Design Staging Issues

What have GDOT designers considered?
Interstate Maintenance Projects

Construction

- I-20 W  (FY2006)
- I-20 E  (FY2007)
- I-85   (FY2006)
- I-185  (FY2006)
- I-75   (FY2006)
Interstate Six-Lane Widening Projects

- **I-75**
  - FY2006/2007
  - 4 projects
  - 26 miles
  - 2 Interch.
  - 7 Overpass
  - $226 million

- **I-95**
  - FY2006
  - 4 projects
  - 26 miles
  - $259 million

- **I-85, North**
  - FY2007-2012
  - 10 projects
  - 60 miles
  - $400 million

- **I-85, South**
  - FY2007/LR
  - 2 projects
  - 27 miles
  - $138 million

- **I-24**
  - Long Range
  - 1 project
  - 6 miles
  - $27 million

- **I-85, South**
  - 2 projects
  - 27 miles
  - $138 million
GET IN – GET OUT

- The “motto” for every major interstate project which GDOT undertakes from design through construction
- Basically, it means design a project that can be done in the least amount of time yet will function for the longest time period with the least amount of maintenance
Items Considered

• Safety - How can the project be built, yet minimize conflicts between traffic and the construction effort.

• Time - What method or methods can be utilized to shortened the total construction period

• Cost – How can the project be built for the most efficient long term product
Safety

• First and foremost the most important factor in developing staging plans
• Eliminating conflicts between the construction efforts and traffic
• Providing means for effective project access through or to emergency situations
Time

- What method or methods can be utilized to shortened the total construction period?
- GDOT strategy “GET IN - GET OUT” – effectively build the project as quickly as possible without compromising the long term effectiveness of the roadway.
- Develop staging plans that minimize traffic shifts, build permanent rather than temporary structures.
Cost

• Look to long term costs rather than short term costs when developing what to build
• Is the cost of removing temporary items (i.e. pavement) more cost efficient than permanent items
• Consider time not only in the sense of construction time, but also delay to the users of the facility as costs
Staging Items of Concern

- Pavement Type Selection
- Pavement connection/design
- Access Issues
CONTRA-FLOW TYPICAL
STAGE 1

STAGE 1
1. SHIFT INTO ONE LANE OF TRAFFIC IN DIRECTION OF CONSTRUCTION.
2. CONSTRUCT 14' OUTSIDE SHOULDERS AND SLOPE.
3. CONSTRUCT 10' INSIDE SHOULDER AND SLOPE.
CONTRA-FLOW TYPICAL

STAGE 2

1. SHIFT ONE LANE OF TRAFFIC ACROSS AND MAINTAIN TWO LANES OF TRAFFIC IN OPPOSITE DIRECTION.
2. CONSTRUCT 12' INSIDE TRAVEL LANE.
3. CONSTRUCT 10' INSIDE SHOULDER AND SLOPE.
1. Shift one lane of traffic and maintain two lanes of traffic in opposite direction.
2. Construct 12' outside travel lane.
STAGE 4

1. SHIFT ONE LANE OF TRAFFIC ACROSS AND MAINTAIN TWO LANES OF TRAFFIC IN OPPOSITE DIRECTION.
2. CONSTRUCT 12' INSIDE TRAVEL LANE.
3. CONSTRUCT 10' INSIDE SHOULDER AND SLOPE.
CONTRA-FLOW TYPICAL

STAGE 5

1. SHIFT ONE LANE OF TRAFFIC AND MAINTAIN TWO LANES OF TRAFFIC IN OPPOSITE DIRECTION.
2. CONSTRUCT 12' OUTSIDE TRAVEL LANE.
I-75 Typical Section
Staging / Concrete Pavement
Construction Phasing

• Can PCC Pavement be a viable option for reconstruction and widening?
• What is the safest way to phase the construction and minimize it’s impact to the traveling public?
• How best are the worker and inspector protected?
Full Depth Replacement of PCC Pavement on I-75

• First Project: 9 Miles of reconstruction and widening, including 3 interchanges & 1 mainline bridge
• 3 Remaining Projects: 16 Miles & 4 interchanges
NH-75-1(204)01 Cook Co.

- Original Contract Amount: $82,294,734.06
- Value Engineering Savings: $10,332,600.66
I-75 Typical Section
Staging / Concrete Pavement

EXISTING 4-LANE SECTION

STAGE 1A

STAGE 1B

STAGE 2

STAGE 3

STAGE 4

VOID
Is there room for improvement?

• Traffic is isolated
• Elevation differences create construction difficulties
• Contra flow provides limited access for rescue vehicles
• Too much time changing configurations from phase to phase
• Narrow median presents safety issues
I-75 Typical Section
Staging / Concrete Pavement

EXISTING 4-LANE SECTION

STAGE 1

STAGE 2

STAGE 3

STAGE 4

STAGE 1 - TEMP. PAVING

CROSS-OVERS

NOTES:
1. Mark streets on all drawings with white in pocket
2. Use project line for all working drawings
3. Use spacing marks on all construction plans
4. Use notes for construction of location shown
5. Use arrow on location of location shown

USE ON CONSTRUCTION
Advantages of new phasing

• Access to work area increased
• Safety of all improved
• Value engineering opportunity
• Minimizes phasing changes
• Allows work to be fast tracked for timely completion
• Use of Narrower Barrier saves Temporary Pavement
• Use of PCC in lieu of AC as temporary pavement
Disadvantage of New Phasing

• Still isolation in a 5 mile stretch for NB traffic
• Impact of other projects unknown
• Reconstruction of Overpass Bridges hindered by mainline staging
LESSONS LEARNED

• Dirt shoulder is inadequate
• Roadway condition should dictate initial phasing
• Where barriers can be removed, they should be and a shoulder wide enough to allow vehicles to pull off should be constructed
• Isolation areas without emergency pull offs should be minimized. Take drainage into account