PSA DATABASE FILES

This section contains additional products that were produced by Calspan during the PSA analysis phase. Please note that the information and support for the data in this section are limited. This section contains the following:

- Two Microsoft Access files that contain the PSA Issues/Risks Database
- A users manual with instructions for operating the Issues/Risks Database
- Two Microsoft Access files that contain the PSA Literature Review Database

These three items are described below:

PSA Issues/Risks Database - The PSA Issues/Risks Database was initially developed by Calspan Corporation for use in their PSA analyses of the automated highway system. The intent of this effort was to summarize the findings in a medium that provides search and filter capabilities. Database implementation has allowed extensive cross-referencing and search capabilities that are not provided by word processing packages.

The start-up password for this database is "new". Users can change this password as per the instructions on page 29 of this manual.

PSA Issues/Risks Database Users Manual - This manual provides instructions on how to load and operate the database. The manual has been indexed for viewing with the Adobe viewer.

PSA Literature Review Database - The PSA Literature Review Database was initially developed by Calspan Corporation for use in their PSA analyses of the automated highway system. The intent of this effort was to provide the literature review in a medium that provides search and filter capabilities. Database implementation has allowed extensive cross-referencing and search capabilities that are not provided by word processing packages. This information is also available within the Calspan body of reports included on this disk. The database files have been included to provide the user with an additional research tool. Although no users manual exists for this database, the function is similar to the Issues/Risks Database. After gaining a familiarity with the Issues/Risk Database and Microsoft Access, you should be able to use this database.

PSA DATABASE MANUAL

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1.0 INTRODUCTION

The PSA Issues / Risks Database was initially developed by Calspan Corporation for use in our precursor systems analyses of automated highway systems. Our intent was to summarize our findings in a medium that provides search and filter capabilities. Database implementation allowed us extensive cross-referencing and search capabilities that are not provided by word processor packages.

A goal of the PSA of AHS study was to standardize issues and key findings formats so that the consortium could resolve them more easily. Therefore, MITRE, under the direction of FHWA, asked Calspan to expand the PSA Issues / Risks Database to accommodate the other PSA contract teams. This involved adapting our input form to reflect the data which FHWA required and changing the database structure to reflect the input form changes. By using MITRE's input form and adapting our database to accommodate all of the PSA contract teams, a standardized format for the issues and risks was accomplished.

When using this database, you will discover that in the add, browse, and report features, specific Calspan options exist. This was necessary because the Calspan input form, while reflecting all of FHWA changes, still includes the task origin and RSC impact fields as contained on our original database form. These fields were included for Calspan study purposes.

2.0 INSTALLATION

A copy of Microsoft Access 2.0 is needed in order to run the PSA Issues / Risks Database. If Access 2.0 is not installed on your PC install it. Consult the Access 2.0 User's Guide for installing Access.

Note: Before using the PSA Issues / Risks Database, it is a good idea to familiarize yourself with Microsoft Access 2.0. The Microsoft Access Getting Started Manual is a good place to begin.

Before copying the PSA Database files to your hard drive you may wish to create a specific directory where the database will reside. For help on the following procedures consult your DOS or Windows manuals.

Create a directory on the hard drive where you intend to store the database files. This can be accomplished two ways. From the DOS prompt, use the make directory command. For example:

1.	Type: cd\	{ENTER} - DOS will display c:\>
2.	Type: md issues	{ENTER} - DOS will display c:\>

Or from the File Manager in Windows use these steps:

- 1. From the File Menu select Create Directory A dialog box appears.
- 2. Type the directory name you want to create for example, c:\issues
- 3. Select OK; Windows will create the directory.

Now we need to copy the PSA Issues / Risks Database files to the PC's hard drive. Insert the PSA Database CD-ROM disk provided into your D: or E: drive. From the DOS prompt use the following procedure:

- 1. Type cd c:\{directory name you created}; for example, cd c:\issues
- Use the copy command to move the files from the CD-ROM disk in d:\psa_data {or e:\} to the hard drive. For example type, copy d:\psa_data*.* c:
- 3. When finished, DOS will display the message 2 file(s) copied.

Using the File Manager in Windows:

- 1. Place the CD-ROM disk provided in the appropriate drive.
- 2. Make sure you are in the proper directory on the hard drive. You can use the mouse (or keyboard up and down arrows and ENTER) to select a directory.
- 3. Select the d: {or e:} icon using the mouse (or use Disk Select Drive from the menu bar). This will display the contents of the CD-ROM disk.
- 4. Highlight the files on the CD-ROM:
 - Using the mouse click once on the top file hold down the SHIFT key and click on the other file
 - Using the keyboard press TAB to get to the file list hold the SHIFT key and use the down arrow to select the files
- 5. Copy the files to the hard drive use the mouse to drag them to the c: icon (or press F8 or Copy from the File Menu and type the directory you will be copying the files to). A dialog box will appear to confirm this action.

You can now open Microsoft Access and open the database from the Access File Menu. The proper file name is PSA_DATA.MDB. To automate this procedure, we can create a new widows group (or item) containing the database that, when doubleclicked on with the mouse, will automatically open Access using the PSA Issues/Risks Database. Use this procedure to create the PSA Database item:

Note: For more help on this procedure, consult your Windows manual.

- 1. Choose New from the Windows File Menu. The New Program Object dialog box will appear asking if you want a new item or group. If you select New Group, type the name of the group that the PSA Database will reside in and press ENTER. For example, use the name PSA of AHS Issues / Risks Database.
- 2. To create a new item in a Windows Group choose New from the Windows File Menu and select Program Item and choose OK, the Program Item Properties dialog will appear.

- 3. Select the Browse command button.
- 4. From the Browse dialog select the directory which contains the database files. From the List Files of Type list in the dialog choose All Files. Select the file PSA_DATA.MDB and choose OK, this will return you to the Program Item Properties dialog.
- 5. Fill out any other information (e.g., working directory, Program Item Name, etc.) or change the icon and select OK. Windows will create the PSA Database item.
- 6. When you double-click on the PSA Database item, Access will open with the PSA Database as the default file.
- Note: The above procedure can also be accomplished using the File Manager in Windows. Select the PSA_DATA.MDB file with the mouse and drag it to an existing group in the Windows Program Manager - Windows will automatically create the PSA_DATA Item.

3.0 LOGGING ON

When the PSA Database opens, a Log On dialog box appears as shown in figure 1.

Microsoft Access	〃 �
Eile <u>H</u> elp	
Log On PSA of AHS Issues / Risks Database Log On Password: OK Cancel	

Figure 1. PSA Log On Screen

The start-up password for this database is new . Users can change this password as per the instructions on page 29 of this manual.

You must enter the correct password (up to eight characters) in order to use the PSA Database. If you enter an incorrect password, a message box will appear stating that the password you entered is incorrect. There is no limit on the number attempts

used to log on. If you select the Cancel option, the message shown in figure 2 will appear. when you select OK the program will automatically exit access. So write the password down in a safe place.

-			Microsoft Access	▼	\$
<u> </u>	ile	<u>H</u> elp			
			PSA Issues/Risks Database		
			PSA of AHS Issues/Risks Database		
			You Must Enter the Correct Password In Order to Use This Database.		
			See the PSA Issues/Risks Database Manual for More Information.		
			OK		

Figure 2. PSA Database Log On Cancel Message

If the password is entered correctly, the Main Menu, shown in figure 3, will appear. There are five features available. They include:

- Add New Issues
- Browse Issues
- Report Issues
- Exit the PSA Database
- Options

-		Microsoft Access		▼ \$
<u>E</u> ile	<u>H</u> elp			
		Main Menu		
		PSA of AHS	Add New Issues	
		Issues / Risks	Browse Issues	
		Database	Report Issues	
		AHST	Exit the PSA Database	
			Options	

Figure 3. PSA Database Main Menu

When the user selects Exit the PSA Database, the file will automatically close and exit Microsoft Access (This can also be accomplished by selecting Exit from the File Menu). The Help menu provides three features Contents, Search, and About the PSA Database. The help files available are the standard Microsoft Access help files and are not specific to this database.

4.0 DATA INPUT

The PSA Database is intended for capturing issues, risks, concerns, and conclusions/findings that come from PSA activities. When entering data put yourself in the consortium role and consider the following:

- Is the item relevant to AHS?
- Is it "value added"?
- Will it be useful to consortium engineers?
- Is it actionable?

The term actionable refers to an issue that is a concept- or architecture-level item--not a design-level item, but also not an item that is so broad that a team of people cannot be put to work on it. Remember that the primary "audience" for AHS issues will be the consortium; it is their job to see that all issues are identified and resolved. Items captured should all be supported by specific sections of your research and its documentation.

4.1 Adding Records

From the Main Menu select the Add New Issues Button by pointing to it and clicking the left mouse button. The dialog box, shown in figure 4, will appear. The user has three options:

- Add New Issues
- (Add New Issues) Use the Calspan Input Form
- Return to the Main Menu

-	Microsoft Access	▼	\$
<u>F</u> ile	Help Add New Records		
	PSA of AHS Issues / Risks Database AHS: To the Main Menu Return to the Main Menu		

Figure 4. Add New Records Dialog

Note: Keyboard Users, use the ENTER key to select the Add New Issues Button. Use the TAB or up/down arrow keys to move from one command button to another.

4.1.1 Add New Issues Using the Standard Input Form

Selecting the Add New Issues from the Main Menu button brings up the dialog screen shown in figure 4. A blank input form opens with (Counter) listed in the Item Number field. The Access screen showing the standard input form is shown in figure 5. A hardcopy printout of the Input form is also included in the Appendix. The item number is automatically entered by the database when an entry is placed in any of the fields on the input form. The item numbers are assigned sequentially. The item number field serves as the Primary Key for the PSA database records. For an explanation of Primary Key see the Microsoft Access 2.0 User's Guide pages 29, 118.

-	Microsoft Access	▼ \$
<u>F</u> ile <u>E</u> dit <u>V</u>	<u>/</u> iew <u>R</u> ecords <u>H</u> elp	
	PSA Database Input Form 🗸 🔺	
<u>File Edit V</u>	Precursor Systems Analyses (PSA) Database Item PSA Contract Team Imm Number Entry date 1201 mg Imm Num Number Entry date 1201 mg Imm Tary date Entry date 1201 mg Imm Tary date Imm Tary date 1201 mg Imm Tary date Att Entry date Entry date	
	tences an informa angleys) A.L. Barry Transit Paldet Special Maintenance • Infrastructure Type: Lipti Henry Transit Paldet Special Maintenance • Infrastructure Type: Dedicated Transition Lanse: (Pendet C) Barrier No Barrier • Dedicated Transition Lanse: (Pendet C) Pendet State Dedicated C) • Dedicated Transition Lanse: (Pendet C) Paldered Vehicle Pendet State Pendet State <td></td>	

Figure 5. Standard PSA Database Input Form

Note: Item Numbers do not necessarily correspond to the database record numbers.

4.1.1.1 Selecting Fields From a Drop Down List

Drop down lists are used in the PSA input form to facilitate data entry. The PSA Contract Team field contains a list of the 15 teams awarded contracts by FHWA to perform precursor systems analyses of automated highway systems. To select the appropriate organization from the list, click the down arrow to the right of the PSA Contract Team field with the left mouse button. A list will appear with the names of the 15 PSA teams. You can select the appropriate team by any of these methods: (The mouse is the most efficient method)

Note: Keyboard Users, ALT+DOWN ARROW or the F4 key activates the drop down list.

- 1. Select the name of your team with the mouse and click the left mouse button.
- 2. Use the down arrow on the keyboard to highlight your team and press enter.
- 3. Type the first few characters of the team name until the proper team is identified and hit enter.
- 4. Type your contract team's name.
- 4.1.1.2 Field Specifics

The following fields are contained in the PSA Input form:

- Entry: Who on your team captured the item and when?
- Entry Date: This field defaults to the current date of when the item was recorded, you can change it by typing a date in the field. The proper format is mo./dd./yr. To reenter the default value use CTRL+ALT+SPACEBAR.
- Review: Who on your team reviewed the item and when?
- Item Type: The item type is selected by pointing to the proper choice and clicking the left mouse button. (The SPACEBAR can also be used to select the proper checkbox.) There are four possible choices:
 - "Issues" refer to items where there are reasonable questions concerning how to proceed; issues may arise as concerns are addressed; they should be posed as questions; Issues are resolved
 - "Risks" are conclusions that identify potentially negative situations that, if they happen, could result in system failure or major problems; severity of risk can be indicated; Risks are Managed
 - "Concerns" is for items that may be risks or issues, but sufficient analyses has not yet been done to know for sure; Concerns are addressed (perhaps through further analysis.)
 - "Conclusions" are supportable results of analyses; they may be resolved issues; Conclusions reference supporting analysis
- Action: This field is for use by the consortium.
- Sources: Indicate your team name, reference the document in which the basis for the item can be found (use whatever identification will be on the documentation submitted to FHWA), and the name of the researcher on your team. If more than one document references this item, list them.

4.1.1.3 Using a Subform

The PSA Database Input form contains a subform (the Sub Contractor, Reference, and Researcher fields) which is used to list references. This subform represents a detail table in the database. Detail tables store the many side of a one-tomany relationship for a database record.

Note: The one-to-many relationship is defined on page 128 of the Microsoft Access 2.0 User's Guide.

This subform is activated by pointing to any of its three fields with the mouse and pressing the left mouse button.

Note: the TAB can also be used to navigate through the form field using the keyboard.

Any number of supporting references can be listed. You can move through any of the Sub Contractor (Reference) Sub Form by using the TAB key, the right / left keyboard arrows, or the mouse. Use the ENTER key to add a new record to the

subform. The number of records entered in the subform is shown on the lower left hand side of the subform. You can browse through these records using the up and down arrows on the keyboard or the mouse.

Note: Keyboard Users: Depress the CTRL+TAB keys to exit the subform and move to the next record of the main form.

4.1.1.4 Remaining Fields

Note: Keyboard Users: The spacebar can be used to check or uncheck a field using a Checkbox control.

- Pertains To: The item must pertain to at least one of the categories shown. Check a box by pointing to it with the mouse and clicking the left mouse button.
- Short Description: This field provides a descriptive title for the item; no more than 10 words.
- Summary: Summarize so the reader can understand the essence, list additional references, no more than 200 words. Use CTRL+ENTER to add a new line to a memo field.
- System Function: Check those functions related or most closely related to the item.
- Infrastructure and Vehicle System: Check those elements of AHS that the item impacts.
- Concept Impact: Check the characteristics of the AHS concept that may be affected by the item.

4.1.2 Calspan Form Differences

A sample Calspan Input form Access screen is shown in figure 6. A hardcopy printout of this form is also included in the Appendix.

	Microsoft Access	▼ \$
<u>File Edit View</u>	<u>R</u> ecords <u>H</u> elp	
-	PSA Database Input Form 🗾 🗸 🔺	
	Precursor Systems Analyses (PSA) Database Item PSA Contract Team Calquan Item Number Country date [12:94] y	
	Record: of Record: of Level All term flot apply) Laren Control Laren Control Laren Control Extern Tunction Check-fin Extern Tunction Check - Oti Check	

Figure 6. Calspan PSA Database Input Form

This form automatically defaults the PSA Contract Team field to Calspan and contains the RSC Impact and Task Origin fields. These fields are described as follows:

- RSC Impact This form is also a subform similar to the Sub Contractor subform above. To select an RSC impact use the mouse, ALT+DOWN ARROW, or F4 key to activate the drop down list and make your selection (or type the appropriate RSC number or ALL). Press the ENTER key to add a new record to the subform. When finished use CTRL+TAB or the mouse to exit the RSC subform.
- Task Origin: The task that originated the item can be selected from a drop down list which shows the 17 PSA tasks. Activate the drop down menu using the mouse, ALT+DOWN ARROW, or the F4 key and make your selection. You can also type the FHWA designation to select your task origin from the list.
- 4.1.3 Making Data Entry Easier

Certain shortcuts can be used to make data entry easier. The CTRL+' key combination will insert the same value in the field that was in the previous record. The CTRL+; combination will insert the current date.

4.1.4 Adding New Records In the Input Form Mode

To add new records with the Input form screen select Add New from the Records Menu at the top of the form screen or use the TAB key from (Control Location:) Balanced field on the form.

4.1.5 Record Navigation

The number of records added for the data input session is shown in the bottom left hand corner of the screen as shown in figure 7. You can view various records by manipulating the navigation buttons with the mouse.



Figure 7. Example Access Form Record Navigation Buttons

To move to a specific record double click the left mouse button in the record number box (or press the F5 key), type the record number, and press ENTER.

The Records menu also provides the following database record navigation options:

- Goto <u>F</u>irst
- Goto <u>P</u>rev
- Goto Next
- Goto <u>L</u>ast

5.0 BROWSING RECORDSIN THE DATABASE

From the Main Menu Select the Browse Issues command button. The dialog box shown in figure 8 will appear providing the following options:

- Browse Issues
- Browse Issues Using the Calspan Form
- Return to the Main Menu



Figure 8. Browse Records Dialog

5.1 Browse Issues

Selecting the Browse Issues option from the Browse Records dialog opens the PSA Contractor Browse Form dialog box shown in figure 9. This form allows the user to filter the database records using any of the fields contained on the form. If no filter criteria are selected, all of the database records will appear.

-	Microsoft Access	▼	
<u>File</u>	Help		
Eile	Help PSA Contractor Issues Browse Form PSA Contract Team: Select Cancel Select Cancel Cancel Cancel Cancel Cancel Cancel		
	Item Type: Risk View Options: O Issue O High O Read Only O Risk O Medium O Edit		
	O Concern O Conclusion		

Figure 9. PSA Contractor Browse Form

5.1.1 Explanation of Browse Form Fields

The PSA Contractor Issues Browse Form filters the database records on any of or any combination of the five fields shown. The field, View Options, allows the user the option of viewing the records in the Read Only (the records can not be altered) or the Edit mode (any record information can be changed). The default view is read only.

The field descriptions are as follows:

- PSA Contract Team This field contains a drop down list identical to that on the input form. Select your contract team from the list or type your team name.
- Researcher: This field queries the database on the researcher field contained on the main form. Any combination of letters can be used here to sort issues on an appropriate researcher much like a key word search. Therefore, the user does not have to type in the researcher's name exactly. However, spelling counts.
- Key Word(s) This field allows a key word search on any of the database item descriptions.
- Item Type: Select any of the four item types.
- Item Risk: Select any of the three risk types available.

After filling in the appropriate filter criteria and view mode, use the Select button to view the database records through the Input Form. The Cancel button returns you to

the Main Menu. A sample Access screen browse output is shown in figure 10. Access browse results are also included as full page printouts in the Appendix.

-					Microsoft Acc	ess				▼ \$
Eil	e <u>E</u> dit	<u>V</u> iew	<u>R</u> ecords	<u>H</u> elp						
		-		F	SA Database Inp	ut Form		•		
									↑	
			Precursor Syst	ems Analyses (PS	A) Database Item PSA C	ontract Team Calsp	an	V		
			Item Number 467	Entry: date	10/21/94 by P. MacDiarmid	Review: date	by			
			Item Type:	Issue 🗿 Ris	c O Concern O Conclusio	n O <u>Risk:</u> Hig	h O Medium O Low	0		
			Action: A	signed		Resolution				
			Sources: Re Sub Contracto	ference Document r	Final Report Volume Reference Document	I; 3.2.1.1 Researcher Researcher	Funke,Levine			
			•					*		
			Resort		N 6			*		
			(chack all items the	smphy.)						
			Pertains To:	Safety Societal	Efficiency User Ac Concept Selection	reptance Environn 7 Demo Design / De	nent 🗌 Legal rvel. 🛛 Test / Evaluation			
			D Ma	ployment 🔲 Maint nagement 🛛	rnance / Operation To Funding	ansition Human Cost Ben	n I/F Program efits			
			Description	HS ramp design.						
			Summary A	HS ramp design must e/snow).Identify scena	accommodate all anticipated vehic ios associated with AHS ramp us	le maneuvers (e.g., check-in including degraded operation	out, queuing, operation on ons and CVO use. Assess			
			n	mp design requiremen	is including requirements for vehi	cle storage. Consult existing	g ramp design guidelines.			
			(check all items that System Function:	apply)	LL Check	In Enter / Memory C	Merge Driver I/F	8		
				Environmental Sens	rge Incident Managem ing Maintenance / Operati	nt Zone Flow Manage	ement Regional Mgmt			
			(check all items that	apply)				_		
			Infrastructure Sys	Roadside Sens	ALL En ors, Comm. / Processors Re Surface Materiale	ry / Exit Configuration gion Command Centers	Lane Configuration Barriers Roadway Maint Equin	H		
						bildgest functs	- Rondway manie Equip.			
			Vehicle System:	Power Tra	ALL Steering Action	ts Braking Actions ts Suspension	Throttle Control Vehicle Electronics			
				Comm	Sensors Chase mications (Intra-vehicle , Ro	is AHS Controller ad - road , Road - vehicl	le, Vehicle - vehicle			
			(check all items that Concept Impact:	apply) AL	. 🗆					
			Vehicle Type: Infrastructure T	Ligi vpe : Dedicate	t Heavy T i Shared w. Manual	ransit Pallet Barrier	Special Maintenance No Barrier			
			Entry / Exit Ty Power Source : Longitudinal C	<u>e</u> : Dedicate On-Board	I 🔀 Iransition Lanes: (Per ICE 🔲 On-Bo	ard APS Representation Representatio Representation Representation Representation Representation) padway Provided Electric Point Followirc	8	¥	
			Record: 1	of 33		rialouicu vehicle	roun ronowing		Ē	

Figure 10. Sample PSA Contractor Browse Filter Output

Note: Consult figure 7 for the record navigation techniques used in the browse mode.

5.2 BROWSE ISSUES USING THE CALSPAN FORM

Select the Browse Issues Using the Calspan Form option from the Browse Records Dialog. The Calspan Issues Browse Form dialog box will appear as shown in figure 11.

0		Microsoft Access	′ ♦
<u>F</u> ile	<u>H</u> elp		
		Calspan Issues Browse Form	
		Calspan Select	
		Task Origin: Cancel	
		Researcher:	
		Key Word(s):	
		Item Type: Risk View Options:	
		O Issue O Risk O Concern O Conclusion O High O Medium O Low O Edit	

Figure 11. Calspan Issues Browse Form

This form is similar to the standard browse form dialog. However, the PSA Contract Team defaults to Calspan and the Task Origin field is added. You can select the appropriate Task Origin from the drop down list identical to that on the Calspan Input Form or type the one letter FHWA designation. Again the default view is Read Only. A sample Calspan browse filter output is shown in figure 12.

File Edit View Records Help	
PSA Database Input Form	
Precersor System Analyses (PSA) Database Item Precersor System Analyses (PSA) Database Item Number [67] Item Number [67]	

Figure 12. Sample Calspan Browse Filter Output

6.0 REPORTING

From the Main Menu select the Report Issues command button, the PSA Database Report Form Dialog will appear as shown in figure 13. There are two standard report types in the PSA Database. Both summarize the database items into formats which present data more clearly for use in other documents. The default report contains item type, risk, PSA contract team, researcher, description, and main reference document. The second report option adds the item summaries to the standard report information.

Note: All the report outputs discussed in this section are included in the Appendix as full page printouts.

-		Microsoft Access								
Eile	e <u>H</u> elp									
		PSA Database Report Form Dialog								
		PSA of AHS Issues / Risks Database AHS () Select								
		Return to the Main Menu								

Figure 13. PSA Database Report From Dialog

Four report filter options are provided:

- Issues By Item Type/Risk
- Issues By Pertains To Information
- Issues By AHS Impacts
- Calspan Issues Report

6.1 Issues By Item Type/Risk

After selecting the Issues By Item Type/Risk option from the PSA Database Report Form Dialog, the Item Criteria Selection Form will appear. This form is shown in figure 14.

-	Microsoft Access	▼	\$
Eil	le Help		
	Item Criteria Selection Form		
	PSA Contract Team: Select		
	Researcher:	=	
	Key Word(s):		
	Item Type: O Issue O Risk O Concern O Conclusion Report View Options:		
	Risk: O High O Medium O Low O Print		
	Do You Want The Item Summaries ? OYes • No • Print Preview		
		_	J

Figure 14. Item Criteria Selection Form

The Item Criteria Selection Form is similar to the PSA Contractor Issues Browse Form discussed earlier. The PSA Contract Team, Researcher, Key Word(s), Item Type, and Risk fields filter the database records based on the user inputs. If no criteria is selected, all of the database records will be reported. The default report output is shown in figure 15.

-				Mic	crosoft Acces	s - [Report:Issu	esByltem]		▼ \$
-	Eile	Help							\$
						•			
		PSA D	atabase Sui	nmary F	Report - Issues by It	em 🔍			
		10/31/9	4						
			Item	D :1		Informa	tion		
		291	Conclusion	High	Calspan	Electric Vehicle Reliability	Pierowicz, MacDiarmid	Final Report Volume	
					*		-	VI Appendix D	
		292	Conclusion	High	Calspan	Pollution Reduction Through Use of APVs	Pierowicz, Mydzian	Final Report Volume VI 3.1.4	_
		294	Conclusion	High	Calspan	RPEVs may be a Logical Starting-Point for AHS Implementation	J. Pierowicz	Final Report Volume VI 3.3	
		295	Conclusion	High	Calspan	APV Infrastructure Requirements	Pierowicz, MacDiarmid	Final Report Volume VI 3.1.2.3	
		298	Conclusion	High	Calspan	Electricity Generation Capacity	J. Pierowicz	Final Report Volume VI 3.1.2.3.3	_
		299	Conclusion	High	Calspan	Cold Weather Performance Impacts on Battery-Operated Vehicles	Pierowicz, MacDiarmid	Final Report Volume VI 3.1.2.1	
	PSA Database Summary Report - Issues by Item					10/31/94	To	tal Pages 1	
M	Page:								

Figure 15. PSA Database Summary Report - Issues by Item

Moreover, two additional report options appear on this form, the Do You Want The Item Summaries? selection box and Report View Options box. The default values for these fields are no summaries and print preview. If the user wants item summaries the summaries report, as shown in figure 16, will appear. Selecting the Print report view will automatically queue the report to the printer.

- <i>N</i>	licrosoft Access - [Report:ItemsWithSummaries]	•
■ Eile Help		•
	PSA Database Summary Report - Items with Summaries 10/31/94 Database Item: 201. By: <u>Berneize</u> From: <u>Culture</u> MacDamal Item Type: <u>Conclusion</u> Risk: High: Available Ite: <u>Enal Report Volume VI Appendix D</u> . Description: <u>Electic Volicle Relubility</u> Summary: <u>Electic Volicle Relubility</u> Summary: <u>Electic Volicle Relubility</u> Summary: <u>Electic Volicle Relubility</u> Summary: <u>Electic Volicle Relubility</u> Duabbase Item: 22 By: <u>Berneize, Mydrian</u> , From: <u>Culture</u>	
	Item Type: Conclusion Risk: High Available In: Final Report Volume VI 3.1.4	
	Description: Politism Reduction Through User (A VV) Summary: APV: can advantatily reduce the polition caused by the automative floet. The utilization of APV: in the automative float can reduce the polition caused by the automative floet. The utilization of APV: in the automative float can reduce the polition caused by transportation. The reduction in "providence gase" is most datamatic with electric vehicles."	
	Database Item: <u>294</u> By: <u>J. Pierowicz</u> From: <u>Calspan</u>	
	Item Type: Conclusion Risk: High Available In: Final Report Volume VI 3.3	
	Description: RPEVs may be a Logical Starting-Point for AHS Implementation	
	Summary: The imital deployment of the AINs may be more efficient it based upon AFV design. This system is negative files use of dockmond lateral constraints of your show of purpose of AINS equipment. An additional benefit is the slower ramp-up in operation for the system that will allow operators to learn how to use the system to full advantage.	
▶ Page: 1 ▶ ▶		

Figure 16. PSA Database Summary Report - Items With Summaries

6.2 Issues By Pertains To Information

Selecting the Issues By Pertains To Information option on the PSA Database Report Form Dialog will open the Pertains To Criteria Selection Form. This form is similar to the Item Criteria Selection Form but it adds the Pertains To fields from the PSA Input Form. The Pertains To Criteria Selection Form is shown in figure 17.

-		Microsoft Access	▼ \$
Ei	le <u>H</u> elp		
		Pertains To Criteria Selection Form	
	PSA Contract		_
	Researcher:	Select	
	Key Word(s)	Cancel	
	Key word(s).		
	Item Type:	• Issue • Risk • Concern • Conclusion Report View Options:	
	Risk:	O High O Medium O Low	
	Do You Wan	t The Item Summaries ? OYes • No	
	Pertains To ⁻		
	Safety	Efficiency User Accept Environment Legal	
	Societal	oncept Select. 97 Demo Design/Devel. Test/Eval.	5
	Deploy.	Maint/Oper. Transition Human I/F Program	
	Manage. 🗌	Funding Cost Benefits	

Figure 17. Pertains To Criteria Selection Form

The Pertains To Criteria Selection Form allows the user to further filter the database records using the Pertains To options. The default views are no summaries and print preview. The default Pertains To Criteria report is shown in figure 18. Notice that this report contains a string in the header which shows the user selected Pertains To criteria that the records were filtered on.

			Micros	oft Access -	[Report:IssuesB	SyPertainsTo	p]	
ile	Help							
	PSAT	Database S	ummary	Report - Issues by I	Pertains To			
	10/21	04		Report Issues by I	Q			
	These It	94	· Safatu					
		-	. Guiety					
	Number	Type Type	Risk	PSA Contract Team	Description	Researcher	Reference Document	
	329	Conclusion	Medium	Calspan	AHS must consider occupant response to lat/long control	L. Parada	Final Report Volume V C2; 3.1, Appendix B	
	337	Conclusion	High	Calspan	High speed and small headway risks for lat/long control.	L. Parada	Final Report Volume V C2; 3.1, 3.2.2, Appendix B	
	338	Conclusion	Medium	Calspan	Manually operated vehicle trailing an automated vehicle - risks.	L. Parada	Final Report Volume V C2; 3.1, 3.2.2, Appendix B	
	340	Conclusion	High	Calspan	Delta V - Safe gap distance determination.	L. Parada	Final Report Volume V C2; 3.2.2	
	341	Conclusion	High	Calspan	All occupants of an automated vehicle should be restrained.	L. Parada	Final Report Volume V C2; 3.2	
	342	Conclusion	High	Calspan	The object/animal in the roadway and AHS.	L. Parada	Final Report Volume V C2; 3.2.5	
	343	Conclusion	Medium	Calspan	Sensors to detect objects or animals must function in dark conditions.	L. Parada	Final Report Volume V C2; 3.2.5	
					1 1		· · · · · · · · · · · · · · · · · · ·	
_								
le:								



The Pertains To report with summaries is shown in figure 19.

-			Microsoft Access - [Report:PertainsWithSummaries]	▼ \$
1	<u>F</u> ile	<u>H</u> elp		\$
	Eile	Help	<section-header><section-header><section-header><section-header><section-header><section-header><section-header><text><text><text><text><text><text><text><text><text></text></text></text></text></text></text></text></text></text></section-header></section-header></section-header></section-header></section-header></section-header></section-header>	
M	Page:			

Figure 19. PSA Database Summary Report - (Pertains To) Items With Summaries

6.3 Issues By AHS Impacts

Selecting the Issues By AHS Impacts option from the PSA Database Report Form Dialog opens the PSA System Criteria Selection Form. This form, shown in figure 20, provides the same selection criteria as the Item Criteria Selection Form but includes the AHS impacts section from the PSA Input form as well.

-	Microsoft Access 🗸 🗸
E	le <u>H</u> elp
	PSA System Criteria Selection Form
Г	PSA Contract Team. Researcher: Select
	Key Word(s): Include Summaries ? OYes ONo Cancel
	Item Type: O Issue ORisk O Concern O Conclusion Risk: O High OMedium O Low
<u>S</u> <u>L</u> <u>L</u> <u>L</u> <u>L</u> <u>L</u> <u>L</u> <u>L</u>	vstem Function ALL Check-In Enter / Merge Driver I/F Longitud. Control Lateral Control Man. Coord Check - Out Exit / Merge Incident Managemt Zone Flow Management Regional Management Environm. Sensing Maintenance / Operation Operational Mode frastructure System ALL Entry / Exit Configuration Lane Configuration Roadside Sensors, Comm. / Processors Region Command Centers Barriers Barriers Surface Materials Bridges / Tunnels Roadway Maint. Equip. 'ehicle System ALL Steering Actions Braking Actions Throttle Control Power Train Control Lights Suspension Vehicle Electronics Sensors Chasis Communications (Intra-veh Road-road Road-veh Veh-veh AHS Controller oncept Impact ALL tight Heavy Transit Pallet Special Maint. 'trastructure Type: Dedicated Shared w. Manual Barrier No Barrier View Options oncept Impact On-Board ICE On-Board APS Road Provided Elect. OPrint
<u>C</u>	ontrol Location: Mostly Vehicle Mostly Infrastructure Balanced

Figure 20. PSA System Criteria Selection Form

Therefore, the user can filter the database records using the AHS impacts selections. The default report is shown in figure 21. Notice that the AHS impact selections are written out as strings in the report header. (One string per section, i.e. System Function, Infrastructure System, etc.) If a particular System Area filter is not selected, no string appears for that section.

-				Micr	osoft Access	- [Report:Issues	sByCriteria]		
-	<u>E</u> ile	Help							
						0			
	PSA Database Summary Report - Issues by System Impact								
		10/31/	94						
		The Fo	ollowing Sele	ection Crit	eria were chosen:				
			0						
		Vehic	le System: All						
		Power	Source: On-B	oard APS, I	RPEV				
			Item			Information			
		Number	Туре	Risk	PSA Contract Team	Description	Researcher	Reference Document	
		294	Conclusion	High	Calspan	RPEVs may be a Logical Starting-Point for AHS Implementation	J. Pierowicz	Final Report Volume VI 3.3	
		416	Concern	Medium	Calspan	AHS vehicle equipment costs.	Cohen, Elias, Gordon	Final Roport Volume VIII, Ch2	
		PSA Da	tabase Summa	ıry Report -	Issues by System Impact	10/31/94	То	tal Pages 2	
		PSA Da	tabase Summar	y Report - Iss	sues by System Impact	10/31/94		Page 2	
-1	Page	2 .							



The System Impact report including item summaries is shown in figure 22.



Figure 22. PSA Database Summary Report - (System Impact) Items With Summaries

6.4 Calspan Issues Report

Selecting the Calspan Issues Report option from the PSA Database Report Form Dialog opens an Item Criteria Selection Form automatically defaulting the PSA Contract Team to Calspan. The Calspan form is shown in figure 23.

-	Microsoft Access	▼	\$
<u>F</u> i	le <u>H</u> elp		
	Item Criteria Selection Form		
	Calspan Team Select		
	Representative System Configuration:	╡	
	Task Origin:		
	Researcher:		
	Key Word(s):		
	Item Type: Risk Report View Options: Include Summaries	?	
	O Issue O High O Print O Yes		
	O Risk O Medium ⊙ Print Preview ⊙ No		
	O Concern O Low		
			I

Figure 23. (Calspan) Item Criteria Selection Form

This dialog provides two filter options not available on the other reports, the Representative System Configuration and Task Origin Fields. The standard Calspan Report Output is shown in figure 24.

-			Mi	crosofi	Access - [Re	port:IssuesByC	CalspanCriteria]	▼ \$				
-	Eile	Help						\$				
						•						
		PSA I)atabase C	alenan Te	am Summary Report	- Issues by Task Orio	in with RSC Impacts					
		PSA Database Calspan Team Summary Report - Issues by Task Origin with RSC Impacts 10/31/94										
		10/31/94										
		Tl-O-		nation Dava	ulaian Contanta Internet							
		Task Of	igin: Alter	native Prop	suision systems impact							
		N 1	Item	- D-1	B001 -	Informati	on De la					
		Item Information Number Type Risk RSC Impacts Resarcher Description 294 Conclusion High 13 J. Pierowicz RPEVs may be algoed Starting-Point for AHS Implementation 287 Conclusion Medium 13 Pierowicz, Mydzian Ground-Up RPEV System for Lateral Control of AHS										
		287	Conclusion	RPEV System for Lateral Control of AHS								
		287 Conclusion Medium 13 Pierowicz, Mydzian Ground-Lip APEV Designs 285 Conclusion Medium 13 Pierowicz, Mydzian RPEV System for LinarD Control of AHS 284 Conclusion Low 13 Pierowicz, Mydzian Roadway, Powered Electric Vehicle 284 Conclusion Low 13 Pierowicz, Mydzian Roadway, Powered Electric Vehicle										
		PSA Da	tabase Summar	y Report - Iss	ues by Task with RSC Impac	ts 10/31/94	Total Pages 2					
M	Page: 2											

Figure 24. PSA Database Calspan Team Summary Report - Issues By Task Origin With RSC Impacts

The Calspan Report with Item Summaries is shown in figure 25.

-			Microsoft Access - [Report:CalspanSummaries]	▼ \$
-	Eile	Help		\$
			PSA Database Calspan Summary Report 10/31/94 Database item: <u>20</u> By: <u>L. Parala</u> RSC impacts: <u>ALL</u> Task Origin: <u>HIS Softwiewe</u> Tem Try E. Caccon: Risk: <u>Medium</u> <u>Available Brit: <u>Parala Convolution V (2, 3, 1, 2)</u> Description: <u>MLS Impacts - Vehicle Braining Imparimeted V partial or complete loss of braining ability. Vehicle Braining Tomparities Vehicles Impaired by a partial or complete loss of braining ability. Vehicle Braining Impacting Vehicles Braining Available Schwarz, Low Convolt to be depided a starting or complete loss of braining ability. Vehicle Braining Impact Schwarz, Schwarz, John Friddward, Als Standeward, John Startiga Johnson, Vehicle Braining Impacting Vehicles Braining Available Schwarz, Schwarz, Schwarz, Schwarz, Schwarz, Schwarz, Schwarz, Schwarz, Schwarz, John Friddwarz, Schwarz, Schwarz, Schwarz, Schwarz, Schwarz, Schwarz, Schwarz, Schwarz, Schwarz, John Friddwarz, Schwarz, Schwarz,</u></u>	
			Less appendix à los traite components lluit mar les lui lluit laiture mode Database Item: 316 Biy: <u>L. Parada</u> RSC Impacts: <u>ALL</u> Task Origin: <u>AIS Safety Issue</u> Item Type: <u>Concern</u> Risk: <u>Medium</u> Available In: <u>Final Report Volume V C2 31, Appendix B</u> Description: <u>AIIS most consider vystem traction degradation</u> Summary: <u>AIIS most consider vystem traction degradation</u>	
			environmental conditions. This may cause a traffic slowdown. Database Item: <u>324</u> By: <u>L. Parada</u> RSC Impacts: <u>ΔLL</u> Task Origin: <u>ΔHS Safety Issues.</u> Item Type: <u>Concern</u> Risk: <u>Medium</u> Available In: <u>Final Report Volume V C2: 3.1.</u> <u>Appendix R</u>	
			Description: AIIS must consider software bugs and their lat/ong control impacts. Summary: Control system outputs may be in error, which could seriously degrade system performance and increase collision potential	
M	Page:			

Figure 25. PSA Database Calspan Summary Report

6.5 Report Mode Features

6.5.1 Report View File Menu Options

When viewing a report, several options are available from the file menu. They are limited to:

- <u>C</u>lose
- Output <u>T</u>o
- Print <u>S</u>etup
- Print Preview
- <u>P</u>rint

The Close, Print Preview, Print, and Print Setup options are standard options available to many Window's applications. The Output To options provides a means for writing the report to a format that can be used for other Windows applications like word processors and spreadsheets. Selecting this option opens a dialog box allowing three output criteria, text (.txt), rich text format (.rtf), or Excel spreadsheet (.xls). For more information on these file menu options see the Access 2.0 User's Guide.

6.5.2 Navigating Report Pages

The Access report navigation buttons are shown in figure 26.



Figure 26. Microsoft Access Report Navigation Buttons

These buttons can be manipulated using the mouse. To move to a specific page double click the left mouse mutton in the page box or press the F5 key, type a number and hit ENTER.

7.0 PSA DATABASE OPTONS

Selecting the Options button from the Main Menu opens the PSA Database Options Dialog shown in figure 27.

-		Microsoft A	Access	▼	\$
<u>F</u> ile	<u>H</u> elp				
	_				
		PSA Databas	e Options		
		PSA Database Options	Clock		
		PSA of AHS Issues / Risks	Database Statistics		
		Database	Change Password		
		AHS:(⊕⊕`	View the Database Window		
			Return to the Main Menu		

Figure 27. PSA Database Options Menu

There are five options available:

- Clock
- Database Statistics
- Change Password
- View the Database Window
- Return to the Main Menu

The clock option runs the standard clock application available from windows, while return to the main menu is self explanatory.

7.1 Database Statistics

The database statistics report is shown in figure 28. It includes a summary of the number of Issues, Risks, Concerns, Conclusions, and Unknown items submitted by each of the PSA Contract Teams. Database totals are also provided.

-			Microsoft A	lcces	s - [R	eport:l	Databa	seStat	s]		▼ \$
-	Eile	Help									\$
		_ ,									
			PSA Issues / Ris	ks Data	base Sta	tistics Re	eport				
			11/2/94								
			11/2/74				~				
			1 C 11001 d		500 I.		<u> </u>				
			As of 11/2/94 th	ere are	599 10	ms in the P	SA Issues / R	isks Databa	se		
			The number of iten	ns logged p	er PSA co	ntract team	is as follows:				
			PSA Contract Team	Issues	Risks	Concerns	Conclusions	Unknown	Total		
			Battelle	7	2	5	19	1	34		
			BDM	3	10	0	26	4	43		
			DELCO	0	25	90	0	2	0		
			Honeywell	7	0	3	4	1	15		
			Martin Marietta	12	0	0	0	0	12		
			Northrup	5	1	3	0	0	9		
			PATH	6	2	10	13	5	36		
			Rockwell	4	1	5	1	2	13		
			SAIC	0	0	0	0	0	0		
			SRI	0	0	0	0	0	0		
			TASC	3	1	0	0	1	5		
			TRW UC Davis	7	2	12	1	2	24		
			Total	140	53	135	253	18	599		
								T	Page 1		
									upe i		
	Page										
	i aye.										

Figure 28. PSA Database Statistics Report

7.2 Change Password

Selecting the Change Password option opens the Change PSA Database Password Dialog shown in figure 29. This will change the PSA Database Log On password. Note that passwords are limited to eight characters. If you change the password, write it down in a safe place and make it available for other authorized users because there is only one password allowed for access to the database. You must enter the old password and new password verification correctly or this process will not work.

-		Microsoft Access		•	•
Eile	<u>H</u> elp				
			1		
		Change PSA Database Password			
		Note: Passwords are Limited to Eight Characters			
		Old Password:			
		New Password:			
		Verification:			

Figure 29. Change PSA Database Password Dialog

7.3 View the Database Window

This feature, intended for database maintenance purposes, can also be accomplished using the F11 key. If you are unfamiliar with Access, do not select this option because it may serve to confuse a user unfamiliar with the application.

8.0 APPENDIX

8.1 PSA of AHS Issues / Risks Database Standard Input Form

Precursor Sys	tems Analyse	es (PSA) D	atabase Item	PSA Contract Team							
Item Number	(counte Entry r	y: date	11/2/94 by			Rev	view: date	;	by		
Item Type:	Issue	O Risk	O Concerr	1 O C	onclusion	0	Risk:	High	O Medium	O Low	0
Action: As	signed				Res	solutior	n				
Sources: Sub Contr	Reference D	Document Referen	ice Document				Resea Resea	rcher			
Record:	of		+							→	
(check all item Pertains To:	<u>is that apply)</u> Safety	Efficie	ncy		User		Enviro	nment	Legal		
	Societal	Conce	pt Selection		'97 Demo		🗌 Desigr	ו / Devel	. 🗌 Test /	ation	
	Deployment		enance /		Transition		🗌 Humai	n I/F		am	
	Manageme nt		ng		Cost		🗌 Benefi	ts			
Description											
Summary											
(check all item	is that apply)										
System Functi	i <u>on:</u> ALL Longituc Exit / Mo	dinal Contr erge	ol Checi Latera	k-In al Contro ent Mana	ol agement		Enter / Mer Maneuver (Zone Flow Manageme	ge Coord. ent	☐ Drive ☐ Che ☐ Reg Mgn	ər I/F ck - Out ional nt	
	Environi Sensing	mental	☐ Maint Opera	enance / ation	1		Operationa	I Mode			
(check all item	ıs <u>that apply)</u>										
Infrastructure	System: ALI Ro	L adside Ser	nsors, Comm.	1	Entry Confi	/ Exit guratio	on nmand	□ L □ B	ane Configu arriers	ration	
	Sui	rface Mate	rials		Bridg	es / Tu	unnels		≀oadway Ma	int. Equip.	
Vehicle Syster	<u>m:</u> ALI Pov Sei	L wer Train (nsors Comn)	Control	Steering Lights Chassis ntra-vehi	∣ Actions cle □, Rc	BI Si Si Al Dad - ro	raking Acti uspension HS Contro oad □, Ro	ons [ller [bad - veh] Throttle C] Vehicle El] ìicle □, Ve	ontrol ectronics hicle - veh	
(check all item	ns that apply)										
Concept Impa Vehicle Type:	<u>.ct:</u> A L	.LL ight	□ □ Heavy		Trans	sit 🗌] Pallet	□ SI	pecia 🗌 M	aintenanc	

Infrastructure Type:	Dedicated 🗌 Shared w. Manua	al 🗌 Barrier	🗌 No Barrier 🔲
Entry / Exit Type:	Dedicated 🛛 Transition	(Periodic 🗌 Unrestricte	
	Lanes:	d	
Power Source:	On-Board ICE	On-Board	Roadway Provided Electric
		APS	-
Longitudinal Control:	Autonomous Vehicle	Platooned Vehicle	Point Following
Lateral Control:	Passive Road (e.g., magnets,	🗌 Barriers 🔲 Active	
	paint)	Road	
Control Location:	Mostly Vehicle	Mostly Infrastructure	Balanced

8.2 PSA of AHS Issues / Risks Database Calspan Input Form

Precursor System	is Analyses (F	PSA) Data	base Item	I	PSA Contr	act Tea	m	Calsp	an		
Item Number (co	ounte Entry:	date 1	1/2/94 by			Reviev	v: date		by		
Item Type:	Issue O	Risk	O Concern	O Cor	nclusion C) <u>R</u>	i <u>sk:</u> H	igh C	D Medium	O Low	0
Action: Assigr	ned				Resol	ution					
Sources: Re	eference Docu	ument					Researc	ner			
Sub Contracto	or F	Reference	Document				Researc	ner			
											Τ
											Ť
Record:	Of		←							→	
(check all items th	nat apply)										
Pertains To: Sa	fety	Efficiency	/		ser		Environn	nent	Legal		
So	cietal	Concept	Selection	·) (9)	7 Demo		Design /	Devel.	Test / Evalua	ition	
De	ployment 🗌	Maintena	ince /	🗌 Tr	ansition		Human I	/F	Progra	m	
Ma	nageme 🗌	Operation Funding	٦		ost		Benefits				
Summary											
RSC Impact				Т	ask Origin	: [
			_								
Record:	of										
(check all items th	at apply)										
System Function:	ALL		Check-	-In		🗌 Ente	er / Merge		Drive	er I/F	
	Longitudina	al Control		Control	omont	∐ Man	euver Co	ord.		k - Out	
		-		n manay	ement	Man	agement		Mgm	t	
	Environmer	ntal	Mainte	nance /		🗌 Ope	rational N	lode			
	Sensing		Operat	ion							
(check all items th	at apply)										
Infrastructure Sys	tem: ALL				Entry / I	Exit tration		∐ La	ne Configui	ation	
	Roads	ide Senso	ors, Comm. /		Region	Comma	and	🗌 Ba	rriers		
	Proces	ssors	•			3 / T				ot Faulia	
	Sunac	e material	5			i i unn	eis		adway Mai	nt. Equip.	
Vehicle System:	ALL		Пs	Steerina A	Actions [∃ Braki	na Action	sП	Throttle Co	ontrol	
	Power	Train Cor	ntrol 🗌 L	ights		Susp	ension		Vehicle Ele	ectronics	\Box
	Senso	rs	icotiona (Int	Chassis			Controlle	r 🗌		viala vahi	ala
		Commun	iicalions (Int			u - 10aŭ			Je ⊡, ver		CIE
(check all items th	at apply)										
Concept Impact:	ALL										
Vehicle Type:	Light		🗌 Heavy		Transit	D P	allet	🗌 Spe	ecia 🗌 Ma	aintenanc	

l e
Barrier 🗌 No Barrier 🗌
Unrestricte)
d
Roadway Provided Electric
I Vehicle Point Following
Road
rastructure 🗌 Balanced 🗌
Barrier No Barrier Unrestricte) d Roadway Provided Electric I Vehicle Point Following Active Road rastructure Balanced

8.3 PSA of AHS Issues / Risks Database Standard Form Browse Mode

Precursor Sys	stems Analyse	es (PSA) Dat	abase Item	PSA Contract Team Calspan							
ltem Number	467 Entr	ry: date 1	10/21/9 by 1	P. MacDiarmid	Review:	date	by				
Item Type:	Issue	Risk	O Concern	O Conclusion	O <u>Risk:</u>	High	O Medium ⊙ Lov	N O			
Action: As	ssigned			Res	solution						
Sources: Sub Cont	Reference ractor	Document Reference	Fina e Document	I Report Volume I	l; 3.2.1.1 Re Re	esearcher esearcher	Funke,Levine	1			
Record:	of		(→ ↓			
/		I						-			
(check all iten Pertains To:	s that apply Safety) Efficience	су		En	vironment	Legal				
	Societal	Concept	t Selection	ight in the second seco	De	esign / Devel.	Test /				
	Deployment	Mainten Operatio	ance /	☑ Transition	🗌 Hu	ıman I/F	Program				
	Manageme nt	⊠ Funding		🗌 Cost	🗌 Ве	enefits					
D											
Description	AHS ramp	design.									
<u>Summary</u>	AHS ramp operation of and CVO u existing rate	design must on ice/snow). use. Assess mp design gu	accommoda Identify scena ramp design iidelines.	te all anticipated v arios associated v requirements incl	vehicle maner vith AHS ram uding require	uvers (e.g., c p use includii ments for vel	heck-in/out, queuing ng degraded operati hicle storage. Consi	l, ons ult			
(check all item	ns that annly)										
System Funct	ion: ALL Longitu Exit / M	idinal Control lerge imental	Check	-In I Control nt Management enance /	☐ Enter / ☐ Maneuv ☐ Zone Fl Manage ☐ Operati	Merge ver Coord. low ement onal Mode	⊠ Driver I/F □ Check - Out ⊠ Regional Mgmt □				
	Sensing	g	Opera	tion							
(check all iten Infrastructure	ns that apply) <u>System:</u> AL	.L		Entry	/ Exit	🖂 La	ane Configuration				
	Ro Pr Su	oadside Sens ocessors ırface Materia	ors, Comm. / als	Confi Regio Cento Bridg	guration on Command ers les / Tunnels	B B	arriers oadway Maint. Equi	□ p. □			
Vehicle System: ALL Steering Actions Braking Actions Throttle Cont Power Train Control Lights Suspension Vehicle Elect Sensors Chassis AHS Controller Communications (Intra-vehicle D, Road - road D, Road - vehicle D, Vehicle D)											

(check all items that apply)

Concept Impact:	ALL					
Vehicle Type:	Light	Heavy	Transit	Pallet	🗌 Specia 📋 Maintenanc	
					l e	
Infrastructure Type:	Dedicated	🗌 Shared w. Manu	ial 🗌	Barrier	🗌 No Barrier 🗌	
Entry / Exit Type:	Dedicated	🛛 Transition	(Periodic	🛛 Unrestricte	⊠)	
		Lanes:		d		
Power Source:	On-Board ICI	Ξ 🗌	On-Board		Roadway Provided Electric	
			APS			
Longitudinal Control:	Autonomous	Vehicle	Platoone	ed Vehicle	Point Following	
Lateral Control:	Passive Road	d (e.g., magnets,	Barriers	Active		
	paint)			Road		
Control Location:	Mostly Vehicl	е	🗌 Mostly Ir	nfrastructure	Balanced	

8.4 PSA of AHS Issues / Risks Database Calspan Form Browse Mode

Precursor Sys	stems Ana	lyses (l	PSA) D	atabase	Item	PSA Contract Team Calspan									
ltem Number	467 E	Entry:	date	10/21/9 4	∂ by	P. Mac	Diarmid	Rev	view:	date		by			
Item Type:	Issue	0	Risk	0 Cc	oncern	0 Cc	onclusion	0	<u>Risk</u>	<u>c.</u>	High	O Me	dium	⊙ Low	0
Action: As	ssigned						Reso	olutior	n						
Sources: Sub Cont	Referen	ce Doc	ument Referen	ice Doci	Final	l Report	Volume II;	3.2.1	.1 R	lesear	cher cher	Fun	ke,Lev	ine	
		-									01101				1
															Ŧ
Record:	C	of			←									-	
(check all iter	ns that app	oly)													
Pertains To:	Safety] Efficie	ncy		<u> </u>	Jser		E	nviron	ment		egal		
	Societal] Conce	ept Selec	ction	\boxtimes	Acceptance 97 Demo	е		esign	/ Devel	I. 🛛 1	est /	tion	
	Deploym	ent 🗌] Mainte	enance /			Fransition		ΠH	luman	I/F	F	rogra	m	
	Managen nt	ne 🖂] Fundir	ng			Cost		В	enefits	5				
Description		mn dae	sian												
Description	Ansia	mp des	sign.												
Summary	AHS ra operation and CV existing	mp des on on ic O use. I ramp	sign mu ce/snow Asses design (st accon /).ldentif s ramp o guideline	nmoda y scena design es.	te all ani arios ass requiren	sociated ve sociated wi nents inclu	ehicle ith AH iding r	mane IS rar requir	euvers np use ement	s (e.g., o e includ s for ve	check-ir ling deg ehicle st	i/out, c raded orage.	operatio Consul	ns It
RSC Imp	act						Task Origi	in·		<u>ې</u>				_	
8							rusik erigi			.0]	
Reco	rd: 1	of 6													
(check all iter	ns that app	olv)													
System Func	tion: ALL				Check	-In		E	Inter	/ Merg	е	\boxtimes	Drive	r I/F	
	Long Exit	gitudina / Mercy	al Contr		Latera	I Contro nt Mana	 nement		Maneu Zone I	Jver C	oord.		Check	k - Out	H
		/ werg	6		molue		gement		Janag	gemen	t		Mgmi		
	Envi	ironme	ntal		Mainte	enance /			Opera	tional	Mode		-		
		sing			Орега										
(check all iter	ns that app System:	<u>оіу)</u> АГІ					Entry	/ Exit				ane Co	nfigur	ation	
minastractare	<u>oystem.</u>						Config	guratio	on				ingui		
		Roads	side Ser	nsors, C	omm. /	,		n Con	nman	d	<u> </u>	Barriers			
		Surfac	ssors ce Mate	rials				ers es / Tu	unnel	S	ΓF	Roadwa	y Mair	nt. Equip	. П
Vahiala Quat		A I I			<u>с</u> ,	Stopping	Actions		rold-	• ^ •±-				ntrol	
venicie Syste	<u>:::::</u>	ALL Power	· Train (Control		_ights	ACUONS		usper	y ACtio Ision	115 [I nro	ue Co cle Ele	ctronics	
		Senso	ors			Chassis	. — -		нs с	ontroll	er [
			Comn	nunicatio	ons (In	tra-vehio	cie ∐, Roa	ad - ro	bad∟	_, Roa	ad - vel	nicle 📋	, Veh	icle - veł	nicle
L		/													

(check all items that apply)

Concept Impact:	ALL					
Vehicle Type:	Light	Heavy	Transit	Pallet	🗌 Specia 📋 Maintenanc	
					l e	
Infrastructure Type:	Dedicated	Shared w. Manu	ial 🗌	Barrier	🗌 No Barrier 🗌	
Entry / Exit Type:	Dedicated	🛛 Transition	(Periodic	🛛 Unrestricte	⊠)	
		Lanes:		d		
Power Source:	On-Board ICI		On-Board		Roadway Provided Electric	
			APS			
Longitudinal Control:	Autonomous	Vehicle	Platoone	ed Vehicle	Point Following	
Lateral Control:	Passive Road	d (e.g., magnets,	Barriers	Active		
	paint)			Road		
Control Location:	Mostly Vehicl	е	🗌 Mostly Ir	nfrastructure	Balanced	

8.5 PSA Summary Report - Issues by Item

PSA Database Summary Report - Issues by Item

10/31/94

	Item	Information				
Number	Туре	Risk	PSA Contract Team	Description	Researcher	Reference Document
291	Conclusion	High	Calspan	Electric Vehicle Reliability	Pierowicz, MacDiarmid	Final Report Volume VI Appendix D
292	Conclusion	High	Calspan	Pollution Reduction Through Use of APVs	Pierowicz, Mydzian	Final Report Volume VI 3.1.4
294	Conclusion	High	Calspan	RPEVs may be a Logical Starting-Point for AHS Implementation	J. Pierowicz	Final Report Volume VI 3.3
295	Conclusion	High	Calspan	APV Infrastructure Requirements	Pierowicz, MacDiarmid	Final Report Volume VI 3.1.2.3
298	Conclusion	High	Calspan	Electricity Generation Capacity	J. Pierowicz	Final Report Volume VI 3.1.2.3.3
299	Conclusion	High	Calspan	Cold Weather Performance Impacts on Battery-Operated Vehicles	Pierowicz, MacDiarmid	Final Report Volume VI 3.1.2.1

PSA Database Summary Report - Issues by Item 10/31/94

8.6 PSA Summary Report - Items with Summaries

PSA Database Summary Report - Items with Summaries

10/31/94

Database Item	: <u>291</u> By: <u>Pie</u>	rowicz, MacDi	<u>armid</u> From:	Calspan
Item Type:	Conclusion	Risk: <u>High</u>	Available In:	Final Report Volume VI Appendix D
Description:	Electric Vehicle	Reliability		
Summary:	Electric vehicle used in EVs are	powerplants a e more reliable	re more reliable th than the SI motor	an those in SI vehicles. The motors sused in automobiles.
Database Item	: <u>292</u> By:	<u>Pierowicz, My</u>	<u>/dzian</u> From:	Calspan

Item Type: Conclusion Risk: High Available In: Final Report Volume VI 3.1.4

Description: Pollution Reduction Through Use of APVs

Summary: APVs can substantially reduce the pollution caused by the automotive fleet. The utilization of APVs in the automotive fleet can reduce the pollution caused by transportation. The reduction in "greenhouse gases" is most dramatic with electric vehicles."

Database Item	: <u>294</u> By:	J. Pierowicz	From: <u>Calspan</u>
Item Type:	<u>Conclusion</u>	Risk: <u>High</u>	Available In: Final Report Volume VI 3.3
Description:	RPEVs may be	a Logical Startir	ng-Point for AHS Implementation
Summary:	The initial deplo This system ner purpose-built R installations of for the system t	oyment of the AF gates the use of PEV/AHS vehicl AHS equipment. hat will allow ope	IS may be more efficient if based upon RPEV designs. a dedicated lateral control system, and allows the use of es. This eliminates the potential for poor after-market An additional benefit is the slower ramp-up in operation erators to learn how to use the system to full advantage.

PSA Database Summary Report - Items with Summaries 10/31/94 Total Pages 1

8.7 PSA Summary Report - Issues by Pertains To

PSA Database Summary Report - Issues by Pertains To

10/31/94

These Items Pertain To:Safety

	Item		Information					
Number	Туре	Risk	PSA Contract Team	Description	Researcher	Reference Document		
329	Conclusion	Medium	Calspan	AHS must consider occupant response to lat/long control	L. Parada	Final Report Volume V C2; 3.1, Appendix B		
337	Conclusion	High	Calspan	High speed and small headway risks for lat/long control.	L. Parada	Final Report Volume V C2; 3.1, 3.2.2, Appendix B		
338	Conclusion	Medium	Calspan	Manually operated vehicle trailing an automated vehicle - risks.	L. Parada	Final Report Volume V C2; 3.1, 3.2.2, Appendix B		
340	Conclusion	High	Calspan	Delta V - Safe gap distance determination.	L. Parada	Final Report Volume V C2; 3.2.2		
341	Conclusion	High	Calspan	All occupants of an automated vehicle should be restrained.	L. Parada	Final Report Volume V C2; 3.2		
342	Conclusion	High	Calspan	The object/animal in the roadway and AHS.	L. Parada	Final Report Volume V C2; 3.2.5		
343	Conclusion	Medium	Calspan	Sensors to detect objects or animals must function in dark conditions.	L. Parada	Final Report Volume V C2; 3.2.5		

PSA Database Summary Report - Issues by Pertains To

10/31/94

8.8 PSA Summary Report - (Pertains To) Items with Summaries

PSA Database Summary Report - Items with Summaries

10/31/94

These Items Pertain To Safety, Maintenance/Operation

Database Item	: <u>338</u>	By:	L. Parada	rom: <u>Calspan</u>	
Item Type: <u>Cor</u>	nclusion	Risk:	<u>Medium</u>	vailable In: <u>Final Report Volume V</u> <u>Appendix B</u>	<u>C2; 3.1, 3.2.2,</u>
Description:	Manual	ly opera	ted vehicle trailin	an automated vehicle - risks.	
Summary:	Manual studies approxi improve approxi	vehicles have be mately 0 ements a mately 1	s have a much g een conducted th 0.3 seconds; this are made. Reacti 1.75 seconds, alt	ater reaction time than automated v showed the reaction time for an au umber may be lowered as sensor a n time for a manually operated vehic ough this is highly dependent on the	ehicles. Clinical tomated vehicle is nd technology cle is e individual driver.
Database Item	: <u>343</u>	By:	L. Parada	rom: <u>Calspan</u>	
Item Type: <u>Cor</u>	nclusion	Risk:	<u>Medium</u>	vailableIn: <u>Final Report Volume V</u>	<u>C2; 3.2.5</u>
Description:	Sensors	s to dete	ct objects or ani	als must function in dark conditions.	
Summary:	57.3% conditio	of crash	es with non-fixed	objects on interstates occur during c	lark lighting
Database Item:	: <u>344</u>	By:	<u>L. Parada</u>	rom: <u>Calspan</u>	
Item Type: <u>Cor</u>	clusion	Risk:	Medium	vailableIn: <u>Final Report Volume V</u>	<u>C2; 3.2.5</u>
Description:	Breakdo	own lane	e - object/animal	the roadway.	
Summary:	Breakdo animals an obje success This pro	own lang in the r ct or ani sfully ma oblem ha	es may be useful oadway. Accider mal in the roadw neuvers around as tremendous in	o provide room for vehicles to avoid statistics show the number of times y. They do not show the number of t n obstacle and still maintains contro vications for an AHS and requires fu	large objects of a vehicle strikes imes a driver I of the vehicle. Inther research.

PSA Database Summary Report - Items with Summaries 10/31/94 Total Pages 1

8.9 PSA Summary Report - Issues by System Impact

PSA Database Summary Report - Issues by System Impact

10/31/94

The Following Selection Criteria were chosen:

Vehicle System: All

Power Source: On-Board APS, RPEV

	ltem		Information					
Number	Туре	Risk	PSA Contract Team	Description	Researcher	Reference Document		
294	Conclusion	High	Calspan	RPEVs may be a Logical Starting-Point for AHS Implementation	J. Pierowicz	Final Report Volume VI 3.3		
416	Concern	Medium	Calspan	AHS vehicle equipment costs.	Cohen,Elias,Gordon	Final Report Volume VIII, Ch2		

PSA Database Summary Report - Issues by System Impact 10/31/94

8.10 PSA Summary Report - (System Impact) Items with Summaries

PSA Database Summary Report - Items with Summaries

10/31/94

The Following Selection Criteria were chosen:

System Function: Check-In

Infrastructure System: Roadway Sensors, Communications, Processors

Vehicle System: Electronics, RV Comm. Concept Impact: All

Database Item	<u>593</u> Ву:	Funke,Levine	From: <u>Calspar</u>	<u>1</u>
Item Type:	Conclusion	Risk: <u>High</u>	AvailableIn:	Final Report Volume II; 3.2.4.4.3
Description:	AHS design sho	ould consider per	sonal privacy iss	sues.
Summary:	There may be c and particularly movement of in- basis. AHS des concerns.	oncerns raised a the right to free, dividual vehicles signers should at	about AHS regard unmonitored mc , there could be i tempt to avoid do	ding its intrusion on personal privacy; ovement. If AHS tracks and records the individuals or groups who object on this esign approaches that raise these

PSA Database Summary Report - Issues by System Impact 10/31/94

8.11 PSA Database Calspan Team Summary Report - Issues by Task Origin with RSC Impacts

PSA Database Calspan Team Summary Report - Issues by Task Origin with RSC Impacts

10/31/94

Task Origin: Alternative Propulsion Systems Impact

	ltem		Information				
Number	Туре	Risk	RSC Impacts	Researcher	Description		
294	Conclusion	High	13	J. Pierowicz	RPEVs may be a Logical Starting-Point for		
					AHS Implementation		
287	Conclusion	Medium	13	Pierowicz, Mydzian	Ground-Up RPEV Designs		
285	Conclusion	Medium	13	Pierowicz, Mydzian	RPEV System for Lateral Control of AHS		
					Vehicles		
284	Conclusion	Low	13	Pierowicz, Mydzian	Roadway Powered Electric Vehicle		
					Implementation		

PSA Database Summary Report - Issues by Task with RSC Impacts10/31/94

8.12 PSA Database Calspan Team Summary Report

PSA Database Calspan Summary Report

10/31/94

Database Item	: <u>300</u>	By:	L. Parada	RSC Impacts:	ALL	
Task Origin:	AHS Sa	afety Iss	ues			
Item Type:	<u>Concer</u>	<u>n</u>	Risk: <u>Medium</u>	AvailableIn: <u>F</u> i	inal Report Volume V C2; 3.1, Appendix B	
Description:	AHS Im	pacts - Y	Vehicle Braking	Impairment		
Summary:	AHS m Vehicle system should breakde individu may lea	ust cons braking s failure be employen lane own lane ial RSC ad to this	ider vehicles imp systems should detection should oyed to avoid sy would be helpfu handling of this p failure mode.	baired by a partia be checked at a l prevent AHS er stems failure and l in alleviating tr problem. See Ap	al or complete loss of braking ability. biannual AHS inspection. Initial braking ngage. Redundant braking systems d loss of longitudinal control. A affic slowdowns. See table 2-10 for pendix B for brake components that	
Database Item	: <u>316</u>	By:	<u>L. Parada</u>	RSC Impacts:	ALL	
Task Origin:	<u>AHS Sa</u>	afety Issi	ues			
Item Type:	<u>Concer</u>	<u>n</u>	Risk: <u>Medium</u>	AvailableIn: <u>F</u> i	inal Report Volume V C2; 3.1, Appendix B	
Description:	AHS m	ust cons	ider system trac	tion degradation		
Summary:	AHS engagement is permitted unless conditions are extreme. Note that there is an increased accident potential and the system may adjust vehicle speeds and maneuvers to suit environmental conditions. This may cause a traffic slowdown.					
Database Item	: <u>324</u>	By:	L. Parada	RSC Impacts:	ALL	
Task Origin:	AHS Sa	afety Iss	ues			
Item Type:	<u>Concer</u>	<u>n</u>	Risk: <u>Medium</u>	AvailableIn: <u>F</u> i	inal Report Volume V C2; 3.1, Appendix B	
Description:	AHS m	ust cons	ider software bu	gs and their lat/lo	ong control impacts.	
Summary:	Control perform	system	outputs may be id increase collis	in error, which co ion potential	ould seriously degrade system	

PSA Database Calspan Summary Report

Page 1

8.13 PSA Issues / Risks Database Statistics Report

PSA Issues / Risks Database Statistics Report

11/2/94

As of 11/2/94 there are 599 Items in the PSA Issues / Risks Database

The number of items logged per PSA contract team is as follows:

PSA Contract Team	lssues	Risks	Concerns	Conclusions	Unknown	Total
Battelle	7	2	5	19	1	34
BDM	3	10	0	26	4	43
Calspan	60	25	90	151	2	328
DELCO	0	0	0	0	0	0
Honeywell	7	0	3	4	1	15
Martin Marietta	12	0	0	0	0	12
Northrup	5	1	3	0	0	9
PATH	6	2	10	13	5	36
Raytheon	24	8	7	33	0	72
Rockwell	4	1	5	1	2	13
SAIC	0	0	0	0	0	0
SRI	0	0	0	0	0	0
TASC	3	1	0	0	1	5
TRW	7	2	12	1	2	24
UC Davis	2	1	0	5	0	8
Total	140	53	135	253	18	599