Using Data to Review TIGER Grant Award Preferences

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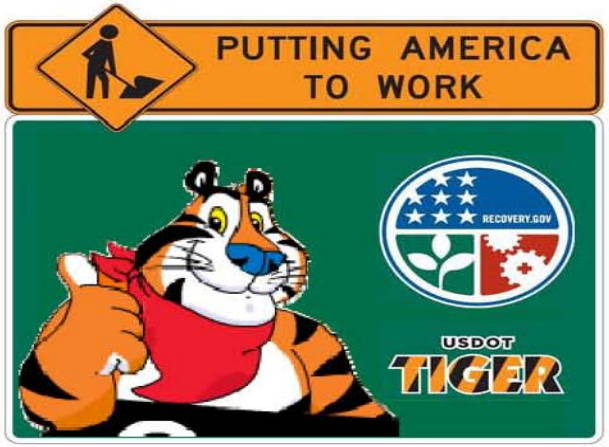
Transportation Investment Generating Economic Recovery (TIGER)

- Discretionary grant program in Recovery Act
- Presentation discusses first Five Rounds
  - Fall 2009
  - Fall 2010
  - Fall 2011
  - Spring 2012
  - Summer 2013



TIGER Selection Criteria

- Technical Review by Mixed Mode Evaluation Teams based on long term strategic DOT strategic goals, job creation & economic stimulus & secondary goals such as innovation and partnership
- Control & Calibration team
- Economic Evaluation Review of Benefit-Cost Analyses
  - Usefulness & expected net benefits (as defined by DOT staff)
- Senior Review Committee selected Grant Awardees
  - Modal Administrators and OST level officials
- *Q1: Did the likelihood that the benefits exceeded the costs influence the selection process of the Senior Review team?*
  - *Especially wouldn't want lower rated projects being likelier to be selected (Yikes!!)*
- *Q2: Did the process favor one mode over any other?*

Methods

- Are there any systematic preferences (statistical biases) for selecting projects based on the likely net benefits or by mode?
  - Single-factor, ANOVA pair-wise comparisons (difference between means) between those awarded a grant and not awarded
    - $F = (\underline{SS_b/(G-1)}) / (SS_w/(N-G))$
      - $SS_b = \sum^G n_g (X_g - X)^2$ $SS_w = \sum^G \sum^{ng} (x_{ig} - X_g)^2$
    - The larger the F-test statistic (the lower the probability) the more likely there is a significant difference between awardees and non-awardees.
    - The lower the probability of an event occurring by chance the more likely the occurrence is due to a preference for a causal factor
- We also modeled a combination of causal factors to determine if combinations of characteristics increased the likelihood of being an award winner
  - Logit regression modeling techniques using explanatory variables from the pair-wise tests
    - $P(y_t=1 \mid x_t) = e^{xt\beta} / 1+ e^{xt\beta}$

Project Characteristics

Characteristic	Description (variable type)
Probability of Net Benefits	Net Benefit Certainty rating (scale from 1 to 5) – low to high
Highway	Project is primarily highway mode-specific (binary)
Transit	Project is primarily transit mode-specific (binary)
Rail	Project is primarily rail mode-specific (binary)
Port	Project is primarily port mode-specific (binary)

Probability of Net Benefits (by average)

Variable	Average Awardees	Average Non-Awardees	F-Value	Probability
TIGER I				
Probability of Net Benefits	3.702	3.439	1.90	.17
TIGER II				
Probability of Net Benefits	3.714	3.333	5.94	.02**
TIGER III[1]				
Probability of Net Benefits	3.568	3.274	3.65	.06*
TIGER IV				
Probability of Net Benefits	3.723	3.569	.81	.37
TIGER V				
Probability of Net Benefits	3.731	3.517	1.74	.19

* Significant at a 90 percent level of confidence
** Significant at a 95 percent level of confidence
*** Significant at a 99 percent level of confidence

Probability of Net Benefits (by rating)

Probability of Net Benefits	Total Count of BC Score for Round / % of Count Awarded				
	TIGER II-V	TIGER II	TIGER III	TIGER IV	TIGER V
1	6 / 0***	0	1 / 0***	2 / 0***	3 / 0***
2	65 / 24.6***	11 / 36.4	15 / 20.0**	20 / 20.0**	19 / 26.3
3	234 / 27.8	66 / 25.8*	61 / 27.9	51 / 25.4	56 / 32.1
4	194 / 28.9	32 / 25.0*	46 / 21.7	56 / 39.3***	60 / 25.0
5	94 / 44.7***	19 / 68.4***	9 / 77.8***	34 / 23.5	32 / 43.8***
ALL	593 / 30.0	128 / 32.8	132 / 28.0	163 /28.8	170 / 30.6
F-Test (Probability)	3.53 (.007) ***	4.82 (.00) ***	3.41(.01) **	1.33 (.26)	1.26 (.29)

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We also conduct a simple hypothesis test between the award percentage for each score and the total award percentage for the round. The null hypothesis is the award percentage for the individual rating score is equal to the award percentage for the entire round (or combined rounds)

Highways

TIGER Round	% of Awardees	% Non-Awardees	F-Value	Probability
I	40.4	43.0	.09	.77
II	38.1	49.4	1.46	.23
III	56.5	54.2	.07	.79
IV	46.8	56.0	1.14	.29

Transit

TIGER Round	% of Awardees	% Non-Awardees	F-Value	Probability
I	34.0	22.4	2.29	.13
II	23.8	27.6	.21	.65
III	23.9	20.6	.21	.65
IV	19.1	12.1	1.38	.24

Rail

TIGER Round	% of Awardees	% Non-Awardees	F-Value	Probability
I	14.9	17.8	.19	.66
II	16.7	10.3	1.03	.31
III	13.0	9.3	.47	.50
IV	8.5	14.7	1.19	.29

Port

TIGER Round	% of Awardees	% Non-Awardees	F-Value	Probability
I	12.8	13.1	.00	.96
II	11.9	14.9	.21	.64
III	6.5	8.4	.16	.69
IV	14.9	8.6	1.40	.24

Outside Presentations & Publications

- TIGER I
  - 2010 Society of Government Economists Annual Meetings
  - 2014 *Public Works Management and Policy*
- TIGER II-IV
  - 2013 Society for Benefit Cost Analysis Annual Meetings
- TIGER II-V
  - 2014 *Journal of Benefit Cost Analysis*


THANK YOU!
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