Climate Change: A Pilgrim’s Progress at MaineDOT

with a focus on Water Resources

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Pilgrim: a traveler to a holy place

• That holy place: *a safe and efficient* transportation system that complies with all applicable Federal and State laws

• The big picture: this already captures Climate Change concerns
  – Just need some minor clarification and guidance
  – And maybe a little push
  – And maybe (more than) a little $$
Runoff & Sea Level Rise in Maine: A Two-Headed Beast

- Runoff: hydraulic capacity issue
- SLR: asset elevation issue

The Bad: A Coastal State

The Good: Not Urban
Culverts have been our biggest challenge

Solution: apply bridge hydraulic design standards to culverts
Riverine Peak Flows: Where We’re At …

• A Good Place …
  – Conservative standard: $H_w/D = 1 @ Q100$
  – Conservative design assumption
    • Steady flow assumption
  – Up-to-Date Methods
    • Regression equations & StreamStats
    • Design rainfall curves (used less often)
  – Indications in Peak Flow Data
    • Trends? Inconclusive …
    • Ongoing research (Collins, Hodgkins, NCHRP)
    • Our biggest need for research & guidance

Freeport, ME 2008
Tidal Settings & SLR

• **Consider SLR**
  - Project by project

• Data trend: about 1 ft / 100 yrs at Portland

• Model projections: *as much as 6’* in next 100 yrs

• *Maybe the weakest part of MaineDOT’s response to climate change*

• Elevation Problem
  - Asset
  - Surrounding roads & land
The Executive Order & Federal Flood Risk Management Std

• Briefly …
• We are pretty close already
• Some minor tweaking and we can make a good case that we are compliant
A New (for us) Way of Looking at Things

• *Programmatic* Risk (Judy Gates)
  – *Underpins our several FHWA Pilot Projects*
  – Not primarily engineering or technical
  – Assume the technical challenges can be met

• Climate Change is just one more *risk* that moves us away from business as usual

• Look at these risks systematically
  – To better manage them
  – Eliminate the surprises
But Some Things Still Drive Me Nuts

• We try to do the right thing
• But what are we to do with language like
  • “… more frequent, more intense storms …”
  • “… climate change may increase peak flows …”
  • “… SLR could be 500’ 100 yrs from now …”
• Lots of “could”, “may”, “suggest”
• Easy to say, difficult to act on in a responsible manner
KEEP CALM – DON’T WORRY

• Use up-to-date methods
• View the WHOLE context
• (Maybe) Build (slightly) bigger & higher structures