

Traffic Sign Life Expectancy

Investigation LAB943

Project TAP Meeting #3

08/07/2013

Project Team

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Project Update and Meeting Overview

- Project Schedule On-Track
- Task 2 Complete - Information (on Website)
- Task 3 In Progress
- Planned Timeline for Task 4
- Discussion / Other Issues

Task 2: Test Deck & Data Collection Plan

Complete

- Identify in-service signs that will be measured
 - Agency data collection – preliminary schedule on website
- Select Spreadsheet Database
 - Useable sign inventory database - Now posted on Website
- How-to videos for data collection
 - Gamma922 Retroreflector manufacturer training videos available:
<http://www.pppcatalog.com/922-training/>
 - Project-specific video – Now posted on Website
 - <http://www.dot.state.mn.us/materials/signretroreflectivity.html>
- Determine need for additional equipment
 - New retroreflector purchased, checked and in operation.
- Develop test deck plan for MnROAD
 - MnROAD Test Deck installed and in operation

Month/Year	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Jul 2013	Loan Out Schedule for Retro Meter #1 (owned by City of Golden Valley)						
	Loan Out Schedule for Retro Meter #2 (owned by MnDOT Office of M&RR)						
	Preliminary Schedule Subject to Change						
	15	16	17	18	19	20	21
	City of Eagan						
	MnDOT Office of M&RR						
	22	23	24	25	26	27	28
	City of Eagan						
	MnDOT Office of M&RR						
	29	30	31	1	2	3	4
City of Eagan							
St. Louis County							
Aug 2013	5	6	7	8	9	10	11
	City of Eagan						
	St. Louis County						
	12	13	14	15	16	17	18
	Delaware County						
	St. Louis County						
	19	20	21	22	23	24	25
	Delaware County						
	Washington County						
	26	27	28	29	30	31	1
Delaware County							
Washington County							
Sep 2013	2 Labor Day	3	4	5	6	7	8
	City of Golden Valley						
	City of Prosser						
	9	10	11	12	13	14	15
	City of Golden Valley						
	Delaware County						
	16	17	18	19	20	21	22
	Delaware County						
	City of Springfield Park						
	23	24	25	26	27	28	29
Delaware County							
City of Springfield Park							
30	1	2	3	4	5	6	
Delaware County							
Delaware County							
Oct 2013	7	8	9	10	11	12	13
	Delaware County						
	Delaware County						
	14 Columbus Day	15	16	17	18	19	20
	Delaware County						
	Delaware County						
	21	22	23	24	25	26	27
	Delaware County						
28	29	30	31 Halloween	1	2	3	
Delaware County							
Delaware County							

(Preliminary)
 Data
 Collection
 Calendar
 on Website.
 Data Collection
 Done before Nov
 2013. (Feedback
 please)

Minnesota Department of Transportation - Windows Internet Explorer

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Sign Retroreflectivity

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Traffic Sign Expected Life Project

The [Minnesota Local Road Research Board](#) is funding a project to develop new expected sign life values. This will enable local agencies to better manage their traffic sign assets and decrease their costs by enabling more efficient sign replacement strategies.

Project Goals

- Develop sign life expectancies for sheeting materials used in Minnesota
- Identify the common drivers of sign replacements
- Provide guidance to local agencies on adoption of sign maintenance policies

Project Schedule

Task 1: Survey of Practice April 30, 2013
 Task 2: Test Deck & Data Collection Plan June 30, 2013
 Task 3: MnROAD Data Collection September 30, 2013 (plus ongoing annual measurements)
 Task 4: System Data Collection December 30, 2013
 Task 5: Data Analysis, Recommendations, Report March 30, 2014

Project Updates

[TAP Meeting - February 2013](#)
[Tap Meeting - May 2013](#)

Resources

[Minnesota State Aid Traffic Safety Page](#)
[Manual on Uniform Traffic Control Devices](#)
[Minnesota Manual on Uniform Traffic Control Devices](#)
[Minnesota's Best Practices for Traffic Sign Maintenance/Management Handbook](#)
[NCHRP Synthesis 431: Practices to Manage Traffic Sign Retroreflectivity](#)
[Pennsylvania's TAP Sign Inventory Management System](#)
[Utah's TAP Safety Suite Including Sign Inventory](#)

Resources for Project Participants


[Proposed Retroreflectometer Loan-out Schedule](#)
[Example Retro Data Collection Worksheet](#)
[MnROAD Sign Retro Test Deck As-Built Plan](#)

MUTCD Update:
 On May 14, 2012 the Federal Highway Administration (FHWA) published [two final rules](#) to make things easier for local and state agencies. These rules resulted in two revisions to the [2009 Manual on Uniform Traffic Control Devices \(MUTCD\)](#). [Revision 1](#) refers to the use of engineering judgment and studies. [Revision 2](#) refers to compliance dates including:

- Compliance date for implementation and continued use of an assessment or management method was changed to June, 2014, and now applies only to regulatory and warning signs.
- Compliance dates for replacement of signs to meet minimum retroreflectivity were eliminated.

For more information see the [Minnesota state aid Research Revisions to Federal MUTCD Compliance Dates page](#)

Gamma 922 Retroreflectometer



2000-2012 Minnesota Department of Transportation
 325 John Ireland Blvd., St. Paul, MN 55155-1522
 651-295-3000 Toll-free 800-657-3774
 To request a MnDOT document in an alternative format, call 651-355-4715 or e-mail ADRequester@dot.state.mn.us

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Project Specific Retro Video



http://www.youtube.com/watch?feature=player_embedded&v=Efi8iyECquw&t=0

Retroreflectometer Lab Comparison

Gamma 922	@ rt edge	MnDOT Analytical		Golden Valley		% Relative Difference	
Sample		0.2 Alpha	0.5 Alpha	0.2 Alpha	0.5 Alpha	0.2	0.5
1331C	white	400	270	378	253	5.5	6.3
1332C	yellow	395	246	385	231	2.5	6.1
1333C	red	85.4	57.9	82.9	54.5	2.9	5.9
1334C	blue	38.1	24.2	34.3	22.3	10.0	7.9
1335C	green	74.7	49.8	70.2	47	6.0	5.6

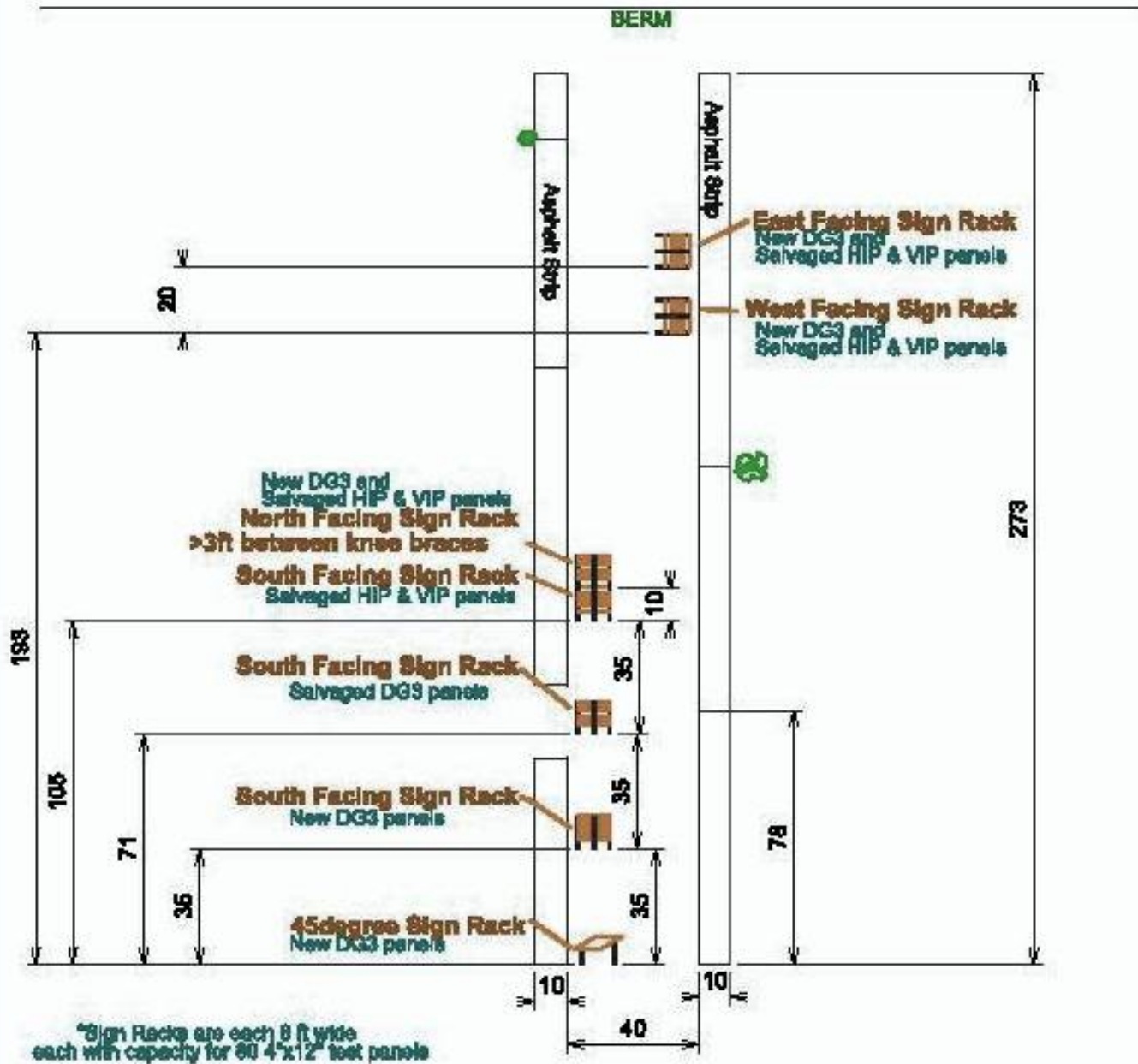
Gamma 922	@ rt edge	MnDOT Analytical		MnDOT Research		% Relative Difference	
Sample		0.2 Alpha	0.5 Alpha	0.2 Alpha	0.5 Alpha	0.2	0.5
1331C	white	385	261	353	234	8.3	10.3
1332C	yellow	386	241	361	215	6.5	10.8
1333C	red	84.8	57.5	78.8	51.5	7.1	10.4
1334C	blue	37.3	23.9	35.1	22.1	5.9	7.5
1335C	green	72.6	48.7	66.6	43.5	8.3	10.7

Gamma / Retro Sign		MnDOT Analytical		MnDOT Metro		% Relative Difference	
	@ center			#1	#2		
Sample		0.2 Alpha		s/n 272	s/n 221	s/n 272	s/n 221
1331C	white	433		447	409	3.2	5.5
1332C	yellow	404		435	406	7.5	0.5
1333C	red	91		112	102	22.6	11.2
1334C	blue	39		35	31	10.0	18.8
1335C	green	81		75	69	7.2	15.2

* readings at 0 and 90 degrees

Sign Test Deck Location at MnROAD





MNROAD SIGN TEST DECK LAYOUT (As-Built)

MnROAD Test Deck Final Plan

Task 3: MnROAD Data Collection

In-Progress

- Construct vertical and 45⁰ accelerated decks
 - 45⁰ deck and vertical decks Installed and Operational
- Populate with Sign Materials
 - New 2013 DG3 panels installed June 2013
 - Spreadsheet for remaining needed salvage panels - Not Complete - Panel Salvaging Started
- Collect retroreflectivity and color annually
 - Initial Readings Taken Prior to Install
- Share Data on Website
 - <http://www.dot.state.mn.us/materials/signretroreflectivity.html>

Task Schedule July 1, 2013 – Nov, 2016

MnROAD Test Deck Pics



INITIAL READINGS - 2013 MN/DOT SIGN SHEETING PANELS LIGHT TUNNEL 6/21/2013		X							
panel ID	STD COLOR	0 Deg 0.2-4	90 Deg 0.2-4	0 Deg 0.2+30	90 Deg 0.2+30	PORT REFL			
2013GI	F	41.9	55.2	23.3	29.2	2013 GI-F	57.8	41.2	
2013GI	S1	41.7	55.3	23.1	28.8	S1	55.2	40.1	
2013GI	S2	40.8	54.2	26.0	28.2	S2	54.7	39.8	
2013GI	S3	39.0	51.6	22.0	26.6	S3	53.9	39.5	
2013GI	N	39.3	51.9	25.7	26.4	N	51	37.6	
2013GI	E	39.2	52.7	22.7	27.8	E	53	38.8	
2013GI	W	43.2	57.4	25.7	31.0	W	56.1	40.1	
		X							
2013RI	F	102.5	183.0	29.3	87.1	2013 RI-F	151	95	
2013RI	S1	105.6	192.0	28.3	87.0	S1	155	98	
2013RI	S2	109.7	193.2	27.8	91.8	S2	169	104	
2013RI	S3	104.1	179.0	27.1	83.9	S3	152	95.7	
2013RI	N	104.2	179.9	24.8	83.4	N	153	94.1	
2013RI	E	105.8	181.9	29.3	83.4	E	152	96.7	
2013RI	W	113.8	197.5	28.4	93.4	W	176	107	
		X							
2013Y	F	622.8	385.2	287.4	100.3	2013 Y-F	575	342	
2013Y	S1	586.1	366.9	293.4	101.6	S1	558	331	
2013Y	S2	608.5	388.5	276.0	100.1	S2	572	341	
2013Y	S3	602.4	383.8	278.8	99.8	S3	569	340	
2013Y	N	606.0	388.3	273.6	103.5	N	577	345	
2013Y	E	611.8	381.9	279.7	100.5	E	566	338	
2013Y	W	608.3	383.6	282.2	102.0	W	584	345	
		X							
2013W	F	710.8	511.7	347.4	135.6	2013 W-F	751	464	
2013W	S1	749.1	525.6	372.3	132.3	S1	791	476	
2013W	S2	748.8	534.8	339.9	122.0	S2	785	467	
2013W	S3	739.7	533.9	361.5	136.2	S3	766	467	
2013W	N	825.1	578.7	354.6	109.9	N	807	481	
2013W	E	803.4	562.0	346.8	111.4	E	808	477	
2013W	W	804.1	581.2	352.6	127.6	W	813	484	

Initial Retro Readings for 2013 DG3 Test Panels

Task 4: System Data Collection In-Progress

- Provide Training at MnDOT Lab
- Coordinate shared retroreflectometers
 - Retro meter to be shared out has been cross-checked to Maplewood lab's meter and verified to be good
- Provide stickers for field control signs
- Annually calibrate purchased equipment
- Review data, collate into database, prepare results, summarize on [webpage](#)

Task Schedule May 1, 2013 – Dec 30, 2013

Discussion

- Drivers of Sign Replacement
 - Need for Study?
 - Factors
- Control Signs
 - Clarify process

Next Steps

- Continue Data Collection with Shared Meters
 - Complete by Nov.1st
- Finalize Plan for Control Signs (Discussion)
- Salvaging of sign panels, testing, and install at MnROAD
- Begin Data Compilation and Preparation
- TAP meeting in Mid-October to cover Progress Report for Task 4

Questions?



Thank You

Stay for a Short Tour of
the Light Tunnel in Lab!
(Time Permitting)
10:00-10:30)