

Road Weather Information System (RWIS) & Maintenance Decision Support System (MDSS) Economic Value Tool (EVT)

SIRWEC 2012 ID0025

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May 2012

VAISALA

RoadDSS Value Calculator

- What is it?
 - A calculator that helps customers assess the level of benefits they could experience as they move up the roads maintenance **maturity curve**
 - A tool to **justify investments** into RWIS, RoadDSS, and other services
- What benefits?
 - Customer
 - Efficiency, Publicity
 - Monetary and time savings in labor, materials, maintenance
 - Community
 - Safety, mobility, and environmental improvements
 - Costs and time savings, pollution and accident reduction

What does the Value Calculator Look Like?

Customer Information

Full Name

Organization

Email Address

Phone Number

SAMPLE DATA

Vaisala has permission to contact me.

Calculator Input

Currency	<input type="text" value="USD"/>	
Weather Events Requiring Treatment	<input type="text" value="60"/>	Events / Season
Number of RWIS Stations	<input type="text" value="12"/>	Stations
Winter Maintenance Budget	<input type="text" value="2500000"/>	USD
Population	<input type="text" value="320000"/>	People
Number of Treatment Vehicles	<input type="text" value="22"/>	Vehicles
Treatment Distance (per Event)	<input type="text" value="530"/>	Lane Miles
Number of Routes	<input type="text" value="19"/>	Routes
Abrasive Cleanup Distance (per Event)	<input type="text" value="250"/>	Miles / Event
Dry Material Use (per Event)	<input type="text" value="100"/>	Tons / Event
Wet Material Use (per Event)	<input type="text" value="5000"/>	Gals / Event
Tolls (per Vehicle)	<input type="text" value="5"/>	USD

Submit

Calculator Features

> EFFICIENCY

Calculate monetary and time savings due to increased efficiency for Road Operations Maintenance groups, including driving, de-icing materials, cleanup, vehicle maintenance, fuel consumption, and IT reduced costs.

> PUBLICITY

Calculate publicity related reductions in complaint and litigation costs.

> SAFETY

Assess savings increases in safety and mobility, and pollution reduction costs that benefit the entire community.

> ADDITIONAL BENEFITS

Provide a list of additional benefits such as reporting, planning, performance tracking, streamlined operations, transparency, marketing and community safety.

> ASSUMPTIONS EDITING

Allow customers to change assumptions to get a more accurate idea of the potential savings for both the software users and the community in general.

Output: Customer Benefits - Monetary

RoadDSS Calculator Results – Potential Benefits

Summary

User Benefits

Community Benefits

Other Benefits

All Benefits

Change Assumptions

Select Benefits Type | **Monetary** Non-Monetary

Efficiency Savings

Decision Time Costs Savings:	\$6,921 USD
Treatment Labor Usage Costs Savings:	\$173,880 USD
Reduced Stress Related Absences Savings:	\$5,200 USD
Dry De-Icing Materials Costs Savings:	\$269,100 USD
Wet De-Icing Materials Costs Savings:	\$122,850 USD
Cleanup Labor Costs Savings:	\$38,500 USD
Vehicle Maintenance Costs Savings:	\$220,600 USD
Fuel Consumption Costs Savings:	\$18,018 USD
Wear Infrastructure Costs Savings:	\$25,800 USD
IT Hardware Costs Savings:	\$3,000 USD
IT Labor Costs Savings:	\$16,000 USD
Increase Revenue from Toll Roads:	\$576,000 USD
Total Efficiency Related Savings:	\$1,475,869 USD



\$412,968
Material Savings



\$240,501
Labor Savings



\$246,400
Maintenance Savings

Publicity Savings

Complaint Costs Savings:	\$8,000 USD
Litigation Costs Savings:	\$327,400 USD
Total Publicity Related Savings:	\$335,400 USD

Customer Benefits: Non-Monetary

RoadDSS Calculator Results – Potential Benefits

Summary

User Benefits

Community Benefits

Other Benefits

All Benefits

Change Assumptions

Select Benefits Type | Monetary **Non-Monetary**

Efficiency Benefits

Reduction in Time to Make Decisions:	138 Hours
Reduction in Operator Treatment Driving Time:	4,968 Hours
Reduction in Stress Related Absences Hours:	104 Hours
Reduction in Dry De-Icing Material Use:	3,900 Tons
Reduction in Wet De-Icing Material Use:	195,000 Gals
Reduction in Cleanup Labor Time:	1,100 Hours
Reduction in Operation Vehicles Needed:	5 Vehicles
Reduction in Operation Laborers Needed:	7 People
Reduction in Distance Driven:	20,592 Miles
Reduction in IT Labor Hours:	457 Hours
Yearly Increase in Toll Vehicles during Events:	115,200 Vehicles



3,900 Tons
Dry Material Use
Reduction



195,000 Gals
Wet Material Use
Reduction

Publicity Benefits

Reduction in Number of Complaints:	800 Complaints
Reduction in Number of Lawsuits:	3 Lawsuits

Community Benefits: Monetary

RoadDSS Calculator Results – Potential Benefits

- Summary
- User Benefits
- Community Benefits
- Other Benefits
- All Benefits
- Change Assumptions

Select Benefits Type | **Monetary** Non-Monetary

Safety Savings

Accident Costs Savings:	\$12,998,198 USD
Fatality Costs Savings:	\$22,023,698 USD
Total Safety Related Savings:	\$35,021,896 USD



\$12,998,198
Accident Costs Savings

Mobility Savings

Reduction in Local Economy Losses:	\$212,352,000 USD
Total Community Related Savings:	\$212,352,000 USD



\$16,629,296
Pollution Costs Savings

Environment Savings

Air Pollution Costs Savings:	\$1,047,217 USD
CO ₂ Community Cost Avoidance	\$15,582,080 USD
Chemical Use Vehicle & Infrastructure Costs Savings:	\$3,968,224 USD
Chemical Use Environmental Costs Savings:	\$1,344,260 USD
Total Environment Related Savings:	\$21,941,781 USD

Community Benefits: Non-Monetary

RoadDSS Calculator Results – Potential Benefits

Summary

User Benefits

Community Benefits

Other Benefits

All Benefits

Change Assumptions

Select Benefits Type | Monetary **Non-Monetary**

Safety Benefits

Reduction in Number of Accidents:	52 Accidents
Reduction in Number of Fatalities:	5 Fatalities
Reduction in Emergency Vehicle Response Time:	482 Hours



52
Fewer Accidents per
Season

Mobility Benefits

Average Increase in Traffic Speed:	19.5 Miles/Hr
Increase in Number of Vehicles on the Road:	16,000 Vehicles
Time Savings due to Optimized Treatment:	6,678,261 Hours



482 Hours
Emergency
Response Time
Reduction

Environment Benefits

Reduction in Dry Road Treatment Materials:	3,900 Tons
Reduction in Green House Gas Creation (CO ₂):	25,970 Tons
Reduction in Polluting Emissions (NOx/VOC/CO):	731 Lbs

Other Benefits

RoadDSS Calculator Results – Potential Benefits

Summary

User Benefits

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Other Benefits

All Benefits

Change Assumptions

Efficiency

Improve performance or reduce cost

- > Materials Type Choice
- > Vehicle Type Optimization

Status reports

- > Budgeting reports
- > Trend analysis reports
- > Material usage vs cost reports
- > Restock alerts reports
- > Historical Reports
- > Current conditions Reports
- > Forecast Reports

Better planning

- > Weed spray planning capabilities
- > Operations planning capabilities

Performance tracking

- > Record driver hours
- > Better communications
- > KPIs to measure contractors
- > Forecast verification
- > Improved forecast accuracy
- > Provision of road forecasting

Streamlined operations

- > Web based open access
- > Continuous availability (resilience)
- > Factual objective data (RWIS)

Publicity

Transparency

- > Solid Maintenance plan/CYA
- > Web site information
- > Media relations

Marketing

- > Toll road marketing value

Safety

Better planning

- > Better driver information

Don't Like the Answers? Then Change The Assumptions

Assumptions Category						
Customer Info	Input	Labor & Infrastructure	Maintenance Fleet	Treatment	Community	Other
Customer Labor & Infrastructure	Decision Maker Rate				\$50.00	USD / Hour
	Driver Rate				\$35.00	USD / Hour
	Complaint Labor Cost				\$10.00	USD / Call
	Hours for Decision to Send Operators				3.0	Hours / Day
	Number of Drivers				30	Drivers
	Number of Decision Makers				4	Decision Ma...
	Stress Related Absences (per Person)				4	Absences
	IT Labor Costs				\$80,000	USD / Year
	IT Hardware Costs				\$4,000	USD / Year
Maintenance Fleet Vehicles	Maintenance Vehicle Fuel Economy				4.0	MPG
	Fuel Cost				\$3.50	USD / Gals
	Cleaning Costs (per Vehicle per Event)				\$100.00	USD / Vehicle
	Servicing Costs (per Vehicle per Year)				\$8,000.00	USD / Vehicle
	Equipment Replacement Costs (per Year)				\$600,000.00	USD / Year
Treatment	Dry Material Cost				\$69.00	USD / Ton
	Wet Material Cost				\$0.63	USD / Gals
	Cleanup Time (per Mile)				0.17	Hours / Miles
	Treatment Time (per Driver per Event)				5.00	Hours / Day
	Cleanup Distance (per Route)				13.16	Miles / Route
	Cleanup Time (per Route)				2.19	Hours / Route

Please Remember.....

The screenshot displays the 'RoadDSS Calculator Results - Potential Benefits' interface. It features a navigation bar with 'Summary', 'User Benefits', 'Community Benefits', 'Other Benefits', 'All Benefits', and 'Change Assumptions'. Below this, there are tabs for 'Monetary' and 'Non-Monetary'. The main content area is divided into two sections: 'Efficiency Savings' and 'Publicity Savings'. The 'Efficiency Savings' section lists various cost savings items with their respective values in USD, totaling \$1,475,869. The 'Publicity Savings' section lists 'Complaint Costs Savings' (\$8,000 USD) and 'Litigation Costs Savings' (\$327,400 USD), totaling \$335,400 USD. On the right side, there are three summary boxes: 'Material Savings' (\$412,968) with a truck icon, 'Labor Savings' (\$240,501) with a briefcase icon, and 'Maintenance Savings' (\$246,400) with a wrench and screwdriver icon.

Efficiency Savings	
Decision Time Costs Savings:	\$6,921 USD
Treatment Labor Usage Costs Savings:	\$173,880 USD
Reduced Stress Related Absences Savings:	\$5,200 USD
Dry De-Icing Materials Costs Savings:	\$269,100 USD
Wet De-Icing Materials Costs Savings:	\$122,850 USD
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Publicity Savings	
Complaint Costs Savings:	\$8,000 USD
Litigation Costs Savings:	\$327,400 USD
Total Publicity Related Savings:	\$335,400 USD

- It is intended as a guide and to provide orders of magnitude and not as an absolute measure
- I would encourage further studies and publications on winter maintenance cost/benefits

The Vaisala RoadDSS Value Calculator can be found at:

<http://www.vaisala.com/roaddsscalc/>

Kiitos!

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