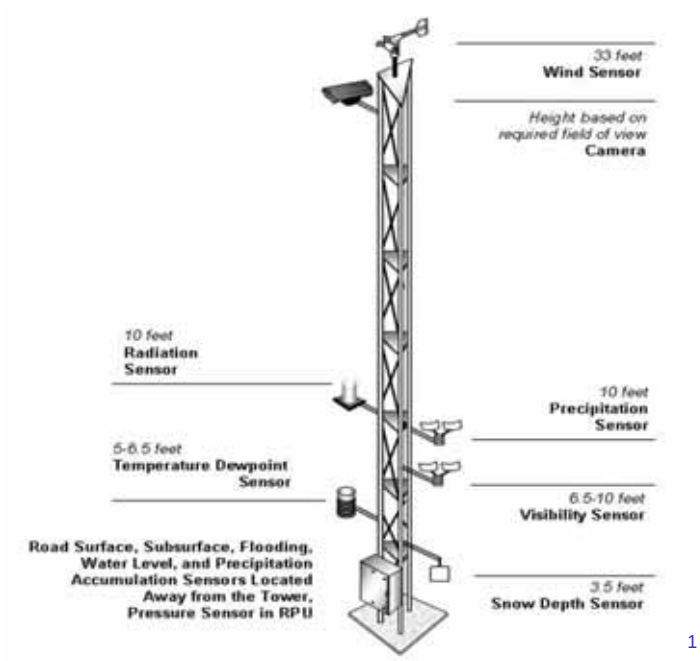
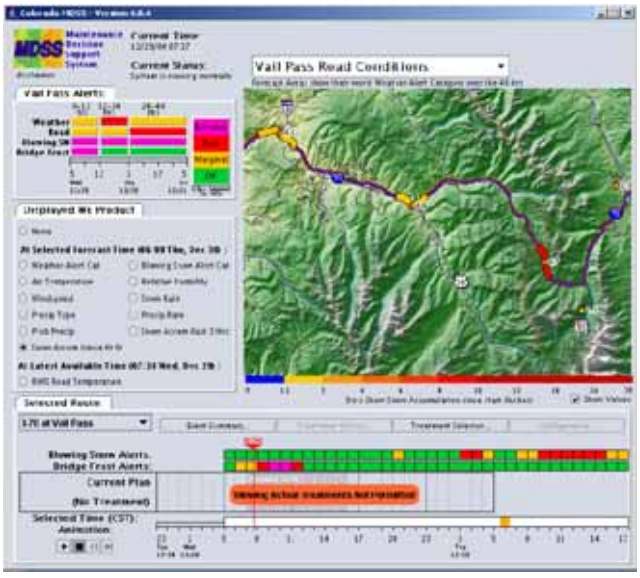


1

The Value of Road Weather Information

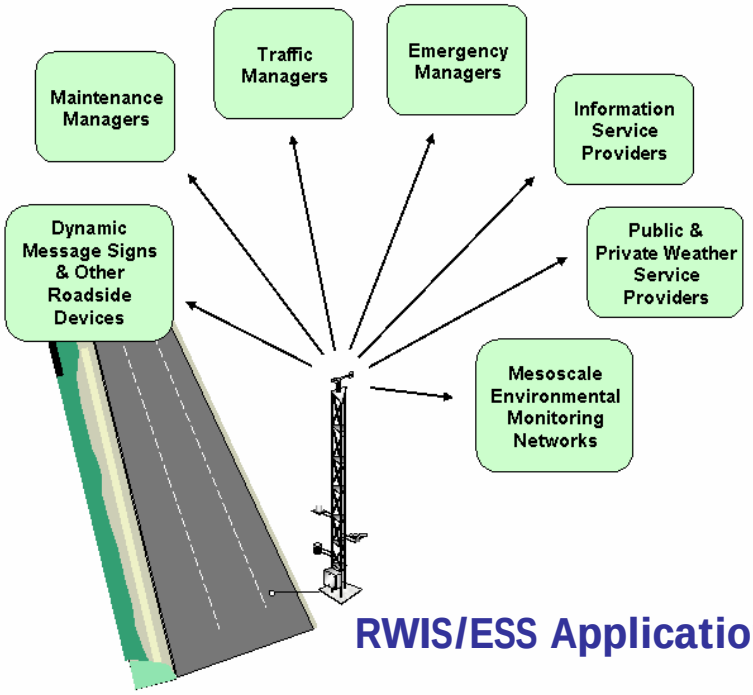


2

RWIS/ESS Siting Guidelines

- **Purpose of the Project**
  - Provide information on the selection & installation of ESS equipment & instrumentation
  - Help ensure that the data adequately supports the specified purposes of the observing site
  - Educate on the importance of participating in the greater community and on issues such as the need for accurate metadata

3



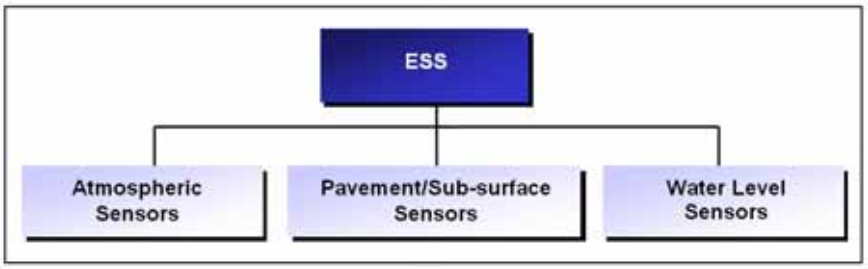
RWIS/ESS Applications

Siting Guidelines Characteristics

- Provide siting criteria that satisfy as many road weather monitoring, detection, & prediction requirements as possible
- Criteria are based on an analysis of other published research & interviews with state DOT experts, equipment suppliers & consultants
- Guidelines are a *set of recommendations & are not mandates or standards*

5

ESS Sensor Categories



6

Planning the ESS Network

- How will the road weather information be used, and who will use it?
  - Will the ESS be used to measure a site-specific condition or provide information that represent conditions across a general area?
- What needs to be measured at each installation?
- What other sources of weather and pavement data are available to share and improve the availability of data to other partner agencies

7

Examples of ESS Sensors

Roadway Element	Sensor
Air Temperature	Thermometer
Water Vapor (Dewpoint or Relative Humidity)	Hygrometer
Wind Speed and Direction	Conventional and Sonic Anemometer and Wind Vane or combined sensor (Aerovane)
Pavement Temperature, Pavement Freeze Point Temperature, Pavement Condition, Pavement Chemical Concentration	Pavement Sensor
Subsurface Temperature	Subsurface Temperature Probe
Subsurface Moisture	Subsurface Moisture Probe
Precipitation Occurrence	Rain Gauge, Optical Present Weather Detector
Precipitation Type	Rain Gauge, Optical Present Weather Detector
Precipitation Intensity	Rain Gauge, Optical Present Weather Detector

8

Regional Site Requirements

- Support broad, real-time monitoring of weather and road conditions
- Provide data to improve the accuracy of surface transportation specific forecasts
- Provide ground truth to evaluate accuracy
- Anticipate changes in road weather from upstream locations

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Local Site Requirements

- Observations used to assist in issuing advisories & short term forecasting
- Observed conditions may be locally worse than surrounding regions, but may be representative of other similar segments or structures
- Highlights specific problems (i.e., historically cold, significant blowing, drifting, heavy snow accumulation, visibility, high winds, etc)

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Siting Tools

- Thermal mapping
  - Better defines thermal characteristics
  - Help identify similar areas
  - Optimize the number of ESS to be installed
- Portable sensor systems
  - Located specifically in problem areas
  - Limited (local) utility, does not include sub-grade sensors

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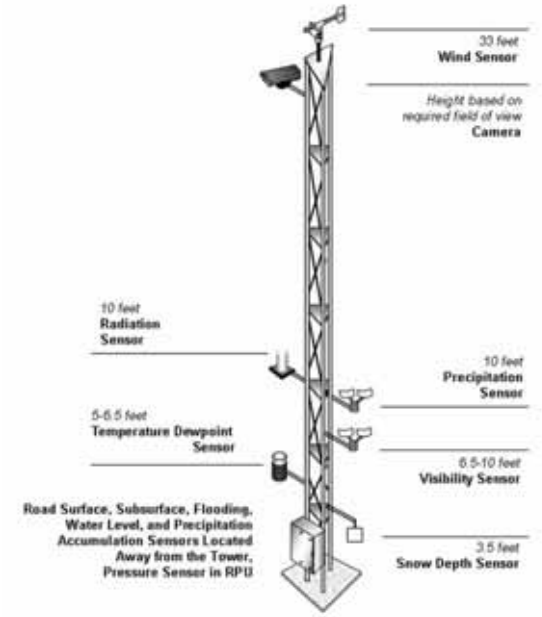
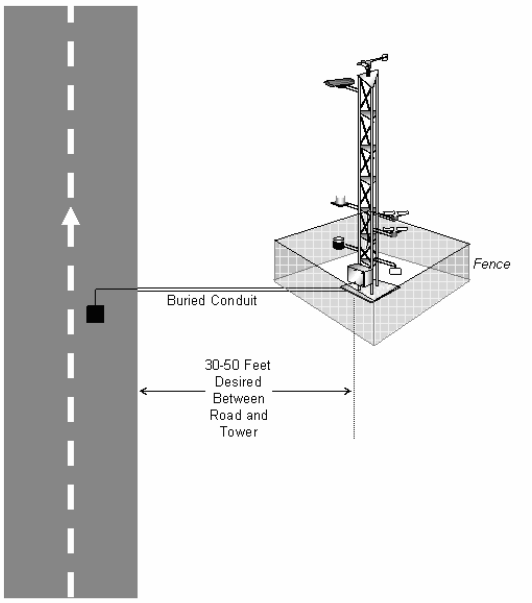
Typical Locations of Tower-Based Sensors



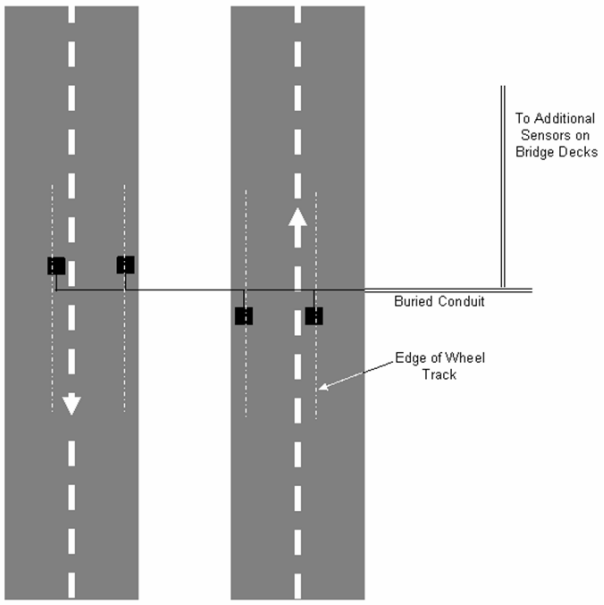
12

ESS Location Relative to Roadway



13

Typical Pavement Sensor Siting



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Siting Metadata

- Metadata: “data about data”
- Metadata are used to document the characteristics of each sensor and its siting to provide users an understanding of what the sensor data really represent
- Standards have been developed for some geospatial metadata, but not for RWIS ESS location and sensor metadata

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Clarus

- What is Clarus (Latin for “Clear”)
  - Design, development and demonstration of a regional road weather observation data management system
  - Quality Control with feedback to DOTs
  - Goal of national participation
- Objective
  - To reduce the impact of adverse weather (e.g., fatalities, injuries and delay) for all road and transit users and operators.

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Clarus – Unlimited Possibilities!

Route Specific Radio & TV Broadcasts of Travel Conditions

Add Detail to HAR & VMS

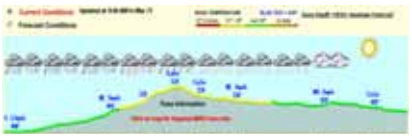
Spawn New technologies (in vehicle, PDA)

Clarus

Enhanced decision making tools

511 Travel Info

Credible & Precise Travel Advice



Create New and More Effective Ways to Convey Surface Transportation Weather Information

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Conclusion

- Collection of road weather information can provide decision support to transportation managers & contribute to more accurate road weather forecasts
- Siting recommendations are designed to satisfy as many road weather monitoring, detecting and predicting requirements as possible
- Siting recommendations encourage uniformity in siting, application and participation in the greater community

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