

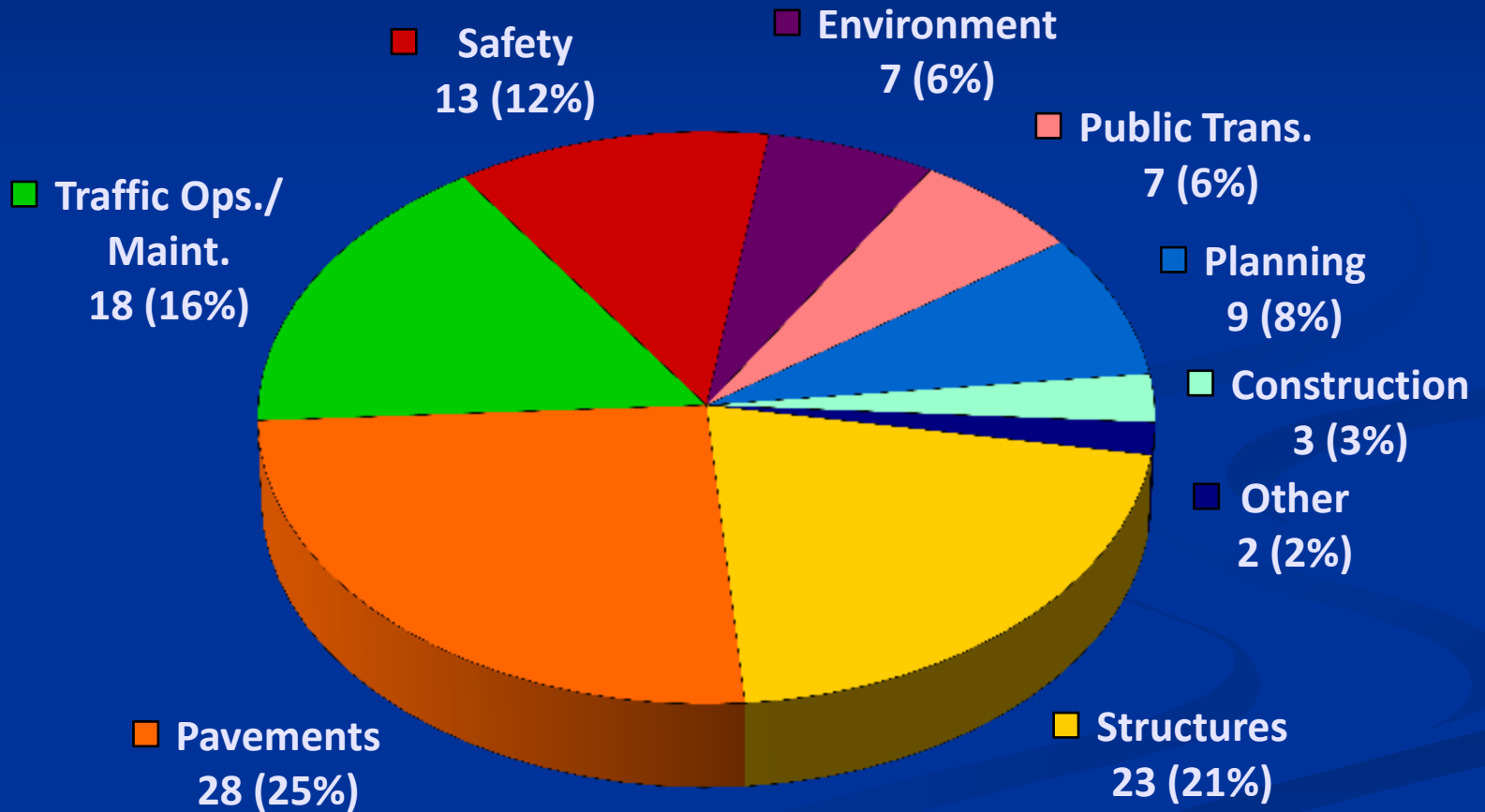
HMA Changes on the Horizon

Amy M. Schutzbach, P.E.
Engineer of Physical Research
Illinois Department of Transportation

Illinois Center for Transportation

- Contract research carried out by ICT
- Intergovernmental agreement (IGA) between IDOT and University of Illinois Board of Trustees
- Federal SPR funds; state funds
- Current FY09 to FY11 IGA: \$15,050,000
- New 5-year IGA being negotiated

ICT – FALL 2010



Illinois' Research Cycle

- Solicit Problem Statements
- January/June


- TAGs vote
- mid-March/mid-August

- ICT Executive Committee votes
- April/September

- Select Researchers
- TRP signs off on work plan/budget

- Project begins
- Fall/Spring Semester

Research Problem Statement


**Illinois Center for Transportation
Proposed Research Idea (Spring 2010)**

Proposed Research Title:

Objective or Purpose of the Proposed Research:
(Briefly describe the objective or purpose of the proposed research, e.g., to solve a problem, improve an existing process, reduce costs, improve safety, etc. Please be specific.)

Proposed Research Statement Summary:
(Explain the proposed research, including relevant background, description of the problem to be solved, the research approach, etc.)

Expected Outcome & Benefit to IDOT/Illinois:
(Briefly describe the expected outcome from the proposed research and the benefit to IDOT and/or the State of Illinois, e.g., in terms of policy advances, cost savings, etc. Please be as specific as possible.)

IDOT Sponsor? (Encouraged but not required):
(If possible, provide the name & organizational unit of an IDOT employee who encouraged your submission & has indicated he/she will help IDOT oversee this research.)

Suggested review by the following Technical Advisory Group (TAG) or TAGs:

<input type="checkbox"/> Structures/ Hydraulics/ Geotechnical	<input type="checkbox"/> Environment
<input type="checkbox"/> Pavement Design & Management/ Materials	<input type="checkbox"/> Public/ Multi-Modal Transportation
<input type="checkbox"/> Traffic Operations & Roadside Maintenance	<input type="checkbox"/> Planning
<input type="checkbox"/> Safety Engineering	<input type="checkbox"/> Construction

Estimated time to complete this project: _____ months

When could this project start? (choose): July/August 2010 If "Other", specify start date: _____

Total Estimated Funding for the Research: \$ _____
This estimate must include the minimum 20% cost share required for all ICT projects.

Contact Name:
Title:
Organization:
Phone and e-mail:

Please Note: Your research idea may be shared with others. IDOT and ICT reserve the right to select any researcher to carry out this research idea. Also, we strongly encourage submitters to do a search, before submitting, to ensure the proposed research has not already been completed or is not currently underway.

Please e-mail this form to: Patricia Broers, IDOT at: Patricia.Broers@illinois.gov
(Questions may be directed to Ms. Broers via e-mail or by calling phone # 217-782-3547.)

Deadline: **Research ideas must be submitted by January 31, 2010, to be considered for the ICT Executive Committee's spring 2010 meeting.**

<http://ict.illinois.edu/RFPs.aspx>

R27-42

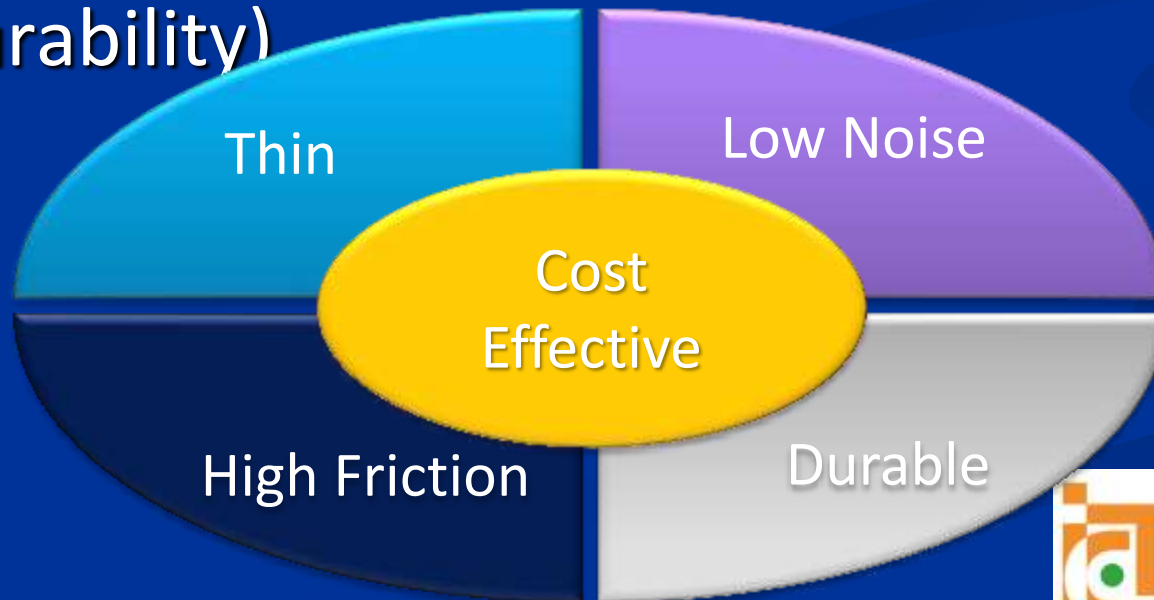
**Thin, Quiet Long-Lasting High
Friction Surface Layers**

Dr. Imad Al-Qadi and Dr. Sam Carpenter

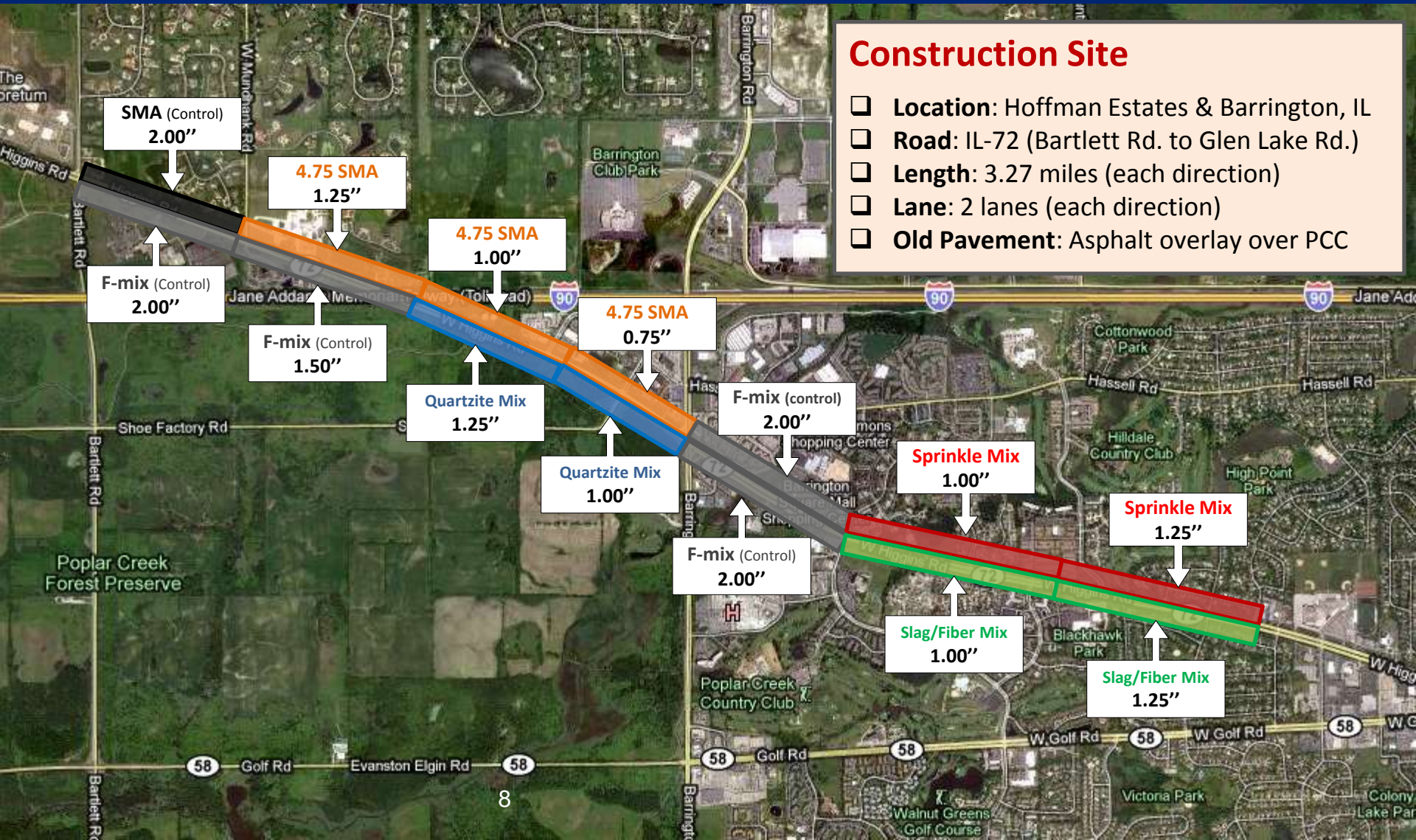
Tom Zehr

Thin, Quiet Long-Lasting High Friction Surface Layer

- Develop a **cost-effective mix** for wearing surface and overlay cross-sections
 - Utilize locally available aggregates
 - Effective and efficient (cost, friction, & durability)



Construction Site



Quartzite Mix

Standard paving procedure



4.75 SMA

Scalping CM13 Quartzite & FM22



Fiber/Slag Mix

- **Steel Slag:** High friction, good resistance to stripping and rutting
- **Fiber:** High tensile strength (Polyolefin and Aramid)



Sprinkle Mix

Quartzite (+ #4) Chips
Pre-coated with 0.75% of PG 64-22
Avg. Spreading Rate = **1.6 lb/yd²**



Testing

Performance	Test	Method
Friction	<ul style="list-style-type: none">•Laser Texture Measuring•Locked Wheel Skid Test•Variable-Speed Friction Test (Lab)	In Place Plant Mix
Noise	<ul style="list-style-type: none">•On-Board Sound Intensity Test	In Place
Rutting	<ul style="list-style-type: none">•Dipstick Transverse Profiler•Wheel Track Test (Lab)	In Place Core/Plant Mix
Durability	<ul style="list-style-type: none">•Cantabro Loss Test (Lab)	Plant Mix
Moisture Susceptibility	<ul style="list-style-type: none">•IL Modified Lottman Test (Lab)	Plant Mix
Dynamic Modulus	<ul style="list-style-type: none">•Dynamic Modulus Test (Lab)	Plant Mix
Fracture	<ul style="list-style-type: none">•Semi-Circular Bending Test (Lab)	Core/Plant Mix

Thin, Quiet Long-Lasting High Friction Surface Layer

- Completion date – 6/30/12
- What can we expect?
 - More options for durable, long-lasting HMA surfaces that recognize limited friction aggregate availability
 - Spec revisions to accommodate new mixes

R27-79

Designing, Producing, and Constructing Fine-Graded HMA on IL Roadways

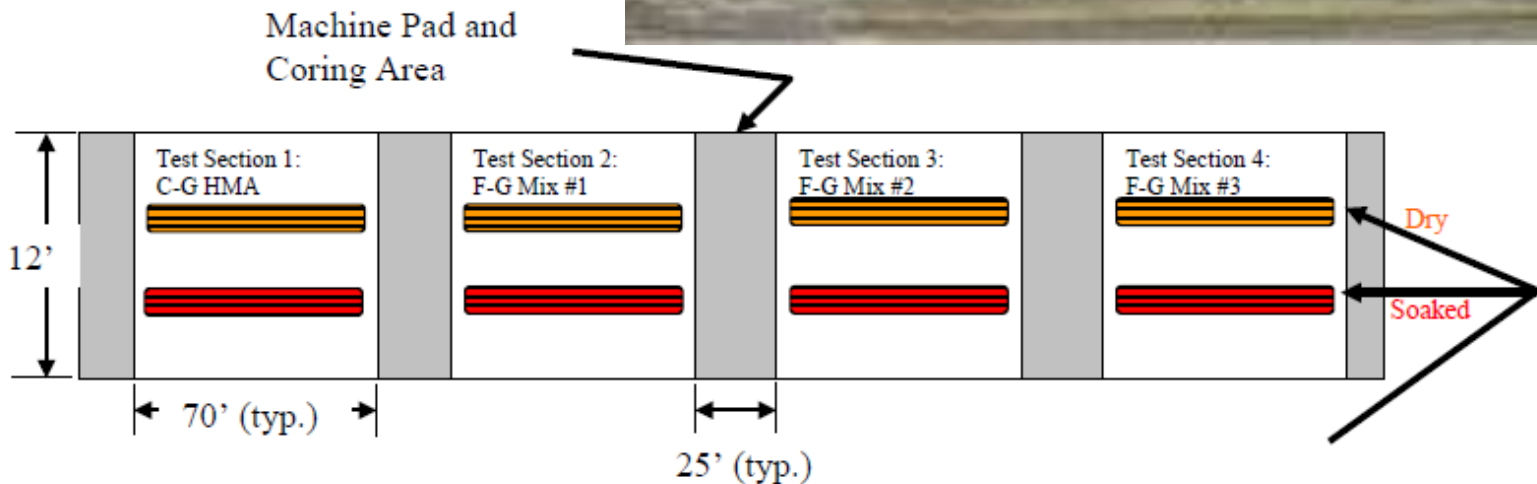
Dr. Bill Buttlar, Tim Murphy, and Bill Pine
Matt Mueller and Laura Shanley

Designing, Producing, and Constructing Fine-Graded HMA on IL Roadways

- Develop fine-graded (F-G) HMA mix designs
- Test in lab (rutting, fatigue, thermal cracking, moisture susceptibility)
- Construct mixes in field and conduct accelerated load testing

Designing, Producing, and Constructing Fine-Graded HMA on IL Roadways

ATLAS -
Accelerated
Transportation
Loading System



Designing, Producing, and Constructing Fine-Graded HMA on IL Roadways

- Completion Date – 12/31/2011
- What can we expect?
 - Recommendations for the development/refinement of F-G HMA spec
 - Recommendations for new aggregate gradations, if necessary

R27-37

Impact of High RAP Content on Pavement Structural Performance

Dr. Sam Carpenter and Dr. Imad Al-Qadi

Jim Trepanier

Impact of High RAP Content on Pavement Structural Performance

- Characterize properties of mixes with high RAP and with no RAP
- Evaluate durability
- Examine effect of single and double grade bumps

Impact of High RAP Content on Pavement Structural Performance

- Completion date – June 30, 2011
- What can we expect?
 - Knowledge of impact of higher RAP percentages on mix properties
 - Spec revisions to accommodate usage of greater RAP percentages with respect to design and construction

R27-78

Evaluating the Effects of Various Asphalt Binder Additives/Modifiers on Moisture Sensitivity in HMA

Dr. Imad Al-Qadi

Jim Trepanier

Evaluating the Effects of Various Asphalt Binder Additives/Modifiers on Moisture Sensitivity in HMA

- Determine the effects of additives/modifiers
- Additives/Modifiers
 - Liquid anti-strip
 - Hydrated lime
 - SBS
 - Poly-phosphoric acid
 - Foamed binder

Evaluating the Effects of Various Asphalt Binder Additives/Modifiers on Moisture Sensitivity in HMA

- Completion Date – 8/15/2012
- What can we expect?
 - Documented performance of asphalt binder additives/modifiers on HMA pavements
 - Recommendations for specification changes as necessary

R27-100

Best Practices for Implementation of Tack Coat TRP Recommendations

Dr. Imad Al-Qadi, Dr. E. Mahmoud, and Bill Pine
Derek Parish

Best Practices for Implementation of Tack Coat TRP Recommendations

- Tack Coat Optimization For HMA Overlays
 - Lab and field/ATLAS testing
 - Questions remained
- Identify best methods for
 - Applying tack coat at the verified rate to optimize tack coat material
 - Pavement cleaning equipment

Best Practices for Implementation of Tack Coat TRP Recommendations

- Completion Date – 3/15/2013
- What can we expect?
 - Information on tack coat material selection, optimum rate for various interfaces, surface cleaning methods, application equipment, in-place application rate measurement
 - Recommendations for specification changes as necessary

Questions?

