JOINT FLORIDA
Model Task Force & Transportation
Data and Analytics Workshop

FreightSIM Update

Frank Tabatabaee, Florida DOT

Krishnan Viswanathan, Cambridge Systematics, Inc.

Model Overview

FAF Flows

FAF Tons (Millions)
675
594
761
172
133
189
76
55
103
Within FL
To FL
From FL
2010
2015
2045

FAF Value (Billions $)
374
377
845
334
311
690
233
179
607
Within FL
To FL
From FL
2010
2015
2045

NETS Data

100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
Basic
Freight
Retail
Service
Education

Firm Evolution

$$[F_{t+1} = F_t + B_t - D_t + I_t - O_t]$$

Order of Estimation of Submodels

Growth Binary → Growth → Death → Move Binary → Location Choice Models → Birth Model

- Series of logit or log-linear models
  - Firm Size binary choice
  - Firm Size change
  - Firm Dissolution & Relocation
  - Firm Location Choice
  - Firm Births
- Submodel estimation done over time
- Models estimated based on the change that happens in a year

Validation

Firms
50,000
40,000
30,000
20,000
10,000
0
Basic
Freight
Retail
Service
Model
Observed

Employment
50,000
40,000
30,000
20,000
10,000
0
Basic
Freight
Retail
Service
Model
Observed

Validation

Freight Firms, Observed
NAICS, 31-42, 48, 49
0 - 5
6 - 10
11 - 20
21 - 30
31 - 50
51 - 100
101 - 200
201 - 500
501 - 1000
1001 - 2000

Freight Firms, Modeled
NAICS, 31-42, 48, 49
0 - 5
6 - 10
11 - 20
21 - 30
31 - 50
51 - 100
101 - 200
201 - 500
501 - 1000
1001 - 2000

Supplier Selection

Goods Demand

SEGMENT	WEIGHT (Millions of Tons)	Percent of Total	VALUE (Billion $)	Percent of Total
Domestic, within FL	422	26%	271	11%
Domestic, within AL/GA	475	30%	282	11%
Domestic, FL to AL/GA	16	1%	27	1%
Domestic, AL/GA to FL	42	3%	43	2%
Domestic, FL to rest of US	32	2%	179	7%
Domestic, rest of US to FL	65	4%	448	17%
Domestic, AL/GA to rest of US	146	9%	302	12%
Domestic, rest of US to AL/GA	249	16%	620	24%
Import, arrive FL, to FL	45	3%	91	4%
Import, arrive FL, to AL/GA	36	2%	164	6%
Export, from FL, depart FL	20	1%	77	3%
Export, from AL/GA, depart FL	46	3%	74	3%
Total	1,594	100%	2,578	100%

Distribution Channel by Commodity

Mode Share by Location

Daily Truck Trips - 2015

	District							
District	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**Total**
1	16,937	942	425	3,274	2,072	1,099	1,983	26,732
2	898	37,430	11,364	976	2,778	415	995	54,856
3	336	10,914	24,963	131	716	546	173	37,779
4	3,078	857	157	47,473	3,994	9,307	532	65,398
5	1,840	2,419	635	3,834	29,787	315	2,028	40,858
6	994	288	521	9,893	352	36,601	288	48,937
7	1,939	1,013	203	450	2,122	358	34,424	40,509
Total	26,022	53,863	38,268	66,031	41,821	48,641	40,423	315,069

Daily Truck Trips - 2045

	District							
District	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**Total**
1	23,959	1,388	421	4,165	2,650	1,480	2,842	36,905
2	1,114	48,284	12,829	994	3,564	660	1,485	68,930
3	389	13,018	31,358	161	996	857	188	46,967
4	3,769	852	209	62,428	5,191	10,341	909	83,699
5	2,544	3,508	940	5,077	38,892	699	3,038	54,698
6	1,138	473	692	11,046	564	46,365	333	60,611
7	2,834	1,587	229	820	3,061	345	36,544	45,420
Total	35,748	69,112	46,681	84,695	54,923	60,753	45,346	397,258

Truck Volumes to Counts

Thank You

Krishnan Viswanathan
kviswanathan@camsys.com