

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)

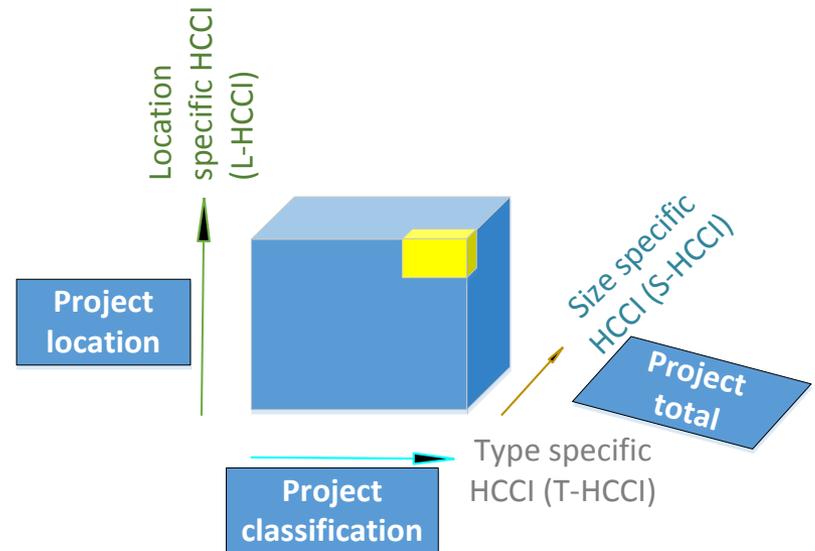
Item categories	Weights (2013)
Excavation	21.18%
Aggregate Base	11.95%
Surfacing	46.38%
Drainage	2.57%
Concrete	3.18%
Reinforcing Steel	1.24%
Bridge	2.85%
Traffic	7.57%
Misc. Items	3.08%
TOTAL	100.00%

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 HCIs

- Bid data used

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



Dyna-Mu-HCCI System

Contract and Project Statistics Item Basket Analyses Item Specific Information HCCI Calculation Help

Prices and quantities for item work type (5 level) based subHCCI calculation for year: 2014

	BITM_C	DESCR	AVG_UNIT_PRICE		
1	104040118	CROSSOVER RECLAMATION	1650		
2	104040121	CROSSOVER-MAINTAIN-CLOSE	1200		
3	105080115	FINISH GRADE CONTROL	0.46		
4	105100200	FINISH GRADE CONTROL	3000		
5	202020025	REMOVE TREE	950		
6	202020140	REMOVE BITUMINOUS PAVEMENT	1.8		
7	202020353	REMOVE CONCRETE	3.84	59.1	226.94
8	202020354	REMOVE SIDEWALK	2.62	1320.5	3459.45
9	202020358	ABANDON WELL	1500	7	10500
1	202020370	REMOVE CURB AND GUTTER	2.5	1890.8	4728.04
1	202020471	REMOVE EMBANKMENT PROTECTOR	30.15	36	1085.4
1	202230000	REMOVE CURB AND GUTTER	16.53	56.9	940.56
1	202241000	REMOVE SIDEWALK	57.58	6	345.48
1	203020100	EXCAVATION-UNCLASSIFIED	4.45	1489952	6634403.7
1	203020175	EXCAVATION-UNCLASS CHANNEL	40.45	1039	42030.48
1	203020200	EXCAVATION-UNCLASS BORROW	4.41	1169404	5151527.92
1	203020225	EXCAVATION-STREET	16.7	45808	764977.67
1	203020275	EXCAVATION-MUCK	2.9	5345	15500.5
1	203020278	EXCAVATION-DIGOUTS	7.4	3659	27076.6
2	203020310	SPECIAL BORROW-NEAT LINE	8.74	532606	4654476.15

Item for Item Specific Information
Item Code: 202020353
DESC: REMOVE CONCRETE
UNIT: SQYD
SubHCCI by Work Type (41 level)
SubHCCI by Work Type (5 level)
Status

Chart
Total Price Overall
series1

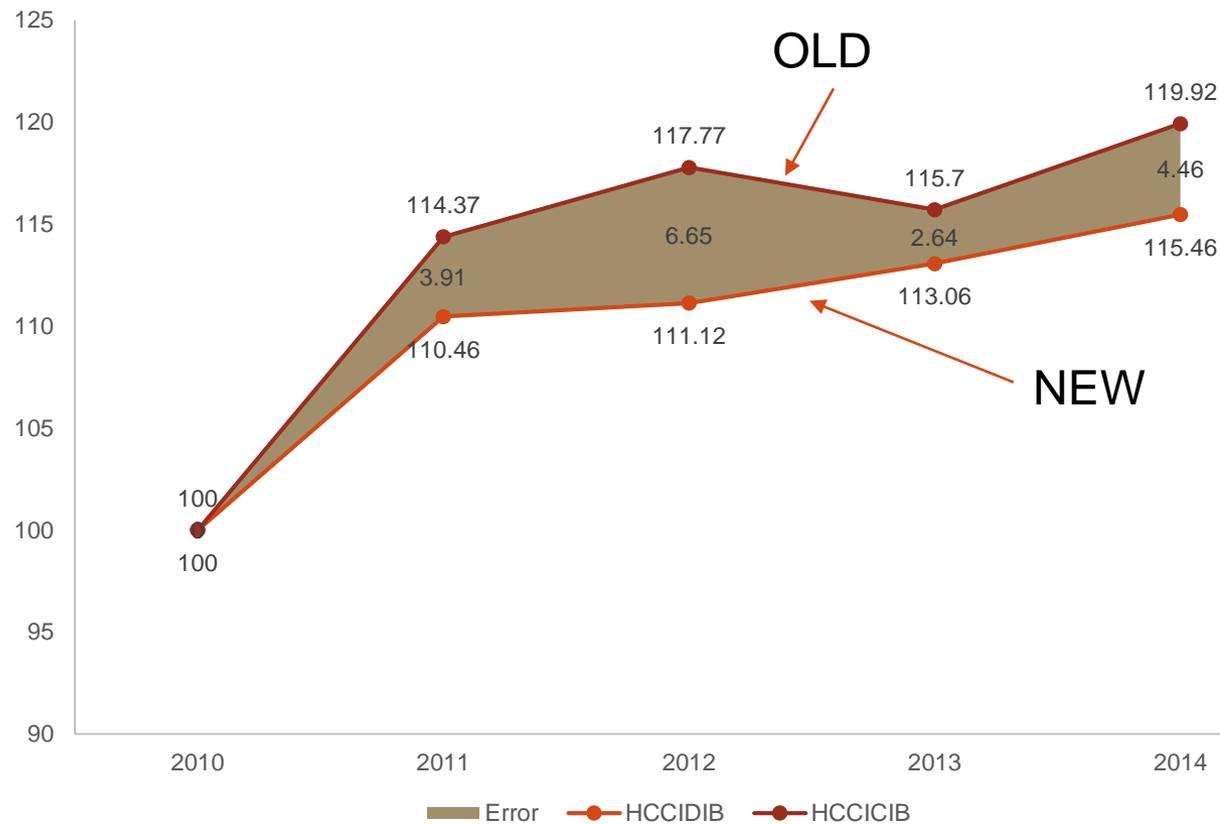
Export Data To Excel Browse and Connect to a DB

Connected to: C:\Users\shrestha\Box Sync\Software\MDT Bid Data Analysis\Version 0.0.1\MDTHCCI\MainWindow\bin\x64\Release\Resources\MDTCostData_Updated_Latest.accdb

- User's manual (Appendix)

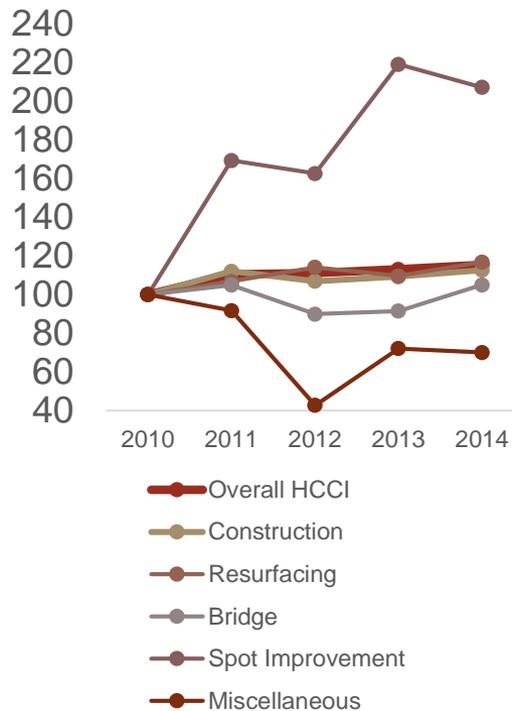
MDT - HCCIs

MDT HCCI with Dynamic Item Basket vs Current Item Basket

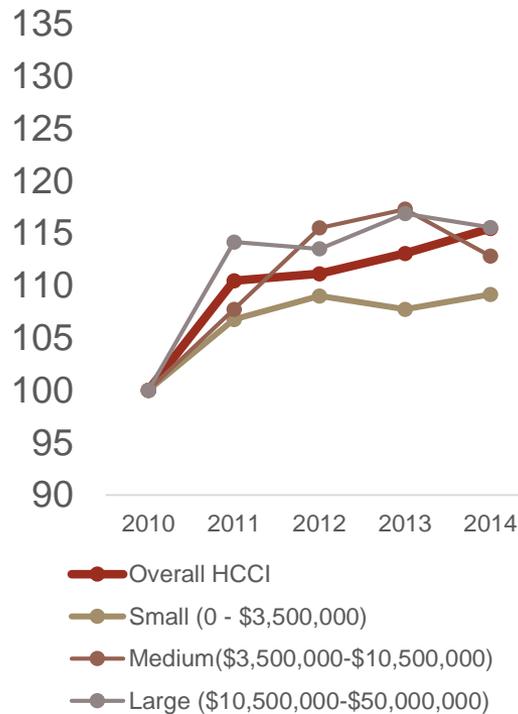


Multi-dimensional HCIs

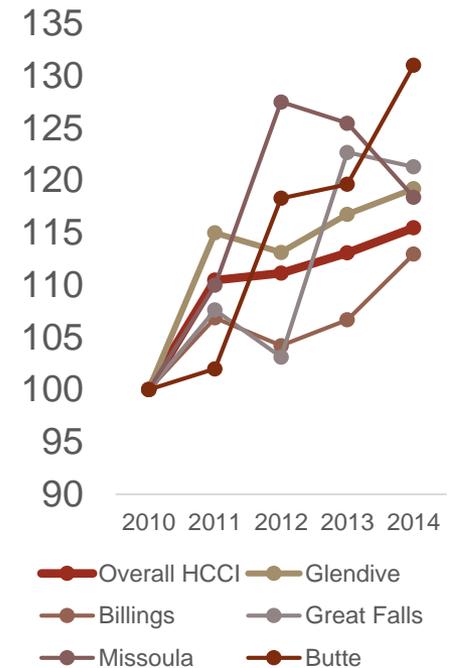
HCCIs by project type



HCCIs by project size



HCCIs by project location



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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