

July 20, 2010

Memorandum

To: MOVES Task Force

From: Daivamani Sivasailam
Principal Transportation Engineer

Subject: Local Vehicle Hours of Travel (VHT) Distributions

Staff has reviewed all the default distributions, and has developed observations. Attached are tables of distributions, comparison charts of default distributions and local distributions, and recommendations for a few of the distributions.

Attachments

Table: Review of MOVES default distributions (1 page)
Default distributions (9 pages)
Comparison Charts (4 pages)

Table. Review of Hourly MOVES Default VHT Distributions from 2.5 mph to 75 mph in 5 mph increments

Weekday Rural		Observations	Recommendation
Facility Type	Vehicle Type		
Restricted	Motorcycle	1. Distributions are identical for all vehicle types 2. Varies by time of day 3. On a restricted facility all vehicle types have a similar driving pattern and therefore having the same VHT profile is acceptable.	1. Comparisons of the default data with local data (Post-processor, Inrix, SKYCOMP) indicate that local urban facilities do not have the high 30% of VHT traveling at < 2.5 mph. 2. It is recommended that VHT profiles be developed using post-processor data since it appears reasonable and can handle both current and forecast years
	Passenger Car		
	Passenger Truck, Light Commercial Truck		
	Intercity Bus, Transit Bus, School Bus		
	Refuse Truck, Single Unit Short-Haul, Single Unit Long Haul Truck, MotorHome		
Unrestricted	Combination Short-Haul Truck, Combination Long-Haul Truck	1. Distributions are identical for all vehicle types 2. Varies by time of day 3. On a unrestricted facility, vehicle types such as transit bus, school bus, refuse trucks have a stop and go driving pattern and definitely should have a different speed profile than the rest of the traffic. This is unacceptable and we have to replace the default data with local data.	Weekday on an urban unrestricted facility we will develop VHT profiles with variations for traffic stream (using post-processor and EPA provided convertor), buses, and refuse trucks by obtaining local data from transit operators and county refuse haulers.
	Motorcycle		
	Passenger Car		
	Passenger Truck, Light Commercial Truck		
	Intercity Bus, Transit Bus, School Bus		
Weekend Rural		1. Distributions are identical for all vehicle types 2. Varies by time of day 3. On a unrestricted facility, all vehicles generally flow at the same speed and therefore all vehicle types having the same VHT profile is acceptable. 4. Same as weekday. Since weekend traffic in our region is different from weekday traffic this is a 'fatal flaw' in the default speed profile	Inrix and SKYCOMP (limited) provide weekend data profiles. Using these profiles and the post-processor weekday profiles we propose to develop new weekend VHT profiles.
Restricted	Motorcycle		
	Passenger Car		
	Passenger Truck, Light Commercial Truck		
	Intercity Bus, Transit Bus, School Bus		
	Refuse Truck, Single Unit Short-Haul, Single Unit Long Haul Truck, MotorHome		
Unrestricted	Combination Short-Haul Truck, Combination Long-Haul Truck	1. Distributions are identical for all vehicle types 2. Varies by time of day 3. On a unrestricted facility, vehicle types such as transit bus, school bus, refuse trucks have a stop and go driving pattern and definitely should have a different speed profile than the rest of the traffic. This is unacceptable and we have to replace with more reasonable local data. 4. Same as weekday. Weekend traffic in our region is different from weekday traffic and this is a 'fatal flaw' in the default speed profile.	For an urban unrestricted facility on a weekend day will develop VHT profiles with variations for traffic stream (method to be determined), buses, and refuse trucks by obtaining local data from transit operators and county refuse haulers.
	Motorcycle		
	Passenger Car		
	Passenger Truck, Light Commercial Truck		
	Intercity Bus, Transit Bus, School Bus		

I). Weekday

A. Urban

1. Restricted

a. Vehicle Type = Motorcycle

Speed(mph)	2.5	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
12am	0.00%	1.37%	0.00%	0.00%	0.00%	0.21%	2.01%	1.46%	2.63%	2.81%	28.58%	12.72%	46.11%	2.57%	0.00%	0.00%
1am	0.00%	0.32%	0.53%	0.00%	0.00%	0.17%	1.82%	1.30%	2.40%	2.42%	29.00%	12.72%	46.52%	2.80%	0.00%	0.00%
2am	0.00%	1.37%	0.00%	0.00%	0.00%	0.17%	1.88%	1.22%	2.24%	2.33%	28.71%	12.85%	46.31%	2.91%	0.00%	0.00%
3am	4.26%	0.30%	0.00%	0.34%	0.00%	0.20%	1.99%	1.45%	2.60%	2.52%	27.63%	11.74%	44.54%	2.43%	0.00%	0.00%
4am	6.14%	0.30%	0.00%	0.33%	0.03%	0.22%	2.21%	1.76%	2.97%	2.94%	26.46%	11.04%	43.51%	2.11%	0.00%	0.00%
5am	10.07%	16.50%	6.37%	4.53%	3.29%	4.62%	3.48%	4.65%	4.66%	4.72%	16.90%	6.34%	12.89%	0.99%	0.00%	0.00%
6am	30.49%	3.87%	2.23%	3.05%	4.13%	3.82%	3.36%	3.02%	2.64%	2.83%	15.98%	9.22%	14.77%	0.58%	0.00%	0.00%
7am	32.48%	2.06%	2.00%	1.19%	1.97%	3.51%	3.56%	3.11%	3.18%	2.56%	15.14%	6.05%	22.58%	0.61%	0.00%	0.00%
8am	20.99%	6.95%	0.76%	0.53%	0.74%	2.40%	2.80%	3.86%	3.78%	3.61%	18.08%	7.83%	26.68%	0.98%	0.00%	0.00%
9am	13.09%	6.78%	2.05%	0.84%	0.79%	2.57%	3.05%	4.10%	3.70%	3.68%	20.61%	8.39%	29.27%	1.07%	0.00%	0.00%
10am	11.81%	2.75%	1.70%	2.64%	2.45%	3.95%	3.90%	3.78%	4.05%	3.52%	20.61%	7.43%	30.58%	0.85%	0.00%	0.00%
11am	15.98%	1.77%	2.46%	2.23%	2.82%	4.32%	4.29%	3.60%	3.31%	3.02%	19.59%	6.73%	29.12%	0.76%	0.00%	0.00%
12pm	13.12%	5.93%	2.06%	1.13%	1.07%	2.88%	3.39%	4.30%	3.75%	3.70%	19.83%	8.03%	29.72%	1.11%	0.00%	0.00%
1pm	17.38%	4.96%	1.98%	0.59%	0.74%	3.14%	3.55%	3.90%	3.65%	4.38%	18.19%	7.98%	28.49%	1.07%	0.00%	0.00%
2pm	22.19%	5.33%	1.21%	1.00%	1.44%	3.87%	3.84%	3.69%	2.80%	3.08%	16.78%	4.16%	29.63%	0.99%	0.00%	0.00%
3pm	16.33%	21.51%	5.89%	3.47%	3.72%	3.31%	4.36%	3.65%	2.92%	3.23%	12.93%	5.20%	12.90%	0.59%	0.00%	0.00%
4pm	23.90%	7.22%	1.47%	2.34%	2.92%	3.34%	5.20%	3.50%	2.51%	3.79%	15.87%	7.19%	19.90%	0.86%	0.00%	0.00%
5pm	25.32%	4.60%	0.36%	0.58%	0.61%	2.23%	2.29%	3.24%	3.21%	4.12%	17.06%	4.41%	31.04%	0.95%	0.00%	0.00%
6pm	21.10%	3.36%	1.21%	0.26%	0.23%	1.47%	2.31%	2.88%	2.58%	4.78%	17.89%	6.96%	33.92%	1.06%	0.00%	0.00%
7pm	16.05%	2.62%	1.06%	0.20%	0.25%	1.17%	2.34%	2.61%	2.71%	4.47%	20.36%	8.05%	36.81%	1.31%	0.00%	0.00%
8pm	9.96%	1.66%	0.83%	0.12%	0.25%	0.83%	2.38%	2.31%	2.88%	4.11%	23.34%	9.37%	40.33%	1.63%	0.00%	0.00%
9pm	5.30%	0.98%	0.69%	0.07%	0.27%	0.55%	2.40%	2.06%	3.01%	3.84%	25.62%	10.37%	43.00%	1.86%	0.00%	0.00%
10pm	2.83%	0.61%	0.61%	0.03%	0.28%	0.41%	2.43%	1.92%	3.06%	3.68%	26.84%	10.91%	44.41%	1.99%	0.00%	0.00%
11pm	0.00%	0.21%	0.52%	0.00%	0.29%	0.25%	2.44%	1.78%	3.14%	3.52%	28.19%	11.51%	46.02%	2.13%	0.00%	0.00%

Observations

1. Varies by time of day

I). Weekday

A. Urban

1. Restricted

f. Vehicle Type = Combination Short-Haul Truck, Combination Long-Haul Truck

Speed(mph)	2.5	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
12am	0.00%	1.37%	0.00%	0.00%	0.00%	0.21%	2.01%	1.46%	2.63%	2.81%	28.58%	12.26%	46.11%	2.57%	0.00%	0.00%
1am	0.00%	0.32%	0.53%	0.00%	0.00%	0.17%	1.82%	1.30%	2.40%	2.42%	29.00%	12.72%	46.52%	2.80%	0.00%	0.00%
2am	0.00%	1.37%	0.00%	0.00%	0.00%	0.17%	1.88%	1.22%	2.24%	2.33%	28.71%	12.85%	46.31%	2.91%	0.00%	0.00%
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Observations

1. Varies by time of day
2. Same as Motorcycle, Passenger Car, Passenger Truck, Intercity Bus, Refuse Truck
3. On a restricted facility all vehicle types have a similar driving pattern and therefore having the same VHT profile is acceptable.

Recommendations

1. Comparison of the default data with local data (Post-processor, Inrix, SKYCOMP) indicate that local urban facilities do not have the high % of VHT traveling at < 2.5 mph.
2. It is recommended that VHT profiles be developed using post-processor data since it can handle both current and forecast years

II). Weekend

A. Urban

1. Restricted

f. Vehicle Type = Combination Short-Haul Truck, Combination Long-Haul Truck

Speed(mph)	2.5	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
12am	0.00%	1.37%	0.00%	0.00%	0.00%	0.21%	2.01%	1.46%	2.63%	2.81%	28.58%	12.26%	46.11%	2.57%	0.00%	0.00%
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10am	11.81%	2.75%	1.70%	2.64%	2.45%	3.95%	3.90%	3.78%	4.05%	3.52%	20.61%	7.43%	30.58%	0.85%	0.00%	0.00%
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Observations

1. Varies by time of day
2. Same as Motorcycle, Passenger Car, Passenger Truck, Intercity Bus, Refuse Truck
3. On a restricted facility, all vehicle flow at the same speed and therefore all Veh. types having the same VHT profile is acceptable.
4. Same as weekday. Since weekend traffic in our region is different from weekday traffic this is a fatal flaw in the default speed profile

Recommendations

1. Inrix and SKYCOMP (limited) provide weekend data profiles. Using these profiles and the post-processor weekday profiles we would develop new weekend VHT profiles.

I). Weekday

A. Urban

2. Unrestricted

f. Vehicle Type = Combination Short-Haul Truck, Combination Long-Haul Truck

Speed(mph)	2.5	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
12am	0.08%	0.00%	18.23%	25.17%	0.82%	3.97%	22.02%	6.04%	16.47%	3.09%	3.03%	0.37%	0.70%	0.01%	0.00%	0.00%
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5am	0.30%	1.98%	18.47%	24.57%	1.50%	6.49%	20.32%	7.50%	13.31%	2.51%	2.39%	0.36%	0.30%	0.01%	0.00%	0.00%
6am	2.59%	1.04%	17.48%	25.48%	6.62%	8.03%	17.06%	4.89%	11.86%	1.59%	2.51%	0.35%	0.50%	0.00%	0.00%	0.00%
7am	2.45%	0.78%	17.54%	24.45%	4.05%	8.40%	18.06%	5.72%	13.18%	1.75%	2.67%	0.31%	0.64%	0.00%	0.00%	0.00%
8am	2.29%	0.57%	17.63%	24.25%	1.75%	7.65%	18.54%	6.81%	14.40%	2.77%	2.84%	0.35%	0.65%	0.00%	0.00%	0.00%
9am	2.30%	0.54%	17.54%	24.31%	1.73%	7.72%	18.49%	6.81%	14.43%	2.88%	2.87%	0.35%	0.65%	0.00%	0.00%	0.00%
10am	2.56%	0.64%	17.52%	24.26%	3.23%	8.70%	18.13%	6.04%	13.78%	1.92%	2.76%	0.32%	0.64%	0.00%	0.00%	0.00%
11am	2.97%	0.78%	17.40%	24.30%	3.96%	8.41%	17.66%	5.74%	13.38%	1.76%	2.69%	0.31%	0.63%	0.00%	0.00%	0.00%
12pm	2.87%	0.94%	17.59%	24.04%	2.04%	7.81%	17.84%	6.71%	14.76%	2.16%	2.78%	0.32%	0.65%	0.00%	0.00%	0.00%
1pm	3.08%	0.90%	17.50%	24.08%	2.34%	7.89%	17.82%	6.53%	14.03%	2.04%	2.82%	0.32%	0.64%	0.00%	0.00%	0.00%
2pm	3.82%	0.99%	17.30%	24.12%	4.13%	8.45%	17.25%	5.37%	13.00%	1.71%	2.85%	0.32%	0.70%	0.00%	0.00%	0.00%
3pm	3.95%	5.64%	17.05%	24.02%	5.57%	8.25%	16.00%	4.68%	10.97%	1.54%	2.72%	0.30%	0.85%	0.00%	0.00%	0.00%
4pm	3.87%	2.50%	17.45%	24.68%	5.93%	8.22%	16.23%	4.59%	11.56%	1.54%	2.50%	0.34%	0.57%	0.00%	0.00%	0.00%
5pm	3.23%	0.90%	17.43%	24.13%	2.40%	7.56%	17.85%	6.47%	14.08%	2.08%	2.86%	0.34%	0.66%	0.00%	0.00%	0.00%
6pm	2.92%	0.81%	17.83%	24.32%	1.10%	5.63%	18.70%	6.68%	15.21%	2.73%	3.05%	0.35%	0.67%	0.00%	0.00%	0.00%
7pm	2.86%	0.66%	17.86%	24.58%	1.00%	4.32%	19.60%	5.80%	16.00%	3.02%	3.19%	0.35%	0.68%	0.00%	0.00%	0.00%
8pm	2.79%	0.70%	17.83%	24.53%	1.06%	4.11%	19.73%	5.89%	16.08%	3.04%	3.20%	0.35%	0.68%	0.00%	0.00%	0.00%
9pm	2.65%	0.35%	17.87%	24.69%	1.01%	4.13%	19.88%	5.92%	16.18%	3.05%	3.23%	0.35%	0.68%	0.00%	0.00%	0.00%
10pm	2.34%	0.51%	18.05%	24.73%	1.00%	4.11%	19.84%	5.90%	16.19%	3.05%	3.24%	0.35%	0.68%	0.00%	0.00%	0.00%
11pm	0.08%	0.00%	18.11%	25.19%	0.87%	4.01%	22.00%	6.02%	16.52%	3.10%	2.93%	0.36%	0.70%	0.01%	0.00%	0.00%

Observations

1. Varies by time of day

2. Same as Motorcycle, Passenger Car, Passenger Truck, Light Commercial Truck, Intercity Bus, Transit Bus, School Bus, Refuse Truck, Single Unit Long-Haul Truck, MotorHome

3. On a unrestricted facility, vehicle types such as transit bus, school bus, refuse trucks has a stop and go driving pattern and definitely should have a different speed profile than the rest of the traffic. This is unacceptable and we have to replace with more reasonable local data.

Recommendations

1. For a urban unrestricted facility on a weekday we will develop VHT profiles with variations for buses, and refuse trucks.

II). Weekend

A. Urban

2. Unrestricted

f. Vehicle Type = Combination Short-Haul Truck, Combination Long-Haul Truck

Speed(mph)	2.5	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
12am	0.08%	0.00%	18.23%	25.17%	0.82%	3.97%	22.02%	6.04%	16.47%	3.09%	3.03%	0.37%	0.70%	0.01%	0.00%	0.00%
1am	0.00%	0.00%	18.24%	25.19%	0.80%	3.93%	22.07%	6.05%	16.51%	3.08%	3.02%	0.37%	0.70%	0.01%	0.00%	0.00%
2am	0.00%	0.00%	18.25%	25.21%	0.77%	3.92%	21.97%	6.07%	16.61%	3.08%	3.04%	0.37%	0.70%	0.02%	0.00%	0.00%
3am	0.00%	0.00%	18.25%	25.20%	0.82%	3.98%	21.93%	6.04%	16.57%	3.10%	3.03%	0.37%	0.70%	0.01%	0.00%	0.00%
4am	0.00%	0.00%	18.24%	25.19%	0.85%	4.02%	21.83%	6.03%	16.64%	3.11%	3.01%	0.36%	0.70%	0.01%	0.00%	0.00%
5am	0.30%	1.98%	18.47%	24.57%	1.50%	6.49%	20.32%	7.50%	13.31%	2.51%	2.39%	0.36%	0.30%	0.01%	0.00%	0.00%
6am	2.59%	1.04%	17.48%	25.48%	6.62%	8.03%	17.06%	4.89%	11.86%	1.59%	2.51%	0.35%	0.50%	0.00%	0.00%	0.00%
7am	2.45%	0.78%	17.54%	24.45%	4.05%	8.40%	18.06%	5.72%	13.18%	1.75%	2.67%	0.31%	0.64%	0.00%	0.00%	0.00%
8am	2.29%	0.57%	17.63%	24.25%	1.75%	7.65%	18.54%	6.81%	14.40%	2.27%	2.84%	0.33%	0.65%	0.00%	0.00%	0.00%
9am	2.30%	0.54%	17.54%	24.31%	1.73%	7.72%	18.49%	6.81%	14.43%	2.28%	2.87%	0.33%	0.65%	0.00%	0.00%	0.00%
10am	2.56%	0.64%	17.52%	24.26%	3.23%	8.20%	18.13%	6.04%	13.78%	1.92%	2.76%	0.32%	0.64%	0.00%	0.00%	0.00%
11am	2.97%	0.78%	17.40%	24.30%	3.96%	8.41%	17.66%	5.74%	13.38%	1.76%	2.69%	0.31%	0.63%	0.00%	0.00%	0.00%
12pm	2.87%	0.94%	17.59%	24.03%	2.04%	7.81%	17.84%	6.71%	14.26%	2.16%	2.78%	0.32%	0.65%	0.00%	0.00%	0.00%
1pm	3.08%	0.90%	17.50%	24.08%	2.34%	7.89%	17.82%	6.53%	14.03%	2.04%	2.82%	0.32%	0.64%	0.00%	0.00%	0.00%
2pm	3.82%	0.99%	17.30%	24.12%	4.13%	8.45%	17.25%	5.37%	13.00%	1.71%	2.85%	0.32%	0.70%	0.00%	0.00%	0.00%
3pm	3.35%	5.64%	17.05%	24.02%	5.57%	8.35%	16.00%	4.68%	10.92%	1.54%	2.27%	0.30%	0.36%	0.00%	0.00%	0.00%
4pm	3.87%	2.50%	17.45%	24.68%	5.93%	8.22%	16.23%	4.59%	11.58%	1.54%	2.50%	0.34%	0.57%	0.00%	0.00%	0.00%
5pm	3.23%	0.90%	17.43%	24.13%	2.40%	7.56%	17.85%	6.47%	14.08%	2.08%	2.86%	0.34%	0.66%	0.00%	0.00%	0.00%
6pm	2.92%	0.81%	17.83%	24.32%	1.10%	5.63%	18.70%	6.68%	15.21%	2.73%	3.05%	0.35%	0.67%	0.00%	0.00%	0.00%
7pm	2.86%	0.66%	17.86%	24.58%	1.00%	4.32%	19.60%	5.90%	16.00%	3.02%	3.19%	0.35%	0.68%	0.00%	0.00%	0.00%
8pm	2.79%	0.70%	17.83%	24.53%	1.06%	4.11%	19.73%	5.89%	16.08%	3.04%	3.20%	0.35%	0.68%	0.00%	0.00%	0.00%
9pm	2.65%	0.35%	17.87%	24.69%	1.01%	4.13%	19.88%	5.92%	16.18%	3.05%	3.23%	0.35%	0.68%	0.00%	0.00%	0.00%
10pm	2.34%	0.51%	18.05%	24.73%	1.00%	4.11%	19.84%	5.90%	16.19%	3.05%	3.24%	0.35%	0.68%	0.00%	0.00%	0.00%
11pm	0.08%	0.00%	18.21%	25.19%	0.87%	4.01%	22.00%	6.02%	16.52%	3.10%	2.93%	0.36%	0.70%	0.01%	0.00%	0.00%

Observations

1. Varies by time of day

2. Same as Motorcycle, Passenger Car, Passenger Truck, Light Commercial Truck, Intercity Bus, Transit Bus, School Bus, Refuse Truck, Single Unit Short_Haul, Single Unit Long-Haul Truck, MotorHome

3. On a unrestricted facility, vehicle types such as transit bus, school bus, refuse trucks has a stop and go driving pattern and definitely should have a different speed profile than the rest of the traffic. This is unacceptable and we have to replace with more reasonable local data.

4. Same as weekday. Weekend traffic in our region is different from weekday traffic and this is a fatal flaw in the default speed profile.

Recommendations

1. For a urban unrestricted facility on a weekend we will develop VHT profiles with variations for buses, and refuse trucks.

I). Weekday

B. Rural

1. Restricted

e. Vehicle Type = Refuse Truck, Single Unit Short-Haul, Single Unit Long Haul Truck, MotorHome

Speed(mph)	2.5	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
12am	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
1am	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
2am	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
3am	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
4am	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
5am	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
6am	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
7am	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
8am	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
9am	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
10am	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
11am	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
12pm	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
1pm	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
2pm	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
3pm	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
4pm	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
5pm	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
6pm	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
7pm	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
8pm	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
9pm	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
10pm	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
11pm	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%

Observations

1. All 24 hours have the same VHT by speed bin profile
2. Same as Motorcycle, Passenger Car, Passenger Truck, Light Commercial Truck, Intercity Bus, Transit Bus, School Bus.

I). Weekday

B. Rural

2. Unrestricted

e. Vehicle Type = Refuse Truck, Single Unit Short-Haul, Single Unit Long Haul Truck, MotorHome

Speed(mph)	2.5	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
12am	0.0022	0.0107	0.0172	0.0387	0.0466	0.0248	0.0425	0.0567	0.1656	0.1579	0.1711	0.1019	0.0835	0.0432	0.0280	0.0093
1am	0.0022	0.0107	0.0172	0.0387	0.0466	0.0248	0.0425	0.0567	0.1656	0.1579	0.1711	0.1019	0.0835	0.0432	0.0280	0.0093
2am	0.0022	0.0107	0.0172	0.0387	0.0466	0.0248	0.0425	0.0567	0.1656	0.1579	0.1711	0.1019	0.0835	0.0432	0.0280	0.0093
3am	0.0022	0.0107	0.0172	0.0387	0.0466	0.0248	0.0425	0.0567	0.1656	0.1579	0.1711	0.1019	0.0835	0.0432	0.0280	0.0093
4am	0.0022	0.0107	0.0172	0.0387	0.0466	0.0248	0.0425	0.0567	0.1656	0.1579	0.1711	0.1019	0.0835	0.0432	0.0280	0.0093
5am	0.0022	0.0107	0.0172	0.0387	0.0466	0.0248	0.0425	0.0567	0.1656	0.1579	0.1711	0.1019	0.0835	0.0432	0.0280	0.0093
6am	0.0022	0.0107	0.0172	0.0387	0.0466	0.0248	0.0425	0.0567	0.1656	0.1579	0.1711	0.1019	0.0835	0.0432	0.0280	0.0093
7am	0.0022	0.0107	0.0172	0.0387	0.0466	0.0248	0.0425	0.0567	0.1656	0.1579	0.1711	0.1019	0.0835	0.0432	0.0280	0.0093
8am	0.0022	0.0107	0.0172	0.0387	0.0466	0.0248	0.0425	0.0567	0.1656	0.1579	0.1711	0.1019	0.0835	0.0432	0.0280	0.0093
9am	0.0022	0.0107	0.0172	0.0387	0.0466	0.0248	0.0425	0.0567	0.1656	0.1579	0.1711	0.1019	0.0835	0.0432	0.0280	0.0093
10am	0.0022	0.0107	0.0172	0.0387	0.0466	0.0248	0.0425	0.0567	0.1656	0.1579	0.1711	0.1019	0.0835	0.0432	0.0280	0.0093
11am	0.0022	0.0107	0.0172	0.0387	0.0466	0.0248	0.0425	0.0567	0.1656	0.1579	0.1711	0.1019	0.0835	0.0432	0.0280	0.0093
12pm	0.0022	0.0107	0.0172	0.0387	0.0466	0.0248	0.0425	0.0567	0.1656	0.1579	0.1711	0.1019	0.0835	0.0432	0.0280	0.0093
1pm	0.0022	0.0107	0.0172	0.0387	0.0466	0.0248	0.0425	0.0567	0.1656	0.1579	0.1711	0.1019	0.0835	0.0432	0.0280	0.0093
2pm	0.0022	0.0107	0.0172	0.0387	0.0466	0.0248	0.0425	0.0567	0.1656	0.1579	0.1711	0.1019	0.0835	0.0432	0.0280	0.0093
3pm	0.0022	0.0107	0.0172	0.0387	0.0466	0.0248	0.0425	0.0567	0.1656	0.1579	0.1711	0.1019	0.0835	0.0432	0.0280	0.0093
4pm	0.0022	0.0107	0.0172	0.0387	0.0466	0.0248	0.0425	0.0567	0.1656	0.1579	0.1711	0.1019	0.0835	0.0432	0.0280	0.0093
5pm	0.0022	0.0107	0.0172	0.0387	0.0466	0.0248	0.0425	0.0567	0.1656	0.1579	0.1711	0.1019	0.0835	0.0432	0.0280	0.0093
6pm	0.0022	0.0107	0.0172	0.0387	0.0466	0.0248	0.0425	0.0567	0.1656	0.1579	0.1711	0.1019	0.0835	0.0432	0.0280	0.0093
7pm	0.0022	0.0107	0.0172	0.0387	0.0466	0.0248	0.0425	0.0567	0.1656	0.1579	0.1711	0.1019	0.0835	0.0432	0.0280	0.0093
8pm	0.0022	0.0107	0.0172	0.0387	0.0466	0.0248	0.0425	0.0567	0.1656	0.1579	0.1711	0.1019	0.0835	0.0432	0.0280	0.0093
9pm	0.0022	0.0107	0.0172	0.0387	0.0466	0.0248	0.0425	0.0567	0.1656	0.1579	0.1711	0.1019	0.0835	0.0432	0.0280	0.0093
10pm	0.0022	0.0107	0.0172	0.0387	0.0466	0.0248	0.0425	0.0567	0.1656	0.1579	0.1711	0.1019	0.0835	0.0432	0.0280	0.0093
11pm	0.0022	0.0107	0.0172	0.0387	0.0466	0.0248	0.0425	0.0567	0.1656	0.1579	0.1711	0.1019	0.0835	0.0432	0.0280	0.0093

Observations

1. No Variation by time of day
2. Different from Motorcycle, Passenger Car, Passenger Truck, Light Commercial Truck, Intercity Bus, Transit Bus, School Bus.

II). Weekend

B. Rural

1. Restricted

f. Vehicle Type = Combination Short-Haul Truck, Combination Long-Haul Truck

Speed(mph)	2.5	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
12am	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
1am	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
2am	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
3am	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
4am	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
5am	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
6am	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
7am	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
8am	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
9am	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
10am	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
11am	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
12pm	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
1pm	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
2pm	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
3pm	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
4pm	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
5pm	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
6pm	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
7pm	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
8pm	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
9pm	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
10pm	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%
11pm	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	2.85%	9.89%	24.83%	61.52%

Observations

1. No Variation by time of day
2. Same as Motorcycle, Passenger Car, Passenger Truck, Light Commercial Truck, all Buses, Refuse Truck, Single Unit, and Combination-unit trucks. Since all traffic on a restricted facility travel at the same speed, this is acceptable.
3. Same as weekday which is a fatal flaw
4. Lowest VHT speed bin even during peak hours is 55 mph. This is another fatal flaw

Recommendations

1. Perform a comparison of local data and develop a VHT profile using local data.

II). Weekend

B. Rural

2. Unrestricted

f. Vehicle Type = Combination Short-Haul Truck, Combination Long-Haul Truck

Speed(mph)	2.5	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
12am	0.0027	0.0082	0.0141	0.0276	0.0348	0.0194	0.0321	0.0507	0.1372	0.1392	0.1730	0.1234	0.1198	0.0632	0.0410	0.0136
1am	0.0027	0.0082	0.0141	0.0276	0.0348	0.0194	0.0321	0.0507	0.1372	0.1392	0.1730	0.1234	0.1198	0.0632	0.0410	0.0136
2am	0.0027	0.0082	0.0141	0.0276	0.0348	0.0194	0.0321	0.0507	0.1372	0.1392	0.1730	0.1234	0.1198	0.0632	0.0410	0.0136
3am	0.0027	0.0082	0.0141	0.0276	0.0348	0.0194	0.0321	0.0507	0.1372	0.1392	0.1730	0.1234	0.1198	0.0632	0.0410	0.0136
4am	0.0027	0.0082	0.0141	0.0276	0.0348	0.0194	0.0321	0.0507	0.1372	0.1392	0.1730	0.1234	0.1198	0.0632	0.0410	0.0136
5am	0.0027	0.0082	0.0141	0.0276	0.0348	0.0194	0.0321	0.0507	0.1372	0.1392	0.1730	0.1234	0.1198	0.0632	0.0410	0.0136
6am	0.0027	0.0082	0.0141	0.0276	0.0348	0.0194	0.0321	0.0507	0.1372	0.1392	0.1730	0.1234	0.1198	0.0632	0.0410	0.0136
7am	0.0027	0.0082	0.0141	0.0276	0.0348	0.0194	0.0321	0.0507	0.1372	0.1392	0.1730	0.1234	0.1198	0.0632	0.0410	0.0136
8am	0.0027	0.0082	0.0141	0.0276	0.0348	0.0194	0.0321	0.0507	0.1372	0.1392	0.1730	0.1234	0.1198	0.0632	0.0410	0.0136
9am	0.0027	0.0082	0.0141	0.0276	0.0348	0.0194	0.0321	0.0507	0.1372	0.1392	0.1730	0.1234	0.1198	0.0632	0.0410	0.0136
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12pm	0.0027	0.0082	0.0141	0.0276	0.0348	0.0194	0.0321	0.0507	0.1372	0.1392	0.1730	0.1234	0.1198	0.0632	0.0410	0.0136
1pm	0.0027	0.0082	0.0141	0.0276	0.0348	0.0194	0.0321	0.0507	0.1372	0.1392	0.1730	0.1234	0.1198	0.0632	0.0410	0.0136
2pm	0.0027	0.0082	0.0141	0.0276	0.0348	0.0194	0.0321	0.0507	0.1372	0.1392	0.1730	0.1234	0.1198	0.0632	0.0410	0.0136
3pm	0.0027	0.0082	0.0141	0.0276	0.0348	0.0194	0.0321	0.0507	0.1372	0.1392	0.1730	0.1234	0.1198	0.0632	0.0410	0.0136
4pm	0.0027	0.0082	0.0141	0.0276	0.0348	0.0194	0.0321	0.0507	0.1372	0.1392	0.1730	0.1234	0.1198	0.0632	0.0410	0.0136
5pm	0.0027	0.0082	0.0141	0.0276	0.0348	0.0194	0.0321	0.0507	0.1372	0.1392	0.1730	0.1234	0.1198	0.0632	0.0410	0.0136
6pm	0.0027	0.0082	0.0141	0.0276	0.0348	0.0194	0.0321	0.0507	0.1372	0.1392	0.1730	0.1234	0.1198	0.0632	0.0410	0.0136
7pm	0.0027	0.0082	0.0141	0.0276	0.0348	0.0194	0.0321	0.0507	0.1372	0.1392	0.1730	0.1234	0.1198	0.0632	0.0410	0.0136
8pm	0.0027	0.0082	0.0141	0.0276	0.0348	0.0194	0.0321	0.0507	0.1372	0.1392	0.1730	0.1234	0.1198	0.0632	0.0410	0.0136
9pm	0.0027	0.0082	0.0141	0.0276	0.0348	0.0194	0.0321	0.0507	0.1372	0.1392	0.1730	0.1234	0.1198	0.0632	0.0410	0.0136
10pm	0.0027	0.0082	0.0141	0.0276	0.0348	0.0194	0.0321	0.0507	0.1372	0.1392	0.1730	0.1234	0.1198	0.0632	0.0410	0.0136
11pm	0.0027	0.0082	0.0141	0.0276	0.0348	0.0194	0.0321	0.0507	0.1372	0.1392	0.1730	0.1234	0.1198	0.0632	0.0410	0.0136

Observations

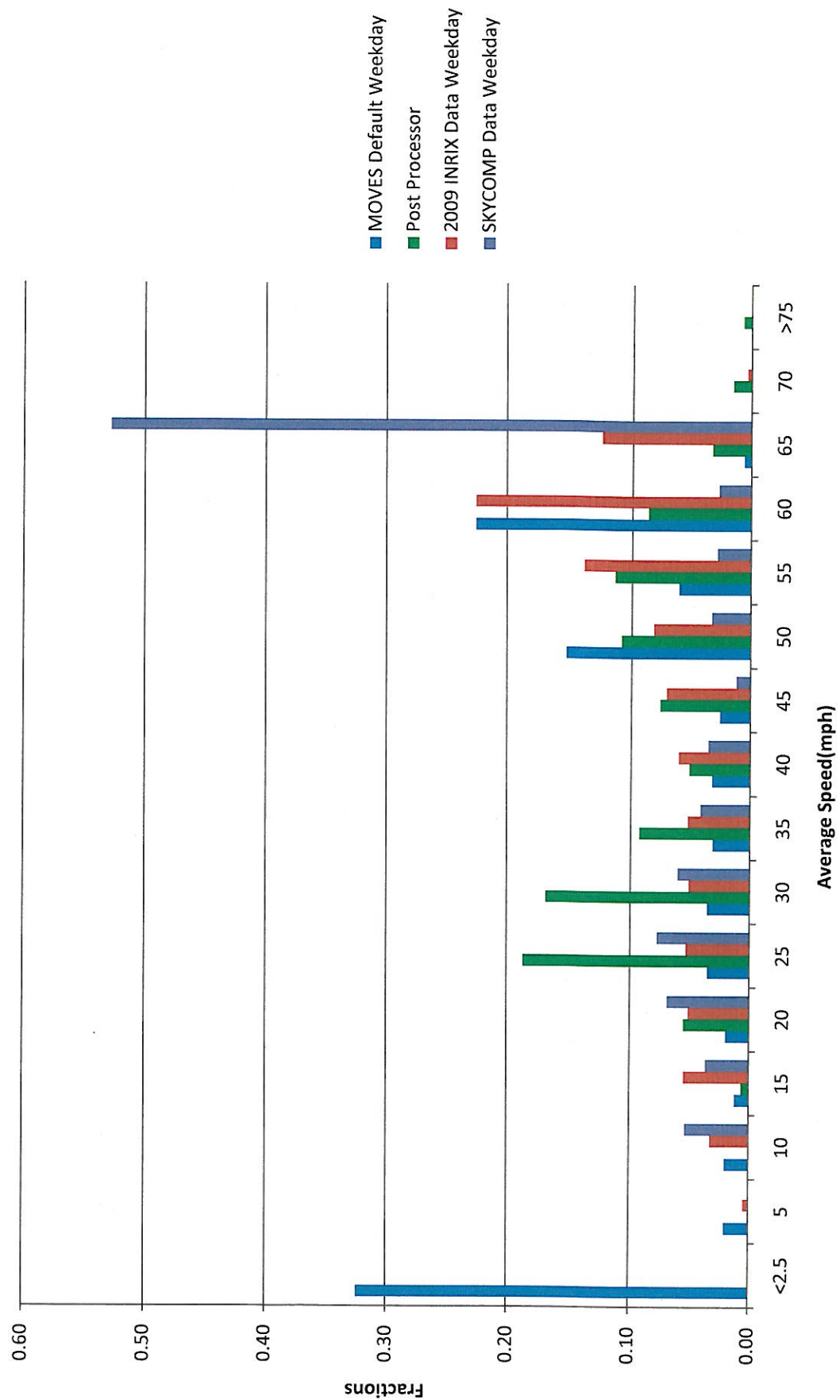
1. No Variation by time of day which is a fatal flaw
2. Different from Motorcycle, Passenger Car, Passenger Truck, Light Commercial Truck, all buses, Refuse Truck, Single Unit trucks, and MotorHome
3. Same as weekday which is another fatal flaw

Recommendations

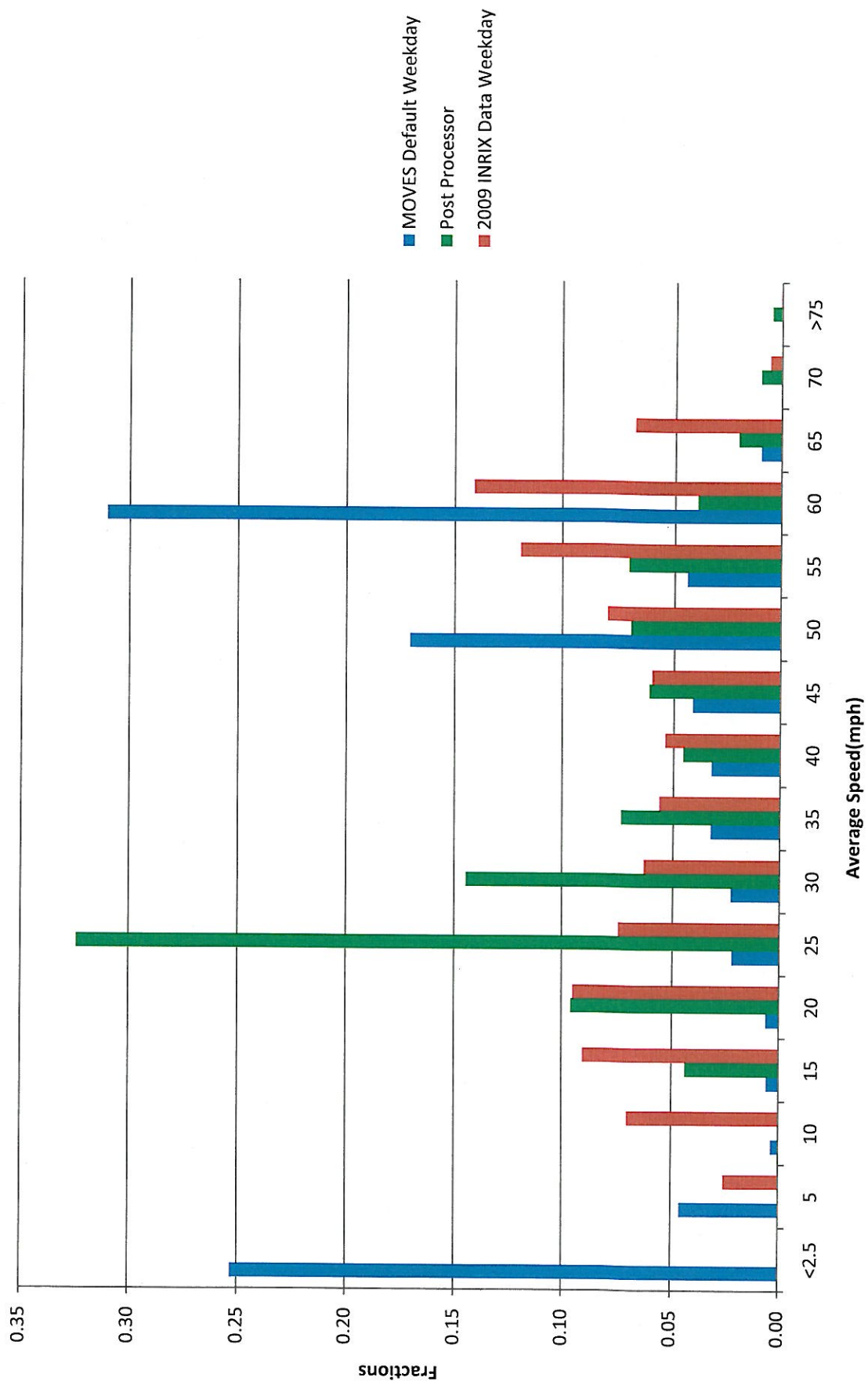
1. Develop new distributions to account for variation by time of day and variation by vehicle type since buses, and refuse truck will have different speed profiles from the rest of the traffic stream.

Weekday Speed Distribution of MOVES Default, Post Processor, INRIX and SKYCOMP Data

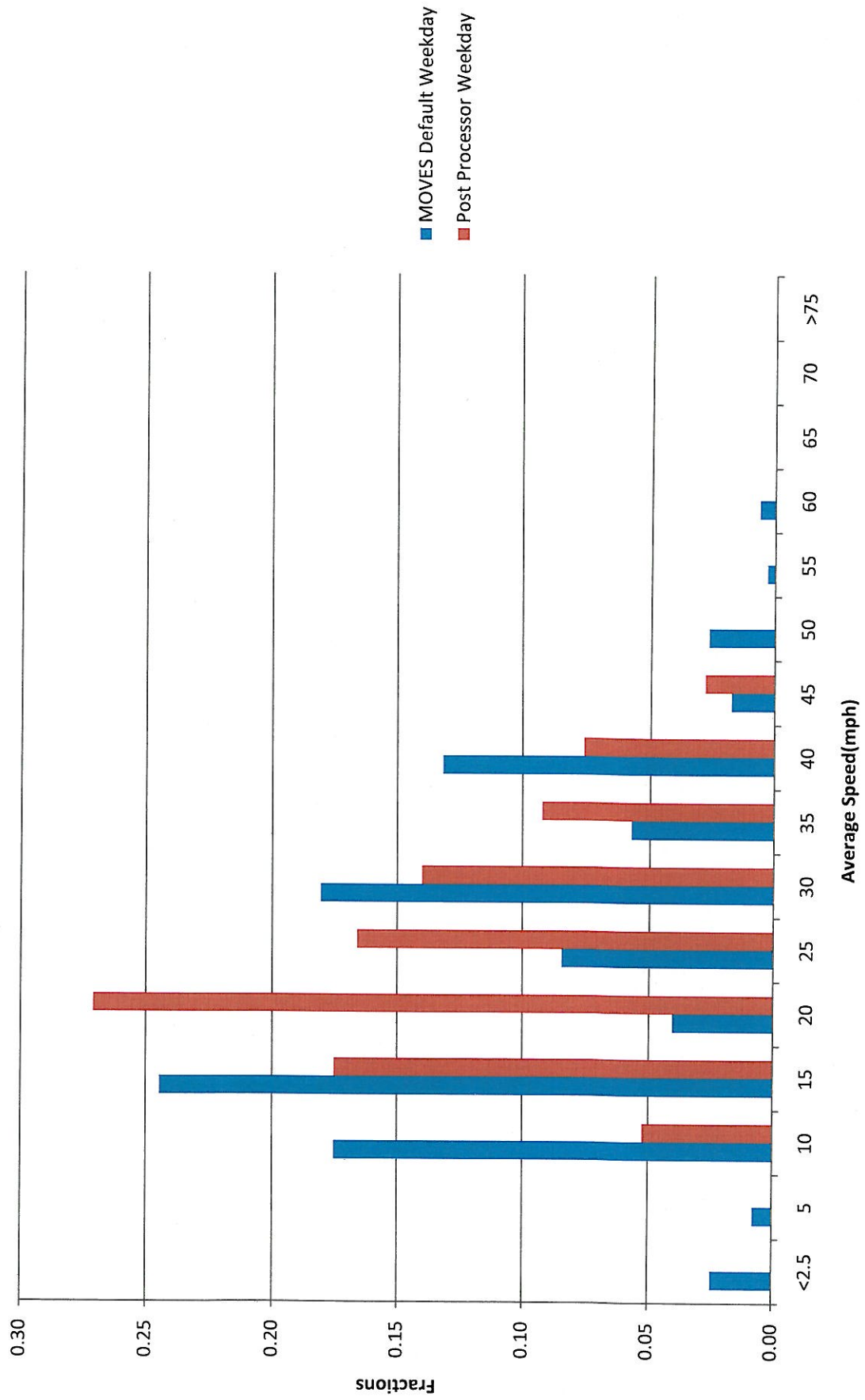
Facility Type = Urban Restricted
(All Jurisdictions 7am-8am)



Weekday Speed Distribution of MOVES Default, Post Processor and INRIX Data **Facility Type = Urban Restricted** **(All Jurisdictions 5pm-6pm)**



Weekday Speed Distribution of MOVES Default and Post Processor Data Facility Type = Urban Unrestricted (All Jurisdictions 7am-8am)



Weekday Speed Distribution of MOVES Default and Post Processor Data Facility Type = Urban Unrestricted (All Jurisdictions 5pm-6pm)

