Using MOVES for Project-level PM Hot-Spot Analyses

Statutory and Regulatory Requirements

- CAA section 176(c) requires that federally supported transportation projects in nonattainment and maintenance areas cannot:
  - Cause or contribute to new air quality violations,
  - Worsen existing violations, or
  - Delay timely attainment of the national ambient air quality standards (NAAQS) or interim milestones

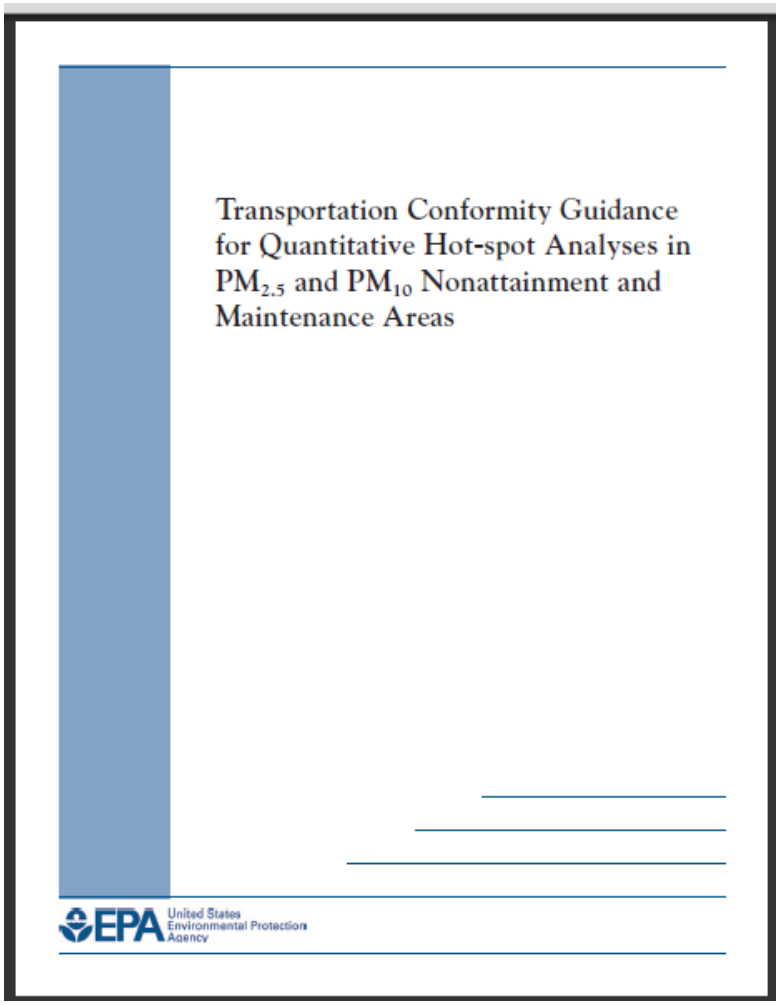
- Conformity rule requires a PM hot-spot analysis only for projects of local AQ concern
  - E.g., new or expanded highway/transit projects with a significant # of diesel vehicles
  - Hot-spot analysis ***not*** required for other projects

What is a hot-spot analysis?

- An estimation of likely future localized pollutant concentrations and a comparison to the relevant NAAQS
  - » Required for certain projects in $PM_{2.5}$, PM_{10}, and CO nonattainment and maintenance areas
- Assesses air quality impacts on a scale smaller than an entire nonattainment or maintenance area
  - » The area substantially affected by the project (the "project area")
- MOVES is appropriate for quantifying vehicle emissions at the project-level

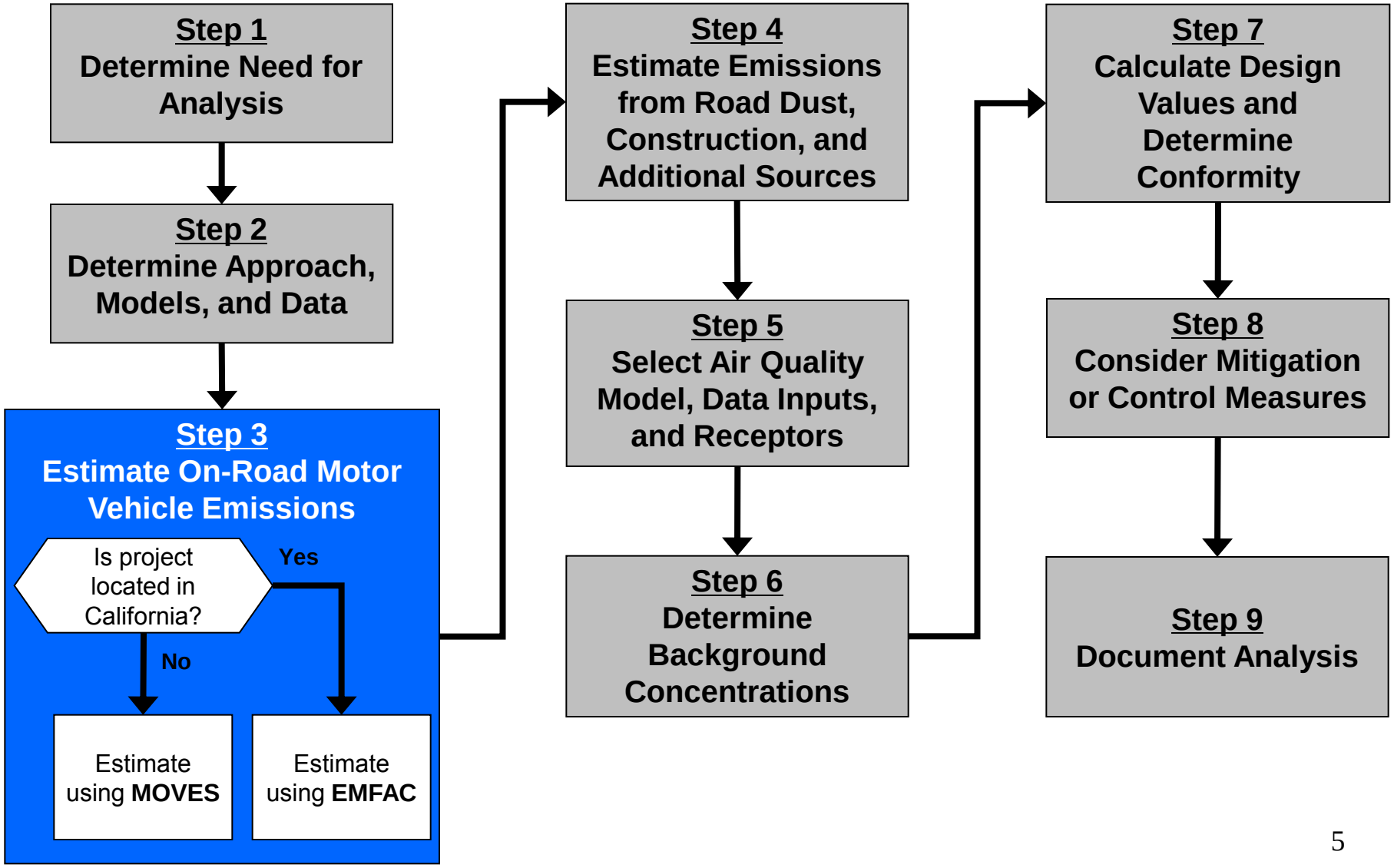
EPA's Quantitative PM Hot-spot Conformity Guidance

- Issued December 2010
- How to model the local PM air quality impacts of transportation projects:
  - » modeling mobile source emissions with **MOVES**
  - » modeling air quality concentrations with dispersion models: **AERMOD** and **CAL3QHCR**
- Does not change existing conformity requirements

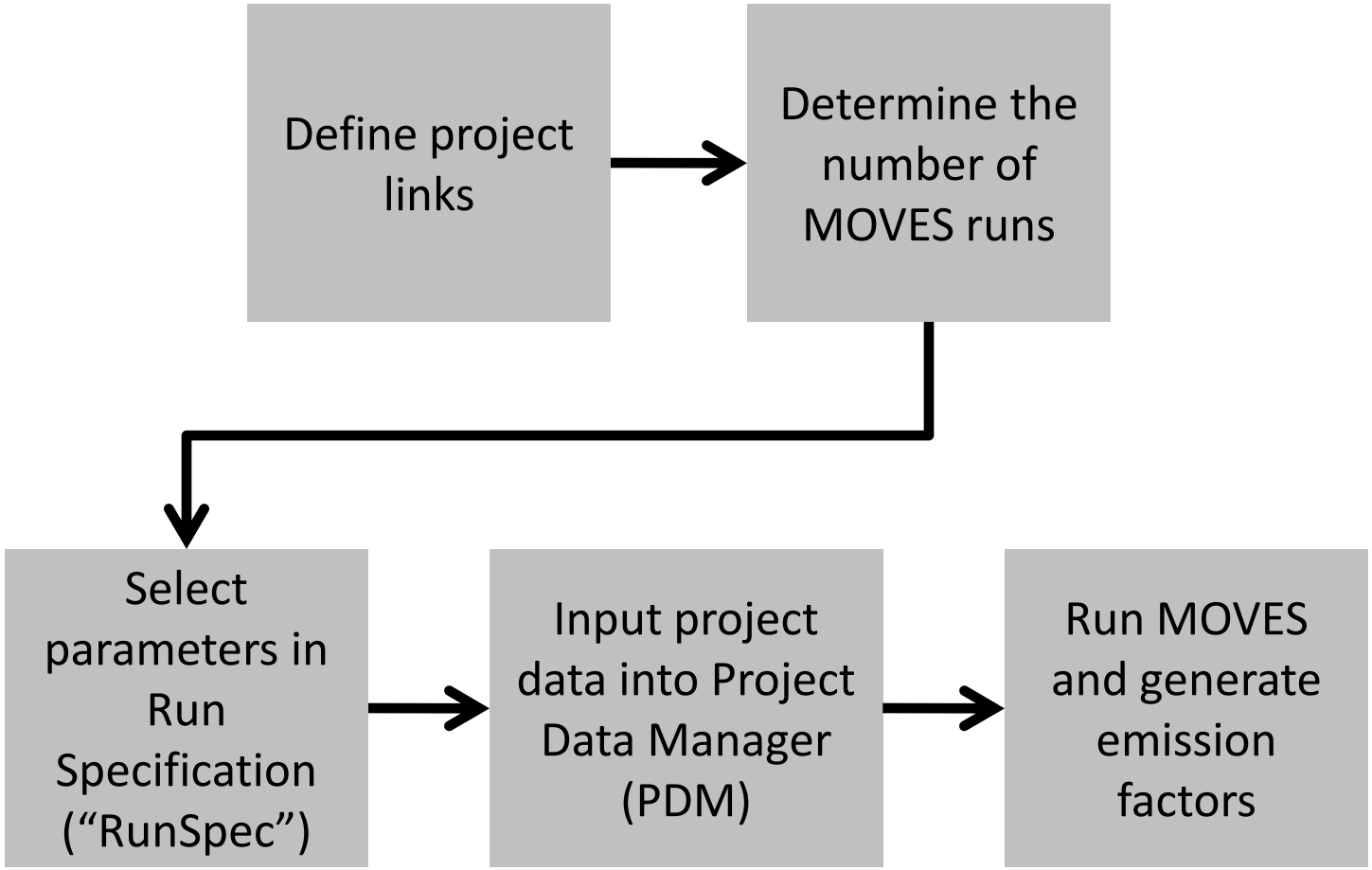


www.epa.gov/otaq/stateresources/transconf/policy/420b10040.pdf

Quantitative PM Hot-spot Analysis Process



Running MOVES at the Project Scale



PM Hot-Spot Example Project

Project Details

- The project is a lane expansion of the existing highway and the addition of an interchange (on/off ramps) to access two new park-and-ride lot and bus terminals
- MOVES will be run to generate emission rates
- The air quality analysis for the project will be done with AERMOD


Existing
Proposed

Project Details

- Location: Washtenaw County, MI
- The project is expected to be completed in 2019
  - » Year of expected peak emissions (analysis year): 2020
- Determined through interagency consultation to be a project of local air quality concern
- The area surrounding the project is primarily residential and commercial, with no nearby sources that need to be included in modeling

Available Traffic Data

- Traffic estimates for all links
  - » Peak hour volume and average speed
  - » Off-peak hour volume and average speed

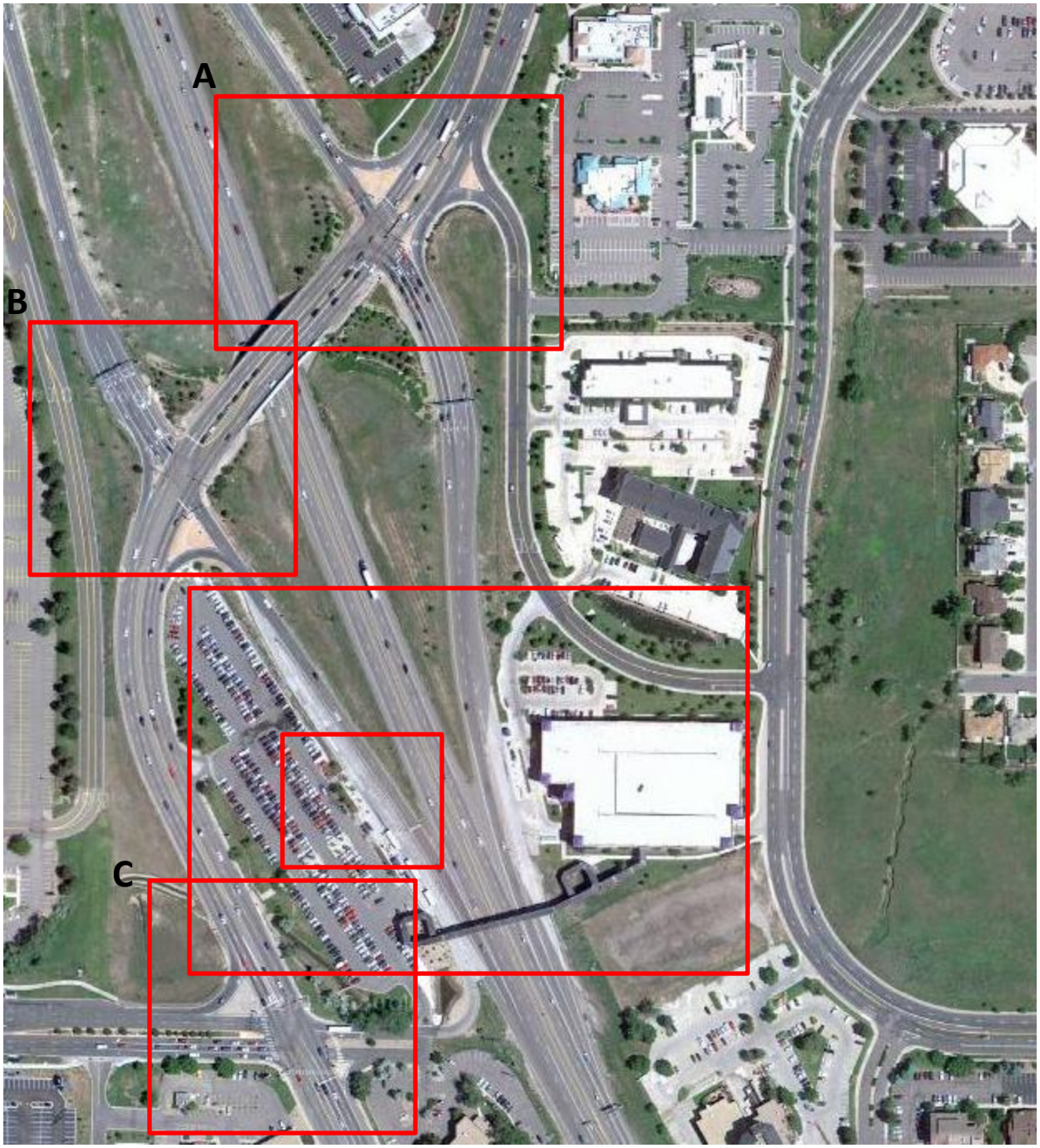
  Average speed approach will be used to define activity

- Expected bus volumes for peak and off-peak periods
  - » Also average dwell time in bus bays

- Expected start activity on parking lots for peak and off-peak periods
  - » Also soak time distribution

Available Fleet Data

- Age distribution provided by MPO
  - » Light-duty from DMV data
  - » Heavy-duty (long-haul trucks) from MOVES national defaults
- Fleet mix provided by state MPO
  - » Arterial mix, Highway mix
- Detailed bus roster (bus type and age distribution) provided by transit agency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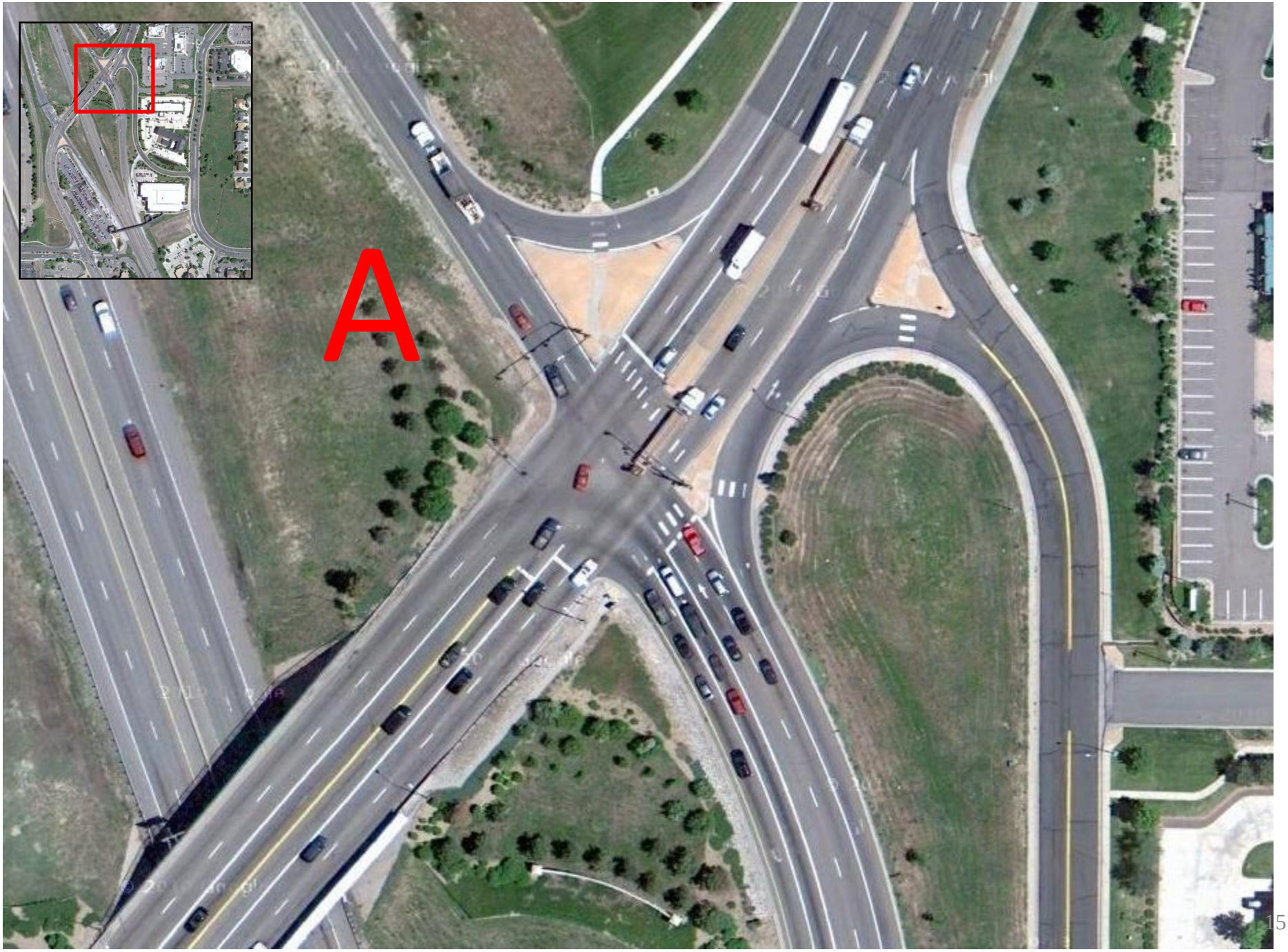
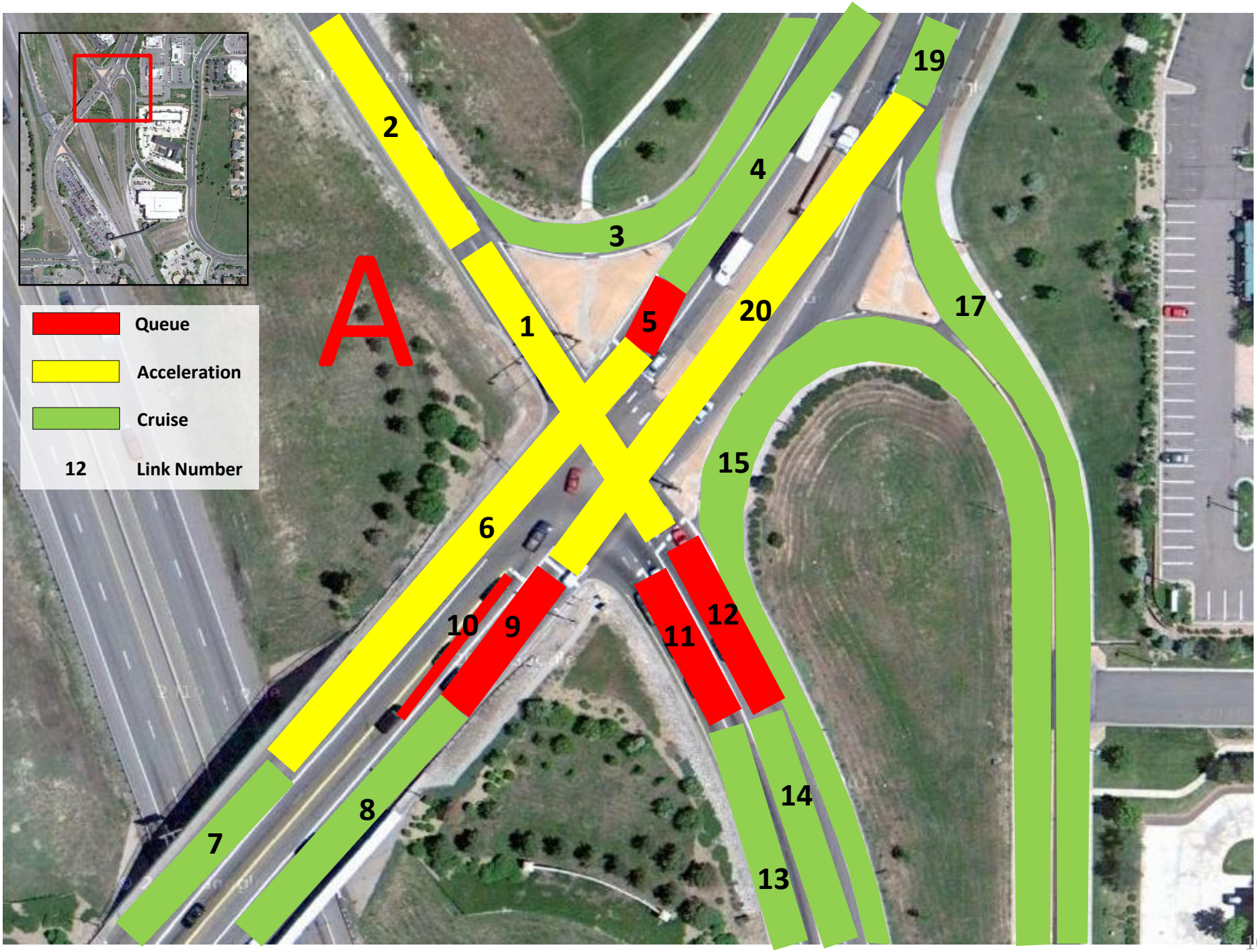

A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Queue
Acceleration
Cruise
12 Link Number
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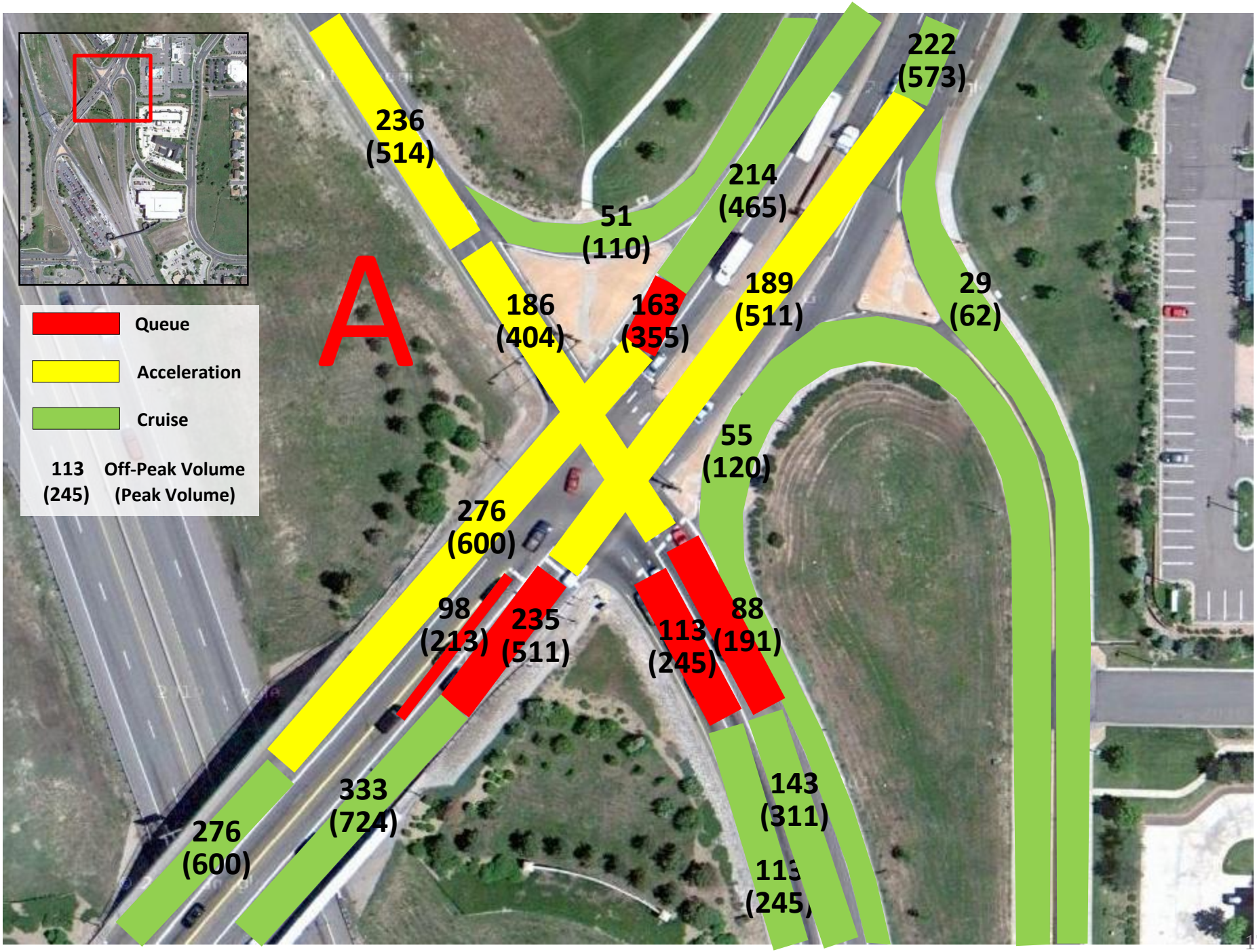
A
Queue
Acceleration
Cruise
113 (245) Off-Peak Volume (Peak Volume)
236 (514)
51 (110)
214 (465)
222 (573)
186 (404)
163 (355)
189 (511)
29 (62)
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276 (600)
98 (213)
235 (511)
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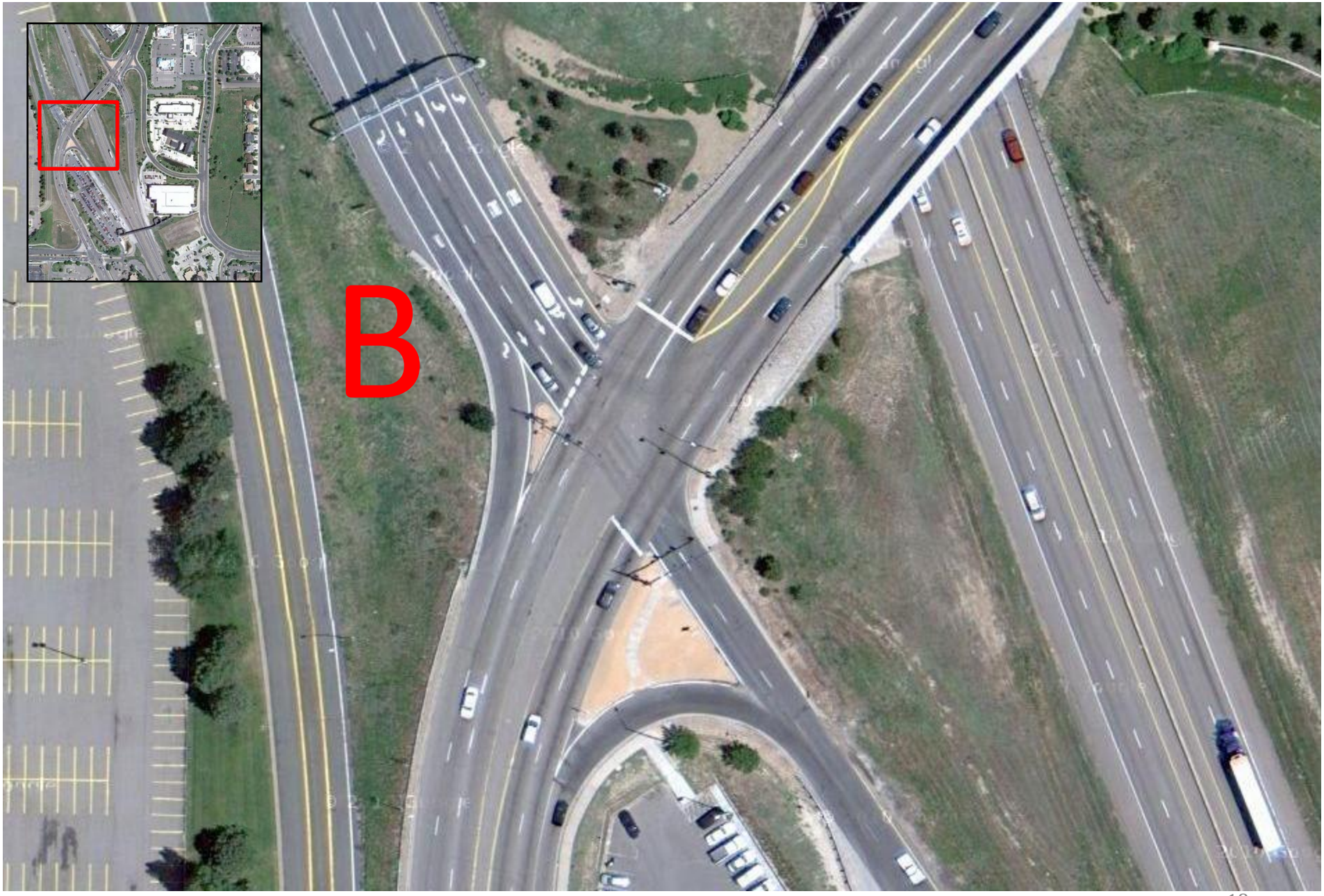
113 (245)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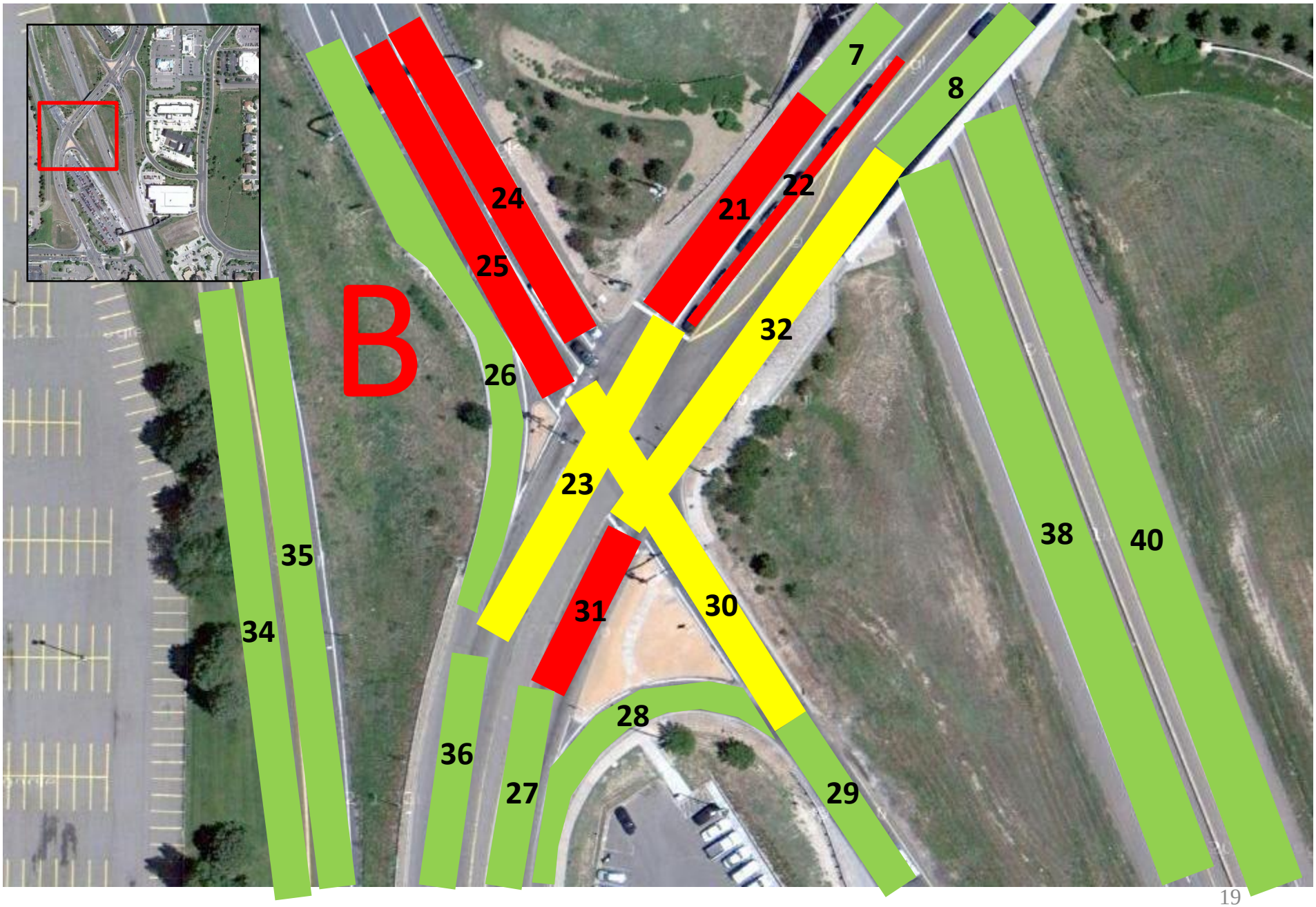
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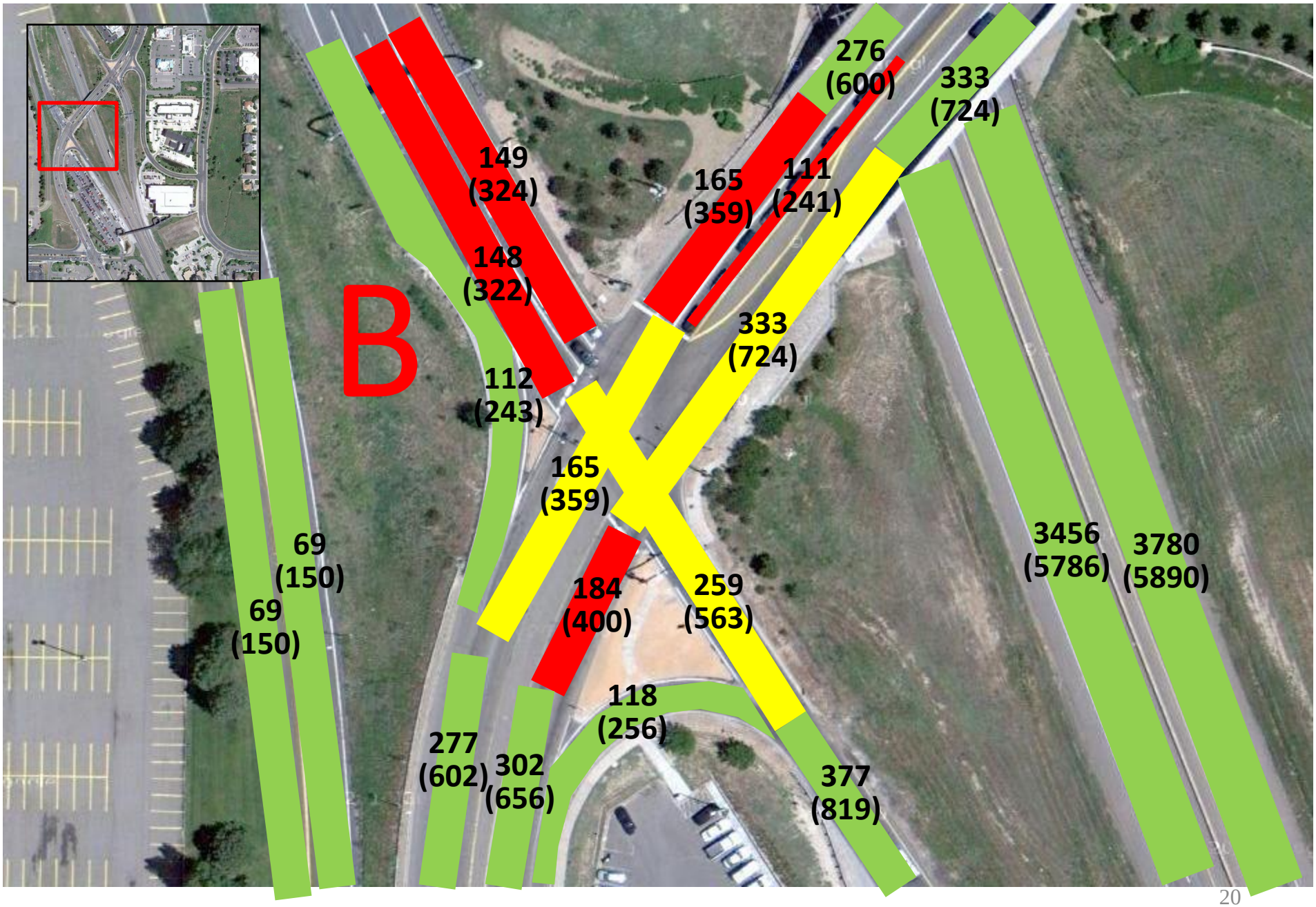
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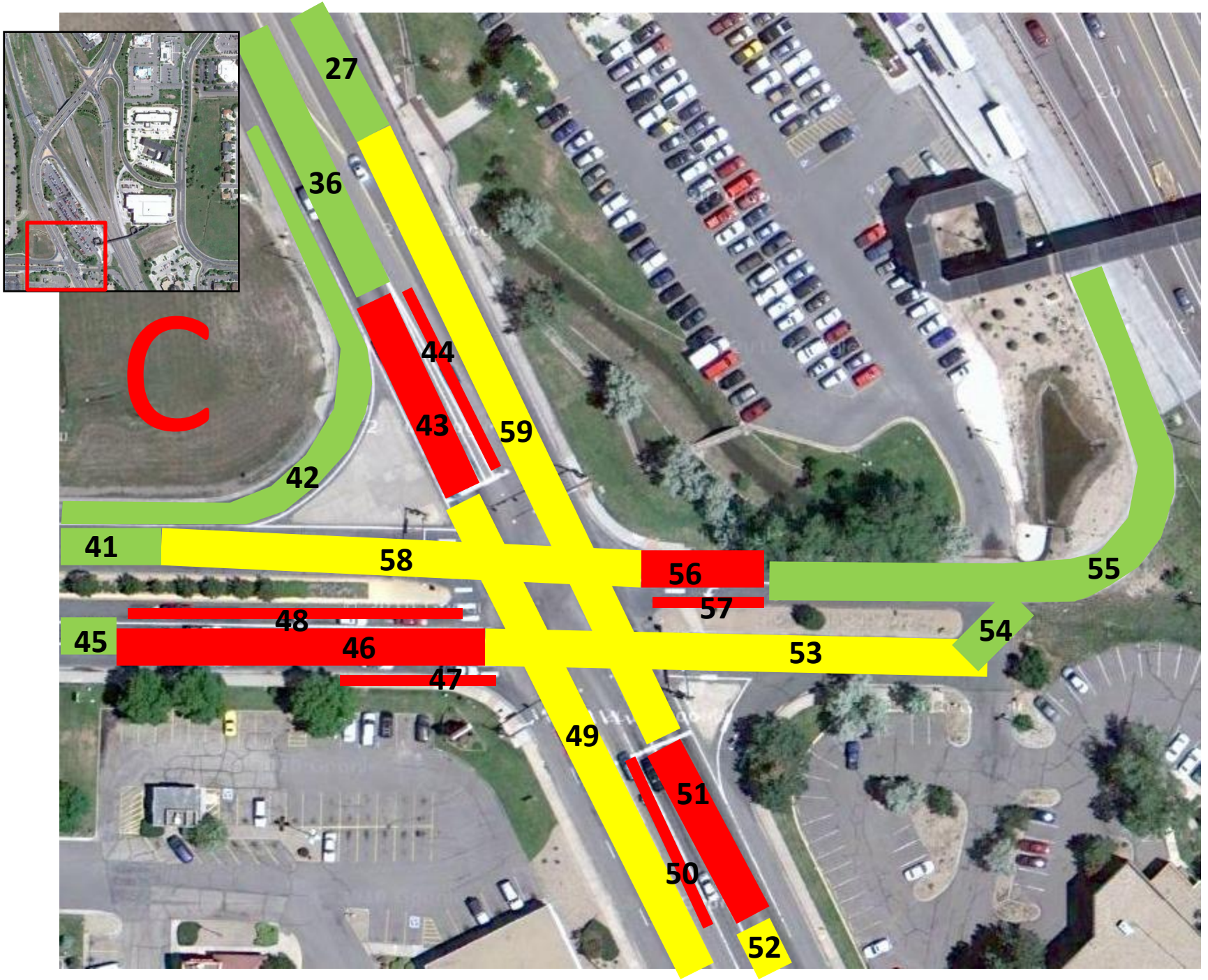
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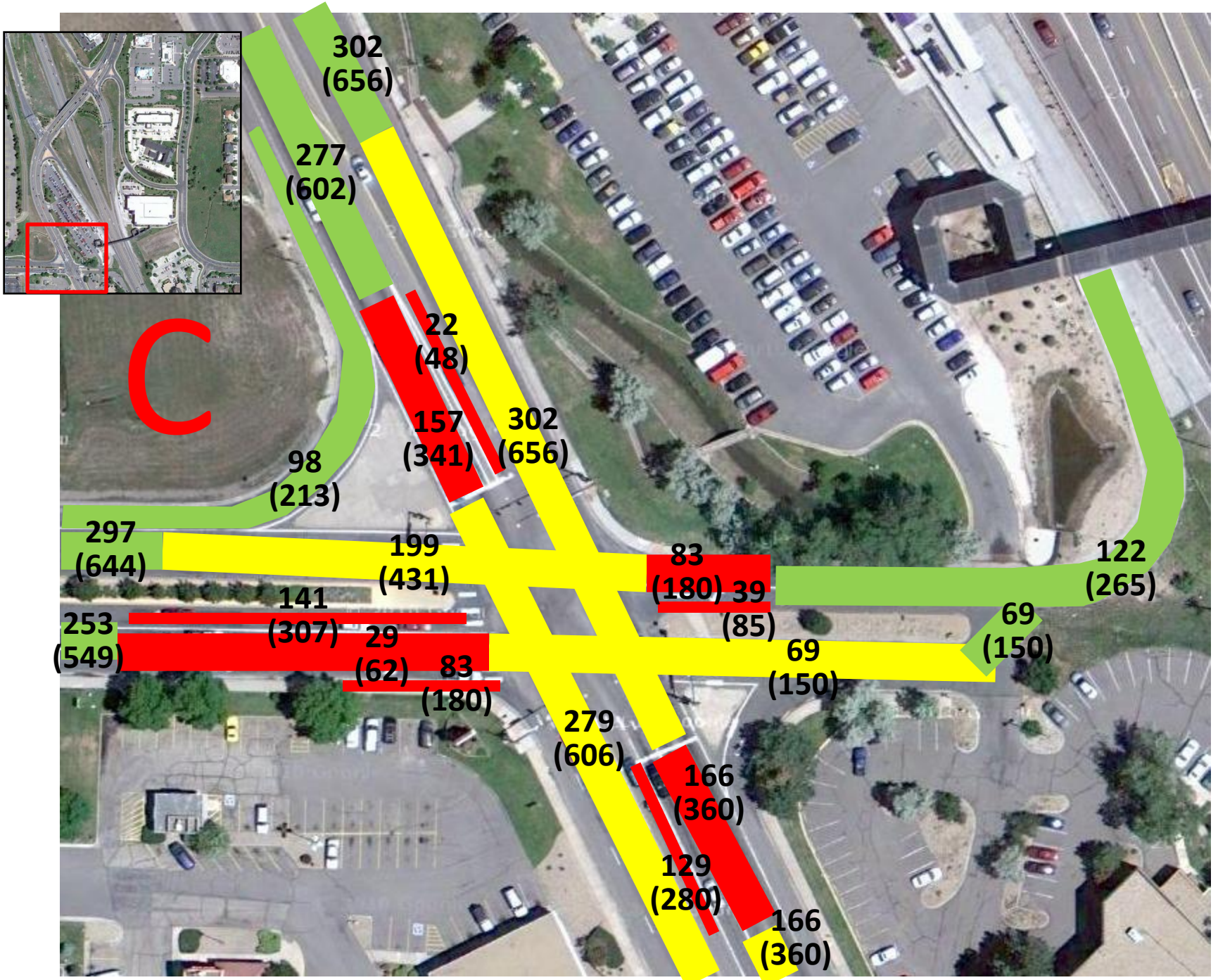
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157
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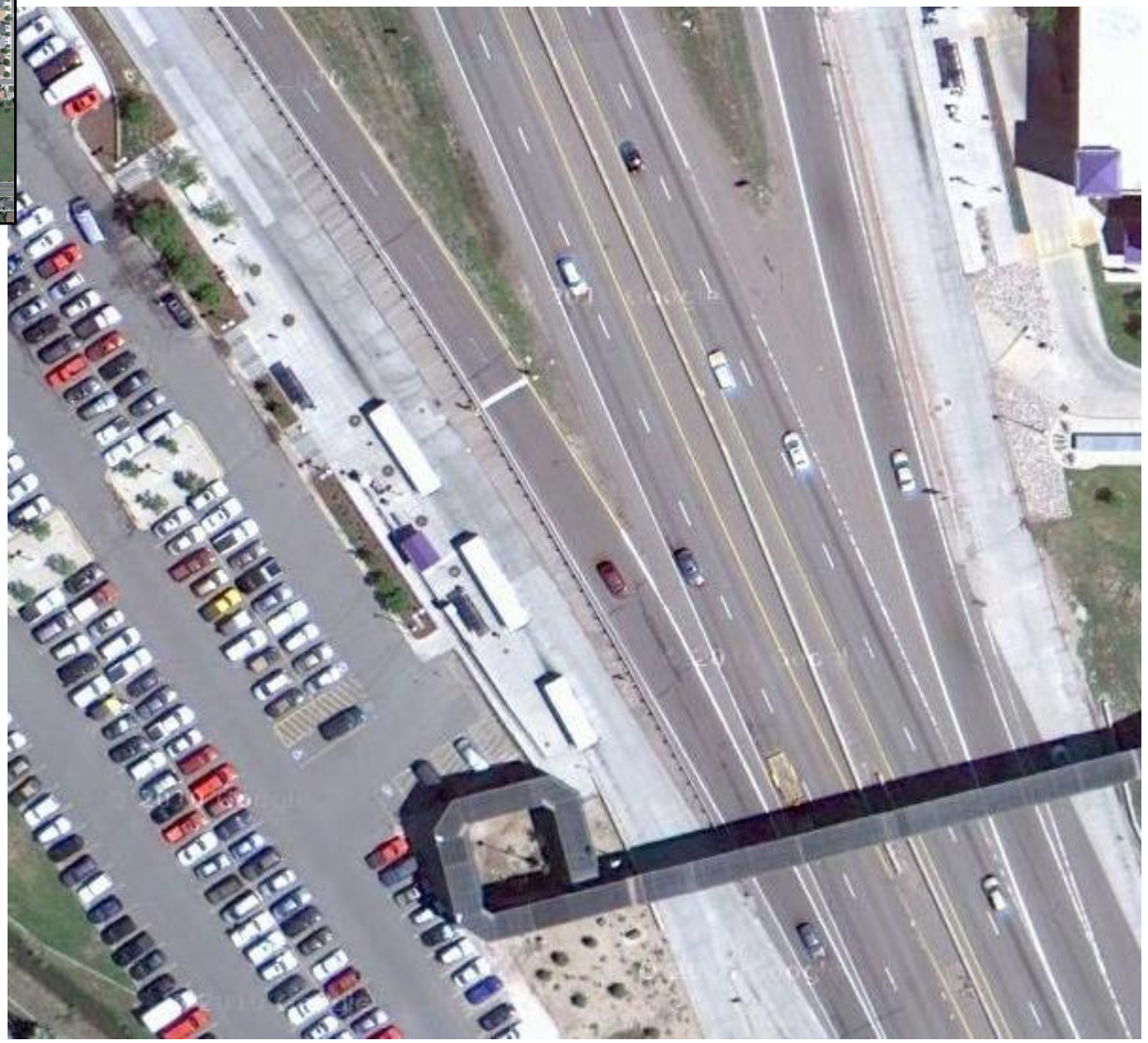

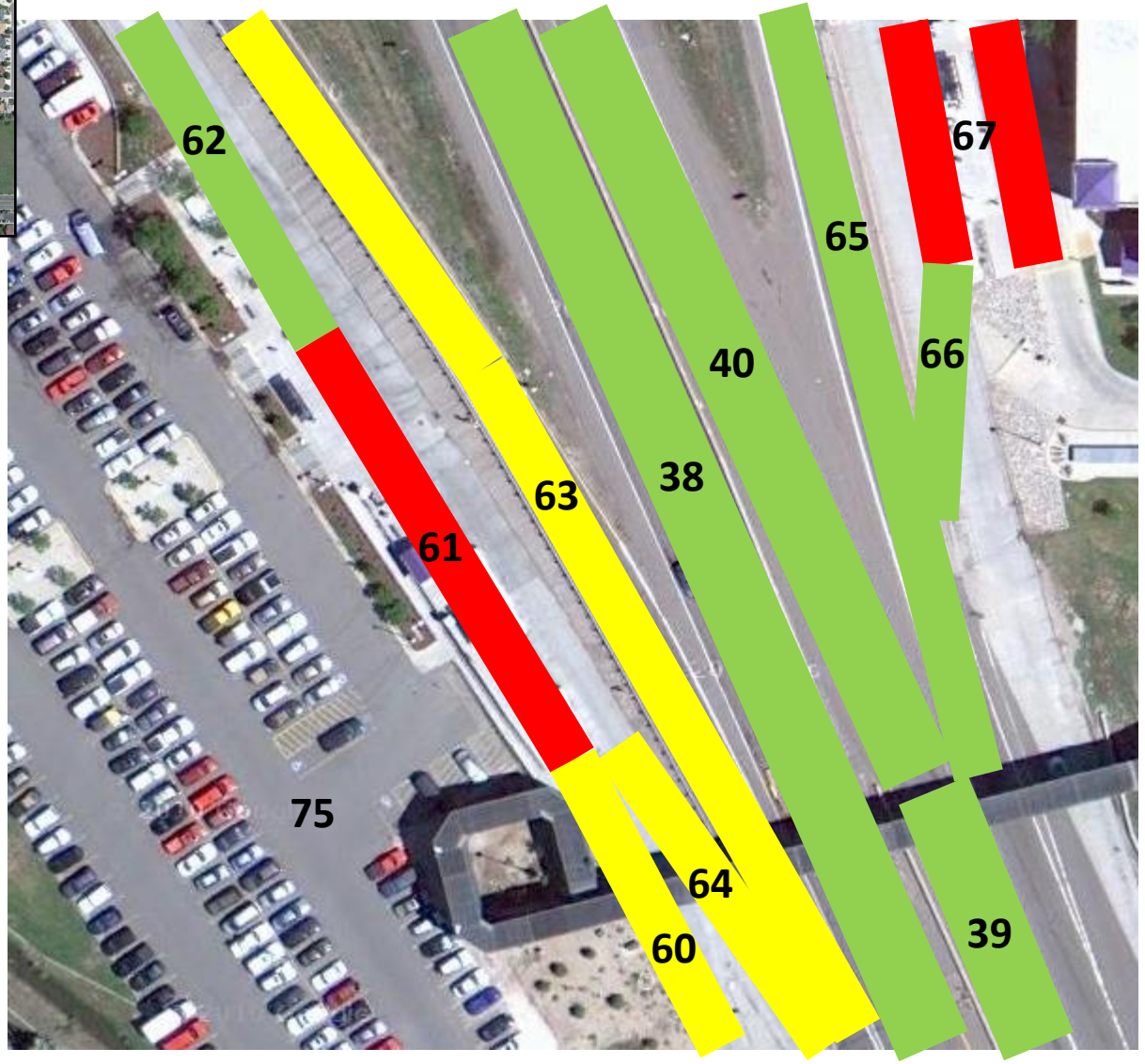
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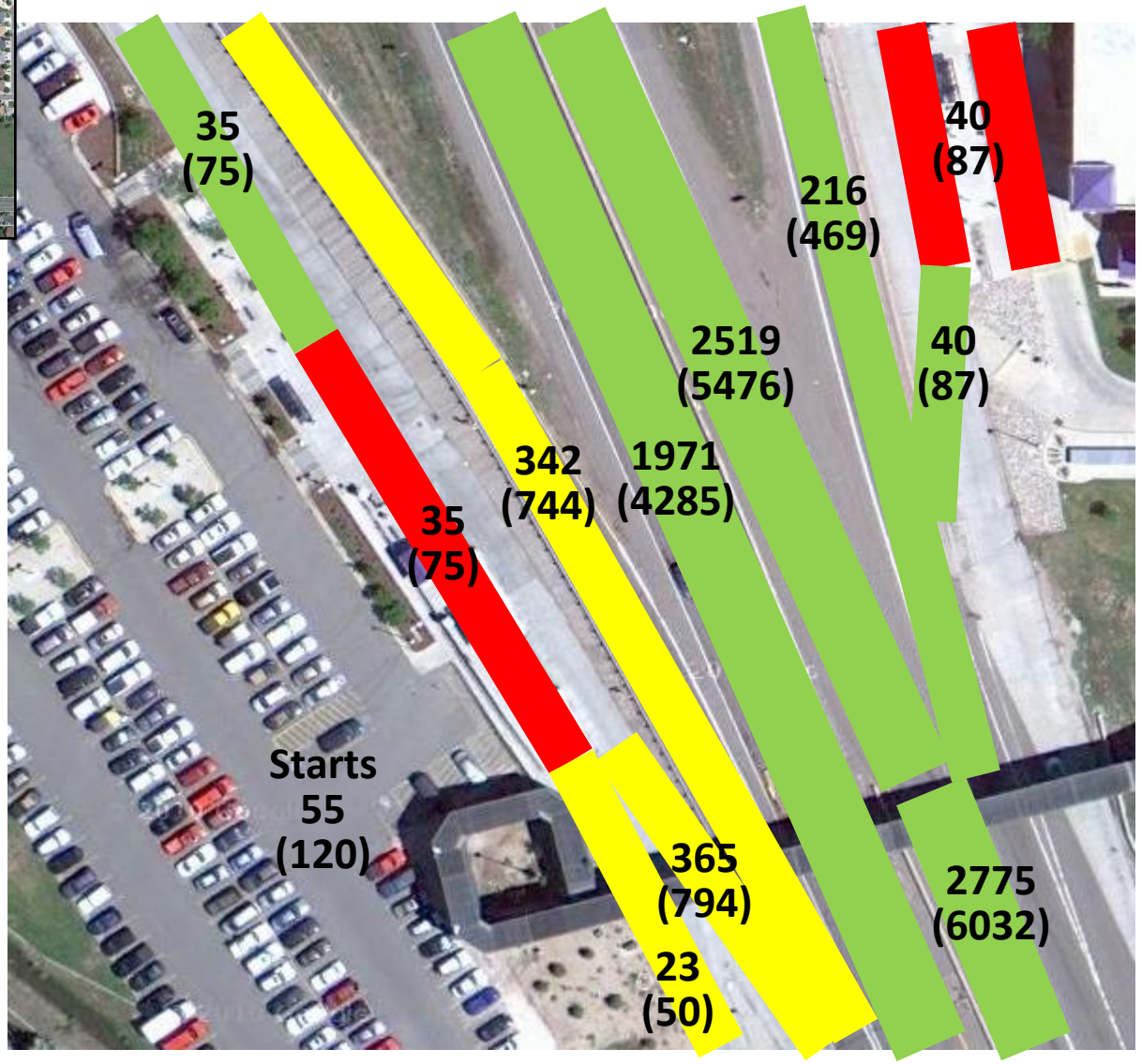
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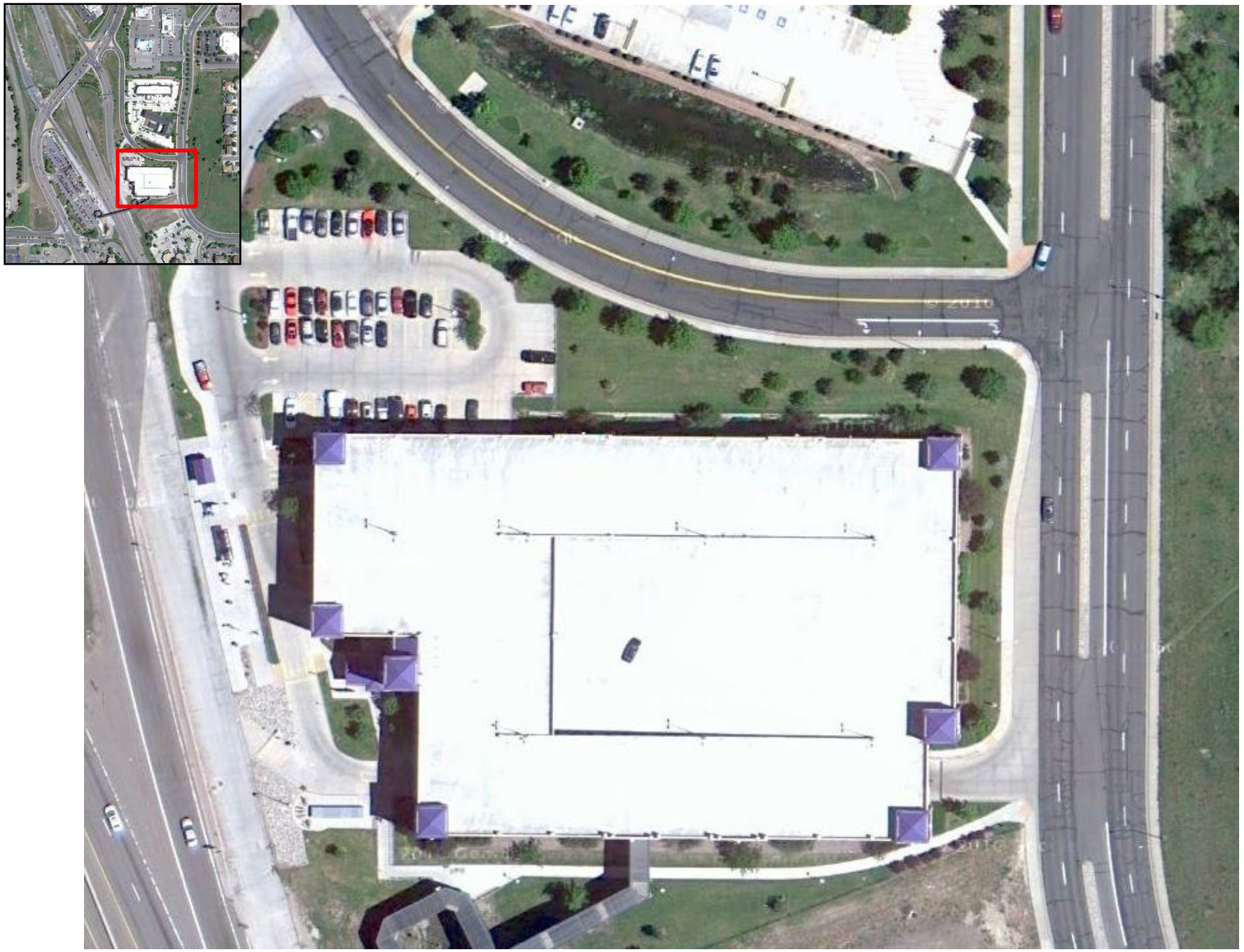

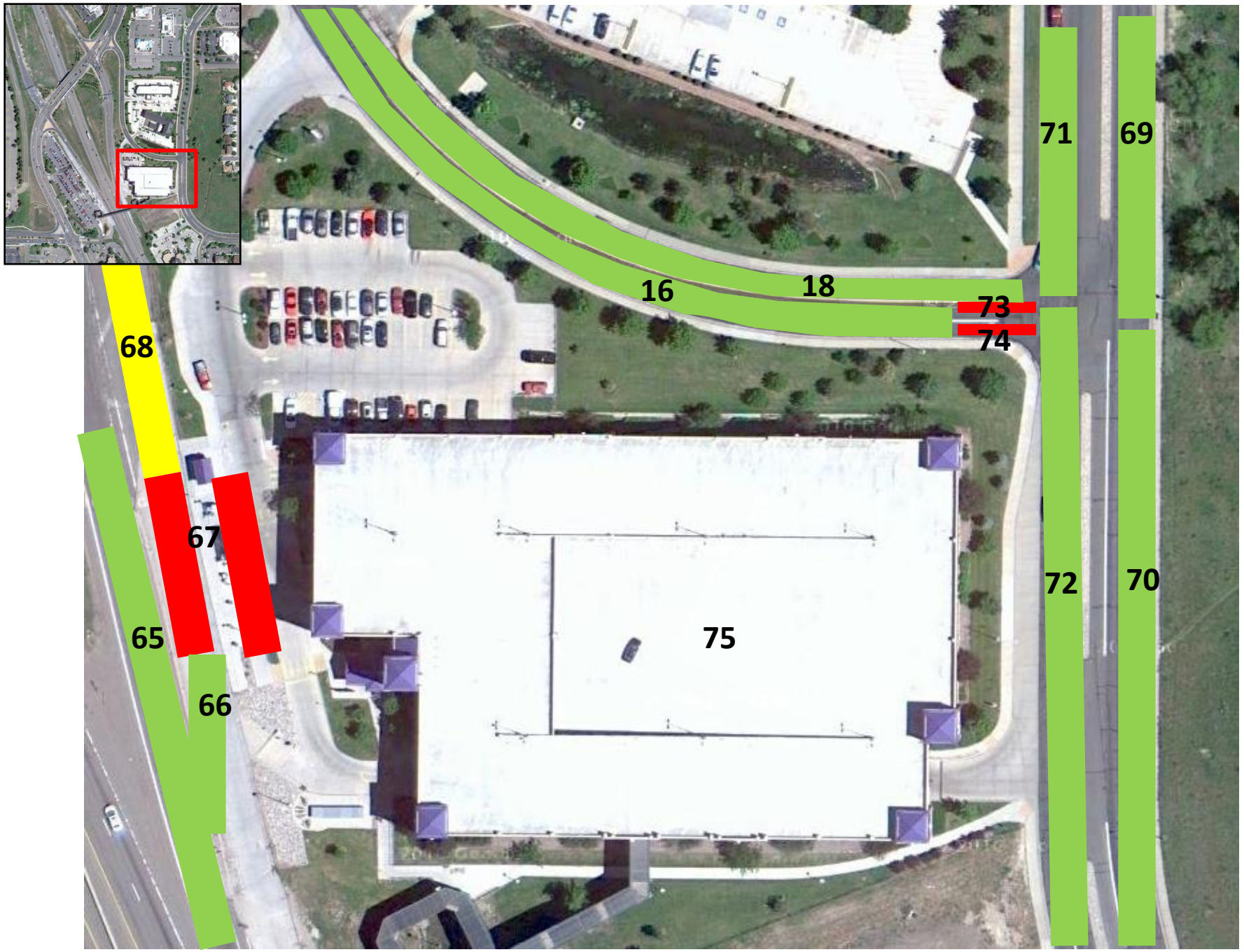
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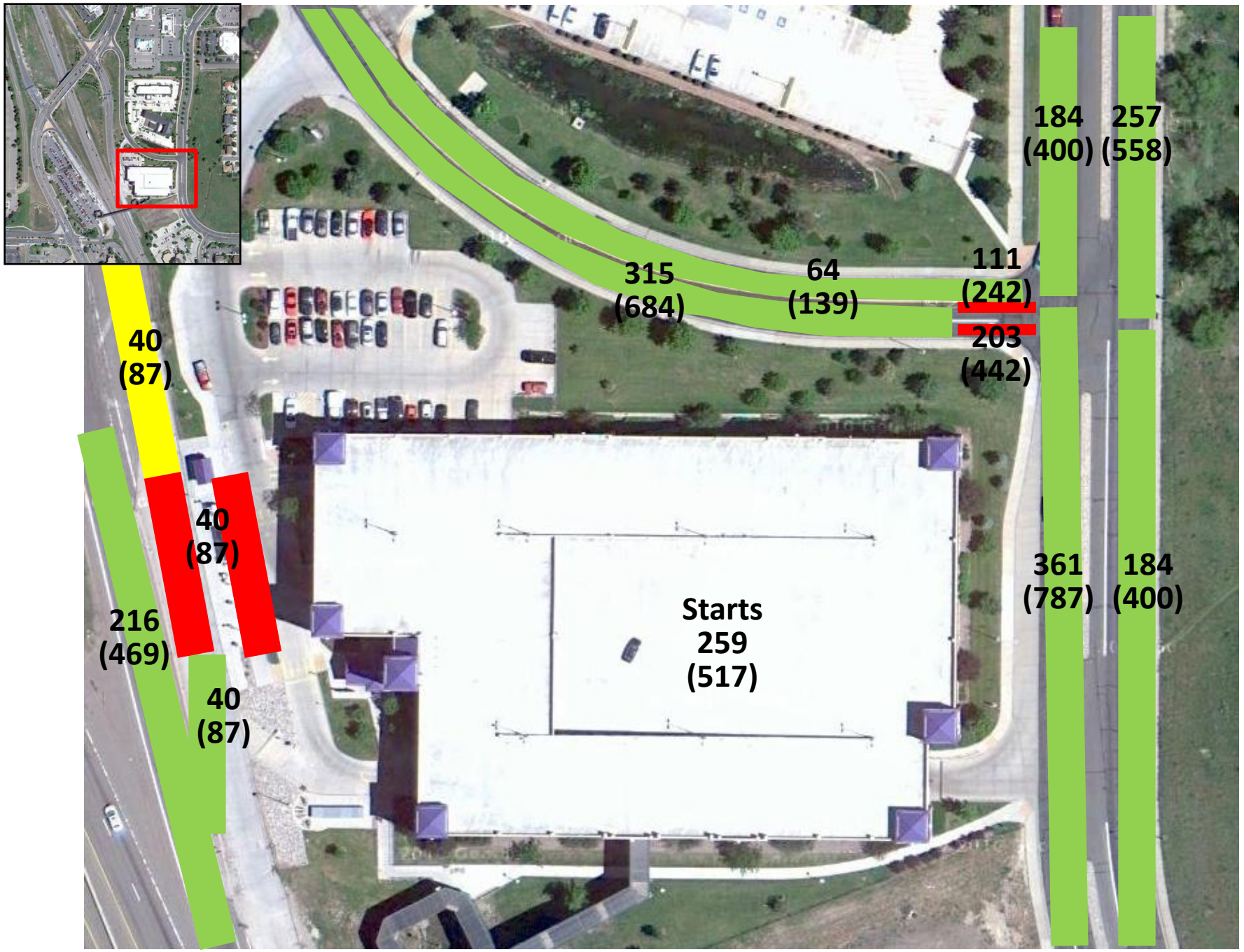
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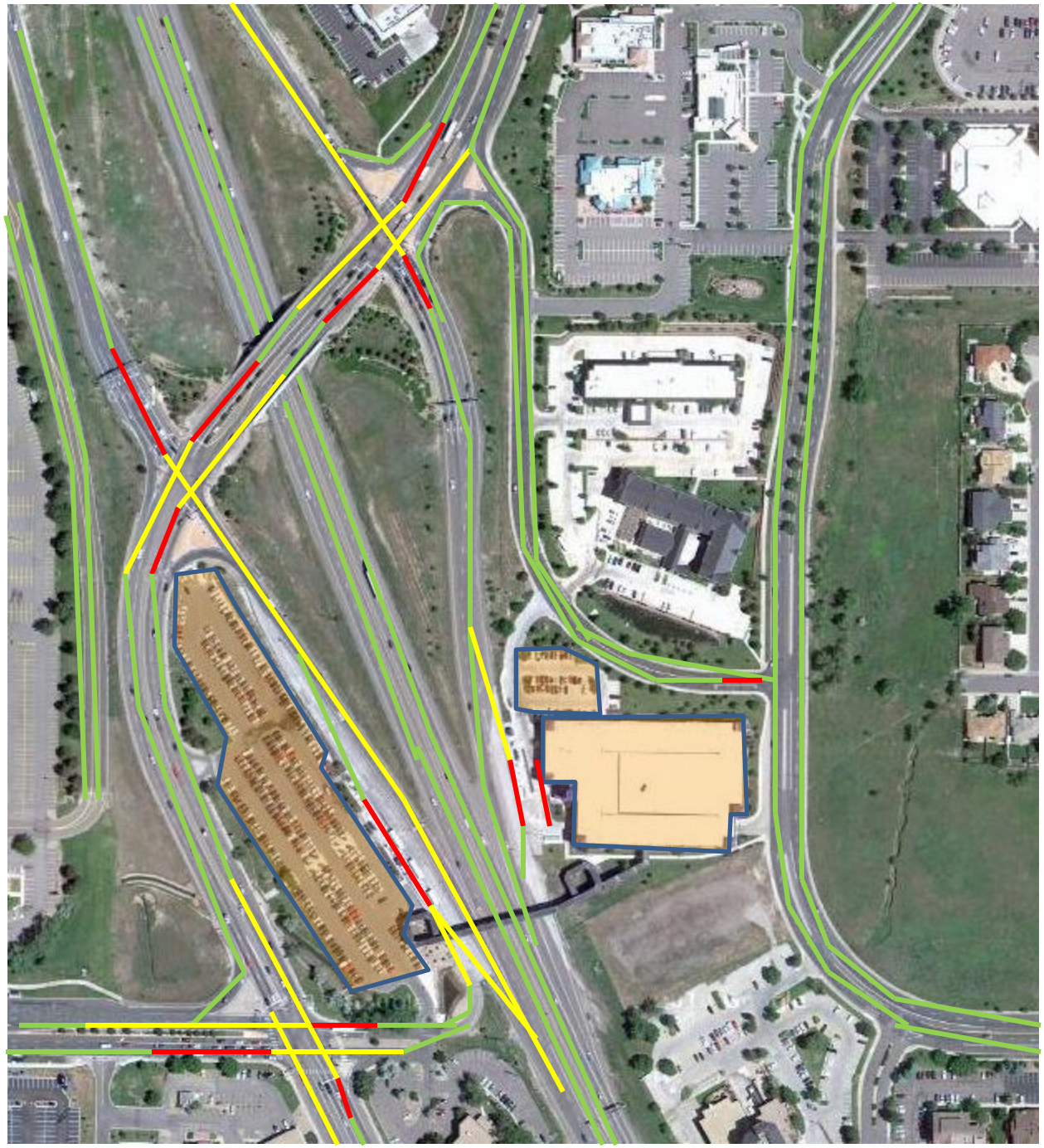


Traffic Data: Link Volumes/Speeds/Lengths

traffic_data.xls [Compatibility Mode]

	A	B	C	D	E	F	G	H	I
1	linkid	Link Description	Link Type	Link Volume (off-peak hour)	Link Volume (peak hour)	average speed - off-peak hour(mph)	average speed - peak hour(mph)	link length (meters)	link length (r
2	1	intersection (A) NW bound entrance ramp	accel	186	404	20.0	20.0	258.5	0.1606
3	2	intersection (A) NW bound entrance ramp	cruise	236	514	40.0	40.0	64.0	0.0397
4	3	intersection (A) WB RT lane	cruise	51	110	40.0	40.0	49.0	0.0304
5	4	intersection (A) SW bound approach	cruise	214	465	40.0	40.0	233.1	0.1448
6	5	intersection (A) SW bound queue	queue	163	355	5.9	5.9	22.1	0.0137
7	6	intersection (A) SW bound departure	accel	276	600	25.8	25.8	90.5	0.0562
8	7	intersection (A) SW bound connect	cruise	276	600	40.0	40.0	68.9	0.0428
9	8	intersection (A) NE bound approach	cruise	333	724	40.0	40.0	68.6	0.0426
10	9	intersection (A) NE bound queue	queue	235	511	12.7	6.2	27.4	0.0170
11	10	intersection (A) NB LT queue	queue	98	213	5.9	5.9	39.6	0.024
12	11	intersection (A) WB LT queue	queue	113	245	5.9	5.9	21.3	0.0132
13	12	intersection (A) NB queue	queue	88	191	5.9	5.9	17.5	0.0108
14	13	intersection (A) WB LT approach	cruise	113	245	40.0	40.0	127.9	0.0794
15	14	intersection (A) NB approach	cruise	143	311	40.0	40.0	142.7	0.0886
16	15	intersection (A) SB to E Transit Center	cruise	55	120	30.0	30.0	294.1	0.1827
17	16	intersection (A) SB to E Transit Center	cruise	315	684	30.0	30.0	86.5	0.0537
18	17	intersection (A) NB from E Transit Center	cruise	29	62	30.0	30.0	257.6	0.1600
19	18	intersection (A) NB from E Transit Center	cruise	64	139	15.0	15.0	116.4	0.072
20	19	intersection (A) NE bound	cruise	264	573	40.0	40.0	215.4	0.133
21	20	intersection (A) NE bound departure	accel	235	511	20.0	20.0	85.1	0.0528
22	21	intersection (B) SW bound queue	queue	165	359	5.9	5.9	17.5	0.0108
23	22	intersection (B) SE LT queue	queue	111	241	5.9	5.9	48	0.0298
24	23	intersection (B) SW bound departure	accel	165	359	20.0	20.0	73.1	0.0454
25	24	intersection (B) NE bound LT queue	queue	149	324	5.9	5.9	30.5	0.0189

Traffic Data | AERMOD input info | Fleet Mix | Bus Roster | Bus Age Distri

Traffic Data: Fleet Mix

traffic_data.xls [Compatibility Mode]

	A	B	C	D	E	F	G	H	I	J	K
1	All Bus										
2	11	Motorcycle	0								
3	21	Passenger Car	0								
4	31	Passenger Truck	0								
5	32	Light Commercial Tı	0								
6	41	Intercity Bus	0								
7	42	Transit Bus	1								
8	43	School Bus	0								
9	51	Refuse Truck	0								
10	52	Single Unit Short-ha	0								
11	53	Single Unit Long-ha	0								
12	54	Motor Home	0								
13	61	Combination Short-	0								
14	62	Combination Long-l	0								
15	Highway										
16	11	Motorcycle	0.0058								
17	21	Passenger Car	0.5170								
18	31	Passenger Truck	0.3350								
19	32	Light Commercial Tı	0.0204								
20	41	Intercity Bus	0.0030								
21	42	Transit Bus	0.0002								
22	43	School Bus	0.0020								
23	51	Refuse Truck	0.0002								
24	52	Single Unit Short-ha	0.0115								
25	53	Single Unit Long-ha	0.0100								
26	54	Motor Home	0.0028								
27	61	Combination Short-	0.0100								
28	62	Combination Long-l	0.0821								
29	Arterial										
30	11	Motorcycle	0.0082								
31	21	Passenger Car	0.5919								
32	31	Passenger Truck	0.3336								
33	32	Light Commercial Tı	0.0290								

AERMOD links | Traffic Data | AERMOD input info | Fleet Mix | Bus R

Age Distribution Based on Bus Roster

traffic_data.xls [Compatibility Mode]

	A	B	C	D	E	F	G	H	I	J	K
1	Bus ID	Type	Age	Fuel			age	count	fraction of total		
2	11	BUS	2	Diesel			2	6	0.061224		
3	12	BUS	2	Diesel			3	22	0.22449		
4	13	BUS	2	Diesel			4	3	0.030612		
5	14	BUS	2	Diesel			5	1	0.010204		
6	86	BUS	2	Diesel			6	2	0.020408		
7	87	BUS	2	Diesel			7	25	0.255102		
8	48	BUS	3	Diesel			8	11	0.112245		
9	88	BUS	3	Diesel			9	9	0.091837		
10	89	BUS	3	Diesel			10	4	0.040816		
11	90	BUS	3	Diesel			12	12	0.122449		
12	91	BUS	3	Diesel			13	1	0.010204		
13	92	BUS	3	Diesel			14	1	0.010204		
14	93	BUS	3	Diesel			15	1	0.010204		
15	94	BUS	3	Diesel							
16	95	BUS	3	Diesel							
17	96	BUS	3	Diesel							
18	97	BUS	3	Diesel							
19	98	BUS	3	Diesel							
20	99	BUS	3	Diesel							
21	100	BUS	3	Diesel							
22	101	BUS	3	Diesel							
23	102	BUS	3	Diesel							
24	103	BUS	3	Diesel							
25	104	BUS	3	Diesel							
26	105	BUS	3	Diesel							
27	106	BUS	3	Diesel							
28	107	BUS	3	Diesel							
29	108	BUS	3	Diesel							
30	9	BUS	4	Diesel							
31	10	BUS	4	Diesel							
32	47	BUS	4	Diesel							
33	8	BUS	5	Diesel							

Traffic Data | AERMOD input info | Fleet Mix | Bus Roster

Age and fuel type of each individual bus

Importing Data

Links: Links_offpeak.xls

Link Source Types: linksource.xls

Link Drive Schedule: not used

Fuel: fuels_jan.xls

Age Distribution: agedist.xls

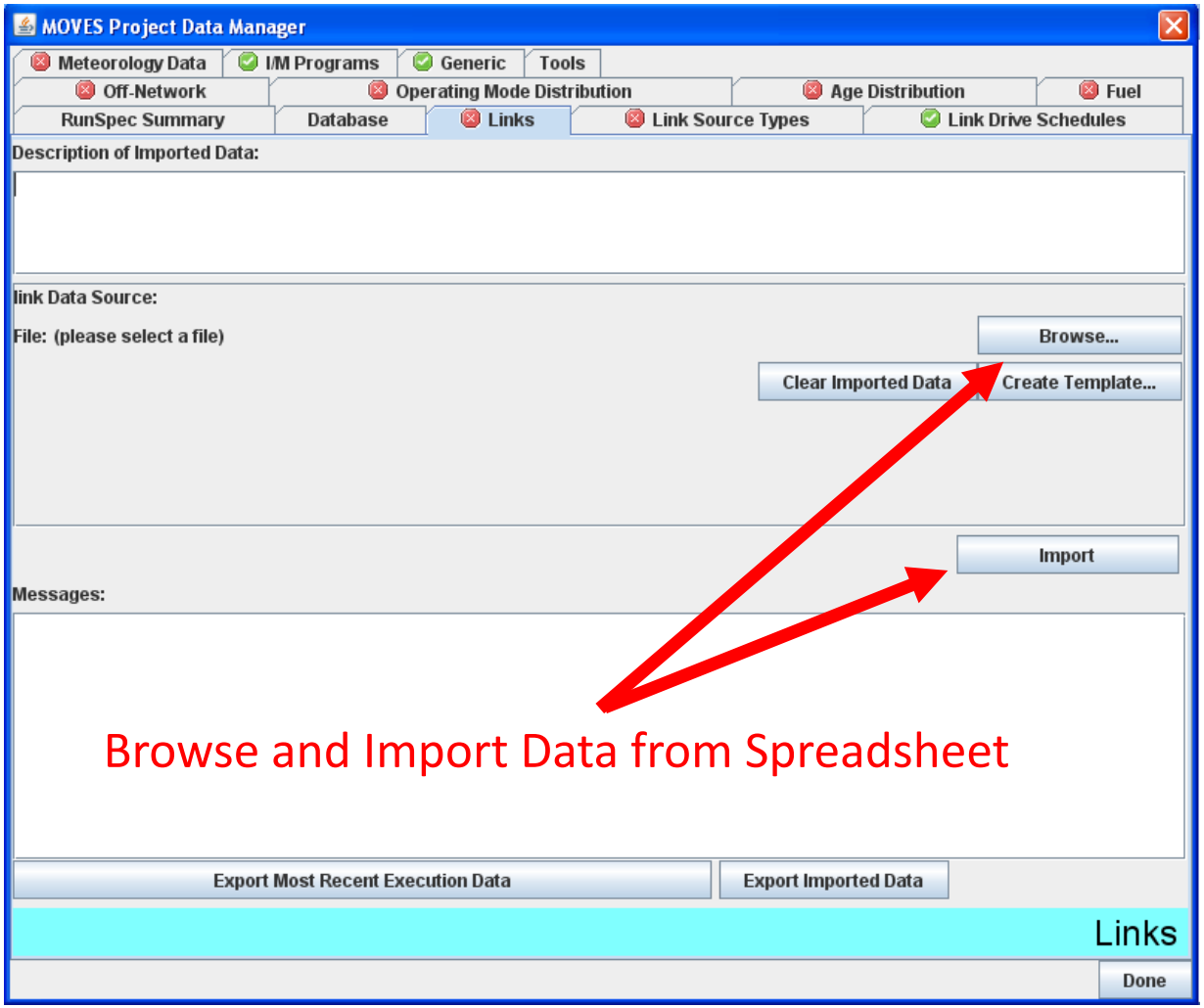
Operating Mode Distribution: opmode.xls

Off-Network: offnetwork.xls

Meteorology Data: met_jan12am.xls

I/M Programs: not used

Generic: not used



Deriving Links Table from Traffic Data

traffic_data.xls [Compatibility Mode]

	A	B	C	D	E	F	G	H	I
1	linkid	Link Description	Link Type	Link Volume (off-peak hour)	Link Volume (peak hour)	average speed - off-peak hour(mph)	average speed - peak hour(mph)	link length (meters)	link length (r
2	1	intersection (A) NW bound entrance ramp	accel	186	404	20.0	20.0	258.5	0.1606
3	2	intersection (A) NW bound entrance ramp	cruise	236	514	40.0	40.0	64.0	0.0397
4	3	intersection (A) WB RT lane	cruise	51	110	40.0	40.0	49.0	0.0304
5	4	intersection (A) SW bound approach	cruise	214	465	40.0	40.0	233.1	0.1448
6	5	intersection (A) SW bound queue	queue	163	355	5.9	5.9	22.1	0.0137
7	6	intersection (A) SW bound departure	accel	276	600	25.8	25.8	90.5	0.0562
8	7	intersection (A) SW bound connect	cruise	276	600	40.0	40.0	68.9	0.0428
9	8	intersection (A) NE bound approach	cruise	333	724	40.0	40.0	68.6	0.0426
10	9	intersection (A) NE bound queue	queue	235	511	12.7	6.2	27.4	0.0170
11	10	intersection (A) NB LT queue	queue	98	213	5.9	5.9	39.6	0.024
12	11	intersection (A) WB LT queue	queue	113	245	5.9	5.9	21.3	0.0132
13	12	intersection (A) NB queue	queue	88	191	5.9	5.9	17.5	0.0108
14	13	intersection (A) WB LT approach	cruise	113	245	40.0	40.0	127.9	0.0794
15	14	intersection (A) NB approach	cruise	143	311	40.0	40.0	142.7	0.0886
16	15	intersection (A) SB to E Transit Center	cruise	55	120	30.0	30.0	294.1	0.1827
17	16	intersection (A) SB to E Transit Center	cruise	315	684	30.0	30.0	86.5	0.0537
18	17	intersection (A) NB from E Transit Center	cruise	29	62	30.0	30.0	257.6	0.1600
19	18	intersection (A) NB from E Transit Center	cruise	64	139	15.0	15.0	116.4	0.072
20	19	intersection (A) NE bound	cruise	264	573	40.0	40.0	215.4	0.133
21	20	intersection (A) NE bound departure	accel	235	511	20.0	20.0	85.1	0.0528
22	21	intersection (B) SW bound queue	queue	165	359	5.9	5.9	17.5	0.0108
23	22	intersection (B) SE LT queue	queue	111	241	5.9	5.9	48	0.0298
24	23	intersection (B) SW bound departure	accel	165	359	20.0	20.0	73.1	0.0454
25	24	intersection (B) NE bound LT queue	queue	149	324	5.9	5.9	30.5	0.0189

Traffic Data | AERMOD input info | Fleet Mix | Bus Roster | Bus Age Distri

Links Input (links_offpeak.xls)

links_offpeak.xls [Compatibility Mode]

	A	B	C	D	E	F	G	H	I	J
1	linkID	countyID	zoneID	roadTypeID	linkLength	linkVolume	linkAvgSpeed	linkDescription	linkAvgGrade	
2	1	26161	261610	5	0.160659	186	20.00	intersection (A) NW bound entrance ramp	0	
3	2	26161	261610	5	0.039776	236	40.00	intersection (A) NW bound entrance ramp	0	
4	3	26161	261610	5	0.030454	51	40.00	intersection (A) WB RT lane	0	
5	4	26161	261610	5	0.144873	214	40.00	intersection (A) SW bound approach	0	
6	5	26161	261610	5	0.013735	163	5.90	intersection (A) SW bound queue	0	
7	6	26161	261610	5	0.056246	276	25.76	intersection (A) SW bound departure	0	
8	7	26161	261610	5	0.042822	276	40.00	intersection (A) SW bound connect	0	
9	8	26161	261610	5	0.042635	333	40.00	intersection (A) NE bound approach	0	
10	9	26161	261610	5	0.017029	235	12.69	intersection (A) NE bound queue	0	
11	10	26161	261610	5	0.024612	98	5.90	intersection (A) NB LT queue	0	
12	11	26161	261610	5	0.013238	113	5.90	intersection (A) WB LT queue	0	
13	12	26161	261610	5	0.010876	88	5.90	intersection (A) NB queue	0	
14	13	26161	261610	5	0.07949	113	40.00	intersection (A) WB LT approach	0	
15	14	26161	261610	5	0.088689	143	40.00	intersection (A) NB approach	0	
16	15	26161	261610	5	0.182784	55	30.00	intersection (A) SB to E Transit Center	0	
17	16	26161	261610	5	0.05376	315	30.00	intersection (A) SB to E Transit Center	0	
18	17	26161	261610	5	0.160099	29	30.00	intersection (A) NB from E Transit Center	0	
19	18	26161	261610	5	0.072343	64	15.00	intersection (A) NB from E Transit Center	0	
20	19	26161	261610	5	0.133872	264	40.00	intersection (A) NE bound	0	
21	20	26161	261610	5	0.05289	235	20.00	intersection (A) NE bound departure	0	
22	21	26161	261610	5	0.010876	165	5.90	intersection (B) SW bound queue	0	
23	22	26161	261610	5	0.029832	111	5.90	intersection (B) SE LT queue	0	
24	23	26161	261610	5	0.045432	165	20.00	intersection (B) SW bound departure	0	
25	24	26161	261610	5	0.018956	149	5.90	intersection (B) NE bound LT queue	0	
26	25	26161	261610	5	0.018956	148	5.90	intersection (B) SE bound queue	0	
27	26	26161	261610	5	0.056619	112	30.00	intersection (B) SB entrance	0	
28	27	26161	261610	5	0.115227	302	40.00	intersection (B) NE bound approach	0	
29	28	26161	261610	5	0.036793	118	30.00	intersection (B) SE bound connect	0	
30	29	26161	261610	5	0.075886	377	40.00	intersection (B) bus lane approach	0	
31	30	26161	261610	5	0.063456	259	20.00	intersection (B) SE bound departure	0	
32	31	26161	261610	5	0.018956	184	5.90	intersection (B) NE bound queue	0	
33	32	26161	261610	5	0.046799	333	20.00	intersection (B) NE bound departure	0	
34	33	26161	261610	5	0.130951	409	40.00	intersection (B) highway exit ramp	0	
35	34	26161	261610	5	0.344438	69	20.00	intersection (B) SB mall	0	
36	35	26161	261610	5	0.342946	69	20.00	intersection (B) NB mall	0	

link | County | RoadType | Zone

Link Source Type Input (linksource.xls)

Arterial and Highway Fleet Mix from MPO county-level analysis

Bus-only links are entirely sourcetype 42

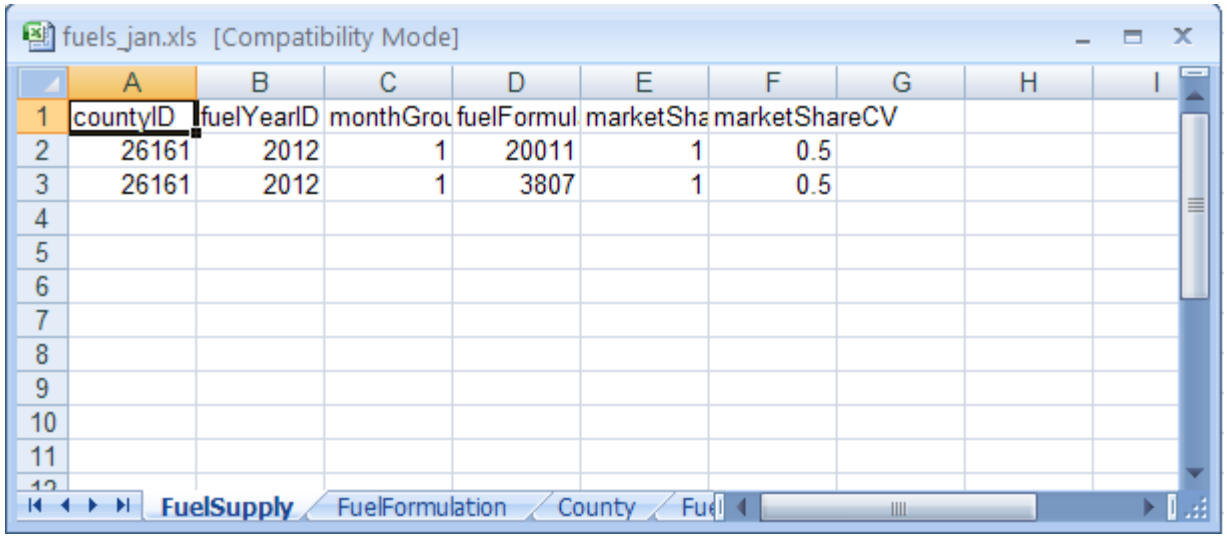
linksource.xls [Compatibility Mode]

	A	B	C	D	E	F
1	linkID	sourceTyp	sourceTypeHourFraction			
2	1	11	0.0082			
3	1	21	0.5919			
4	1	31	0.3336			
5	1	32	0.0290			
6	1	41	0.0004			
7	1	42	0.0002			
8	1	43	0.0028			
9	1	51	0.0003			
10	1	52	0.0178			
11	1	53	0.0020			
12	1	54	0.0040			
13	1	61	0.0046			
14	1	62	0.0052			
15	2	11	0.0082			
16	2	21	0.5919			
17	2	31	0.3336			
18	2	32	0.0290			
19	2	41	0.0004			
20	2	42	0.0002			
21	2	43	0.0028			
22	2	51	0.0003			
23	2	52	0.0178			
24	2	53	0.0020			
25	2	54	0.0040			
26	2	61	0.0046			
27	2	62	0.0052			
28	3	11	0.0082			
29	3	21	0.5919			
30	3	31	0.3336			
31	3	32	0.0290			
32	3	41	0.0004			

linkSourceTypeHour | SourceUse

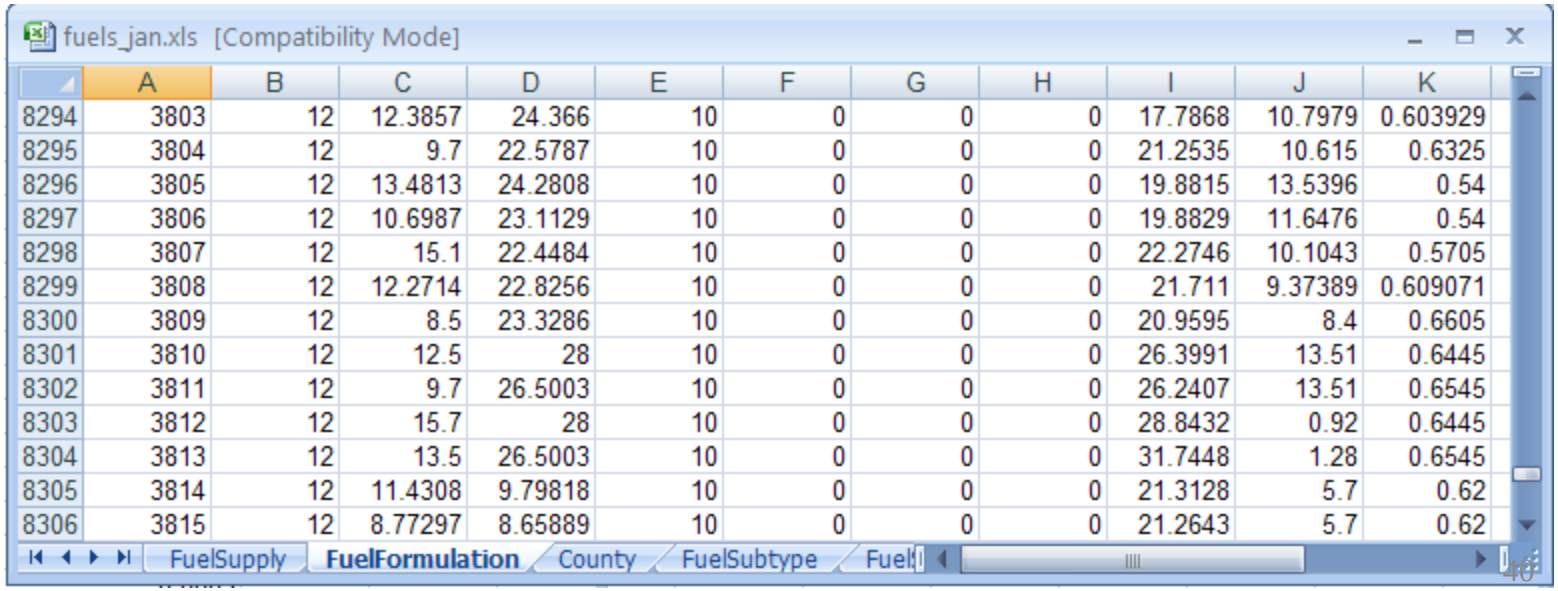
Fuels Input (fuel_jan.xls)

MOVES Default Fuel Supply and Fuel Formulation Used


fuels_jan.xls [Compatibility Mode]

	A	B	C	D	E	F	G	H	I
1	countyID	fuelYearID	monthGrou	fuelFormul	marketSha	marketShareCV			
2	26161	2012	1	20011	1	0.5			
3	26161	2012	1	3807	1	0.5			
4									
5									
6									
7									
8									
9									
10									
11									

FuelSupply | FuelFormulation | County | Fue


fuels_jan.xls [Compatibility Mode]

	A	B	C	D	E	F	G	H	I	J	K
8294	3803	12	12.3857	24.366	10	0	0	0	17.7868	10.7979	0.603929
8295	3804	12	9.7	22.5787	10	0	0	0	21.2535	10.615	0.6325
8296	3805	12	13.4813	24.2808	10	0	0	0	19.8815	13.5396	0.54
8297	3806	12	10.6987	23.1129	10	0	0	0	19.8829	11.6476	0.54
8298	3807	12	15.1	22.4484	10	0	0	0	22.2746	10.1043	0.5705
8299	3808	12	12.2714	22.8256	10	0	0	0	21.711	9.37389	0.609071
8300	3809	12	8.5	23.3286	10	0	0	0	20.9595	8.4	0.6605
8301	3810	12	12.5	28	10	0	0	0	26.3991	13.51	0.6445
8302	3811	12	9.7	26.5003	10	0	0	0	26.2407	13.51	0.6545
8303	3812	12	15.7	28	10	0	0	0	28.8432	0.92	0.6445
8304	3813	12	13.5	26.5003	10	0	0	0	31.7448	1.28	0.6545
8305	3814	12	11.4308	9.79818	10	0	0	0	21.3128	5.7	0.62
8306	3815	12	8.77297	8.65889	10	0	0	0	21.2643	5.7	0.62

FuelSupply | FuelFormulation | County | FuelSubtype | Fuel

Age Distribution Input (agedist.xls)

Provided by MPO

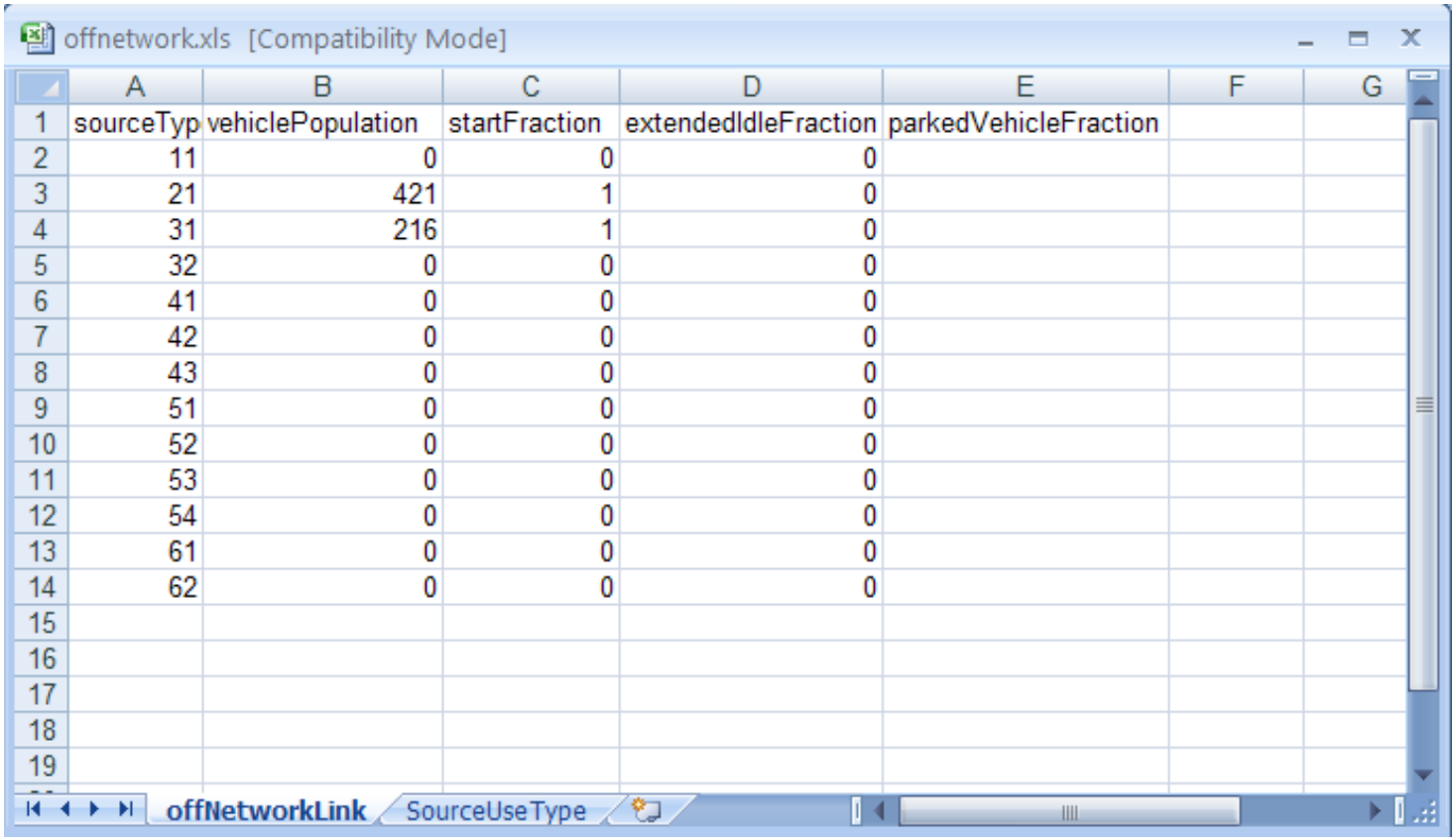
Local Data for Transit Buses (sourcetype 42) Obtained from Bus Roster

agedist.xls [Compatibility Mode]

	A	B	C	D	E	F	G	H
1	sourceTyp	yearID	ageID	ageFraction				
2	11	2020	0	0.071362				
3	11	2020	1	0.071075				
4	11	2020	2	0.071147				
5	11	2020	3	0.070357				
6	11	2020	4	0.068521				
7	11	2020	5	0.065452				
8	11	2020	6	0.064117				
9	11	2020	7	0.061838				
10	11	2020	8	0.058894				
11	11	2020	9	0.054936				
12	11	2020	10	0.047725				
13	11	2020	11	0.042259				
14	11	2020	12	0.037962				
15	11	2020	13	0.033661				
16	11	2020	14	0.030885				
17	11	2020	15	0.028874				
18	11	2020	16	0.024984				
19	11	2020	17	0.021669				
20	11	2020	18	0.015195				
21	11	2020	19	0.011895				
22	11	2020	20	0.009375				
23	11	2020	21	0.00763				
24	11	2020	22	0.006016				
25	11	2020	23	0.004323				
26	11	2020	24	0.003227				
27	11	2020	25	0.002695				
28	11	2020	26	0.002217				
29	11	2020	27	0.002197				
30	11	2020	28	0.002242				
31	11	2020	29	0.001777				
32	11	2020	30	0.005492				

sourceTypeAgeDistribution | AgeCatego

Off-network Input (offnetwork.xls)



offnetwork.xls [Compatibility Mode]

	A	B	C	D	E	F	G
1	sourceTyp	vehiclePopulation	startFraction	extendedIdleFraction	parkedVehicleFraction		
2	11	0	0	0			
3	21	421	1	0			
4	31	216	1	0			
5	32	0	0	0			
6	41	0	0	0			
7	42	0	0	0			
8	43	0	0	0			
9	51	0	0	0			
10	52	0	0	0			
11	53	0	0	0			
12	54	0	0	0			
13	61	0	0	0			
14	62	0	0	0			
15							
16							
17							
18							
19							

offNetworkLink SourceUseType

Expected use of park-and-ride facility (ratio of source types 21 vs. 31 correct, but numbers are only a placeholder… actual grams/start emission rates will be calculated in a post-processing step)

Deriving OpMode Distribution from Traffic Data

Expected use of park-and-ride facility

traffic_data.xlsx

	A	B	C	D	E	F
1	opmode bin	description	fraction PM peak hour	fraction all other hours		
2	101	Soak Time < 6 minutes	0.05	0.05		
3	102	6 minutes <= Soak Time < 30 minutes	0	0		
4	103	30 minutes <= Soak Time < 60 minutes	0	0		
5	104	60 minutes <= Soak Time < 90 minutes	0	0		
6	105	90 minutes <= Soak Time < 120 minutes	0	0		
7	106	120 minutes <= Soak Time < 360 minutes	0	0.05		
8	107	360 minutes <= Soak Time < 720 minutes	0.95	0.8		
9	108	720 minutes <= Soak Time	0	0.1		
10						
11						
12						
13						
14						

Traffic Data | Fleet Mix | Bus Roster | Bus Age Distribution | Soak D

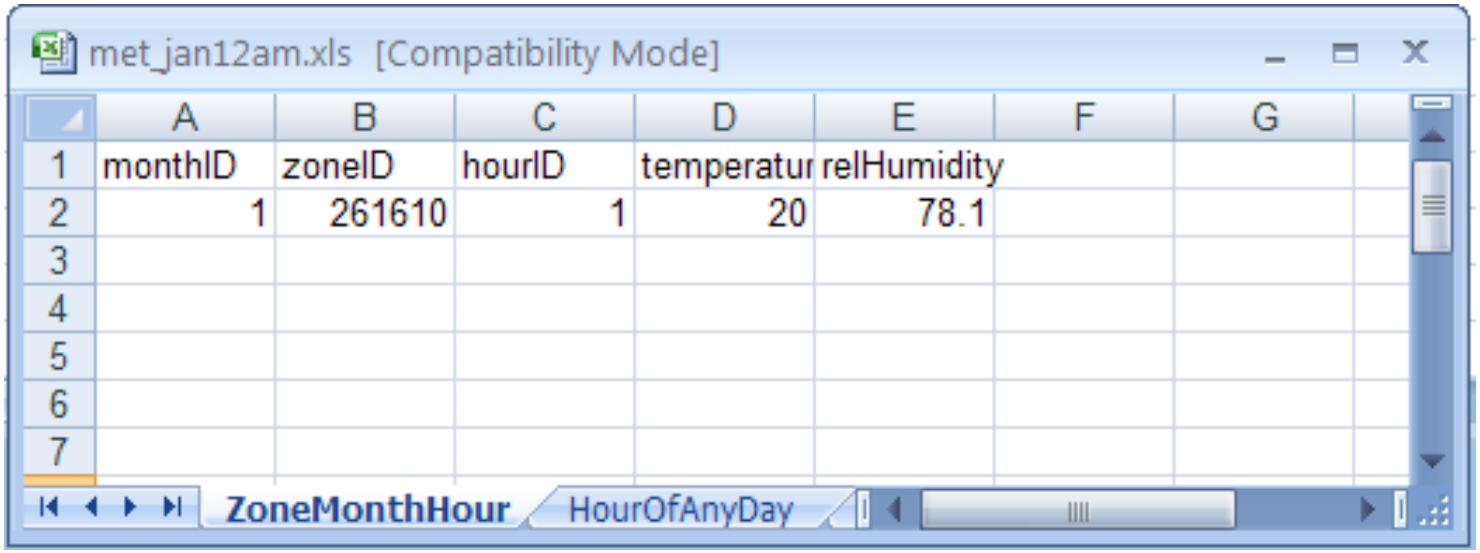
OpMode Distribution Input (opmode.xls)

opmode.xls [Compatibility Mode]

	A	B	C	D	E	F	G
1	sourceTypeID	hourDayID	linkID	polProcessID	opModeID	opModeFraction	
2	11	15	75	9102	101	0.05	
3	11	15	75	9102	106	0.05	
4	11	15	75	9102	107	0.8	
5	11	15	75	9102	108	0.1	
6	11	15	75	11002	101	0.05	
7	11	15	75	11002	106	0.05	
8	11	15	75	11002	107	0.8	
9	11	15	75	11002	108	0.1	
10	11	15	75	11016	101	0.05	
11	11	15	75	11016	106	0.05	
12	11	15	75	11016	107	0.8	
13	11	15	75	11016	108	0.1	
14	11	15	75	11102	101	0.05	
15	11	15	75	11102	106	0.05	
16	11	15	75	11102	107	0.8	
17	11	15	75	11102	108	0.1	
18	11	15	75	11116	101	0.05	
19	11	15	75	11116	106	0.05	
20	11	15	75	11116	107	0.8	
21	11	15	75	11116	108	0.1	
22	11	15	75	11202	101	0.05	
23	11	15	75	11202	106	0.05	
24	11	15	75	11202	107	0.8	
25	11	15	75	11202	108	0.1	
26	11	15	75	11216	101	0.05	
27	11	15	75	11216	106	0.05	
28	11	15	75	11216	107	0.8	
29	11	15	75	11216	108	0.1	
30	11	15	75	11502	101	0.05	

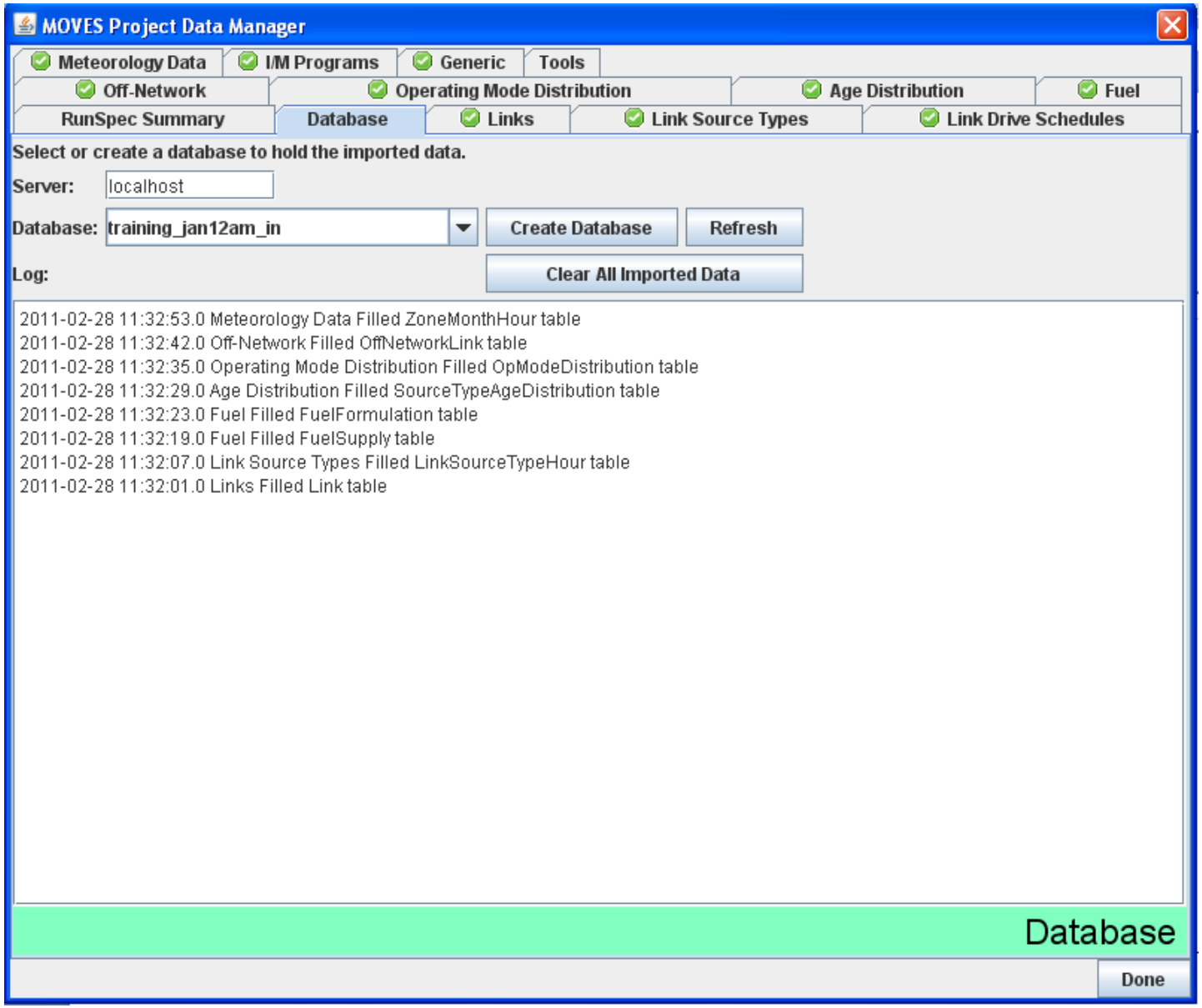
opModeDistribution | HourDay | Operati

Meteorology Input (met_jan12am.xls)

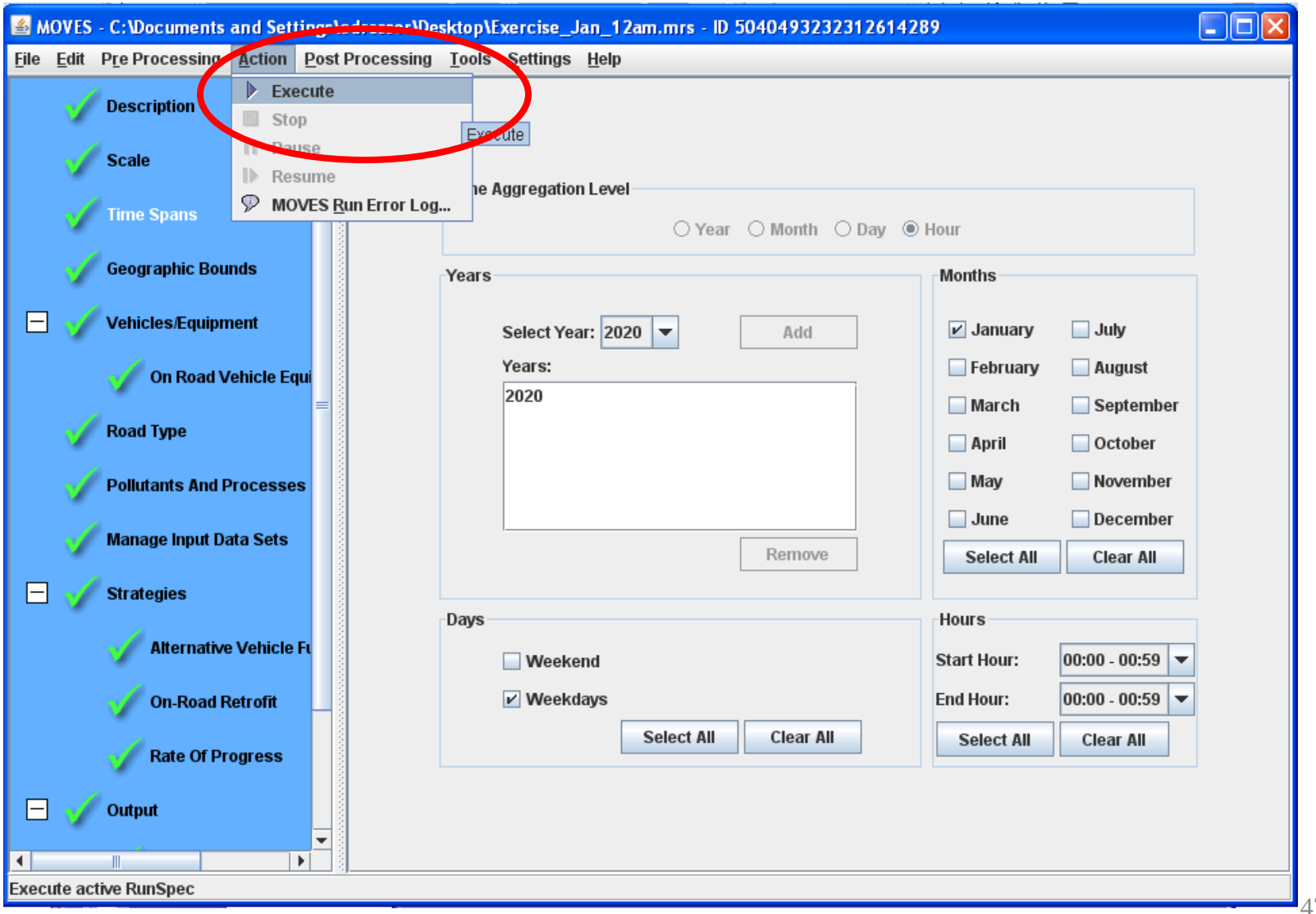


Temperature and humidity data taken from nearby met station (same dataset used for air quality analysis)

All Files Imported

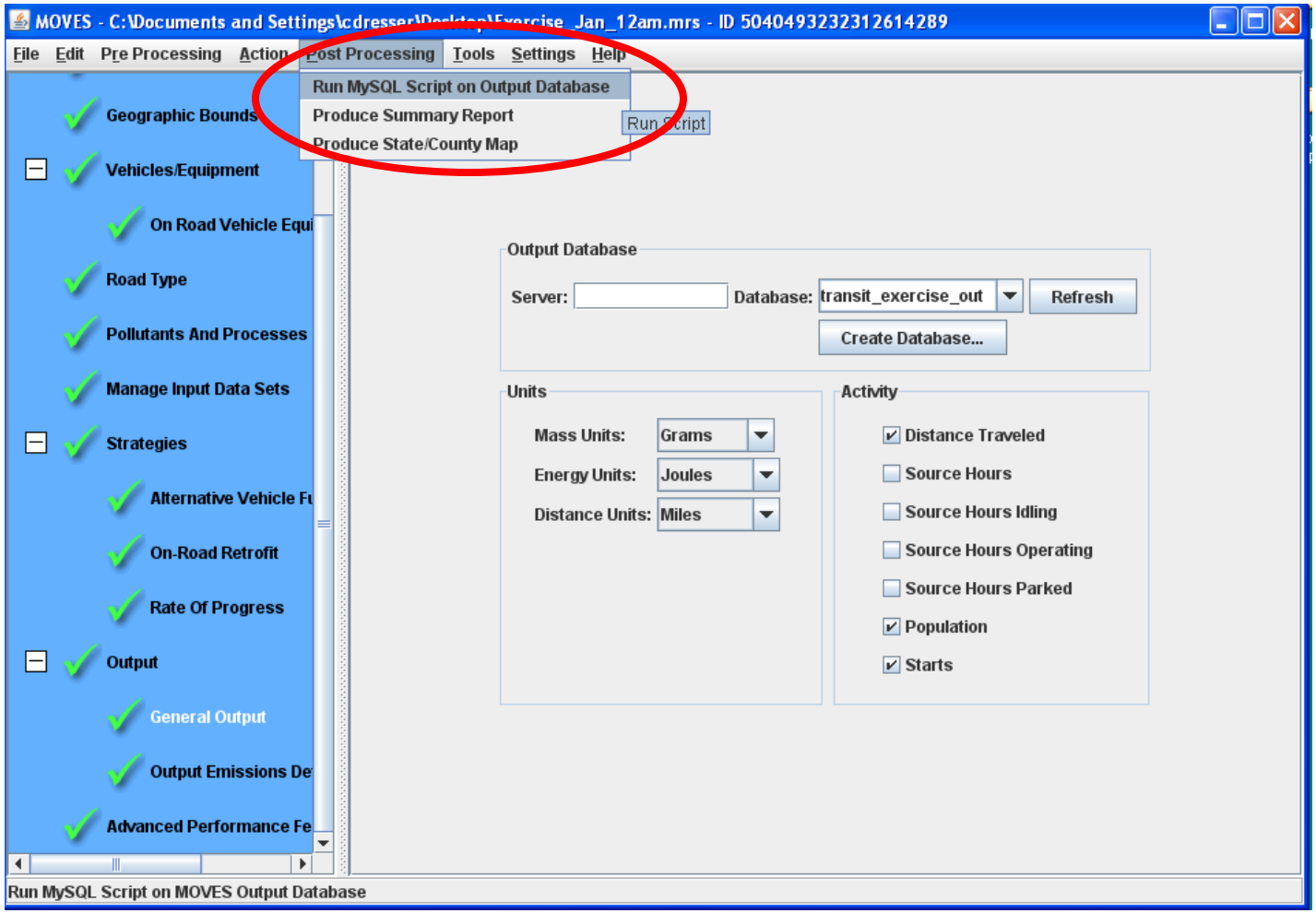


Execute RunSpec



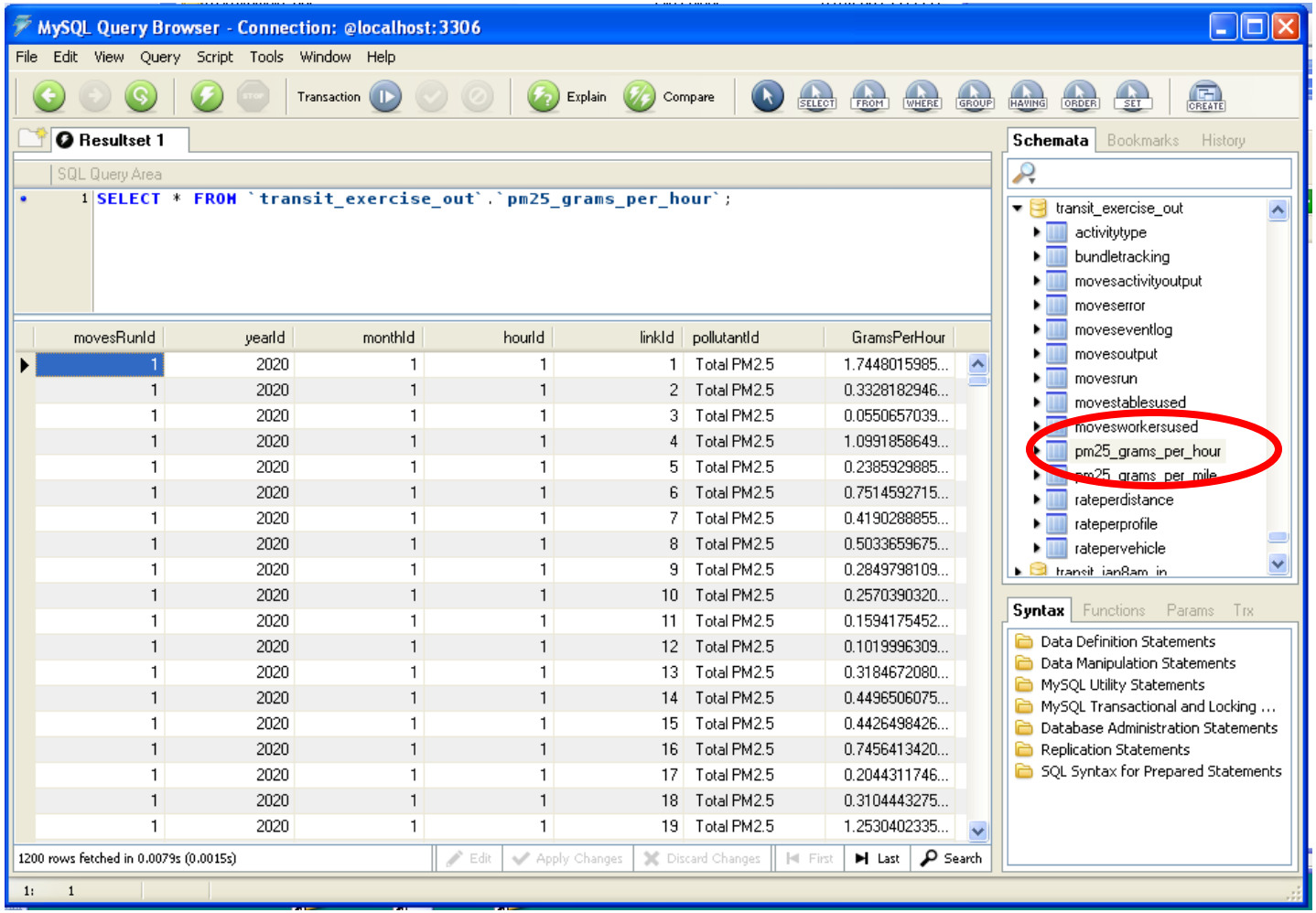
Run Script on Output

In MOVES, select from Post Processing Menu > Run MySQL Script on Output Databse



Gram per Hour Emission Rates

In MySQL output database “Transit_Exercise_Out” new table was created called pm25_grams_per_hour that includes a single emission rate for each link and MOVES run



For More Information

- See EPA's conformity website for:
  - Regulations, policy guidance, FR notices, training
  - http://www.epa.gov/otaq/stateresources/transconf/policy.htm#project
- See EPA's MOVES website for:
  - Software, MOVES MySQL scripts, technical documentation, and other helpful background materials
  - www.epa.gov/otaq/models/moves/
- Questions?
  - General questions on PM hot-spot guidance
    - patulski.meg@epa.gov
  - General questions on CO project-level MOVES guidance
    - bizot.david@epa.gov
  - Technical questions about both guidance documents:
    - conformity-hotspot@epa.gov