
IMPACT FEE INFLATION INDEX

CALCULATIONS:

NEW PROCEDURES

Regression Analysis Driving
Year-to-Year Percentage Changes

Prepared By:

ROBERT W. BURCHELL, Ph.D.
WILLIAM DOLPHIN, MA; MEGAN SAUNDERS
RUTGERS UNIVERSITY

Prepared For:

NATIONAL IMPACT FEE ROUNDTABLE (NIFR)
UPDATE ON INDEXING
PORTLAND, OREGON
3:45PM TO 5:00PM

11 OCTOBER 2007

Impact Fees

■ **Definition**

Revenue mechanism for government to provide adequate capital infrastructure relative to growth

■ **Indexing**

Keeps impact fees as current as possible by accounting for inflation increases over time

Adjustment of Impact Fees

- States requiring impact fees allow localities to maintain fees at optimal levels by indexing them to inflation
 - California
 - Florida
 - Oregon
 - Washington
 - Texas
 - Illinois
 - Virginia (proffer)

Adjustment in Collier County

- Collier County updates impact fees every 2-3 years with annual mid-cycle indexing. Building costs, land costs, equipment costs and transportation costs are the components of 9 individual impact fees.

Impact Fee	Building Costs	Land Costs	Equipment Costs	Transportation Costs
Parks (Community & Regional)	✓	✓		
Libraries	✓	✓	✓	
Fire Rescue			✓	
Schools	✓	✓	✓	
Roads		✓		✓
Jails	✓			
EMS	✓	✓	✓	
Government Buildings	✓	✓		
Law Enforcement	✓	✓	✓	

Indexing in Florida

- Impact fee indexing has been done simply and elegantly for over a decade.
- Impact fee initiators (counties) begin to realize that simple/elegant approaches may not give appropriate answers. Some look to more complex yet less elegant techniques.

Common Inflation Indices (I)

- **Consumer Price Index (CPI)** – day-to-day inflation in prices as experienced by consumers
- **Producer Price Index (PPI)** – the direction and magnitude of price changes for finished goods.
- **Turner Construction Index** – national index for building cost increases – strictly at the national level

Common Inflation Indices (II)

- **Engineering News Record (ENR)** – national index of building cost increases using 30 city average and these individual costs as local average
- **RSMeans Index** – national index of building cost increases using 30 city average and these individual costs as local average
- **Land costs** – “just value” (equalized) changes in year-to-year land prices over time
- **Transportation costs** – bid sheet cost comparisons of similar projects over time

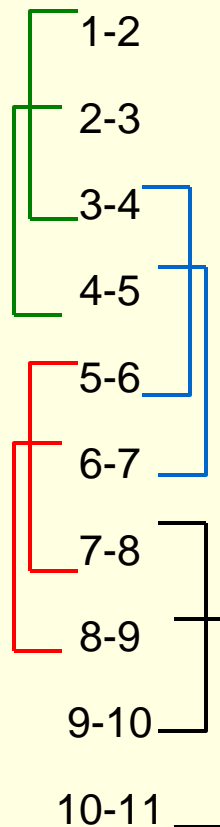
Threats to a Good Inflation Index

- **Time** – data points reflect actually observed not constrained conditions. Data points cannot be picked or avoided to achieve a particular end.
- Time – data points reflect the correct geography of inflation
 - Data points should represent the actual conditions of the site for which inflation is being projected.
- Time – data points reflect the dominant condition of component causing inflation
 - Data points should be guided by the most significant source of price changes.

Interpreting Multiple Years of Data

- Emphasize the far point?
 - Emphasize the near point?
 - Use a combination of both?
1. For multi-year data (10-12 years), use all of the data in groups of 2-3 year averages
 2. 11 years of data provide 8 three-year averages:
1, 2, 3 // 2, 3, 4 // 3, 4, 5 // 4, 5, 6 // 5, 6, 7 // 6, 7, 8 // 7, 8, 9 // 8, 9, 10
 3. This leaves 8 three-year rolling averages
 4. This is fitted with a linear regression.

Data Points into Regression Analysis



- 11 Years of data
- 10 Percentage Intervals
- 8 Three-year Averages
- Change in Change
- Fit with Linear Regression

Land Cost Index: (Appraisal – No Adjustment)

“Just” Equalized Value of Land Over Time

Year	Land Value	Year to Year % Change	3 Year Rolling Average	Fitted Regression Results
1996	\$21,751,280,540	N/A	N/A	N/A
1997	\$23,436,330,545	7.7%	N/A	N/A
1998	\$25,777,151,470	10.0%	N/A	N/A
1999	\$29,830,939,079	15.7%	11.2%	13.1%
2000	\$33,902,799,963	13.6%	13.1%	14.1%
2001	\$41,333,321,441	21.9%	17.1%	15.1%
2002	\$49,671,844,946	20.2%	18.6%	16.1%
2003	\$57,761,717,617	16.3%	19.5%	17.1%
2004	\$64,236,986,518	11.2%	15.9%	18.1%
2005	\$78,260,241,235	21.8%	16.4%	19.1%
2006	\$102,357,800,980	30.8%	21.3%	20.2%
2007				21.2%
2008				22.2%
2009				23.2%

Building Cost Index:

Average of Three Construction Cost Indices

Year	(National – adjusted) Turner Index	(National – adjusted) ENR Index	(Local – Adjusted) RSMMeans Index	Average of Indices	Fitted Regression Results
1999	5.5%	3.5%	3.1%	4.0%	2.2%
2000	5.6%	2.3%	2.2%	3.4%	2.9%
2001	4.9%	2.3%	3.4%	3.5%	3.7%
2002	3.6%	2.1%	3.8%	3.2%	4.5%
2003	1.8%	1.9%	4.9%	2.9%	5.3%
2004	2.9%	4.8%	5.9%	4.5%	6.0%
2005	6.4%	6.6%	9.7%	7.6%	6.8%
2006	10.6%	7.3%	12.0%	10.0%	7.6%
2007					8.4%
2008					9.1%
2009					9.9%

Building Equipment Cost Index:

Average of Two Building Equipment Cost Indices

Year	(National – Adjusted) Public Furniture Index	(Local – Adjusted) CPI Index	Average of Indices	Fitted Regression Results
1999	1.5%	4.2%	2.9%	2.0%
2000	1.0%	4.3%	2.6%	2.5%
2001	1.1%	5.4%	3.2%	3.0%
2002	0.5%	5.5%	3.0%	3.4%
2003	0.0%	5.1%	2.5%	3.9%
2004	1.4%	4.7%	3.0%	4.4%
2005	3.9%	6.7%	5.3%	4.9%
2006	6.1%	7.7%	6.9%	5.4%
2007				5.9%
2008				6.3%
2009				6.8%

Transportation Cost Index:

Average of Two Road Construction Cost Indices

Year	(State – Adjusted) FDOT Costs	(National – Adjusted) Highway/ Street Construction Index	Average of Indices	Fitted Regression Results
2002	10.6%	4.1%	7.3%	N/A
2003	8.2%	0.1%	4.2%	2.2%
2004	6.3%	7.3%	6.8%	9.7%
2005	32.4%	14.1%	23.2%	17.1%
2006	47.9%	15.2%	31.5%	24.6%
2007				32.0%
2008				39.5%
2009				46.9%

Summary of Projected Inflation Costs from 2006 to 2007

	Land Costs	Building Costs	Building Equipment Costs	Transportation Costs
2007 (New)	21.2%	8.4%	5.9%	32.0%
2007 (Orig.)	30.8%	4.8%	2.8%	7.1%

- Amounts are generally larger than in the past
- Unconstrained numbers drive transportation costs
- Public building prices affected by steel
- Land prices lag residential market price deflation

Conclusions (I)

- New procedures provide more accurate year-to-year inflation results.
- New procedures use more history than just the simple changes of earlier years.
- New procedures take into account wage rate changes at desired location.

Conclusions (II)

- New procedures combine multiple sources of information if they exist.
- As more complex procedures are used laymen's understanding decreases.
- The above has both good and not-so-good consequences.