

PART I

From:
To:
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SOME THOUGHTS ON THE 2007 E-ZPass EVALUATION CRITERIA

I have up-dated my previous Thoughts on the Evaluation Criteria, and included the cross-reference paragraphs for the individual items as the specification is now written so that we can see how they add up to influence the net functional effects. This I believe, as I indicate, can be used to insure that enough weighting is given to each functional area of the AVI system, regardless of the technology, and/or the presence or absence of the applicability of any one particular lower level item.

I do not wish to imply that the RFP Specification or the Evaluation Criteria list as presently arrived at should be altered because it insures that all possible pertinent items will be considered in determining the functional performance for any possible technology which might be proposed. It is just another way (i.e. functional), and an additional way (i.e. technology, OBUs, RSU, etc.) of looking at the scoring.

I will find this useful in performing my contribution to the evaluations. I would prefer not to be bound by the individual score allocations for the specific items, but rather to the next functional level up, but would use the lower level score assignments as applicable.

ADDITIONAL COMMENTS

In regard to qualifications, paras. 4.2 and 4.3, we might ask that they include any ISO standards or other quality standards organizations criteria that the proposers meet.

We also ask proposers to present the accuracy of their existing installations. The correct terms should be "Read/Write" capture rate, Lane position accuracy, and accuracy of all Data, i.e, account numbers, plaza, lane ID, time, etc.

In the spec. with regards to emissions standards, para. 2.6.3.5.1, perhaps we should re-enforce that they meet all applicable safety, and emissions standards, including but not limited to federal, state, and local standards within the local operating regions of all of the IAG agencies, including toll and non-toll collection regions, i.e., airports, or any other sensitive regions within range of IAG facilities.

Any other thoughts which you would like presented, or not presented at tomorrow's IAG Technical Committee meeting.

We are still looking at the spec. for "write" performance. At present we specify shall be 99.9 for read/write, should be 99.95. I may have reservation about whether shall be 99.9 is possible for the "write" performance. I am awaiting our best performance at Spring Valley now that Mark IV has optimally calibrated this facility. Concern is that if nobody can meet 99.9 we may have to fail everyone.

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P.S.

Although we discussed many things in the course of discussion, I think one specific item related to direct read/write on the OBU, vs. other possibilities of making entry data available, is that of timing. The only paragraph in the spec, 2.6.6.15.5, that presently relates to presenting timely data is stated to be for the puposes of correlating vehicles in the lanes and enabling timely operation of other lane equipment, i.e. signal lights, gates, etc. (And this gets only 0.5% of the evaluation criteria, or perhaps up to 15.4% if we allow discretion with-in the functional catagoies under item 1. of the referenced attached Some Thoughts... document).

The specification does not specifically address the timeliness of presenting entry data for purposes of revenue compilation and customer billing. If we allow other than direct OBU write, I think we must address this.

CC:

SOME THOUGHTS ON THE 2007 E-ZPass Spec. Evaluation Criteria
revised 1/8/07

As we go through the evaluation criteria it still seems to me that we have too many individual items. By combining items, based on the totality of their functional effect, as we did at some previous meetings seems to help. The idea is to provide enough weight and visibility to the totality of the functional effect for several related items so that the really important performance items stand out and do not become “swamped” by the possible accumulation of good scores for lesser important items. Another consideration is that all items within a particular functionality may not be pertinent to all possible technologies. In this way we can judge all technologies equally by providing the same total available points based solely on functionality.

Security now seems to be a more important consideration lest a breach severely compromise the entire E-ZPass system. Perhaps security should represent a more significant percentage of the evaluation criteria.

Another consideration that I question is whether we should actually score items which are more related to “policy”, than an actual level of performance. That is not to say that we should not evaluate an item as to whether it actually achieves the item’s objective, but that its value relative to the over-all proposal considering both performance and cost considerations plus any other considerations may be a policy decision. (i.e. should the availability of a “replaceable battery” influence the over-all performance score, particularly since it possibly could be negotiated later for those specifically interested in this item. Would we universally sacrifice over-all performance of the system for this item?) These items are listed as “P”.

I have taken a stab at the current order of importance for the evaluation items as grouped together according to their over-all function by adding up the current evaluation points per the referenced paragraphs in the December 1, 2006 Technical Requirements Evaluation Criteria document.

1. Correlation of OBU to Proper Vehicle -15.4%

- | | | |
|---------------|-------------------------------|--------|
| - 2.6.3.1.9.1 | - toll lane reporting zone | - 2.2% |
| - 2.6.3.1.9.2 | - open highway reporting zone | - 6.2% |
| - 2.6.3.2.6 | - reporting accuracy | - 6.5% |
| - 2.6.6.15.5 | - timing to present data | - 0.5% |

All items relating to ability of system to correlate the OBU to the proper vehicle. This encompasses capture zone, reporting zone, lane reporting accuracy. The total points could be allocated among; open road, toll lane, etc, as the evaluation sees fit and as related to the way a particular proposer’s system functions or the nature of its technology. (Note; This is important because errors could miss-bill customers).

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2. Security (10 % as of Dec.1, 2006 + 2.0% as suggested below) - 12.0%

- 2.6.2.8 general security & toll avoidance - 4.4%
- 2.6.5.2.3 OBU programming security - 1.3%
- 2.6.5.4.3 security related to exterior OBU fastening - 2.3%
- 2.6.5.4.4 exterior OBU tampering - 1.0%
- 2.6.6.11 RSE security - 1.0%

All items including those in general requirements, and the OBUs. I note that there is 5% allocated to Additional Identification Requirements. This seems excessive relative to Security for something which is more or less un-defined, therefore I propose that 2% of this be allocated to Security, (already added in above). In addition, I would suggest that 1.0% each be added to Derivation of Product, and Exception Vehicles, (as added below).

3. Primary OBU Size/Mounting Considerations -7.1%

- 2.6.5.1 prefer interior removable OBU - 1.6%
- 2.6.5.1 non-removable available - 1.0%
- 2.6.5.3.1 mounting tolerance & accuracy - 1.3%
- 2.6.5.3.2 correct mtg. orientation assured - 2.6%
- 2.6.5.3.4 size - 0.6%

Primary OBU approved mounting, including size, attachment method, system tolerance to orientation/position, etc.

4. RSU/RSE Lane Equipment Size & Mounting Considerations - 6.6%

- 2.6.6.2 RSU size - 1.0%
 - 2.6.6.3.1 RSE over-head equipment - 3.0%
 - 2.6.6.3.2 RSE clearances - 0.8%
 - 2.6.6.3.3 RSE cabling - 0.8%
 - 2.6.6.3.6 RSE ease of installation - 1.0%
- & any effects on capture, etc.

5. System Sensitivity to Environmental Factors - 5.9%

System or Technology's functional Susceptibility to Interference due to Weather, or other Environmental Factors such as RF Interference, etc.

- 2.6.2.7.3 meet emissions stds. - 2.0%
- 2.6.3.2.1 weather - 1.3%
- 2.6.3.2.1 electrical/RF/emissions - 1.3%
- 2.6.3.2.1 vehicle mix/speeds - 1.3%

6. RSU/RSE MTBF/MTTR/Availability/Maintenance and Diagnostics - 5.7%

- 2.6.6.7	RSU/RSE MTBF	- 0.8%
- 2.6.6.7.1-.3	MTTR and Availability and	
- 2.6.6.8	“ “ “	- 1.3%
- 2.6.6.9	RSU/RSE life	- 0.5%
- 2.6.6.13	Pwr. Fail data protect	- 0.8%
- 2.6.6.15.1	single point failure	- 1.0%
- 2.6.6.15.6	data retention/retrieve	- 0.3%
- 2.6.6.15.8	diagnostics	- 1.0%

MTBF/Availability and MTTR, and Preventative Maintenance required, and System Performance and Fault Diagnostics effectiveness.

7. Performance Risk Due to Changes to Agency Equipment/Infrastructure - 4.9%

Functional Risk Stemming from Required Changes to the Agencies Equipment, Software, Lane Configurations, etc. (not including cost factors).

2.6.2.3	Lane Controller/SW	- 0.8%
2.6.2.3	Lane Controller algorithms	- 1.6%
2.6.2.3	Lane infrastructure	- 0.8%
2.6.2.3	Plaza changes	- 1.2%
2.6.6.15.10.2	Plaza/LC interface	- 0.5%

8. Derivation of Product (3.6% + 1.0% as indicated above) - 4.6%

Derivation of Product, Experience, Proven Performance and the Effect of any Necessary Changes to the Product to meet our needs.

2.6.2.2	uses same hardware	- 1.6%
2.6.2.4	minimal changes require	- 2.0%

9. Exception Vehicles (3.2% + 1.0% as indicated above) -4.2%

Minimize Exception vehicles and minimize exception effect. Including type of OBUs, external, interior, and mounting and size considerations; and subject to Damage.

2.6.3.2.2	minimize number of exception vehicles & minimize accuracy degradation	- 2.2%
2.6.5.1.2	exception vehicle tag mounting	- 1.0%

10. OBU Life and Battery Life - 3.6%

OBU 8 yr. vs 10 yr. Battery Life and OBU Failure/MTBF, etc.

2.6.5.2.9.1	OBU electronics life	1.3%
2.6.5.2.9.2	Battery 8yr./10/yr.	1.3%
2.6.5.2.9.3	Alternate/exterior OBU	1.0%

11. Additional Lane Types Supported - 3.2%

Ability to support CVO, Airports, Parking, Retail Sales, etc.

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2.6.1.4	Support additional applications	2.2%	
2.6.5.2.10	OBU's compatible with existing other application	1.0%	
<u>12. Alternate OBU's</u>			-2.8%
Primary OBU approved mounting, including size, attachment method, system tolerance to orientation/position, etc.			
2.6.5.4.2	mounting and tolerance to	1.0%	
2.6.5.4.5.1	size and protrusions (license plate)	0.6%	
2.6.5.4.5.2	size and protrusions (non-license plate)	0.6%	
2.6.5.4.6	environmental	0.6%	
<u>13. RSU/RSE Equipment Tolerance to Environment and not Cause Interference to Agency Equipment</u>			- 2.7%
Equipment tolerance to plaza and road environment, and its ability to not Interfere with other agency equipment.			
2.6.2.8.3	not interfere with other equipment	1.6%	
2.6.6.12	enclosure exceeds NEMA TS-1	0.3%	
2.6.6.12	environmental requirements	0.8%	
<u>14. OBU Tolerance to Environment and Ruggedness</u>			- 2.6%
Exceeds minimum ruggedness requirements Temperature, Vibration, Drop, ESD, etc.			
2.6.5.2.5	exceed environmental/shock/vibe etc. ex temp.	1.6%	
2.6.5.3.5	exceed temp range	1.0%	
<u>15. Capture</u>			- 2.6%
Capture Rate, each vehicle reported only once, Read when there are multiple OBU's in the same vehicle.			
2.6.3.2.3	exceeds min. capture rate	1.3%	
2.6.3.6	reads when multiple OBU's	1.3%	
<u>16. General System Safety Issues</u>			- 2.6%
Exceeds all Safety Standards, Federal, State, Municipal, Local, etc. RF Radiation, Laser Safety, or other system relevant features.			
2.6.3.5	exceed applicable emissions safety	0.9%	
2.6.3.5.X	additional Maint. Worker emissions protect	0.9%	
2.6.6.10	minimize physical RSE hazards	0.8%	
<u>17. Components and Mfg Standards</u>			- 2.0%
Components, Manufacturing, ISO stds. etc.			
2.6.2.6	Available from multiple sources	0.4%	
2.6.2.6	Modern design and processes	1.6%	
<u>18. Additional OBU Data</u> (5.9% - 4.0% as indicated above)			- 1.9%
Additional OBU data available and can read other group OBU's			
2.6.1.4	support additional new TBD functions	1.0%	

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2.6.3.3	read other format/function OBUs	0.9%	
<u>19. OBU Programmer</u>			- 1.7%
2.6.7.1	additional programmer features	1.7%	
<u>20. Value RSU</u>			- 1.7%
2.6.7.4	Value RSU available	1.7%	
<u>21. OBU Safety</u>			- 1.2%
	Consumer Product Safety, Not a Projectile, etc.		
2.6.5.2.2 & 2.6.5.3.2	safety in an accident/not a projectile	0.6%	
2.6.5.2.2	components approved for consumer safety	0.6%	
<u>22. OBU Reader</u>			- 1.0%
2.6.7.2	OBU Reader features	1.0%	
<u>23. RSU Interfaces</u>			- 0.9%
	Additional interfaces, Ethernet, etc.		
2.6.3.7	additional processing/interfacing features	0.9%	
<u>24. OBU Test Set</u>			- 0.6%
2.6.7.3.2	size of test set	0.6%	
<u>25. OBU Disposal</u>			- 0.6%
2.6.5.2.7	ease of disposal	0.6%	
TOTAL	-----		96.9%

The Policy Items could be (including their the present evaluation assignment percentages):

P. Ease of Transition	- tbd%
P. Impact on VES, i.e. required/not required, or nature of	- tbd%
P. Removable OBUs vs. Fixed "sticker" types	- 1.0%
P. Accommodate other applications, CVO etc.	- 1.0%
P. Antennas & Cables Guarantee	- 1.0%
P. Technology Availability from Multiple Sources	- 0.4%
P. OBUs with Driver Feedback	- 0.3%
P. OBUs with Replaceable Battery	- 0.3%
P. TOTAL	----- 4.0%

SUMMARY.

Over-all it appears that for most of the criteria, after combining related items, the order of importance seems to correlate well with the numbers derived from our discussions of each item on an absolute basis vs. the relative importance basis described above.