past for the development of a

passenger rail network in the U.S., the High Speed Intercity Passenger Rail Program has gained the most interest. This program is reviewed below because none of the other FRA programs are accepting funding applications at this time according to the FRA website⁵. Any decision that federal funds will be available to CDOT will need to consider the likelihood and level of possible future funding for high-speed rail.

High-Speed Rail Positives

Beginning in 2009, the High Speed Intercity Passenger Rail Program was implemented to give 80 percent of Americans access to high-speed rail within the next 25 years. A total of \$10.1 billion was made available for high speed rail development and rail improvements, which illustrates a major commitment to this type of transportation.

High-Speed Rail Negatives

Nearly 99 percent of the \$10.1 billion available for high-speed rail development has been obligated. Colorado received a total of \$1.4 million for the *Colorado State Freight and Passenger Rail Plan* prepared in 2012 and the *Interregional Connectivity Study*. It is unlikely that additional funds will be made available under this program without the Passenger Rail Investment and Improvement Act of 2008 (PRIIA) reauthorization.

7.8 Industry Outreach and Involvement

The two main outreach activities related to the financial analysis are described in this section.

7.8.1 Funding and Financing Work Group Meetings

A Funding and Financing Work Group held three meetings in collaboration with the ICS Team and the High Performance Transportation Enterprise financial consultants to develop possible financing/funding strategies. The goal of the Funding and Financing Work Group was to evaluate and recommend the most viable funding alternatives available to the AGS for project delivery. To achieve this goal, the Work Group:

- Determined which viable funding alternatives should be included in its report.
- Developed evaluation methods and reported the results of the evaluations of the alternatives, including an assessment of funding alternative options and considerations for the most viable options.
- Developed strategies for passing a vote for new tax funds, including whether these should be combined with other infrastructure projects.
- Implemented strategies for including input from the AGS PLT.

The final result of the Working Group's activities was a set of recommendations for the funding and financing of the AGS that was issued to the AGS PLT during the development of

⁵ <http://www.fra.dot.gov/Page/P0021>

the Request for Statements of Financial Information (RFSOFI). The funding and financing recommendations were included in the RFSOFI.

7.8.2 Request for Statements of Financial Information (RFSOFI)

CDOT issued a RFSOFI on May 17, 2013, and responses were received on June 28, 2013. The RFSOFI solicited Statements of Financial Information (SOFI) from the financial community, which included public-private partnership concessionaires/developers, and financiers. Technology providers, constructors, and operators were also included. The RFSOFI is included in Appendix J.

The stated goal of the RFSOFI was to establish if there were one or more feasible financial alternatives to fund or implement an AGS by 2025, as prescribed by the *I-70 Mountain Corridor PEIS Record of Decision*. The SOFIs were to address the financial feasibility of the AGS, as developed using the technologies that each technology provider had proposed in their SOTI. The RFSOFI noted that the AGS Study Team had completed capital cost estimates for the various alignment and technology alternatives that had been provided under the SOTI.

SOFI Response Summary

The following six technology providers submitted SOFIs.

- Colorado MAGLEV Group
- Maglev Trans
- Owens Transit Group, Inc.
- Public Personal Rapid Transit Consortium
- SkyTran Incorporated (only responded to Section 2)
- Swift Tram, Inc.

The compiled responses and the conclusions regarding them are summarized in the following sections, along with input gained from members of the concession and financial community. Included in Appendix K is a detailed analysis of the responses.

Respondents' Financial Background

The respondents were all technology providers who had previously responded to the RFSOTI. Because none of the respondents were concessionaires or financial providers, follow-up discussions were held with various members of the financial community. The concessionaires/ financial providers indicated their reluctance to respond because the AGS is in the early stage of development, and key issues surrounding technology, demand, constructability and funding had not yet been defined. They were unwilling to submit on a purely speculative basis because the submittals would reflect on their reputation in the industry.

This lack of responses emphasizes that securing and demonstrating state, regional, and local financial commitment for AGS is essential to attracting the attention of the private sector. It is also essential to obtaining federal funds. Additional activities needed to further the AGS such as a Tier 2 NEPA analysis, acquisition of right-of-way, and definition of the project sponsor (CDOT, entity like RTD, or other) with authorized funding sources are needed to establish a credible financial plan. Once a detailed and credible sponsor's base case financial plan is proposed (with the details of the state and local funding strategy), the private sector will have more information and be more inclined to provide meaningful feedback.

SOFI Responses on Funding and Financing Components

Responders were asked to provide recommendations regarding the funding streams needed for successful financing of AGS. Their responses are categorized by type of funding/financing, and in many cases reflect a wide range of opinions and approaches.

Federal Funding Opinions & Approaches

- 50 percent federal funding match with a 50/50 chance for future high-speed rail funding being approved for appropriation.
- Federal funding for the project must only be 2 percent of project costs to cover due diligence, legal, establishment, and commitment fees.
- CDOT must underwrite 100 percent funding for the AGS (0 percent federal funding).
- Federal funding is not required for the AGS, but bonds issued for the project would be secured by the federal government under the America Fast Forward program.
- AGS is not a New Starts candidate and other federal funding is unlikely.
- AGS is a good candidate for several federal funding sources, including MAP-21 Formula Programs, Department of Energy energy-efficiency in transport grants, and FRA grants.

Additional Public Funding Opinions and Approaches

- Special transportation district assessment.
- Self-taxing economic development zones around stations.
- Savings from highway lanes not developed redeployed into state funding payments.
- Gasoline tax.
- Vehicle Miles Traveled tax.

Opinions and Approaches Regarding Other Project Revenue Sources

- Station development and other fees.
- High-value freight, light freight.
- Leased telecommunication fiber space, other telecommunication revenue.
- Solar and wind power generation.

- Rights of the gravel generated during construction and development rights, value of removed materials during construction.
- Transmission of power and telecommunications along the right-of-way.
- Station naming rights, advertising in stations.

Financing Opinions and Approaches

- Concessionaires and market participants are highly unlikely to accept farebox and travel demand risk.
- Concessionaires and market participants will rely on only a portion of fare revenues given the uncertainties regarding demand and technology risk which may interfere with the reliable operation of AGS service.
- Financing of the project will need to be supported by one or more predictable revenue sources derived from broad-based tax sources such as a sales tax, income tax and/or motor fuel or vehicle tax.

SOFI Conclusions

- The level of federal funding potentially available for high-speed transit systems is highly speculative at this time.
- At this time it is unclear which agency would control a new generation technology such as maglev – it is most likely to be the FRA.
- While some additional revenues beyond the farebox could be generated from the project, they are unlikely to provide material support for the AGS.
- Substantial new public revenues from one or more predictable revenue sources are needed for capital costs, as well as potentially for a portion of operations and maintenance (O&M) plus long-term renewal and replacement (R&R).
- The required revenues will need to be broad-based tax sources (sales tax, income tax and/or motor fuel or vehicle tax) requiring public vote of to impose tax and issue debt.

Responses on Financing Capacity

SOFI Responses

- With adequate preparation, there is no reason to believe the financing of the AGS cannot be achieved, but more study is needed.
- If 100 percent backed by sovereign credit rating of S&P A-/Moody's A3, the Capital Lease Infrastructure Program can provide an absolute dollar amount of \$3.9 billion, dependent on the current return on investment. All options described in the AGS RFSOFI would be impossible to fund. The project must generate minimum 7 percent return after stabilization for it to be considered fundable.
- Under one proposed model, the project would be funded through small, community specific builds and special purpose authorities resulting in lower costs.

- A recommendation was made that bonds be based on dedicated revenue sources with an estimated need of \$7.222 billion, or 87.7 percent of the total construction budget.

Financial Industry Responses

- Given the magnitude of the AGS project costs for either the Minimum Operable Segment (MOS) or the Full System, it is likely that the financing will need to be staged over a period of time to allow the market to absorb the transaction and to ensure the cost-effectiveness of the financing.
- In today's market, large public transit deals financed in the tax exempt markets are typically no more than \$1 billion. This could potentially be extended to as much as \$2 to 3 billion with exceptionally strong commitments and revenue sources.
- To maximize the available financing, it is preferable that several debt and credit structures be used to attract broad market participation and maximize investor interest.
- For a potential P3 like the AGS, private activity bonds would be a viable option, such as those used for the Eagle P3 project.

Critical Security Features for Cost-Effective Financing

- The preferable structure is a design-build-operate-maintain contract that provides fixed-price/fixed-schedule construction contract with appropriate incentives and disincentives to ensure the on-budget/on-time completion of the project, as well as predictable annual operations and maintenance costs.
- Ridership and fare revenue risk will be expected to be retained by the public sponsor and is not an element of the financing.
- Availability payments would be expected to secure the debt and pay O&M, future R&R, capital expenditures, and other project-related expenses. These payments must be derived from a predictable, creditworthy source, such as a sales tax.
- Availability payments would provide sufficient coverage to address potential cash flow and project performance variability. Since availability payments are predictable if they are derived from stable sources that have a collection history and the amounts paid are clearly defined in the concession agreement, minimum debt service coverage ratios as low as 1.20 could be reasonable if a very high-quality bond rating could be achieved, or they may require higher coverage ratios, as was the case for RTD's Eagle P3 financing (1.56x minimum on the Private Activity Bonds of \$398 million).
- The terms and conditions under which the availability payment is provided to the concessionaire must be clearly defined in the concession agreement and the documents governing the debt.

- The debt structure is likely to require reserves to provide liquidity in the event of disruption of the availability payments—these would include a debt service reserve fund, an O&M reserve, and R&R/mandatory capital expenditure funds.
- The selected concessionaire must have the necessary experience and expertise to design, construct, operate, and maintain the project.

Conclusions

- There are significant challenges to achieving financing at the level of \$3 billion or greater.
- The maximum level of financing requires a significant level of government backing, plus a very strong revenue stream. Any financing will require minimum debt service coverage ratios of at least 1.2x, but more likely at higher levels.
- Up-front grants will need to be in place for a significant portion of project costs.
- There will be significant perceived risks by the financial community if the selected technology is unproven.

Responses on Financing Cost

SOFI Responses

- A broad range of responses advocated that the project be 100 percent underwritten by CDOT.
- Other responses were well below known government financing costs of 3 to 4 percent.

Financial Industry Responses

- The financing costs will depend upon the credit, term, and tax status of the bonds issued.
- It is important that the plan of finance include sufficient cushion to accommodate potential market volatility.

Conclusions

- The ultimate financing costs depend on credit, term, and tax status of debt.
- The plan of finance must include sufficient cushion (i.e., coverage ratio) to create a financing structure that is acceptable in the marketplace.
- Current interest rates remain close to historic lows; long-term tax exempt rates are approaching a ten-year average.
- 30-year maturity for an AA tax exempt credit as of July 22, 2013, 4.46 percent; 5.34 percent for BBB.
- Private debt has higher interest rates even when using Private Activity Bonds – up to 200 basis points and equity returns of usually 12 percent or higher.
- The annual debt payments provided assumed true interest cost of 5.628 percent for 30-year debt and 5.839 percent for 40-year debt.

SOFI Responses on Recommended Term

Responses on the recommended term varied from 20 to 99 years. The general financial industry consensus is that for private financing an optimal concession term for the public agency is probably 50 years. If it is a tax-exempt financing, the likely term is 30 to 40 years.

SOFI Responses on Availability Payment Structure

Availability payment structures are the most likely approach for a transit project. This is a financing approach where the private sector issues the debt for a project, but the repayment is guaranteed by regular payments from the public partner.

- Responses varied and included supporting the approach, supporting it with construction milestone payments with a preference for design-build-finance; and one firm did not support this approach.
- This approach would likely require substantial milestone payments to the concessionaire during the construction phase to buy down the amount of long-term debt to a financeable level.
- Recent financing activity for P3 availability payment structures in the U.S. are requiring substantial milestone payments. Recent examples have seen 51 to 69 percent of design-build cost, meaning as the net amount financing varies from 49 to 31 percent.

SOFI Responses on General Terms

A well-defined and committed funding strategy of federal, state, regional and/or local revenues is needed to attract both private sector and federal interest. As AGS is further developed, it is recommended that CDOT or the designated governance entity craft a more specific financing assumption in a sponsor's case financial plan. This plan would define its strategy for funding, financing, and implementation on a year-by-year basis.

SOFI Responses on Recommendations on Governance Structure

There was no consensus on the most appropriate governance structure. Responses ranged from full control by CDOT to a fully privatized model.

SOFI Responses on Recommended Delivery Structure

There was general consensus on the P3 delivery structure, including financing capital plus O&M components, based on a private delivery model with guaranteed payments from the public sector. One firm recommended splitting the capital and O&M components as different risk pools.

SOFI Responses on Technology Selection

Because the respondents were technology providers, each of them advocated their own technology solution. The financial community wants proven technology that does not present a material constructability risk/failure to perform. The use of availability payments further emphasizes technology risk because payments are often not made until a project is available for use.

Responses on Roles and Responsibilities

The RFSOFI divided this question into which roles/risk should be transferred to the private sector partner and which roles/risks the public sector should retain. The resulting recommendations covered a range of ideas.

SOFI Responses

- The private sector is willing to take responsibility for design, engineering, construction cost, schedule, O&M; assuring operating performance; closing the necessary financing; and adhering to the budget for delivery of the AGS.
- The public sector should provide the necessary revenues and funding to support the capital costs because these will belong to the public sector. The public sector partner should also take responsibility for achieving environmental approvals, assembling needed right-of-way, and obtaining the necessary legal authorities to implement the procurement and deliver the project.
- One responder suggested the following would be risks shared between the public and private sector: utilities costs, right-of-way, hazardous materials, security, public relations, marketing, financing, farebox rates, and force majeure.
- The respondents suggested that the public sector should manage system specification, change in scope, environmental approvals and ridership projections.

Financial Industry Responses

- The private sector must have sufficient payment guarantees to obtain necessary bank or capital markets financing.
- Any scenario that requires the private sector to take revenue risk will increase the cost of private financing.
- The private sector will require clear design, build, operations and maintenance criteria to maintain control over the delivery of the project.

SOFI Responses on Revenue Generation Risk – Fare Box

There was no consensus on this aspect. One group of respondents would “require” the control of farebox pricing. Others would retain excess fares but require CDOT guarantees of debt in case of a fare revenue shortfall. Others insisted this risk should be fully on CDOT.

SOFI Responses on Revenue Generation Risk – Other Revenue Streams

This is another response that resulted in a wide range of opinions. One group required control of station rents and freight rates. Some would retain excess revenues as long as CDOT underwrites all revenue shortfall. Some gave general statements on possible revenue streams but no specifics on conditions.

SOFI Responses on Project Components

The respondents were asked to comment on whether including the AGS with either future managed lanes or tolls on I-70 would be beneficial. They were also asked if the AGS and the ICS System should be combined. The following summarizes their responses.

- Two respondents recommended AGS and highway project should be coupled.
- One respondent suggested an option of first right of refusal to undertake the highway project if the AGS provides insufficient congestion relief.
- One respondent stated that tolls on I-70 are not necessary.
- Two respondents indicated that they did not see any synergies between the ICS System and AGS.
- One respondent would require a first right of refusal on the ICS System.
- One respondent indicated that the projects should be combined as one if it makes both projects more feasible.
- One respondent said any combination could be beneficial.

7.8.3 Key Takeaways from the SOFI Responses and Financial Industry Input

- There is no clarity on what constitutes realistic expectations for federal funding.
- There is very little potential for project-generated revenue sources.
- No consensus was provided on the requirements for additional public funding.
- SOFI respondents were not able to provide meaningful responses on financing capacity.
- Many respondents were not able to provide meaningful input as to financing costs.
- The recommended term ranges from 20 to 99 years.
- There was general support for availability payment structure.
- There was a broad range of views on appropriate terms and conditions.
- The governance question resulted in a broad range of responses.
- The technology solution input was not meaningful because each SOFI respondent was pushing their own specific technology solution.

7.9 Financing Analysis

As a supplement to the information received from the respondents, two sets of financing analysis were prepared for the three alignments—a 30-year debt term (Table 7-4) and a 40-year debt term (Table 7-5), with varying levels of federal grant funding. While the financial community indicated that a 50-year term would be optimal, current market conditions

indicate that a 40-year debt term would be the maximum available at this time for such a large financing.

When reviewing the results of the analysis, it is important to note that the amount of Total Bond Proceeds shown includes the funds needed to pay back the capital costs plus interest, as well as the costs to issue and underwrite the bonds. It is also important to note that these results do not include the costs associated with funding the shortfall between farebox revenues and O&M costs for the MOS or the expected surplus revenue likely to be generated by the Full System.

Table 7-4: AGS Financing (30-Year Scenario)

	0% Federal Grants	20% Federal Grants	50% Federal Grants
Breckenridge to I-70/C-470 – Hybrid/120 mph Maglev, \$5.5 Billion Principal			
Total Bond Proceeds	\$ 5,949,265,000	\$ 4,759,410,000	\$ 2,974,633,000
Bond Proceeds Project Fund Deposit	\$ 5,317,858,000	\$ 4,254,286,000	\$ 2,658,929,000
Debt Service Reserve Fund	\$ 584,634,000	\$ 467,707,000	\$ 292,317,000
Cost of Issuance	\$ 17,539,000	\$ 14,031,000	\$ 8,770,000
Underwriter's Discount	\$ 29,232,000	\$ 23,385,000	\$ 14,616,000
Average Annual Debt Service	\$ 413,100,000	\$ 330,480,000	\$ 206,550,000
Total Debt Service - 30 Years	\$ 12,393,002,000	\$ 9,914,402,000	\$ 6,196,509,000
Breckenridge to I-70/C-470 – Hybrid/High Speed Maglev, \$6.8 Billion Principal			
Total Bond Proceeds	\$ 7,609,442,000	\$ 6,087,553,000	\$ 3,804,724,000
Bond Proceeds Project Fund Deposit	\$ 6,801,837,000	\$ 5,441,470,000	\$ 3,400,919,000
Debt Service Reserve Fund	\$ 747,780,000	\$ 598,224,000	\$ 373,890,000
Cost of Issuance	\$ 22,433,000	\$ 17,947,000	\$ 11,217,000
Underwriter's Discount	\$ 37,389,000	\$ 29,911,000	\$ 18,695,000
Average Annual Debt Service	\$ 528,378,000	\$ 422,703,000	\$ 264,189,000
Total Debt Service, 30 Years	\$ 15,851,346,000	\$ 12,681,085,000	\$ 7,925,681,000
ECRA to I-70/C-470 – Hybrid/High Speed Maglev, \$13.3 Billion Principal			
Total Bond Proceeds	\$ 14,921,092,000	\$ 11,936,874,000	\$ 7,460,546,000
Bond Proceeds Project Fund Deposit	\$ 13,337,490,000	\$ 10,669,992,000	\$ 6,668,745,000
Debt Service Reserve Fund	\$ 1,466,295,000	\$ 1,173,036,000	\$ 733,148,000
Cost of Issuance	\$ 43,989,000	\$ 35,191,000	\$ 21,994,000
Underwriter's Discount	\$ 73,315,000	\$ 58,652,000	\$ 36,657,000
Average Annual Debt Service	\$ 1,036,079,000	\$ 828,863,000	\$ 518,039,000
Total Debt Service, 30 Years	\$ 31,082,368,000	\$ 24,865,892,000	\$ 15,541,177,000

Table 7-5: AGS Financing (40-Year Scenario)

	0% Federal Grants	20% Federal Grants	50% Federal Grants
Breckenridge to I-70/C-470 – Hybrid/120 mph Maglev, \$5.5 Billion Principal			
Total Bond Proceeds	\$ 5,953,806,000	\$ 4,763,045,000	\$ 2,976,906,000
Bond Proceeds Project Fund Deposit	\$ 5,317,858,000	\$ 4,254,286,000	\$ 2,658,929,000
Debt Service Reserve Fund	\$ 588,838,000	\$ 471,070,000	\$ 294,419,000
Cost of Issuance	\$ 17,665,000	\$ 14,132,000	\$ 8,833,000
Underwriter's Discount	\$ 29,442,000	\$ 23,554,000	\$ 14,721,000
Average Annual Debt Service	\$ 385,802,000	\$ 308,641,000	\$ 192,901,000
Total Debt Service, 40 Years	\$ 15,432,070,000	\$ 12,345,655,000	\$ 7,716,059,000
Breckenridge to I-70/C-470 – Hybrid/High Speed Maglev, \$6.8 Billion Principal			
Total Bond Proceeds	\$ 7,615,245,000	\$ 6,092,197,000	\$ 3,807,625,000
Bond Proceeds Project Fund Deposit	\$ 6,801,837,000	\$ 5,441,470,000	\$ 3,400,919,000
Debt Service Reserve Fund	\$ 753,156,000	\$ 602,525,000	\$ 376,578,000
Cost of Issuance	\$ 22,595,000	\$ 18,076,000	\$ 11,297,000
Underwriter's Discount	\$ 37,658,000	\$ 30,126,000	\$ 18,829,000
Average Annual Debt Service	\$ 493,462,000	\$ 394,770,000	\$ 246,731,000
Total Debt Service, 40 Years	\$ 19,738,474	\$ 15,790,792	\$ 9,869,235,000
ECRA to I-70/C-470 – Hybrid/High Speed Maglev, \$13.3 Billion Principal			
Total Bond Proceeds	\$ 14,932,475,000	\$ 11,945,984,000	\$ 7,466,237,000
Bond Proceeds Project Fund Deposit	\$ 13,337,490,000	\$ 10,669,992,000	\$ 6,668,745,000
Debt Service Reserve Fund	\$ 1,476,837,000	\$1,181,470,000	\$ 738,419,000
Cost of Issuance	\$ 44,305,000	\$ 35,444,000	\$ 22,153,000
Underwriter's Discount	\$ 73,842,000	\$ 59,074,000	\$ 36,921,000
Average Annual Debt Service	\$ 967,613,000	\$ 774,090,000	\$ 483,806,000
Total Debt Service, 40 Years	\$ 38,704,506,000	\$ 30,963,611,000	\$ 19,352,253,000

7.10 Key Considerations for Financing AGS

Regardless of whether financing of the AGS is accomplished through taxable or tax-exempt financing, the following would apply:

- Some level of up-front payments would be required during the construction period. On some recent P3 projects, the up-front payments (commonly known as milestone payments) have ranged from 33 to 52 percent of total project costs and from 51 to 69 percent of design and construction costs.
- A limit would apply on the absolute amount of funds that could be financed, both on the public financing/bonding side, as well as the private financing side.

- A definitive and reliable funding stream would be required to be in place to repay the debt. For a transit financing, this would typically be government taxes that might be supplemented by dedicated user fees.
- Capital markets financings require ratings from at least one of three rating agencies: S&P, Moody's, and/or Fitch.
- "Private" financing rates would apply for a project structured as Design-Build-Finance-Operate-Maintain. The equity portion is likely to be in the range of 20 to 25 percent. The remainder would be taxable bonds, bank debt, Private Activity Bonds, and/or TIFIA. Equity carries the highest return, at least 12 percent interest.
- The most likely structure for a concession would be an availability payment structure with milestone payments during the construction period.

7.11 Conclusions

As of 2014, there are no local, state or federal funds currently available for an AGS for the I-70 Mountain Corridor, and therefore it is not financially feasible at this time. Funding from local, state, and federal sources would be required to advance an AGS and to obtain financing from the private sector:

- The capital cost of the Full System AGS is estimated at \$13.3 billion based on the most-developed alignment/technology pairing.
- The capital cost of the AGS MOS is estimated at \$6.8 billion based on the most-developed alignment/technology pairing.
- Concessionaires/public-private partnerships could offer financing in the range of \$1 to 3 billion.
- With private concession/P3 money potentially available, a gap of at least \$10.3 Billion must be filled by local, state and federal dollars just to cover capital costs for the Full System AGS, or at least \$3.8 billion just to cover capital costs for the MOS.

A number of outstanding actions must be accomplished before a project could be considered in the future:

- Establish governance structure.
- Complete environmental clearances.
- Acquire right-of-way.
- Secure voter approval for local/regional/state funding in the form of bonding &/or taxes.
- Obtain federal approval of technology.
- Obtain federal funding grant agreement.

In the meantime, the following can be concluded:

- The AGS currently has no identified funding for capital construction.

- The Full System, once implemented, would generate sufficient operating revenues through the farebox to pay for operations and maintenance expenses, but there would not be sufficient revenues to provide material contributions toward financing the capital costs of the project.
- The AGS MOS (Breckenridge to I-70/C-470) would not generate sufficient farebox revenue to cover O&M costs, and would require an operating subsidy. With the level of funding and financing required, the AGS MOS at estimated capital costs between at \$6.8 billion is challenging as a “starter project.”
- For an AGS to become fundable by 2025:
 - Substantial growth of the Colorado population and economy is required,
 - Significant support from the public for an AGS or similar high-speed transit project must be demonstrated, and
 - Significant increases in federal investment for intercity rail projects are needed.