



# AGS Feasibility Study

PLT Meeting 4  
July 18, 2012

# Agenda

- ▶ Introduction to the Meeting
- ▶ Public Comment
- ▶ Debrief from High Speed Rail Conference Attendees
- ▶ Review Land Use & Station Criteria
- ▶ Review Industry Comment on Draft System Performance and Operational Criteria
- ▶ Feasibility Discussion
- ▶ AGS/ICS/Co-Development Project Coordination
- ▶ Conclusion, Final Remarks and Next Steps

# Introduction to the Meeting

## ▶ Meeting Objectives

- Review & Discuss Land Use & Station Criteria
- Review & Discuss Industry Comments on Draft System Performance & Operational Criteria
- Review & Discuss Draft RFQ
- Provide Update on AGS/ICS/Co-Development Project Coordination
- Discuss Next PLT Meeting

# Introduction to the Meeting

- ▶ Review and Approve Meeting Minutes from Last Meeting
- ▶ Review Action Items from Last Meeting
- ▶ Website Update
- ▶ Media Outreach

# Public Comment

- ▶ Invitation for any comments by the public



# Debrief from HSR Conference Attendees

- ▶ David Krutsinger
- ▶ Mark Imhoff
- ▶ Kevin O'Malley
- ▶ Tom Breslin
- ▶ Tim Mauck



# Review Land Use & Station Criteria

- ▶ Technical Committee Meeting 3 held July 11, 2012
- ▶ 6 of 13 TC members attended
- ▶ 2 consultant team members, 1 CDOT DTR staff and 2 PLT members attended
- ▶ Beth Vogelsang presented possible station criteria
- ▶ Through interaction with TC, draft station criteria and plan to begin land use discussions were developed

# Review Land Use & Station Criteria

- ▶ Presentation by Beth Vogelsang, O&V Consulting



# Break



# Review Industry Comments on Draft System Performance and Operational Criteria

- ▶ We have received comments from three technology providers
  - ET3
  - Owens Transit Group
  - Skytran



# Review Industry Comments on Draft System Performance and Operational Criteria

## ▶ Travel Time

- Comment that 65 mph is too low of speed. Suggest 100 mph.
- Systems that can provide a one-seat ride to the final destination via a fully integrated feeder network should score higher

## ▶ Special Use Vehicles

- Special use vehicles should include ADA compliant designs

## ▶ Technology

- Technology on verge of commercialization should be considered.

CDOT would fund independent evaluation of technologies not yet commercially available but that meet project criteria



# Review Industry Comments on Draft System Performance and Operational Criteria

## ▶ Technology

- Technology on verge of commercialization should be considered.
- CDOT should fund independent evaluation of technologies not yet commercially available but that meet project criteria

## ▶ Noise

- Passenger cars do not meet the 60 dB requirement. Suggest using 70 dB as requirement.

# Review Industry Comments on Draft System Performance and Operational Criteria

## ▶ Footprint

- Total noise footprint (not just external dB) should be included in the definition of environmental footprint.
- Physical footprint, underground or elevated, is different than surface footprint and should be accounted for

## ▶ Grade

- No comments

# Review Industry Comments on Draft System Performance and Operational Criteria

## ▶ Safety

- TSI criteria is technology specific (trains) and therefore prejudicial to technologies that use acceleration/deceleration typically found in main stream modes of cars and aircraft.
- There are far more aspects to safety that must be considered:
  - Death rate per billion passenger miles traveled
  - Access portal safety & security
  - Guideway security
  - Protection of AGS from errant vehicles leaving I-70
  - Protection of I-70 traffic from errant AGS vehicles
  - Need to isolate wildlife from ROW (no at grade wildlife crossings)



# Review Draft System Performance and Operational Criteria

- ▶ Weather
  - Another component of weather is visibility – technologies that mitigate lack of visibility should be preferred
- ▶ Wind
  - No comments
- ▶ Scalability
  - Degree of granularity is important aspect (cars have better scaling granularity than buses, buses are better than trains). Suggested that granularity be a key metric of scalability.

# Review Industry Comments on Draft System Performance and Operational Criteria

## ▶ Passenger Comfort

- European HSR Rolling Stock passenger comfort parameters/standards assumes train technology. Perhaps using comfort standards similar to cars & aircraft would be better
- Studies show that significant percentage of people refuse to ride large public transit vehicles due to fear of crowds, strangers, exposure to germs, etc.



# Review Industry Comments on Draft System Performance and Operational Criteria

## ▶ Passenger Comfort

- Ability to have cup of coffee on board without spilling it
  - Please define or eliminate (automotive style or marine style cup holders? Not sliding off a table top? Is there not concern about spilling a drink in a car driving in mountains?)
- Ride comfort – ability to move around without being slammed against a wall
  - Implied requirement to walk around in a vehicle. This not typically done in cars & commuter aircraft.
  - Prejudicial to small vehicle systems

# Review Industry Comments on Draft System Performance and Operational Criteria

## ▶ Passenger Comfort

### ◦ Restrooms

- Implies large vehicles, long trip times and captive passengers (no ability to make an intermediate stop)
- Prejudicial to small vehicle systems.
- Suggest that accessibility to restrooms within a certain time limit as alternative

### ◦ ADA Compliant

- Are autos ADA compliant? Prejudicial to small vehicle systems. Suggest a percentage of vehicles have special accessibility options (not all)

# Review Industry Comments on Draft System Performance and Operational Criteria

- ▶ **Baggage**
  - No comments
- ▶ **Light Freight**
  - Proposals that provide package delivery to the final destinations (optimally via feeder lines) should score higher
  - Proposals should describe how packages transfer to feeder lines
- ▶ **Heavy Freight**
  - No comments

# Review Industry Comments on Draft System Performance and Operational Criteria

- ▶ Growth
  - No comments
- ▶ Tunnels
  - Suggest using the term “preferred” instead of “acceptable”
  - Tunnels have many environmental advantages such a less noise, less visual impacts, protection from weather (also disadvantages such as spoils)
  - Technologies that minimize sectional area of tunnels should be preferred

# Review Industry Comments on Draft System Performance and Operational Criteria

## ▶ Reliability

- Is not arrival time the more important measure?
- Also consider mean time before failure (MTBF) as measure of reliability

## ▶ Headways

- No comments

## ▶ Operational Efficiencies & Maintenance Costs

- No comments

## ▶ Context Sensitive Solutions

- Provided that the community defining the CSS pays any additional cost increase compared to standard station

# Review Industry Comments on Draft System Performance and Operational Criteria

- ▶ Power Generation, Transmission & Distribution
  - No comments
- ▶ Energy Efficiency
  - The greenest (and lowest cost) form of electrical power is hydroelectric. Why is it missing from list?
- ▶ Sustainability
  - There are many dimensions of sustainability; energy, ecology, financial & social
  - What of vital issues of market sustainability? Financial sustainability? Social sustainability?

# Review Industry Comments on Draft System Performance and Operational Criteria

## ▶ Cost

- Focusing on cost and not value is foolish
- System cost/mile, cost per passenger capacity and cost per passenger mile should be value metrics, not “no limit” cost
- Priority should be for systems capable of recovering their entire cost, including right-of-way, guideway construction, vehicle (per seat cost), access portal cost (per passengers per hour) as well as O&M costs
- Having more time to learn about the project and to arrange for cost effective specialists will reduce costs substantially
- CDOT should heavily weight systems that are profitable
- Proposals that require large tax subsidies should be negatively rated



# Review Industry Comments on Draft System Performance and Operational Criteria

## ▶ Alignment

- Alignment should maximize ridership while keeping guideway length minimized. Following the I-70 corridor will be helpful. Using launching for guideway erection should be considered

## ▶ Termini

- In our opinion if the PPP method of finance is used then the system can be built rapidly without delays
- Difficulty is verifying sufficient ridership to justify project
- Delaying construction by many years is counterproductive to building a cost-effective & Investor attracting project



# Review Industry Comments on Draft System Performance and Operational Criteria

- ▶ Right-of-Way (ROW)
  - Please defined “cleared”. If we define an underground ROW, will CDOT “clear” all rock from the ROW?
- ▶ Interface with Existing & Future Transit Systems
  - Proposals that have the technical capability to provide a comprehensive feeder system and include a financial plan for deployment should be scored higher than proposals that do not

# Review Industry Comments on Draft System Performance and Operational Criteria

- ▶ Potential System Owner & Operator
  - If this is to be a true PPP, why not allow for other options such as co-ownership or private ownership of ROW and infrastructure (as is done for power & telecom industries)?
- ▶ Station Locations
  - What about DIA?

# Review Industry Comments on Draft System Performance and Operational Criteria

## ▶ Other Comments

- Weighting should be done for the criteria so that it can be used in evaluating proposals
- Identify criteria which are mandatory and thus not part of weighting system
- Consider “Small Community Oriented Transport (SCOT) as opposed to “Train Oriented Development”
- Determine how to treat discovery of valuable minerals when building system. Assured mineral exploitation rights and ownership would help attract private investment
- Establish process to integrate I-25 corridor with same technology to attract private investment

# Feasibility Discussion

- ▶ Seeks to get us more to the “what” of determining feasibility for three key areas:
  - Alignment
  - Technology
  - Funding/financing

# Feasibility Discussion

- ▶ In order to attract support, the benefits of the AGS must be greater than the costs of the AGS
- ▶ Assume for time being that fare box revenue can cover O&M costs
- ▶ If benefit is not greater than cost, then system should not be built
- ▶ Benefit must be measurable and defensible
- ▶ Capital cost plus interest and ROI over time must be defined

# Feasibility Discussion

- ▶ Physical feasibility will be defined by industry as part of their technical proposals
- ▶ The technical proposals will present the engineering solutions to make the project feasible from a construction standpoint
- ▶ The technical proposal will also present what is necessary for operational feasibility
- ▶ A key element of the technical proposal will be development of an estimate of the capital costs and the operations/maintenance costs for the system

# Feasibility Discussion

- ▶ The ridership study for the system will define the amount of revenue that can be expected to be generated by the system
- ▶ The expected revenue can then be compared to the capital and operations/maintenance costs to determine if the project can exist on its own without additional funding
- ▶ All evidence to date points to the fact that the system may be able to cover the O&M costs but not the capital costs

# Feasibility Discussion

- ▶ For that reason, additional sources of funding will be required
- ▶ It is not important at this time to determine what share of those additional funding sources would be public and/or private. Either one has costs associated with it
- ▶ The first step in defining financial feasibility will be to determine the difference between the capital costs and any excess revenue that might be generated by the fare box over a length of time



# Feasibility Discussion

- ▶ The length of time of the concession is important because of the cost of money associated with initial capital costs for the system
- ▶ Carrying a large amount of the capital costs over a time period results in high interest costs
- ▶ On the other hand, fare box revenue will likely hit its peak and then stay flat (or increase slightly) over time
- ▶ The same can be said for other sources of revenue, such as shared use of the guideway with utilities, rents and royalties related to development rights and other non fare box revenues

# Feasibility Discussion

- ▶ The total amount of capital costs plus interest plus a reasonable rate of return over the concession period needs to be calculated
- ▶ Then projected excess revenue can be estimated
- ▶ The difference between the two will be the short fall must be covered by public funding
- ▶ Through the financial task force, we will be looking at how that public funding can be raised

# Feasibility Discussion

- ▶ However, in order to justify future public funding, and prove financial feasibility, it is necessary to show that the amount of funding required is captured by the benefits accrued due to the implementation of the AGS

# Feasibility Discussion

- ▶ Measuring Benefits of AGS
  - The ridership model will be able to provide the data that will be required to calculate the cost benefits of the AGS
  - From the ridership model, the reduction in vehicle miles traveled (VMT), reductions in average daily traffic (ADT) and reductions in peak hour traffic can be determined

# Feasibility Discussion

- ▶ Measuring Benefits of AGS
  - Reduction in vehicle miles traveled (VMT), reductions in average daily traffic (ADT) and reductions in peak hour traffic can be used to directly measure benefits to include:
    - Vehicle cost reductions
    - Travel time savings
    - Safety and health benefits
    - Parking reduction
    - Congestion reduction
    - Reduction in roadway facility costs
    - Roadway land value

# Feasibility Discussion

- ▶ Measuring Benefits of AGS
  - Reduced need for traffic services
  - Value of transportation diversity
  - Reduction in air pollution
  - Reduction in highway noise
  - Reduced resource consumption
  - Land use impacts
  - Reduced water pollution and hydrologic impacts
  - Reduction in vehicle waste disposal
- Methodology exists for quantifying actual cost benefits of each of these

# Feasibility Discussion

Criterion	Measure of Feasibility or Success	Study Level When Achieved
Alignment	A1. Vertical & horizontal curves meet speed/travel time criteria	Feasibility
	A2. Refined for speed & time	Feasibility
	A3. Refined for speed, time, & cost	Feasibility
	A4. Basic ROW ownership identification	Feasibility
	A5. Non-binding ownership commitment to acquire ROW	Feasibility
	A6. Right of way legally defined	EIS
	A7. Right of way acquired	Implementation

# Feasibility Discussion

Criterion	Measure of Feasibility or Success	Study Level When Achieved
Technology	T1. Technology qualifications submittal. Basic performance criteria and commercial readiness.	Feasibility
	T2. Initial operations simulation based on A1 alignment and information on possible speed/time improvements	Feasibility
	T3. Refined operations simulation and technology finding. Summary of individual findings results in recommendation(s)	Feasibility
	T4. Cost of infrastructure – conceptual estimate	Feasibility
	T5. Cost of infrastructure – 30% design estimate	EIS
	T6. Formal vehicle specifications written	EIS
	T7. Vehicles ordered/purchased.	Implementation



# Feasibility Discussion

Criterion	Measure of Feasibility or Success	Study Level When Achieved
Funding/Financing	F1. Rough order of magnitude cost estimate.	Feasibility
	F2. Review and estimation of percentage costs covered by various revenue sources.	Feasibility
	F3. Analysis of actual capacity of those sources to generate the revenue.	Feasibility
	F4. Funding commitments to pay for EIS	Feasibility
	F4. Vote passed for local funding	EIS
	F5. Federal funding agreement signed.	EIS
	F6. Concession agreement created and reviewed	EIS
	F7. Concession agreement competed	Implementation
F8. Concession agreement commercial close	Implementation	

# AGS/ICS/Co-Development Coordination

- ▶ ICS PLT Meeting was held July 9, 2012
- ▶ ICS is holding 4 public meetings this week
  - Meeting in Golden (CDOT D1) is 7/19 from 4:00PM to 7:00PM
- ▶ AGS/ICS Project Managers regularly coordinate efforts
- ▶ AGS staff actively involved in ICS ridership model development
- ▶ Co-Development RFP was issued on 7/6
- ▶ Proposals are due August 15, 2012

# Conclusions, Final Remarks & Next Steps

- ▶ Draft Request for Qualifications will be sent to PLT within next week
- ▶ Review comments will be due 1 week after it is sent out
- ▶ Next PLT meeting August 8, 2012
  - Update on industry outreach
  - Discuss RFQ review & scoring
  - Endorse RFQ