Implementation Meeting

Advanced Methodology to Determine Highway Construction Cost Index (HCCI)

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Agenda

- Brief Review
- Recommendations / Discussions

Research Goal

Develop an advanced methodology to calculate Highway Construction Cost Indexes (HCCIs) using historical bid data
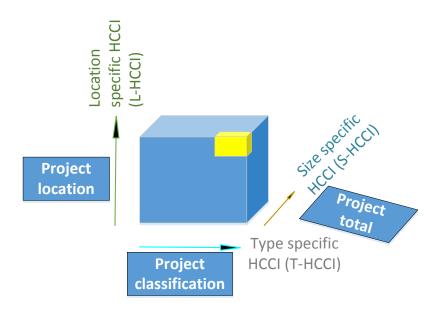
Current MDT HCCI Methodology

- Indexing formula used: Laspeyres (Young) index
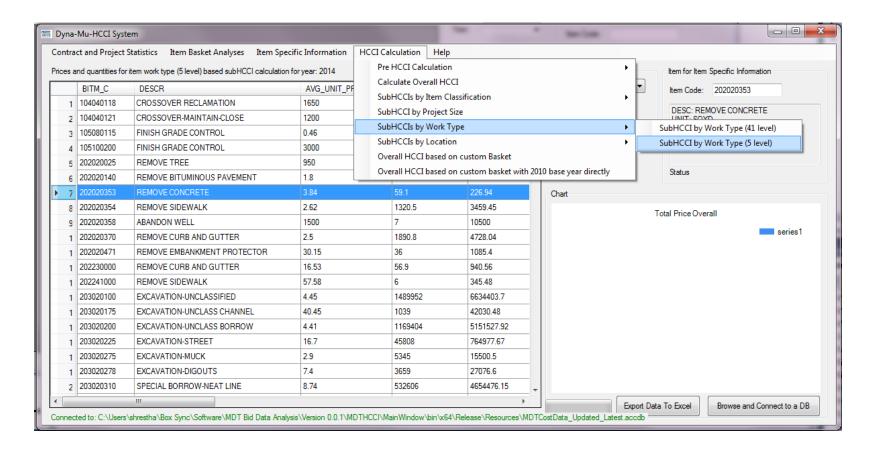- 9 categories of 71 items (2013)

Item categories	Weights (2013)
Excavation	21.18%
Aggregate Base	11.95%
Surfacing	46.38%
Drainage	2.57%
Concrete	3.18%
Reinforcing Steel	1.24%
Bridge	2.85%
Traffic	7.57%
Misc. Items	3.08%
TOTAL	100.00%

New HCCI Methodology

- Chained Fisher Index (FHWA's recommendation)
- Approximately 650 bid items used annually (about 8 times more)
- Covers more than 70% of total construction costs
- Multi-dimensional HCCIs

- Bid data used
  - Data from 2010 to 2014
  - Dollar value: over $1.8 billion
  - Number of projects: 687
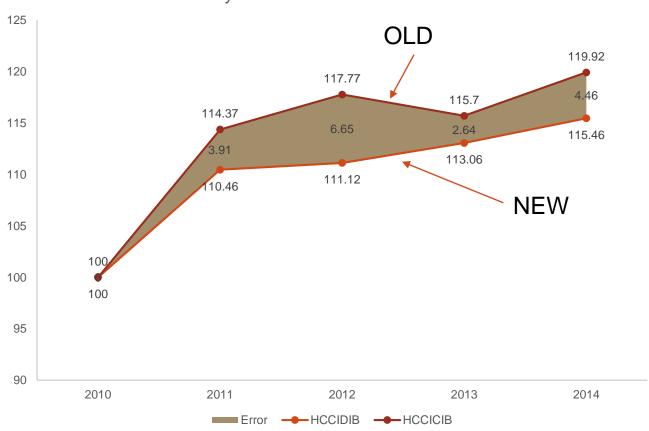 - Number of item records: 33,975

Location specific HCCI (L-HCCI)

Size specific HCCI (S-HCCI)

Project location

Project total

Type specific HCCI (T-HCCI)

Project classification

Dyna-Mu-HCCI System

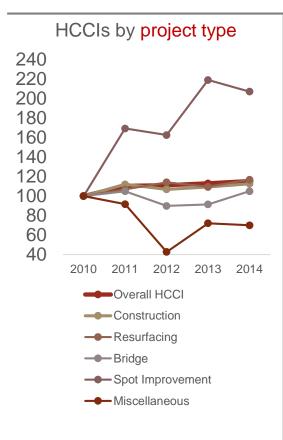- User's manual (Appendix)

MDT - HCCIs

MDT HCCI with Dynamic Item Basket vs Current Item Basket

Multi-dimensional HCCIs

HCCIs by project type

(y-axis: 40, 60, 80, 100, 120, 140, 160, 180, 200, 220, 240; x-axis: 2010, 2011, 2012, 2013, 2014)

- Overall HCCI
- Construction
- Resurfacing
- Bridge
- Spot Improvement
- Miscellaneous

HCCIs by project size

(y-axis: 90, 95, 100, 105, 110, 115, 120, 125, 130, 135; x-axis: 2010, 2011, 2012, 2013, 2014)

- Overall HCCI
- Small (0 - $3,500,000)
- Medium($3,500,000-$10,500,000)
- Large ($10,500,000-$50,000,000)

HCCIs by project location

(y-axis: 90, 95, 100, 105, 110, 115, 120, 125, 130, 135; x-axis: 2010, 2011, 2012, 2013, 2014)

- Overall HCCI
- Glendive
- Billings
- Great Falls
- Missoula
- Butte

Recommendations / Discussions

- Designate a MDT staff member for managing the HCCI system
  - Identify useful and meaningful sub-HCCIs
  - Update and publish those HCCIs in the MDT website annually

- Use new HCCIs for budgeting and early cost estimating
  - Use the average cost increase rate for the past three to five years as the future construction cost inflation rate to account for regional market condition and changes
    - Consider project type, project location, etc.

  - Use the project type HCCIs for determining the escalation rates for ID/IQ projects

Recommendations / Discussions

- In developing engineer's estimates, use the bid item level historical cost trend as a reference

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