

RESEARCH PROGRAM

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WVDOT - Research Section

- ▶ Part of Division of Highways/Planning Division
- ▶ Funded with SPR Funds
- ▶ State Match 80/20 or 50/50
- ▶ Part of the SPR Work Program
- ▶ Minimum 25% of SPR Budget

WVDOH Research Section

- ▶ Administers Federally or State funded research activities
- ▶ Generally, use West Virginia Universities
- ▶ Approximately \$2.7M per year available for research
- ▶ Most “Problem Statements” are generated internally to find solution(s)
- ▶ Participates in “Pooled Funded” research projects
- ▶ Serves on TRB’s RAC

WVDOH Research Section

- ▶ Participates in Peer Exchanges
- ▶ Funds American Association of State Highway Transportation Officials (AASHTO), Transportation Research Board (TRB), Local Technical Assistance Program (LTAP), National Cooperative Highway Research Program (NCHRP)
- ▶ Attends TRB and other Research Related Conferences

Research Selection Process

- ▶ Solicitations Opened to Internal Submissions
- ▶ Application for Funding is Submitted
- ▶ Research Staff Reviews for Previous Similar Studies
- ▶ Research Advisory Committee (RAC) Receives Applications
- ▶ RAC Selects Projects to Move Forward
- ▶ RFPs are Advertised for Interested Parties to Submit
- ▶ RAC Recommends Proposals to Management for Approval
- ▶ SOW Defined and Priced

Internally Generated Problem Statements

- ▶ Evaluation and Recommendations to the WVDOT's Seeding and Mulching Processes and Specifications RP-293
 - ▶ Developed Standard Process for the Selection of Seed Mixtures
 - ▶ Divide State into Geographic Regions to Apply Seed Mix
 - ▶ Develop Recommendations for Soil Testing
 - ▶ Determine Seed Mixture given Constraints
 - ▶ Determine if Seed Mixtures include grasses that are common food source for deer
 - ▶ Identify needs for Mulching and Additives
 - ▶ Create Specification(s) for Use in Construction

Internally Generated Problem Statements

- ▶ Thermal Stress Analysis of Mass Concrete Structures
 - ▶ Purpose is to Develop Mass Concrete Definition Tables that Reduce Thermal Cracking
 - ▶ Used for Common Types of Pier-caps
 - ▶ Used five different mix designs
 - ▶ Technical Advisory Group Contained Industry Representation
 - ▶ Research Results used for Kanawha River Crossing

Pooled Funded Research

- ▶ Clear Roads
 - ▶ Analyzes Winter Maintenance Operations
 - ▶ Focuses on Testing of Materials, Equipment and Methods
 - ▶ Provides for the State to be Part of the Technical Advisory Committee
 - ▶ Select Different Projects to Evaluate Each Year

Pooled Funded Research

- ▶ Clear Roads Technical Committee
 - ▶ Inform the Clear Roads research agenda by proposing topics for future projects.
 - ▶ Help prioritize and select projects for funding.
 - ▶ Evaluate technical proposals for conducting the research from academic and private-sector investigators.
 - ▶ Serve on subcommittees that oversee the research projects.
 - ▶ Meet with other professionals from around the country to discuss winter maintenance issues and share state practices.

Pooled Funded Research

- ▶ Roadside Safety Research of Manual for Assessing Safety Hardware (MASH) Implementation
 - ▶ Minimize the Likelihood of Serious Injuries when a Motorist Leaves the Roadway
 - ▶ Facility in Olympia, Washington
 - ▶ Intensive Testing Facility for Crash Testing Different Vehicles and Safety Devices
 - ▶ Uniform Guidelines for Testing
 - ▶ Cable Barriers, Jersey Barriers, Guardrail, Crash Cushions, Signs and Posts
 - ▶ Median Crossover Protection

Pooled Funded Research

- ▶ Applications of Enterprise GIS for Transportation
 - ▶ National Transportation Framework (AEGIST)
- ▶ Develop and Support Transportation Performance Management Capacity Development Needs
- ▶ Technology Transfer Concrete Consortium
- ▶ National Center for Asphalt Technology (NCAT)

Additional Research Duties

- ▶ Bicycle/Pedestrian Coordinator
- ▶ Electric Vehicle Program (NEVI Development)
- ▶ Autonomous Vehicles

Pretreatment of Roadways

- ▶ Pilot Selected Beet Juice as a pilot project
- ▶ Knew about beet properties from mining industry
- ▶ Tried to bid out delivery of beet juice
 - ▶ No bids received
 - ▶ Obtained three verbal bids
 - ▶ Were able to award contract to SNF, Inc.

Salt

- ▶ Salt is corrosive to infrastructure and vehicles
- ▶ Runoff into streams, lakes and water table
- ▶ Damaging to vegetation
- ▶ Only effective to around 15 degrees
- ▶ Brine mixture of 23% salt greatly reduces amount of salt used
- ▶ Agricultural by-products are available that reduce salt use, while improving performance

Sugar Beet

- ▶ 55-60% of the sugar produced in U.S
- ▶ 20% of the sugar worldwide
- ▶ “Juice” is the by-product after most of the sugar has been extracted
- ▶ Freeze point of -40 degrees

Beet Juice Project

- ▶ Trial in District 8
 - ▶ Mixing 70% salt brine with 30% beet juice
 - ▶ Anti-icing
 - ▶ De-icing
 - ▶ Adding straight beet juice to prewet salt



Tucker County

- ▶ Two Identical Storms
 - ▶ 1st storm - pretreated with beet juice/brine mixture
 - ▶ Used 5,400 gallons during storm
 - ▶ Could plow twice before reapplying
 - ▶ 2nd storm - Used straight salt brine
 - ▶ Used 9,800 gallons during storm
 - ▶ Had to reapply brine after each plow

Tucker County

- ▶ Clean-up After Storm
 - ▶ Applied beet juice/ brine to one lane and salt to the other
 - ▶ The lane with beet juice/brine was clear in just over an hour
 - ▶ The lane with salt took over 2-1/2 hours to clear

Tucker County

- ▶ During a Big Storm
 - ▶ Prewet salt with beet juice
 - ▶ Performed better
 - ▶ Plowed easier
 - ▶ Stayed in lane

Tucker County

- ▶ Pretreat
- ▶ Salt Brine in southbound lane
 - ▶ Did not plow to clear asphalt
- ▶ Beet juice/brine in northbound lane
 - ▶ ¼” less snow
 - ▶ Plowed to clear asphalt

Randolph County

Closed section between Elkins and Kerens

- ▶ Treated one lane with salt brine
- ▶ Treated other lane with beet juice/brine
 - ▶ Much quicker - Noticeable melting within 15 minutes



Issues

- ▶ Learning Curve
 - ▶ Needs filtering
 - ▶ Warm temperatures - Decomposes and coagulates
 - ▶ Can not mix ahead of time - will separate

