Revisions to IDOT Significant Route Maps

TO: Illinois Department of Transportation, Bureau of Safety Engineering

FROM: CH2M HILL

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Background

Safety Engineering Policy 3-07, Work Zone Safety and Mobility Rule, effective October 12, 2007 complies with updated Federal Highway Administration (FHWA) work zone regulations at 23 CFR 630 Subpart J, referred to as the Work Zone Safety and Mobility Rule (Rule). The intent of the rule is to address safety and mobility issues on a continual basis throughout project development, from project inception through construction. Safety Policy 3-07 details IDOTs plan to implement the requirements and intent of the rule.

In conjunction with the development of Safety Policy 3-07, statewide and district Significant Route Maps have been developed to illustrate the *state routes where lane closure on the roadway is expected to cause sustained work zone impacts that are not considered tolerable based on the goals and objectives of* [the] *policy or public opinion.* IDOT further clarifies significant routes as either short term (less than three days) or Long Term (work greater than 3 days) and establishes the guidelines for work zone impact analysis on Significant Routes for each of these conditions.

Review of Other State's Practices

A recently published FHWA Work Zone Mobility and Safety Fact Sheet (Fact Sheet 17, Lane Closure Policies and Management Systems) was used as a resource to identify an initial set of States for review of best practices associated with lane closure policies. In most cases, lane closure policies related to the implementation of the Rule are often communicated through maps or electronic tools, by identifying the times when lanes can be closed without causing unacceptable delays. Based on information in the FHWA Fact Sheet, Colorado, Indiana, Maryland, Ohio, and Wisconsin were identified for additional review. Based on information and references in the initial states' documentation, one additional state's policies and procedures, Massachusetts, was also reviewed for specific procedural elements directly pertaining to implementation of the Rule or identification of 'Significant Routes'.

Interpretation of Review

Based on the available literature, all of the states appear to follow the same general three step process when identifying significant routes, permitted lane closure scenarios, and determination of required supplemental analysis:

1. Initial screening.
2. Analysis
3. Exception Request (if applicable)

States generally have an initial screening process where projects are screened for the proposed roadway condition considering facility type, volume, normal lane condition, and proposed lane condition to determine if a proposed lane closure would create unreasonable delays. Factors such as

terrain or truck percentage are either explicitly incorporated in the screening process as independent variables, or implicitly applied via adjustment to volumes. The types of facilities for which screening criteria or processes were defined included freeway, multi-lane arterial, two-lane arterial, and intersections; some categorize these further by rural or urban. Volume conditions used in the screening were in ADT (general or location specific), Design Hour, or a more location specific peak hour. It is in this screening step that there seems to be the most difference between states in the level of effort expended on setting the criteria and/or processes for screening a project. Some states initially employ a simpler method that either utilizes a Highway Capacity Manual application or references research by the Texas Transportation Institute. Both result in tables by facility type that specify the maximum ADT or vehicles per hour per lane (vphpl) capacity under various closure conditions. Other states employ variations of more complex evaluation as part of their screening process in which on-line tools, tables, schedules or maps are developed for the state that prescribe permitted closure parameters in detail such as time of day or day of the week. Development of these criteria often requires detailed analysis of individual routes with route specific data.

All states incorporate a component of traffic and operations analysis at some point within the process that evaluates queuing and delay as a result of a project that cannot be constructed under the conditions defined in the screening process. Some states require this be performed for all projects, others for certain types (short vs. long). Some have a stepped approach in determining the level of analysis that is needed for a project, whereas some employ the same level of analysis for all projects. .

One point of consistency between states is the requirement for an exception be prepared if a project condition, including reasonable alternative temporary traffic control measures, cannot be constructed within the limits of the lane closure criteria. This request may include an accompanying TMP, or supporting analysis and be approved prior to commencement of the construction activities.

Recommendations

IDOT's Safety Policy 3-07 is very similar in approach and application to many of the elements in the various state policies and procedures that were reviewed in conjunction with this memo. Based on the review of best practices in the implementation of the Rule, it is recommended that the current IDOT policy and procedures be expanded to allow for a screening step that would utilize HCM methodology to establish the volume capacity per lane criteria under various closure conditions for certain typical freeway and multi-lane conditions throughout the state.

The route types not addressed by the criteria stated above include facilities with four lanes or more and access point density exceeding the established HCM adjustment factors and facilities of three lanes or less. Roadway segments that fall into these categories require site specific details to evaluate the feasibility of a closure and the HCM methodology would not apply. Detailed project specific analysis would be required for any length of closure on these routes to assess impacts of the closure within the context of the project area.

Methodology for Updating the Illinois Significant Route Maps

Functional Classification Determination

The first step was to determine the general groupings of state facilities by common characteristics and functional classifications or peer group assignments. In general the state routes fell into the following four primary categories:

1. Interstates/Freeways/Expressways (FC 10 and FC 20)
2. Multi lane Highways (FC 30 and higher) – 4 lanes or higher, 40 mph and higher
3. Two-lane Highways (FC 30 and higher) - 40 mph and higher
4. Two-lane and Multilane Highways (FC 30 and higher) – less than 40 mph

Lane Capacity Determination

The Highway Capacity Manual (HCM) was used to first define a base work zone lane capacity by characteristic and then further into function classification specific to IDOT roadways. The following paragraphs break down how the base work zone lane capacities were developed for each functional classification.

1. <u>Interstates/Freeways/Expressways</u>

   The HCM references research that suggest a capacity of 1,600 pc/h/ln be used for short term freeway work zones, regardless of lane closure configuration, while long term construction zone the capacities range from 1,550 pc/h/ln for work zones with crossover to 1,750 without. (HCM 2000, pg. 22-7)

   The distinguishing feature used in the HCM to differentiate between short-term and long-term construction was the nature of the traffic control devices used to demarcate the work area and not the actual length of construction activity. Short-term work zones were defined as those that generally utilize standard MUTCD channeling devices (drums, vertical panels. cones) while the long-term work zones were generally utilizing temporary concrete barriers. To be conservative, the long term work zone research results were used for the base capacity values. These values are considered to be applicable as screening criteria whether short-term or long-term by HCM definition.

   To estimate non-significant, approaching, and significant routes, the adjusted volumes less than 1,550 pc/h/ln would not be considered a significant route while adjusted volumes greater than 1,750 would be considered a significant route. For values between the two, segments were categorized as approaching significant route status.

   The HCM equation 22-2 (HCM2000, pg. 22-7) was applied to estimate the reduced capacity within the work zone due to the type, intensity, and location of work activity, heavy vehicles, lane width and the presence of ramps. Several reductions in capacity were applied for these conditions to allow for a conservative estimate of capacity by route type. To calculate the generalized adjustment applied for all freeway capacity reductions, the following assumptions were made:

   - The HSM suggests a capacity reduction of 10 percent for activities that are more intense than normal.
   - The HCM suggests that the presence of ramps may affect capacity depending on the volume carried by the ramp. Since the reduction is directly related to the volume of traffic on the ramp and the presence of ramps could not be reasonably generalized for all segments on the State system, it is recommended that this be evaluated on a case by case basis. No capacity adjustments for ramps were made.
   - The HSM suggest an additional adjustment factor can be applied for a reduction in lane width which is a common application used in work zones. In general a 9-14 percent reduction in capacity for widths less than existing lane widths could be created. A capacity

reduction of 10% was applied to account for potential lane width reductions within work zones.

- The HSM also suggest that weather and other environmental conditions, particularly rain and night time darkness can affect the capacity of a roadway. Capacity reduction for both rain and darkness ranged from 12-19 percent for both conditions. A capacity reduction of 15% was applied to account for the effects of potential environmental conditions within work zones.
- Truck percentages ranging from 3-25 percent were obtained from IDOT's "Illinois Travel Statistics 2009" summary report, Table TVT-1 per the different functional classifications and applied by functional classification for Illinois state facilities with the assumption of rolling terrain.

2. Multilane Highways – 4 lanes or more and 40 mph and higher

The HCM (Chapter 12) describes multi-lane highways as highways of four or six lanes, both directions, with posted speed limit ranging 40-55 mph. While the HCM specifically describes lane capacity for work zone conditions, it does not provide work zone capacity for multilane highways; however, the HCM does provide information on the upper limit for low volume multilane highways or the unaffected Free Flow Speed (FFS) of 1400 pc/h/ln (HCM2000, pg. 12-3). This value was used as the low end base work zone capacity and any value less than this would be expected to operate without disruption of the FFS. The upper end base work zone capacity of 1550 pc/h/ln for multilane highways was determined using information from Chapter 21-3 for a 45 mph FFS and LOS D. Any volume higher than the 1550 pc/h/ln would be considered a significant route. Volumes between the two would be considered as approaching significant route status.

Similar to Freeways, the base per lane capacity values were adjusted for work zone intensity, lane width reduction, environment, and truck percentages.

3. Two-lane Highways – 40 mph and higher

The closure of a single lane on a two-lane highway has the potential to significantly interrupt flow for higher volume roadways if no alternative route were available. Because of the added complexities involved in closing a lane on a two-lane highway, the HCM service flow rates for LOS C and LOS D were selected as the low and high base capacity rates. The lower end base work zone capacity of 1190 pc/h was selected and any value less than this would not be considered a significant route, while the upper end base work zone capacity of 1830 pc/h was selected and any value greater than this would be considered as a significant route (HCM 2000, pg. 12-16).

Similar to Freeways, the base per lane capacity values were adjusted for work zone intensity, lane width reduction, environment, and truck percentages.

4. Two-lane Highways and Multi-lane Highways – lower than 40 mph

Two-lane and multi-lane highways with speeds lower than 40 mph are typically indicative of roadways in suburban or urban areas, where speed has been lowered due to development and/or access point density. In these cases, the capacity of the roadway is governed by the speed of the vehicles using the facility rather than through evaluation of total volume and vehicle speed along urban and suburban routes is influenced more by the presence and

frequency of intersections. The HCM does not provide for directional capacities or present methods to adjust per lane capacity similar to that used for work zone intensity, lane width reduction, trucks percentages or for intersection spacing for lower speed routes. Based on these details, no adjusted per lane capacity values were generated for this group given that volume alone would not be the best determination of significant route status.

Average Daily Traffic Estimation

To determine a per lane capacity for the different roadway sections, queries were performed using the 2009 data within IDOT's data base per associated functional classifications. The averaged K and D factors for the various functional classifications of state roadways were obtained from IDOT, as shown in the table below, for converting the adjusted Design Hour Volumes (DHV) to Average Daily Traffic (ADT). These factors had to be evaluated differently between District 1 and Districts 2-9, because of the mostly urban characteristics in District 1 and the mix of urban and rural characteristics in the remaining Districts. This approach helped reduce the amount of time required to develop DHVs and ADTs for each district and allowed the District 2-9 routes to be queried as one group.

District	FHWA FC	IL FC	FC name	U / R	Avg "K"	Avg "D"
D1	11	10	Urban Interstate	U	7.20	57
D1	12	20	Freeway	U	8.54	62
D1	14	30	Urban Other Principal Arterial	U	8.89	59
D1	16	70	Urban Minor Arterial	U	8.53	59
D1	17	80	Collector	U	8.67	58
D2-9	11	10	Urban Interstate	U	9.40	55
D2-9	01	10	Interstate	R	8.82	53
D2-9	12	20	Freeway	U	9.53	55
D2-9	14	30	Urban Other Principal Arterial	U	9.80	55
D2-9	02	30	Other Principal Arterial	R	9.14	53
D2-9	06	40	Minor Arterial	R	10.18	55
D2-9	07	50	Major Collector	R	10.89	55
D2-9	16	70	Urban Minor Arterial	U	10.28	55
D2-9	17	80	Collector	U	10.78	56

Once the averaged per lane ADTs were developed for each functional classification, the work zone lane configuration was determined based on the number of through lanes in the existing segment minus one lane in each direction. For segments with an odd number of lanes (e.g. 3, 5, 7, 9 lanes) it was assumed that these conditions likely represented an even number of lanes in each direction with an additional auxiliary lane creating the odd number of lanes. The last step was to determine

the high and low capacity values for each lane configuration within each functional classification by multiplying the average per lane ADT by the number of work zone lanes in that segment. These high and low ADT ranges by functional classification were used to perform queries on the IDOT data base to determine the designation of each route. Routes with ADTs up to and including the low ADT values were coded as green within the maps, routes with ADTs equal or greater than the high ADT values were coded as red within the maps and routes with ADTs that fell between the low and high ADT values were coded as yellow within the maps.

As noted previously, no per lane capacity for multi-lane highways or total ADT for two-lane highways with speeds less than 40 mph were developed. Consequently, to determine the significant route status for these roadways, each segment was evaluated independently utilizing aerial photography. Knowledge of ADT and engineering judgment was applied to determine significant route status for these facilities.

Design Hour Volume (DHV)

for

Interstates, Freeways and Expressways

INTERSTATES, FREEWAYS, AND EXPRESSWAYS

District	Functional Class	Rural/Urban Present	Heavy Trucks	ET Rolling	FHV	Intensity Adjust	Lane Width Adjust	Env Adjust	DHV Low		DHV High	
									1550	Rounded	1750	Rounded
1	10- Interstate (PAS)	U	13	2.5	0.84	0.1	0.1	0.15	843	840	952	950
1	20- Freeway/Expressway (Urban Only PAS)	U	7	2.5	0.90	0.1	0.1	0.15	912	910	1029	1030
2-9	10- Interstate (PAS)	U	13	2.5	0.84	0.1	0.1	0.15	843	840	952	950
2-9	10- Interstate (PAS)	R	29	2.5	0.70	0.1	0.1	0.15	702	700	793	790
2-9	20- Freeway/Expressway (Urban Only PAS)	U	7	2.5	0.90	0.1	0.1	0.15	912	910	1029	1030

Design Hour Volume (DHV)

for

Multi-lane Highways

MULTI-LANE HIGHWAYS, 4 OR MORE LANES, SPEED OF 40 MPH OR MORE

District	Functional Class	Rural/Urban Present	Heavy Trucks	ET Rolling	FHV	Intensity Adjust	Lane Width Adjust	Env. Adjust	DHV LOW		DHV HIGH	
									1400	Rounded	1550	Rounded
1	30- Other Principal Arterial (PAS)	U	7	2.5	0.90	0.1	0.1	0.15	824	820	912	910
1	40- Minor Arterial (Non-Urban)	N/A										
1	50- Major Collector (Non-Urban)	N/A										
1	55- Minor Collector (Non-Urban)	N/A										
1	60- Local Road/Street (Non-Urban)	N/A										
1	70- Minor Arterial (Urban)	U	7	2.5	0.90	0.1	0.1	0.15	824	820	912	910
1	80- Collector (Urban)	U	6	2.5	0.92	0.1	0.1	0.15	835	830	924	920
1	90- Local Road/Street (Urban)	N/A										
2-9	30- Other Principal Arterial (PAS)	R	12	2.5	0.85	0.1	0.1	0.15	771	770	854	850
2-9	30- Urban Other Principal Arterial	U	7	2.5	0.90	0.1	0.1	0.15	824	820	912	910
2-9	40- Minor Arterial (Non-Urban)	R	10	2.5	0.87	0.1	0.1	0.15	791	790	876	880
2-9	50- Major Collector (Non-Urban)	R	8	2.5	0.89	0.1	0.1	0.15	813	810	900	900
2-9	55- Minor Collector (Non-Urban)	N/A										
2-9	60- Local Road/Street (Non-Urban)	N/A										
2-9	70- Minor Arterial (Urban)	U	7	2.5	0.90	0.1	0.1	0.15	824	820	912	910
2-9	80- Collector (Urban)	U	6	2.5	0.92	0.1	0.1	0.15	835	830	924	920
2-9	90- Local Road/Street (Urban)	N/A										

Design Hour Volume (DHV)

for

Two-lane Highways

TWO-LANE HIGHWAYS, SPEED OF 40 MPH OR MORE

District	Functional Class	Rural/Urban Present	Heavy Trucks	ET Rolling	FHV	Intensity Adjust	Lane Width Adjust	Env. Adjust	DHV LOW		DHV HIGH	
									1190	Rounded	1830	Rounded
1	30- Other Principal Arterial (PAS)	U	7	2.5	0.90	0.1	0.1	0.15	700	700	1076	1080
1	40- Minor Arterial (Non-Urban)	N/A										
1	50- Major Collector (Non-Urban)	N/A										
1	55- Minor Collector (Non-Urban)	N/A										
1	60- Local Road/Street (Non-Urban)	N/A										
1	70- Minor Arterial (Urban)	U	7	2.5	0.90	0.1	0.1	0.15	700	700	1076	1080
1	80- Collector (Urban)	U	6	2.5	0.92	0.1	0.1	0.15	710	710	1091	1090
1	90- Local Road/Street (Urban)	N/A										
2-9	30- Other Principal Arterial (PAS)	R	12	2.5	0.85	0.1	0.1	0.15	656	660	1008	1010
2-9	30- Urban Other Principal Arterial	U	7	2.5	0.90	0.1	0.1	0.15	700	700	1076	1080
2-9	40- Minor Arterial (Non-Urban)	R	10	2.5	0.87	0.1	0.1	0.15	673	670	1034	1030
2-9	50- Major Collector (Non-Urban)	R	8	2.5	0.89	0.1	0.1	0.15	691	690	1062	1060
2-9	55- Minor Collector (Non-Urban)	N/A										
2-9	60- Local Road/Street (Non-Urban)	N/A										
2-9	70- Minor Arterial (Urban)	U	7	2.5	0.90	0.1	0.1	0.15	700	700	1076	1080
2-9	80- Collector (Urban)	U	6	2.5	0.92	0.1	0.1	0.15	710	710	1091	1090
2-9	90- Local Road/Street (Urban)	N/A										

Work Zone Capacity Calculations

All Districts

Interstate, Freeway, Expressway Multilane Roadways

District 1 - Urban Interstate, IL FC 10					District 1 - Urban Interstate, IL FC 10				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl	840				DHV vphpl	950			
K	7.20%				K	7.20%			
D	57.00%				D	57.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
1	0	0	N/A	0	1	0	0	N/A	0
2	1	1	N/A	11,670	2	1	1	N/A	13,190
3	2	2	N/A	23,330	3	2	2	N/A	26,390
4	3	3	N/A	35,000	4	3	3	N/A	39,580
4-5	1	1+1; 1+2	20,470	N/A	4-5	1	1+1; 1+2	23,150	N/A
6-7	2	2+2; 2+3	40,940	N/A	6-7	2	2+2; 2+3	46,300	N/A
8-9	3	3+3; 3+4	61,400	N/A	8-9	3	3+3; 3+4	69,440	N/A
10-11	4	4+4; 4+5	81,870	N/A	10-11	4	4+4; 4+5	92,590	N/A
12	5	5+5	102,340	N/A	12	5	5+5	115,740	N/A

Districts 2 thru 9 - Urban Interstate, IL FC 10					Districts 2-9 - Urban Interstate, IL FC 10				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl	840				DHV vphpl	950			
K	9.40%				K	9.40%			
D	55.00%				D	55.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
1	0	0	N/A	0	1	0	0	N/A	0
2	1	1	N/A	8,940	2	1	1	N/A	10,110
3	2	2	N/A	17,870	3	2	2	N/A	20,210
4	3	3	N/A	26,810	4	3	3	N/A	30,320
4-5	1	1+1; 1+2	16,250	N/A	4-5	1	1+1; 1+2	18,380	N/A
6-7	2	2+2; 2+3	32,500	N/A	6-7	2	2+2; 2+3	36,750	N/A
8-9	3	3+3; 3+4	48,740	N/A	8-9	3	3+3; 3+4	55,130	N/A
10-11	4	4+4; 4+5	64,990	N/A	10-11	4	4+4; 4+5	73,500	N/A
12	5	5+5	81,240	N/A	12	5	5+5	91,880	N/A

Work Zone Capacity Calculations

Districts 2-9

Interstate, Freeway, Expressway Multilane Roadways

District 1 - Rural Interstate, IL FC 10					District 1 - Rural Interstate, IL FC 10				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl	N/A				DHV vphpl	N/A			
K	N/A				K	N/A			
D	N/A				D	N/A			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
1	0	0	N/A	N/A	1	0	0	N/A	N/A
2	1	1	N/A	N/A	2	1	1	N/A	N/A
3	2	2	N/A	N/A	3	2	2	N/A	N/A
4	3	3	N/A	N/A	4	3	3	N/A	N/A
4-5	1	1+1; 1+2	N/A	N/A	4-5	1	1+1; 1+2	N/A	N/A
6-7	2	2+2; 2+3	N/A	N/A	6-7	2	2+2; 2+3	N/A	N/A
8-9	3	3+3; 3+4	N/A	N/A	8-9	3	3+3; 3+4	N/A	N/A
10-11	4	4+4; 4+5	N/A	N/A	10-11	4	4+4; 4+5	N/A	N/A
12	5	5+5	N/A	N/A	12	5	5+5	N/A	N/A

Districts 2 thru 9 - Rural Interstate, IL FC 10					Districts 2-9 - Rural Interstate, IL FC 10				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl	700				DHV vphpl	790			
K	8.82%				K	8.82%			
D	53.00%				D	53.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
1	0	0	N/A	0	1	0	0	N/A	0
2	1	1	N/A	7,940	2	1	1	N/A	8,960
3	2	2	N/A	15,870	3	2	2	N/A	17,910
4	3	3	N/A	23,810	4	3	3	N/A	26,870
4-5	1	1+1; 1+2	14,970	N/A	4-5	1	1+1; 1+2	16,900	N/A
6-7	2	2+2; 2+3	29,950	N/A	6-7	2	2+2; 2+3	33,800	N/A
8-9	3	3+3; 3+4	44,920	N/A	8-9	3	3+3; 3+4	50,700	N/A
10-11	4	4+4; 4+5	59,900	N/A	10-11	4	4+4; 4+5	67,600	N/A
12	5	5+5	74,870	N/A	12	5	5+5	84,500	N/A

Work Zone Capacity Calculations

All Districts

Interstate, Freeway, Expressway Multilane Roadways

District 1 - Freeway/Expressway (Urban Only PAS), IL FC 20					District 1 - Freeway/Expressway (Urban Only PAS), IL FC 20				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl	910				DHV vphpl	1030			
K	8.54%				K	8.54%			
D	62.00%				D	62.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
1	0	0	N/A	0	1	0	0	N/A	0
2	1	1	N/A	10,660	2	1	1	N/A	12,060
3	2	2	N/A	21,310	3	2	2	N/A	24,120
4	3	3	N/A	31,970	4	3	3	N/A	36,180
4-5	1	1+1; 1+2	17,190	N/A	4-5	1	1+1; 1+2	19,450	N/A
6-7	2	2+2; 2+3	34,370	N/A	6-7	2	2+2; 2+3	38,910	N/A
8-9	3	3+3; 3+4	51,560	N/A	8-9	3	3+3; 3+4	58,360	N/A
10-11	4	4+4; 4+5	68,750	N/A	10-11	4	4+4; 4+5	77,810	N/A
12	5	5+5	85,930	N/A	12	5	5+5	97,270	N/A

Districts 2 thru 9 - Freeway/Expressway (Urban Only PAS), IL FC 20					Districts 2 thru 9 - Freeway/Expressway (Urban Only PAS), IL FC 20				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl	910				DHV vphpl	1030			
K	9.53%				K	9.53%			
D	55.00%				D	55.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
1	0	0	N/A	0	1	0	0	N/A	0
2	1	1	N/A	9,550	2	1	1	N/A	10,810
3	2	2	N/A	19,100	3	2	2	N/A	21,620
4	3	3	N/A	28,650	4	3	3	N/A	32,420
4-5	1	1+1; 1+2	17,360	N/A	4-5	1	1+1; 1+2	19,650	N/A
6-7	2	2+2; 2+3	34,720	N/A	6-7	2	2+2; 2+3	39,300	N/A
8-9	3	3+3; 3+4	52,080	N/A	8-9	3	3+3; 3+4	58,950	N/A
10-11	4	4+4; 4+5	69,450	N/A	10-11	4	4+4; 4+5	78,600	N/A
12	5	5+5	86,810	N/A	12	5	5+5	98,250	N/A

Work Zone Capacity Calculations

All Districts

Interstate, Freeway, Expressway Multilane Roadways

4+ MORE LANES; WITH SPEED OF 40 MPH OR MORE

District 1 - Other Principal Arterial Urban, IL FC 30					District 1 - Other Principal Arterial Urban, IL FC 30				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl	820				DHV vphpl	910			
K	8.89%				K	8.89%			
D	59.00%				D	59.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
1	0	0	N/A	0	1	0	0	N/A	0
2	1	1	N/A	9,220	2	1	1	N/A	10,240
3	2	2	N/A	18,450	3	2	2	N/A	20,470
4	3	3	N/A	27,670	4	3	3	N/A	30,710
4-5	1	1+1; 1+2	15,630	N/A	4-5	1	1+1; 1+2	17,350	N/A
6-7	2	2+2; 2+3	31,270	N/A	6-7	2	2+2; 2+3	34,700	N/A
8-9	3	3+3; 3+4	46,900	N/A	8-9	3	3+3; 3+4	52,050	N/A
10-11	4	4+4; 4+5	62,530	N/A	10-11	4	4+4; 4+5	69,400	N/A
12	5	5+5	78,170	N/A	12	5	5+5	86,750	N/A

4+ MORE LANES; WITH SPEED OF 40 MPH OR MORE

Districts 2 thru 9 - Other Principal Arterial Urban, IL FC 30					Districts 2 thru 9 - Other Principal Arterial Urban, IL FC 30				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl	820				DHV vphpl	910			
K	9.80%				K	9.80%			
D	55.00%				D	55.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
1	0	0	N/A	0	1	0	0	N/A	0
2	1	1	N/A	8,370	2	1	1	N/A	9,290
3	2	2	N/A	16,730	3	2	2	N/A	18,570
4	3	3	N/A	25,100	4	3	3	N/A	27,860
4-5	1	1+1; 1+2	15,210	N/A	4-5	1	1+1; 1+2	16,880	N/A
6-7	2	2+2; 2+3	30,430	N/A	6-7	2	2+2; 2+3	33,770	N/A
8-9	3	3+3; 3+4	45,640	N/A	8-9	3	3+3; 3+4	50,650	N/A
10-11	4	4+4; 4+5	60,850	N/A	10-11	4	4+4; 4+5	67,530	N/A
12	5	5+5	76,070	N/A	12	5	5+5	84,420	N/A

Work Zone Capacity Calculations

Districts 2-9

Interstate, Freeway, Expressway Multilane Roadways

4+ MORE LANES; WITH SPEED OF 40 MPH OR MORE

District 1 - Principal Arterial Rural, IL FC 30					District 1 - Principal Arterial Rural, IL FC 30				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl	N/A				DHV vphpl	N/A			
K	N/A				K	N/A			
D	N/A				D	N/A			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
1	0	0	N/A	N/A	1	0	0	N/A	N/A
2	1	1	N/A	N/A	2	1	1	N/A	N/A
3	2	2	N/A	N/A	3	2	2	N/A	N/A
4	3	3	N/A	N/A	4	3	3	N/A	N/A
4-5	1	1+1; 1+2	N/A	N/A	4-5	1	1+1; 1+2	N/A	N/A
6-7	2	2+2; 2+3	N/A	N/A	6-7	2	2+2; 2+3	N/A	N/A
8-9	3	3+3; 3+4	N/A	N/A	8-9	3	3+3; 3+4	N/A	N/A
10-11	4	4+4; 4+5	N/A	N/A	10-11	4	4+4; 4+5	N/A	N/A
12	5	5+5	N/A	N/A	12	5	5+5	N/A	N/A

4+ MORE LANES; WITH SPEED OF 40 MPH OR MORE

Districts 2 thru 9 - Principal Arterial Rural, IL FC 30					Districts 2 thru 9 - Principal Arterial Rural, IL FC 30				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl	770				DHV vphpl	850			
K	9.14%				K	9.14%			
D	53.00%				D	53.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
1	0	0	N/A	0	1	0	0	N/A	0
2	1	1	N/A	8,420	2	1	1	N/A	9,300
3	2	2	N/A	16,850	3	2	2	N/A	18,600
4	3	3	N/A	25,270	4	3	3	N/A	27,900
4-5	1	1+1; 1+2	15,900	N/A	4-5	1	1+1; 1+2	17,550	N/A
6-7	2	2+2; 2+3	31,790	N/A	6-7	2	2+2; 2+3	35,090	N/A
8-9	3	3+3; 3+4	47,690	N/A	8-9	3	3+3; 3+4	52,640	N/A
10-11	4	4+4; 4+5	63,580	N/A	10-11	4	4+4; 4+5	70,190	N/A
12	5	5+5	79,480	N/A	12	5	5+5	87,730	N/A

Work Zone Capacity Calculations

Districts 2-9

Interstate, Freeway, Expressway Multilane Roadways

4+ MORE LANES; WITH SPEED OF 40 MPH OR MORE

District 1 - Minor Arterial (Non-Urban), IL FC 40					District 1 - Minor Arterial (Non-Urban), IL FC 40				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl	N/A				DHV vphpl	N/A			
K	N/A				K	N/A			
D	N/A				D	N/A			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
1	0	0	N/A	N/A	1	0	0	N/A	N/A
2	1	1	N/A	N/A	2	1	1	N/A	N/A
3	2	2	N/A	N/A	3	2	2	N/A	N/A
4	3	3	N/A	N/A	4	3	3	N/A	N/A
4-5	1	1+1; 1+2	N/A	N/A	4-5	1	1+1; 1+2	N/A	N/A
6-7	2	2+2; 2+3	N/A	N/A	6-7	2	2+2; 2+3	N/A	N/A
8-9	3	3+3; 3+4	N/A	N/A	8-9	3	3+3; 3+4	N/A	N/A
10-11	4	4+4; 4+5	N/A	N/A	10-11	4	4+4; 4+5	N/A	N/A
12	5	5+5	N/A	N/A	12	5	5+5	N/A	N/A

4+ MORE LANES; WITH SPEED OF 40 MPH OR MORE

Districts 2 thru 9 - Minor Arterial (Non-Urban), IL FC 40					Districts 2 thru 9 - Minor Arterial (Non-Urban), IL FC 40				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl	790				DHV vphpl	880			
K	10.18%				K	10.18%			
D	55.00%				D	55.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
1	0	0	N/A	0	1	0	0	N/A	0
2	1	1	N/A	7,760	2	1	1	N/A	8,640
3	2	2	N/A	15,520	3	2	2	N/A	17,290
4	3	3	N/A	23,280	4	3	3	N/A	25,930
4-5	1	1+1; 1+2	14,110	N/A	4-5	1	1+1; 1+2	15,720	N/A
6-7	2	2+2; 2+3	28,220	N/A	6-7	2	2+2; 2+3	31,430	N/A
8-9	3	3+3; 3+4	42,330	N/A	8-9	3	3+3; 3+4	47,150	N/A
10-11	4	4+4; 4+5	56,440	N/A	10-11	4	4+4; 4+5	62,870	N/A
12	5	5+5	70,550	N/A	12	5	5+5	78,590	N/A

9/9/2011

Work Zone Capacity Calculations

Districts 2-9

Interstate, Freeway, Expressway Multilane Roadways

4+ MORE LANES; WITH SPEED OF 40 MPH OR MORE

District 1 - Major Collector (Non-Urban), IL FC 50					District 1 - Major Collector (Non-Urban), IL FC 50				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl	N/A				DHV vphpl	N/A			
K	N/A				K	N/A			
D	N/A				D	N/A			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
1	0	0	N/A	N/A	1	0	0	N/A	N/A
2	1	1	N/A	N/A	2	1	1	N/A	N/A
3	2	2	N/A	N/A	3	2	2	N/A	N/A
4	3	3	N/A	N/A	4	3	3	N/A	N/A
4-5	1	1+1; 1+2	N/A	N/A	4-5	1	1+1; 1+2	N/A	N/A
6-7	2	2+2; 2+3	N/A	N/A	6-7	2	2+2; 2+3	N/A	N/A
8-9	3	3+3; 3+4	N/A	N/A	8-9	3	3+3; 3+4	N/A	N/A
10-11	4	4+4; 4+5	N/A	N/A	10-11	4	4+4; 4+5	N/A	N/A
12	5	5+5	N/A	N/A	12	5	5+5	N/A	N/A

4+ MORE LANES; WITH SPEED OF 40 MPH OR MORE

Districts 2 thru 9 - Major Collector (Non-Urban), IL FC 50					Districts 2 thru 9 - Major Collector (Non-Urban), IL FC 50				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl	810				DHV vphpl	900			
K	10.89%				K	10.89%			
D	55.00%				D	55.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
1	0	0	N/A	0	1	0	0	N/A	0
2	1	1	N/A	7,440	2	1	1	N/A	8,260
3	2	2	N/A	14,880	3	2	2	N/A	16,530
4	3	3	N/A	22,310	4	3	3	N/A	24,790
4-5	1	1+1; 1+2	13,520	N/A	4-5	1	1+1; 1+2	15,030	N/A
6-7	2	2+2; 2+3	27,050	N/A	6-7	2	2+2; 2+3	30,050	N/A
8-9	3	3+3; 3+4	40,570	N/A	8-9	3	3+3; 3+4	45,080	N/A
10-11	4	4+4; 4+5	54,090	N/A	10-11	4	4+4; 4+5	60,110	N/A
12	5	5+5	67,620	N/A	12	5	5+5	75,130	N/A

9/9/2011

Work Zone Capacity Calculations

All Districts

Interstate, Freeway, Expressway Multilane Roadways

4+ MORE LANES; WITH SPEED OF 40 MPH OR MORE

District 1 - Minor Arterial (Urban), IL FC 70					District 1 - Minor Arterial (Urban), IL FC 70				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl	820				DHV vphpl	910			
K	8.53%				K	8.53%			
D	59.00%				D	59.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
1	0	0	N/A	0	1	0	0	N/A	0
2	1	1	N/A	9,610	2	1	1	N/A	10,670
3	2	2	N/A	19,230	3	2	2	N/A	21,340
4	3	3	N/A	28,840	4	3	3	N/A	32,000
4-5	1	1+1; 1+2	16,290	N/A	4-5	1	1+1; 1+2	18,080	N/A
6-7	2	2+2; 2+3	32,590	N/A	6-7	2	2+2; 2+3	36,160	N/A
8-9	3	3+3; 3+4	48,880	N/A	8-9	3	3+3; 3+4	54,250	N/A
10-11	4	4+4; 4+5	65,170	N/A	10-11	4	4+4; 4+5	72,330	N/A
12	5	5+5	81,470	N/A	12	5	5+5	90,410	N/A

4+ MORE LANES; WITH SPEED OF 40 MPH OR MORE

Districts 2 thru 9 - Minor Arterial (Urban), IL FC 70					Districts 2 thru 9 - Minor Arterial (Urban), IL FC 70				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl	820				DHV vphpl	910			
K	10.28%				K	10.28%			
D	55.00%				D	55.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
1	0	0	N/A	0	1	0	0	N/A	0
2	1	1	N/A	7,980	2	1	1	N/A	8,850
3	2	2	N/A	15,950	3	2	2	N/A	17,700
4	3	3	N/A	23,930	4	3	3	N/A	26,560
4-5	1	1+1; 1+2	14,500	N/A	4-5	1	1+1; 1+2	16,090	N/A
6-7	2	2+2; 2+3	29,010	N/A	6-7	2	2+2; 2+3	32,190	N/A
8-9	3	3+3; 3+4	43,510	N/A	8-9	3	3+3; 3+4	48,280	N/A
10-11	4	4+4; 4+5	58,010	N/A	10-11	4	4+4; 4+5	64,380	N/A
12	5	5+5	72,520	N/A	12	5	5+5	80,470	N/A

9/9/2011

Work Zone Capacity Calculations

All Districts

Interstate, Freeway, Expressway Multilane Roadways

4+ MORE LANES; WITH SPEED OF 40 MPH OR MORE

District 1 - Collector (Urban), IL FC 80					District 1 - Collector (Urban), IL FC 80				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl	830				DHV vphpl	920			
K	8.67%				K	8.67%			
D	58.00%				D	58.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
1	0	0	N/A	0	1	0	0	N/A	0
2	1	1	N/A	9,570	2	1	1	N/A	10,610
3	2	2	N/A	19,150	3	2	2	N/A	21,220
4	3	3	N/A	28,720	4	3	3	N/A	31,830
4-5	1	1+1; 1+2	16,510	N/A	4-5	1	1+1; 1+2	18,300	N/A
6-7	2	2+2; 2+3	33,010	N/A	6-7	2	2+2; 2+3	36,590	N/A
8-9	3	3+3; 3+4	49,520	N/A	8-9	3	3+3; 3+4	54,890	N/A
10-11	4	4+4; 4+5	66,020	N/A	10-11	4	4+4; 4+5	73,180	N/A
12	5	5+5	82,530	N/A	12	5	5+5	91,480	N/A

4+ MORE LANES; WITH SPEED OF 40 MPH OR MORE

Districts 2 thru 9 - Collector (Urban), IL FC 80					Districts 2 thru 9 - Collector (Urban), IL FC 80				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl	830				DHV vphpl	920			
K	10.78%				K	10.78%			
D	56.00%				D	56.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
1	0	0	N/A	0	1	0	0	N/A	0
2	1	1	N/A	7,700	2	1	1	N/A	8,530
3	2	2	N/A	15,400	3	2	2	N/A	17,070
4	3	3	N/A	23,100	4	3	3	N/A	25,600
4-5	1	1+1; 1+2	13,750	N/A	4-5	1	1+1; 1+2	15,240	N/A
6-7	2	2+2; 2+3	27,500	N/A	6-7	2	2+2; 2+3	30,480	N/A
8-9	3	3+3; 3+4	41,250	N/A	8-9	3	3+3; 3+4	45,720	N/A
10-11	4	4+4; 4+5	55,000	N/A	10-11	4	4+4; 4+5	60,960	N/A
12	5	5+5	68,750	N/A	12	5	5+5	76,200	N/A

9/9/2011

Work Zone Capacity Calculations

All Districts

Principal Arterials - Urban

District 1 - Other Principal Arterial Urban, IL FC 30					District 1 - Other Principal Arterial Urban, IL FC 30				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl (both directions)	700				DHV vphpl (both directions)	1080			
K	8.89%				K	8.89%			
D	59.00%				D	59.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
2-3	2	1+1	15,750	N/A	2-3	2	1+1	24,300	N/A

Districts 2 thru 9 - Other Principal Arterial Urban, IL FC 30					Districts 2 thru 9 - Other Principal Arterial Urban, IL FC 30				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl (both directions)	700				DHV vphpl (both directions)	1080			
K	9.80%				K	9.80%			
D	55.00%				D	55.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
2-3	2	1+1	14,290	N/A	2-3	2	1+1	22,040	N/A

Work Zone Capacity Calculations

Districts 2-9

Principal Arterials - Rural

District 1 - Principal Arterial Rural, IL FC 30					District 1 - Principal Arterial Rural, IL FC 30				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl (both directions)	N/A				DHV vphpl (both directions)	N/A			
K	N/A				K	N/A			
D	N/A				D	N/A			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
2-3	2	1+1	N/A	N/A	2-3	2	1+1	N/A	N/A

Districts 2 thru 9 - Principal Arterial Rural, IL FC 30					Districts 2 thru 9 - Principal Arterial Rural, IL FC 30				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl (both directions)	660				DHV vphpl (both directions)	1010			
K	9.14%				K	9.14%			
D	53.00%				D	53.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
2-3	2	1+1	14,440	N/A	2-3	2	1+1	22,100	N/A

Work Zone Capacity Calculations

Districts 2-9

Minor Arterials - Rural

District 1 - Minor Arterial (Non-Urban), IL FC 40					District 1 - Minor Arterial (Non-Urban), IL FC 40				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl (both directions)	N/A				DHV vphpl (both directions)	N/A			
K	N/A				K	N/A			
D	N/A				D	N/A			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
2-3	2	1+1	N/A	N/A	2	2	1+1	N/A	N/A

Districts 2 thru 9 - Minor Arterial (Non-Urban), IL FC 40					Districts 2 thru 9 - Minor Arterial (Non-Urban), IL FC 40				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl (both directions)	670				DHV vphpl (both directions)	1030			
K	10.18%				K	10.18%			
D	55.00%				D	55.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
2-3	2	1+1	13,160	N/A	2-3	2	1+1	20,240	N/A

Work Zone Capacity Calculations

Districts 2-9

Minor Arterials - Rural

District 1 - Major Collector (Non-Urban), IL FC 50					District 1 - Major Collector (Non-Urban), IL FC 50				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl (both directions)	N/A				DHV vphpl (both directions)	N/A			
K	N/A				K	N/A			
D	N/A				D	N/A			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
2-3	2	1+1	N/A	N/A	2-3	2	1+1	N/A	N/A

Districts 2 thru 9 - Major Collector (Non-Urban), IL FC 50					Districts 2 thru 9 - Major Collector (Non-Urban), IL FC 50				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl (both directions)	690				DHV vphpl (both directions)	1060			
K	10.89%				K	10.89%			
D	55.00%				D	55.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
2-3	2	1+1	12,670	N/A	2-3	2	1+1	19,470	N/A

Work Zone Capacity Calculations

All Districts

Minor Arterials - Urban

District 1 - Minor Arterial (Urban), IL FC 70					District 1 - Minor Arterial (Urban), IL FC 70				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl (both directions)	700				DHV vphpl (both directions)	1080			
K	8.53%				K	8.53%			
D	59.00%				D	59.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
2-3	2	1+1	16,410	N/A	2-3	2	1+1	25,320	N/A

Districts 2 thru 9 - Minor Arterial (Urban), IL FC 70					Districts 2 thru 9 - Minor Arterial (Urban), IL FC 70				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl (both directions)	700				DHV vphpl (both directions)	1080			
K	10.28%				K	10.28%			
D	55.00%				D	55.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
2-3	2	1+1	13,620	N/A	2-3	2	1+1	21,010	N/A

Work Zone Capacity Calculations

All Districts

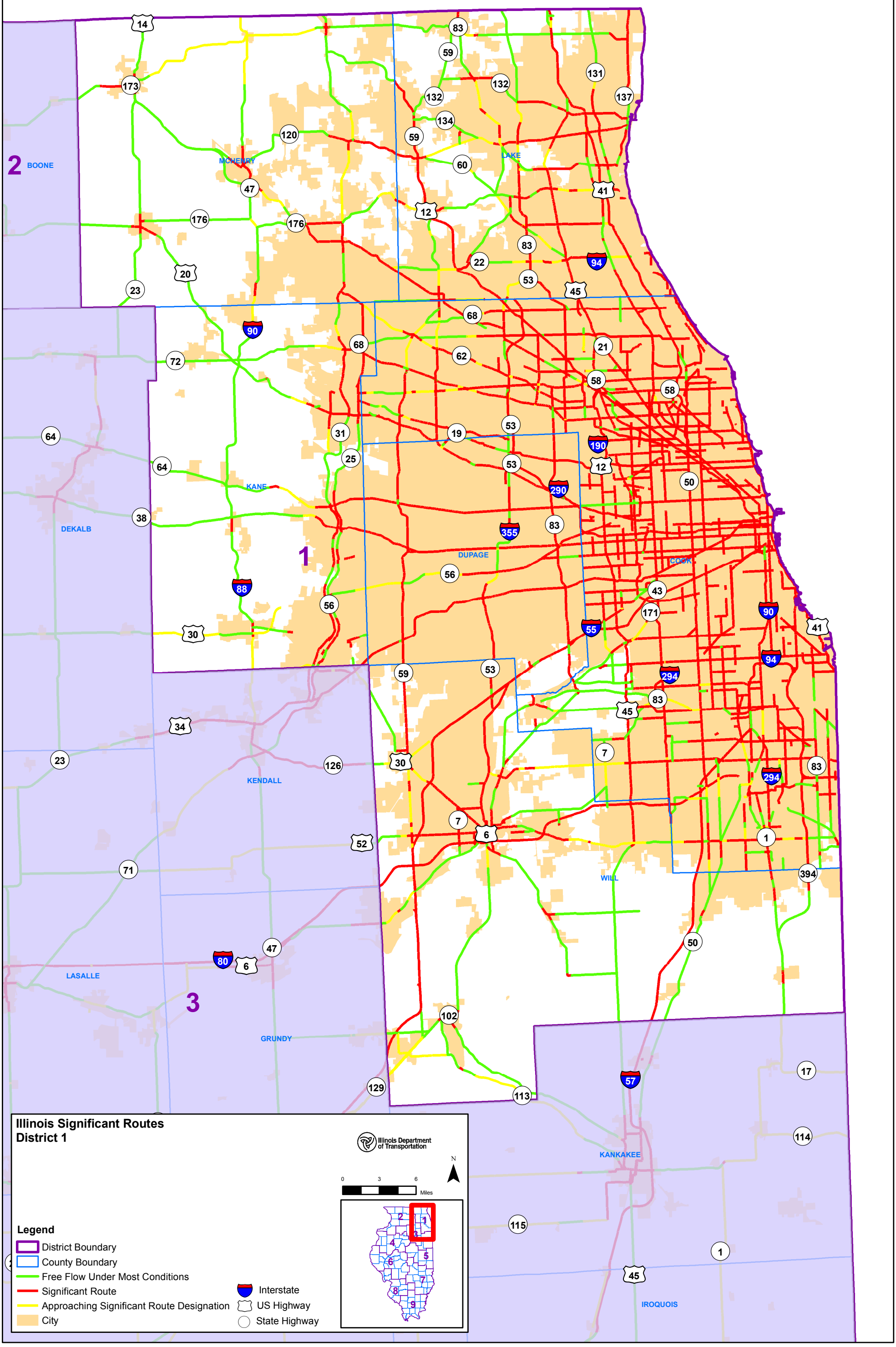
Collectors - Urban

District 1 - Collector (Urban), IL FC 80				
Low				
Terrain	Rolling			
DHV vphpl (both directions)	710			
K	8.67%			
D	58.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD	
2-3	2	1+1	16,380	N/A

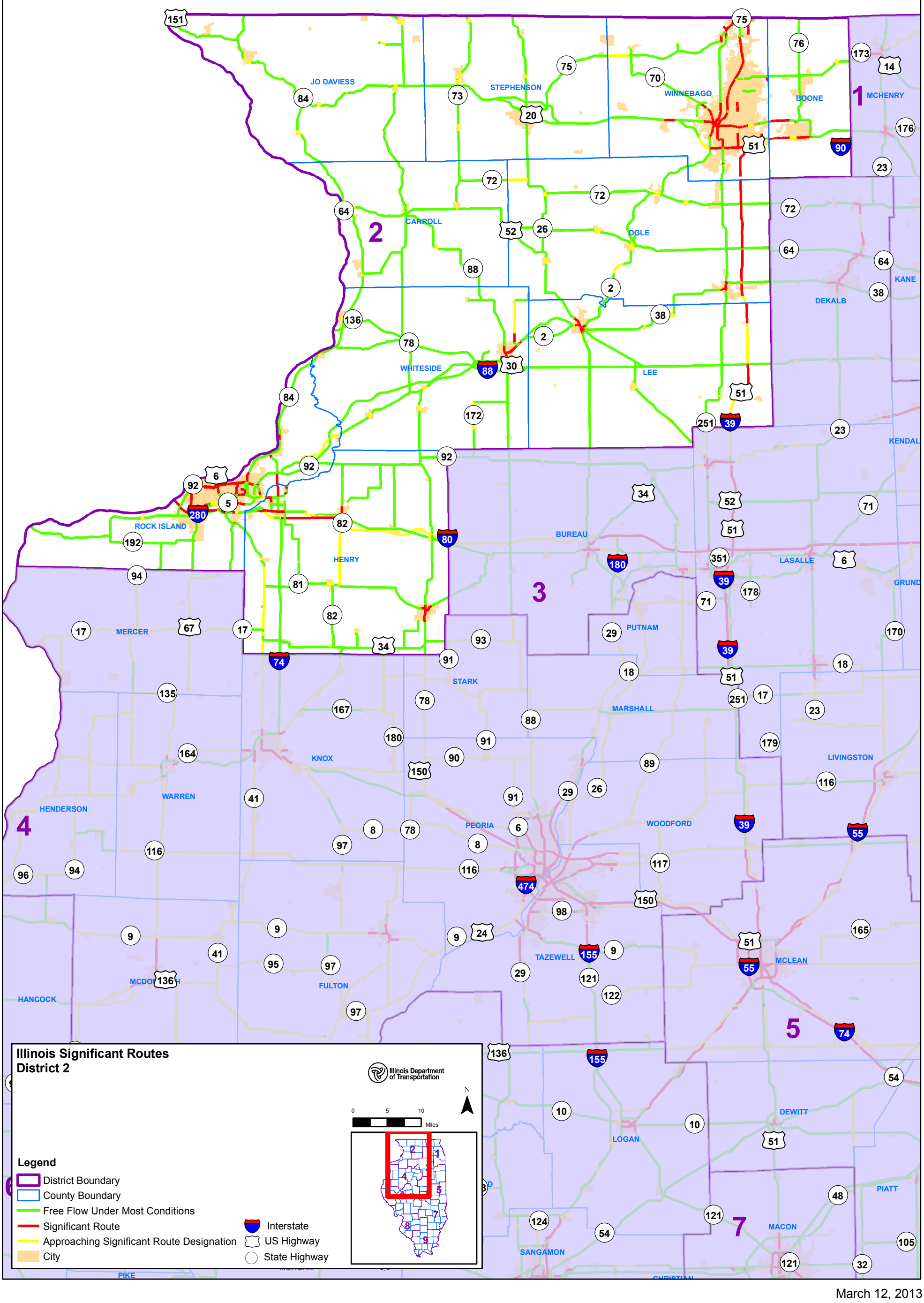
District 1 - Collector (Urban), IL FC 80				
High				
Terrain	Rolling			
DHV vphpl (both directions)	1090			
K	8.67%			
D	58.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD	
4-5	2	1+1	25,140	N/A

Districts 2 thru 9 - Collector (Urban), IL FC 80				
Low				
Terrain	Rolling			
DHV vphpl (both directions)	710			
K	10.78%			
D	56.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD	
2-3	2	1+1	13,170	N/A

Districts 2 thru 9 - Collector (Urban), IL FC 80				
High				
Terrain	Rolling			
DHV vphpl (both directions)	1090			
K	10.78%			
D	56.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD	
2-3	2	1+1	20,220	N/A



March 12, 2013



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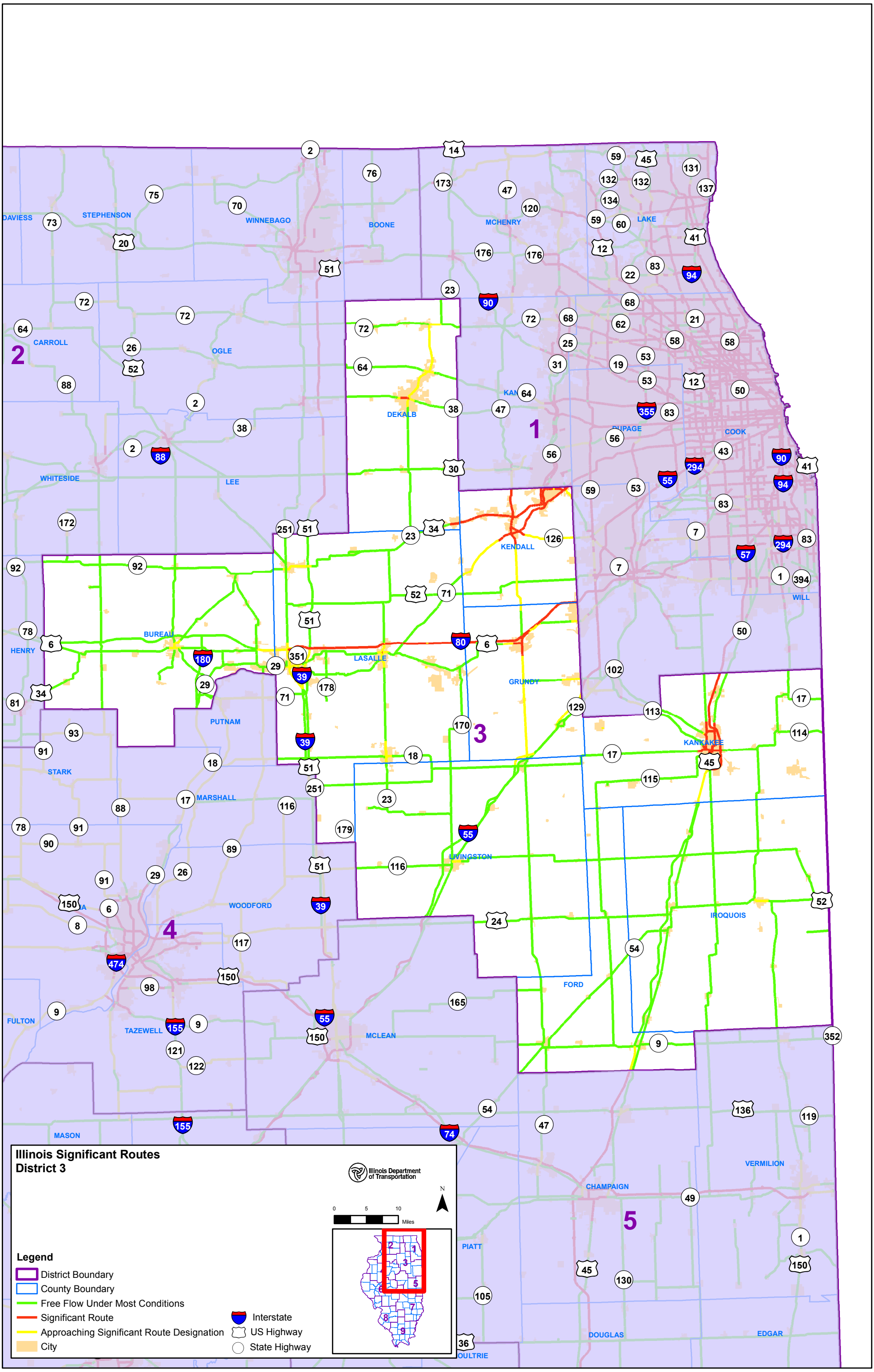

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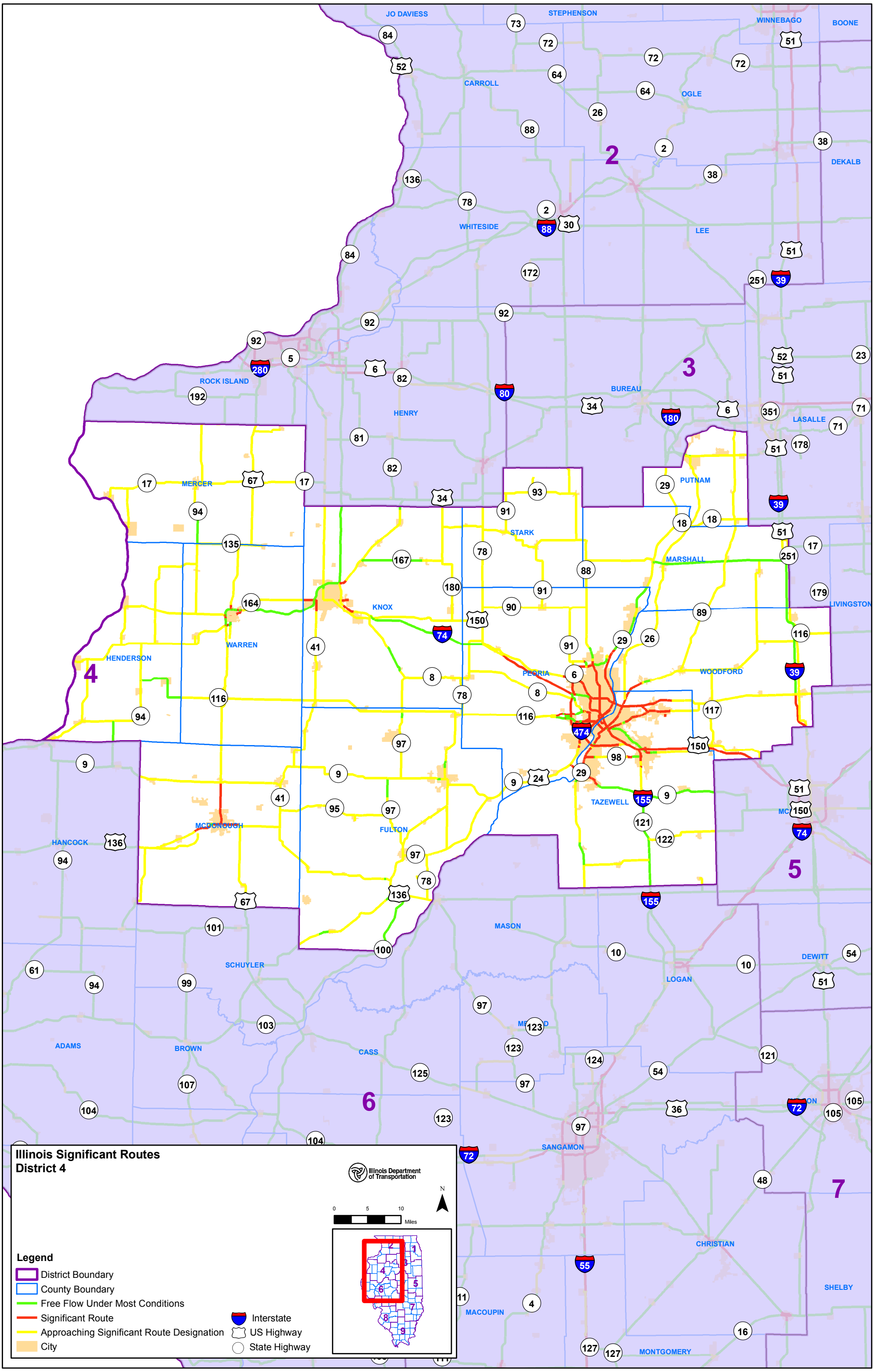

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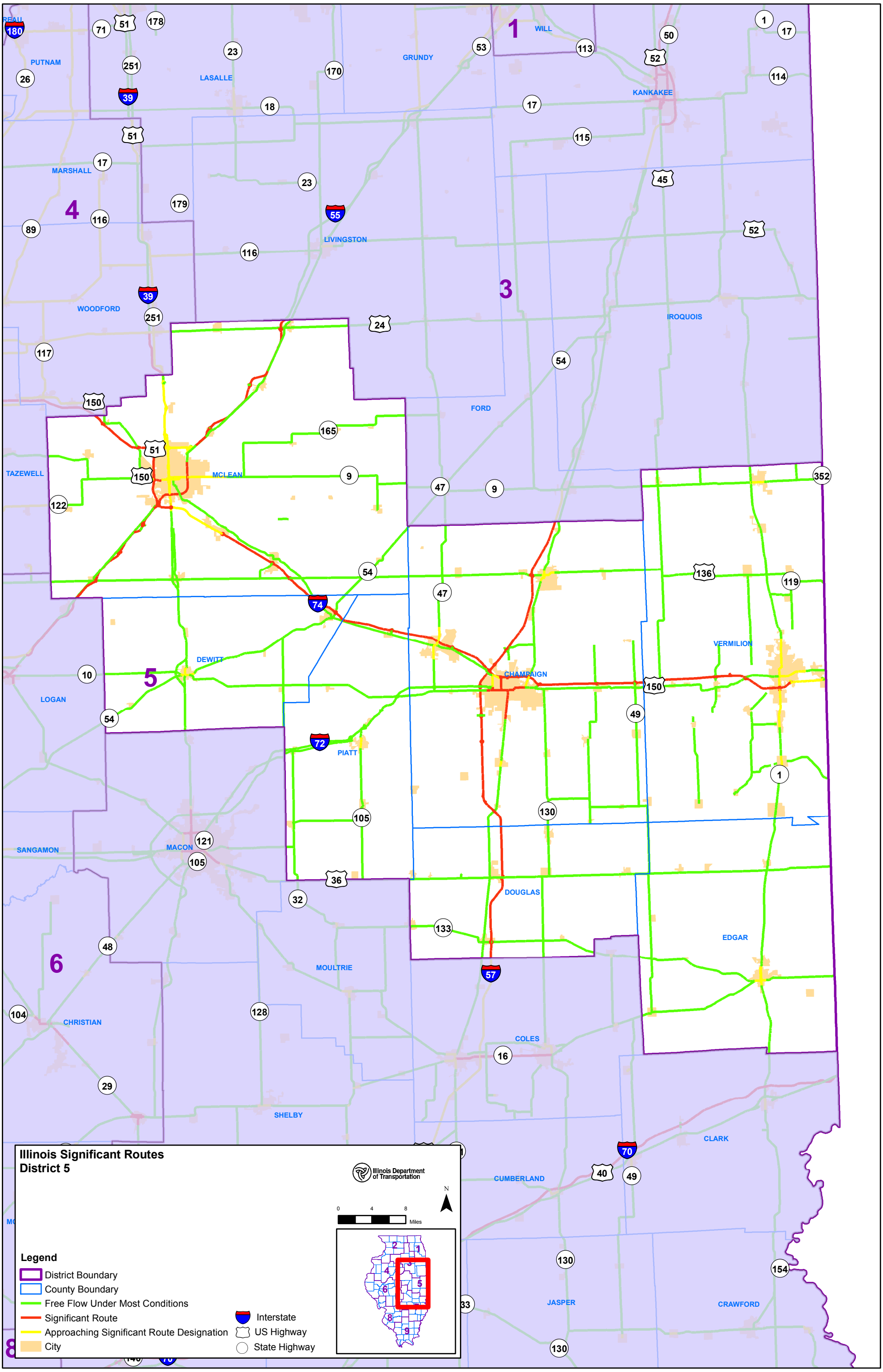

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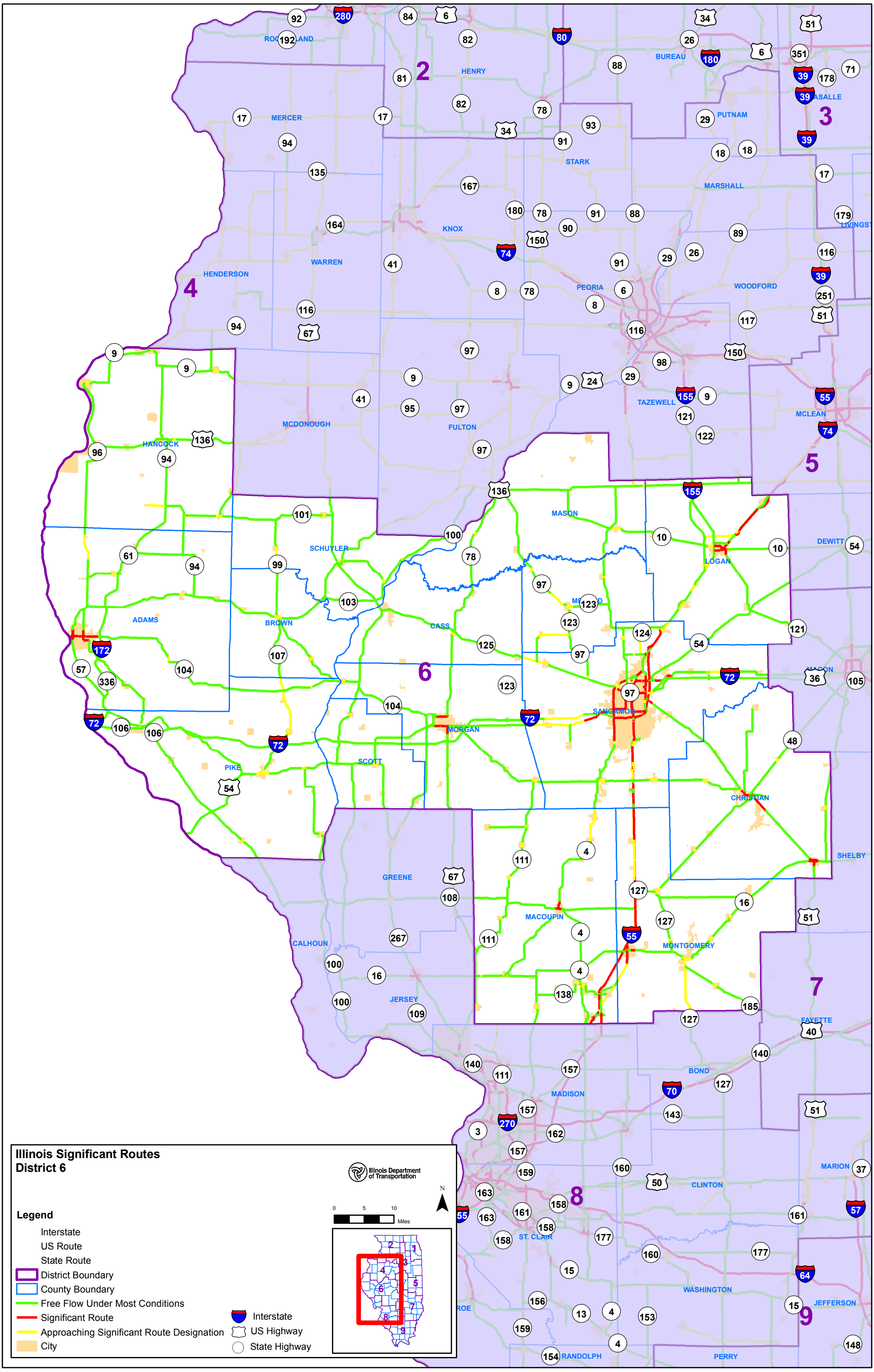

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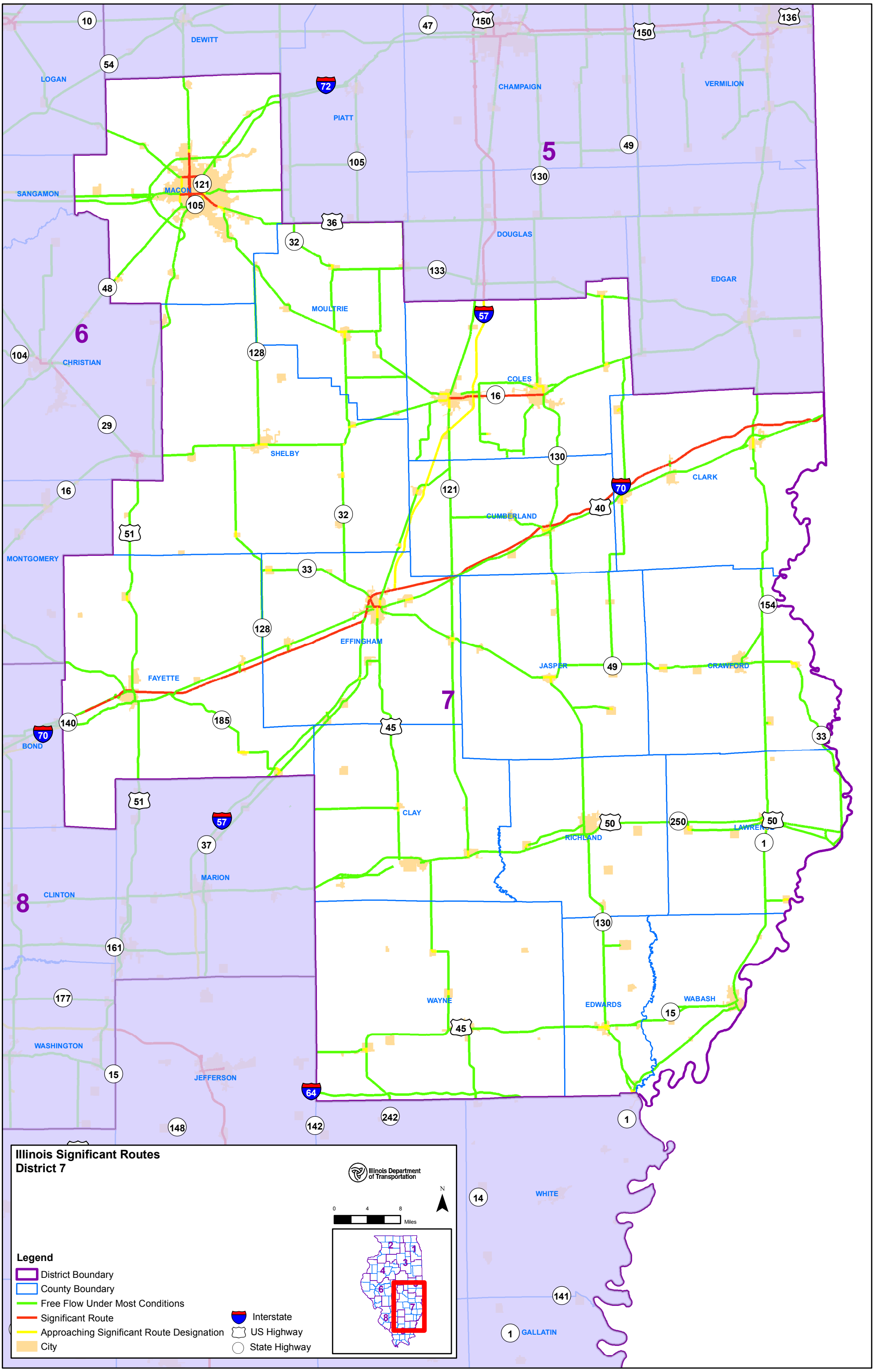

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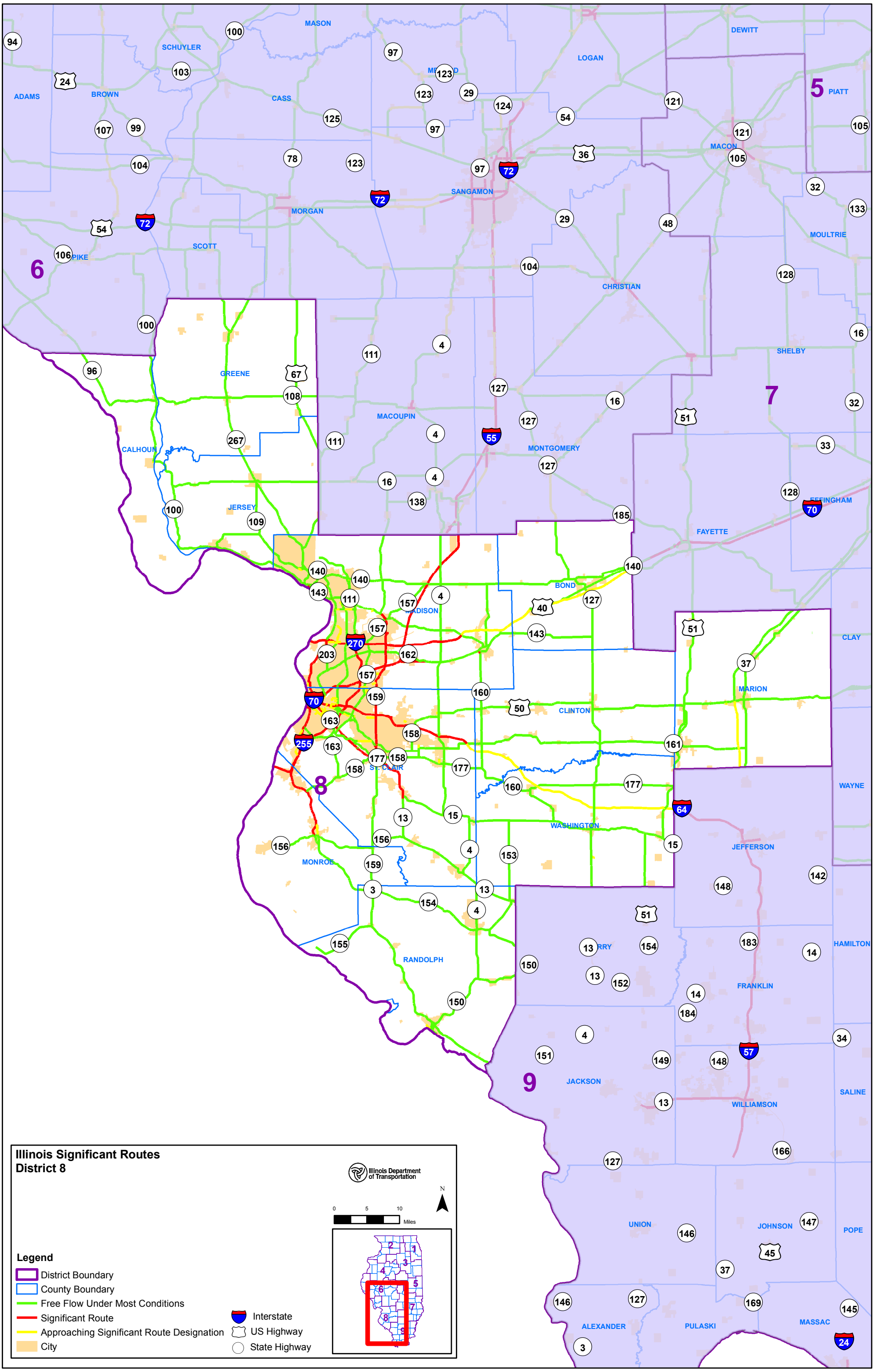

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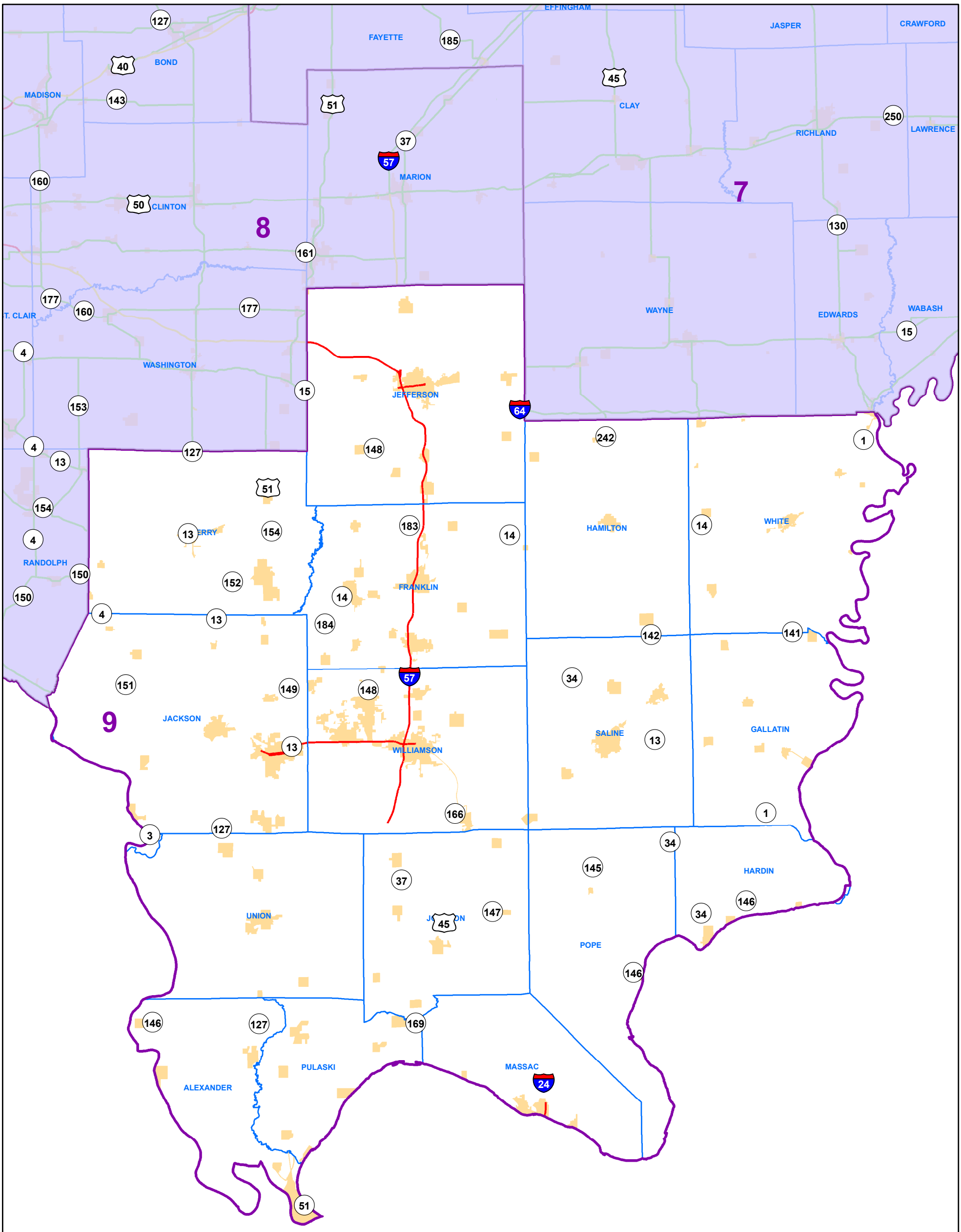


Illinois Significant Routes
District 9

Illinois Department of Transportation

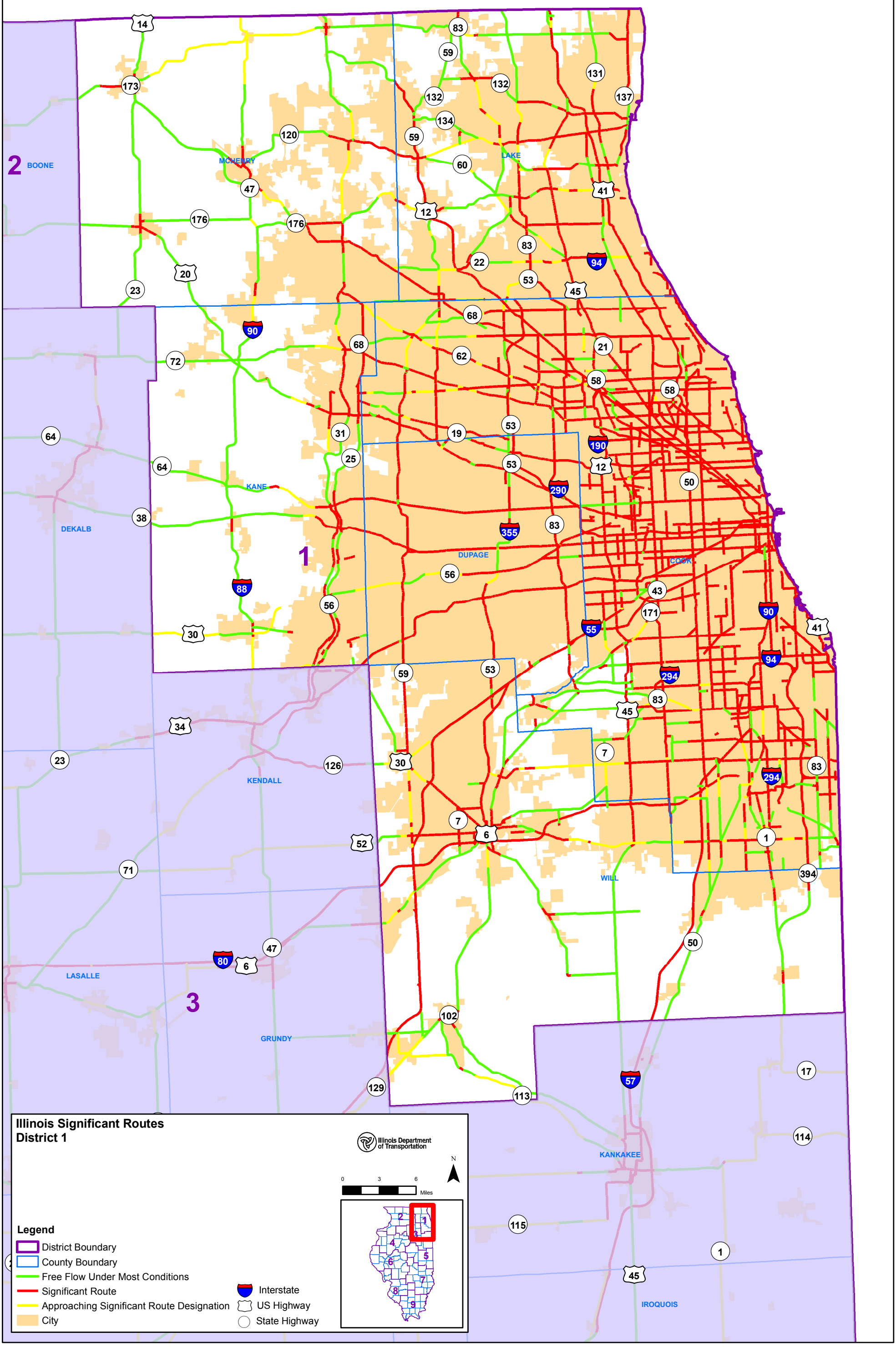
0 5 10 Miles

N

Legend

- District Boundary
- County Boundary
- Free Flow Under Most Conditions
- Significant Route
- Approaching Significant Route Designation
- City
- Interstate
- US Highway
- State Highway

March 12, 2013



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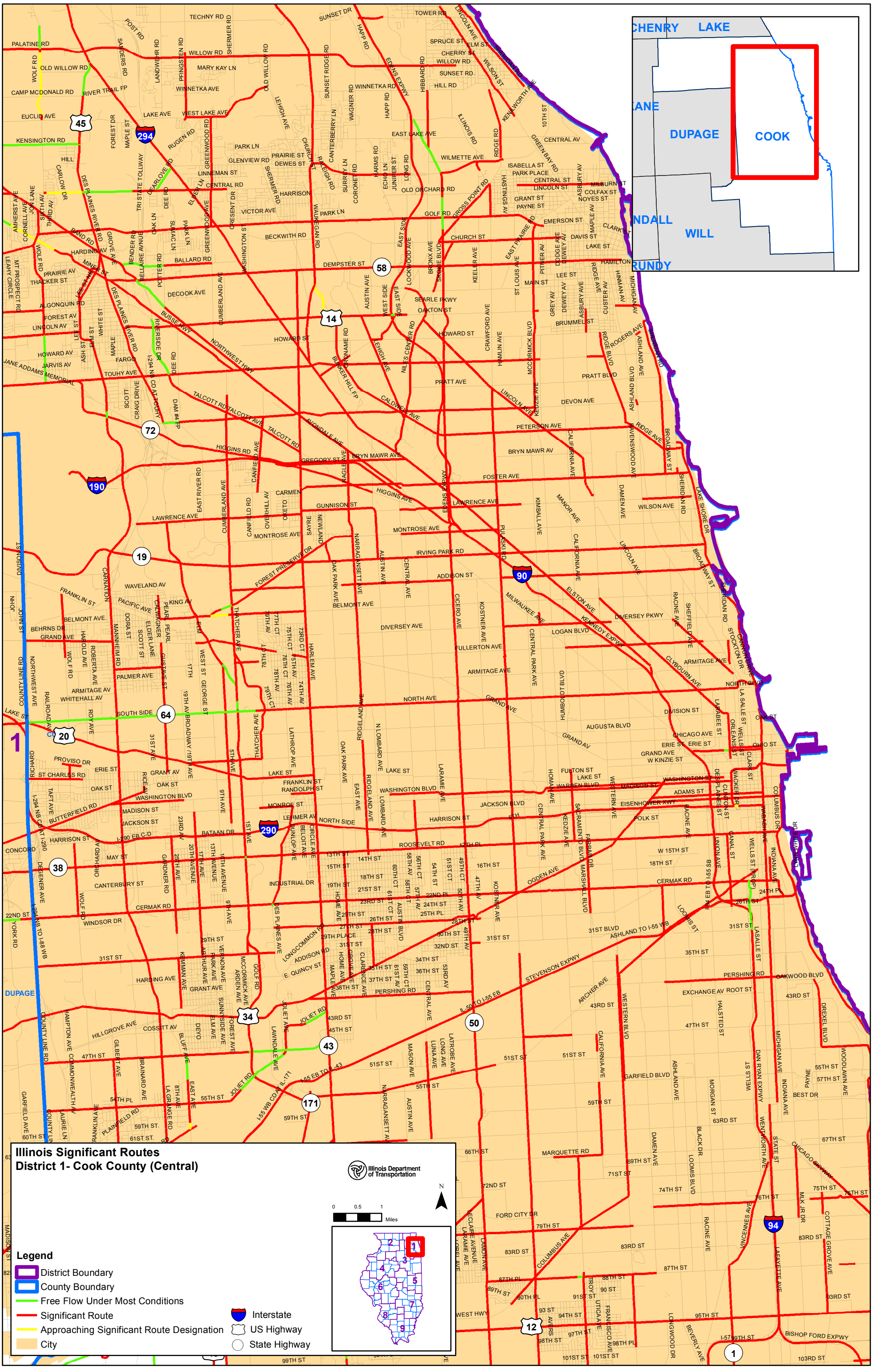

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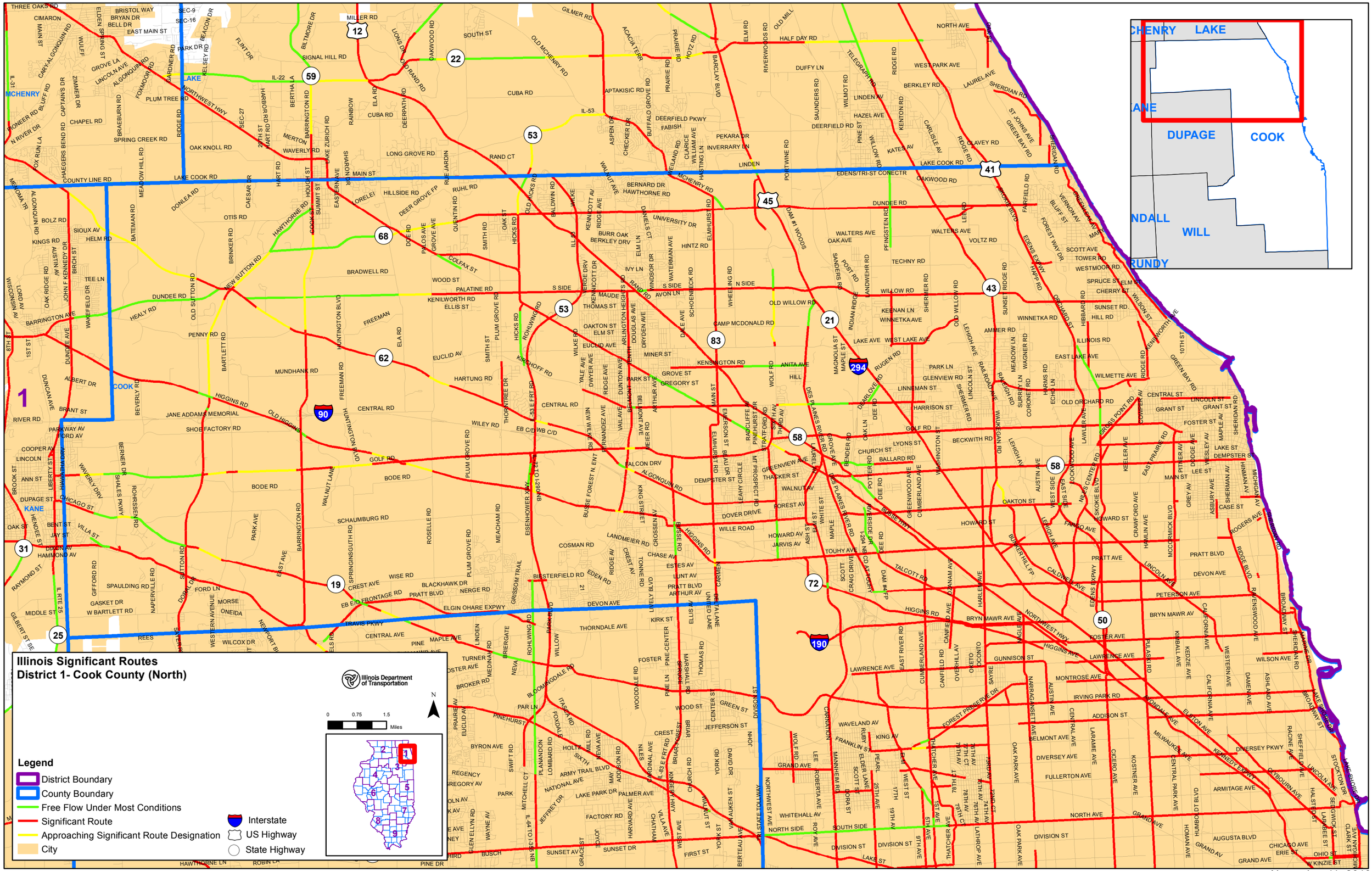

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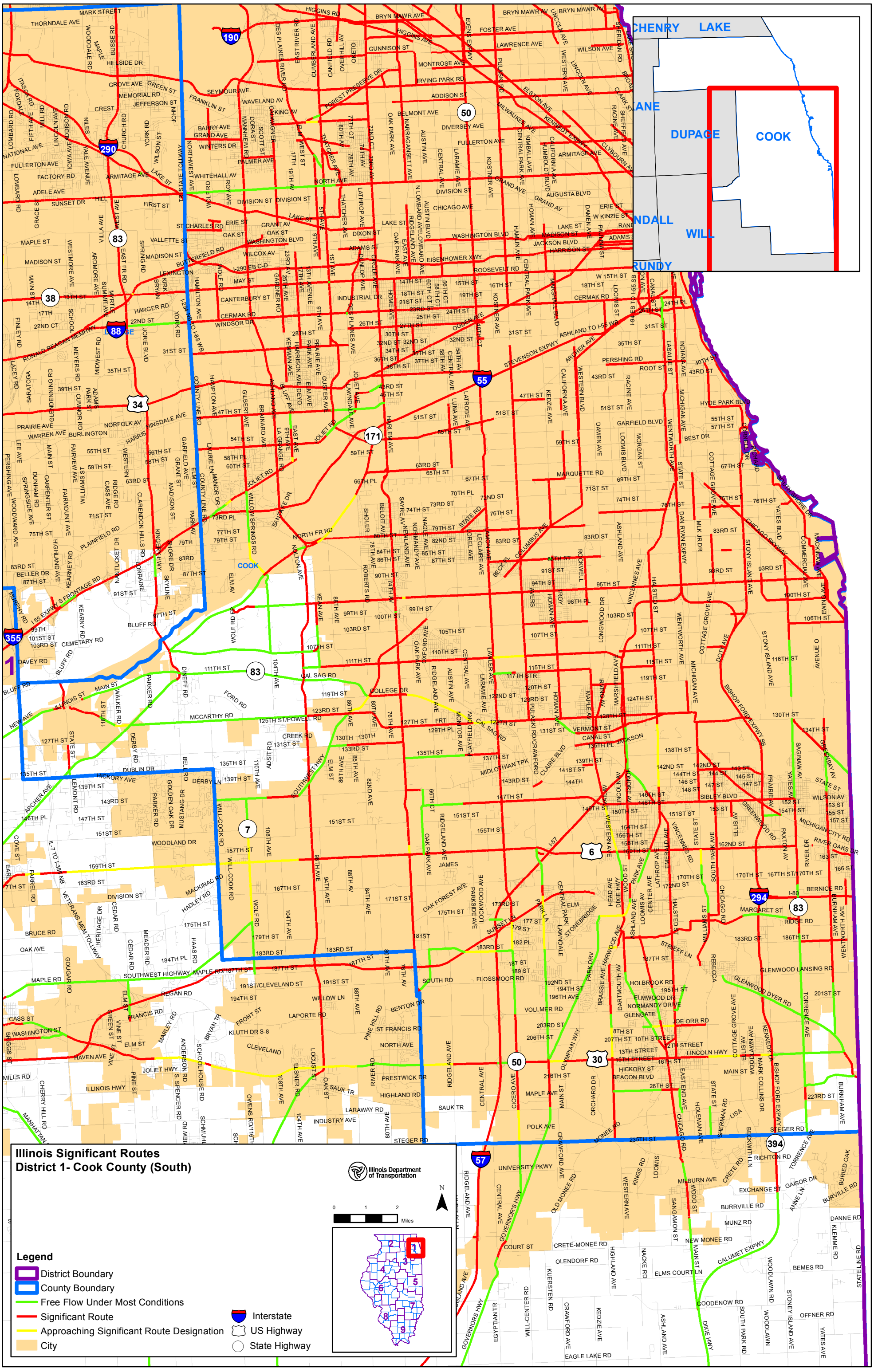

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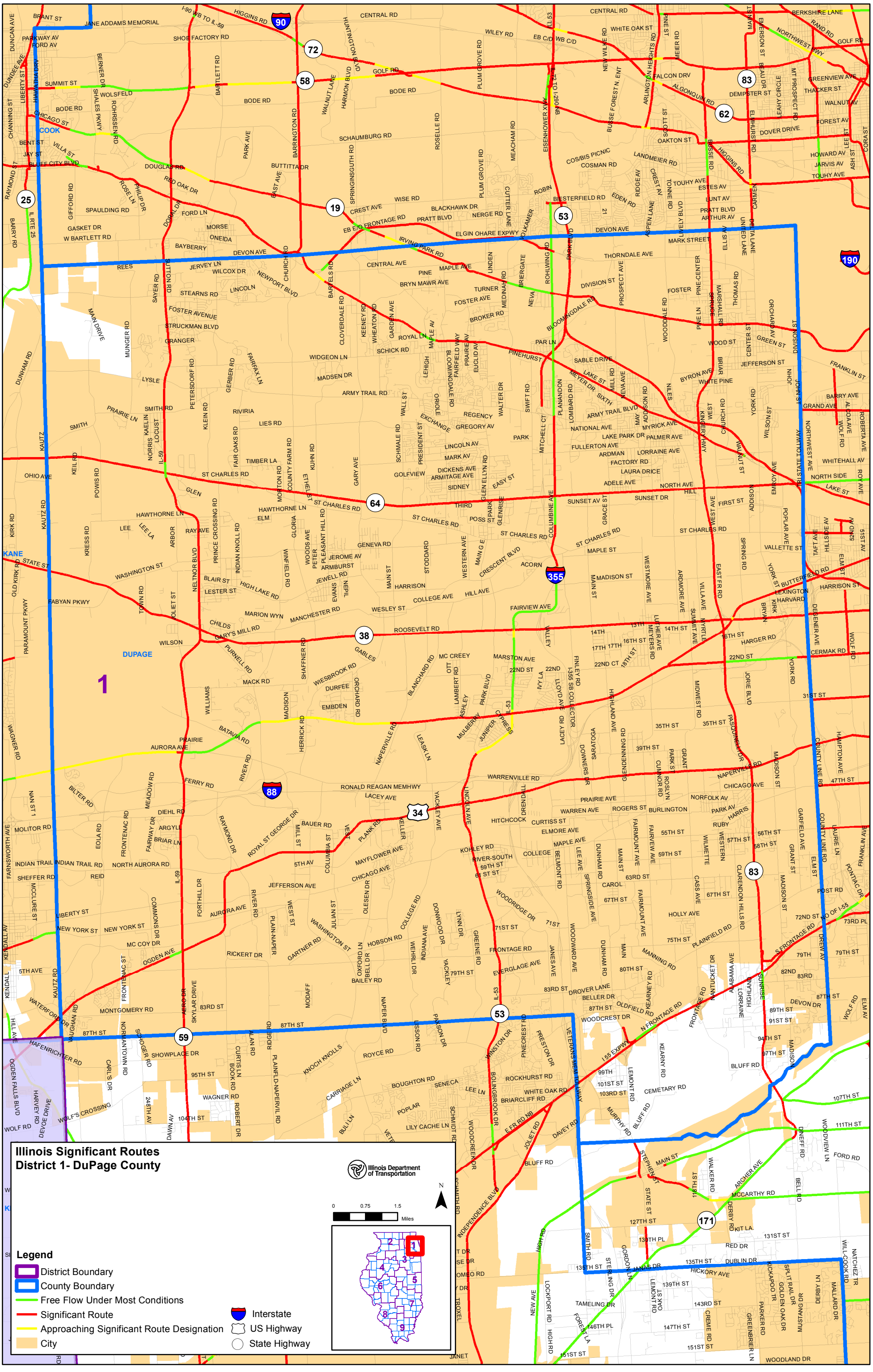

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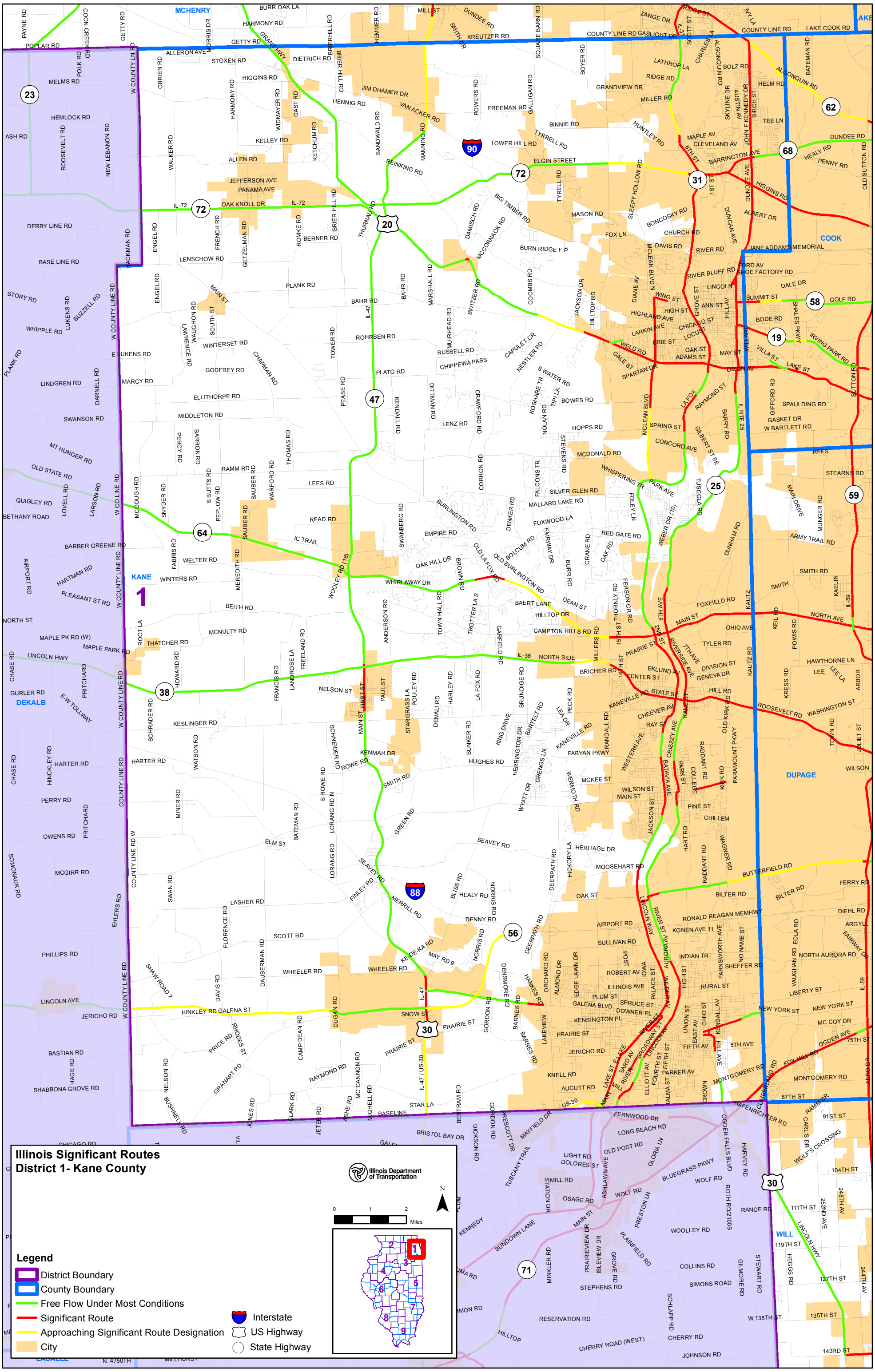

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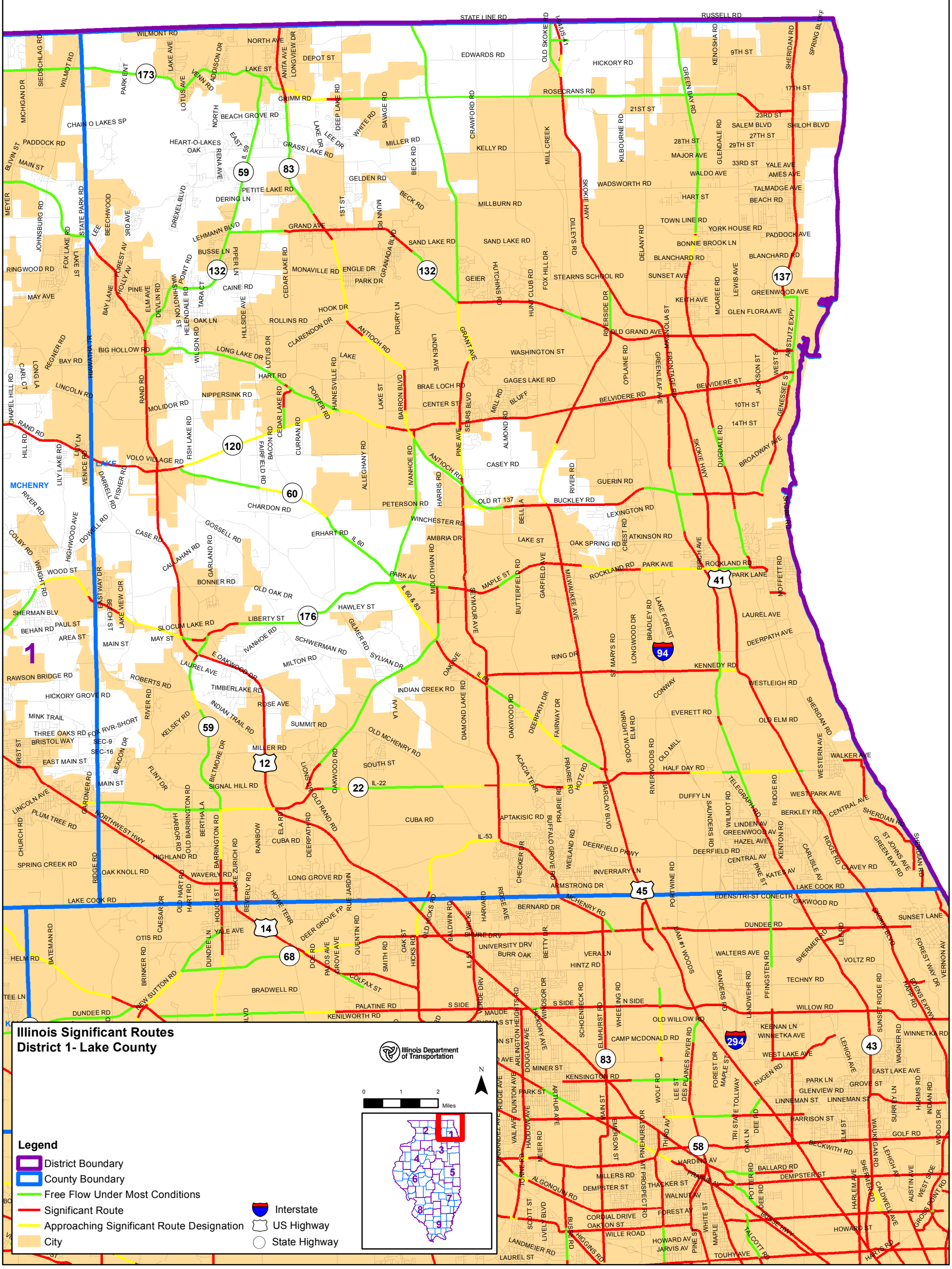

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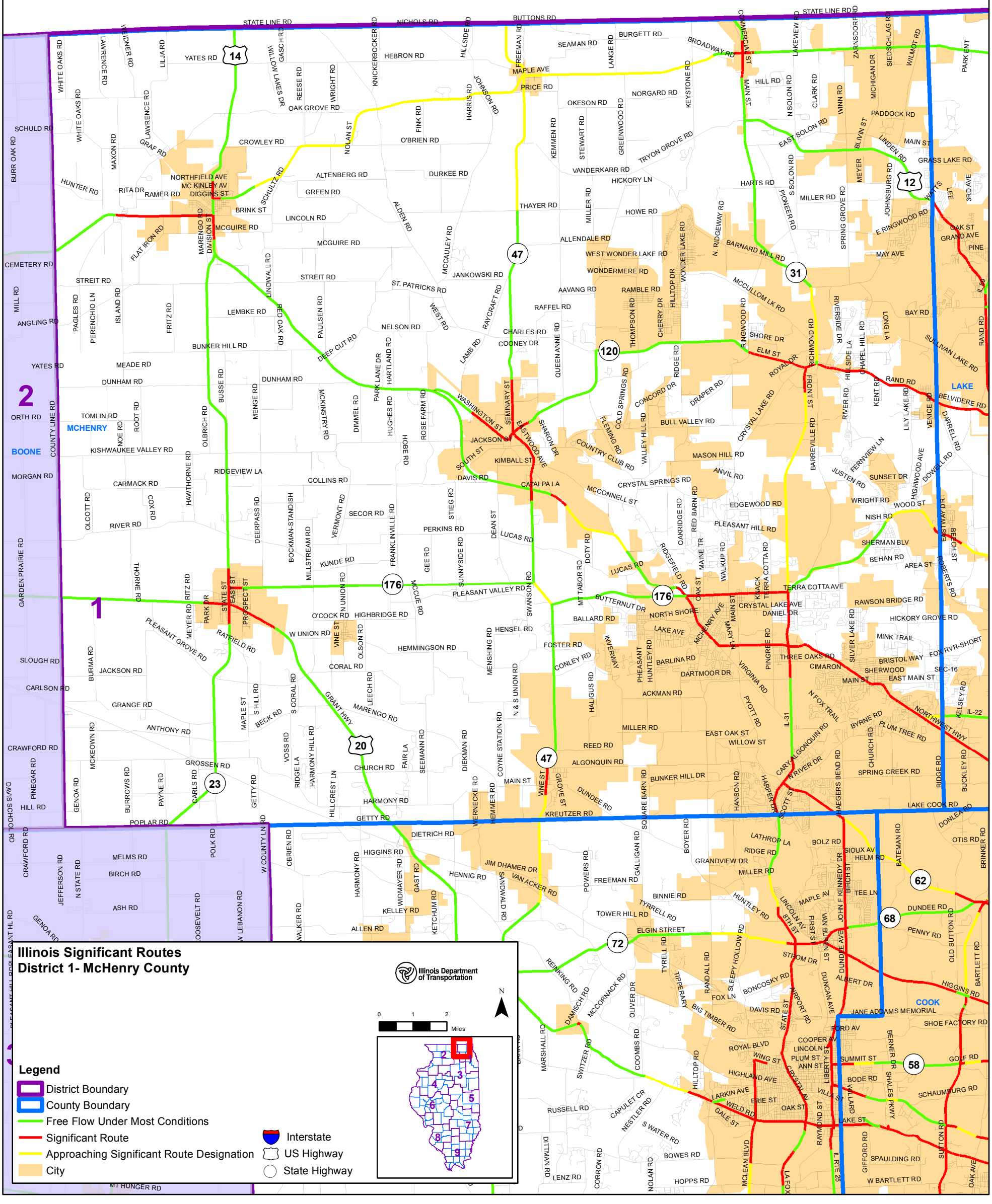

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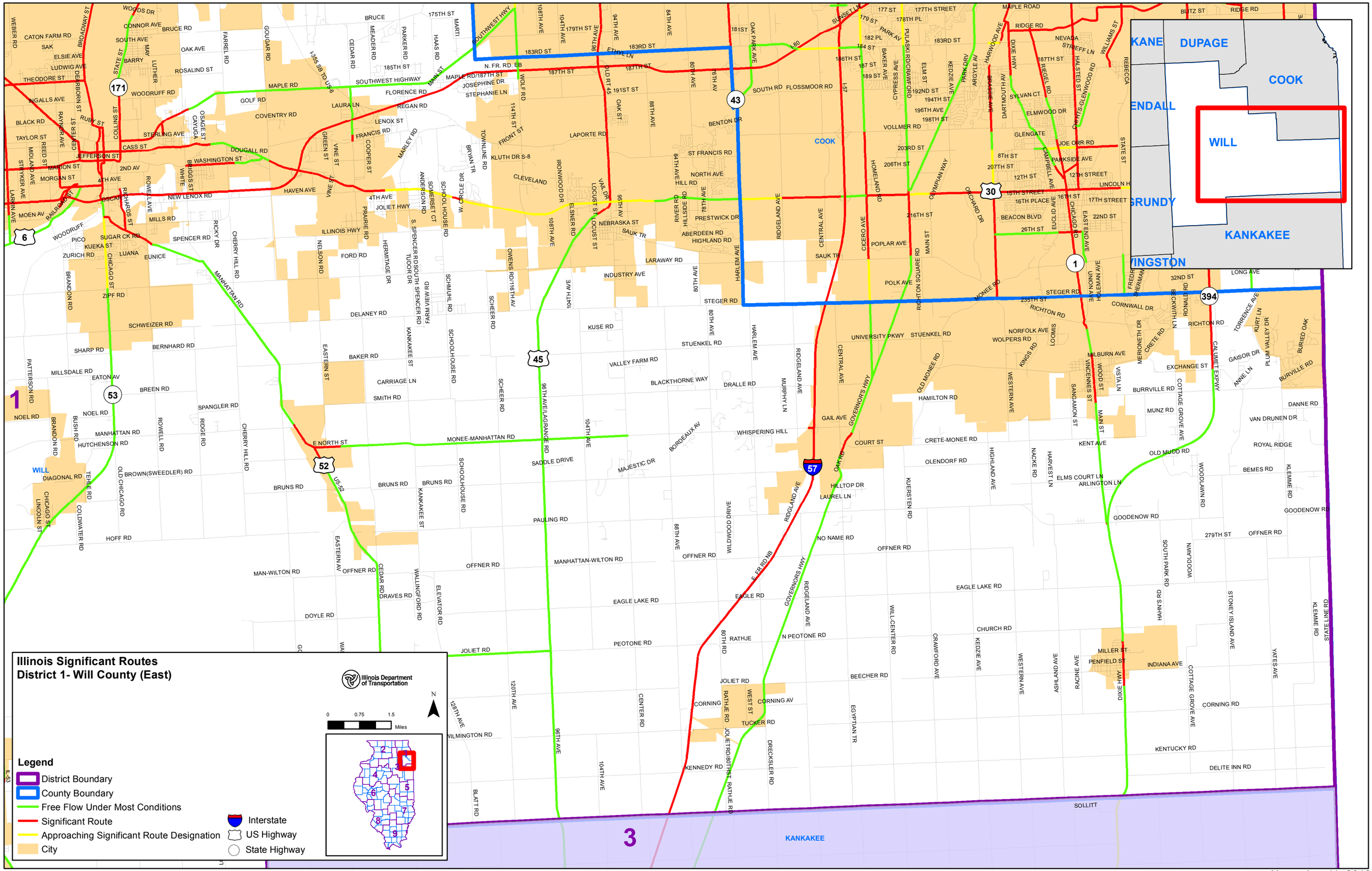

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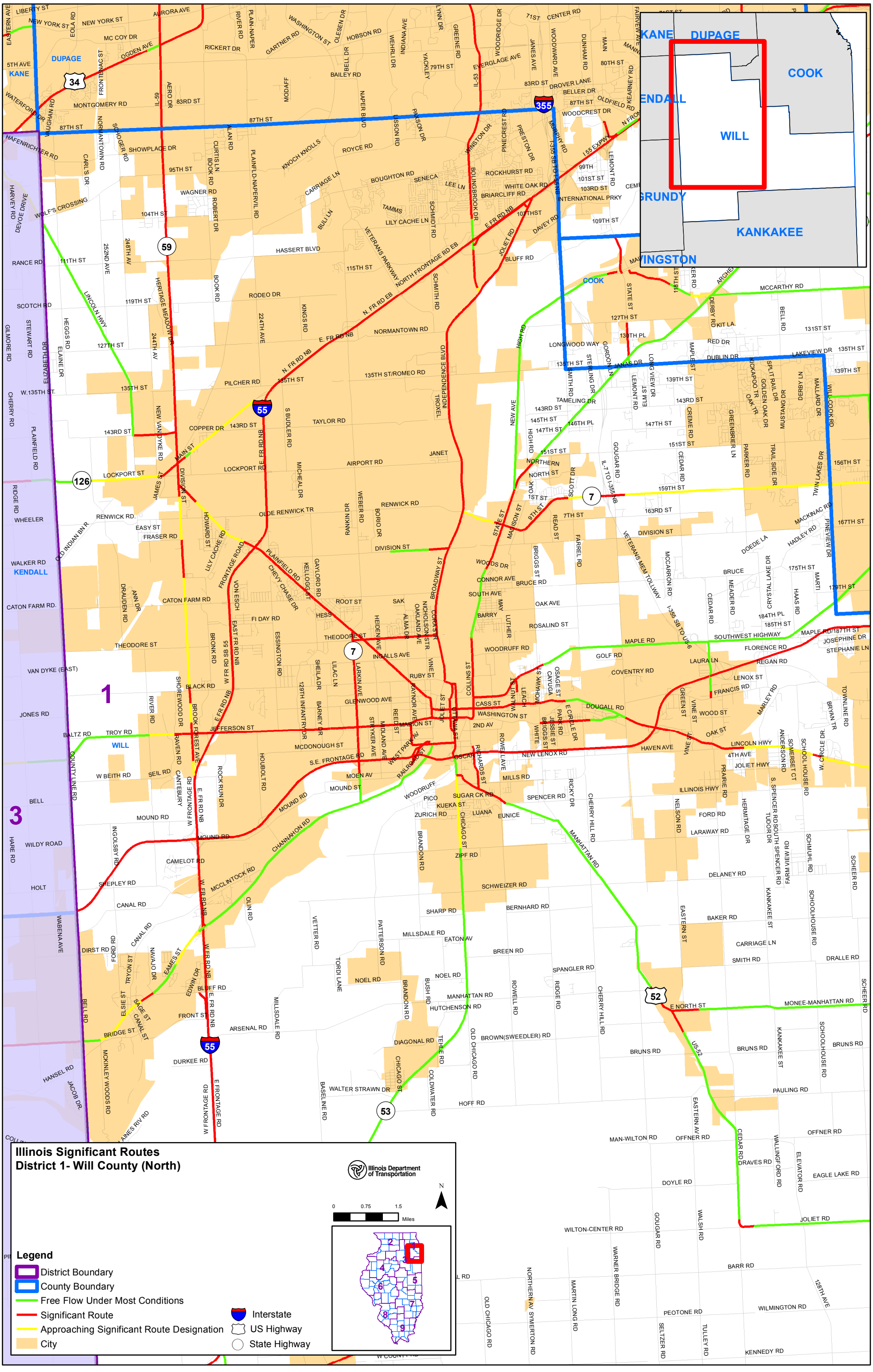

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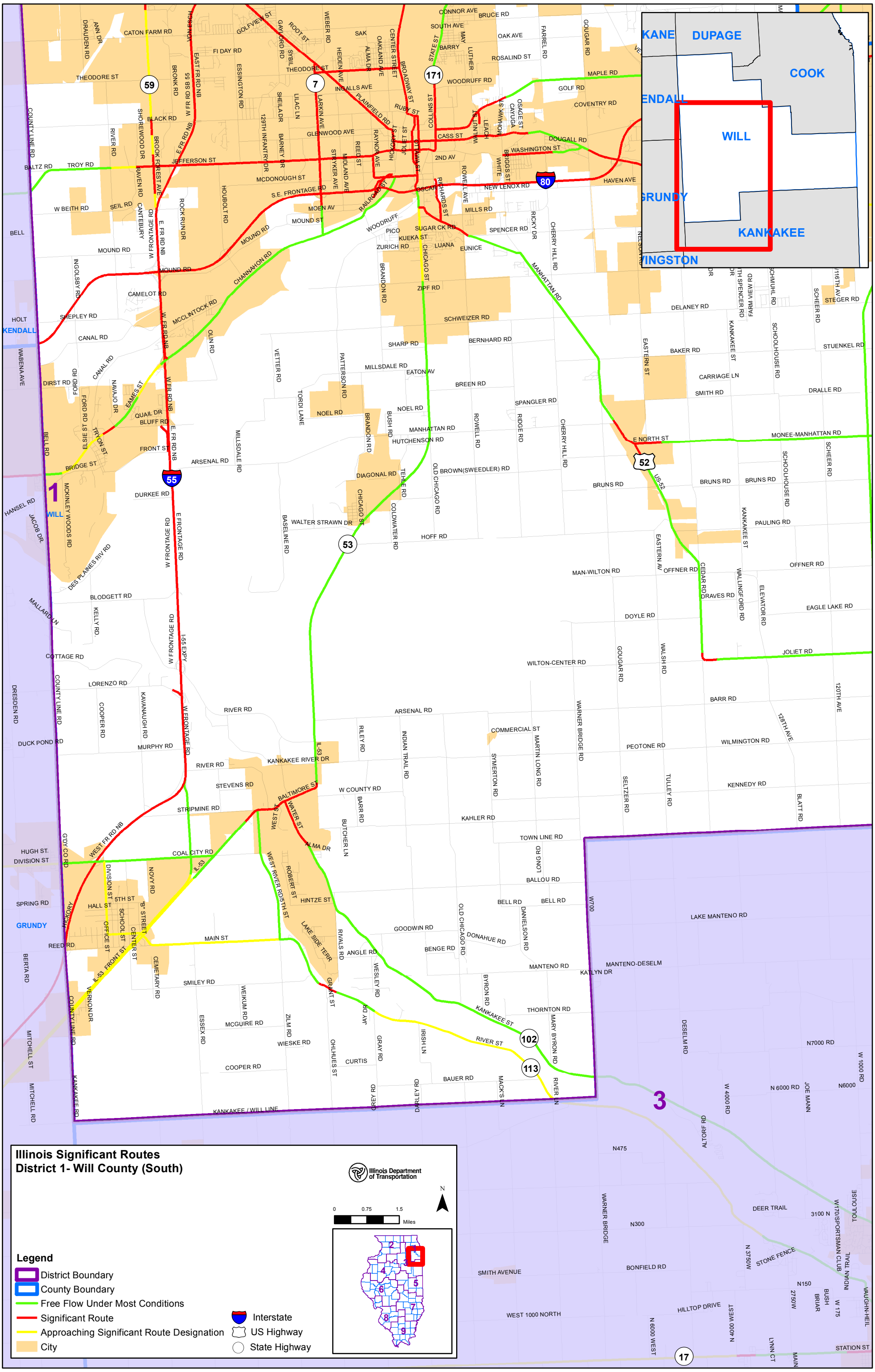

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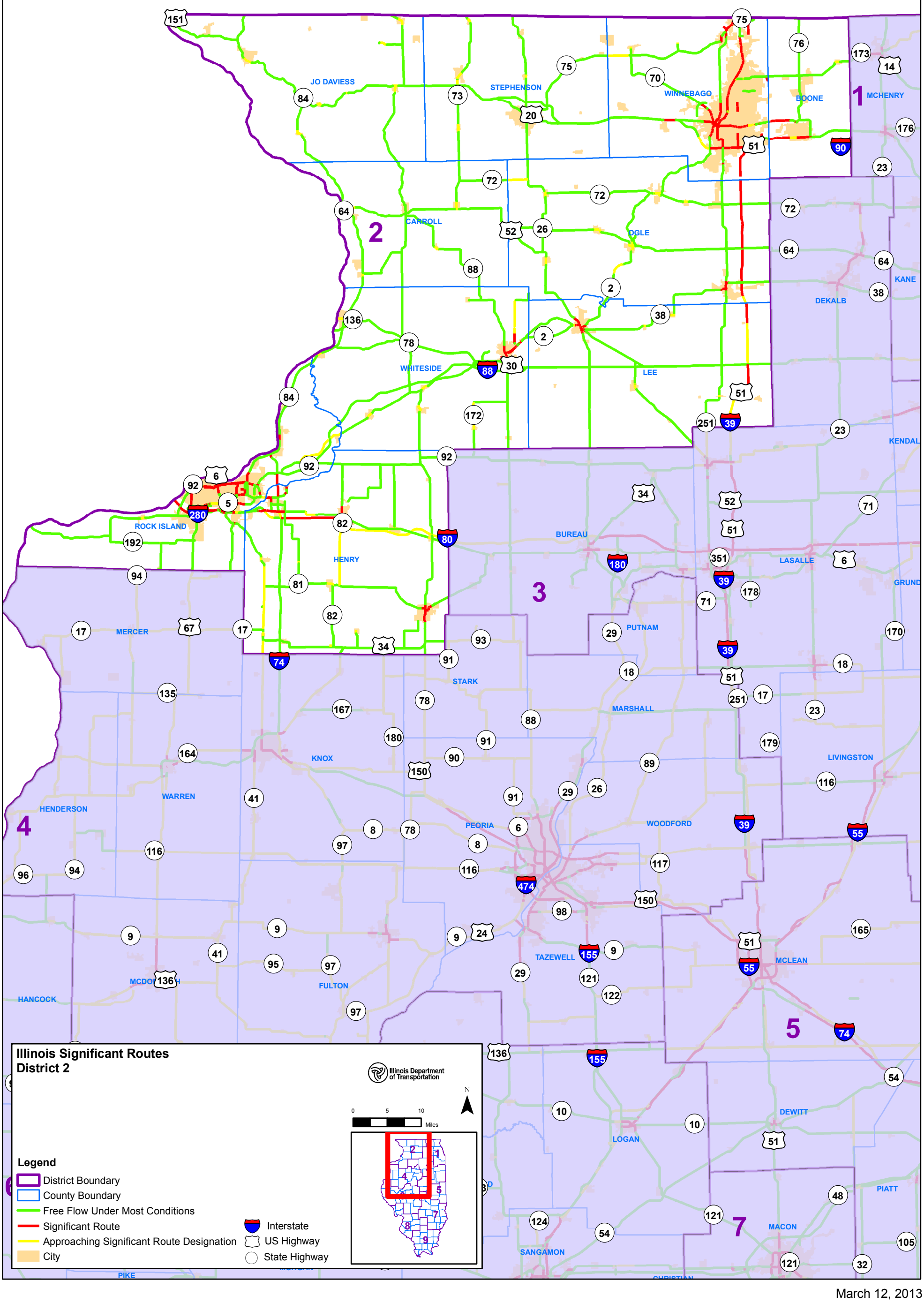

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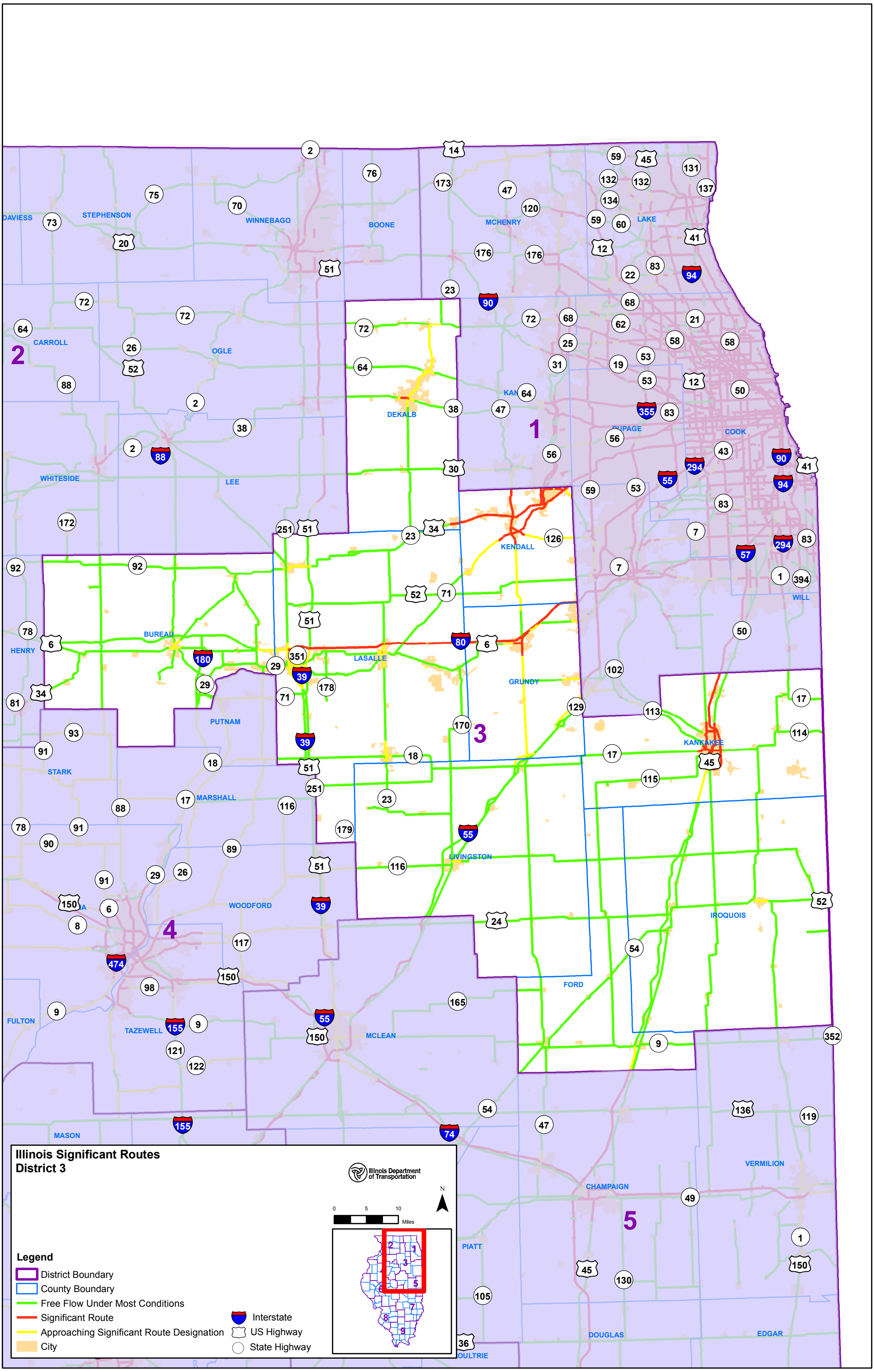

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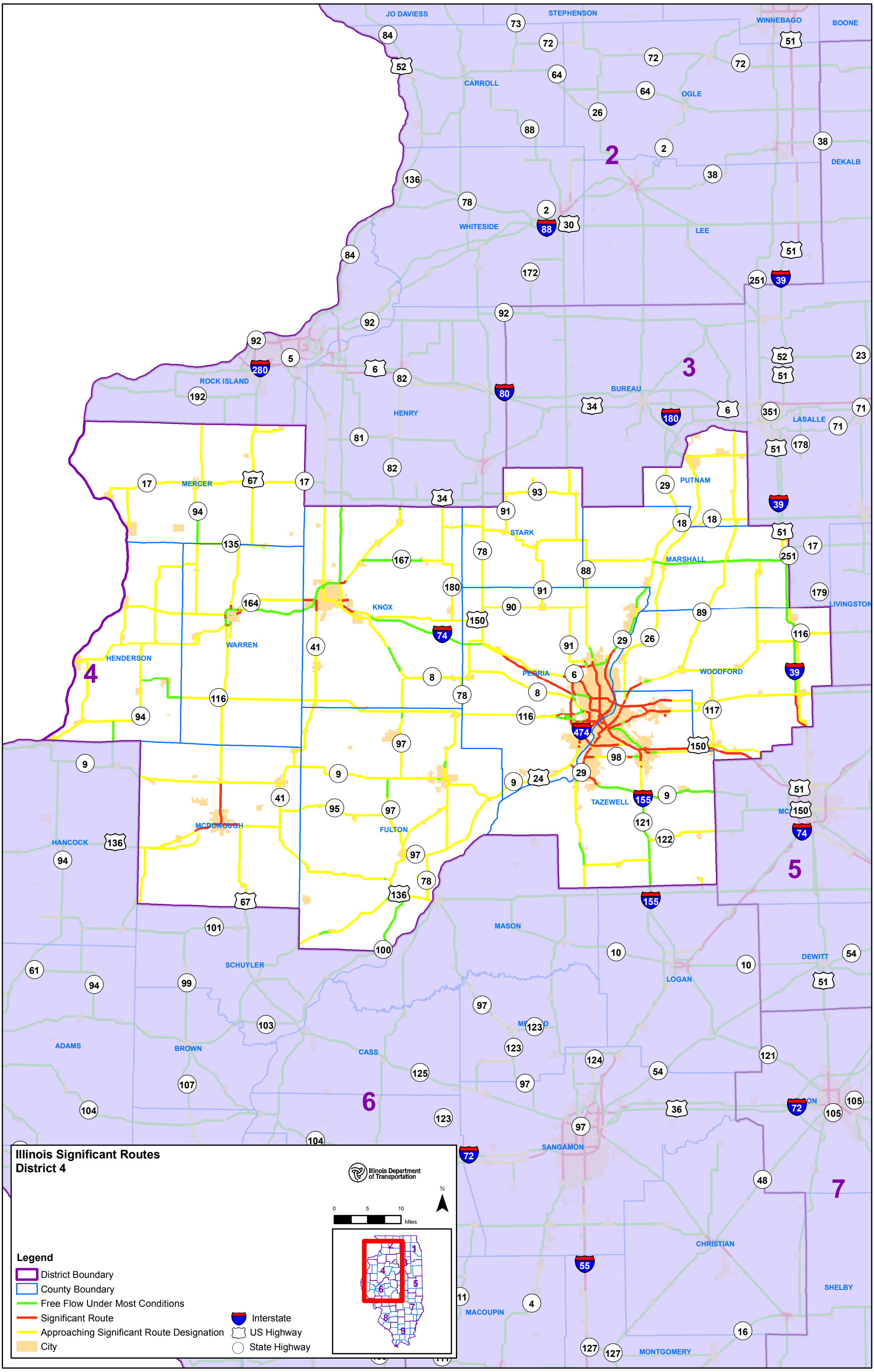

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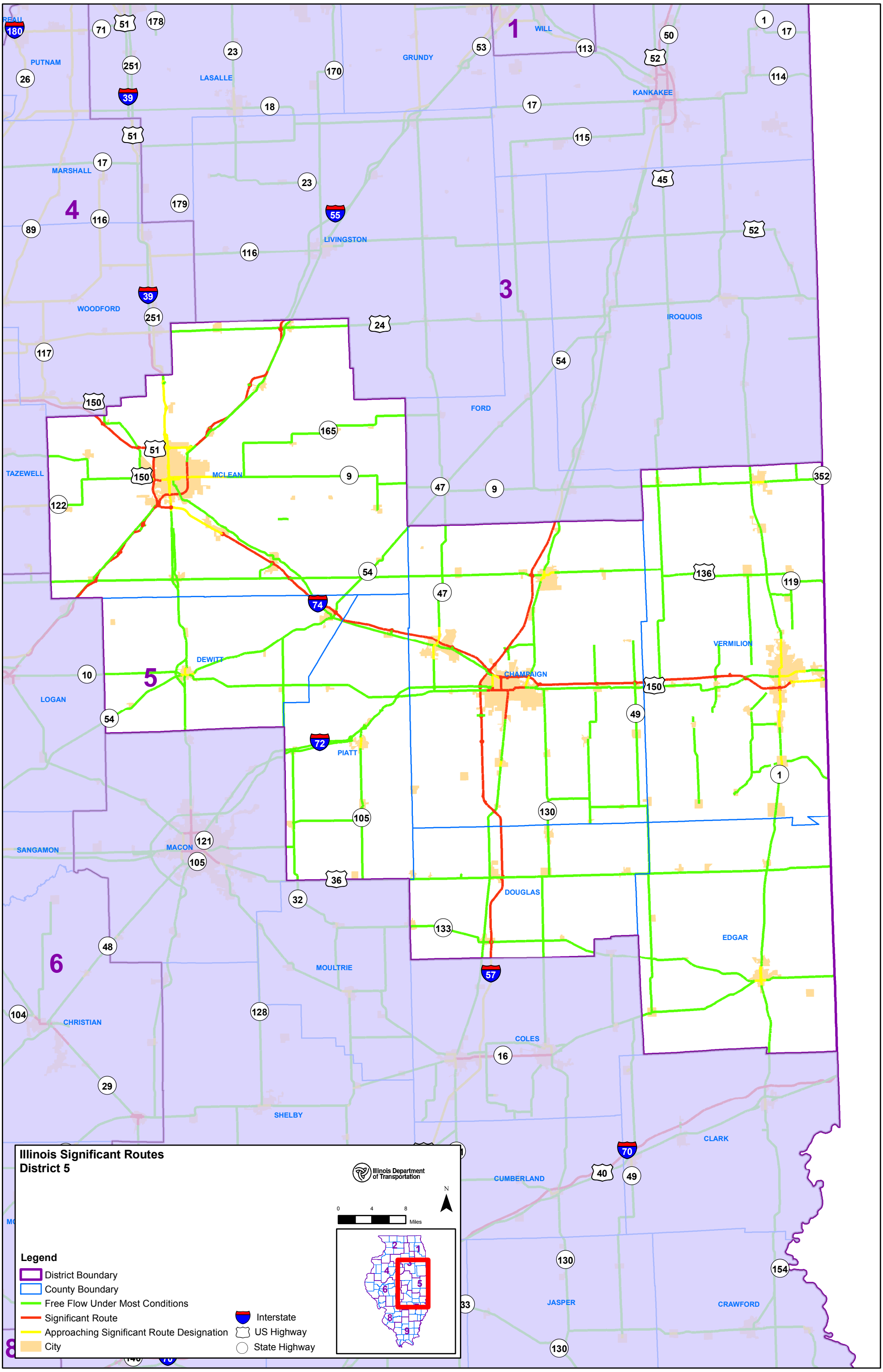

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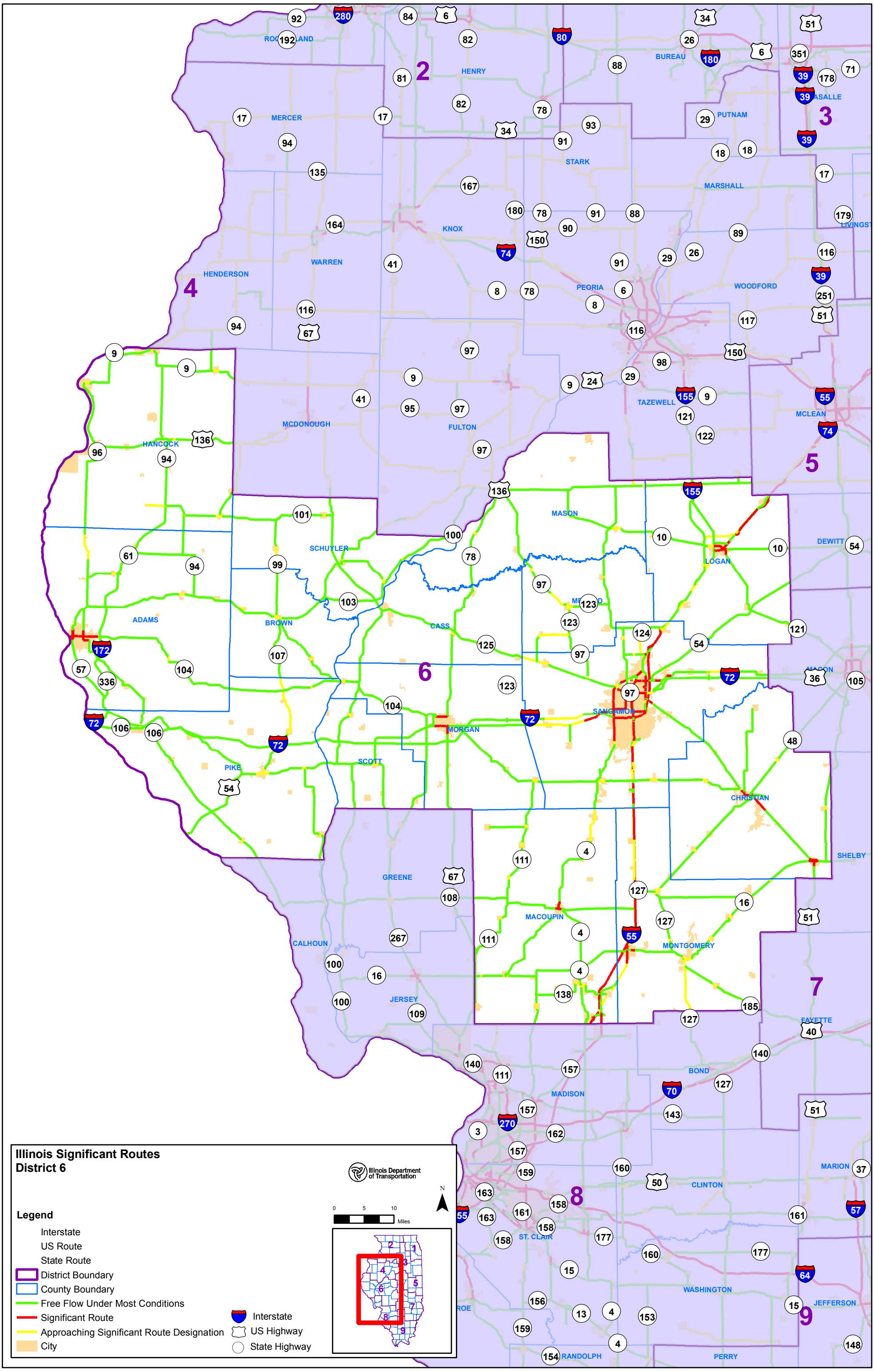

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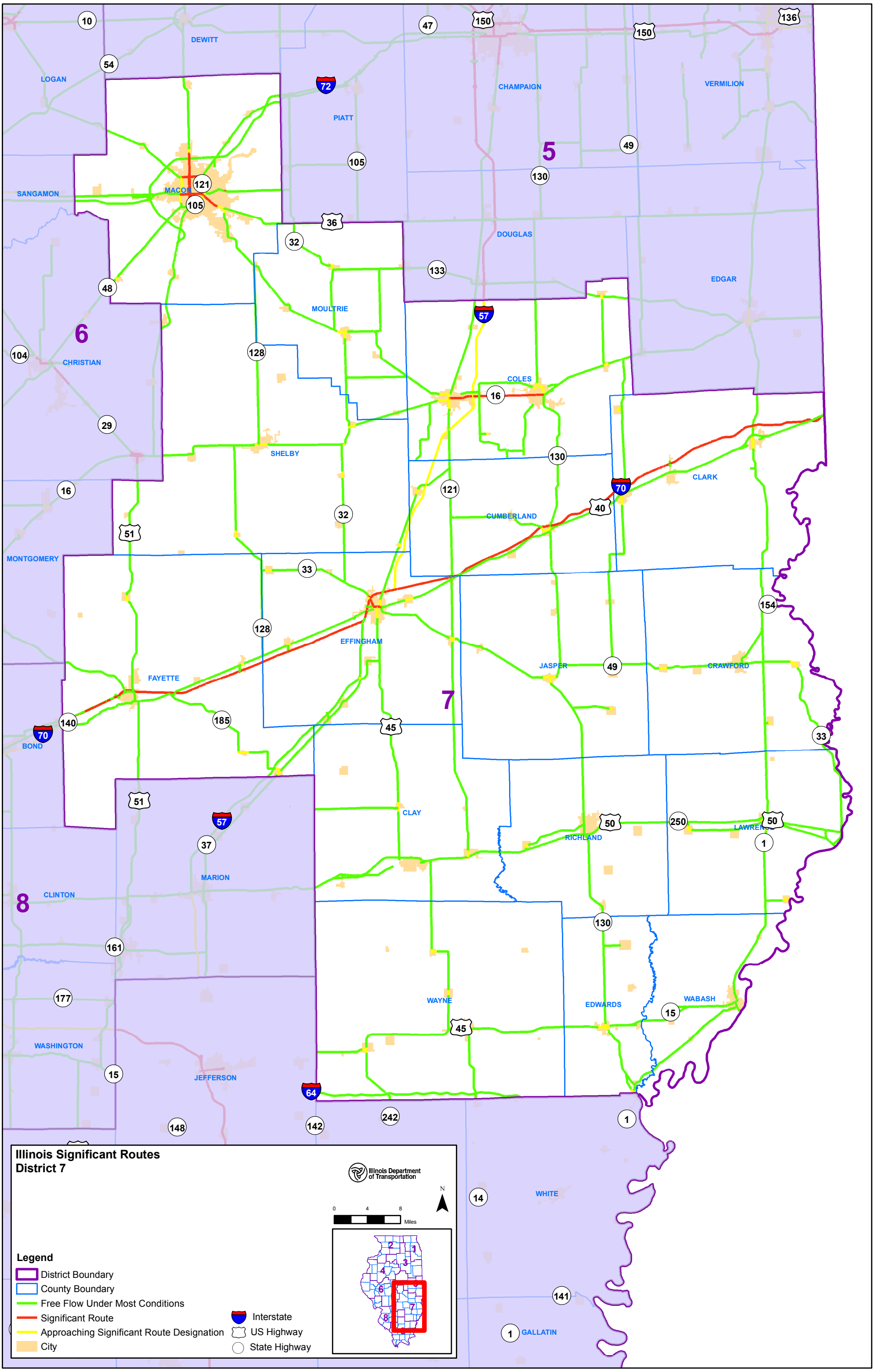

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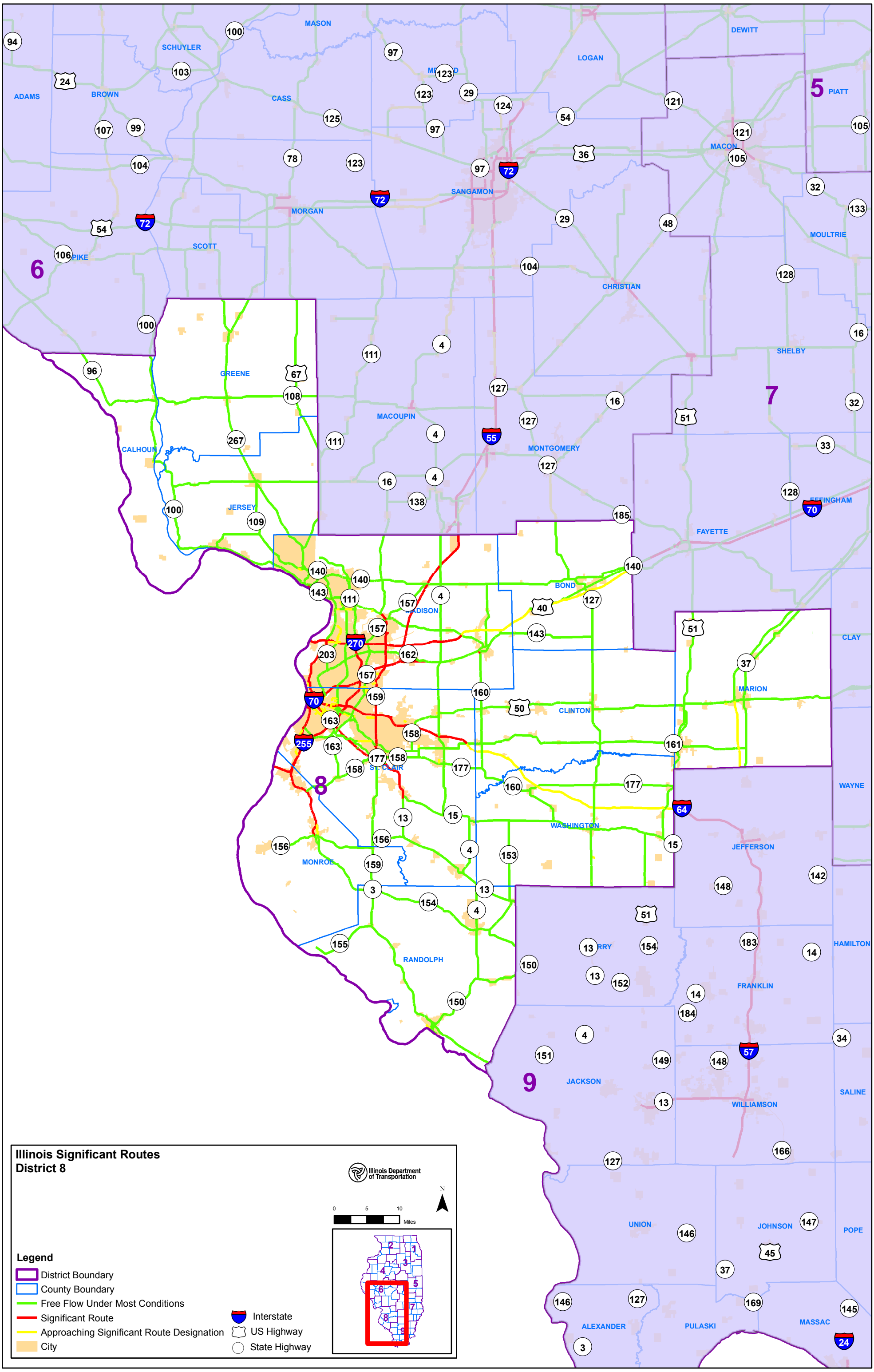

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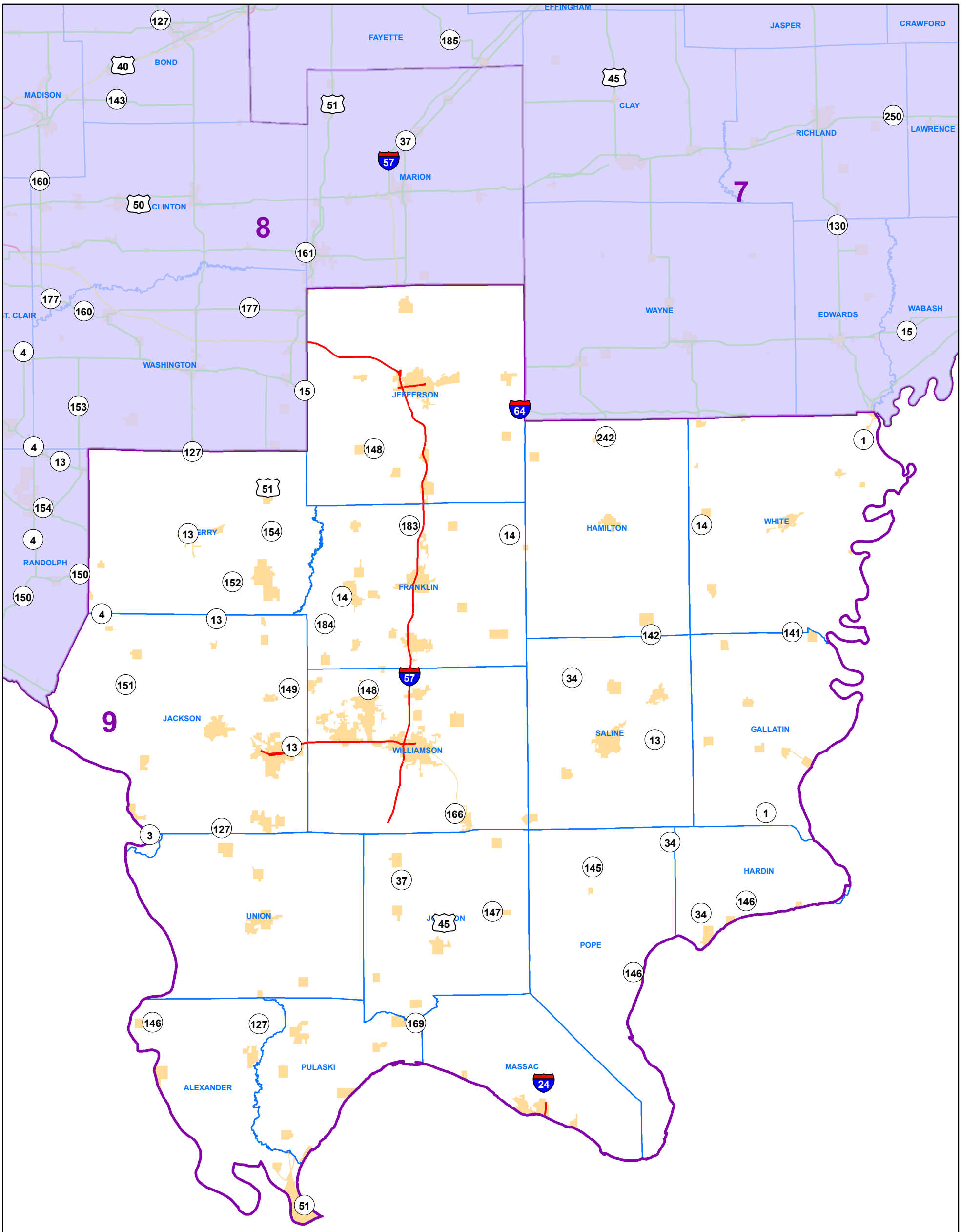

Illinois Significant Routes
District 9

Illinois Department of Transportation

0 5 10 Miles

N

Legend

- District Boundary
- County Boundary
- Free Flow Under Most Conditions
- Significant Route
- Approaching Significant Route Designation
- City
- Interstate
- US Highway
- State Highway

March 12, 2013

Design Hour Volume (DHV)

for

Interstates, Freeways and Expressways

INTERSTATES, FREEWAYS, AND EXPRESSWAYS

District	Functional Class	Rural/Urban Present	Heavy Trucks	ET Rolling	FHV	Intensity Adjust	Lane Width Adjust	Env Adjust	DHV Low		DHV High	
									1550	Rounded	1750	Rounded
1	10- Interstate (PAS)	U	13	2.5	0.84	0.1	0.1	0.15	843	840	952	950
1	20- Freeway/Expressway (Urban Only PAS)	U	7	2.5	0.90	0.1	0.1	0.15	912	910	1029	1030
2-9	10- Interstate (PAS)	U	13	2.5	0.84	0.1	0.1	0.15	843	840	952	950
2-9	10- Interstate (PAS)	R	29	2.5	0.70	0.1	0.1	0.15	702	700	793	790
2-9	20- Freeway/Expressway (Urban Only PAS)	U	7	2.5	0.90	0.1	0.1	0.15	912	910	1029	1030

Design Hour Volume (DHV)

for

Multi-Lane Highways

MULTI-LANE HIGHWAYS, 4 OR MORE LANES, SPEED OF 40 MPH OR MORE

District	Functional Class	Rural/Urban Present	Heavy Trucks	ET Rolling	FHV	Intensity Adjust	Lane Width Adjust	Env. Adjust	DHV LOW		DHV HIGH	
									1400	Rounded	1550	Rounded
1	30- Other Principal Arterial (PAS)	U	7	2.5	0.90	0.1	0.1	0.15	824	820	912	910
1	40- Minor Arterial (Non-Urban)	N/A										
1	50- Major Collector (Non-Urban)	N/A										
1	55- Minor Collector (Non-Urban)	N/A										
1	60- Local Road/Street (Non-Urban)	N/A										
1	70- Minor Arterial (Urban)	U	7	2.5	0.90	0.1	0.1	0.15	824	820	912	910
1	80- Collector (Urban)	U	6	2.5	0.92	0.1	0.1	0.15	835	830	924	920
1	90- Local Road/Street (Urban)	N/A										
2-9	30- Other Principal Arterial (PAS)	R	12	2.5	0.85	0.1	0.1	0.15	771	770	854	850
2-9	30- Urban Other Principal Arterial	U	7	2.5	0.90	0.1	0.1	0.15	824	820	912	910
2-9	40- Minor Arterial (Non-Urban)	R	10	2.5	0.87	0.1	0.1	0.15	791	790	876	880
2-9	50- Major Collector (Non-Urban)	R	8	2.5	0.89	0.1	0.1	0.15	813	810	900	900
2-9	55- Minor Collector (Non-Urban)	N/A										
2-9	60- Local Road/Street (Non-Urban)	N/A										
2-9	70- Minor Arterial (Urban)	U	7	2.5	0.90	0.1	0.1	0.15	824	820	912	910
2-9	80- Collector (Urban)	U	6	2.5	0.92	0.1	0.1	0.15	835	830	924	920
2-9	90- Local Road/Street (Urban)	N/A										

Design Hour Volume (DHV)

for

Two-Lane Highways

TWO-LANE HIGHWAYS, SPEED OF 40 MPH OR MORE

District	Functional Class	Rural/Urban Present	Heavy Trucks	ET Rolling	FHV	Intensity Adjust	Lane Width Adjust	Env. Adjust	DHV LOW		DHV HIGH	
									1190	Rounded	1830	Rounded
1	30- Other Principal Arterial (PAS)	U	7	2.5	0.90	0.1	0.1	0.15	700	700	1076	1080
1	40- Minor Arterial (Non-Urban)	N/A										
1	50- Major Collector (Non-Urban)	N/A										
1	55- Minor Collector (Non-Urban)	N/A										
1	60- Local Road/Street (Non-Urban)	N/A										
1	70- Minor Arterial (Urban)	U	7	2.5	0.90	0.1	0.1	0.15	700	700	1076	1080
1	80- Collector (Urban)	U	6	2.5	0.92	0.1	0.1	0.15	710	710	1091	1090
1	90- Local Road/Street (Urban)	N/A										
2-9	30- Other Principal Arterial (PAS)	R	12	2.5	0.85	0.1	0.1	0.15	656	660	1008	1010
2-9	30- Urban Other Principal Arterial	U	7	2.5	0.90	0.1	0.1	0.15	700	700	1076	1080
2-9	40- Minor Arterial (Non-Urban)	R	10	2.5	0.87	0.1	0.1	0.15	673	670	1034	1030
2-9	50- Major Collector (Non-Urban)	R	8	2.5	0.89	0.1	0.1	0.15	691	690	1062	1060
2-9	55- Minor Collector (Non-Urban)	N/A										
2-9	60- Local Road/Street (Non-Urban)	N/A										
2-9	70- Minor Arterial (Urban)	U	7	2.5	0.90	0.1	0.1	0.15	700	700	1076	1080
2-9	80- Collector (Urban)	U	6	2.5	0.92	0.1	0.1	0.15	710	710	1091	1090

Work Zone Capacity Calculations

All Districts

Interstate, Freeway, Expressway Multilane Roadways

District 1 - Urban Interstate, IL FC 10					District 1 - Urban Interstate, IL FC 10				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl	840				DHV vphpl	950			
K	7.20%				K	7.20%			
D	57.00%				D	57.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
1	0	0	N/A	0	1	0	0	N/A	0
2	1	1	N/A	11,670	2	1	1	N/A	13,190
3	2	2	N/A	23,330	3	2	2	N/A	26,390
4	3	3	N/A	35,000	4	3	3	N/A	39,580
4-5	1	1+1; 1+2	20,470	N/A	4-5	1	1+1; 1+2	23,150	N/A
6-7	2	2+2; 2+3	40,940	N/A	6-7	2	2+2; 2+3	46,300	N/A
8-9	3	3+3; 3+4	61,400	N/A	8-9	3	3+3; 3+4	69,440	N/A
10-11	4	4+4; 4+5	81,870	N/A	10-11	4	4+4; 4+5	92,590	N/A
12	5	5+5	102,340	N/A	12	5	5+5	115,740	N/A

Districts 2 thru 9 - Urban Interstate, IL FC 10					Districts 2-9 - Urban Interstate, IL FC 10				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl	840				DHV vphpl	950			
K	9.40%				K	9.40%			
D	55.00%				D	55.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
1	0	0	N/A	0	1	0	0	N/A	0
2	1	1	N/A	8,940	2	1	1	N/A	10,110
3	2	2	N/A	17,870	3	2	2	N/A	20,210
4	3	3	N/A	26,810	4	3	3	N/A	30,320
4-5	1	1+1; 1+2	16,250	N/A	4-5	1	1+1; 1+2	18,380	N/A
6-7	2	2+2; 2+3	32,500	N/A	6-7	2	2+2; 2+3	36,750	N/A
8-9	3	3+3; 3+4	48,740	N/A	8-9	3	3+3; 3+4	55,130	N/A
10-11	4	4+4; 4+5	64,990	N/A	10-11	4	4+4; 4+5	73,500	N/A
12	5	5+5	81,240	N/A	12	5	5+5	91,880	N/A

Work Zone Capacity Calculations

Districts 2-9

Interstate, Freeway, Expressway Multilane Roadways

District 1 - Rural Interstate, IL FC 10					District 1 - Rural Interstate, IL FC 10				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl	N/A				DHV vphpl	N/A			
K	N/A				K	N/A			
D	N/A				D	N/A			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
1	0	0	N/A	N/A	1	0	0	N/A	N/A
2	1	1	N/A	N/A	2	1	1	N/A	N/A
3	2	2	N/A	N/A	3	2	2	N/A	N/A
4	3	3	N/A	N/A	4	3	3	N/A	N/A
4-5	1	1+1; 1+2	N/A	N/A	4-5	1	1+1; 1+2	N/A	N/A
6-7	2	2+2; 2+3	N/A	N/A	6-7	2	2+2; 2+3	N/A	N/A
8-9	3	3+3; 3+4	N/A	N/A	8-9	3	3+3; 3+4	N/A	N/A
10-11	4	4+4; 4+5	N/A	N/A	10-11	4	4+4; 4+5	N/A	N/A
12	5	5+5	N/A	N/A	12	5	5+5	N/A	N/A

Districts 2 thru 9 - Rural Interstate, IL FC 10					Districts 2-9 - Rural Interstate, IL FC 10				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl	700				DHV vphpl	790			
K	8.82%				K	8.82%			
D	53.00%				D	53.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
1	0	0	N/A	0	1	0	0	N/A	0
2	1	1	N/A	7,940	2	1	1	N/A	8,960
3	2	2	N/A	15,870	3	2	2	N/A	17,910
4	3	3	N/A	23,810	4	3	3	N/A	26,870
4-5	1	1+1; 1+2	14,970	N/A	4-5	1	1+1; 1+2	16,900	N/A
6-7	2	2+2; 2+3	29,950	N/A	6-7	2	2+2; 2+3	33,800	N/A
8-9	3	3+3; 3+4	44,920	N/A	8-9	3	3+3; 3+4	50,700	N/A
10-11	4	4+4; 4+5	59,900	N/A	10-11	4	4+4; 4+5	67,600	N/A
12	5	5+5	74,870	N/A	12	5	5+5	84,500	N/A

Work Zone Capacity Calculations

All Districts

Interstate, Freeway, Expressway Multilane Roadways

District 1 - Freeway/Expressway (Urban Only PAS), IL FC 20					District 1 - Freeway/Expressway (Urban Only PAS), IL FC 20				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl	910				DHV vphpl	1030			
K	8.54%				K	8.54%			
D	62.00%				D	62.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
1	0	0	N/A	0	1	0	0	N/A	0
2	1	1	N/A	10,660	2	1	1	N/A	12,060
3	2	2	N/A	21,310	3	2	2	N/A	24,120
4	3	3	N/A	31,970	4	3	3	N/A	36,180
4-5	1	1+1; 1+2	17,190	N/A	4-5	1	1+1; 1+2	19,450	N/A
6-7	2	2+2; 2+3	34,370	N/A	6-7	2	2+2; 2+3	38,910	N/A
8-9	3	3+3; 3+4	51,560	N/A	8-9	3	3+3; 3+4	58,360	N/A
10-11	4	4+4; 4+5	68,750	N/A	10-11	4	4+4; 4+5	77,810	N/A
12	5	5+5	85,930	N/A	12	5	5+5	97,270	N/A

Districts 2 thru 9 - Freeway/Expressway (Urban Only PAS), IL FC 20					Districts 2 thru 9 - Freeway/Expressway (Urban Only PAS), IL FC 20				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl	910				DHV vphpl	1030			
K	9.53%				K	9.53%			
D	55.00%				D	55.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
1	0	0	N/A	0	1	0	0	N/A	0
2	1	1	N/A	9,550	2	1	1	N/A	10,810
3	2	2	N/A	19,100	3	2	2	N/A	21,620
4	3	3	N/A	28,650	4	3	3	N/A	32,420
4-5	1	1+1; 1+2	17,360	N/A	4-5	1	1+1; 1+2	19,650	N/A
6-7	2	2+2; 2+3	34,720	N/A	6-7	2	2+2; 2+3	39,300	N/A
8-9	3	3+3; 3+4	52,080	N/A	8-9	3	3+3; 3+4	58,950	N/A
10-11	4	4+4; 4+5	69,450	N/A	10-11	4	4+4; 4+5	78,600	N/A
12	5	5+5	86,810	N/A	12	5	5+5	98,250	N/A

Work Zone Capacity Calculations

All Districts

Interstate, Freeway, Expressway Multilane Roadways

4+ MORE LANES; WITH SPEED OF 40 MPH OR MORE

District 1 - Other Principal Arterial Urban, IL FC 30					District 1 - Other Principal Arterial Urban, IL FC 30				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl	820				DHV vphpl	910			
K	8.89%				K	8.89%			
D	59.00%				D	59.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
1	0	0	N/A	0	1	0	0	N/A	0
2	1	1	N/A	9,220	2	1	1	N/A	10,240
3	2	2	N/A	18,450	3	2	2	N/A	20,470
4	3	3	N/A	27,670	4	3	3	N/A	30,710
4-5	1	1+1; 1+2	15,630	N/A	4-5	1	1+1; 1+2	17,350	N/A
6-7	2	2+2; 2+3	31,270	N/A	6-7	2	2+2; 2+3	34,700	N/A
8-9	3	3+3; 3+4	46,900	N/A	8-9	3	3+3; 3+4	52,050	N/A
10-11	4	4+4; 4+5	62,530	N/A	10-11	4	4+4; 4+5	69,400	N/A
12	5	5+5	78,170	N/A	12	5	5+5	86,750	N/A

4+ MORE LANES; WITH SPEED OF 40 MPH OR MORE

Districts 2 thru 9 - Other Principal Arterial Urban, IL FC 30					Districts 2 thru 9 - Other Principal Arterial Urban, IL FC 30				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl	820				DHV vphpl	910			
K	9.80%				K	9.80%			
D	55.00%				D	55.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
1	0	0	N/A	0	1	0	0	N/A	0
2	1	1	N/A	8,370	2	1	1	N/A	9,290
3	2	2	N/A	16,730	3	2	2	N/A	18,570
4	3	3	N/A	25,100	4	3	3	N/A	27,860
4-5	1	1+1; 1+2	15,210	N/A	4-5	1	1+1; 1+2	16,880	N/A
6-7	2	2+2; 2+3	30,430	N/A	6-7	2	2+2; 2+3	33,770	N/A
8-9	3	3+3; 3+4	45,640	N/A	8-9	3	3+3; 3+4	50,650	N/A
10-11	4	4+4; 4+5	60,850	N/A	10-11	4	4+4; 4+5	67,530	N/A
12	5	5+5	76,070	N/A	12	5	5+5	84,420	N/A

Work Zone Capacity Calculations

Districts 2-9

Interstate, Freeway, Expressway Multilane Roadways

4+ MORE LANES; WITH SPEED OF 40 MPH OR MORE

District 1 - Principal Arterial Rural, IL FC 30					District 1 - Principal Arterial Rural, IL FC 30				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl	N/A				DHV vphpl	N/A			
K	N/A				K	N/A			
D	N/A				D	N/A			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
1	0	0	N/A	N/A	1	0	0	N/A	N/A
2	1	1	N/A	N/A	2	1	1	N/A	N/A
3	2	2	N/A	N/A	3	2	2	N/A	N/A
4	3	3	N/A	N/A	4	3	3	N/A	N/A
4-5	1	1+1; 1+2	N/A	N/A	4-5	1	1+1; 1+2	N/A	N/A
6-7	2	2+2; 2+3	N/A	N/A	6-7	2	2+2; 2+3	N/A	N/A
8-9	3	3+3; 3+4	N/A	N/A	8-9	3	3+3; 3+4	N/A	N/A
10-11	4	4+4; 4+5	N/A	N/A	10-11	4	4+4; 4+5	N/A	N/A
12	5	5+5	N/A	N/A	12	5	5+5	N/A	N/A

4+ MORE LANES; WITH SPEED OF 40 MPH OR MORE

Districts 2 thru 9 - Principal Arterial Rural, IL FC 30					Districts 2 thru 9 - Principal Arterial Rural, IL FC 30				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl	770				DHV vphpl	850			
K	9.14%				K	9.14%			
D	53.00%				D	53.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
1	0	0	N/A	0	1	0	0	N/A	0
2	1	1	N/A	8,420	2	1	1	N/A	9,300
3	2	2	N/A	16,850	3	2	2	N/A	18,600
4	3	3	N/A	25,270	4	3	3	N/A	27,900
4-5	1	1+1; 1+2	15,900	N/A	4-5	1	1+1; 1+2	17,550	N/A
6-7	2	2+2; 2+3	31,790	N/A	6-7	2	2+2; 2+3	35,090	N/A
8-9	3	3+3; 3+4	47,690	N/A	8-9	3	3+3; 3+4	52,640	N/A
10-11	4	4+4; 4+5	63,580	N/A	10-11	4	4+4; 4+5	70,190	N/A
12	5	5+5	79,480	N/A	12	5	5+5	87,730	N/A

Work Zone Capacity Calculations

Districts 2-9

Interstate, Freeway, Expressway Multilane Roadways

4+ MORE LANES; WITH SPEED OF 40 MPH OR MORE

District 1 - Minor Arterial (Non-Urban), IL FC 40					District 1 - Minor Arterial (Non-Urban), IL FC 40				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl	N/A				DHV vphpl	N/A			
K	N/A				K	N/A			
D	N/A				D	N/A			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
1	0	0	N/A	N/A	1	0	0	N/A	N/A
2	1	1	N/A	N/A	2	1	1	N/A	N/A
3	2	2	N/A	N/A	3	2	2	N/A	N/A
4	3	3	N/A	N/A	4	3	3	N/A	N/A
4-5	1	1+1; 1+2	N/A	N/A	4-5	1	1+1; 1+2	N/A	N/A
6-7	2	2+2; 2+3	N/A	N/A	6-7	2	2+2; 2+3	N/A	N/A
8-9	3	3+3; 3+4	N/A	N/A	8-9	3	3+3; 3+4	N/A	N/A
10-11	4	4+4; 4+5	N/A	N/A	10-11	4	4+4; 4+5	N/A	N/A
12	5	5+5	N/A	N/A	12	5	5+5	N/A	N/A

4+ MORE LANES; WITH SPEED OF 40 MPH OR MORE

Districts 2 thru 9 - Minor Arterial (Non-Urban), IL FC 40					Districts 2 thru 9 - Minor Arterial (Non-Urban), IL FC 40				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl	790				DHV vphpl	880			
K	10.18%				K	10.18%			
D	55.00%				D	55.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
1	0	0	N/A	0	1	0	0	N/A	0
2	1	1	N/A	7,760	2	1	1	N/A	8,640
3	2	2	N/A	15,520	3	2	2	N/A	17,290
4	3	3	N/A	23,280	4	3	3	N/A	25,930
4-5	1	1+1; 1+2	14,110	N/A	4-5	1	1+1; 1+2	15,720	N/A
6-7	2	2+2; 2+3	28,220	N/A	6-7	2	2+2; 2+3	31,430	N/A
8-9	3	3+3; 3+4	42,330	N/A	8-9	3	3+3; 3+4	47,150	N/A
10-11	4	4+4; 4+5	56,440	N/A	10-11	4	4+4; 4+5	62,870	N/A
12	5	5+5	70,550	N/A	12	5	5+5	78,590	N/A

Work Zone Capacity Calculations

Districts 2-9

Interstate, Freeway, Expressway Multilane Roadways

4+ MORE LANES; WITH SPEED OF 40 MPH OR MORE

District 1 - Major Collector (Non-Urban), IL FC 50					District 1 - Major Collector (Non-Urban), IL FC 50				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl	N/A				DHV vphpl	N/A			
K	N/A				K	N/A			
D	N/A				D	N/A			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
1	0	0	N/A	N/A	1	0	0	N/A	N/A
2	1	1	N/A	N/A	2	1	1	N/A	N/A
3	2	2	N/A	N/A	3	2	2	N/A	N/A
4	3	3	N/A	N/A	4	3	3	N/A	N/A
4-5	1	1+1; 1+2	N/A	N/A	4-5	1	1+1; 1+2	N/A	N/A
6-7	2	2+2; 2+3	N/A	N/A	6-7	2	2+2; 2+3	N/A	N/A
8-9	3	3+3; 3+4	N/A	N/A	8-9	3	3+3; 3+4	N/A	N/A
10-11	4	4+4; 4+5	N/A	N/A	10-11	4	4+4; 4+5	N/A	N/A
12	5	5+5	N/A	N/A	12	5	5+5	N/A	N/A

4+ MORE LANES; WITH SPEED OF 40 MPH OR MORE

Districts 2 thru 9 - Major Collector (Non-Urban), IL FC 50					Districts 2 thru 9 - Major Collector (Non-Urban), IL FC 50				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl	810				DHV vphpl	900			
K	10.89%				K	10.89%			
D	55.00%				D	55.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
1	0	0	N/A	0	1	0	0	N/A	0
2	1	1	N/A	7,440	2	1	1	N/A	8,260
3	2	2	N/A	14,880	3	2	2	N/A	16,530
4	3	3	N/A	22,310	4	3	3	N/A	24,790
4-5	1	1+1; 1+2	13,520	N/A	4-5	1	1+1; 1+2	15,030	N/A
6-7	2	2+2; 2+3	27,050	N/A	6-7	2	2+2; 2+3	30,050	N/A
8-9	3	3+3; 3+4	40,570	N/A	8-9	3	3+3; 3+4	45,080	N/A
10-11	4	4+4; 4+5	54,090	N/A	10-11	4	4+4; 4+5	60,110	N/A
12	5	5+5	67,620	N/A	12	5	5+5	75,130	N/A

Work Zone Capacity Calculations

All Districts

Interstate, Freeway, Expressway Multilane Roadways

4+ MORE LANES; WITH SPEED OF 40 MPH OR MORE

District 1 - Minor Arterial (Urban), IL FC 70					District 1 - Minor Arterial (Urban), IL FC 70				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl	820				DHV vphpl	910			
K	8.53%				K	8.53%			
D	59.00%				D	59.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
1	0	0	N/A	0	1	0	0	N/A	0
2	1	1	N/A	9,610	2	1	1	N/A	10,670
3	2	2	N/A	19,230	3	2	2	N/A	21,340
4	3	3	N/A	28,840	4	3	3	N/A	32,000
4-5	1	1+1; 1+2	16,290	N/A	4-5	1	1+1; 1+2	18,080	N/A
6-7	2	2+2; 2+3	32,590	N/A	6-7	2	2+2; 2+3	36,160	N/A
8-9	3	3+3; 3+4	48,880	N/A	8-9	3	3+3; 3+4	54,250	N/A
10-11	4	4+4; 4+5	65,170	N/A	10-11	4	4+4; 4+5	72,330	N/A
12	5	5+5	81,470	N/A	12	5	5+5	90,410	N/A

4+ MORE LANES; WITH SPEED OF 40 MPH OR MORE

Districts 2 thru 9 - Minor Arterial (Urban), IL FC 70					Districts 2 thru 9 - Minor Arterial (Urban), IL FC 70				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl	820				DHV vphpl	910			
K	10.28%				K	10.28%			
D	55.00%				D	55.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
1	0	0	N/A	0	1	0	0	N/A	0
2	1	1	N/A	7,980	2	1	1	N/A	8,850
3	2	2	N/A	15,950	3	2	2	N/A	17,700
4	3	3	N/A	23,930	4	3	3	N/A	26,560
4-5	1	1+1; 1+2	14,500	N/A	4-5	1	1+1; 1+2	16,090	N/A
6-7	2	2+2; 2+3	29,010	N/A	6-7	2	2+2; 2+3	32,190	N/A
8-9	3	3+3; 3+4	43,510	N/A	8-9	3	3+3; 3+4	48,280	N/A
10-11	4	4+4; 4+5	58,010	N/A	10-11	4	4+4; 4+5	64,380	N/A
12	5	5+5	72,520	N/A	12	5	5+5	80,470	N/A

Work Zone Capacity Calculations

All Districts

Interstate, Freeway, Expressway Multilane Roadways

4+ MORE LANES; WITH SPEED OF 40 MPH OR MORE

District 1 - Collector (Urban), IL FC 80					District 1 - Collector (Urban), IL FC 80				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl	830				DHV vphpl	920			
K	8.67%				K	8.67%			
D	58.00%				D	58.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
1	0	0	N/A	0	1	0	0	N/A	0
2	1	1	N/A	9,570	2	1	1	N/A	10,610
3	2	2	N/A	19,150	3	2	2	N/A	21,220
4	3	3	N/A	28,720	4	3	3	N/A	31,830
4-5	1	1+1; 1+2	16,510	N/A	4-5	1	1+1; 1+2	18,300	N/A
6-7	2	2+2; 2+3	33,010	N/A	6-7	2	2+2; 2+3	36,590	N/A
8-9	3	3+3; 3+4	49,520	N/A	8-9	3	3+3; 3+4	54,890	N/A
10-11	4	4+4; 4+5	66,020	N/A	10-11	4	4+4; 4+5	73,180	N/A
12	5	5+5	82,530	N/A	12	5	5+5	91,480	N/A

4+ MORE LANES; WITH SPEED OF 40 MPH OR MORE

Districts 2 thru 9 - Collector (Urban), IL FC 80					Districts 2 thru 9 - Collector (Urban), IL FC 80				
Low					High				
Terrain	Rolling				Terrain	Rolling			
DHV vphpl	830				DHV vphpl	920			
K	10.78%				K	10.78%			
D	56.00%				D	56.00%			
Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)	Non-workzone condition (both directions)	Minimum Workzone Lane Condition (one direction)	Work Zone Lane Conditions Addressed by this Condition	Maximum ADT (both directions)	Maximum ADT (one way)
# Lanes			VPD		# Lanes			VPD	
1	0	0	N/A	0	1	0	0	N/A	0
2	1	1	N/A	7,700	2	1	1	N/A	8,530
3	2	2	N/A	15,400	3	2	2	N/A	17,070
4	3	3	N/A	23,100	4	3	3	N/A	25,600
4-5	1	1+1; 1+2	13,750	N/A	4-5	1	1+1; 1+2	15,240	N/A
6-7	2	2+2; 2+3	27,500	N/A	6-7	2	2+2; 2+3	30,480	N/A
8-9	3	3+3; 3+4	41,250	N/A	8-9	3	3+3; 3+4	45,720	N/A
10-11	4	4+4; 4+5	55,000	N/A	10-11	4	4+4; 4+5	60,960	N/A
12	5	5+5	68,750	N/A	12	5	5+5	76,200	N/A

Segment Totals from All Sheets

7683
14037
1560