



TRANSPORTATION MODEL ADVISORY COMMITTEE (TMAC)  
**MONDAY, DECEMBER 22, 2014 - 1:30 PM**  
COMPASS, 700 NE 2nd Street, 2<sup>nd</sup> Floor Large Conference Room  
Meridian, Idaho

**\*\* AGENDA \*\***

**I. CALL TO ORDER (1:30)**

**II. AGENDA ADDITIONS/CHANGES**

**III. OPEN DISCUSSION/ANNOUNCEMENTS**

**IV. CONSENT AGENDA**

Page 2 \*A. Approve September 9 and November 4, 2014, TMAC Meeting Notes

**V. INFORMATION/DISCUSSION ITEM**

1:50 \*A. Travel Demand Forecast Model Update

MaryAnn Waldinger

Page 6 *Staff prepared a document outlining the calibration efforts and validation results. Staff will continue to work on model refinement until the meeting date.*

**VI. OTHER**

A. **Next Meeting:** Tuesday, January 20, 2015, 1:30 p.m., at COMPASS.

**VII. ADJOURNMENT (3:00)**

\*Enclosures. Times are approximate. Agenda is subject to change.

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**ITEM IV A**

**Transportation Model Advisory Committee  
September 9, 2014  
COMPASS, 2<sup>nd</sup> Floor Large Conference Room  
700 NE 2<sup>nd</sup> Street, Suite 200, Meridian**

**\*\* Amended Meeting Notes \*\***

**ATTENDEES:** Clair Bowman, City of Nampa, **Chair**  
Stephen Lewis, Keller Associates  
David Luft, Department of Environmental Quality  
Jeff Madsen, Public Participation Committee  
Austin Petersen, City of Meridian  
Amar Pillai, Ada County Highway District  
Tim Richard, Canyon Highway District #4  
Kevin Sablan, Idaho Transportation Department, Dist. 3  
Andrea Tuning, City of Boise  
Jay Witt, URS Energy and Construction

**MEMBERS ABSENT:** Rhonda Jalbert, Valley Regional Transit  
Shawn Martin, Ada County Highway District, **Vice Chair**  
Patricia Nilsson, Canyon County Development Services  
Jim Pline, Pline Engineering, Inc.  
Mark Wasdahl, Idaho Transportation Department, Dist. 3  
Vacant, Ada County

**OTHERS PRESENT:** Tina Fuller, COMPASS  
Len Grady, City of Nampa  
MaryAnn Waldinger, COMPASS  
Nancy Brecks, COMPASS

**CALL TO ORDER**

Chair Bowman called the meeting to order at 1:30 p.m.

**AGENDA ADDITIONS/CHANGES**

None.

**OPEN DISCUSSION/ANNOUNCEMENTS**

Chair Bowman introduced Nampa City Engineer Len Grady.

## **CONSENT AGENDA**

### **A. Approve July 8, 2014, Meeting Minutes**

Jay Witt moved and Amar Pillai seconded to approve the Consent Agenda as presented. Motion passed unanimously.

## **INFORMATION/DISCUSSION ITEM**

### **A. Travel Demand Update Elements**

MaryAnn Waldinger recapped completed tasks as of September 9, 2014, and reviewed the following elements:

Cross-classification trip production rates and results  
Trip attraction rates and process used to develop preliminary rates  
Trip generation results  
Friction Factors  
Other Model Items

MaryAnn said better results have been received using survey data with the new process for filling in and refining rates, and minor refinement on individual rates is getting better.

MaryAnn said under reporting has to be addressed and is left in. Under reporting is based on real data and can test prevailing trends. Mary Ann would rather adjust the raw rate.

Chair Bowman recapped Mary Ann's goal is getting calibrations that get a good fit, and leaving unanswered questions that will need to be addressed when running the model for future years.

Tina Fuller reviewed Friction Factors, e.g., home based work trips, home base shopping trips, home base social trips, home based school trips, home based other trips, and non-home based trips.

Next steps, by end of this week estimate classification for goodness of fit friction factors and what adjustments need to be done.

Chair Bowman asked MaryAnn to send results to the committee based on individual jurisdictions.

## **OTHER**

**Next Meeting:** Tuesday, November 4, 2014, 1:30 p.m., at COMPASS, 2<sup>nd</sup> Floor Large Conference Room.

## **ADJOURNMENT**

**The meeting adjourned at 2:25p.m.**



**Transportation Model Advisory Committee  
November 4, 2014  
COMPASS, 2<sup>nd</sup> Floor Large Conference Room  
700 NE 2<sup>nd</sup> Street, Suite 200, Meridian**

**\*\*Meeting Notes\*\***

**ATTENDEES:**

Clair Bowman, City of Nampa, **Chair**  
Stephen Lewis, Keller Associates  
Jeff Madsen, Public Participation Committee  
Brent Orton, City of Caldwell  
Austin Petersen, City of Meridian  
Jim Pline, Pline Engineering, Inc.  
Tim Richard, Canyon Highway District #4  
Kevin Sablan, Idaho Transportation Department, Dist. 3  
Andrea Tuning, City of Boise  
Jay Witt, URS Energy and Construction

**MEMBERS ABSENT:**

Margaret Havey, Valley Regional Transit  
David Luft, Department of Environmental Quality  
Shawn Martin, Ada County Highway District, **Vice Chair**  
Patricia Nilsson, Canyon County Development Services  
Mark Wasdahl, Idaho Transportation Department, Dist. 3

**OTHERS PRESENT:**

Tina Fuller, COMPASS  
MaryAnn Waldinger, COMPASS  
Nancy Brecks, COMPASS

**CALL TO ORDER**

Quorum not present at 1:30 pm. Chair Bowman requested staff start with the Information/Discussion item.

**AGENDA ADDITIONS/CHANGES**

None.

**OPEN DISCUSSION/ANNOUNCEMENTS**

None.

## CONSENT AGENDA

### A. Approve September 9, 2014, Meeting Minutes

This item was moved to the next meeting to allow for a correction to the next meeting date.

## INFORMATION/DISCUSSION ITEM

### A. Travel Demand Forecast Model Update

MaryAnn Waldinger recapped completed tasks as of November 4, 2014, in the following categories:

- Trip generation
- Cross classifications tables
- Trip distribution
- Daily and peak (5 p.m.) models

**(Quorum was met at 1:43 p.m.)**

After discussion, **Jay Witt moved and Tim Richard seconded to approve the cross classification tables and trip attraction rates as presented. Motion passed unanimously.**

MaryAnn reviewed the Friction Factors by trip purpose.

Discussion took place regarding:

- if friction factors will change for future updates to the model
- if travel time data from household travel surveys could be integrated into the congestion management process, and
- comparison of travel time data from the 2002 household travel survey to the 2011/12 household travel survey

After discussion, **Jay Witt moved and Jim Pline seconded to approve Friction Factors for this calibration of the model as presented. Motion passed unanimously.**

MaryAnn provided a general overview of Ada to Canyon and Canyon to Ada Overall Person Trip Distribution, and the Daily Model and Peak Hour (5 p.m.) Model, which are not yet validated.

## OTHER

**Next Meeting:** It was agreed to cancel the proposed December 23, 2014, meeting. MaryAnn will send a notice out when she is ready for the next meeting.

## ADJOURNMENT

**The meeting adjourned at 2:25 p.m.**

### Introduction to TMAC Members:

The following information outlines recent refinements to the regional travel demand model through December 15, 2014. Model calibration and validation an iterative process that requires multiple model runs testing rate adjustments, frequency curve weights, assignment methodology and updates to input parameters. Many of these items have been discussed at previous TMAC meetings. This summary is intended to address some of the latest model refinements, sensitivity tests, results and next steps.

## Model Results

As of December 15, 2014

### Trip Generation

Table 1 summarizes the expanded data targets from the 2011/12 household survey data and raw productions by trip purposes by county prior to making more changes to HBSc and NHB cross-classification rates. Figure 1 on the next page shows the cross-classification rates used to yield these results.

#### Ada County

- raw home base school (HBSc) productions were low by 34,300
- raw non-home base (NHB) productions by county were low by 23,100

#### Canyon County

- raw home base school (HBSc) productions were over by 5,700
- raw non-home base (NHB) productions by county were over by 4,400

Table 1

	Expanded Data - Targets		Model Estimates		Difference	
	Ada	Canyon	Ada	Canyon	Ada	Canyon
Households	150,170	62,309				
HBWork	243,308	94,518	242,144	92,857	(1,164)	(1,661)
HBShop	200,877	92,990	198,350	93,066	(2,527)	76
HBSocial	160,189	63,039	161,730	64,016	1,541	977
HBSchool	287,653	98,597	253,266	104,359	(34,387)	5,762
HBOther	303,205	105,933	300,572	106,785	(2,633)	852
NHB	370,535	146,896	347,367	151,296	(23,168)	4,400
	<b>1,565,769</b>	<b>601,973</b>	<b>1,503,429</b>	<b>612,379</b>	<b>(62,340)</b>	10,406

Table 2 summarizes the results after adjusting cross-classification rates for both counties for both HBSc and NHB trip purposes. Figure 2 on the next page shows the cross-classification rates used to yield these results. The HBSc and NHB rates adjusted are highlighted and were based on the 2011/12 household survey data.

Table 2

	Expanded Data - Targets		Model Estimates		Difference	
	Ada	Canyon	Ada	Canyon	Ada	Canyon
Households	150,170	62,309				
HBWork	243,308	94,518	242,144	92,857	(1,164)	(1,661)
HBShop	200,877	92,990	198,350	93,066	(2,527)	76
HBSocial	160,189	63,039	161,730	64,016	1,541	977
HBSchool	287,653	98,597	287,714	97,631	61	(966)
HBOther	303,205	105,933	300,572	106,785	(2,633)	852
NHB	370,535	146,896	367,247	147,750	(3,288)	854
	<b>1,565,769</b>	<b>601,973</b>	<b>1,557,757</b>	<b>602,105</b>	<b>(8,012)</b>	132

Figure 1

Used until November 24, 2014										
		Home base Work	Home base Shop	Home base Social	Home base School	Home base Other	Non-home base	total		NCHRP 716
	;Vehicles	Persons								
Ada County	0	1	0.42	0.65	0.31	0.11	0.90	1.03	3.42	2.3
	1	1	0.56	0.82	0.50	0.14	1.09	1.38	4.49	3.9
	2	1	0.82	1.02	0.45	0.24	1.12	1.54	5.19	4.7
	3	1	1.05	1.02	0.47	0.24	1.29	1.54	5.61	5.0
	4	1	1.18	1.11	0.67	0.24	1.54	1.56	6.30	
	0	2	0.70	0.95	0.62	0.22	1.49	1.64	5.62	6.2
	1	2	0.90	1.06	0.70	0.69	1.88	1.75	6.98	7.0
	2	2	1.33	1.23	0.78	1.45	1.89	2.07	8.75	7.9
	3	2	1.38	1.45	0.89	1.57	1.95	2.10	9.34	8.1
	4	2	1.60	1.65	0.91	1.60	1.95	2.24	9.95	
	0	3	1.46	1.06	0.78	1.38	1.51	2.00	8.19	8.6
	1	3	1.80	1.20	1.01	1.45	1.71	2.17	9.34	11.2
	2	3	2.44	1.29	1.20	2.50	1.88	2.27	11.58	12.4
	3	3	2.96	1.50	1.30	2.79	1.97	2.30	12.82	14.4
	4	3	2.96	1.77	1.30	2.84	1.97	2.61	13.45	
	0	4	1.74	1.17	1.32	3.58	1.94	2.61	12.36	12.2
	1	4	2.04	1.38	1.80	4.89	1.99	2.96	15.06	14.6
	2	4	2.58	1.70	2.00	5.82	2.32	4.37	18.79	18.5
	3	4	3.48	1.70	2.53	5.82	3.04	4.62	21.19	19.7
	4	4	3.83	1.85	2.82	6.02	3.09	5.35	22.96	
		Home base Work	Home base Shop	Home base Social	Home base School	Home base Other	Non-home base	total		NCHRP 716
	;Vehicles	Persons								
Canyon County	0	1	0.33	0.81	0.19	0.11	0.51	0.51	2.46	2.3
	1	1	0.38	0.85	0.42	0.14	0.86	1.33	3.98	3.9
	2	1	0.63	0.91	0.53	0.24	0.94	1.45	4.70	4.7
	3	1	0.95	1.02	0.50	0.24	1.04	1.68	5.43	5.0
	4	1	1.09	1.07	0.70	0.24	1.09	1.71	5.90	
	0	2	0.68	0.95	0.37	0.14	0.94	1.38	4.46	6.2
	1	2	1.00	1.22	0.42	0.17	1.28	1.73	5.82	7.0
	2	2	1.24	1.44	0.78	0.24	1.63	1.97	7.30	7.9
	3	2	1.51	1.65	0.78	0.24	1.63	2.32	8.13	8.1
	4	2	1.51	1.67	0.80	0.24	1.68	2.47	8.37	
	0	3	1.00	1.04	0.64	1.01	0.99	1.46	6.14	8.6
	1	3	1.20	1.33	1.00	1.59	1.56	2.29	8.97	11.2
	2	3	2.00	1.43	1.00	1.68	1.66	2.43	10.20	12.4
	3	3	2.69	1.76	1.11	1.77	1.73	2.54	11.60	14.4
	4	3	2.69	1.80	1.19	1.89	1.85	2.72	12.14	
	0	4	1.00	1.17	1.08	3.02	1.70	2.30	10.27	12.2
	1	4	1.87	1.57	1.17	3.29	1.99	2.49	12.38	14.6
	2	4	2.64	1.79	1.65	4.63	1.99	3.52	16.22	18.5
	3	4	3.28	1.90	1.75	4.71	2.41	3.61	17.66	19.7
	4	4	3.43	2.49	1.93	4.71	2.51	3.71	18.78	

Figure 2

As of December 1, 2014										
		Home base Work	Home base Shop	Home base Social	Home base School	Home base Other	Non-home base	total		NCHRP 716
	;Vehicles	Persons								
Ada County	0	1	0.42	0.65	0.31	0.13	0.90	1.03	3.44	2.3
	1	1	0.56	0.82	0.50	0.44	1.09	1.38	4.79	3.9
	2	1	0.82	1.02	0.45	0.82	1.12	1.54	5.77	4.7
	3	1	1.05	1.02	0.47	0.97	1.29	1.54	6.34	5.0
	4	1	1.18	1.11	0.67	1.18	1.54	1.56	7.24	
	0	2	0.70	0.95	0.62	0.69	1.49	1.64	6.09	6.2
	1	2	0.90	1.06	0.70	0.95	1.88	1.91	7.40	7.0
	2	2	1.33	1.23	0.78	1.45	1.89	2.07	8.75	7.9
	3	2	1.38	1.45	0.89	1.57	1.95	2.10	9.34	8.1
	4	2	1.60	1.65	0.91	1.60	1.95	2.24	9.95	
	0	3	1.46	1.06	0.78	1.38	1.51	2.00	8.19	8.6
	1	3	1.80	1.20	1.01	1.69	1.71	2.34	9.75	11.2
	2	3	2.44	1.29	1.20	2.79	1.88	2.38	11.98	12.4
	3	3	2.96	1.50	1.30	2.79	1.97	3.02	13.54	14.4
	4	3	2.96	1.77	1.30	2.84	1.97	2.61	13.45	
	0	4	1.74	1.17	1.32	3.58	1.94	2.61	12.36	12.2
	1	4	2.04	1.38	1.80	4.89	1.99	2.96	15.06	14.6
	2	4	2.58	1.70	2.00	5.82	2.32	4.37	18.79	18.5
	3	4	3.48	1.70	2.53	5.82	3.04	4.62	21.19	19.7
	4	4	3.83	1.85	2.82	6.02	3.09	5.35	22.96	
		Home base Work	Home base Shop	Home base Social	Home base School	Home base Other	Non-home base	total		NCHRP 716
	;Vehicles	Persons								
Canyon County	0	1	0.33	0.81	0.19	0.11	0.51	0.51	2.46	2.3
	1	1	0.38	0.85	0.42	0.14	0.86	1.33	3.98	3.9
	2	1	0.63	0.91	0.53	0.24	0.94	1.45	4.70	4.7
	3	1	0.95	1.02	0.50	0.24	1.04	1.68	5.43	5.0
	4	1	1.09	1.07	0.70	0.24	1.09	1.71	5.90	
	0	2	0.68	0.95	0.37	0.14	0.94	1.38	4.46	6.2
	1	2	1.00	1.22	0.42	0.17	1.28	1.73	5.82	7.0
	2	2	1.24	1.44	0.78	0.24	1.63	1.97	7.30	7.9
	3	2	1.51	1.65	0.78	0.24	1.63	2.32	8.13	8.1
	4	2	1.51	1.67	0.80	0.24	1.68	2.47	8.37	
	0	3	1.00	1.04	0.64	1.01	0.99	1.46	6.14	8.6
	1	3	1.20	1.33	1.00	1.35	1.56	2.21	8.65	11.2
	2	3	2.00	1.43	1.00	1.68	1.66	2.35	10.12	12.4
	3	3	2.69	1.76	1.11	1.77	1.73	2.54	11.60	14.4
	4	3	2.69	1.80	1.19	1.89	1.85	2.72	12.14	
	0	4	1.00	1.17	1.08	3.02	1.70	2.30	10.27	12.2
	1	4	1.87	1.57	1.17	3.29	1.99	2.49	12.38	14.6
	2	4	2.64	1.79	1.65	4.63	1.99	3.52	16.22	18.5
	3	4	3.28	1.90	1.75	4.71	2.41	3.61	17.66	19.7
	4	4	3.43	2.49	1.93	4.71	2.51	3.71	18.78	

Table 3 summarizes the results of the raw and balanced production and attraction rates by trip purpose after adjusting cross-classification rates for both counties for both HBSc and NHB.

Table 3: Production and Attractions by Trip Purpose

<b>Test 20- Dec 1</b>				
	Raw P's	Raw A's	Difference	
HBW	334,991	332,235	2,756	1%
HBS	291,448	265,756	25,692	9%
HBSO	225,721	234,117	(8,396)	-4%
HBSc	385,312	386,717	(1,405)	0%
HBO	407,362	386,192	21,170	5%
NHB	515,001	517,298	(2,297)	0%
I-X	31,047	37,913		
X-I	38,570	95,806		
I to I	2,159,835	2,122,315	37,520	2%
Total	2,229,452	2,256,034	(26,582)	-1%
	Balanced P's	Balanced A's		Targets
HBW	334,991	334,991	15.5%	15.6%
HBS	291,448	291,448	13.5%	13.6%
HBSO	225,721	225,721	10.4%	10.3%
HBSc	386,717	386,717	17.9%	17.8%
HBO	407,362	407,362	18.8%	18.9%
NHB	517,298	517,298	23.9%	23.9%
I-X	31,047	31,047		
X-I	95,806	95,806		
I to I	2,163,537	2,163,537	10.06	
Total	2,290,390	2,290,390	10.65	

\*Home Base Shop

The Raw P's (Productions) are calculated using cross-classification rates above in Figure 2.

The Raw A's (Attractions) are calculated using the rates below in Figure 3. These come from NCHRP 365 and NCHRP 716.

The rates in these reports are reasonable starting points. The goal is to have the Raw P's and A's within 5%.

Therefore, the HBS attraction rates were reviewed. Adjusting P's and A's will also impact inter-county trips discussed in the next section.

Figure 3: Trip Attraction Rates

IF (I==1-50,52-75) ; DOWNTOWN Boise TAZs increased attraction rates for DT zones

$$A[1] = 1.20 * ALLEMP$$

$$A[2] = (1.10 * RET)$$

$$A[3] = (0.90 * OFF) + (0.25 * GOVT) + (0.30 * HH)$$

$$A[4] = (2.41 * ELEM) + (3.03 * MIDSCH) + (3.20 * HIGHSCH) + (2.30 * UNIVPR) + (3.20 * UNIVPUB)$$

$$A[5] = (0.70 * RET) + (0.80 * OFF) + (1.00 * (IND + GOVT + AGRI)) + (0.50 * HH)$$

$$A[6] = (1.40 * RET) + (1.20 * OFF) + (1.00 * (IND + GOVT + AGRI)) + (0.50 * HH)$$

ELSEIF (I==51,76-2000) ; rest of Ada County TAZ 51, is at the fringe of DT contains Winco and Whole Foods

$$A[1] = 1.20 * ALLEMP$$

$$A[2] = (5.40 * RET) ; using retail rates 8.4 NCHRP 716$$

$$A[4] = (2.41 * ELEM) + (3.03 * MIDSCH) + (3.20 * HIGHSCH) + (2.30 * UNIVPR) + (3.20 * UNIVPUB)$$

$$A[3] = (0.90 * OFF) + (0.50 * GOVT) + (0.30 * HH)$$

$$A[5] = (3.00 * RET) + (0.70 * OFF) + (0.30 * (IND + GOVT + AGRI)) + (0.50 * HH)$$

$$A[6] = (4.70 * RET) + (1.20 * OFF) + (0.70 * (IND + GOVT + AGRI)) + (0.40 * HH)$$

ELSEIF (I==2001-3000) ; Canyon County TAZs

$$A[1] = 1.20 * ALLEMP$$

$$A[2] = (5.90 * RET) ; over the retail rates 8.4 NCHRP 716$$

$$A[3] = (1.50 * OFF) + (0.50 * GOVT) + (0.30 * HH) ; higher than Ada given county-level job dist and too many C to A HBSO trips$$

$$A[4] = (2.41 * ELEM) + (3.03 * MIDSCH) + (3.20 * HIGHSCH) + (2.30 * UNIVPR) + (3.20 * UNIVPUB)$$

$$A[5] = (3.00 * RET) + (0.70 * OFF) + (0.30 * (IND + GOVT + AGRI)) + (0.50 * HH)$$

$$A[6] = (4.70 * RET) + (1.20 * OFF) + (0.70 * (IND + GOVT + AGRI)) + (0.40 * HH)$$

As shown in both Table 3 the HBSshop (A[2]) raw production and attractions are different by 9%. Per the trip distribution results, summarized in Table 7, Canyon County was “under-attracting” trips from Ada County and Ada County was “over-attracting” trips from Canyon trips. This is simply a reflection of actual job distribution and can be moderated by adjusting attraction rates and frequency curves.

In order to improve this imbalance the attraction rates applied to Canyon County HBSshop purpose and retail jobs was reviewed and tested. The retail attraction rates in NCHRP 716 range from 7.7 to 8.4. These rates are intended as starting points not directives. However, staying within reason is a goal. Retail jobs are part of the shop, other and non-home base purpose. Therefore, when increasing the attraction rate for HBSshop the attraction rate for retail jobs may need decreased for HBOther. After completing several tests with increasing the retail attraction rate from 5.4 to 5.9 and finally to 6.5 (increased by 0.10 for each test) the HBSshop raw p’s and a’s were within 6%. Going over 6.5 and decreasing the HBOther retail below 2.0 is not recommended. The change to the HBOther retail attraction had to be offset by increasing the office attraction rate. The attraction rates recommended (for now) are shown in Figure 4.

Figure 4: Trip Attraction Rates as of December 15, 2014

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IF (I==1-50,52-75) ; DOWNTOWN Boise TAZs increased attraction rates for DT zones
  A[1] = 1.20 * ALLEMP
  A[2] = (1.10 * RET)
  A[3] = (0.90 * OFF) + (0.25 * GOVT)+ (0.30 * HH)
  A[4] = (2.41 * ELEM) + (3.03 * MIDSCH) + (3.20 * HIGHSCH) + (2.30 * UNIVPR)+ (3.20 * UNIVPUB)
  A[5] = (0.70 * RET) + (0.80 * OFF) + (1.00 * (IND + GOVT + AGRI)) + (0.50 * HH)
  A[6] = (1.40 * RET) + (1.20 * OFF) + (1.00 * (IND + GOVT + AGRI)) + (0.50 * HH)
ELSEIF (I==51,76-2000) ; rest of Ada County TAZ 51, is at the fringe of DT contains Winco and Whole Foods
  A[1] = 1.20 * ALLEMP
  A[2] = (5.40 * RET) ; using retail rates 8.4 NCHRP 716
  A[4] = (2.41 * ELEM) + (3.03 * MIDSCH) + (3.20 * HIGHSCH) + (2.30 * UNIVPR)+ (3.20 * UNIVPUB)
  A[3] = (0.90 * OFF) + (0.50 * GOVT)+ (0.30 * HH)
  A[5] = (3.00 * RET) + (0.70 * OFF) + (0.30 * (IND + GOVT + AGRI)) + (0.50 * HH)
  A[6] = (4.70 * RET) + (1.20 * OFF) + (0.70 * (IND + GOVT + AGRI)) + (0.40 * HH)
ELSEIF (I==2001-3000) ; Canyon County TAZs
  A[1] = 1.20 * ALLEMP
  A[2] = (6.50 * RET) ; retail rates 8.4 NCHRP 716 adjusted HBOther retail rate
  A[3] = (1.50 * OFF) + (0.50 * GOVT)+ (0.30 * HH) ; higher than Ada given county-level job dist and too many C to A HBS so trips
  A[4] = (2.41 * ELEM) + (3.03 * MIDSCH) + (3.20 * HIGHSCH) + (2.30 * UNIVPR)+ (3.20 * UNIVPUB)
  A[5] = (2.00 * RET) + (1.10 * OFF) + (0.30 * (IND + GOVT + AGRI)) + (0.50 * HH)
  A[6] = (4.70 * RET) + (1.20 * OFF) + (0.70 * (IND + GOVT + AGRI)) + (0.40 * HH)
ENDIF

```

Model calibration is iterative and often requires going back to the first step of the model and refining inputs. HBSschool and HBO attraction rates still may need refinement because to improve the inter-county trip results. Perfect matches between current year model estimates and “actual” data or targets is NOT the goal. Models are for forecasting so reasonableness is the key. In some cases, the model estimates will be far different than actuals – that is part of modeling ☺

Trip Generation - Latest Inputs and Results:

The following are the latest rates and results. These figures and table are the same as ones presented earlier in this document.

Figure 5: Final Set of Cross-Classification Rates by Trip Purpose by County

**Recommendation 1:** accept of the cross-classification rates in Figure 5

	;Vehicles	Persons	Home base Work	Home base Shop	Home base Social	Home base School	Home base Other	Non-home base	total	NCHRP 716
Ada County	0	1	0.42	0.65	0.31	0.13	0.90	1.03	3.44	2.3
	1	1	0.56	0.82	0.50	0.44	1.09	1.38	4.79	3.9
	2	1	0.82	1.02	0.45	0.82	1.12	1.54	5.77	4.7
	3	1	1.05	1.02	0.47	0.97	1.29	1.54	6.34	5.0
	4	1	1.18	1.11	0.67	1.18	1.54	1.56	7.24	
	0	2	0.70	0.95	0.62	0.69	1.49	1.64	6.09	6.2
	1	2	0.90	1.06	0.70	0.95	1.88	1.91	7.40	7.0
	2	2	1.33	1.23	0.78	1.45	1.89	2.07	8.75	7.9
	3	2	1.38	1.45	0.89	1.57	1.95	2.10	9.34	8.1
	4	2	1.60	1.65	0.91	1.60	1.95	2.24	9.95	
	0	3	1.46	1.06	0.78	1.38	1.51	2.00	8.19	8.6
	1	3	1.80	1.20	1.01	1.69	1.71	2.34	9.75	11.2
	2	3	2.44	1.29	1.20	2.79	1.88	2.38	11.98	12.4
	3	3	2.96	1.50	1.30	2.79	1.97	3.02	13.54	14.4
	4	3	2.96	1.77	1.30	2.84	1.97	2.61	13.45	
	0	4	1.74	1.17	1.32	3.58	1.94	2.61	12.36	12.2
1	4	2.04	1.38	1.80	4.89	1.99	2.96	15.06	14.6	
2	4	2.58	1.70	2.00	5.82	2.32	4.37	18.79	18.5	
3	4	3.48	1.70	2.53	5.82	3.04	4.62	21.19	19.7	
4	4	3.83	1.85	2.82	6.02	3.09	5.35	22.96		
Canyon County			Home base Work	Home base Shop	Home base Social	Home base School	Home base Other	Non-home base	total	NCHRP 716
	0	1	0.33	0.81	0.19	0.11	0.51	0.51	2.46	2.3
	1	1	0.38	0.85	0.42	0.14	0.86	1.33	3.98	3.9
	2	1	0.63	0.91	0.53	0.24	0.94	1.45	4.70	4.7
	3	1	0.95	1.02	0.50	0.24	1.04	1.68	5.43	5.0
	4	1	1.09	1.07	0.70	0.24	1.09	1.71	5.90	
	0	2	0.68	0.95	0.37	0.14	0.94	1.38	4.46	6.2
	1	2	1.00	1.22	0.42	0.17	1.28	1.73	5.82	7.0
	2	2	1.24	1.44	0.78	0.24	1.63	1.97	7.30	7.9
	3	2	1.51	1.65	0.78	0.24	1.63	2.32	8.13	8.1
	4	2	1.51	1.67	0.80	0.24	1.68	2.47	8.37	
	0	3	1.00	1.04	0.64	1.01	0.99	1.46	6.14	8.6
	1	3	1.20	1.33	1.00	1.35	1.56	2.21	8.65	11.2
	2	3	2.00	1.43	1.00	1.68	1.66	2.35	10.12	12.4
	3	3	2.69	1.76	1.11	1.77	1.73	2.54	11.60	14.4
	4	3	2.69	1.80	1.19	1.89	1.85	2.72	12.14	
0	4	1.00	1.17	1.08	3.02	1.70	2.30	10.27	12.2	
1	4	1.87	1.57	1.17	3.29	1.99	2.49	12.38	14.6	
2	4	2.64	1.79	1.65	4.63	1.99	3.52	16.22	18.5	
3	4	3.28	1.90	1.75	4.71	2.41	3.61	17.66	19.7	
4	4	3.43	2.49	1.93	4.71	2.51	3.71	18.78		

Figure 6: Trip Attraction Rates as of December 15, 2014

IF (I==1-50,52-75) ; *DOWNTOWN Boise TAZs increased attraction rates for DT zones*  
 A[1] = 1.20 \* ALLEMP  
 A[2] = (1.10 \* RET)  
 A[3] = (0.90 \* OFF) + (0.25 \* GOVT) + (0.30 \* HH)  
 A[4] = (2.41 \* ELEM) + (3.03 \* MIDSCH) + (3.20 \* HIGHSCH) + (2.30 \* UNIVPR) + (3.20 \* UNIVPUB)  
 A[5] = (0.70 \* RET) + (0.80 \* OFF) + (1.00 \* (IND + GOVT + AGRI)) + (0.50 \* HH)  
 A[6] = (1.40 \* RET) + (1.20 \* OFF) + (1.00 \* (IND + GOVT + AGRI)) + (0.50 \* HH)  
 ELSEIF (I==51,76-2000) ; *rest of Ada County TAZ 51, is at the fringe of DT contains Winco and Whole Foods*  
 A[1] = 1.20 \* ALLEMP  
 A[2] = (5.40 \* RET) ; *using retail rates 8.4 NCHRP 716*  
 A[4] = (2.41 \* ELEM) + (3.03 \* MIDSCH) + (3.20 \* HIGHSCH) + (2.30 \* UNIVPR) + (3.20 \* UNIVPUB)  
 A[3] = (0.90 \* OFF) + (0.50 \* GOVT) + (0.30 \* HH)  
 A[5] = (3.00 \* RET) + (0.70 \* OFF) + (0.30 \* (IND + GOVT + AGRI)) + (0.50 \* HH)  
 A[6] = (4.70 \* RET) + (1.20 \* OFF) + (0.70 \* (IND + GOVT + AGRI)) + (0.40 \* HH)  
 ELSEIF (I==2001-3000) ; *Canyon County TAZs*  
 A[1] = 1.20 \* ALLEMP  
 A[2] = (6.50 \* RET) ; *retail rates 8.4 NCHRP 716 adjusted HBother retail rate*  
 A[3] = (1.50 \* OFF) + (0.50 \* GOVT) + (0.30 \* HH) ; *higher than Ada given county-level job dist and too many C to A HBSO trips*  
 A[4] = (2.41 \* ELEM) + (3.03 \* MIDSCH) + (3.20 \* HIGHSCH) + (2.30 \* UNIVPR) + (3.20 \* UNIVPUB)  
 A[5] = (2.00 \* RET) + (1.10 \* OFF) + (0.30 \* (IND + GOVT + AGRI)) + (0.50 \* HH)  
 A[6] = (4.70 \* RET) + (1.20 \* OFF) + (0.70 \* (IND + GOVT + AGRI)) + (0.40 \* HH)  
 ENDIF

Table 4: Latest Person Trip Production and Attraction Results

<b>Test 23- Dec 15</b>				
	Raw P's	Raw A's	Difference	
HBW	334,991	332,235	2,756	1%
HBS	291,448	272,938	18,510	6%
HBSO	225,721	234,117	(8,396)	-4%
HBSc	385,312	386,717	(1,405)	0%
HBO	407,362	385,719	21,643	5%
NHB	515,001	517,298	(2,297)	0%
I-X	31,047	37,913		
X-I	38,570	95,983		
I to I	2,159,835	2,129,024	30,811	1%
Total	2,229,452	2,262,920	(33,468)	-2%
	Balanced P's	Balanced A's	Model	Targets
HBW	334,991	334,991	15.5%	15.6%
HBS	291,448	291,448	13.5%	13.6%
HBSO	225,721	225,721	10.4%	10.3%
HBSc	386,717	386,717	17.9%	17.8%
HBO	407,362	407,362	18.8%	18.9%
NHB	517,298	517,298	23.9%	23.9%
I-X	31,047	31,047		
X-I	95,983	95,983		
I to I	2,163,537	2,163,537	10.06	
Total	2,290,567	2,290,567	10.65	

Overall the model is estimating over 2.1 million person trips, excluding trips from surrounding counties, for Ada and Canyon Counties. The raw p's and a's are well-within the recommended difference of 5%.

According to the data collected during the 2011/12 household travel survey each household produces about 10.95 person trips once adjusted for the under-reporting rate.

## Trip Distribution

Trip distribution provides the TAZ to TAZ person trips for all trip purposes. These are often referred to as "O-D tables". The tables and figures below show the Ada County and Canyon County summarize the total person trip targets, model results and differences.

How to interpret these tables:

Person Trips from Ada to Ada		Person Trips from Ada to Canyon		Data Targets Estimated from survey			
ii comp				46,028	94,531		
				Data Target	3.1%	17.3%	
				1,583,594	573,490		
Icomp				A to A	A to C	C to C	C to A
1		1,524,827	58,767	1,524,827	58,767	471,909	101,580
2		101,580	471,909	96.3%	3.7%	82.3%	17.7%
Ada County = 1				Compared to Target	0.6%	0.4%	
Canyon County = 2					12,739	7,049	
Person Trips from Canyon to Ada		Person Trips from Canyon to Canyon					

Table 5: Internal-Internal Person Trips

Total Internal to Internal trips: too many Ada to Canyon and Canyon to Ada trips.	ii comp				46,028	94,531		
					Data Target	3.1%	17.3%	
					1,545,559	612,631		
	Icomp				A to A	A to C	C to C	C to A
	1		1472246	73312.69	1,472,246	73,313	497,755	114,877
2		114876.6	497754.8	95.3%	4.7%	81.2%	18.8%	
				Compared to Target	1.6%	1.5%		
					27,285	20,346		
Results after a series of adjustments to individual trip purposes	ii comp				46,028	94,531		
					Data Target	3.1%	17.3%	
					1,581,655	576,225		
	Icomp				A to A	A to C	C to C	C to A
	1		1517932	63723.23	1,517,932	63,723	470,982	105,243
2		105243.2	470982.2	96.0%	4.0%	81.7%	18.3%	
				Compared to Target	0.9%	1.0%		
					17,695	10,712		

Results after a series of additional adjustments to individual trip purposes – continues to yield a decrease in the inter-county trips.

ii comp				46,028	94,531		
Data Target				3.1%	17.3%		
				1,583,594	573,490		
IIcomp				A to A	A to C	C to C	C to A
1	1524827	58767.01		1,524,827	58,767	471,909	101,580
2	101580.2	471909.3		96.3%	3.7%	82.3%	17.7%
Compared to Target				0.6%	0.4%		
				12,739	7,049		

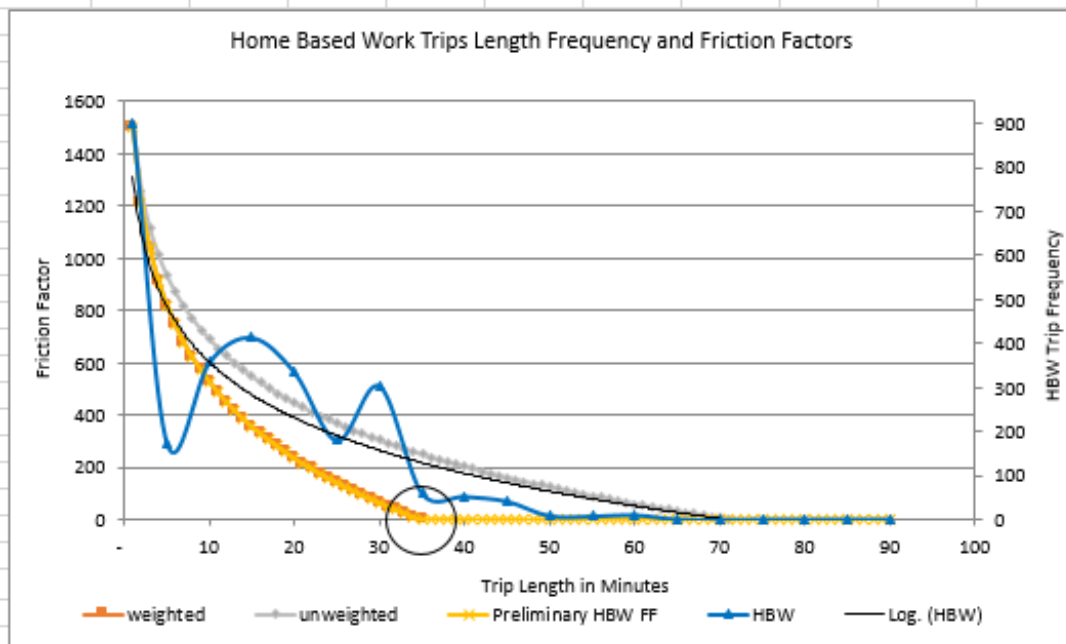
December 15, 2014: **Latest Results** – these are all internal to internal person trip purposes after all refinements outlined below

II Person Trips				46,028	94,531		
Data Target				3.1%	17.3%		
				1,583,562	573,485		
IIcomp				A to A	A to C	C to C	C to A
1	1526953	56609.77		1,526,953	56,610	479,324	94,161
2	94160.87	479324		96.4%	3.6%	83.6%	16.4%
Compared to Target				0.4%	-0.9%		
				10,582	(370)		

Table 6: Home Base Work Person Trips

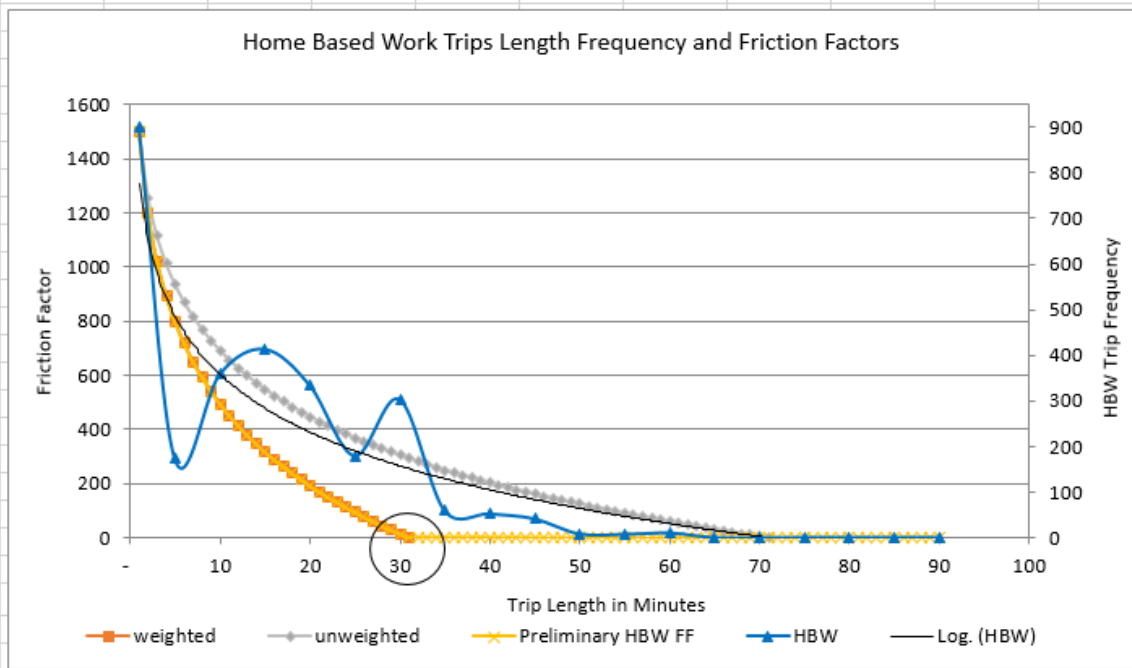
Home Base Work: too many inter-county HBW trips

home base work				13,502	34,409		
Data Target				5.5%	36.4%		
				241,752	93,103		
HBWCOMP				A to A	A to C	C to C	C to A
1	219892.8	21859.07		219,893	21,859	53,905	39,198
2	39198.38	53905.09		91.0%	9.0%	57.9%	42.1%
3	0	0			3.5%		5.7%
Compared to Target				8,357	4,789		



Tested different friction factor curve weighting to evaluate sensitivity of HBW inter-county trip distribution.

home base work				13,502	34,409	
Data Target				5.5%	36.4%	
				241511.01	92306.97	
HBWCOMP	1	2	A to A	A to C	C to C	C to A
1	225410.8	16100.19	225,411	16,100	59,386	32,920
2	32920.49	59386.48	93.3%	6.7%	64.3%	35.7%
Compared to Target				2,598	(1,489)	



**December 12 Results** –Adjusted FF curve and changed Canyon HBW Attraction Rate from 1.30 to 1.20 (NCHRP 716 rate, the same rate used for Ada County, shown in Figure 4 and Figure 6 for A[1]).

home base work				13,502	34,409	
Data Target				5.5%	36.4%	
				241,518	92,307	
HBWCOMP	1	2	A to A	A to C	C to C	C to A
1	227353.2	14164.93	227,353	14,165	56,749	35,558
2	35558.24	56748.93	94.1%	5.9%	61.5%	38.5%
Compared to Target				0.3%	2.1%	
				663	1,149	

**HBWork recommendation 2:** accept the cross-classification rates Figure 5, attraction rates Figure 6 and friction factors (Preliminary HBW FF shown in the above chart).

Table 7: Home Base Shop Person Trips

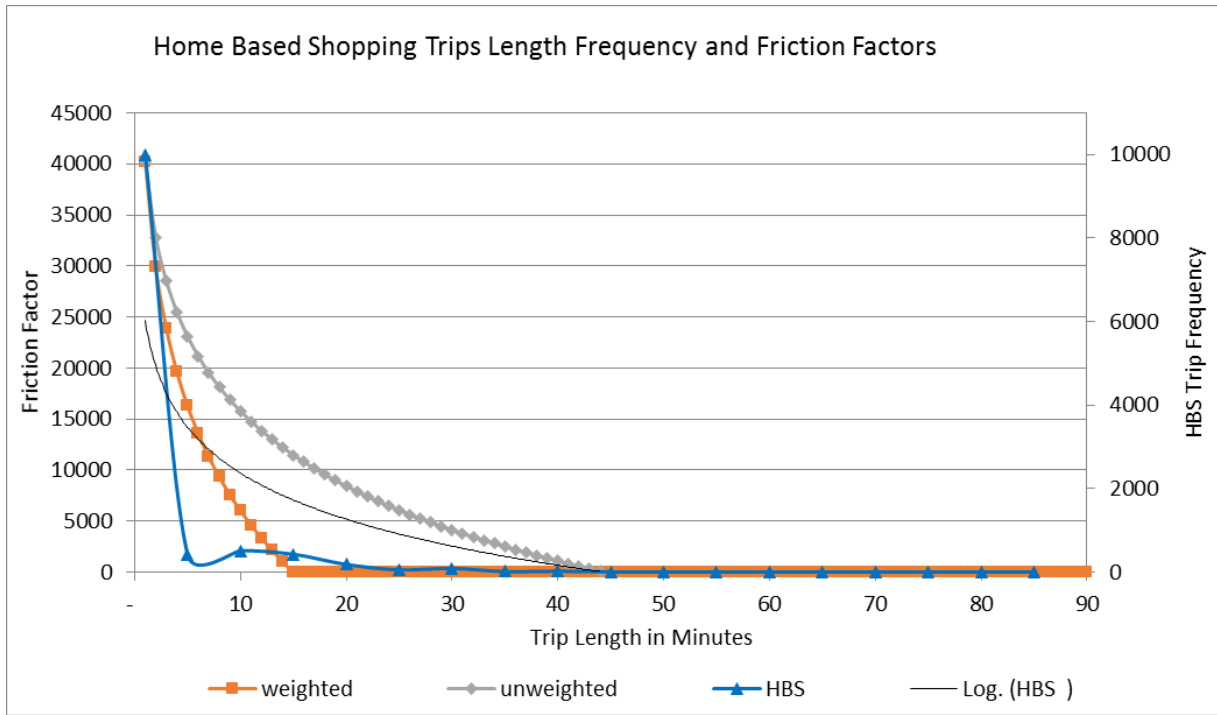
<p>Home Base Shop: Canyon County's HBS attraction rate (A[2] in table 4) was 5.50. The overall HBS attractions are low and too many Canyon trips are going to Ada and not enough Ada trips are going to Canyon</p>	<table border="1"> <tr> <td colspan="2">home base shop</td> <td colspan="2"></td> <td>6,531</td> <td></td> <td></td> <td>8,367</td> </tr> <tr> <td colspan="2"></td> <td colspan="2">Data Target</td> <td>3.3%</td> <td></td> <td></td> <td>9.0%</td> </tr> <tr> <td colspan="2"></td> <td colspan="2"></td> <td>198,025</td> <td></td> <td>92,747</td> <td></td> </tr> <tr> <td>HBSCOMP</td> <td>1</td> <td>2</td> <td></td> <td>A to A</td> <td>A to C</td> <td>C to C</td> <td>C to A</td> </tr> <tr> <td>1</td> <td>197156.8</td> <td>868.05</td> <td></td> <td>197,157</td> <td>868</td> <td>72,535</td> <td>20,212</td> </tr> <tr> <td>2</td> <td>20212.19</td> <td>72534.93</td> <td></td> <td>99.6%</td> <td>0.4%</td> <td>78.2%</td> <td>21.8%</td> </tr> <tr> <td colspan="2"></td> <td colspan="2"></td> <td>Compared to Target</td> <td>-2.8%</td> <td></td> <td>12.8%</td> </tr> <tr> <td colspan="2"></td> <td colspan="2"></td> <td></td> <td>(5,663)</td> <td></td> <td>11,845</td> </tr> </table>								home base shop				6,531			8,367			Data Target		3.3%			9.0%					198,025		92,747		HBSCOMP	1	2		A to A	A to C	C to C	C to A	1	197156.8	868.05		197,157	868	72,535	20,212	2	20212.19	72534.93		99.6%	0.4%	78.2%	21.8%					Compared to Target	-2.8%		12.8%						(5,663)		11,845
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home base shop				6,531			8,367																																																																	
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					198,017		92,734																																																																	
	HBSCOMP	1	2		A to A	A to C	C to C	C to A																																																																
	1	196875	1142		196,875	1,142	76,170	16,564																																																																
	2	16564	76170		99.4%	0.6%	82.1%	17.9%																																																																
					Compared to Target	-2.7%		8.9%																																																																
						(5,389)		8,197																																																																
	<p>(December 1, 2015) Recommend testing a decrease of the retail attraction rate in HBO A[5] and increase the office, industrial, government and agriculture attraction rates to offset the total Canyon County attraction rates for HBO. Any decrease in HBO retail rate will be shifted to HBS attraction rate A[2]</p>																																																																							
	<table border="1"> <tr> <td colspan="2">home base shop</td> <td colspan="2">2</td> <td>6,531</td> <td></td> <td></td> <td>8,367</td> </tr> <tr> <td colspan="2">test 6.10 HBS Canyon Att rate</td> <td colspan="2"></td> <td>Data Target</td> <td>3.3%</td> <td></td> <td>9.0%</td> </tr> <tr> <td colspan="2"></td> <td colspan="2"></td> <td>198,017</td> <td></td> <td>92,737</td> <td></td> </tr> <tr> <td>HBSCOMP</td> <td>1</td> <td>2</td> <td></td> <td>A to A</td> <td>A to C</td> <td>C to C</td> <td>C to A</td> </tr> <tr> <td>1</td> <td>196696.5</td> <td>1320.03</td> <td></td> <td>196,697</td> <td>1,320</td> <td>77,890</td> <td>14,848</td> </tr> <tr> <td>2</td> <td>14847.77</td> <td>77889.7</td> <td></td> <td>99.3%</td> <td>0.7%</td> <td>84.0%</td> <td>16.0%</td> </tr> <tr> <td colspan="2"></td> <td colspan="2"></td> <td>Compared to Target</td> <td>-2.6%</td> <td></td> <td>7.0%</td> </tr> <tr> <td colspan="2"></td> <td colspan="2"></td> <td></td> <td>(5,211)</td> <td></td> <td>6,481</td> </tr> </table>								home base shop		2		6,531			8,367	test 6.10 HBS Canyon Att rate				Data Target	3.3%		9.0%					198,017		92,737		HBSCOMP	1	2		A to A	A to C	C to C	C to A	1	196696.5	1320.03		196,697	1,320	77,890	14,848	2	14847.77	77889.7		99.3%	0.7%	84.0%	16.0%					Compared to Target	-2.6%		7.0%						(5,211)		6,481
	home base shop		2		6,531			8,367																																																																
	test 6.10 HBS Canyon Att rate				Data Target	3.3%		9.0%																																																																
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					Compared to Target	-2.6%		7.0%																																																																
						(5,211)		6,481																																																																

**December 12**

**Results -**

Attraction rates used:  
 HBS A[2] = 6.5\*Retail  
 HBO A[5] = 2.0\*Retail  
 and 1.10\*office

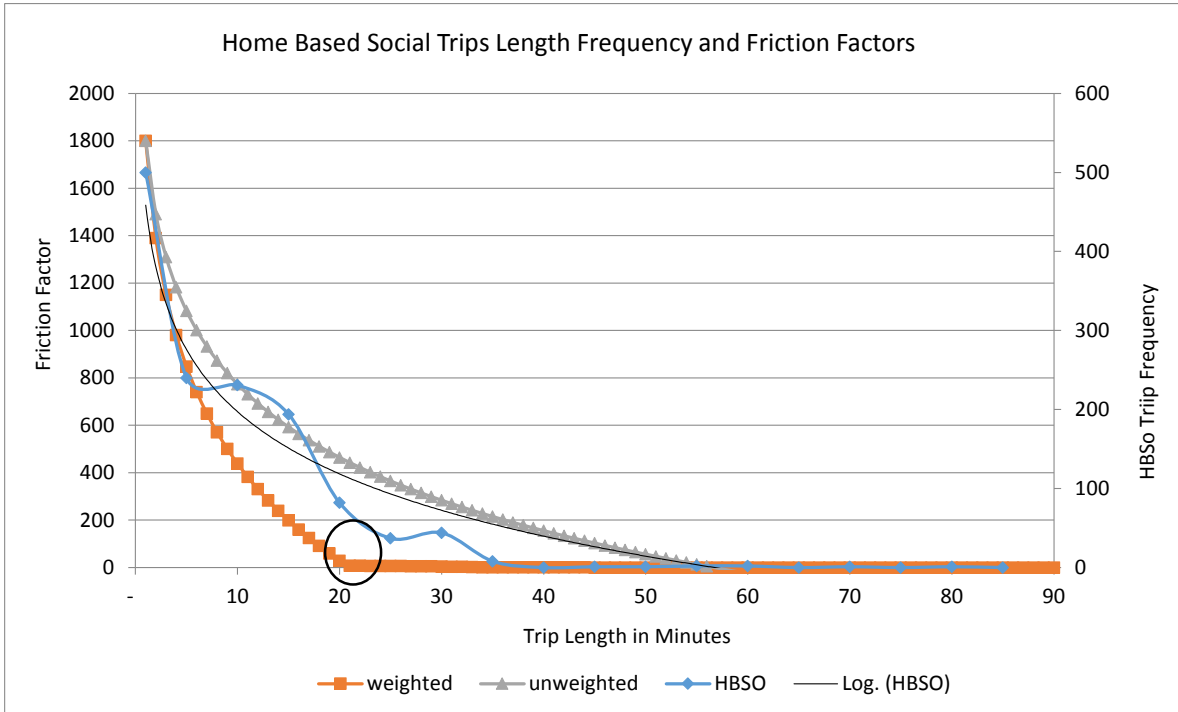
home base shop				6,531		8,367	
Data Target				3.3%		9.0%	
				198,006	92,734		
HBSCOMP	1	2		A to A	A to C	C to C	C to A
1	196213.6	1792.53		196,214	1,793	81,171	11,563
2	11563.01	81170.6		99.1%	0.9%	87.5%	12.5%
				Compared to Target	-2.3%		3.5%
				(4,738)			3,196



**HBSshop recommendation 3:** accept the cross-classification rates Figure 5, attraction rates Figure 6. Continue with the preliminary HBS FF were accepted at the previous TMAC meeting and are show in the chart above for reference.

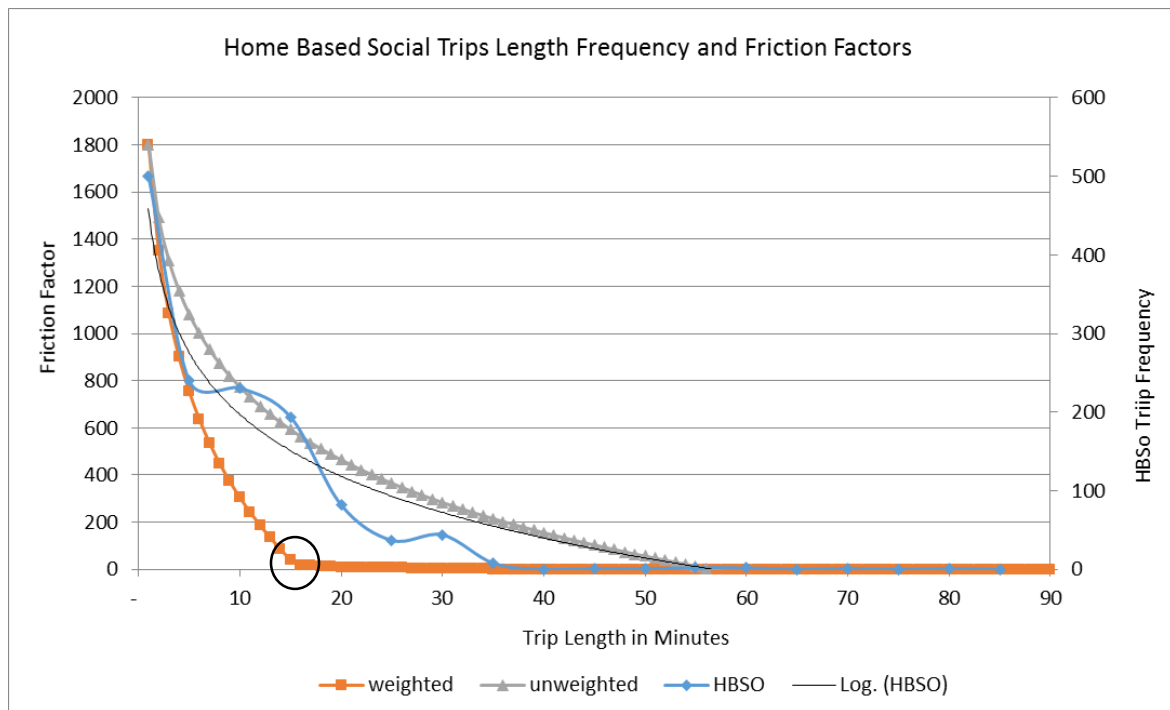
Table 8: Home Base Social Person Trips

Home Base Social: Tested different friction factor curve weighting to evaluate sensitivity of HBSO inter-county trip distribution. Original FF's weighted at 21 minutes		home base social				3459		4447
		Data Target				2.2%		7.1%
				160999.11		65628.81		
HBSOCOMP		1	2	A to A	A to C	C to C	C to A	
	1	155211.92	5787.19	155211.92	5787.19	55095.35	10533.46	
	2	10533.46	55095.35	96.4%	3.6%	83.9%	16.1%	
					1.4%		9.0%	
					2328.19		6086.46	



**December 12 Results:** Adjusted FF curve with weight at 16 minutes.

home base social				3,459		4,447	
		Data Target		2.2%		7.1%	
				160,900		63,356	
HBSOCOMP		1	2	A to A	A to C	C to C	C to A
	1	154953.87	5946.33	154,954	5,946	55,209	8,147
	2	8146.89	55209.42	96.3%	3.7%	87.1%	12.9%
					Compared to Target	1.5%	5.8%
					2,487		3,700



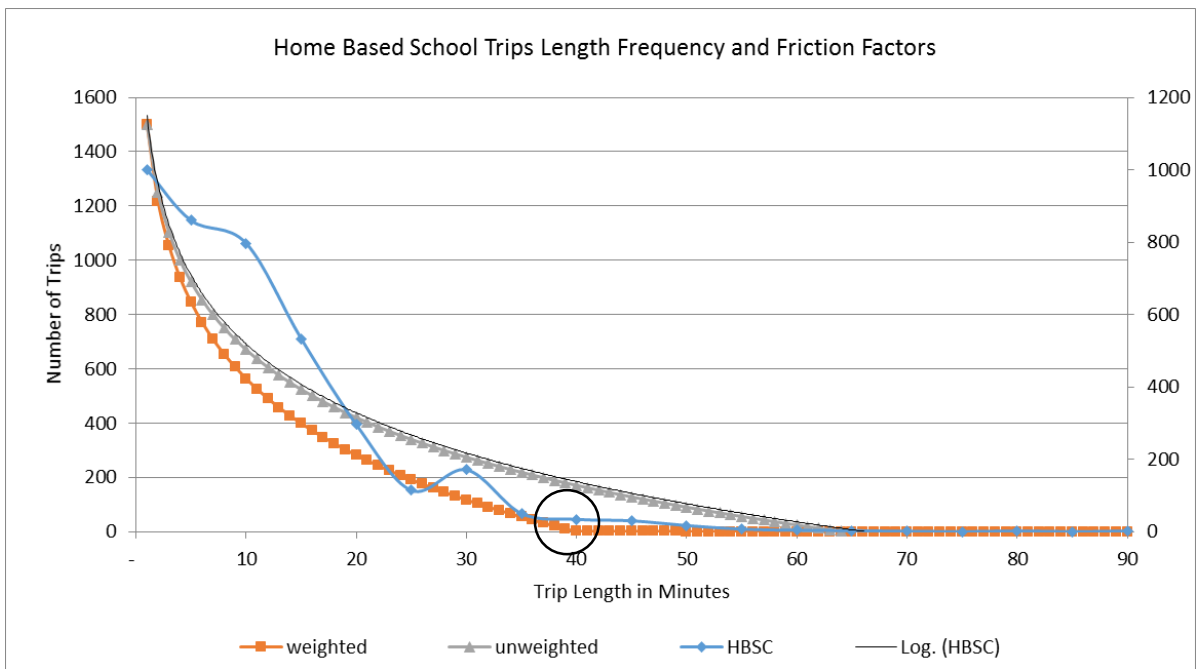
**HBSocial recommendation 4:** accept the cross-classification rates Figure 5, attraction rates Figure 6 and friction factors (Preliminary HBSo FF shown in the above chart).

Table 9: Home Base School Person Trips

Home Base School: too many inter-county trips	<table border="1"> <tr> <td colspan="3">home base school</td> <td>5,889</td> <td></td> <td>6,564</td> <td></td> </tr> <tr> <td colspan="3">Data Target</td> <td>2.0%</td> <td></td> <td>6.4%</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td>273,852</td> <td></td> <td>112,559</td> <td></td> </tr> <tr> <td>HBSCCOM</td> <td>1</td> <td>2</td> <td>A to A</td> <td>A to C</td> <td>C to C</td> <td>C to A</td> </tr> <tr> <td>1</td> <td>258821.3</td> <td>15030.56</td> <td>258,821</td> <td>15,031</td> <td>102,335</td> <td>10,224</td> </tr> <tr> <td>2</td> <td>10224.3</td> <td>102334.7</td> <td>94.5%</td> <td>5.5%</td> <td>90.9%</td> <td>9.1%</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>3.4%</td> <td></td> <td>2.7%</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>9,142</td> <td></td> <td>3,660</td> </tr> </table>							home base school			5,889		6,564		Data Target			2.0%		6.4%					273,852		112,559		HBSCCOM	1	2	A to A	A to C	C to C	C to A	1	258821.3	15030.56	258,821	15,031	102,335	10,224	2	10224.3	102334.7	94.5%	5.5%	90.9%	9.1%					3.4%		2.7%					9,142		3,660
	home base school			5,889		6,564																																																									
Data Target			2.0%		6.4%																																																										
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				9,142		3,660																																																									
Adjusted the raw Ada and Canyon production rates (shown in tables 1 and 2 and figures 1 and 2). These refinements did not impact the inter-county trip distribution	<table border="1"> <tr> <td colspan="3">home base school</td> <td>5,889</td> <td></td> <td>6,564</td> <td></td> </tr> <tr> <td colspan="3">Data Target</td> <td>2.0%</td> <td></td> <td>6.4%</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td>285,155</td> <td></td> <td>101,263</td> <td></td> </tr> <tr> <td>HBSCCOM</td> <td>1</td> <td>2</td> <td>A to A</td> <td>A to C</td> <td>C to C</td> <td>C to A</td> </tr> <tr> <td>1</td> <td>268585.8</td> <td>16569.28</td> <td>268,586</td> <td>16,569</td> <td>92,482</td> <td>8,781</td> </tr> <tr> <td>2</td> <td>8780.88</td> <td>92481.8</td> <td>94.2%</td> <td>5.8%</td> <td>91.3%</td> <td>8.7%</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>3.8%</td> <td></td> <td>2.3%</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>10,680</td> <td></td> <td>2,217</td> </tr> </table>							home base school			5,889		6,564		Data Target			2.0%		6.4%					285,155		101,263		HBSCCOM	1	2	A to A	A to C	C to C	C to A	1	268585.8	16569.28	268,586	16,569	92,482	8,781	2	8780.88	92481.8	94.2%	5.8%	91.3%	8.7%					3.8%		2.3%					10,680		2,217
home base school			5,889		6,564																																																										
Data Target			2.0%		6.4%																																																										
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				3.8%		2.3%																																																									
				10,680		2,217																																																									

Adjusted the trip distribution calculation based on enrollment (public elementary, middle/jr and senior)– 85% of the school trips use the enrollment boundary TAZs, 15% (private, alternative, charters, colleges and universities) use the friction factors

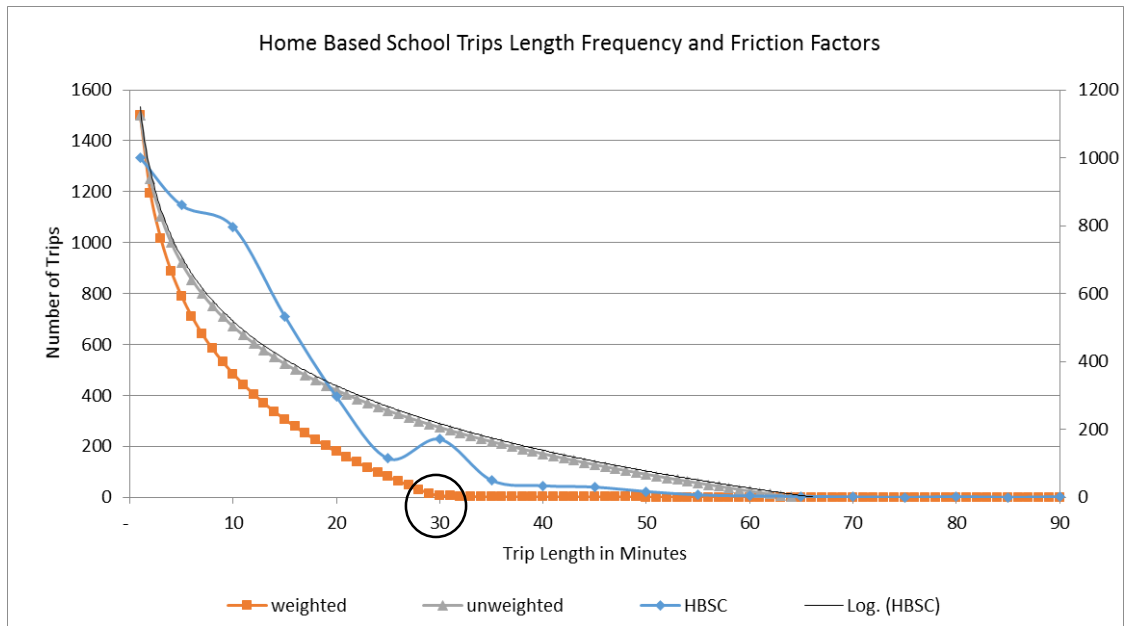
home base school				5,889		6,564
				Data Target	2.0%	6.4%
				288,720	97,674	
HBSCCOM	1	2	A to A	A to C	C to C	C to A
1	278302.7	10417.28	278,303	10,417	92,098	5,576
2	5575.96	92098.22	96.4%	3.6%	94.3%	5.7%
					1.6%	-0.6%
					4,528	-988



(December 1, 2014) Recommend test 1) increase of the HBSc attraction rates for Ada County, A[4] in Figure 6 2) decrease the HBSc attraction rates for Canyon County 3) adjust the friction factor curve 4) update the proportion of HBSc trips that use the friction factor or the enrollment boundary parameters. Items 3 and 4 have been completed.

**December 12 Results**

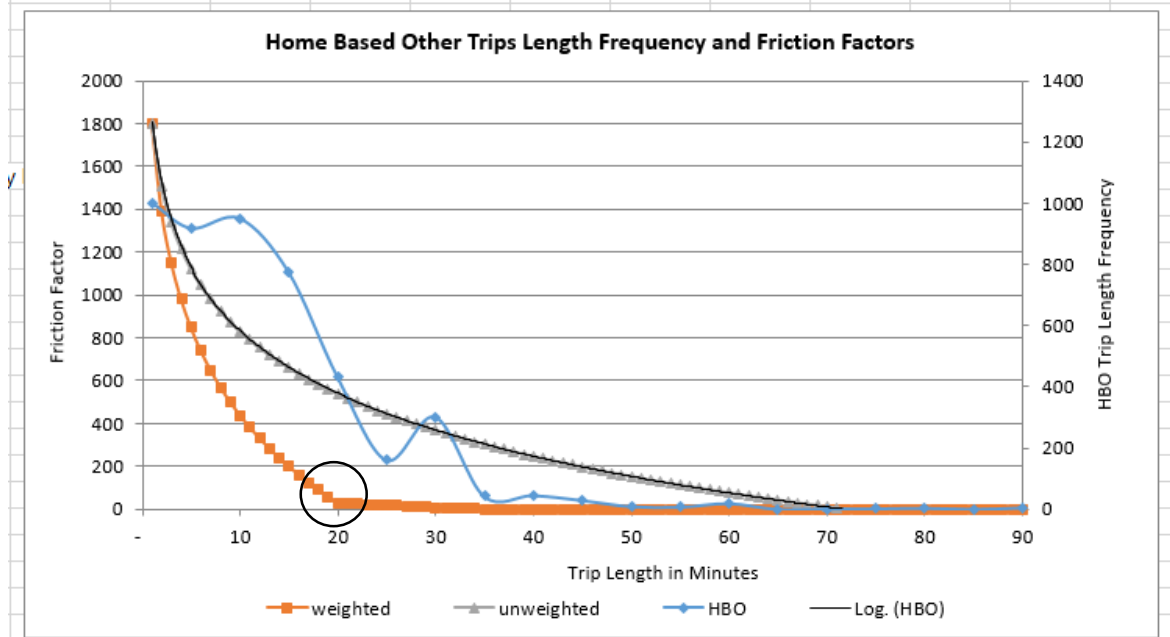
home base school				5,889		6,564
pub 85%, pvt 15%				Data Target	2.0%	6.4%
30 min weight				288,713	97,669	
HBSCCOMP	1	2	A to A	A to C	C to C	C to A
1	280635.5	8077.52	280,635	8,078	94,430	3,238
2	3238.43	94430.17	97.2%	2.8%	96.7%	3.3%
					0.8%	-3.0%
					2,189	-3,326



**HBSchool recommendation 5:** accept the cross-classification rates Figure 5, and friction factors (Preliminary HBSc FF shown in the above chart). Test an increase Ada County HBSc rate to account for the enrollment level at BSU. Evaluate how the model responds.

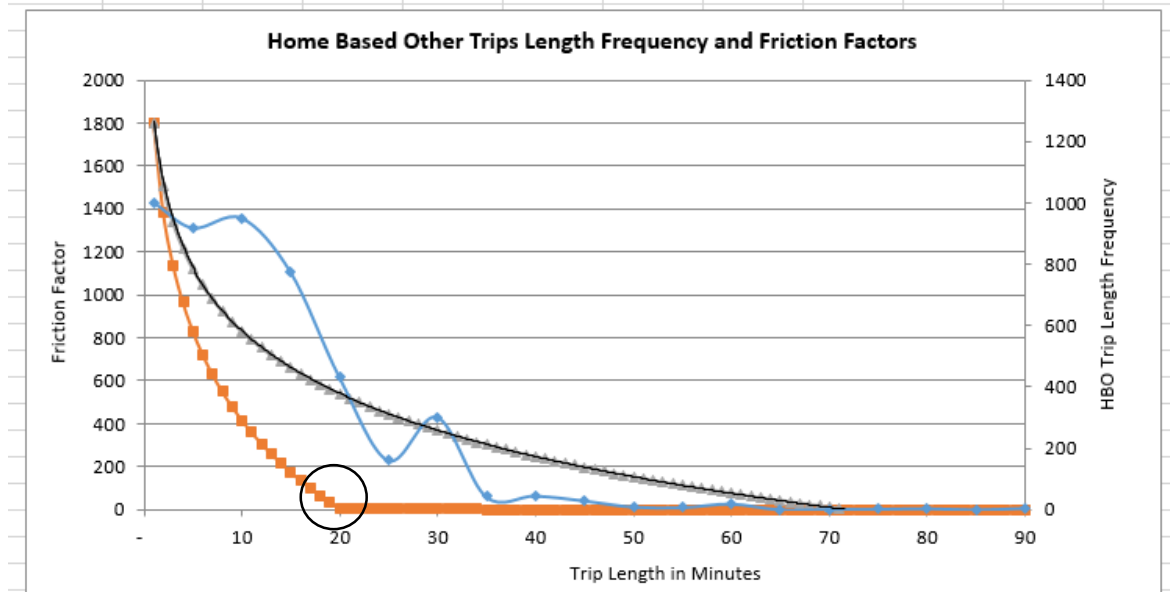
Table 10: Home Base Other Person Trips

Home Base Other: too many inter-county trips	home base other								4,605		15,902
	Data Target								1.5%		15.0%
									299,822		106,185
	HBOCOMP		1	2		A to A	A to C	C to C	C to A		
	1	287873.2	11948.61		287,873	11,949	86,239	19,946			
	2	19945.6	86238.91		96.0%	4.0%	81.2%	18.8%			
									2.5%		3.8%
								7,344		4,044	
Increased HBO attraction rates applied to government jobs in the downtown Boise TAZs. The friction factor curve is weighted at 21 minutes (see below)	home base other								4,605		15,902
	adjusted Attraction rates								Data Target	1.5%	15.0%
									299,830		106,183
	HBOCOMP		1	2		A to A	A to C	C to C	C to A		
	1	288124.3	11706.03		288,124	11,706	85,857	20,326			
	2	20326.22	85856.51		96.1%	3.9%	80.9%	19.1%			
									2.4%		4.1%
								7,101		4,424	



Adjusted the friction factor curve weighted at 20 minutes (see below)

home base other				4,605		15,902	
test wt at 20min				Data Target	1.5%	15.0%	
				299,797		106,169	
HBOCOMP	1	2		A to A	A to C	C to C	C to A
	1	290989.2	8807.8	290,989	8,808	88,725	17,444
	2	17444.13	88725.17	97.1%	2.9%	83.6%	16.4%
					1.4%		1.4%
					4,203		1,542



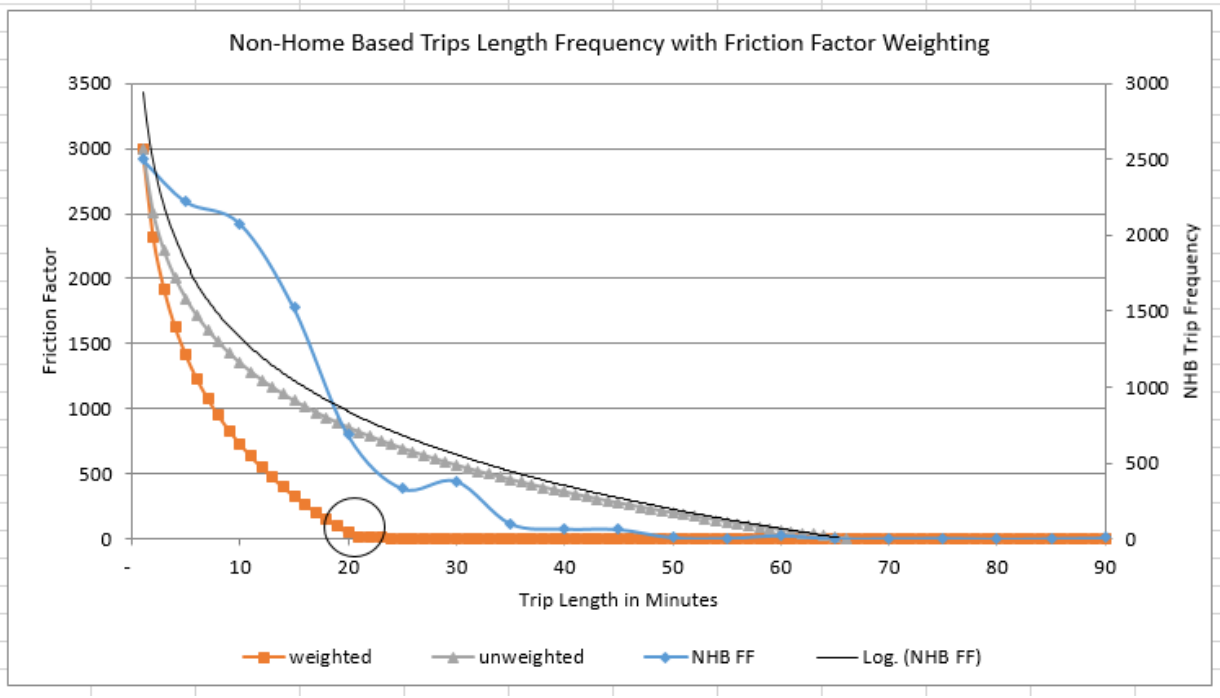
**HBOther recommendation 6:** accept the cross-classification rates Figure 5, attraction rates Figure 6 and friction factors (Preliminary HBO FF shown in the above chart).

Table 11: Non Home Base Person Trips

Non Home Base: too many Ada to Canyon and too few Canyon to Ada trips		Non home base						12,041	25,141
		Data Target						3.2%	17.1%
		384,991						136,068	
NHBCOMP		1	2	A to A	A to C	C to C	C to A		
1	362648.4	22342.36	362,648	22,342	113,727	22,342			
2	22341.78	113726.7	94.2%	5.8%	83.6%	16.4%			
								2.6%	-0.7%
								10,301	(2,799)

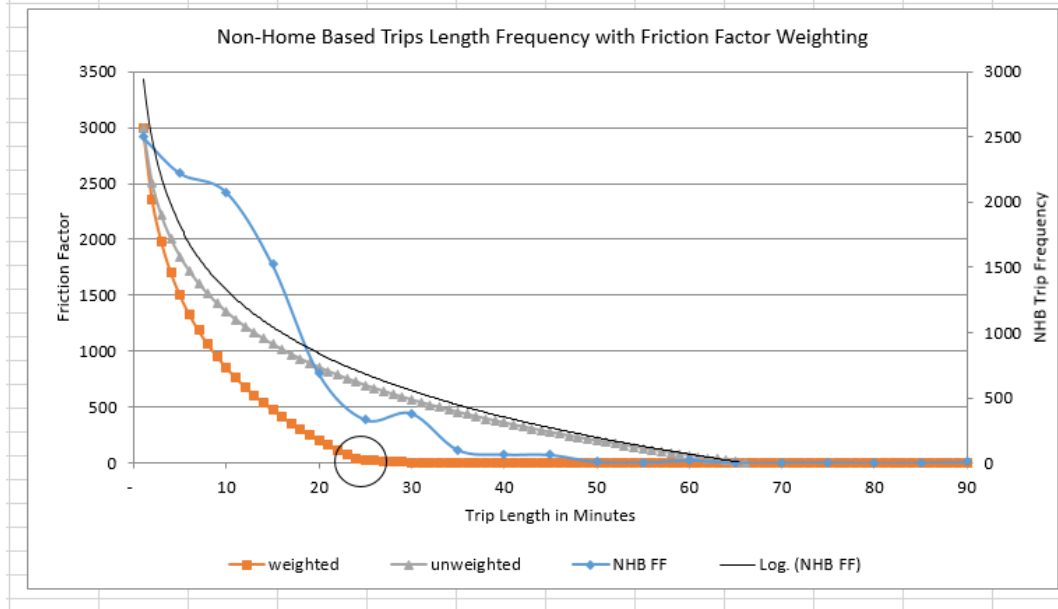
  

Adjusted the raw Ada and Canyon production rates (shown in tables 1 and 2 and figures 1 and 2) and the friction factor curve at 20 minutes (was weighted at 25 minutes) These refinements impacted the inter-county trip distribution with Ada to Canyon improving but Canyon to Ada worsening.		Non home base						12,041	25,141
		wt at 20 min						3.2%	17.1%
		371,229						145,299	
NHBCOMP		1	2	A to A	A to C	C to C	C to A		
1	357960.8	13267.98	357,961	13,268	132,031	13,268			
2	13268.11	132031.3	96.4%	3.6%	90.9%	9.1%			
								0.3%	-8.0%
								1,227	(11,873)



Use the original friction factors.

Non home base				12,041		25,141
used orig curve				Data Target	3.2%	17.1%
				371,367		145,405
NHBCOMP	1	2	A to A	A to C	C to C	C to A
1	348582	22785.39	348,582	22,785	122,618	22,786
2	22786.3	122618.5	93.9%	6.1%	84.3%	15.7%
				2.9%		-1.4%
				10,744		(2,355)



Used the original NHB friction factors and adjusted attraction rates – only minor changes occurred.

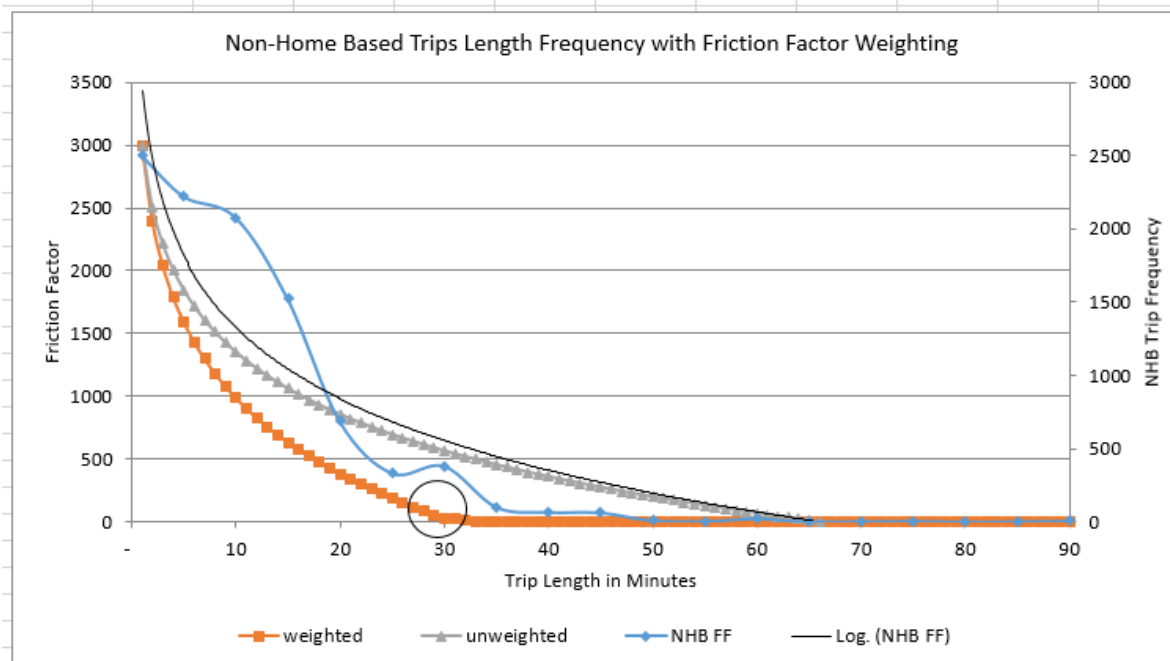
Non home base				12,325		24,244
adjusted A rates				Data Target	3.2%	17.1%
				379,285		141,657
NHBCOMP	1	2	A to A	A to C	C to C	C to A
1	356608	22677	356,608	22,677	118,980	22,677
2	22677	118980	94.0%	6.0%	84.0%	16.0%
				2.7%		-1.1%
				10,352		(1,567)

Made minor adjustments to the NHB attraction rates and used original friction factors.

Non home base				12,762		21,223
wt at 25 min				Data Target	3.2%	17.1%
				392,727		124,001
NHBCOMF	1	2	A to A	A to C	C to C	C to A
1	370704	22023	370,704	22,023	101,980	22,021
2	22021	101980	94.4%	5.6%	82.2%	17.8%
				2.4%		0.6%
				9,261		798

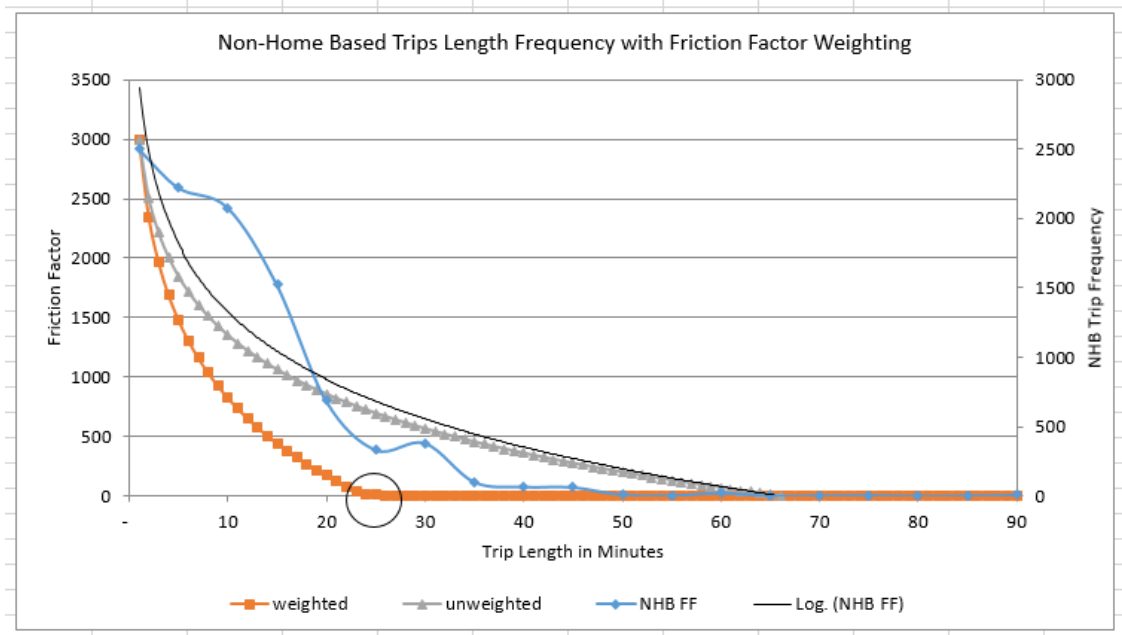
Weighed the friction factor curve at 30 minutes to test sensitivity.

Non home base				12,765		21,237
wt at 30 min				Data Target	3.2%	17.1%
				392,817		124,083
NHBCOMF	1	2	A to A	A to C	C to C	C to A
1	358867	33950	358,867	33,950	90,130	33,953
2	33953	90130	91.4%	8.6%	72.6%	27.4%
				5.4%		10.2%
				21,185		12,716



Weighed the friction factor curve at 24 minutes based on sensitivity tests.

Non home base				12803.02				20751
wt at 24 min				Data Target	3.2%	17.1%		
				393986.9	121245.9			
NHBCOMF	1	2		A to A	A to C	C to C	C to A	
1	375739.5	18247.35		375739.5	18247.35	102998	18247.81	
2	18247.81	102998		95.4%	4.6%	84.9%	15.1%	
					1.4%		-2.1%	
					5,444		(2,503)	



**Non-Home Base recommendation 7:** accept the cross-classification rates Figure 5, and friction factors (Preliminary NHB FF shown in the above chart). Test an increase Ada County NHB attraction rate and evaluate how the model responds.

## Daily Auto-Person Trips and Results

Table 12 summarizes the estimate of vehicle trips per household for driver trips from the 2011/12 household travel survey. This regional estimate is intended to provide a starting point to determine if the model is estimating a reasonable level of vehicle trips.

Table 12

	2011/12 Households	Households Surveyed	Driver Trips	Average Vehicle Trips	Estimate of Vehicle Trips
Ada	150,821	2,162	15,402	7.12	1,074,443
Canyon	64,334	807	5,027	6.23	400,752
				Target	1,475,195

Table 13 summarizes the total vehicle trips for Ada, Canyon internal and internal to external as compared to the target. After the first round and noticing the model estimates were low by 68,000 the auto occupancy factors were evaluated and adjusted.

Table 13

	Target	1,475,195	Difference
Model Results	Round 1	1,407,067	(68,128)
	Round 2	1,412,546	(62,649)
	Round 3	1,412,964	(62,231)
	Round 4	1,449,711	(25,484)
	Round 5	1,424,297	(50,898)
	Round 6	1,440,142	(35,053)
	Round 7	1,441,487	(33,708)

Prior to adjusting for school bus trips

Table 14 shows the original single occupant vehicle (SOV) percent and high occupant vehicle rate (HOV) for round 1 and round 7 (the latest set). The rates were adjusted but still largely based on the household travel survey data.

Table 14

Round 1	Round 7 Auto Occupancy Rates
SOV_PCT_HBW = 0.94	SOV_PCT_HBW = 0.96
HOV_ACC_HBW = 2.47	HOV_ACC_HBW = 2.00
SOV_PCT_HBS = 0.72	SOV_PCT_HBS = 0.75
HOV_ACC_HBS = 2.28	HOV_ACC_HBS = 2.13
SOV_PCT_HBSO = 0.67	SOV_PCT_HBSO = 0.67
HOV_ACC_HBSO = 2.63	HOV_ACC_HBSO = 2.43
SOV_PCT_HBO = 0.63	SOV_PCT_HBO = 0.63
HOV_ACC_HBO = 2.42	HOV_ACC_HBO = 2.19
SOV_PCT_HBSC = 0.46	SOV_PCT_HBSC = 0.46
HOV_ACC_HBSC = 2.61	HOV_ACC_HBSC = 2.61
	Other_Mode_Occ = 2.62
	School_Bus_Occ = 22
SOV_PCT_NHB = 0.60	SOV_PCT_NHB = 0.60
HOV_ACC_NHB = 2.44	HOV_ACC_NHB = 2.05
IX_OCC = 1.67	IX_OCC = 1.75

HBW - changed SOV pct to 0.96 and HOV to 2.42

HBO - changed rate to .006 pct of "other" motorized trips by taxi, motorcycle, other based on survey data

HBO - calculated average auto occup for taxi, motorcycle, and other from survey data  
 HBW HOV auto occup decreased from 2.42 to 2.14  
 NHB HOV auto occup decreased from 2.44 to 2.05  
 HBS auto occupancy increase SOV to .75 and decrease from 2.28 to 2.13  
 HBSc school bus occupancy at 22 based on data from Idaho State Department of Education

### Daily Model Results

After several model runs, refinements, sensitivity testing and updating of parameters the daily validation results were promising but overall too low (-11.9%) and minor arterials were out of "range", see Figure 7. This is one of the main reasons to compare the estimated vehicle trip targets and model estimates. Another assignment procedure was also evaluated called "generalized" cost. This process uses both travel time and distance in route choice (the assignment of vehicle trips to the network). Generalized cost method was tested to see if the model would respond appropriately when taking into account both time and distance.

Figure 7

*** %RMSE by Link Class Test ***			
Facility Type	%RMSE	MAX	Validation
INTERSTATE&RAMPS	12.5%	< 40%	PASS
PRINCIPAL ARTERL	27.8%	< 40%	PASS
<b>MINOR ARTERIALS</b>	<b>43.9%</b>	<b>&lt; 40%</b>	
COLLECTORS	70.2%	< 40%	(not expected to pass given low volumes and limited roads)
LOCALS	79.3%	< 40%	(not expected to pass given low volumes and limited roads)
Overall	37.7	< 40%	PASS
WO LOCAL	36.6%	< 40%	PASS
WO LOCAL_COLL	31.8%	< 40%	PASS
*** %ERR by Functional Class Test ***			
Function Class	V/C %Err	MAX	Validation
INTERSTATE&RAMPS	0.2%	< 7%	PASS
PRINCIPAL ARTERL	-8.7%	< 10%	PASS
<b>MINOR ARTERIALS</b>	<b>-18.2%</b>	<b>&lt; 15%</b>	
COLLECTORS	-23.4%	< 25%	PASS
LOCALS	-5.4%	< 25%	PASS
OVERALL	-11.9		

Table 15 summarizes and compares the daily model validation results using the two different assignment methodologies.

Table 15

Without Generalized Cost				With Generalized cost			
*** %RMSE by Link Class Test ***				*** %RMSE by Link Class Test ***			
Facility Type	%RMSE	MAX	Validation	Facility Type	%RMSE	MAX	Validati
-----	-----	-----	-----	-----	-----	-----	-----
INTERSTATE&RAMPS	12.7%	< 40%	PASS	INTERSTATE&RAMPS	18.6%	< 40%	PASS
PRINCIPAL ARTERL	26.4%	< 40%	PASS	PRINCIPAL ARTERL	27.3%	< 40%	PASS
MINOR ARTERIALS	42.2%	< 40%		MINOR ARTERIALS	39.8%	< 40%	PASS
COLLECTORS	69.7%	< 40%		COLLECTORS	69.3%	< 40%	
LOCALS	78.0%	< 40%		LOCALS	78.0%	< 40%	
-----	-----	-----	-----	-----	-----	-----	-----
Overall	36.2	< 40%	PASS	Overall	37.2	< 40%	PASS
WO LOCAL	35.2%	< 40%	PASS	WO LOCAL	36.2%	< 40%	PASS
WO LOCAL_COLL	30.4%	< 40%	PASS	WO LOCAL_COLL	31.4%	< 40%	PASS
*** %ERR by Functional Class Test ***				*** %ERR by Functional Class Test ***			
Function Class	V/C %Err	MAX	Validation	Function Class	V/C %Err	MAX	Validation
-----	-----	-----	-----	-----	-----	-----	-----
INTERSTATE&RAMPS	1.6%	< 7%	PASS	INTERSTATE&RAMPS	-7.7%	< 7%	
PRINCIPAL ARTERL	-5.7%	< 10%	PASS	PRINCIPAL ARTERL	-5.5%	< 10%	PASS
MINOR ARTERIALS	-14.0%	< 15%	PASS	MINOR ARTERIALS	-10.4%	< 15%	PASS
COLLECTORS	-21.8%	< 25%	PASS	COLLECTORS	-17.2%	< 25%	PASS
LOCALS	1.5%	< 25%	PASS	LOCALS	3.6%	< 25%	PASS
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OVERALL	-8.8			OVERALL	-8.3		

### Conclusion and Next Steps

The daily model is still not validated but is close. A few issues remain prior to declaring victory:

1. Vehicle trips
  - a. continue to refine and test auto occupancy rate adjustments until the model estimates are closer to the estimate of 1.475 million
2. Assignment methodology
  - a. Stay with traditional assignment
  - b. Continue to test generalized cost methodology
    - i. Background and use of generalized cost will be discussed at the December 22, 2014 TMAC meeting.
3. When are the results good enough?
  - a. Open discussion