MDSS
Functional Prototype Design and Architecture

FY2002
Functional Prototype Domain

• Domain will be Minnesota.
• Core forecast points will be observational sites in and around MN.
• Interpolate to roadways.
• Focus on smaller area, 2-3 DOT routes, ~5-10 sites per route.
Functional Prototype Design
Conceptual

Weather Data ➔ Weather Technologies ➔ Road Condition Modules ➔ Decision Support ➔ Display
Functional Prototype
RWFS Design

Data:
Model (ftp)
MOS (ftp)
Ensemble (LDM from FSL)
----------------
NWS obs (LDM)
ESS (LDM from FSL)
----------------
Climatology

Forecast Modules:
Avn
Eta
Model Ensemble
NGM MOS
MRF MOS
AVN MOS
Persistence
Climatology

Non-verifiable
Data extraction

Post Process

Output For Road Condition Modules
Functional Prototype
Decision Support System

Three System Solutions (Outputs):
• No user action taken
  – No winter road maintenance actions taken during event
• Recommended actions taken
  – The system automatically applies recommendations from the Rules of Practice module
• Recommendations overridden by user
  – The user can edit the ROP recommendations
Decision Support System
Recommended Actions Taken

RWFS → Chemical Concen. Module

Road temp/ Snow depth Module → Net Mobility Module

Net Mobility Module → ROP

ROP → Plow/ Chem appl. action

Plow/ Chem appl. action → Road temp/ Snow depth Module

Road temp/ Snow depth Module → Chemical Concen. Module

Chemical Concen. Module → RWFS
Decision Support System
User Edited Actions

- RWFS
  - Chemical Concentration Module
  - Road Temperature/Snow Depth Module
  - Net Mobility Module
  - Plow/Chemical Application Module
  - Accept or Input Alternate Action

- ROP
Decision Support System
No Actions Taken

RWFS → Road temp/ Snow depth Module → Net Mobility Module → Time series of road cond/weather
NCAR
Road Weather Forecast System
NSSL Precipitation Type Algorithms
Web Server
Content Generation
MDSS Display Host
Transportation System Data

CRREL
Road Temperature Algorithm
Chemical Concentration Algorithm
Net Mobility Index

CRREL/LL
Rules of Practice Module

NSSSL
Mesoscale Model

FSL
Ensemble Forecasting System

Stakeholder Viewing
PC Browser

Internet