AADT Estimation Pooled Fund

FHWA Annual Highway Information Seminar

Wednesday 12:30 pm – 1:30 pm
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Federal Highway Administration

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Today's Objectives

- Value of AADT
- Task 2 – AADT calculation
- Task 3 – Duration of counts
- Task 4 – Frequency of counts
- Task 5 – Special events and holidays
- Classification factoring – with example

Value of AADT data

- Who uses it? (see the 2013 TMG, page 59)
  - Federal
  - State
  - Locals/MPOs
  - Public
    - Investment – numerous travel and fuel based companies
    - Roadside advertising
    - Business owners
- Methods established over 30 years ago

Task 2 – AADT Final Report

- 4 Methods studied for best AADT accuracy
  - Simple average
  - AASHTO
  - AASHTO modified
  - New HPSJB hourly method (smaller time intervals work too)
- Transportation Pooled Fund: TPF-5(292)
- FHWA Pooled Fund Website:

  http://www.pooledfund.org/

Task 3 – Duration of Counts

- See the final report due out soon

Task 4 – Frequency of Counts

- Counts done every year – whole system
- Counts done every other year (50% yearly factored)
- Counts done every 3rd year (first 1/3 one year factors applied and second 1/3 with 2 year factors applied)
- Counts done every 6 years

- Note - overlap of sites for Task 3 as much as possible
- Only 24 hour and 48 hour durations studied for frequency

Task 5 – Special Events & Holidays

- Influence of Events on AADT
  - TAC events
  - NASCAR, sporting events, environmental
  - Do you have events we should study
- Influence of Holidays
  - Varies by State – some celebrated and some not
  - Number of days effected
  - Changes to the data varies by year

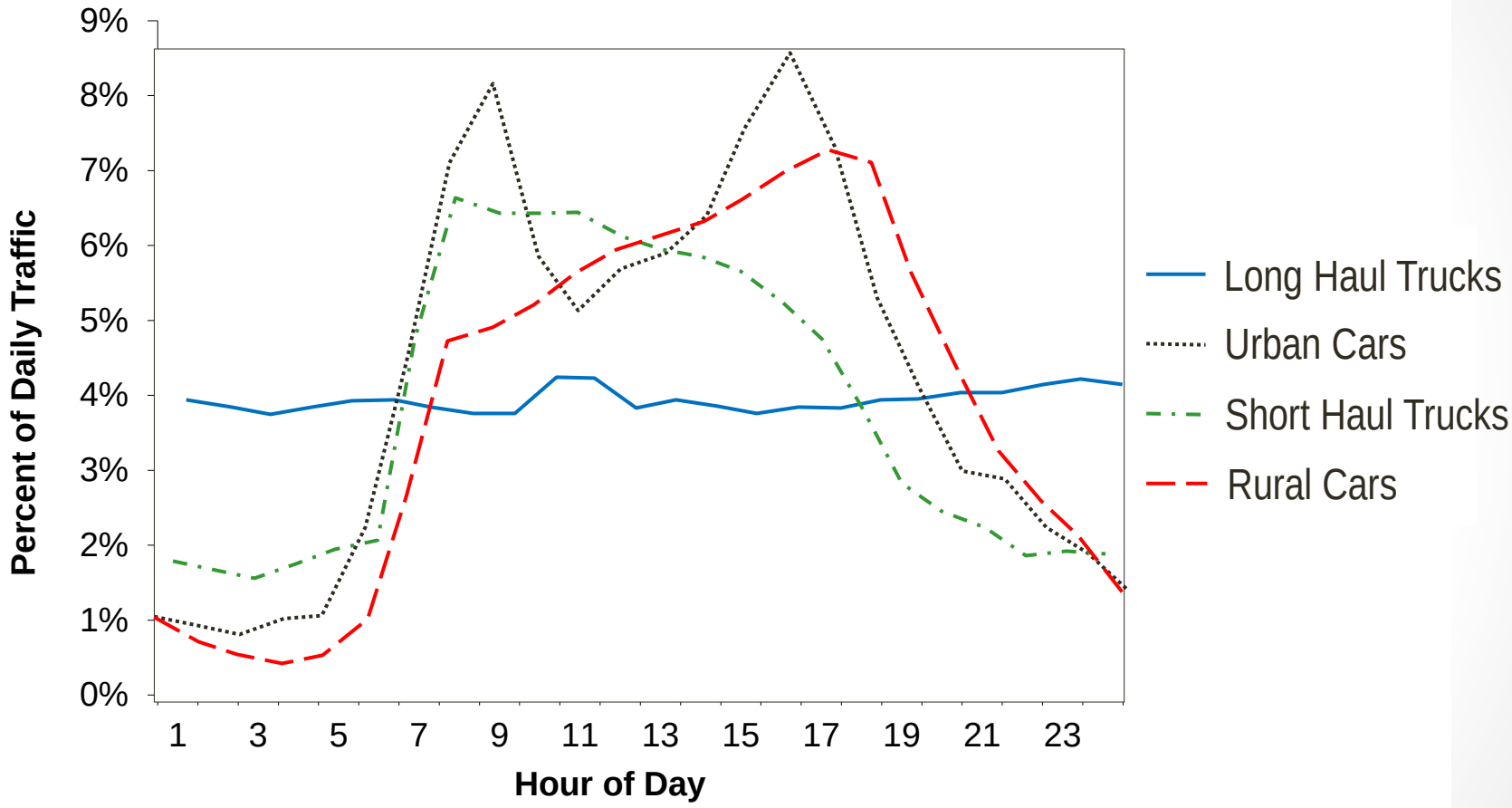
Factoring for class – why?

- Motorcycle travel patterns
- Passenger car travel patterns
- Single Unit Vehicle travel patterns
- Bus travel patterns
- Combination travel patterns

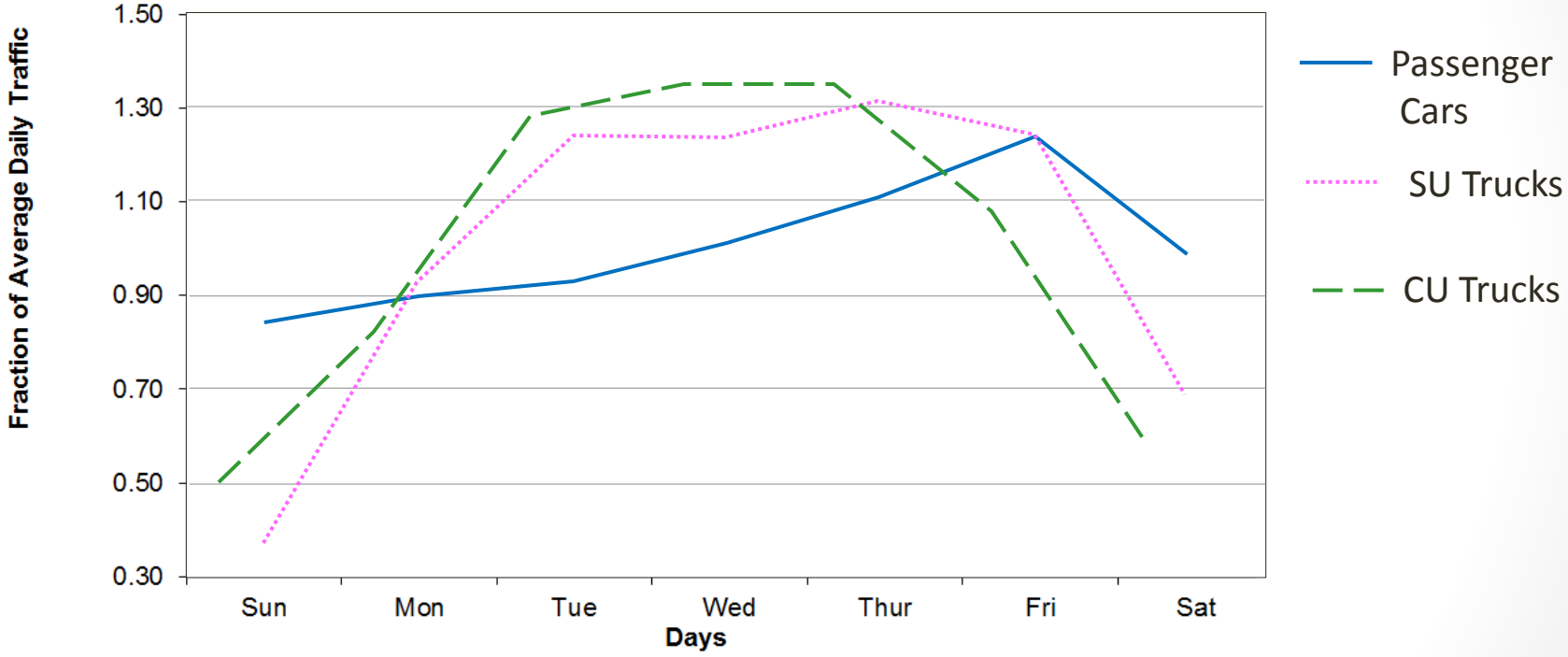
Reasons for Continuous Classification Program

- Highly accurate measure of different vehicle types at a limited number of sites
- Track changes in class volumes over time
- Travel patterns of vehicle types on different roadways
- Adjustment factors and factor groups – conversion of short duration counts into annual estimates

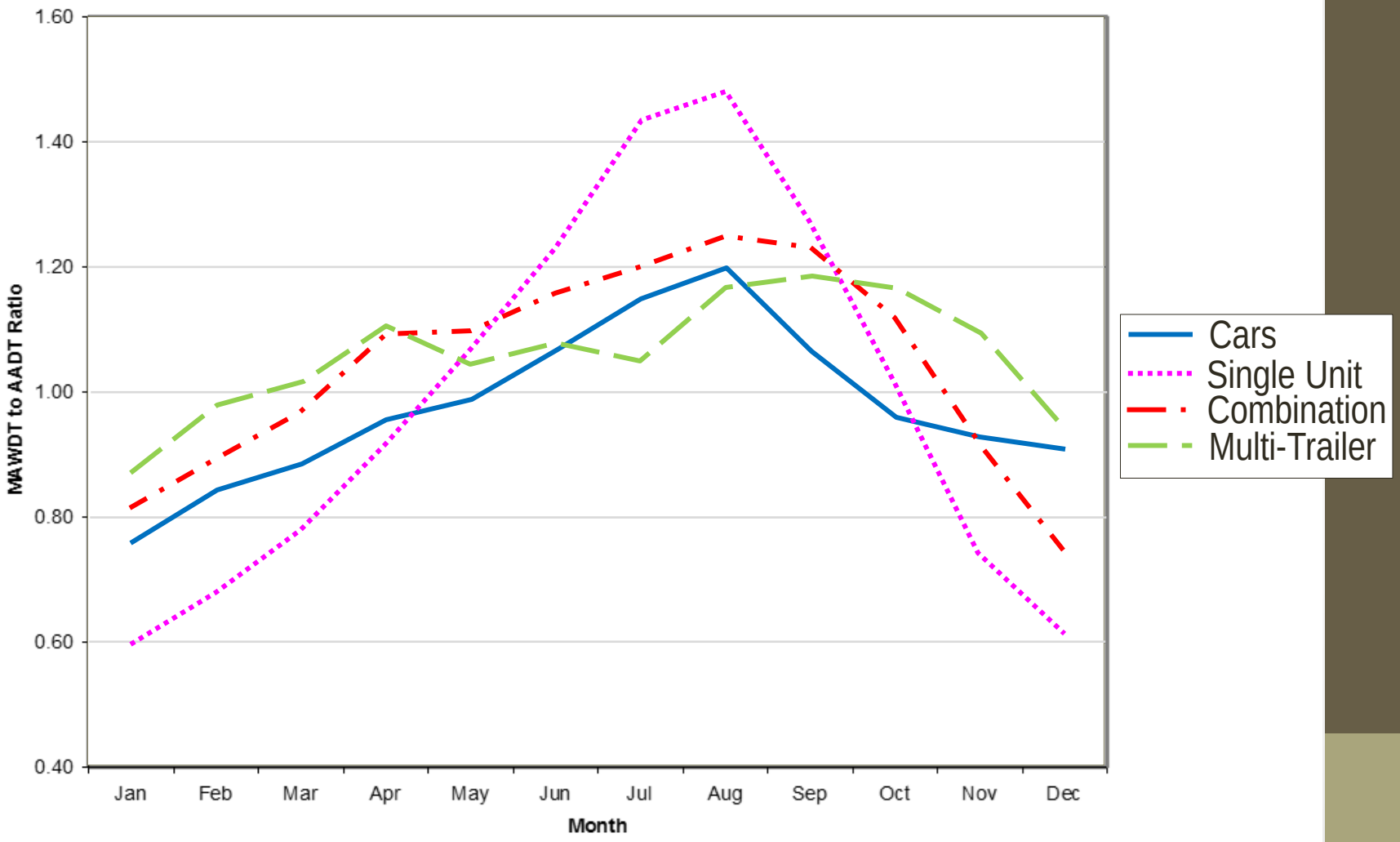
Hour-of-Day Patterns



Day-of-Week Patterns



Monthly Patterns



Determine Factoring Groups

- By type of vehicle travel
- Geographic travel patterns
- Special travel such as ports, recreational or others
- Minimum of 6 sites per factor group
- 4 simple groups to start with is better than using 1.0
  - Urban Interstates
  - Rural Interstates
  - Other Rural
  - Other Urban
- Consider the factor groups for volume to start with – they may be just fine with minor tweaks
- Travel patterns may not be used for all classification sites, you may have sites for unique vehicle class factoring
- See the TMG for recommendations and process

Minimum Classes for Factoring

HPMS Vehicle Class Group		FHWA Vehicle Classification Number
	Group 1: Motorcycles	1
	Group 2: Passenger Vehicles	2
	Group 3: Light Trucks over 121”	3
	Group 4: Buses	4
	Group 5: Single-unit vehicles	5,6,7
	Group 6: Combination-unit vehicles	8 - 13

By Class AADT Calculation Example

- Calculate Annual Average Daily Motorcycle Traffic (AADMT) from Average Daily Motorcycle Traffic (ADMT) based on monthly and day-of-week factors
- 48-hour count (Tues/Wed 8/14-8/15)
- Same process as for trucks (AADTT from ADTT)

ADMT x MOY x DOW = AADMT

By Class AADT Calculation Example

Month	Monthly ADT	Monthly Factor
Jan	474	1.05
Feb	453	1.10
Mar	506	0.99
Apr	510	0.98
May	516	0.97
Jun	523	0.95
Jul	513	0.97
Aug	524	0.95
Sep	508	0.98
Oct	512	0.97
Nov	492	1.01
Dec	458	1.09
AADT	499	1.00

By Class AADT Calculation Example

Day	ADMT	Resulting MC Day-of-Week Factors
Monday	396	1.26
Tuesday	403	1.24
Wednesday	405	1.23
Thursday	428	1.17
Friday	655	0.76
Saturday	725	0.69
Sunday	483	1.03
ADMT	499	

By Class AADT Calculation Example

Date ____	ADMT	ADT
Aug. 14 (Tues)	518	50,761
Aug. 15 (Wed)	494	51,231
Average	506	50,996

ADMT x MOY x DOW = AADMT

518 x 0.95 x 1.24 = 610

494 x 0.95 x 1.23 = 577

(610 + 577) / 2 = 594

506 vs. 594 = 15% underestimation

By Class AADT Calculation Example

- The same process must be performed with each of the vehicle classes

  (or grouped classes)
- Sum of class-specific AADTs compared against total volume AADT to create final AADT by class

By Class AADT Calculation Example

Date	MC Volume	PC Volume	LT Volume	Bus Volume	SU Volume	CU Volume	ADT
Aug. 14 (Tues)	518	30,705	11,215	58	4,103	4,162	50,761
Aug. 15 (Wed)	494	31,689	11,834	48	3,697	3,469	51,231
Tuesday Factor	1.24	1.02	1.02	1.06	0.88	0.8	
Wednesday Factor	1.23	1.00	1.00	1.03	0.89	0.79	
August Factor By Class	0.95	0.97	0.97	0.81	0.84	0.91	
AADT Based on Tuesday	610	30,380	11,096	50	3033	3030	48,199
AADT Based on Wednesday	577	30,738	11,479	40	2764	2,494	48,092
Average	594	30,559	11,288	45	2898	2,762	48,145
AADT computed from total volume = (50,761 + 51,231) × 0.95 × 0.98 DOW factor) =							47,477
Difference of average computed from total volume minus average computed by class specific factors and then summed							-668
Fraction of Traffic	0.012	0.635	0.234	0.001	0.060	0.057	
Proportional Adjustment (Fraction of Vehicles × Error)	-8	-424	-157	-1	-40	-38	
Final AADT by Class (Volume + Proportional Adjustment)	585	30,135	11,131	44	2,858	2,724	47,477

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