RESEARCH AT NEVADA DEPT OF TRANSPORTATION

NEVADA TRANSPORTATION CONFERENCE

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PRESENTATION OVERVIEW

- Federal and State funding of Research
- What has Research given NDOT
- NDOT's Research Program
- Past Research/Current NDOT Research
- Future Research Submittal
- Conclusion

Why Research?

- Research has gotten us…
- Research during my Construction years
  - My Thoughts Prior to 2008 - Lots of money that could be used for infrastructure projects
- Research as Chief Materials Engineer – TRB Annual meeting (Research Clearing house), NDOT Research (Research Advisory Committee), Product Evaluation Committee (QPL) and UNR

Federal/State Research funding

- Federal-MAP 21
  - Highway Research and Development Program
    - $115 Million for 2013 and 2014 (20% match)
  - Technology and Innovation Deployment Program
    - $62 Million for 2013 and 2014 (20% match)
- Other Federal Research Programs
  - Transportation Research Board-Goal is provide Research and information exchange…

Funding Continued

- State of Nevada
  - NDOT receives $2 Million Annually for Research, with $400,000 being state funds (20% match)
    - NCHRP $380,000
    - TRB $80,000
    - SHRP2 $70,000 (Planning $210,000)
    - Research Division Salaries $350,000
    - Product Evaluation $100,000
    - Remaining goes to: $1,020,000
      - Pooled funded projects, new/on-going NV research projects

What has Research given NDOT

- Cold-In-Place Recycling – Long Term Performance on rural roads
- Seismic Retrofitting of Bridges
- Seismic Connections of Bridges
- Rut resistant/intersection mixes
- Joint density specification
- Polymer Modified asphalt
- Lime marination

NDOT Research Program

- How are Research Projects selected?
- Proposers develop problem statements… find Champions.
- Meetings with proposers
- Problem Statements are submitted to NDOT
- Research Advisory Committee (RAC) – receives proposals early Spring (77 submitted in 2014)

NDOT Research Continued

- Problem Statements are ranked by RAC
- Spread selection out amongst NDOT Divisions
- Number is based on quality of proposals, value to NDOT and continuation of previous Research Projects
- Approved Problem Statements sent out for 2nd round as Full Proposal

NDOT Research Continued

- Full Proposal's are evaluated by RAC, then sent to Research Management Committee (RMC)
- RMC approves 5 to 10 Problem Statements for funding
- Best submittal is selected
  - Criteria:
    - Understanding problem statement, Schedule, Cost, Benefits, Experience in field

NDOT Research Projects

- MSE Backfill study in Clark County
  - 174 MSE Walls in Nevada
  - MSE Wall straps were corroding due to backfill
  - Changed backfill test to AASHTO test method
  - Placed steel coupons in MSE Walls monitoring corrosion.
- MSE Walls using Geosynthetic straps
  - Are Geosynthetics usable in Nevada

NDOT Research Projects

- Effectiveness of wildlife crossings on US 93 north of Wells
  - Estimated 300 animals per year are hit (yes, the structures are being used)
  - 7,000 animals per year are using these crossings
- Speed reduction through small towns
  - Towns want slow traffic and traffic wants to go fast
  - Safety is number one

NDOT Research Projects

- Evaluation of Bridge Columns After an Earthquake
  - Nevada is 2nd most active state in nation
- Signal Timing
  - 20% of all car crashes occur at intersections
- Evaluation of Geometric Design on I-15 through Las Vegas
  - What could be done using ITS to make it safer

NDOT Research Projects

- Reducing Aggregate Base depth using Geotextile
  - Correct problems with shallow utilities, drainage features or cost savings.
- Pervious Concrete
  - Collect fines from entering the lake produced by erosion or ice control.

NDOT Research Projects

- Long Term Pavement Performance sections
  - Currently submitting for two Warm Mix Sections
- Compare different sediment measuring tools for calculating the quantity of fines that reach Lake Tahoe
  - Currently use Pollutant Load Reduction Model, does not account for cut, fill slopes
  - Try new tool that is used on California side of Basin

NDOT Research Projects

- Post Tensioning of Bridges
  - A number of Nevada's bridges cracked near the post tensioning ducts during stressing.
- Self Consolidating Concrete (SCC)
  - NDOT has used SCC in drilled shafts with some success and some failure, this research will use local materials and required admixtures and give NDOT recommendations for successful SCC.

NDOT Research Projects

- Evaluation of the Benefits of Open Graded Friction Course In Nevada
  - Open Grade is it worth the cost?

Submitting Problem Statements and Full Proposals

- Problem Statements or Full Proposals can be submitted by anybody/firm, but…
- Make sure the problem statement is well defined and the “Researchers” will get results
- Material Suppliers use Product Evaluation Coordinator for material usage on NDOT projects

Conclusion

- Research is:
  - Supported by the Federal Government
  - Great tool for new products, systems, ideas
  - NDOT has benefited significantly from this opportunity in many areas of a Highway Lifecycle

QUESTIONS?