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AGS Feasibility Study
Meeting Notes

Meeting Type & Number: PLT Meeting #14
Meeting Date: September 11, 2013
Meeting Time: 10:00 AM to 1:00 PM
Location: Tommyknocker's Restaurant, 1401 Miner St Idaho Springs, CO
Prepared by: Mike Riggs
Date published: September 27, 2013
Attendees:

Attendees (* - PLT Member, ** - PLT Alternate)		
Scott Burton, Jefferson County*	Mary Jane Loevlie, I-70 Coalition*	Flo Raitano, Summit County*
Eva Wilson, Eagle County*	Jim Bemelen, CDOT*	Tom Breslin, Clear Creek County*
Jacob Riger, DRCOG*	David Krutsinger, CDOT DTR*	Mike Riggs, AZTEC/TYPSA*
Angie Drumm, CDOT*	Randy Jensen, FHWA*	Danny Katz, COPIRG*
Mark Imhoff, CDOT DTR	Jill Ryan, Eagle County	Tim Mauck, Clear Creek County*
Andy Mountain, GBSM	Miller Hudson, CMG	Beth Vogelsang, OV Consulting
Bob Wilson, CDOT	Patrick Byrne, Colorado Ski Country USA	Matthew Helfant, DRCOG
Wendy Wallach, Parsons	Smith Myung, Cambridge Systematics	Tracey MacDonald CDOT DTR

1. Introduction to the Meeting

David Krutsinger opened the meeting and welcomed the PLT. All attendees introduced themselves.

Andy Mountain reviewed the meeting agenda and outlined the meeting objectives, which included:

- Summary of August Meeting & Approval of Meeting Minutes
- Ridership Refinements & Operations & Maintenance Costs
- Benefit/Cost Analysis
- Funding/Financial Determination
- Next Steps

2. Public Comment

No public comment.

3. Summary of August Meeting & Approval of Meeting Minutes

Andy Mountain led the PLT through a summary of the August 14, 2013 PLT Meeting (Meeting #13) by first asking if there was any comments on the meeting notes.

A PLT member wanted to make sure that the notes reflected the PLT's position that an economic impact analysis needs to be done to determine how an AGS would benefit the I-70 Mountain Corridor. Mike Riggs stated that it was addressed in the notes.

Mike also requested that Randy Jensen check to see if the alignments developed that follow the I-70 alignment but that are not within the right of way meet the requirements of the Record of Decision/Programmatic EIS, preferably in writing. Randy said he would work on getting a written response.

Andy's summary of the August 14 PLT meeting included the following key points:

- The system should be governed by a statewide or super-regional entity that is a creature of the state
- Input from P3 Concessionaires and Financial Community indicates AGS should:
    - Be Statewide or State authorized
    - Have super-regional/multi-regional support
    - Have Governor/Legislature support
    - If technology based, they would want a sole-source deal
    - If finance based, they would compete for the deal with the best price and risk allocation
- Input from P3 Concessionaires and Financial Community indicates AGS financing limitations include:
    - The maximum theoretical private financing limit is $2 to $3 billion but it is likely that actual private financing would be $0.5 to $1 billion
    - Bonding using anticipated fare revenues is not possible
    - There is a net funding gap of $4.5 to $5 billion on a $5.5 billion project
- In order to get interest from P3 Concessionaires and the Financial Community, the following needs to happen:
    - Establish governance structure
    - Complete environmental clearances
    - Acquire right of way
    - Secure voter approval for bonding and taxes
    - Obtain Federal approval of technology
    - Obtain Federal funding/grants agreement

4. Ridership Refinements: Sensitivity Testing, Full Build and Minimum Operating Segment (MOS)

Mike Riggs presented the ridership refinements that have occurred since the last meeting. He began by showing the June 2013 ridership data which compared AGS ridership estimates at that point to various other studies done in the corridor. He then showed a slide of the ridership estimates developed in July 2013.

Mike explained that since July, the AGS Team's modeler, Cambridge Systematics (CS) had done additional modeling. Mike reminded the PLT that previous MOS data had been done with a "back of the envelope" methodology where ridership to all destinations west of Breckenridge had simply been removed. The new methodology specifically covers the MOS so takes into account travel to the MOS stations. As a result, the MOS ridership has increased.

Mike presented a slide that summarized various ridership refinements made by CS. He explained that CS's direction was to provide ridership for four scenarios:

- Alternate 1 and 1a: MOS standalone (Golden to Breckenridge) for high speed and medium speed maglev

- Alternative 2 and 2a: MOS with full ICS (Front Range plus Denver International Airport (DIA) to Golden) for high speed and medium speed maglev
- Alternate 4: MOS standalone (DIA to Breckenridge) for high speed maglev
- Alternate 5: MOS standalone (Golden to Breckenridge) for high speed maglev with El Rancho Station

Where applicable, the model used the ICS A5a alignment through Denver, which has the east-west following the I-76 alignment, and north south along E-470.

CS compared the runs they developed against Steer Davies Gleave (SDG) A5a hybrid high speed maglev run for full AGS and ICS system. Smith Myung explained that the results presented today only included the inter-urban model. The intra-urban model needs to be run by SDG due to software issues. The inter-urban will increase ridership for scenarios that include the ICS system within the Denver Metro area. It does not have an impact on scenarios where only AGS is considered.

Smith then pointed out observations made after analyzing the data:

- For Alternative 1, removal of Vail, Avon and Eagle County Regional Airport (ECRA) results in about 1/3 fewer riders for the I-70 to I-70 market compared to A5a high speed hybrid (1.2 million versus 1.6 million riders per year)
- For Alternative 2, removal of Vail, Avon and ECRA results in about 17% loss in ridership compared to Alternative A5a (8.3 million versus 9.9 million riders per year)
- For Alternative 4, adding DIA and the I-76/72nd Avenue Station has little impact on ridership compared to Alternative 1 (1.21 million versus 1.27 million riders per year)
- For Alternative 5, adding El Rancho Station results in loss in ridership compared to Alternative 1 (1.16 million versus 1.21 million). This due to longer travel time
- For Alternative 1a, MS maglev results in fewer riders compared to HS maglev (1.0 million versus 1.2 million). This is due to longer travel time
- For Alternative 2a, MS maglev results in fewer riders compared to HS maglev (1.6 million versus 1.8 million) but only the I-70 market is impacted. This is due to longer travel time
- For Alternative 1, comparing to SDG's AGS standalone run, I-70 interurban ridership is significantly lower (1.2 million versus 2.9 million) but:
    - Not an apples to apples comparison
    - SDG's AGS standalone includes ECRA and Vail; also Clear Creek County Station is in Georgetown
    - Removing all ECRA and Vail markets from SDG's AGS standalone results in I-70 ridership around 1 million

David Krutsinger then presented an update to SDG's modeling efforts. They have done sensitivity analysis using different fares and found that lower fares increases ridership and revenue. However, as David pointed out, the optimal fare of about $0.1925 per mile would be outside the statistical confidence level of the data from the Stated Preference Survey. Therefore, SDG is re-analyzing the ICS system using a fare of $0.2625 per mile. David presented a slide that compared ridership and revenue for AGS HS Rail, ICS Alternative B2-A which showed reducing from fare for $0.35 to $0.2625 per mile:

- Increases ridership from 4.254 million to 6.502 million riders per year (53% increase) on the AGS Corridor

- Increases revenue from $134.8 million to $167.6 million (24% increase) on the AGS Corridor
- Reduces fare per rider from $31.69 to $25.77 (19% less per ride) on the AGS Corridor

He then presented a slide that compared the changes to ridership for HS maglev and MS maglev for the MOS with the two fares. In general, the lower fare results in a 46% increase in ridership, 24% increase in fare revenue and between 15 and 25% less cost per ride.

PLT members had the following questions/comments:

- Is induced demand shown on Slide 14 the same as latent demand? David Krutsinger stated that he will talk to SDG to determine if this is the same
- Does the bus diversion ridership shown on Slide 14 include ski buses? David Krutsinger stated that he will talk to SDG to determine if it does
- In relation to Slide 18, how did statistically significant apply to I-70 corridor? David stated that Stated Preference Survey (SPS) included both I-70 and I-25 so finding that $0.2625 fare per mile is within bounds of statistical significant apply to I-70 corridor
- A PLT member questioned the validity of the SPS for I-70 travel. Smith Myung stated they had reviewed the SPS and model and determined that it was valid. He stated CS might have done some things differently but are satisfied with the model
- A PLT member stated that we need to make sure that the modeling is fully reported in the AGS Study
- A PLT member stated that the ridership for AGS does not make sense based on volumes on I-70. David replied that this had been reviewed in previous meetings and that the total share of transit trips diverted appeared to have been accepted at the time.
- A PLT member stated that there needs to be an explanation of the modeling done in layman's terms. David stated there would be more such layman information in the Draft Report.
- A PLT member asked if we need to do another SPS based on lower fares. David responded no as based on Slide 18, revenue is flattening out at $0.2625 per mile.

5. Operating & Maintenance (O&M) Costs: Full Build and MOS

Mike Riggs presented the results of the development of O&M costs. They were developed by Connectics Transportation Group with assistance from Frank Sherkow of AZTEC.

Mike related the general methodology used:

- Costs are driven by service and facility characteristics
- Used known commuter rail cost data as starting point
- Modified cost characteristics for specific line items based on technology
- Used information provided by technology providers (Transrapid & American Maglev) as basis for cost modifications

Mike explained the assumed organizational structure:

- Operations, including administration, train operations and station operations
- Maintenance, including administration, vehicle maintenance and right-of-way (guideway) maintenance

- General administration

The following had consistent cost assumptions (regardless of technology):

- O&M administration
- Train crews (one operator and one attendant – driven by number of train hours)
- Stations O&M (driven by number of stations)
- Train and station security (assumed to be contracted)
- Vehicle cleaning (assumed to be contracted)
- General administration

Labor wages were consistent and based on typical transit wages; fringe benefit rate was assumed to be 40% of wages.

The following had variable cost assumptions, meaning that they varied by technology:

- Propulsion power, which was driven by route-miles
- Vehicle maintenance (labor & non-labor)
- ROW maintenance (labor and non-labor)

Mike then explained the service assumptions that were used to generate O&M cost estimates:

- Full build
    - Suburban West to ECRA
    - HS Rail included spur to Breckenridge
    - 6 stations for HSR, 7 stations for HS maglev and 8 stations for 120 mph maglev
    - 24 round trips Thursday to Sunday, 15 round trips Monday to Wednesday
- MOS
    - Suburban West to Breckenridge
    - 4 stations for all technologies
    - 24 round trips Thursday to Sunday, 15 round trips Monday to Wednesday

Mike provided a description of the train consist assumptions used to generate the O&M costs:

- HSR – 10 passenger cars per consist with 450 total passengers
- HS maglev – 5 passenger cars per consist with 410 total passengers
- MS maglev – 2-car married pair with 186 total passengers
    - Also evaluated another service scenario as a result of lower passenger load
        - 48 trips per day Thursday to Sunday for comparable passenger capacity to other technologies

Mike presented the O&M cost estimates for the technologies:

- Full Build System
    - HSR = $55.461 million/year
    - MS maglev = $47.013 million/year
    - MS maglev, 30 minute frequency = $45.213 million/year
    - MS maglev, 15 minute frequency = $52.694 million/year
- MOS
    - HSR = $36.191 million/year

  - MS maglev = $27.258 million/year
  - MS maglev, 30 minute frequency = $26.072 million/year
  - MS maglev, 15 minute frequency = $29.485 million/year

For each, Mike presented slides with bar graphs showing the breakdown of the O&M costs by expense category.

Mike noted that these O&M estimates are lower than those used in the Level 2 analysis done as part of the ICS.

Using the farebox revenues associated with the various technologies, Mike calculated the operating (farebox recovery) ratio for the various technologies for both the full system and the MOS:

- Full Build System
  - HSR – operating ratio = 1.69
  - HS maglev – operating ratio = 2.44
  - MS maglev – operating ratio = 1.77
- MOS
  - HSR – operating ratio = 0.60
  - HS maglev – operating ratio = 1.94
  - MS maglev – operating ratio = 1.60

With the exception of the HSR MOS, all of the technologies/alignments would generate more revenue than O&M costs.

PLT members had the following questions/comments:

- On slides, change low speed maglev to MS or 120 mph maglev and change train to consist
- A PLT member asked why for MS maglev is it a two-car married pair. Mike responded that is what the American Maglev system is proposing
- A PLT member asked if we had compared results to other systems. Mike responded that they were compared to other systems, but there are limited systems to compare to.
- A PLT member pointed out that having different frequencies for MS maglev does not allow an even comparison. Mike stated that the operating ratios were for worst case scenario in any case for MS maglev.
- A PLT member stated that the operating ratios point towards full system deployment.
- A PLT member stated that since “train” in the O&M usage of the word is generic for a consist of vehicles that a different term be used so that it doesn’t imply high-speed rail

6. Benefit/Cost Analysis

Mike Riggs passed out the benefit/cost ratio calculation sheet and explained the various elements that went into developing the calculations. He pointed out that the analysis used the methodology developed for the ICS, was based on the $0.35 per mile fare and was calculated for both the full system and the MOS. Key inputs used were:

- Capital Costs
- Revenue
- O&M costs

- Reduction in vehicle miles traveled and vehicle hours traveled
- Federal funding levels

Mike then presented a table showing the benefit/cost ratios for the technologies/alignments based on various levels of federal funding. It showed:

- At 10% federal funding, only MS maglev had a positive benefit/cost ratio. This is due to the lower capital cost
- At about 20% federal funding, all technologies and alignments had positive benefit/cost ratios
- At 50% federal funding, benefit/cost ratios ranged from 1.68 (full system HSR) to 1.95 (MOS MS maglev). For both the full system and the MOS, HS maglev had a benefit/cost ratio of 1.75

PLT members had the following questions/comments:

- A PLT member asked how the benefits of reduction in fatalities were calculated. Mike responded that it probably based on statewide average for fatalities per VMT but he would check. Might be beneficial to make it specific to I-70 corridor.
- A PLT member asked about the federal funding multiplier and whether it included economic benefit. Mark Imhoff explained that it recognizes the economic benefit of infusion of "new" money into economy as the federal funding is not generated by local economy per se.

7. Funding & Financing Determination

David Krutsinger presented a series of slide that recapped the funding and financing conclusions that included:

- There is currently no funding identified for the AGS MOS
- The project is not financeable without funding
- At cost of $5.5 billion, the AGS MOS is challenging as a starter project
- There are overall transportation funding challenges outside this project including the minimum program from the PEIS and other major projects throughout the State
- The AGS has all of the high risks – cost, mountains, tunneling, weather and new technologies
- There isn't any political support for the AGS outside the corridor and no support for funding

Therefore, David proposed a draft funding and financing determination of AGS is not financially feasible at this time. For it to be feasible in future would require:

- Identified and committed Federal, State and local funding
- Advancement in technology to decrease risks for maglev and tunneling

David then put the draft funding and financing determination in context of the PEIS/ROD:

- The PEIS allows for Adaptive Management
- CDOT will continue to pursue the minimum program of highway improvements as funds become available

- The minimum program projects are not an impediment to the AGS
- The PEIS has a re-assessment trigger in 2020

David stated what this means to CDOT:

- AGS will be included in the update to the State Freight and Passenger Rail Plan
- The next step for AGS is probably years into future, dependent on support for funding
- AGS will be included in Statewide conversations about prioritization

To close, David stated that the AGS PLT was invited to the ICS PLT meeting on September 17 at the CDOT Headquarters Auditorium. He then opened the floor for open discussion on the Draft Feasibility Statement.

The following questions/comments were made:

- A PLT member stated that he disagrees with the idea that the project is not financially feasible. The fact that we have not done enough analysis of the economic benefits of the AGS makes it hard to say that it is not feasible. A different PLT member said that economic development benefits of the AGS and ICS needs to be done before a determination of feasibility can be made. Another PLT member stated that sustainability should also be taken into account.
- David stated that the feasibility determination message needs to be framed correctly for the press
- A PLT member stated that there are still questions unanswered and suggested that CDOT needs to fund further studies to answer these questions.
- Andy Mountain asked if we can assume there is no Federal or State funding at this time. The PLT agreed with this assumption.
- A PLT member said we need to clarify choice on technology, cost and how to finance.
- Mark Imhoff stated we need to figure out how to make this a part of the Statewide system and how to prioritize it
- David stated that the feeling of most transit agencies, including those in the I-70 Mountain Corridor, is that we don't need to do more studies
- A PLT member suggested a way to help sell AGS is to explain how AGS will help alleviate weekend congestion on I-70
- Mark Imhoff stated that he believes maglev is the proper technology for the corridor but feels Federal government may not be supportive of maglev
- A PLT member stated that the decision to say that AGS is not financially feasible at this time sends wrong message
- A PLT member asked whether we are getting more information to determine feasibility. He asked whether we need to do more studies and questioned whether an economic benefits study would do anything to change the conclusion
- A PLT member stated that as a baseline, we all need improvements on I-70 corridor but minimal improvements will cost $1 billion which we don't have.
- David stated that any economic development studies need to be beyond I-70 corridor alone.

8. Next Steps

Briefly, David closed by outlining next steps and schedule.

- September 13: STAC Update
- October 9: AGS PLT re: Draft Report
- October 9: I-70 Corridor Coalition Meeting
- October/November Corridor Meetings
- October 11: STAC Presentation re: Draft Report
- October 11: TRAC Presentation re: Draft Report
- October 17: CDOT Transportation Commission (TC) Workshop re: Draft Report
- November 9: STAC Presentation: re: Final Report
- November 21: CDOT TC action re: Final Report

Mike Riggs will send PLT an outline of Draft Feasibility Study and ask for any suggestions as to what needs to be covered in study.

Beth indicated she will send out request to counties for meeting dates and locations.

Next PLT Meeting will be in late October in Summit County. Exact location to be determined. Topic will be review of Draft Feasibility Study.