

# WisDOT Design Software Transition

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### Methods Development

- The team's primary responsibility is statewide support of computer-aided engineering (CAE) software for WisDOT.
- Software supported includes Microstation, CAiCE, AutoTurn, and CAEPlot.
- Business areas supported
  - Survey (contact primarily with Gene Hafermann and Cindy McCallum)
  - Design, right of way plats, and construction (contact with CAE advisory group, CADDs standards group, R/W plat users group, and ACEC)
- Functions supported
  - End-user support and training for WisDOT staff
  - Software management and customization
  - Supplying resource files for WisDOT and consultant use

### CAiCE Replacement Project History

- CAiCE is WisDOT's engineering design and survey software.
- Late 2003 - Autodesk announced they would no longer continue developing CAiCE. They were focusing their efforts on their new Civil 3D product which would replace CAiCE. Methods Development staff decided not to evaluate new software products as we could maintain CAiCE until another operating system change (post Windows XP).
- 2005 - Methods Development staff started a project plan for replacing CAiCE.

### CAiCE Replacement Project History (continued)

- 2006 – Methods Development learned and used Bentley's InRoads and Autodesk's Civil 3D products on WisDOT project data and documented costs and benefits of each system.
- March 2007 - WisDOT workflow with both products was demonstrated to region staff. Civil 3D was chosen as the replacement for CAiCE.
- February 2008 – After many levels of approvals, contract for professional services and software licenses is let. Implementation of Civil 3D can proceed.

## Factors in choosing Civil 3D

In comparing Civil 3D and InRoads, the Evaluation Team used a software evaluation criteria table from the Gartner Group to ensure they evaluated all the appropriate criteria and gave each criterion the proper level of importance. The Gartner Group is the world's leading information technology research and advisory company. A summary of the evaluation criteria is as follows:

- Functionality – 30%
- Investment – 20%
- Services – 15%
- Viability – 15%
- Technical Architecture – 10%
- Vision – 10%

### Factors in choosing Civil 3D (continued)

Using this criteria yielded the following:

- Civil 3D ranked higher than InRoads in the two most important criteria of Functionality and Investment.
- Civil 3D surpassed InRoads on 60% of the evaluation criteria; Functionality, Investment, and Vision.
- Civil 3D was equivalent to InRoads on the remaining 40% of the criteria; Services, Viability, and Technical Architecture.

### Factors in choosing Civil 3D (continued)

Observations made by the Evaluation Team that were confirmed by user groups:

- Civil 3D is the clear cut choice from a user's perspective.
- Existing CAiCE users will adapt to Civil 3D quicker and more easily than InRoads.
- The Civil 3D user-interface is superior to the InRoads user-interface.
- For users with a CAiCE background the Civil 3D roadway design workflow is vastly superior to InRoads.
- Civil 3D was completely rewritten to efficiently and effectively combine CAiCE and other Autodesk software(s). InRoads has evolved over time.

### Factors in choosing Civil 3D (continued)

Observations (continued):

- Civil 3D offers a roadway design workflow that makes it easier for our designers to adhere to WisDOT design standards.
- Civil 3D fits the ultimate workflow concepts better.
- Infrequent design software users will be able to effectively design more easily in Civil 3D.
- Civil 3D is a better organizational fit and Methods Development can support Civil 3D better.

Note: Comparison was between Microstation/CAiCE and Microstation/Civil 3D workflows.

## General workflow concepts/improvements to be implemented

- A complete Civil 3D workflow will be implemented and will eliminate issues with multi-software workflows (file transfers, user support and training, communication). Other supported workflows will be CAiCE/Microstation and Civil 3D/Microstation.
- Project data management will be improved with Vault. Vault is a database system that manages and facilitates the use, ownership, and editing of all survey, design, and right-of-way files and plan sheets across functions and locations.
- Sheet set manager will provide simple management and plotting of sheets.

## Design workflow concepts/improvements to be implemented

- Meaningful relationships between parent and child objects will reduce workload. Example: An alignment change triggers a change in stationing, design surface, plan sheets, cross-section sheets, and earthwork quantities.
- Computer Aided Drafting commands will replace many current coordinate geometry commands.
- Ability to use native GIS data files (parcels, wetlands, soils, local roads, aerial imagery) in new design system. Design functions will be available earlier into corridor and impact analysis functions.
- A hydrological and hydraulic analysis package is included with Civil 3D. Autodesk acquired Intellisolve (Hydraflow).

## Potential design workflow improvements due to 3D model approach

The initial product of design is a 3D surface.

- Cross sections and quantity sheets are by-products.
- Earthwork calculations can be by end area or surface-to-surface based.
- Civil 3D is more capable of designing complex 3D design situations like: roundabouts, cul-de-sacs, intersections, and interchange ramps.
- Surfaces that are ready for machine control grading operations will be easier to produce.

## Civil 3D implementation = next phase of CAiCE replacement

Completed Items:

- All levels of project approval in WisDOT have been obtained.
- A contract with Autodesk for software licenses and professional services has been signed.
- Methods Development will soon complete Autodesk training curriculum for Civil 3D.
- An IT project has been approved for implementation of new IT infrastructure.
- Project kickoff meeting with IT and Autodesk was conducted on February 20, 2008.

## Civil 3D implementation current and future tasks

- Methods Development will continue to use the process presented to region staff. The team will develop and refine workflow models (people applying the software to WisDOT business needs) for survey, design, plan development, and right of way plats.
- These workflows will be reviewed by Autodesk for best practices and improvements.
- Methods Development will identify gaps (where the software cannot do the work) and work with Autodesk to solve them.
- Methods development will create the items necessary to implement workflows.
  - CADD standards, reports, custom tools, design items, IT infrastructure model, training material

## Civil 3D implementation (continued)

- Once the entire system is at a mostly complete state, Methods Development will present progress to impacted staff for feedback on the project progress (internal gap analysis).
- Methods development is currently aiming for a fall 2008 implementation which will include:
  - All hardware, software, standards, and customizations complete to accomplish workflows
  - Recommendations defined for good candidate projects and staff to convert existing design projects to Civil 3D
  - Introduction training material ready for delivery
  - Software ready for deployment
  - WisDOT state package to be included in Civil 3D for public use

## Civil 3D transition issues

- In May 2008, Methods Development will decide whether or not implementation should be delayed from fall 2008.
- Before implementation occurs, Methods Development will contact region offices regarding:
  - Qualities of a good early-adopter designer
  - Qualities of new projects that are good for starting on Civil 3D
  - Qualities of existing projects that are good for converting to Civil 3D
  - Coordinating the staff, projects, training, and timelines for successful implementation
  - Impacts of the three potential design/plan production workflows (CAiCE/Microstation, Civil 3D/Microstation, all Civil3D)

## Civil 3D transition issues (continued)

- Production rate on new Civil 3D projects may be lower than current expectations.
- Support network will be much thinner than current CAiCE support network until local staff become experienced.
- Methods development will continue to provide the training, tools, and support necessary for efficient computer-aided engineering.

## Questions/Discussion

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