



30.1.1 Introduction

Road Weather Information Systems (RWIS) are a key part of maintenance operations and traffic management systems. The roadside weather stations, known as Environmental Sensor Stations (ESS) are used by county highway department personnel and traffic operations staff to continuously monitor a variety of road and atmospheric parameters. These include:

- Air temperature and relative humidity
- Wind speed and direction
- Precipitation
- Visibility
- Road surface temperature
- Road surface state (dry, wet, etc.)
- Amount of deicing chemical present

These systems were originally designed for winter maintenance use, but are now used year-round and by traffic operations as well.

The live, real time, RWIS system can be viewed online. RWIS operations manuals and annual reports are available on the internal WisDOT intranet site and may be requested.

30.1.2 Needs Assessment

Normally, new installations are planned as part of highway improvement projects. However, if funding is available, they can be installed as a stand-alone project. Personnel involved in the decision on whether a new ESS site is justified include:

- WisDOT RWIS Program Manager (Bureau of Highway Operations)
- WisDOT Regional Area Supervisors
- County highway department patrol superintendents
- Project Engineer

These agencies will discuss the need for the new ESS site. If it is determined that an ESS site is required, they will then decide upon the appropriate sensor configuration for the new location. This includes locations for in-pavement sensors, non-contact pavement sensors, and atmospheric sensors.

30.1.3 Sensor Selection

Once the tower location is determined, the next step is to decide upon the sensor configuration. At a minimum, all sites will consist of an air temperature/relative humidity sensor, a wind speed/direction sensor, and some combination of the following:

- Precipitation sensor. Options range from basic yes/no to more advanced technologies that determine precipitation type as well as visibility.
- Road surface sensors. Determination must be made as to which specific lanes they will be installed in, as well as whether or not to install bridge deck sensors.
- Non-contact sensors. In areas where lane closures are not feasible to accomplish regular maintenance and repairs of roadway sensors, consideration should be given to installing non-contact (remote) roadway sensors.
- Subsurface temperature probes. They measure the temperature of the ground 18 inches below the surface.
- Roadway cameras.
- Traffic sensors. These can be integrated into the RWIS, which can result in savings on infrastructure costs.

Table 30.1-1 RWIS Design Process Checklist

1. Collect initial needs assessment (see 30.1.2)	
2. Determine ESS sensor needs (see 30.1.3)	
3. Determine location of ESS tower, cabinet, and sensors (see 30.3.2 and 30.3.3)	
4. Establish corridor operations plan for proposed trailblazer deployment (see 30.1.2.1)	
5. Assign name to ESS site (see 30.2.1)	
6. Determine the location of the dynamic trailblazer assemblies and controller cabinet. (see 30.3.1 and 30.3.2)	
7. Begin the process to establish electrical service for the proposed location with the local power company. This should be done early in the design process to establish an acceptable electrical service location. (see 30.3.6)	
8. Prepare the underground infrastructure, including conduit and pullboxes (see 30.3.4)	
9. Perform cable routing to provide hardwire interconnection between the controller cabinet and ESS devices such as electrical service, etc. (see 30.3.5)	
10. Determine the communications medium used for the proposed location (see 30.5.2)	
11. Determine the construction details, special provisions, and standard specification bid items need for the proposed design along with those that need to be modified and created to provide a complete construction plan (see 30.5.4 and appendix 70)	