



# *NRRA Meeting*

Executive Committee



September 27, 2016

We all have a stake in **A  B**



# Meeting Details

- **Current Activities**
  - Illinois Request for IC training from MnDOT
- **2017 Construction Needs**
  - Process of Approval
    - Survey Monkey Later
    - Provide Feedback to the Teams (cuts?)

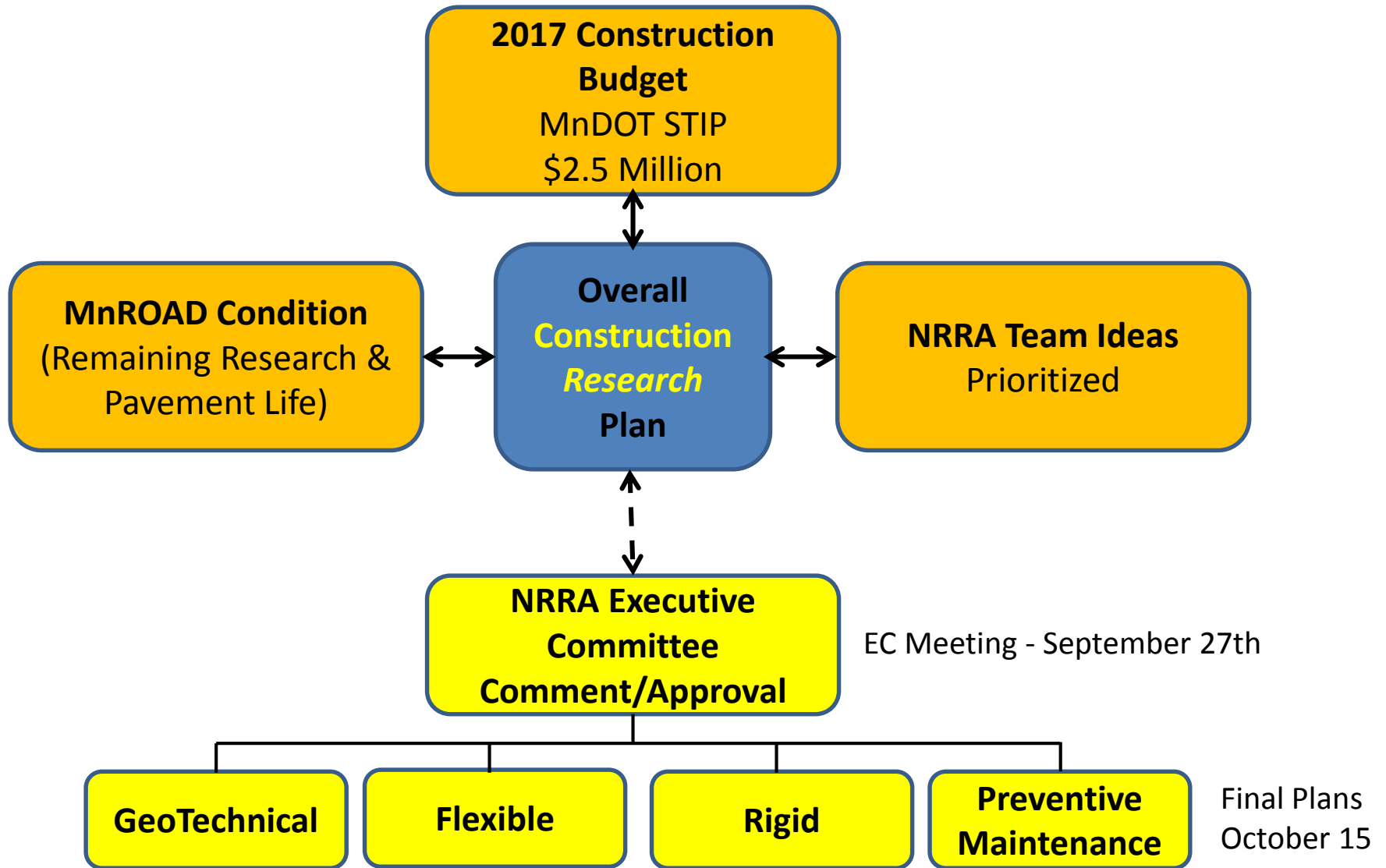


# 2017 Possible Criteria

1. Efforts must concentrate on cost-effectively improving the performance (life) of our various infrastructure elements, ie. pavements, bridges, walls, drainage structures.
  - Currently MnDOT like other agencies have a number of roadways in “poor” condition and not enough funding to solve the problem. The right fix may not always be the best fix.
2. We need to concentrate our efforts on new methods and materials.
  - New technologies with the capabilities of making great leaps forward are encouraged. We must be bold.
3. Some research is more easily implemented than others.
  - Our efforts should improve field performance and make work more effective for office, lab, and field personnel.
4. Efforts with a large return on investment will be given a higher priority.
  - Each project will be analyzed separately to determine its effectiveness potential.



# NRRA Test Section Construction



# 2017 Test Section Details

- **Process**

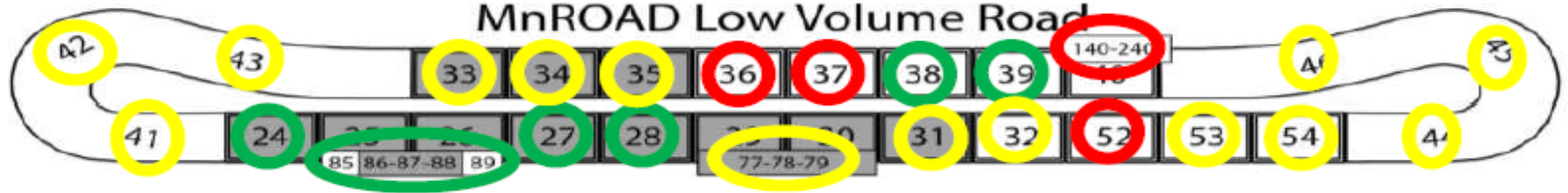
1. Cell Status (Condition and Research need to keep)
2. What best “fit” each existing cell and location
  - Mainline, LVR, Stockpile, I-94 Bypass
3. What fit NRRA Team Prioritized Needs
  - Primary Study
  - Secondary Studies
4. Balance the plan
5. Cost?
  - Estimates from past construction
  - Depends on industry partnerships and MnDOT

- **Details on the WebSite**

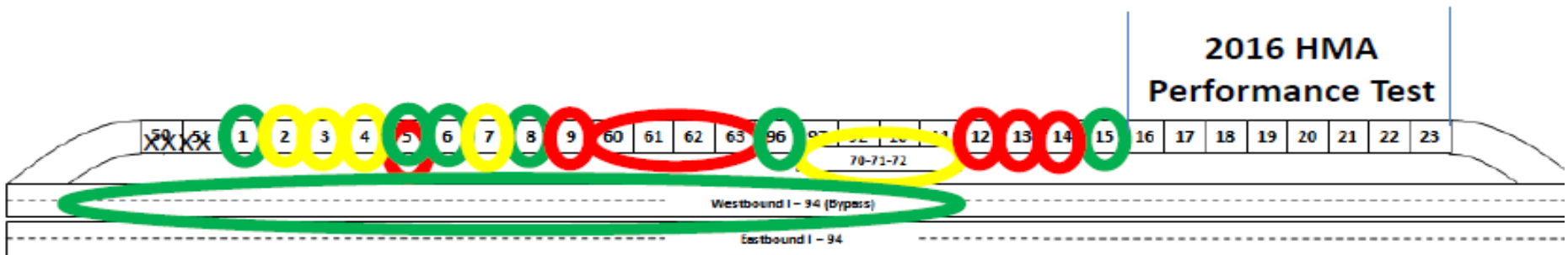


# MnROAD Availability

MnROAD Low Volume Road



2016 HMA Performance Test



- Red (Retain – active research still going on)
- Yellow (If better research developed then section available)
- Green (Cell needs work – open for research ideas)



# 2017 Test Section Details

## (Cells that Need Work)

		Rigid				Flexible		Geotechnical			PM			LRRB	
		1 - Fiber Reinforced	2 - PCC Diamond Grinding	3 - PCC Early Opening	4 - PCC Optimized Mix	1 - HMA Overlay of PCC	2 - Enhancing Compaction	1 - Recycled Base Agg	2 - Larger Base Aggregate	4 - Shoulder Alternatives	1 - Maintaining Poor Roads	2 - PCC Partial Depth Repair	3 - HMA Aging	Local Needs	
Primary Study	# Cells	3	0	0	4	0	0	4	4	0	4	0	0	1	Cost Summary  <b>\$ 1,515,000</b>
	Total Feet	750	0	0	1,000	0	0	1,000	880	0	1,177	0	0	500	
Secondary Study	# Cells	0	0	0	0	2	11	0	0	18	0	1	2	2	
	Total Feet	0	0	0	0	677	2,557	0	0	4,807	0	500	440	500	
	Cost	275,000	0	0	400,000	0	0	300,000	300,000	0	140,000	0	0	100,000	

**\$1.5 Million**







# Geotechnical Team (Terry Beaudry)

Priority - Study	Cost	Primary Research Variables to Design Around
1 - Use of Recycled Materials in Aggregate Base	\$ 300,000	<p>Existing cells - LVR 27-28 (1000')</p> <p>4" Common HMA mix / clay subgrade</p> <p>MnROAD test sections proposed (each ~250 feet)</p> <ul style="list-style-type: none"> <li>• Cell A - 3.5" HMA (standard mix) / 12" Natural Gravel agg base (Class-6) / Clay</li> <li>• Cell B - 3.5" HMA (standard mix) / 12" Recycle Mix agg base (Class 6) / Clay</li> <li>• Cell C - 3.5" HMA (standard mix) / 12" RCA Coarse agg base (Class 5Q) / Clay</li> <li>• Cell D - 3.5" HMA (standard mix) / 12" RCA Fine agg base (Class-6) / Clay</li> </ul> <p>Cell D will be the shared control cell for the large subbase study/recycled base study.</p>
2 - Determining Characteristics of Large-Aggregate Granular Sub-base Materials	\$ 300,000	<p>Existing - LVR 85-86, 88-89 (1000 ft)</p> <p>MnROAD test sections proposed (each ~220 feet)</p> <ul style="list-style-type: none"> <li>• Cell A - 3.5" HMA (standard mix) / 6" agg base (Class-6) / 13" Large agg sub-base / Sand</li> <li>• Cell B - 3.5" HMA (standard mix) / 6" agg base (Class-5Q) / 13" Large agg sub-base / Sand</li> <li>• Cell C - 3.5" HMA (standard mix) / 6" agg base (Class-6) / 13" Large agg sub-base / Clay</li> <li>• Cell D - 3.5" HMA (standard mix) / 6" agg base (Class-5Q) / 13" Large agg sub-base / Clay</li> </ul>
3 - Subgrade Stabilization	\$ -	Not as high of a priority
4 - Shoulder Alternatives	TBD	Could do every test cell or rehab other existing cells. Need to discuss - Many ties to the other groups - Expect a cost but should be wrapped up in the construction costs of the cells planned. If we rehab old shoulders then an extra (\$100,000 estimate) might be expected.



# Preventive Maintenance Team (Jerry Geib)

Priority - Study	Cost	Primary Research Variables to Design Around
1 - Maintaining Poor Roads	\$ 190,000	<p><b>ML-1 (500 ft)</b> HMA Poor Roadway Repair Needed (split into two 250 ft sections?)</p> <p><b>ML-8 (500 ft)</b> PCC Poor Roadway Repair Needed (split into two 250 ft sections?)</p> <p><b>ML-15 (500 ft)</b> 2008 HMA Overlay Repair Needed (split into two 250 ft sections?)</p> <p><b>ML-96 (177 ft)</b> Very poor condition of the whitetopping joints - could use as repair of very poor PCC and overlay - might need to remove and do new construction.</p>
2 - PCC Partial Depth Repair	\$ 25,000	<p><b>I-94 Bypass (2000 ft)</b> Keep to a 5-year field study See past efforts at MnROAD posted on the PM teams page to help develop this effort.</p> <p>Many ties to other test sections as second study needs especially related to HMA overlays of PCC - develop common repairs (corner, trans/long joints, wheelpath) in many panels for contractors to do repairs for monitoring on 3 panels each. Contractors could pay for the evaluation?</p>
3 - HMA Aging	\$ -	<p>Treat "Chip Seal" 1/2 of cells 16-23 from 2016 or other HMA sections planned for 2017 - Expect a cost but will be less than \$40,000</p>



# Flexible Team (Barry Paye)

Priority - Study	Cost	Primary Research Variables to Design Around
1 - Rehabilitation of Concrete Roadways with Hot Mix Asphalt (HMA) Overlays	\$ 350,000	<p><b>Bypass I-94 (4000 ft)</b> - Keep to a 5-year field study - Test Sections (500' each):</p> <p>A - PCC Control (do nothing)</p> <p>B - HMA Overlay Control - single conventional single lift overlay treatment</p> <p>C - Slab jacking/undersealing with single-lift overlay treatment</p> <p>D - 12.5mm mix at 1.75" thick using a conventional paver and distributor truck with a tack coat application rate (not residual rate) of 0.10 gal/sy.</p> <p>E - 4" thick overlay consisting of 2.25" of a 19.0 mm mix overlaid with 1.75" of a 12.5 mm mix or two lifts of a 12.5 mm mix at 1.75" thick each.</p> <p>F - 12.5 mm mix at 1.75" thick using a spray paver with a tack coat application rate of 0.20 gal/sy.</p> <p>G - ¾" thick or 1" thick layer covered by a 12.5 mm mix at 1.75" thick. The thin layer could consist of either an open graded mix such as a nova chip, an open graded friction course or a 4.75 mm mix.</p> <p>H - Ultra-thin Bonded Asphaltic Wearing Surface (i.e. nova chip). Provide specifications for ¾" thick mixture that would need to be placed through a spray paver and utilizes a polymer modified emulsion membrane applied at 0.20 gal/sy.</p>
2 - Enhancing Compaction	\$ 350,000	<p><b>Bypass I-94 (3500 ft)</b> - Keep to a 5-year field study - Construct the following test sections in the following three areas:</p> <p>A - SuperPave 5 - Normal 4% void mixture</p> <p>B - SuperPave 5 - 5% design mixture, compacted to 5% in-place voids (gyrations reduced 75 to 50)</p> <p>C - 3% Air Void Regression - Normal 4% void mixture</p> <p>D - 3% Air Void Regression - Design aggregate structure for 4% normal void mixture, then add predetermined amount of asphalt binder (0.3-0.5%) during production to achieve 3% voids.</p> <p>E - Asphalt mixture additives - Evotherm Mix</p> <p>F - Asphalt mixture additives - Crumb Rubber</p> <p>G - Asphalt mixture additives - Other WMA additives</p>
3 - Performance Testing	\$ -	Will be done on all HMA mixes as a part of the normal testing



# Rigid Team (Brett Trautman)

Priority - Study	Cost	Primary Research Variables to Design Around
1 - Fiber Reinforced	\$ 275,000	<p><b>Mainline cells 305-405, 306-406 (750 ft)</b>            Design three 250' concrete test sections            Fiber Mix Type 1 overlay            Fiber Mix Type 2            Fiber Mix Type 3            Needs New Construction due to test cell condition</p>
2 - PCC Diamond Grinding	\$ 30,000	<p><b>LVR 41-46 (3000 ft)</b>            Each cell contains different aggregates and cements that a prone to ASR reactions see NRRA rigid team web site for details. Grind 250' of each cells in both lanes (4 variables - grind with and without traffic and no grind with and without traffic)</p>
3 - PCC Early Opening	\$ 150,000	<p><b>Stockpile Area 83-84 (900 feet)</b>            Design for 9 areas each 100 feet paved using forms to save money for 100' each day over 9 days. On day X? traffic would load the cells for couple months. Could make it one 12' lane to save money. Existing cells 83-94 have 8" and 9" of existing class-5 base (very similar) to use. Some discussion if this should be on the LVR for long term issues with early loading</p>
4 -PCC Optimized Mix	\$ 400,000	<p><b>LVR-38-39 (1000 ft)</b>            Design for four variables of different mix types to try to determine the minimal cement need. Suggest to take risks on the LVR and maybe include new technologies.            Mix Design 1            Mix Design 2            Mix Design 3            Could be a concrete overlay or new construction on the existing test cells 38-39 but cell-7 also considered at this time. <b>Some comments that only 2 variables might need to be looked at and that only one cell could be used.</b></p>



# LRRB Shared Items (LRRB Input)

	Priority - Study	Cost	Primary Research Variables to Design Around
	Local Needs	\$ 440,000	<p>LVR-24 (500 ft) - <b>Included in the Rigid Fiber statement</b>            Fiber reinforced concrete over stabilized full depth recycling for local street design <b>(100K)</b></p> <p>LVR-32 (500 ft) - <b>Written up in the Rigid Group</b>            Roller Compacted Concrete City Street            Surface treatment / finishing agent? <b>(100K)</b></p> <p>LVR 33-35 (1500 ft) - <b>Written up in the Flexible Group</b>            100% Recycling of Existing Mix <b>(240K)</b>            Cold in Place Recycling with emulsion            Cold in Place Recycling with foam            Cold Central Plant Mix with foam            Cold Central Plant Mix with emulsion</p>



# What's Next

- **Survey Monkey**
  - (High priority / Lower Priority) and Comment
  - Need to cut down to 2.4/2.5 million → NEED CUTS
    - Design/Contract Administration Costs
  - Email to report back findings
  - Possible Meeting if needed



# What's Next

- **Technology Transfer**
  - Newsletter
  - Communication Plan
  - Hire Tech Transfer Consultant
    - Start working on Team Priorities
- **Next Meeting**
  - **November 2016** (doodle to setup)
  - **January 2017** (TRB Room – setup in November)
  - **Other Dates?** Discussion
  - **May 18<sup>th</sup> 2017 Pavement Conference**
    - Plan on demonstrations, meetings, tours, conference



# Team Meeting Plan

## Wednesday – once Month

Flexible - 10:00-11:00

Rigid - 1:00-2:00

## Thursday – once Month

Pavement Maintenance - 10:00-11:00

Geotechnical - 12:30-1:30

Tech Transfer - 2:00-3:00

