ANNUAL REGIONAL CONGESTION REPORT (2016)

LARRY GRITHER
ZAKARI MUMUNI

1. Background

Congestion management is the application of strategies to improve transportation system performance and reliability by reducing the adverse impacts of congestion on the movement of people and goods.

A CMP is required in metropolitan areas with population exceeding 200,000, known as Transportation Management Areas (TMAs).

Federal requirements also state that in all TMAs, the CMP shall be developed and implemented as an integrated part of the metropolitan transportation planning process.

Our CMP specifies that we develop an annual report on regional congestion, mitigation efforts and evaluation results.

2. Primary Performance Measures

1. **Planning Time Index**

$$= \frac{95\% \text{ Travel Time}}{\text{Free} - \text{Flow Travel Time}}$$

2. **Travel Time Index**

$$= \frac{\text{Avg. Travel Time}}{\text{Free} - \text{Flow Travel Time}}$$

3. **Speed Index**

$$= \frac{\text{Avg. Speed}}{\text{Free} - \text{Flow Speed}}$$

* Free-flow travel times are equal to 85th-percentile of all speeds.

3. CMP Network

Figure 1: Arterials

Freeways

Figure 2: Freeways

Figure 3: Summary of Arterial Congestion

Figure 4: Summary of Freeway Congestion

4. Selecting Congested Locations (Speed Index*)

Table 1: Congestion Thresholds

Congestion Categories	Arterials	Freeways
Light	> 0.74	> 0.9
Moderate	0.53 to 0.74	0.8 to 0.9
Heavy	0.44 to 0.53	0.6 to 0.8
Severe	< 0.44	< 0.6

*Speed Index = Average Speed / Free-Flow Speed

Table 2: Congested Arterial Locations

No.	Route	Limits	Direction	State	Peak	Queue Length
1	US-67	I-270 to Old Halls Ferry Rd	NB	MO	PM	5.59
2	MO-340	I-170 to US-67/N Lindbergh Blvd	SB	MO	PM	4.32
3	MO-D	I-170 to Schuetz Rd	WB	MO	PM	4.28
4	MO-94	I-64/US-40/US-61 to Mid Rivers Mall Dr	NB	MO	AM	4.19
5	MO-94	I-64/US-40/US-61 to Mid Rivers Mall Dr	NB	MO	PM	4.19
6	MO-141	MO-30 to MO-21	SB	MO	PM	4.14
7	MO-141	Hawkins to Vance	NB	MO	AM	4.10
8	MO-141	Big Bend to I-44	SB	MO	PM	3.90
9	MO-K	I-70 to MO-364	SB	MO	PM	3.50
10	MO-94	I-70/Veterans Memorial Pky/Bogey Rd to MO-364	WB	MO	PM	3.39
11	MO-340	Chesterfield Pky North to Baxter Rd	SB	MO	PM	2.74
12	FOREST PARK AVE	I-64 to Kingshighway	WB	MO	AM	2.14
13	FOREST PARK AVE	I-64 to Kingshighway	WB	MO	PM	2.14
14	FOREST PARK AVE	Kingshighway to I-64	EB	MO	PM	2.05
15	FOREST PARK AVE	Kingshighway to I-64	EB	MO	AM	2.05
16	IL-111	Forest Blvd to I-55/I-70/US-40	NB	IL	AM	2.01
17	IL-111	Forest Blvd to I-55/I-70/US-40	NB	IL	PM	2.01
18	JEFFERSON	Broadway to I-44	NB	MO	PM	1.99
19	IL-143	IL-111 to IL-3	WB	IL	AM	1.78
20	IL-143	IL-111 to IL-3	WB	IL	PM	1.78
21	MO-141	MO-AB/Ladue Rd to I-64/US-40/US-61	SB	MO	PM	1.63
22	KINGSHIGHWAY	US-40 to Delmar	NB	MO	PM	1.62
23	MO-100	Vandeventer to Kingshighway	WB	MO	PM	1.57
24	KINGSHIGHWAY	I-64/US-40 to I-44	SB	MO	PM	1.47
25	MO-100	Big Bend to McCausland	EB	MO	PM	1.42
26	HANLEY	MO-100/Manchester Rd to I-64/US-40/Eager Rd	NB	MO	PM	1.30
27	HANLEY	Shaw Park Dr to I-64/US-40/Eager Rd	SB	MO	PM	1.30
28	JEFFERSON	I-64/US-40 to I-44	SB	MO	PM	1.05
29	HAMPTON AVE	I-64/US-40 to I-44	SB	MO	PM	1.02
30	MO-141	Marshall to I-44	SB	MO	AM	0.85
31	IL-157	Horseshoe Lake Rd to I-55/I-70/US-40	SB	IL	AM	0.78
32	IL-157	Horseshoe Lake Rd to I-55/I-70/US-40	SB	IL	PM	0.78
33	KINGSHIGHWAY	I-64/US-40 to Lindell	NB	MO	AM	0.75
34	KINGSHIGHWAY	Laclede to I-64/US-40	SB	MO	PM	0.75
35	SALISBURY ST	N. Florissant to I-70	EB	MO	PM	0.75
36	MO-D	I-270 to Schuetz Rd	EB	MO	AM	0.53
37	IL-157	I-55/I-70/US-40 to Horseshoe Lake Rd	NB	IL	AM	0.47
38	IL-157	I-55/I-70/US-40 to Horseshoe Lake Rd	NB	IL	PM	0.47
		TOTAL				80.80

Table 3: Congested Freeway Locations

No.	Route	Limits	Direction	State	Peak	Queue Length
1	I-270	I-70 to I-55/I-255/Exit 1	SB	MO	PM	21.00
2	I-70	Cave Springs/Exit 225 to Natural Bridge Rd/Exit 237/Exit 238	EB	MO	AM	14.16
3	I-64	Chesterfield Pky/Exit 20 to McCausland Ave/Exit 33	EB	MO	PM	14.00
4	I-70	Bryan Rd/Exit 216 to MO-W/Exit 203	WB	MO	PM	14.00
5	I-270	I-55/I-255/Exit 1 to I-64/US-40/US-61/Exit 12	NB	MO	AM	12.70
6	I-270	McDonnell Blvd/Exit 23 to MO-367/Exit 31	EB	MO	PM	12.00
7	I-64	I-170/Brentwood Blvd/Exit 31 to Chesterfield Pky/Exit 20	WB	MO	PM	12.00
8	I-44	Big Bend Rd/Exit 278 to Antire Rd/Exit 269	WB	MO	PM	11.00
9	I-70	I-270/Exit 232 to Jennings Sta Rd/Exit 242	EB	MO	PM	11.00
10	I-64	MO-K to I-70	WB	MO	PM	10.00
11	I-64	I-270/Exit 25 to McCausland to Ave/Exit 33	EB	MO	AM	9.57
12	I-170	Forest Park Pky/Exit 1E to Hanley Rd/Exit 9	NB	MO	PM	8.98
13	MO-364	Jungerman to I-270/MO-D	EB	MO	AM	8.61
14	MO-364	I-270/MO-D to MO-94/Muegge Rd/Exit 13/Exit 12	WB	MO	PM	8.61
15	I-70	Lake St Louis Blvd/Exit 214 to MO-79/Exit 220	EB	MO	AM	8.50
16	I-44	Berry Rd/Exit 279 to Kingshighway/Exit 287	EB	MO	AM	7.94
17	I-270	Lilac/Exit 33 to Elizabeth/Washington St/Exit 28	WB	MO	AM	7.15
18	I-170	MO-180/St Charles Rock/Exit 5 to I-64/Eager Rd/Exit 1B/Exit 1A	SB	MO	PM	6.69
19	I-70	I-170/Exit 238 to I-270/Exit 232	WB	MO	PM	6.45
20	I-55	Potomac to Park Ave/7Th St/Exit 208	NB	MO	AM	6.21
21	I-270	Dorsett Rd/Exit 17 to MO-AB/Ladue Rd/Exit 13	SB	MO	AM	6.18
22	I-64	Baxter to I-270/Exit 25	EB	MO	AM	6.15
23	I-55	Grand Ave/Exit 247 to I-44/I-55/Gravois/Exit 207	EB-SB	MO	PM	5.77
24	I-64	Kingshighway/Exit 36 to I-170/Brentwood Blvd/Exit 31	WB	MO	AM	5.52
25	I-55	Virginia Ave/Exit 203 to Reavis Barracks Rd/Exit 199	SB	MO	PM	5.31
26	I-44	I-55/Exit 290 to Arsenal St/Exit 284	WB	MO	PM	5.20
27	I-70	I-270/Exit 232 to Cave Springs/Exit 225	WB	MO	PM	5.00
28	I-44	MO-141/Exit 272 to I-270/Exit 276	EB	MO	AM	4.70
29	I-170	I-64 to MO-D	SB	MO	AM	4.49
30	I-55	Baugh Ave. to Poplar St Brg.	WB-SB	IL	AM	4.39
31	I-44	Bowles Ave/Exit 274 to US-50/US-61/US-67/ Exit 277	EB	MO	PM	4.31
32	I-64	Kingshighway/Exit 36 to I-55/I-70/US-40	EB	MO	PM	4.30
33	I-70	Broadway/Exit 246 to Lucas & Hunt Rd/Exit 241	WB	MO	AM	3.35
34	I-70/I-44/I-55	Stan Musial Brg. to Park	EB/WB/NB	MO	PM	3.11
35	I-55	I-44/I-55/Gravois/Exit 207 to Potomac St/Exit 206	SB	MO	PM	2.48
36	I-70	Shreve/Exit 245 to MO-N/Florissant Rd/Exit 240	WB	MO	PM	2.44
37	I-44	Tenth St/Exit 249 to I-55/I-64/US-40/Exit 251	WB	MO	AM	2.02
TOTAL						285.29

- **Congested Freeway Locations (Sample)**

Figure 5: I-64 Congestion Scan

5. Ranking Congested Locations

- Severity of Congestion = Avg. of PTI and TTI
- Total Impact = Congested Miles x TTI
- Variability = PTI/TTI

Table 4: Arterial Rankings

Severity

No.	Route	Limits	Direction	State	Peak	Queue Length	PTI	TTI	Severity	Total Impact	Variability
1	IL-157	I-55/I-70/US-40 to Horseshoe Lake Rd	NB	IL	PM	0.47	2.88	2.32	2.60	1.09	1.24
2	HAMPTON AVE	I-64/US-40 to I-44	SB	MO	PM	1.02	3.12	1.89	2.51	1.93	1.65
3	MO-D	I-270 to Schuetz Rd	EB	MO	AM	0.53	2.93	1.52	2.23	0.81	1.93
4	IL-157	I-55/I-70/US-40 to Horseshoe Lake Rd	NB	IL	AM	0.47	2.42	1.89	2.16	0.89	1.28
5	IL-157	Horseshoe Lake Rd to I-55/I-70/US-40	SB	IL	PM	0.78	2.21	1.76	1.99	1.37	1.26
6	MO-141	Hawkins to Vance	NB	MO	AM	4.10	2.56	1.39	1.98	5.70	1.84
7	HANLEY	Shaw Park Dr to I-64/US-40/Eager Rd	SB	MO	PM	1.30	2.46	1.42	1.94	1.85	1.73
8	FOREST PARK AVE	I-64 to Kingshighway	WB	MO	PM	2.14	2.11	1.66	1.89	3.55	1.27
9	MO-141	MO-AB/Ladue Rd to I-64/US-40/US-61	SB	MO	PM	1.63	2.27	1.49	1.88	2.43	1.52
10	JEFFERSON	I-64/US-40 to I-44	SB	MO	PM	1.05	2.30	1.40	1.85	1.47	1.64

Total Impact

No.	Route	Limits	Direction	State	Peak	Queue Length	PTI	TTI	Severity	Total Impact	Variability
1	US-67	I-270 to Old Halls Ferry Rd	NB	MO	PM	5.59	2.04	1.41	1.73	7.88	1.45
2	MO-141	Big Bend to I-44	SB	MO	PM	3.90	1.97	1.72	1.85	6.71	1.15
3	MO-94	I-64/US-40/US-61 to Mid Rivers Mall Dr	NB	MO	PM	4.19	1.96	1.55	1.76	6.49	1.26
4	MO-141	Hawkins to Vance	NB	MO	AM	4.10	2.56	1.39	1.98	5.70	1.84
5	MO-141	MO-30 to MO-21	SB	MO	PM	4.14	2.06	1.37	1.72	5.67	1.50
6	MO-94	I-64/US-40/US-61 to Mid Rivers Mall Dr	NB	MO	AM	4.19	1.52	1.33	1.43	5.57	1.14
7	MO-340	I-170 to US-67/N Lindbergh Blvd	SB	MO	PM	4.32	1.81	1.26	1.54	5.44	1.44
8	MO-D	I-170 to Schuetz Rd	WB	MO	PM	4.28	1.49	1.17	1.33	5.01	1.27
9	MO-K	I-70 to MO-364	SB	MO	PM	3.50	1.76	1.41	1.59	4.94	1.25
10	MO-94	I-70/Veterans Memorial Pky/Bogey Rd to MO-364	WB	MO	PM	3.39	1.84	1.33	1.59	4.51	1.38

Variability

No.	Route	Limits	Direction	State	Peak	Queue Length	PTI	TTI	Severity	Total Impact	Variability
1	MO-D	I-270 to Schuetz Rd	EB	MO	AM	0.53	2.93	1.52	2.23	0.81	1.93
2	MO-141	Hawkins to Vance	NB	MO	AM	4.10	2.56	1.39	1.98	5.70	1.84
3	HANLEY	Shaw Park Dr to I-64/US-40/Eager Rd	SB	MO	PM	1.30	2.46	1.42	1.94	1.85	1.73
4	HAMPTON AVE	I-64/US-40 to I-44	SB	MO	PM	1.02	3.12	1.89	2.51	1.93	1.65
5	JEFFERSON	I-64/US-40 to I-44	SB	MO	PM	1.05	2.30	1.40	1.85	1.47	1.64
6	MO-340	Chesterfield Pky North to Baxter Rd	SB	MO	PM	2.74	2.04	1.26	1.65	3.45	1.62
7	MO-141	MO-AB/Ladue Rd to I-64/US-40/US-61	SB	MO	PM	1.63	2.27	1.49	1.88	2.43	1.52
8	MO-141	MO-30 to MO-21	SB	MO	PM	4.14	2.06	1.37	1.72	5.67	1.50
9	KINGSHIGHWAY	US-40 to Delmar	NB	MO	PM	1.62	2.20	1.48	1.84	2.40	1.49
10	KINGSHIGHWAY	I-64/US-40 to I-44	SB	MO	PM	1.47	2.16	1.47	1.82	2.16	1.47

Table 5: Freeway Rankings

Severity

No.	Route	Limits	Direction	State	Peak	Queue Length	PTI	TTI	Severity	Total Impact	Variability
1	I-64	Kingshighway/Exit 36 to I-55/I-70/US-40	EB	MO	PM	4.30	3.99	1.92	2.96	8.26	2.08
2	I-55	Grand Ave/Exit 247 to I-44/I-55/Gravois/Exit 207	EB-SB	MO	PM	5.77	3.36	1.78	2.57	10.24	1.89
3	I-44	I-55/Exit 290 to Arsenal St/Exit 284	WB	MO	PM	5.20	3.19	1.44	2.32	7.49	2.22
4	I-64	Kingshighway/Exit 36 to I-170/Brentwood Blvd/Exit 31	WB	MO	AM	5.52	2.97	1.50	2.24	8.28	1.98
5	I-70	I-270/Exit 232 to Cave Springs/Exit 225	WB	MO	PM	5.00	2.86	1.52	2.19	7.60	1.88
6	I-270	I-55/I-255/Exit 1 to I-64/US-40/US-61/Exit 12	NB	MO	AM	12.70	2.79	1.50	2.15	19.05	1.86
7	I-270	I-70 to I-55/I-255/Exit 1	SB	MO	PM	21.00	2.79	1.48	2.14	31.08	1.89
8	I-270	McDonnell Blvd/Exit 23 to MO-367/Exit 31	EB	MO	PM	12.00	2.73	1.50	2.12	18.00	1.82
9	I-64	Chesterfield Pky/Exit 20 to McCausland Ave/Exit 33	EB	MO	PM	14.00	2.75	1.47	2.11	20.58	1.87
10	I-170	MO-180/St Charles Rock/Exit 5 to I-64/Eager Rd/Exit 1B/Exit 1A	SB	MO	PM	6.69	2.70	1.50	2.10	10.04	1.80

Total Impact

No.	Route	Limits	Direction	State	Peak	Queue Length	PTI	TTI	Severity	Total Impact	Variability
1	I-270	I-70 to I-55/I-255/Exit 1	SB	MO	PM	21.00	2.79	1.48	2.14	31.08	1.89
2	I-64	Chesterfield Pky/Exit 20 to McCausland Ave/Exit 33	EB	MO	PM	14.00	2.75	1.47	2.11	20.58	1.87
3	I-270	I-55/I-255/Exit 1 to I-64/US-40/US-61/Exit 12	NB	MO	AM	12.70	2.79	1.50	2.15	19.05	1.86
4	I-270	McDonnell Blvd/Exit 23 to MO-367/Exit 31	EB	MO	PM	12.00	2.73	1.50	2.12	18.00	1.82
5	I-70	Cave Springs/Exit 225 to Natural Bridge Rd/Exit 237/Exit 238	EB	MO	AM	14.16	2.11	1.20	1.66	16.99	1.76
6	I-70	Bryan Rd/Exit 216 to MO-W/Exit 203	WB	MO	PM	14.00	1.62	1.18	1.40	16.52	1.37
7	I-64	I-170/Brentwood Blvd/Exit 31 to Chesterfield Pky/Exit 20	WB	MO	PM	12.00	2.24	1.29	1.77	15.48	1.74
8	I-70	I-270/Exit 232 to Jennings Sta Rd/Exit 242	EB	MO	PM	11.00	2.23	1.21	1.72	13.31	1.84
9	I-44	Big Bend Rd/Exit 278 to Antire Rd/Exit 269	WB	MO	PM	11.00	1.55	1.17	1.36	12.87	1.32
10	I-64	MO-K to I-70	WB	MO	PM	10.00	2.51	1.27	1.89	12.70	1.98

Variability

No.	Route	Limits	Direction	State	Peak	Queue Length	PTI	TTI	Severity	Total Impact	Variability
1	I-44	I-55/Exit 290 to Arsenal St/Exit 284	WB	MO	PM	5.20	3.19	1.44	2.32	7.49	2.22
2	I-64	Kingshighway/Exit 36 to I-55/I-70/US-40	EB	MO	PM	4.30	3.99	1.92	2.96	8.26	2.08
3	I-70	Shreve/Exit 245 to MO-N/Florissant Rd/Exit 240	WB	MO	PM	2.44	2.26	1.12	1.69	2.73	2.02
4	I-64	Kingshighway/Exit 36 to I-170/Brentwood Blvd/Exit 31	WB	MO	AM	5.52	2.97	1.50	2.24	8.28	1.98
5	I-64	MO-K to I-70	WB	MO	PM	10.00	2.51	1.27	1.89	12.70	1.98
6	I-64	Baxter to I-270/Exit 25	EB	MO	AM	6.15	2.75	1.42	2.09	8.73	1.94
7	I-55	Grand Ave/Exit 247 to I-44/I-55/Gravois/Exit 207	EB-SB	MO	PM	5.77	3.36	1.78	2.57	10.24	1.89
8	I-64	I-270/Exit 25 to McCausland to Ave/Exit 33	EB	MO	AM	9.57	2.46	1.30	1.88	12.44	1.89
9	I-270	I-70 to I-55/I-255/Exit 1	SB	MO	PM	21.00	2.79	1.48	2.14	31.08	1.89
10	I-70	I-270/Exit 232 to Cave Springs/Exit 225	WB	MO	PM	5.00	2.86	1.52	2.19	7.60	1.88

- **Figure 6: Freeway Rankings Top Locations**

Congested Locations:

A. I-64, EB, Kingshighway/Exit 36 to I-55/I-70/US-40
B. I-64, WB, Kingshighway/Exit 36 to I-170/Brentwood Blvd/Exit 31
C. I-64, WB, I-170/Brentwood Blvd/Exit 31 to Chesterfield Pkwy/Exit 20
D. I-64, EB, Chesterfield Pkwy/Exit 20 to McCausland Ave./exit 33
E. I-64, WB, MO-k to I-70
F. I-270, NB, I-55/I-255/Exit 1 to I-64/US-40/US-61/Exit 12
G. I-270, SB, I-70 to I-55/I-255/Exit 1
H. I-270, EB, McDonnell Blvd/Exit 23 to MO-367/Exit 31

8. Congested Locations Trend Analysis

Figure 7: PTI and TTI Trends

Thank You!
Questions

larry.grither@ewgateway.org
zakari.mumuni@ewgateway.org