



WisDOT InterCAD Data Exchange Guidelines

Wisconsin Traffic Operations and Safety Laboratory

This document highlights the key considerations for integrating county and other agency CAD incident data into the WisTransPortal InterCAD system. It is not intended as a strict set of requirements; rather it provides a set of guidelines for agencies that wish to maximize the level of automation and interoperability with the WisDOT Statewide Traffic Operations Center. Specific references to the Wisconsin State Patrol (WSP) CAD XML feed are provided to illustrate an existing process.

Architecturally, the WisTransPortal InterCAD system has three main components:

1. An agency facing interface which consumes real-time agency CAD incident data.
2. An XML transform engine which translates agency incident data into IEEE 1512 standard message sets.
3. A web service component which routes the resulting IEEE 1512 XML incident data to the STOC.

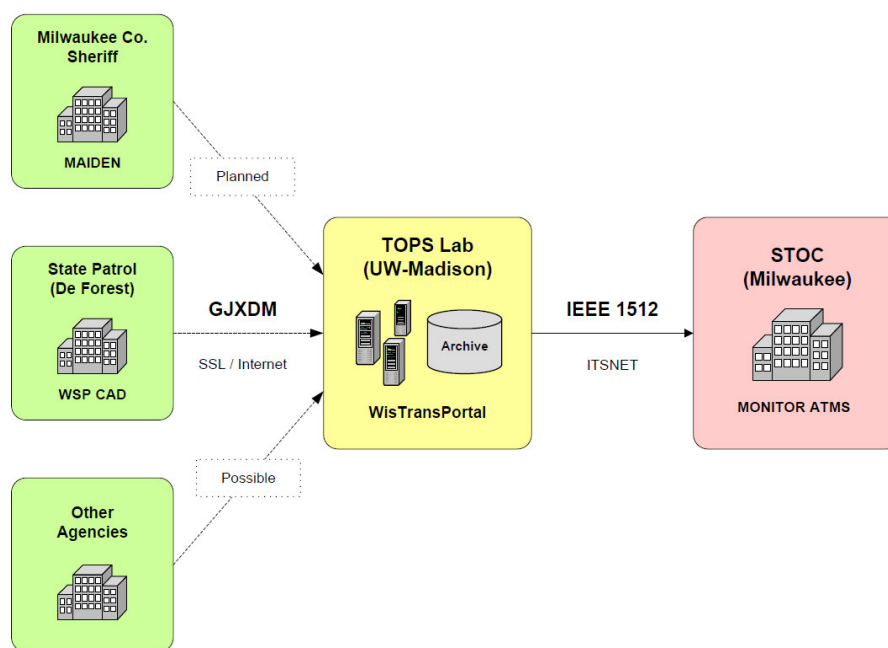


Figure 1. InterCAD Data Flow Architecture

The integration considerations can be broken into two main categories related to technical considerations (data format, transmission protocol, error handling) and data availability considerations (location elements, traffic impact, incident status information).

Technical Considerations

The main technical considerations relate to the agency facing interface. A certain amount of customization at this layer is expected and, in particular, the InterCAD

architecture is designed to accommodate a range of agency data formats and transmission methods. Specifically:

1. **XML Format:** The InterCAD system works internally as an XML transform engine that translates between agency specific XML data and IEEE 1512 XML format. As such, the transform engine requires a valid XML source. The specific translation details are expected to vary by agency. The WSP CAD system generates XML in the Global Justice (GJXDM) format, which appears to be gaining wide acceptance in the public safety community. NIEM is another emerging standard that includes GJXDM as a subset.
2. **Agency Push:** The data transmission mechanism is designed for agency CAD systems to “push” incident data to InterCAD. That is, InterCAD listens for data that is sent to the agency facing interface and does not actively pull data from the agency system. WSP uploads its CAD XML over a secure internet connection using HTTP/SSL. Other possibilities include a web service interface and/or use of the WisDOT fiber.
3. **System Monitoring:** Data transmission monitoring, error handling, and recovery may require customization to the agency CAD system and/or separate IT development. In the WSP case, an in-house program was developed to upload the WSP CAD XML to InterCAD since the CAD system itself simply writes the XML onto a local file server. Depending on the transmission method and capabilities for error handling, feedback mechanisms can be built into the InterCAD agency interface to provide transmission status, etc.

Data Availability

The InterCAD IEEE 1512 XML feed is structured around six main traffic incident data elements that are used in the STOC control room. These categories represent an ideal situation – many CAD systems may not have some (or many) of these data elements or any easy way to map existing CAD elements into these categories. The 1512 XML itself can accommodate a much smaller subset.

1. *Agency Incident ID:* the unique ID for a traffic incident from the agency CAD system. This ID should persist over the lifetime of the incident, and is used to tie together multiple updates of the same incident. It is also used as a reference if STOC operators need to contact the reporting agency.
2. *Incident Type:* the CAD code describing the incident. The use of standard incident codes becomes increasingly important as additional agencies connect to InterCAD and exchange incident data. The InterCAD system currently implements the ITIS “Accidents and Incidents” enumeration list which includes over forty incident event category classifications. In addition, all WSP CAD codes are included as locally defined enumerations in the existing InterCAD XML schema. Ideally, agency incident types can be mapped to an existing code.
3. *Incident Location:* Standardized incident location information is critical for interoperability between systems. Although STOC operators have the ability to manually place incidents on the map, the following elements are considered basic to support an automated process: *county*, *highway name*, *highway direction*, and *coordinate information (longitude / latitude)*. To manually place an incident, a recognizable landmark or milepost may be sufficient in place of coordinate information.

4. *Incident Description*: this includes any narrative information and/or comments about an incident that are relevant to traffic operations.
5. *Lanes Affected*: The traffic impact of an incident, indicated by the number of lanes affected (e.g., single lane closed, full-freeway closure, etc.).
6. *Incident Status*: In addition to basic descriptive elements, incident status information such as time of arrival on-scene and incident clearance time is important. The InterCAD system is designed to handle multiple updates per incident. The basic requirement is for agency incident messages to include a unique incident ID that persists over the duration of the incident.

Some additional agency-specific data elements are also included in the XML for future use but are not fully integrated into the STOC event manager software at this time.

Other Considerations

1. **XML Filtering**: In general, data in the source agency XML that is not related to traffic operations, such as witness information and driver records, is excluded from the 1512 XML by the transform process. The following considerations relate to the handling of sensitive information within InterCAD:
 - The InterCAD system filters traffic incidents by incident type and only transmits traffic related messages (crashes, road-debris, etc.) to the STOC. This is primarily to limit the amount of data presented to the STOC operators on the control room event manager interface. WSP may also limit the transmission of some messages within their CAD system based on incident type.
 - WSP CAD excludes dispatch operator comments by default. Operators must include a particular keystroke to transmit a comment message to InterCAD. However, every incident report includes a basic narrative description.
 - Witness and other sensitive information that is coded in specific XML fields is generally ignored by InterCAD. However the system does not have the ability to automatically exclude sensitive information that may be included in a larger narrative description.
 - InterCAD maintains an archive database of traffic incidents. In general, the archive contains records for all incident reports received, regardless of whether a message was transmitted to the STOC. This database is limited to the traffic operations data elements above, i.e., it is based on the 1512 XML message rather than the agency source data. The system, which is still under development, will also allow for the possibility of purging sensitive data (e.g., that may have been transmitted in a narrative description).
2. **XML File Names**: Although not strictly a requirement for InterCAD processing, developing a standard naming convention for the XML files is encouraged. The WSP file names are unique and include the incident ID, timestamp, and reporting post. This simplifies front-end processing in the WSP interface since basic message information is available without processing the XML. Including the incident ID in the file name, in particular, makes it easier to connect multiple XML files associated with the same incident.

InterCAD Contact Information

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