Alaska Department of Transportation & Public Facilities

Accelerated Bridge Construction in Alaska

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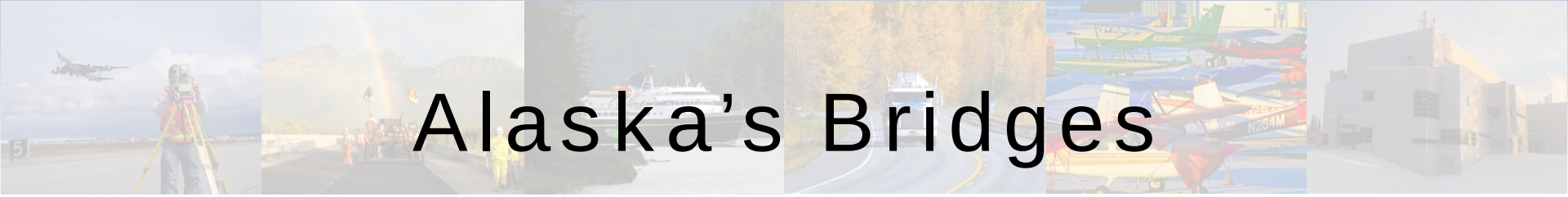


Alaska's Bridges

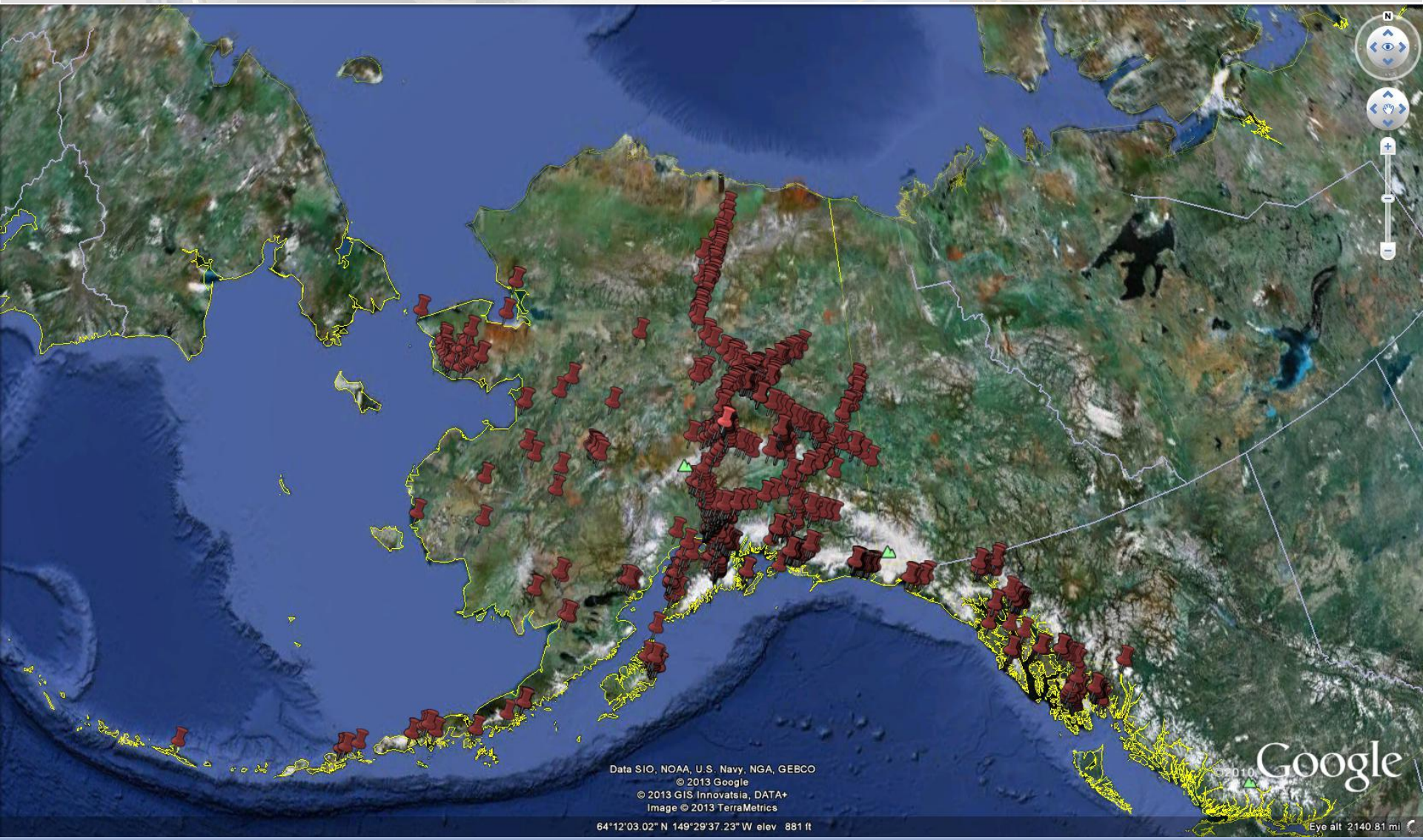
Only…

- ~1,000 bridges
- ADTs from 10 to 60,000

But…

- Spread over area of 1/5 of contiguous US
- ~20% of bridges are remote (i.e. not accessible on road system)
- NO detours available in many places
- "Engaged" oil and trucking industries

Alaska's Bridges



Why bridges can’t be closed

“Minor” Constraint

- Usually just 3 months of good weather and daylight

Typical *Highway* Work Zone

ABC that fits our needs...

Temporary Bridges

Build Ahead of Time

- Prefabricated Bridge Elements and Systems (PBES) such as:
  - Precast Decked Bulb-Tee Girders
  - Precast Deck Panels (steel bridges)
  - Precast Pier Caps
  - Precast Soldier Pile Lagging
  - Precast Backwalls (past practice)

Decked Bulb-Tee Girders

- High strength (≥ 8,000 psi)
- Quality control
- Cost-effective (made in Anchorage)
- Design for zero tension

Decked Bulb-Tee Girders

- Still require 7 days for rail curb pour/cure
- Require crane(s), heavy to transport

Precast Deck Panels

- Remote jobs
- Grout keys used

Precast Deck Panels

- CIP rail for continuity
- Leveling screws helpful
- Place in similar sequence to CIP deck

Precast Pile Caps

- First use with our bent system
- Concerns: Tolerances and seismic behavior

Polyester Concrete

- Experimental Features project
- Minimize flagger or one-way signal times from 7 days to 1 day
- Inconclusive Results

Alternate Contracting Methods

- Design-build = ~10-12 projects
- Construction Manager/General Contractor (CMGC) = 1 underway, 1 in planning

Design-Build Experiences

- Poor quality products
- Lack of seismic/local knowledge
- “Hand holding” costs State time/money
- Local contractors not set up for many innovative methods

CMGC Experiences

- Better than Design-Build
- Validated current design/construction practices
- Offered knowledge transfer

CMGC Experiences - Cost

- DOT&PF, ICE, and Contractor develop Guaranteed Maximum Price (GMP)
  - Agreement reached = proceed to construction
  - No agreement reached = proceed to competitive bid

	Total Basic Bid				
Organization	50% Design	75% Design	100% Design	GMP	Percent Change from 50% Design to GMP
DOT&PF (Engineer's Estimate)	$11,946,036	$10,380,355	$11,714,376	$11,714,376	-2%
Hamilton Construction Company	$13,622,225	$10,543,432	$11,183,230	$10,727,261	-21%
Stanton Constructability Services (ICE)	$17,321,540	$11,063,780	$9,019,069	$10,110,029	-42%

CMGC Experiences - Cost

- No Change Orders
- Cost Certainty
  - Added extra 400-ft of paving at 75%
- Construction Staging
  - Upfront coordination allowed for use of NPS parking lot as staging area
- Time Savings = $$ Savings
  - Reduced construction season from 2 years to 1 year
  - Reduced design level of effort
  - Improved internal & external timelines

When to Use CMGC

- Constructability issues
- Innovations in schedule, cost, risk mitigation, materials & technologies
- Early or accelerated construction
  - Example: Early construction of frontage roads in access control project
- Risk of project changes due to unknowns
  - Example: Bridge foundations
- Complicated/high profile permitting or traffic control issues
- Fixed funding
  - Example: GO Bond projects

Questions/Answers

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