IRIS ATMS
GPL Software

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Presentation Outline

- Overview of IRIS Freeway Management System Control Software
- Reasons for sharing IRIS
- Reason for General Public License approach
- Current status
- Vision
IRIS Overview

- IRIS development began with in-house staff starting in the late 1990s:
  - In preparation for moving to the new center
  - To comply with NTCIP standards
  - To support the increased number of field devices
  - To eliminate significant software costs of ongoing licensing and upgrades of the operating system and programs by using open source software
  - To take advantage of the lower cost of required computer hardware resources
IRIS Capabilities (MnDOT)

- Operating 500 mile Twin Cities Freeway Management System
- Dynamic Message Signs (150): monitor & control (incidents, travel times and Amber Alerts)
- Traffic detectors (5500): monitor & archive
- Ramp meters (425): monitor & central control
- Cameras (550): monitor & control
- Incidents: monitor & display
- Lane Control Signals (315): monitor & control
- Delivery of traffic data to MnPass HOT lanes
- Mapping: the above are placed on an interactive map graphical user interface
IRIS Software Integrated Features

- GIS Based Mapping
- Graphical User Interface
- Intuitive Menus and eHelp Screens
- Roadway Congestion/Speed Monitoring
- Color Coded Congestion Maps
- Travel Time Calculations
- Analog Video Switch and Camera Control
- Digitized Video Feed and USB Joystick for Camera Control
- DMS Control
- Ramp Metering Control and Configuration
- User Definable Parameters
- Signal System Detector Data
- NTCIP and Serial Communication Protocols
- Device Maintenance/Work Order Module
- Extensive Reporting Facility
IRIS Development & Ownership

- Developed entirely by MnDOT staff

- Utilizes General Public License (GPL) operating system (Linux)

- Utilizes General Public License (GPL) open source utility software

- Clients can be Linux or Windows
Dynamic Message Signs
Traffic Detection and Monitoring
Feeds Data to Traffic Flow Map
Ramp Metering
Cameras

- PTZ control via joystick or on-screen
Incidents
Lane Control Signals
IRIS Roadway Network Builder
Reasons for Sharing IRIS

- IRIS is reliable and well developed traffic management / traveler information software
- Other states have requested IRIS
- Increase number of software developers familiar with IRIS (lower risks)
- Share costs of ongoing developments and enhancements
- Speed development of new features
- Increased number of field devices supported
- Benefit from outside perspective and ideas on development
Software License Options Considered

- **Proprietary:** Circulation for use, but not for modifying/enhancing

- **Public Domain** No control over the future

- **GPL:** Liberties of open circulation (not price)
  - freedom to run
  - freedom to study
  - freedom to improve
  - freedom to redistribute
GPL Software License Selected

- **GPL (General Public License)**
  - Not Public Domain
  - Copyrighted
  - Copylefted (preserves freedoms in all later releases)
  - Typically an ongoing act of verifying any changes
Open Source Software

- Source code is available to everyone
- Source code from all ‘derivative works’ also must be available to everyone
- Shared cooperative development of IRIS
- Build a community familiar with IRIS
- Zero licensing costs (initial or ongoing)
- Leverage development expertise from many agencies
Caltrans contracted with the Advanced Highway Maintenance & Construction Technology (AHMCT) Research Center at the University of California, Davis, to evaluate the feasibility of implementing IRIS.

IRIS has been deployed in District 10. Continuing to expand to 3 other districts.
Status of IRIS Sharing – Other DOTs

- WisDOT
  - Contracted with Kimley-Horn to assess the feasibility of implementing IRIS for their statewide TMC in Milwaukee
  - Set up a test IRIS server for evaluation

- Wyoming DOT
  - Set up a test IRIS server for evaluation

- Other Interest
  - Illinois
  - Tennessee
  - Colorado
The Vision

- MnDOT has released IRIS as GPL
- MnDOT invites other agencies to implement IRIS and share in continued development
- Create an IRIS Group consisting of agencies implementing IRIS
  - Identify future features and lead agency for each feature
  - Develop mechanism for developers to ask questions, share ideas, etc.
  - The number of software programmers familiar with IRIS will significantly increase to the benefit of all
Current IRIS Resources

- [http://iris.dot.state.mn.us](http://iris.dot.state.mn.us)
- [http://www.selenic.com/mercurial](http://www.selenic.com/mercurial)
- [http://ahmct.ucdavis.edu](http://ahmct.ucdavis.edu)
Questions