

**AASHTO<sup>®</sup>ware**

**Year 2000 Readiness  
Statement**



**American Association of State  
Highway and Transportation Officials**

**October 1998**

AASHTOWare®

# Year 2000 Readiness Statement



**American Association of State  
Highway and Transportation Officials**

**October 1998**

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# Overview

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## Introduction

The Year 2000 issue is one of the great challenges facing the AASHTO member departments and private-sector firms today. To address this issue, AASHTO is pleased to provide its AASHTOWare® Year 2000 Readiness Statement, which is intended to assist you in assessing your Year 2000 needs.

AASHTO's assessment of its AASHTOWare products for Year 2000 readiness is an ongoing effort. The information provided in this statement may not be exhaustive and is subject to change. The reader is encouraged to look for updates to this document on the AASHTOWare web site, <http://www.aashtoware.org>.

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## Standards for the Year 2000 Issue

There is no general software standard for the Year 2000 issue. As a result, many organizations have developed their own set of criteria for defining Year 2000 conformity. The following two references are widely used as the standards for defining the Year 2000 issue:

- A Definition of Year 2000 Conformity Requirements, British Standards Institute, London, UK (DISC PD2000-1).
- IEEE Standard for Year 2000 Terminology, IEEE Computer Society (IEEE Std. 2000.1-1998).

In addition, a number of organizations, such as Software Engineering Institute at the Carnegie Mellon University, have developed comprehensive procedures designed to help organizations determine their readiness for the Year 2000.

AASHTO has utilized these resources in determining its AASHTOWare Year 2000 readiness definition and readiness status. We recommend that you explore these resources to determine the Year 2000 readiness of your organization.

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## Disclaimer

The descriptions in this document are provided for informational purposes only, and do not constitute a certification or warranty, express or implied, of any kind. AASHTO's obligations and responsibilities regarding its AASHTOWare products are governed solely by the agreements under which they are licensed. AASHTO

makes no representation or warranty as to, and this document does not address, the Year 2000 readiness of third-party hardware, firmware, software, services, protocols, data, interfaces to third-party systems, or user-customized functions or features that may be used with AASHTOWare products. For third-party software that AASHTO bundles with AASHTOWare products, the responsibility for Year 2000 readiness remains with the original publisher.

AASHTO is providing this information to help you understand and address your Year 2000 needs. You are solely responsible for meeting your Year 2000 needs and AASHTO does not guarantee your results.

# AASHTOWare and Year 2000

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## Introduction

AASHTO has undertaken and completed a review of its AASHTOWare products to ensure that your investment in AASHTOWare software continues to give you value to the year 2000 and beyond. A summary of results from this review is presented in this section. A detailed analysis of the Year 2000 issue for each AASHTOWare product is also provided as an appendix to this document.

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## Year 2000 Readiness Definition

AASHTOWare considers a product Year 2000 ready if the product's performance and functionality are unaffected by processing of dates prior to, during and after the Year 2000, but only if all products (for example hardware, software and firmware) used with the product properly exchange accurate date data with it.

In the case of non-AASHTOWare software, whether or not obtained from AASHTO, we recommend that you contact the third party product developer directly for information about Year 2000 readiness.

---

## Year 2000 Readiness Classifications

AASHTO has established the following Year 2000 readiness classifications to identify the status of each AASHTOWare product with respect to its Year 2000 readiness:

*Table 1 - AASHTOWare Year 2000 Readiness Classifications.*

<b>Classification</b>	<b>Description</b>
Ready	The product has been tested and meets the AASHTOWare Year 2000 readiness definition.
Ready with minor issues	The product has been tested and meets the AASHTOWare Year 2000 readiness definition with minor exceptions.
Not ready	The product has been tested and does not meet the AASHTOWare Year 2000 readiness definition.
Testing yet to be completed	Testing has not been completed or may not have been started.
Will not be tested	The product will not be tested for Year 2000 readiness.

Classification	Description
Not applicable	The product has been discontinued or has been replaced by another AASHTOWare product.

## Year 2000 Readiness Status

The Year 2000 readiness status of each AASHTOWare product is provided in Table 2. This Table is organized by product and module name (see the AASHTOWare Catalog for complete product information), the earliest release number that has been or will be fully tested to be Year 2000 ready with release or expected release date, current Year 2000 readiness status, and comment.

*Table 2. AASHTOWare Year 2000 Readiness Status.*

Product	Module	Release	Status	Comment
Trns•port	CES	Since inception	Ready	
	PES	4.0a – April 1997	Ready	
	LAS	4.0a – April 1997	Ready	
	CAS	4.0a – April 1997	Ready	
	BAMS/DSS	Since inception	Ready	
	Expedite	3.0a – February 1998	Ready	
	Estimator	Since inception	Ready	
	SiteManager	1.0 – May 1998	Ready	
BRIDGEWare	Opis	2.0 – March 1999	-	Release 2.0 of the product will be Year 2000 ready
	Virtis	1.0 – March 1997	Ready	
Pontis	-	3.2 – July 1997	Ready	
IGrds	-	97 – September 1997	Ready	
DARWin	-	2.01 – August 1994	Ready	
SDMS	-	3.4 – June 1999	-	Release 3.4 of the product will be Year 2000 ready
BDS	-	-	Will not be tested	Product will be sunset before Year 2000
DNPS86/PC	-	-	Not applicable	Product is no longer supported or maintained and has been replaced by the DARWin product
BRADD	-	-	Not applicable	Product is no longer supported or maintained and has been replaced by the BRIDGEWare product
BARS	-	-	Not applicable	Product is no longer supported or maintained and has been replaced by the BRIDGEWare product

AASHTO is committed to updating this table as new products are added or as the status of product changes.

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## Third-Party Software and Hardware

AASHTOWare products have dependencies on third party software. This includes, but is not limited to, database, database connectivity and operating system software. In addition, some AASHTOWare products, such as AASHTOWare SDMS, have hardware platform dependencies. Therefore, non-compliance in third party software and hardware may affect AASHTOWare products. AASHTO accepts no responsibility for losses incurred as a result of non-compliance, and/or expenses incurred to diagnose the source of non-compliance.

---

## Questions and Comments

If you are aware of any problems with the AASHTOWare products that we have described as Year 2000 ready, or if you have any questions or comments, please direct them to:

Jan M. Edwards, Project Director  
AASHTO  
444 N. Capitol Street N.W., Suite 249  
Washington, D.C. 20001  
(202) 624-8599  
Fax: (202) 624-5469  
E-mail: jedwards@ashto.org

To obtain a copy of this document, or to be automatically sent any major updates of this document, send your complete mailing address to:

Angelique Williams, Special Assistant Software Projects  
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Washington, D.C. 20001  
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E-mail: angelw@ashto.org

An electronic version of this document in Adobe Acrobat format can also be downloaded from our web site at <http://www.aashtoware.org/download>.

# Appendix

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## AASHTOWare Year 2000 Readiness Documentation

The details of each AASHTOWare product review for Year 2000 readiness have been documented in technical memorandums developed by the AASHTOWare software development contractors. These technical memorandums provide specific information on Year 2000 issues and resolutions with respect to each product. Following is a list of technical memorandums included in this appendix:

- AASHTO Trns•port family excluding SiteManager – Info Tech.
- AASHTO Trns•port SiteManager – MCI Systemhouse.
- BRIDGEWare family including Opis and Virtis – Michael Baker Jr., Inc.
- AASHTOWare Pontis – Cambridge Systematics, Inc.
- AASHTOWare IGrds – C. W. Beilfuss & Associates, Inc.
- AASHTOWare DARWin – ERES Consultants, Inc.
- AASHTOWare SDMS – Cambridge Systematics, Inc.

# info tech

The Information Technology Company

September 25, 1998

Ms. Jan M. Edwards  
Project Director  
American Association of State Highway  
and Transportation Officials  
444 North Capitol Street, NW, Suite 249  
Washington, DC 20001

Re: Year 2000 Compliance in AASHTO's Trns\*port™

Dear Ms. Edwards:

As we have discussed, the Trns\*port components in use at AASHTO member agencies are fully Year 2000 compliant, and all future releases will maintain this full compliance. The enclosed paper, *Trns\*port and the Year 2000 Challenge*, provides more detail on this topic, but please note the following:

1. All Trns\*port components are Year 2000 compliant through use of the base-date windowing method described in the enclosed paper or through the use of true dates for storage. The table that follows describes the timing for initial Year 2000 compliance for each component.

Trns*port Component	First Year 2000 Compliance	
	Release	Date
Expedite	3.0a	2/98
Estimator	Since inception	
CES	Since inception	
BAMS/DSS	Since inception	
PES, LAS, CAS	4.0a	4/97

2. After completion of the Batch Rewrite project, currently scheduled for June 30, 1999, the client/server version of the Trns\*port components listed above will be fully Year 2000 compliant through use of true dates throughout. Base date windowing will then be unnecessary in the client/server components.
3. Year 2000 compliance may be verified in these components by setting up a sample project for testing purposes and processing it through its full life cycle using the components of interest. We recommend that the project first be set up to start and end before January 1, 2000. A second and third run of the project then should be performed, first with a start date

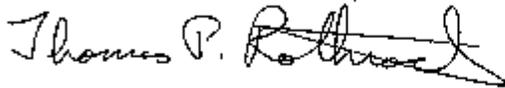
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E-mail: info@InfoTechFL.com

Year 2000 Compliance in AASHTO's *Transport*<sup>TM</sup>  
September 25, 1998  
Page 2

before January 1, 2000 and an end date after January 1, 2000, and then with start and end dates both after January 1, 2000.

I hope this provides the information you need. Please call if you have any questions about this letter or the enclosed paper.

Sincerely,

A handwritten signature in cursive script that reads "Thomas P. Rothrock". The signature is written in dark ink and is positioned above the typed name.

Thomas P. Rothrock, Ph.D.  
Senior Vice President

Enclosure

*AASHTO Transport Year 2000 Readiness Documentation (Continued)*

## Trns•port and the Year 2000 Challenge

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September, 1998

Info Tech, Inc.

### Overview

The year 2000 is fast approaching, and the need to plan for and address its handling by critical software systems is immediate. AASHTOWare software, including Trns•port and its related systems, is no exception to this rule.

This paper discusses the general issues surrounding the year 2000 challenge, how those issues specifically relate to the Trns•port systems maintained by Info Tech, and the manner in which those issues have been and are being addressed. As of July 1, 1997, all releases of Trns•port components (including Expedite and Estimator) were certified to function properly with year 2000 dates and beyond. This was achieved using a combination of *true dates* and *base-date windowing* as described below. Our current client/server project, scheduled for release in mid-1999, will provide *true date* compliance for all of the client/server components, and will address a minor defect in one of the software tools used by those components (see "Other Issues" later in this document.) Current and future compliance information for each component of Trns•port is provided below.

### General Issues

Although we may refer to it as the "year 2000 challenge" or the "year 2000 problem," the central feature of the problem facing software systems as the year 2000 approaches is the use of two digit years in date fields, whether for data entry and display, database storage, sorting, or interfaces between different systems. The "challenge" is to certify, and where necessary modify, Trns•port software to function properly when dates are used which span the year 2000; that is, to make the software "year 2000 compliant." The current releases of Trns•port all meet this requirement.

In this discussion, year 2000 compliance will be divided into two levels. True compliance, which is the eventual goal, requires 4 digit years to be used for all date fields in database storage, screen display and entry, and interfaces between systems. This level of compliance will be called *true date* compliance.

A lesser level of compliance, which can provide an adequate solution for a number of years, relies on the use of "base-date windowing" to properly interpret the century represented by 2 digit year values. For example, a base date of 70 might be chosen, and then all 2 digit year values that are 70 or greater will be presumed to be before the year 2000. All values less than 70 will be presumed to represent years from 2000 to 2069. This level of compliance will be called *base-date windowing* compliance.

Base-date windowing can work effectively as long as no dates need to be stored which span the years allowed by the base-date window. In the example above, this means that no years before 1970 or after 2069 could be represented in the system. As long as this criterion can be met, and as long as base dates are used correctly throughout, the system will work properly.

A combination of either true date or base-date windowing is currently in place for all Transport modules described in this document.

Areas of compliance include:

Database Support of "True Dates": To be compliant, the underlying data model for the system must store dates in a format which retains all four digits of the year.

Display/Entry of Years In Date Fields: Date fields should be able to display and allow the entry of four digit years. Minimally, date fields should use a base date which allows 2-digit years below a certain number to represent dates in the next century.

Sorting By Date In Reports and Lists: Reports and list windows (or scroll screens) which are sorted by a date field should properly order dates which span January 1, 2000.

Use of Dates in Calculations: It is especially important that when dates spanning the year 2000 are used in calculations (e.g., time intervals, regressions) a four digit year is used or a meaningful base date is used to determine the proper century for two-digit years.

Interfaces Between Systems: Even if an individual system is fully year 2000 compliant, it may need to exchange date information with other systems that are not fully compliant. Often this may require changes to both sides of the interface.

### ***Transport and Year 2000 Compliance***

This section discusses the areas in which the various Transport modules, versions, and subsystems currently support the year 2000 challenge, and the areas in which changes need to be made. We will see that a large degree of compliance already exists, simplifying the effort required in order for Transport to fully support dates spanning the turn of the century.

#### **Modules/Subsystems Discussed**

The level of current compliance will be discussed for the following areas:

- Expedite
- Estimator
- CES
- BAMS/DSS
- PES, LAS, CAS User Interfaces
- Mainframe User Interfaces
- Batch Programs

#### ***Expedite***

- Dates are stored as true dates in Expedite data files.
- Years are displayed and entered using only two digits. This has no effect on year 2000 compliance for Expedite.
- Two digit years are passed in the Expedite interfaces with other Trans\*port modules.
- A base date is used for conversion of dates entered into the system or passed through interfaces.

#### ***Estimator***

- Dates are stored as true dates in Estimator data files.
- Years are displayed using four digits and may be entered using either two or four digits. If only two digits are used for data entry, a base date is used to resolve the century.
- Two digit years are passed in the Estimator interfaces with other Trans\*port modules.
- A base date is used for interpreting the two-digit dates passed between Estimator and Trans\*port.

***CES (current OS/2 version)***

- Dates are stored as true dates in the CES database.
- Years are displayed using four digits and may be entered using either two or four digits. If only two digits are used for data entry, a base date is used to resolve the century.
- Two digit years are passed in the CES interfaces with the rest of the Trns·port modules.
- A base date is used for interpreting the two-digit dates passed between CES and the rest of Trns·port.

***CES (new client/server version, available Fall 1999)***

- Dates are stored as true dates in the database.
- An installation option controls how dates are entered and displayed, and the state may choose to require 4-digit year entry. The date will be displayed on the screen in the manner in which it was entered, but will always be stored as a true date. If only two digits are used for data entry, a base date is used to resolve the century.
- Two digit years are passed in the CES interfaces with the other Trns·port modules.
- A base date is used for interpreting the two-digit dates passed between CES and the rest of Trns·port.

***BAMS/DSS***

- Dates are stored as true dates in the DSS database, except for the VMS version. The VMS version stores DSS data in ISAM files, wherein date fields are character fields with only two digit years.
- Years are displayed and entered using only two digits.
- Two digit years are used in the interfaces from LAS, CAS, and SiteManager.
- A base date may be set using a SAS system option.

#### ***Client/Server PES/LAS/CAS User Interface***

- Dates are stored as true dates in the DBMS
- An installation option controls how dates are entered and displayed, and the state may choose to require 4 digit year entry. The date will be displayed on the screen in the manner in which it was entered, but will always be stored as a true date. If only two digits are used for data entry, a base date is used to resolve the century.
- Dates are passed to batch programs during job submission using two digit years with a base date used to resolve the century.

#### ***Mainframe User Interfaces (CICS/DB2 and VMS/ISAM)***

- Dates are stored as character strings using only two-digit year values.
- Dates are displayed and entered using only two digits.
- Dates are passed to batch programs during job submission using two digit years.
- Base dates are not implemented in the user interface, since dates only have computational effects in batch programs.

#### ***PES/LAS/CAS Batch Programs (Current)***

- All batch code supports two digit years in dates, even if the DBMS supports true dates (as in the Client/Server version).
- RTF currently supports only two digit year values.
- Several reports produce output that is sorted in two digit year order, namely the Contract Status Report, the Vendor Invoice, and the Securities Statement. For contracts and/or lettings which span or are near the year 2000, this may cause incorrect sort ordering of these reports.
- A base date is used wherever date arithmetic occurs.

#### ***Rewritten Client/Server CES/PES/LAS/CAS Batch Programs***

- The rewritten batch programs for the new client/server versions will support 4-digit years throughout, including in RTF templates. This version is scheduled to be available in mid to late 1999, depending upon the database platform chosen by the state.

### Summary of Current Compliance

The following table summarizes the above listings, showing the areas in which the Tms\*port modules and subsystems are currently year 2000 compliant. Check marks indicate that a particular set of software is compliant.

	Expedite	Estimator	CES	DSS	C/S P/L/C UI	M/F UI	Batch
Dates Stored As True Dates	✓	✓	✓	✓	✓		C/S
Years Displayed/Entered Using 4 Digits	Not Required	✓	✓		✓		
Interfaces Capable of Handling 4 Digit Years	Using Base Dates	N/A	Using Base Dates				
Base-date Capability	✓	✓	✓	✓	✓		
Reports Use 4 Digits							
Sorting Done Using 4 Digits	✓	✓	✓	✓	✓		

### Solution Options for Current PES/LAS/CAS Batch Processes

When the Tms\*port Task Force directed that Info Tech research the issues surrounding year 2000 compliance for Tms\*port, two main alternative approaches were identified. One alternative was to correct all of the existing software so that it stores data, allows entry of data, and passes data between modules using four digit years throughout. This alternative would have required numerous changes to the Tms\*port databases for PES, LAS, and CAS. Database changes are significant in scope, as they require changes to system metadata, screens and windows, report layouts, documentation, internal record layouts in batch programs, and supporting software such as the Database Interface Services and RTF. Database conversion programs would also need to be provided. Due to the cumulative scope of all of these changes, this approach was not recommended for the immediate term. It was determined that a full solution would be more efficiently accomplished in the context of the client/server Batch Rewrite project (currently underway.)

The chosen alternative was to retain two digit years in date fields in the batch and the mainframe user interfaces, but implement comprehensive use of base-date windowing to ensure that calculations are performed correctly (e.g., interval calculations in the Voucher and Bid-Based pricing processes.) In general, this would not require database, screen, or report modifications, and so would be a much smaller effort. In addition to reducing costs, this had the advantage of allowing a workable solution to be provided in a much more timely manner, and this work was in fact completed by the Fall of 1997.

This second alternative does have certain limitations which should be made clear. One limitation is that all dates stored in all modules must fall within the 100 year window provided (e.g., all dates must be after 1970 and before 2069.) This is not expected to be a problem during the few years in which this interim solution is in effect.

Another limitation is that years will still be displayed on screens and reports using only two digits, which is not strictly ANSI year 2000 compliant. This should not pose any practical problems however, given that users can properly discriminate the century intended by a given two-digit year.

Finally, the reports mentioned above that are sorted by a date field (the Contract Status Report, the Vendor Invoice, and the Securities Statement) may in some cases sort in the incorrect order on mainframe platforms. This should be a relatively minor limitation, since it can be easily spotted and accounted for by the person viewing the report, and will only occur during a limited time right around the year 2000 on the mainframe platforms.

### **Other Issues**

There are several other issues relating to the year 2000 challenge that are not strictly under the control of Trns-port itself. Briefly, these are the following:

- **Hardware Support:** The processors and low-level system software, such as the BIOS, must be able to handle the year 2000 transition.
- **Software Tool Support:** Third party software tools that are used in Trns-port, such as SAS, PowerBuilder, DB2, Oracle, Windows, DOS and other operating systems, must be able to handle true dates.

For example, the version of PowerBuilder used by the current releases of client/server Trns-port PES, LAS, CAS, and BAMS/DSS has a minor bug that causes it to recognize the years 2002, 2006, etc. as leap years instead of the correct years 2000, 2004, etc. This defect has been corrected in PowerBuilder version 6, which will be used for all 1999 releases of those modules, as well as the new version of CES.

- **Embedding of 2-Digit Years in Non-Date Fields:** Often, a state might embed a two-digit year value in a non-date field, such as a contract number. This is an issue that is beyond the scope of Trns-port, but should be planned for. Of course, this problem will not cause serious software failures, but instead causes "nuisance" problems in areas such as report sorting.
- **Exports to Non-AASHTOWare Systems (e.g., accounting interfaces):** These export programs will continue to pass two-digit year values. The downstream system may need to be modified to interpret these correctly.

- **Report Output Used As Input to Other Programs:** In some cases, such as proposal preparation, a Transport report file might be used as input into another automated process. If the report file contains two-digit year values, these will need to be interpreted correctly by that process.

### **Summary**

To summarize the main points about Transport and the Year 2000 Challenge:

- All systems currently will work using the base-date windowing method described. This was implemented during the 1996-1997 AASHTO year.
- After Batch Rewrite, the client/server systems will be fully Year 2000 Compliant.



MCI Systemhouse Corp.  
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Atlanta, GA, U.S.A. 30339  
Telephone 770-433-2907  
Fax 770-433-2689  
<http://www.shl.com>

January 27th, 1997

Mr. Jeff Hisem  
Estimating Project Engineer, Tms•port™ Task Force Chairperson  
Ohio Department of Transportation  
25 South Front Street  
Columbus, Ohio 43216

Dear Jeff:

The following documents the approach for date format and storage within the AASHTO Tms•port™ SiteManager™.

SiteManager™ has an installation option which allows participants to identify the format for entry and displaying of dates on SiteManager™ windows and reports. The options are described as follows:

	<u>Option 1 (US)</u>	<u>Option 2 (Canadian)</u>
Window Entry/Display	mm/dd/yy	dd/mm/yy
Reports Display	mm/dd/yyyy	dd/mm/yyyy

Regardless of the display option chosen, the physical format of the date stored on the SiteManager™ database will be numeric as CCYYMMDD.

When dates are entered into SiteManager™, they are validated through a common routine. If the date passes the validation edits, it is then formatted in the ANSI format and stored on the database as CCYYMMDD. An algorithm is used such that if the YY entered is greater than 50, "19" will be stored as the century. If the YY entered is 50 or less, "20" will be stored as the century. The following provides examples of these situations (using the US option format):

<u>User Entered on SiteManager™ Window</u>	<u>Stored in SiteManager™ Database</u>
12/31/97	19971231
12/31/00	20001231

A current version of the SiteManager™ Physical Database is available on Lotus Notes for participants to verify the physical format of dates which will be stored on the SiteManager™ database tables. This information is stored in the "General Project Documentation" database forum in Lotus Notes under the category of "Physical Database Report".



Interface and conversion programs which transfer data from the Trns·port™ PES, LAS and CAS modules have been developed to provide the same algorithm as above. The extract program to transfer data to the Trns·port™ DSS module will also provide an algorithm to convert SiteManager™ formatted dates to the date format in DSS.

I hope this provides you with sufficient information. If you have any questions or require additional details, please contact me at (770) 433-5604.

Sincerely,

A handwritten signature in cursive script that reads "Monelle McKay".

Monelle McKay  
Project Manager, MCI Systemhouse

**Baker**

July 21, 1998

Mr. Kurt Johnson, Virtis/Opis Project Manager  
American Association of State Highway and Transportation Officials  
444 North Capitol Street NW  
Suite 249  
Washington, DC 20001

**Michael Baker Jr., Inc.**

*A Unit of Michael Baker Corporation*

P.O. Box 12259  
Pittsburgh, PA 15231-0259

(412) 269-4600  
FAX (412) 269-7915

*Office Location:*  
Airport Office Park, Building 9  
420 Rouser Road  
Coraopolis, PA 15108

RE: Year 2000 Certification

Dear Mr. Johnson:

We have reviewed your request regarding Year 2000 compliance of Virtis and Opis and offer the following response.

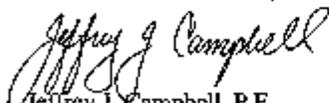
Virtis version 1.0 was delivered on March 7, 1997 and as of that time is Year 2000 compliant. Version 2.0 of Virtis and Opis are scheduled for delivery in the first quarter of 1999. The design of the AASHTOWare database and all software being developed according to our Work Plan is Year 2000 compliant. The two relational database management systems supported by Virtis/Opis, Oracle 7.3 and Sybase SQLAnywhere version 5.5 are also compliant.

Compliance can be verified by changing the date on the PC to a day in the year 2000 and running Virtis/Opis to perform an analysis or rating. The analysis process creates a new event with a timestamp. The timestamp will contain a 4-digit year.

If you have any further questions please call me at 412-269-7948.

Sincerely yours,

MICHAEL BAKER JR., INC.



Jeffrey J. Campbell, P.E.  
Engineering Manager

JJC/jad



*BRIDGEWare including Opis and Virtis Year 2000 Readiness Documentation*



August 27, 1998

Mr. Kurt Johnson  
Pontis Project Manager  
American Association of State Highway and Transportation Officials  
444 North Capitol Street NW  
Suite 249  
Washington, DC 20001

Re: Pontis Year 2000 Compliance

Dear Mr. Johnson:

This letter is written to confirm that Pontis™ is Year 2000 compliant. All dates stored in Pontis databases within the supported database types, namely Oracle, Sybase SQL Anywhere and Microsoft Access, are fully qualified with a century, and will properly process and utilize dates beyond December 31, 1999.

Pontis became Year 2000 compliant with the release of Pontis Version 3.2 in July 1997. No new version, release or upgrade patch is required to achieve Year 2000 compliance.

If Pontis users wish to test Pontis for Year 2000 compliance, we would recommend that they use the Defense Information Systems Agency (DISA) Year 2000 Testing Guideline, dated December 1997. Specifically, Appendix D of the guideline includes a Year 2000 system compliance checklist, and Appendix E of the guideline includes Year 2000 test dates.

Please feel free to contact me if you have any further questions.

Sincerely,

CAMBRIDGE SYSTEMATICS, INC.

Allen R. Marshall  
Principal

ARM/wer/6758

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December 16, 1997

Mr. Dan Bubler  
IGrds Task Force Chairman  
Manitoba Department of Highways and  
Transportation  
12 - 215 Garry Street  
Winnipeg, Manitoba  
Canada R3C 3Z1

Subject: Year 2000 Compliance for IGrds

Dear Dan:

This letter concerns Year 2000 issues as they relate to IGrds to insure that the product will be compliant. The IGrds product includes all components such as the IG and AN Options, along with IGapps, Limits of Construction, and the CAiCE DTM module provided by AGA Computer Services. Additionally, it is assumed that the product will exist on all current platforms: Windows NT, Windows 95, HP/UX and Sun Solaris.

Compliance Issues and Compliance:

Compliance issues revolve around areas where date information is used by the System. Areas where dates need to be addressed are the following:

- Operating system
- MicroStation CAD environment
- Development tools (all platforms)
- IGrds computational process (includes all AASHTO owned modules)
- IGrds security devices (hardware lock)
- CAiCE DTM module shipped with IGrds

With regard to operating systems, it is assumed that Year 2000 issues will be appropriately addressed by the respective vendors. This holds true for the MicroStation CAD environment and the various development tools used by IGrds on all platforms. Beyond the fact that it is assumed that each of these components will function in a Year 2000 transition environment, impact issues regarding IGrds are date handling methodologies and functions. Dates currently may be handled by these systems as two

Mr. Dan Buhler  
IGrds Task Force Chairman

December 16, 1997  
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digit or four digit numbers. IGrds accesses date information through function calls provided by the various development tools (i.e., C/FORTRAN functions and MDL functions) which ultimately rely on basic system calls. Any adaptations made by these vendors to date function calls will be addressed by IGrds in an appropriate manner, thus insuring IGrds compliance.

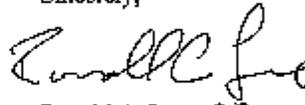
Within IGrds itself (i.e., all AASHTO owned components), dates are used for reporting purposes only. There are no computations which involve date information. IGrds will be fully compliant with Year 2000 issues.

Security devices now in use by IGrds hold date information in four digit form. The security devices will be compliant with Year 2000.

The CAiCE DTM module is owned by a third party vendor, AGA Computer Services. Compliance issues for the DTM module need to be certified by AGA.

Given the information stated above, we feel IGrds will fully address Year 2000 compliance issues. If you have any questions or comments, please feel free to call.

Sincerely,



Ronald A. Love, P.E.  
Project Manager

May 1, 1997

Mr. Norman Clark  
Kansas Department of Transportation  
Materials and Research Center  
2300 Van Buren Street  
Topeka, KS 66611

Re: Year 2000 Compliance for DARWin 3.0 and DARWin 2.01

Dear Mr. Clark:

The purpose of this letter is to ensure that DARWin 3.0 and DARWin 2.01 meet the Year 2000 AASHTOWare Compliance Issues with respect to its application and operating system. A brief description of the issues and a detailed explanation of DARWin compliance are presented.

#### Year 2000 Compliance Issues

Because personal computers use a "shorthand" date of two-digit year representation, the upcoming turn of the century could potentially cause difficulty. The problem incurred involves the comparison of two dates. If both dates are within the same century, the two-digit representation does not present any problems. For example, the difference between 1996 and 1990 is the same as the difference between 96 and 90, which is 6 years. If the dates are not within the same century, however, the difference is not reliably accurate. The years 2006 and 1990 become 06 and 90 in two-digit representation, a difference of -84 (or 84), when the computed value should be 16 years.

Obviously, a two-digit representation is inadequate. The most obvious solution is to use the full four-digit representation for year descriptions. However, data derived from two-digit representations are meaningless unless "19" is the assumed prefix or the data are manually corrected.

#### DARWin 3.0 and DARWin 2.01 Compliance

In DARWin 2.01, time in year is represented as an interval in years (i.e., initial construction is assumed to be year 0, and other activities are assigned a year from the time of initial construction. Therefore, DARWin 2.01 will be year 2000 compliant since it does not rely on either a two-digit or four-digit date format.

In DARWin 3.0, the Year 2000 Compliance Issue is addressed fully by using the four-digit year. There are two specific areas in which the four-digit year is implemented within DARWin 3.0.

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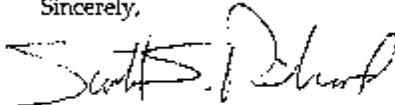
One area is the Life Cycle Cost Analysis module. In DARWin 3.0, this information is stored as a four-digit year to correctly identify the year in which the pay item costs were used. Also, importing these data from previous DARWin releases assumes that the starting point of the interval (year of initial construction) is the current year (year of data import). This assumption allows correct calculation of the project life cycle cost while providing the ability to identify the appropriate year of construction, maintenance, and rehabilitation for all future life cycle cost analysis projects.

In DARWin 3.0, the software piracy protection device is another area in which year codes are used. The devices that are used for DARWin 3.0 provide the option to use a four-digit year to identify the DARWin 3.0 evaluation software license termination date. Therefore, the design for the implementation of this device fully addresses the Year 2000 Compliance Issue.

#### Assessment Document

To better assess the Year 2000 Compliance Issue, ERES completed the 17-page *Century Date Change Assessment Document* developed for the Commonwealth of Virginia. The document is designed to uncover any problem areas with respect to the turn of the century. No problem areas were identified as a result of completing this document, thus reconfirming our belief that DARWin 3.0 and DARWin 2.01 fully address the Year 2000 Compliance Issue.

Sincerely,



Scott S. Pickard  
President and CEO

xc: Riaz Ahmad, AASHTO



September 1, 1998

Ms. Jan Edwards  
Project Director  
American Association of State Highway and Transportation Officials  
444 North Capitol Street N.W., Suite 249  
Washington, D.C. 20001

Subject: AASHTOWare Survey Data Management System (SDMS) Year 2000 Compliance

Dear Ms. Edwards:

This letter provides information on AASHTOWare SDMS Year 2000 compliance issues. The SDMS product is based on the AASHTO Survey Data Management System Data Structure Technical Guide and operates on a variety of handheld data collectors and personal computers. The software can be used for stand-alone data collection or in combination with total station surveying instruments.

In SDMS release 3.3, the date is not recorded in Year 2000 compliant format. This is attributed to the ROM based operating systems used in many handheld data collection devices. In addition the date format specified in the AASHTO Survey Data Management System Data Structure Technical Guide, published in September 1991, is not Year 2000 compliant. Following is a brief description of SDMS data items that are not Year 2000 compliant.

- **Date (DT):** The date data item records the date of a survey task or activity. In SDMS software the date and time information are obtained from the operating system of the data collection device. All currently supported SDMS data collection devices (except personal computers) cannot provide Year 2000 compliant date information.
- **Close Project (CP):** The close project data item is a data field that indicates where and when a project ended. This data item is automatically added to the SDMS project file whenever an SDMS project is closed and the data field contains both date and time information.
- **Suspend Project (SP):** The suspend project data item is a data field that indicates where and when a project was suspended. This data item is automatically added to the SDMS project file whenever an SDMS project is suspended and the data field contains both date and time information.

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Ms. Jan Edwards  
September 1, 1998  
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It should be noted that date data items are not used in any SDMS computation. Therefore, the format of date data is not critical for the proper functioning of the SDMS software. The main reason for making the DT, CP, and SP data fields Year 2000 compliant is due to concerns that other software that reads the SDMS data files may have problems if the SDMS dates are not Year 2000 compliant.

In SDMS release 3.4, currently under development, the Year 2000 compliance issues will be addressed fully by soft converting the date information obtained from the operating system of the data collection device to a Year 2000 compliant format. In addition, SDMS release 3.4 will convert any date fields as it reads in SDMS data files collected by previous releases of the software. The SDMS release 3.4 is expected to be available in early 1999.

A revised version of the AASHTO SDMS Data Structure Technical Guide will also be available to SDMS users and third-party software developers. This revised Technical Guide will provide specifications on Year 2000 compliant date format necessary to process SDMS data using commercial infrastructure modeling and design products.

If you have questions or need additional information of SDMS Year 2000 compliance, please call SDMS Task Force chairman, Gene Hafermann at (608) 266-0112 or the Cambridge Systematics project manager, Rob Hranac at (510) 873-8700.

Sincerely,

CAMBRIDGE SYSTEMATICS, INC.

  
Hyun-A Park  
Principal

