BRIDGING THE GAP:
BRIDGE DESIGNER TO PROJECT MANAGER

Jim Earl, PE  INDOT
Dan Thatcher, PE  HNTB
AGENDA

• Goal
• Bridge Design to Project Development
• Other Disciplines
• Career Stories
GOAL

• Designers considering moving out of pure design role
• How to translate to Project Management
• Does my experience so far help – just how different is it?
BRIDGE DESIGN PROCESS

• Design Criteria
• Geometry
• Loading
• Superstructure
  • Slab, Beams, Bearings
• Substructure
  • Cap, Column, Footing
• Plans
  • Sections, Elevations, Details
BRIDGE DESIGN

• Design Criteria
• Geometry
• Loading
• Design
  • Superstructure
    • Slab, Beams, Bearings
  • Substructure
    • Cap, Column, Footing

• Plans
  • Sections, Elevations, Details

PROJECT DEVELOPMENT

• Project Intent
• Survey
• Geometrics (Road)
• Impacts
  • Environmental
  • Drainage
  • Utilities
  • Geotech
  • Right of Way
  • Maintenance of Traffic

• Final Contract Documents
IMPACT OF OTHER DISCIPLINES

• Utilities
IMPACT OF OTHER DISCIPLINES

• Environmental
  • NEPA process establishes the Project Purpose and Need
  • Evaluates alternatives and measures impacts (human and natural)

• Document Types
  • Categorical Exclusion (CE) → from 4-6 weeks up to 6-12 months
  • Environmental Assessment (EA) → from 4-6 months up to 12-18 months
  • Environmental Impact Statement (EIS) → from 9-12 months up to multiple years (10+)

• Correlation: NEPA ↔ SST
IMPACT OF OTHER DISCIPLINES

• Permitting
  • USACE 404 Clean Water Permit → from 4-6 months up to 12-18 months
  • IDEM 401 Water Quality Certification → from 3-4 months up to 4-6 months
  • IDEM Rule 5 Storm Water Prevention Plan → from 3-4 months up to 4-6 months
  • IDNR Construction in a Floodway Permit → from 3-4 months up to 4-6 months
  • Others (FAA, FCC, Local Drainage Boards, etc.) → up to 2 years

• Impact of going to construction without permits
  • Project-wide risk assessment
  • Targeted areas for construction
IMPACT OF OTHER DISCIPLINES

• Real Estate
  • Right-of-Way Engineering ➔ done during design
  • Appraising ➔ 2-4 months per parcel
  • Buying ➔ 1-2 months per parcel
  • Condemnation ➔ up to 6 months for clearing (case could last years)
  • Relocation ➔ 2-6 months per parcel
  • Demolition ➔ typically done during construction

• All activities occur sequentially, but also concurrently ➔ takes 12+ months

• R/W is almost always the “Critical Path” to completing a project
IMPACT OF OTHER DISCIPLINES

• Maintenance of Traffic
  • Various methods
    • Full closures
    • Lane closures
    • Detours
    • Runarounds
    • Phased construction
    • Combination
  • Requires local input and coordination (schools, EMS, local festivals, etc.)
  • Some additional construction activities may be needed in advance of main contract, including shoulder widening/strengthening, radius improvements, temporary signals
  • Main indicator for success is communication and early coordination

• Correlation: MOT ↔ PFC
CAREER STORY - JIM

- Education
  - High School in Noblesville, IN
  - BSCE/MSCE at Purdue
  - Emphasis in Structural Engineering

- Private sector work
  - Beam, Longest, & Neff
  - HNTB

- Public sector work
  - Hamilton County
  - INDOT
"Learning the ropes ..."

- Summer Intern
  - Starting to learn how work gets done
  - Learning roles and responsibilities
  - Understanding contracts

- Lessons Learned

  *Everyone has a role to be played.*
  *Being helpful isn’t always helpful.*
CARER STORY - JIM

“My first REAL JOB!”

• Not exactly what I had in mind
  • Small structure inspections
  • Bridge inspections
  • Bridge inventories

• More like I envisioned
  • Bridge design
  • Plan development

➢ Lessons Learned

There are important ways to learn other than books.
You may not like what you thought you would.
CAREER STORY - JIM

“Branching out and finding my niche ...”

• More to engineering than designing bridges
  • Roadway design
  • Hydraulic design
  • Design review
  • CADD development

• Discovering strengths and weaknesses
  • First career setbacks
  • Balancing personal and professional

Lessons Learned

Each person defines professional success differently. Balance is important to sustaining happiness.
Your happiness on the job has very little to do with the work itself. Never follow your passion, but always bring it with you. (Because) when it comes to making a living it’s easy to forget the dirty truth: Just because you’re passionate about something doesn’t mean you won’t suck at it. And just because you’ve earned a degree in your chosen field, it doesn’t mean you’re going to find your ‘dream job.’

- Mike Rowe, host of Dirty Jobs
“Establishing myself ...”

- Senior Project Manager
  - Multiple projects throughout Indiana
  - SR25 Hoosier Heartland Highway
  - US231 Bypass around Purdue
  - I-69 Section 6 (NEPA Co-Project Manager)

- I-69 Section 6 Delivery Director
- IDIQ Statewide Program Director

Lessons Learned

Find ways to optimize the abilities of everyone your work with.
Continue to challenge your comfort zone to find other niches.
CAREER STORY - DAN

• Education
  • High School in Bloomington, IN
  • Undergrad at Purdue
  • Co-op with Wiss Janney Elstner in Chicago
  • Masters in Structural Engineering at Texas

• Started at HNTB in Indianapolis in 2000
  • Bridge Designer

• Most important result of my job ...
CAREER STORY - DAN

- Bridge Designer and Cadd Technician
- Lead Bridge Design
  - One Bridge
    - Focused on bridge design
  - All bridges on a project – intersect with
    - Road
    - Hydraulics
    - Geotech
- All bridges on a Design Build project
  - Maintenance of Traffic
  - Utilities
CAREER STORY - DAN

- Design + Manager
  - Lead all structures on D-B project
  - Environmental
  - Right-of-Way
- Responsible for budget
- Increased client interaction
CAREER STORY - DAN

• Project Manager
  • Bridge Projects

• Small Structure Projects

• Road Rehabs
• Slide Corrections
• Intersection Improvements

• Large Interstate Projects
CONTACT INFO

• Jim Earl, PE – INDOT
  • jearl@indot.in.gov
  • 317-233-2072

• Dan Thatcher, PE – HNTB
  • dthatcher@hntb.com
  • 317-636-4682
Bridging the Gap Africa is a non-profit constructing footbridges in sub-Saharan Africa to save lives and improve access to education, health care, and economic opportunity. BtGA believes that marginalized African communities should not suffer from the dangers posed by impassable rivers. To learn more please visit us at: [http://bridgingthegapafrica.org/](http://bridgingthegapafrica.org/)
Or please feel free to contact Burleigh Law at [blaw@hntb.com](mailto:blaw@hntb.com) or (317)636-4682