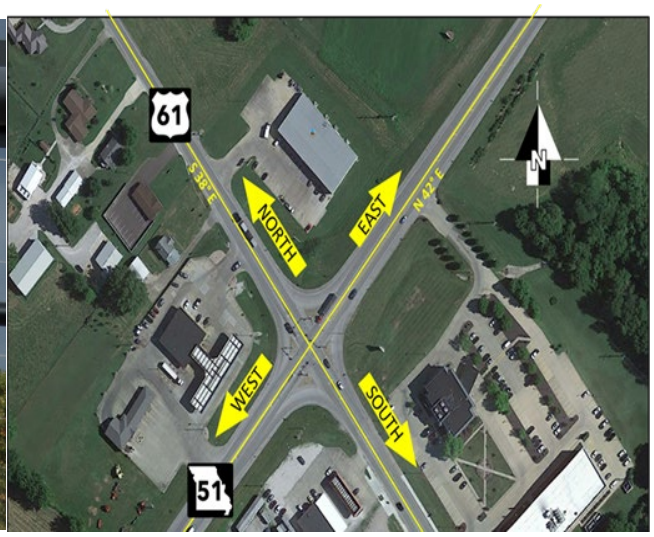
Safety Evaluation of Permissive Flashing Yellow Arrows for Left-Turn Movements in Missouri



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16. Abstract
With over a decade of crash data available since the beginning of flashing yellow arrow (FYA) use, MoDOT decided to objectively investigate the safety performance of the system. Additionally, they wished to have an accurate inventory of all FYA installations statewide, and a determination of the benefit-cost ratio of the signal system. A virtual survey of every signalized intersection on the MoDOT system revealed 841 FYA signals, and the research team either recorded dates relayed by MoDOT or estimated them from as-built plans or photo logs. A simple before and after analysis revealed FYA operation appears to reduce KABC left turn opposite direction crashes about 14 percent and left turn opposite direction O crashes approximately 18 percent when protected-permissive left turn phasing is used before and after FYA installation. Further, this analysis estimates that the lifecycle benefits of installing FYA on an intersection approach are expected to be approximately 5 to 44 times greater than the installation cost, depending on the left turn phasing used before and after FYA installation.

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SAFETY EVALUATION OF PERMISSIVE FLASHING YELLOW ARROWS FOR LEFT-TURN MOVEMENTS IN MISSOURI

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DISCLAIMER

The opinions, findings, and conclusions expressed in this document are those of the investigators. They are not necessarily those of the Missouri Department of Transportation, U.S. Department of Transportation, or Federal Highway Administration. This information does not constitute a standard or specification.

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EXECUTIVE SUMMARY

With over a decade of crash data available since the beginning of flashing yellow arrow (FYA) use, the Missouri Department of Transportation (MoDOT) decided to objectively investigate the safety performance of the system. Additionally, they wished to have an accurate inventory of all FYA installations statewide, and a determination of the economic impact of the signal system.

Traffic engineers use protected-permissive left-turn signals because they can improve operations and reduce delay by providing an additional phase in which motorists can complete left turns if there are safe gaps in oncoming traffic. Over the years, transportation agencies have mostly relied upon 5-section signal heads with a LEFT TURN YIELD ON GREEN sign.

Although this configuration was used frequently, engineers still had concerns that drivers turning left on a circular green indication might inadvertently mistake the signal as implying the left-turn vehicle has the right of way over oncoming traffic. As a result, the National Cooperative Highway Research Program (NCHRP) initiated a research project that eventually concluded FYA signals allowed more flexibility and operational benefits, provided significant improvements to left-turn safety, and were better understood by the public than other left-turn signal variations.

In 2007, the Federal Highway Administration (FHWA) issued a policy memorandum stating that motorists responded strongly and favorably to the concept and intuitively knew what the FYA meant. In 2009, the Manual on Uniform Traffic Control Devices (MUTCD) included FYA signal indication as a standard when a separate left-turn signal head is used over the left-turn lane and is operated in a protected/permissive mode or a permissive mode.

Even before the 2007 FHWA memorandum, MoDOT began using FYA indications under an interim approval agreement with FHWA. The agency did not undertake a wholesale replacement program but rather began installing FYA for permissive movements at new signals and replacing existing circular green permissive indications with FYA when they had reached the end of their service life.

Before any safety analysis could begin, the research team had to determine the location of every FYA left turn signal indication in the State. This involved a virtual examination of every signalized intersection statewide. The virtual examination was necessitated by the project's budget and timeline, and an existential pandemic—COVID-19—that was at its height during the data collection phase. The team used MoDOT's Automatic Road Analyzer (ARAN) video logs and the *Streets* function of Google Maps or Google Earth to perform the examinations.

Following the virtual survey and the documentation of installation dates for each FYA indication, the research team queried the corresponding crash data for a 3-year before and after installation. From this data, they were able select sites for study and perform the safety analysis. The simple before and after study they performed was sufficient to meet MoDOT's

objective of determining the safety of FYA indications. Given this and the fact that the findings were generally consistent with previous nationwide research, the agency and the research team deemed a more robust analysis such as Empirical Bayes infeasible and unnecessary.

The virtual survey of every signalized intersection on the MoDOT system revealed 841 FYA signals, with installation dates ranging from 2007 to 2021. The safety analysis revealed that FYA operation appears to reduce fatal+injury (KABC) left turn opposite direction crashes by about 14 percent and left turn opposite direction property damage only (O) crashes approximately 18 percent when protected-permissive left turn phasing is used before and after FYA installation.

When left turn phasing shifts from protected to more permissive phasing, there is an expected increase in LTOD crashes, irrespective of left turn signal indication. The safety benefit associated with installing FYA does not appear to overcome this increase.

The economic analysis estimated the lifecycle benefits of installing FYA on an intersection approach are expected to be approximately 5 to 44 times greater than the installation cost, depending on the left-turn phasing used before and after installing FYA operation.

Based on these results, FYA could be expected to produce a safety and economic benefit for left turn opposite direction crashes at locations where it is being used to replace circular green permissive left-turn indications.

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ABBREVIATIONS

A	Serious injury crash
AADT	Average annual daily traffic
ARAN	Automatic Road Analyzer
B	Minor injury crash
B/C	Benefit-cost
C	Possible injury crash
CD	Central District
CMF	Crash modification factor
COVID-19	Coronavirus disease of 2019
E	East
EB	Empirical Bayes
FHWA	Federal Highway Administration
FYA	Flashing yellow arrow
K	Fatal crash
KABC	Fatal + injury crashes
KABCO	All crash severities
KC	Kansas City District
LTOD	Left-turn opposite direction
MoDOT	Missouri Department of Transportation
MUTCD	Manual on Uniform Traffic Control Devices
N	North
NCHRP	National Cooperative Highway Research Program
NE	Northeast District
NW	Northwest District
O	No injury crash – property damage only
PM	Permissive
PP	Protected-permissive
PT	Protected
RAISE	Rebuilding American Infrastructure with Sustainability and Equity
S	South
SL	St. Louis District
SE	Southeast District
SW	Southwest District
TMS	Transportation Management System
US	United States
USDOT	United States Department of Transportation
W	West

Introduction

Traffic engineers use protected/permissive left-turn signals because they can improve operations and reduce delay for motorists by providing a phase in which left-turn traffic has the right of way (protected) and a phase when drivers can complete left turns if there are safe gaps in oncoming traffic (permissive). Over the years, transportation agencies have used many variations in signal phasing, signal displays, placement, and supplemental signs to accommodate protected/permissive left turns. The most common was the five-section signal head with a LEFT TURN YIELD ON GREEN sign. Although this configuration was used frequently, engineers still had concerns that drivers turning left on a circular green indication might inadvertently mistake the signal as implying the left-turn vehicle has the right of way over oncoming traffic.

As a result, the National Cooperative Highway Research Program (NCHRP) initiated a research project in the mid-1990s to evaluate the operational and safety characteristics of all the various signal displays transportation agencies were using for protected/permissive left-turn movements. Over a 7-year period, researchers conducted a comprehensive investigation, including engineering analyses, static and video-based driver comprehension studies, field implementation, video conflict studies, and crash analyses. In 2003, these researchers published their findings in NCHRP Report 493, *Evaluation of Traffic Signal Displays for Protected/Permissive Left-Turn Control* (USDOT, 2006). The findings of this research project and a 2007 follow-up safety study (Noyce, et al., 2008) revealed that the flashing yellow arrow (FYA) signal allowed more flexibility and operational benefits, provided significant improvements to left-turn safety, and was better understood by the public than other left-turn signal variations.

The Federal Highway Administration's (FHWA) Office of Transportation Operations also reviewed the published research and deemed the FYA to be successful. In 2007, FHWA issued a policy memorandum, *Interim Approval for Optional Use of FYA for Permissive Left-Turns.* FHWA's evaluation stated that motorists responded strongly and favorably to the concept with little or no public information, and they intuitively knew what the FYA meant. In addition to the research that indicated a low risk of safety or operational concerns, FHWA did not anticipate any negative reactions by industry, manufacturers, or suppliers, nor perceive any adverse financial impacts if the FYA were to be widely implemented. Overall, practitioner consensus was in support of the FYA.

In 2009, the Manual on Uniform Traffic Control Devices (MUTCD) included FYA signal indication as a standard when a separate left-turn signal head is used over the left-turn lane and is operated in a protected/permissive mode or a permissive mode. The MUTCD states that a circular green signal indication shall not be used in this situation (USDOT, 2009).

Even before the 2007 FHWA memorandum, the Missouri Department of Transportation (MoDOT) began using FYA indications under an interim approval agreement with FHWA. The agency did not undertake a wholesale replacement program but rather began installing FYA for permissive movements at new signals and replacing existing circular green permissive indications with FYA when they had reached the end of their service life.

As an agency, MoDOT has been satisfied with FYA performance, and apart from a few anecdotal disapprovals, the indications seemed to be acceptable to the traveling public. With over a decade of crash data available since the beginning of FYA use in Missouri, the agency decided to objectively investigate the safety performance of the system. Additionally, they wished to have an accurate inventory of all FYA installations statewide, and a determination of the benefit-cost ratio of the signal system.

This study investigates those variables. Specifically, it will accomplish the following objectives:

- Develop an inventory of permissive turn movements designating which indication is currently in use
- Update MoDOT's Transportation Management System (TMS) inventory, including installation date by approach for flashing yellow arrows
- Conduct safety analysis of intersections with permissive flashing yellow arrow movements
- Analyze safety study results together with deployment costs to formulate benefit-cost values for the implementation of flashing yellow arrows
- If adequate data is available, develop one or more crash modification factor (CMF) values for flashing yellow arrows on Missouri travel ways
- Identify risk factors that a FYA may mitigate and associated benefit cost for deploying FYA based on these risk factors

Asset Data Collection

Virtual Survey

Before any meaningful safety analysis could begin, the research team had to determine the location of every FYA left turn signal indication in the State. MoDOT's TMS contains a fairly accurate and current database of signalized intersections, but in the 15 years since FYA use began, the fields containing specific records of those indications had lapsed. Most districts however, had either hardcopy or local electronic logs of their FYA inventories. Nevertheless, the research team examined every signalized intersection virtually to either determine FYA presence or to verify a reported presence.

The virtual examination was necessitated by the project's budget and timeline, and an existential pandemic—COVID-19—that was at its height during the data collection phase. A

field visit to each of MoDOT's 2,627 signalized intersections was simply infeasible. The examination relied primarily on MoDOT's Automatic Road Analyzer (ARAN) video logs to view each signalized intersection. This was a reliable method since ARAN footage is collected annually. If footage was missing or unusable, the research team used the *Streets* function of Google Maps or Google Earth to examine the intersection virtually.

There are inherent limitations in ARAN video logs. The distance interval for each frame is 0.02 miles or approximately 105 feet. With this spacing, finding a vantage point close enough to visually examine the signal head can be difficult. Each ARAN video frame is also a static image allowing for neither pan, tilt, nor zoom. Additionally, ARAN imagery is subject to the time of day, weather, and cleanliness of the camera. This means that sometimes a sun glare may obscure the image, raindrops blur the image, or dead insect residue conceal a critical portion of the image. For these reasons, ARAN was used mostly to identify the presence of FYA given its signature 4-section signal head.

While the majority of FYA exist on these 4-section heads, there are a few permissive only left turn movements that are controlled by 3-section heads. As such, the research team reexamined each intersection using Google Streets. This software features dynamic photographs at approximately 30-foot intervals. Each image allows a 360-degree range of motion for pan and for tilt, and a 15-time zoom. Researchers relied on the presence of sign LEFT TURN YIELD ON FLASHING ARROW (R10-27a) to determine if an indication that was not illuminated in the photograph was in fact an FYA.

Attributes

The following attributes were collected per approach for each signalized intersection with an FYA:

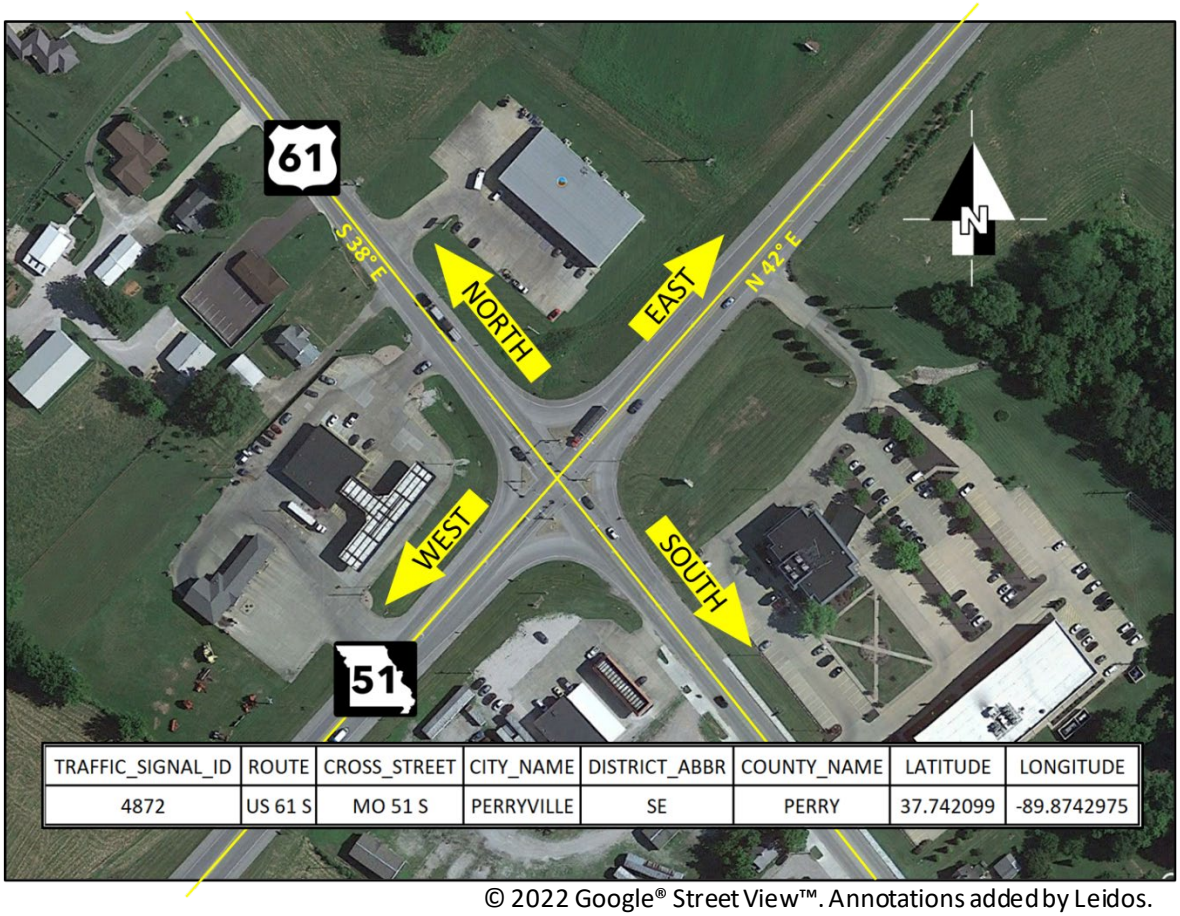
- FYA installation date – The determination of FYA installation dates is detailed later in this report
- Number of through lanes – Through lanes were counted from an aerial view, then verified at street level
- Number of left turn lanes – Left turn lanes were counted from an aerial view, then verified at street level
- Left turn phasing – The determination of left turn phasing is detailed later in this report
- Presence of backplates – Backplates were assigned a yes/no value based on observation

Cardinal Direction Assignment

Not all roadway segments are aligned truly north-south or east-west. To align the crashes with the appropriate approaches assigned them during reporting, the research team adopted the following convention irrespective of the true bearing on Earth. The primary route of the

intersection contained in the TMS database field named [ROUTE] was used as the primary route. The direction assigned to it in that field was used as the directional alignment (e.g., US 61 S). By default, the secondary route direction was assigned as the complimentary direction to the primary route, irrespective of the directional assignment in the TMS field [CROSS_STREET].

This concept is illustrated in Figure wherein the mainline route is US 61, bearing approximately south 38 degrees east. Given its directional assignment of "S" in the database, the researchers assigned it the north-south designation. By default, the cross street was assigned the east-west direction even those though it bears approximately north 42 degrees east, and the database lists it as "S."



TRAFFIC_SIGNAL_ID	ROUTE	CROSS_STREET	CITY_NAME	DISTRICT_ABBR	COUNTY_NAME	LATITUDE	LONGITUDE
4872	US 61 S	MO 51 S	PERRYVILLE	SE	PERRY	37.742099	-89.8742975

Figure 1. Cardinal direction assignments for intersection

Operational Data Collection

Current signal phasing, as well as phasing prior to FYA installation, are critical to discerning the safety impacts of the signals themselves. Since the flashing arrow was rarely illuminated in the static photographs upon which the virtual survey was conducted, researchers developed the rules shown graphically in Figure 2 to classify the signal phasing.

Any 5-section head was considered protected-permissive, as was any 4-section head mounted in conjunction with Sign R10-27a. Three-section heads without a sign were considered protected, and 3-section heads mounted in conjunction with sign LEFT TURN YIELD ON GREEN (R10-12), LEFT TURN SIGNAL YIELD ON GREEN (R10-21), or R10-27a were considered permissive.

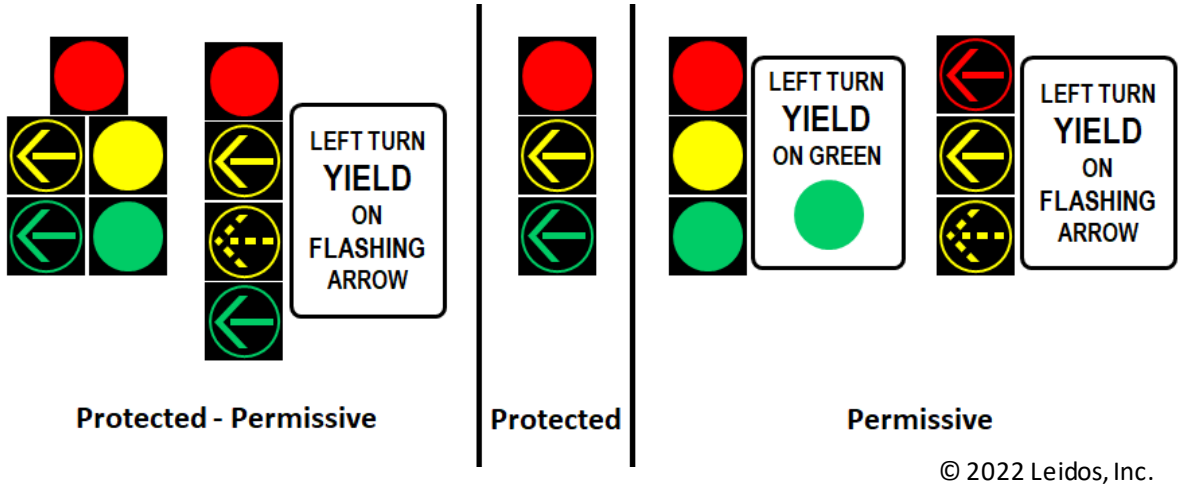


Figure 2. Phasing rules

The research team determined the signal phasing prior to FYA installation by the same set of rules shown in Figure 2. Instead of observing conditions on current video and photo logs however, they used the most recent ARAN and Google Streets prior to FYA having been installed. This was an iterative process that represented the most accurate picture of prior phasing without hardcopy phasing logs which in most cases, did not exist.

Installation Dating

A primary objective of this research was to discern the installation dates of FYA signals on all approaches of signalized intersections in the state. These dates would bring MoDOT's asset management database current as of March 2021, but they are also critical for the safety analysis of FYA in Missouri. Specifically, they demarcate the before and after periods for crash consideration.

The primary method of determining installation dates was to seek information from the districts that had previously created and subsequently maintained logs of FYA signals in their jurisdictions. Five of MoDOT's districts fell within this category. The remaining two districts—Central and St. Louis—had only scattered records of FYA installation dates. As such, the research team developed and executed a hierarchy of procedures to determine the dates.

The first attempt involved examining the controller cabinet maintenance logs for installation dates. Given the virtual nature of the data-gathering efforts, this method—while accurate—relied on reproductions of the logs sent by district traffic professionals who were visiting the

cabinets during their regular conduct of business. This resulted in a disjointed and unreliable flow of information. Furthermore, the logs examined yielded only a few actual entries of FYA installation dates. Only six of the 115 FYA signals in the Central District were dated using this method.

The second method involved reviewing construction plans (as-built plans) available on MoDOT's TMS. Researchers checked the location of each FYA installation in the St. Louis and Central Districts and compared their locations with known as-built plans in the system. If as-built plans that contained the FYA installation were available, then the date of the signal sheet representing the intersection was recorded and noted as the installation date of the signal. This exercise yielded an additional 60 dates in the St. Louis District.

Following review of TMS as-built plans, the research team identified the specific type of 4-section signal head used for FYA signals. MoDOT queried this pay item in their *Site Manager* software and generated a list of projects since 2007 that used that head. Upon completing the list, researchers obtained electronic copies of the as-built plans and compared them to known locations of FYA signals statewide, following the same rules for date estimation as detailed above. This procedure resulted in an additional 16 dates in the Central District, and 232 in St. Louis.

Several FYA signals were installed by permit in the St. Louis District. MoDOT officials in this district recovered electronic copies of all permit projects and applications and provided them to the research team. They in turn reviewed each permit and according to the rules above, estimated an additional 53 installation dates.

The final method of estimating FYA signal installation dates involved reviewing the annual ARAN video logs for the first appearance of the FYA signal at an intersection. ARAN was the preferred medium for this exercise since those video logs are updated annually. Once a date was estimated, the research team sought to further focus the date estimation using Google Streets photo logs. Google's updates are much more random than MoDOT's annual ARAN logs, so this method yielded better results in only about half the cases. In any case, the research team was confident that this date estimation was accurate to within one year. Only six signals in the Central District, and six signals in St. Louis were dated using this method.

Table 1 is a summary of the methodology distribution for discerning FYA signal installation dates.

Table 1. Summary of methods used to estimate FYA installation dates

District	MoDOT Reported	Cabinet Logs	TMS As-Built Plans	Queried As-Built Plans	Permit Installations	Video and Photo Logs	Total
NW	21						21
NE	13						13
KC	153						153
CD	87	6		16		6	115
SL	44		60	232	53	6	395
SW	92						92
SE	52						52
Total	462	6	60	248	53	12	841

Crash Data

The project team used crash data provided by MoDOT, in conjunction with the intersection inventory, to calculate the "before" and "after" crash statistics for each intersection. The earliest opening date (i.e., the year FYA was installed) of any leg at an intersection was used as the "construction year." Crashes in years prior to the construction year were considered "before" crashes, and crashes in years after the construction year were considered "after" crashes.

Table 2 summarizes the data requested by the research team, its availability, and its source. Three requested data elements were not available for use: signal operation, construction history, and pedestrian volumes.

Table 2. Safety analysis data summary

Requested Data Elements	Data Provided?	Data Source
Number of legs	Yes	Intersection inventory
Lane configuration	Yes	Intersection inventory
Left-turn phasing by approach	Yes	Intersection inventory
Signal operation (pretimed, coordinated, lead/lag)	No	Unavailable
AADT by approach	Yes	MoDOT TMS
Speed limit by approach	Yes	MoDOT TMS
Opening date	Yes	Intersection inventory
Number of total and left turn crashes before and after FYA installation	Yes	MoDOT crash data
Construction history	No	Unavailable
Pedestrian volumes	No	Unavailable
Urban/rural land use	Yes	MoDOT TMS

MoDOT queried their crash data repository in TMS and provided the research team with a comprehensive data set spanning the years from 2007 to 2020. Given the desired 3-year before and after periods, only signals installed between the years 2010 and 2017 were considered. MoDOT also conducted a second query after more Central and St. Louis Districts FYA date, and off-system volume information became available.

Site Selection

Sample Sizes

The project team reviewed the crash sites provided by MoDOT to identify candidates for the simple before-after safety analysis. To be eligible for the simple safety analysis, sites must have had three years of before data and three years of after. Sites were removed from consideration for the following reasons:

- Unusual geometry/configuration (e.g., five or more legs)
- A left turn movement was previously not allowed (prohibited, no receiving leg, or no intersection in before condition) or signalized
- Construction year of 2018 through 2021 (i.e., less than three years of after data available)

Table 3 and Table 4 summarize the potential sample sizes of different site groupings, in terms of the number of intersections, approaches with FYA installations, and number of crashes. Crash data was broken-out by total and left turn crashes at the intersection level, and the project team investigated the potential accuracy of assigning crashes to specific approaches.

Table 3. Sites and crashes by number of legs, land-use context, and FYA approach phasing[1]

Variable	Number of Intersections	Number of FYA Approaches	Total Crashes (Before)	Total Crashes (After)	Left Turn Crashes (Before)	Left Turn Crashes (After)
Number of Legs						
3	62	62	7,849	4,298	1,670	1,054
4	204	560	26,629	13,481	5,111	2,766
Total	**266**	**622**	**34,478**	**17,779**	**6,781**	**3,820**
Land-use Context						
Urban	228	536	30,015	15,839	5,822	3,334
Rural	38	86	4,463	1,940	959	486
Total	**266**	**622**	**34,478**	**17,779**	**6,781**	**3,820**
Left Turn Phasing of FYA Approach(es) (Before to After)[2]						
Permissive to Permissive	8	15	971	735	168	123
Permissive to Protected-Permissive	7	14	678	279	150	70
Protected-Permissive to Protected-Permissive	144	303	18,730	10,404	3,816	2,314
Protected to Permissive	2	3	900	243	181	49
Protected to Protected-Permissive	42	78	4,736	2,491	869	532
Total	**203**	**413**	**26,015**	**14,152**	**5,184**	**3,088**

[1]Final sample sizes are subject to change as further analysis is conducted.
[2]Only intersections for which the phasing across all approaches with FYA is consistent are included in this section.

Table 4. FYA approaches by left turn phasing

Left Turn Phasing	Before Phasing Number of Approaches	After Phasing Number of Approaches
Permissive	110	71
Protected-Permissive	403	551
Protected	109	0
Total	**622**	**622**

There were 266 intersections with 622 approaches with FYA signals in the after condition that may be used in the simple safety analysis. These sample sizes were subject to increase had the

more detailed crash modification factor (CMF) development task been conducted, because it would not require three years of after data.

These intersections are primarily in urban areas (86 percent), with 73 percent of FYA approaches operating in protected-permissive mode in both the before and after condition, and 19 percent of approaches changing from protected to protected-permissive phasing. Only two intersections, corresponding to three approaches, changed from protected to permissive phasing.

Research Approach

Based on the available data and sample sizes noted in the previous sections, the research team decided upon the following methodology:

- Investigate if left turn crashes can reasonably be assigned to individual approaches using the provided crash data
- Perform a simple before/after crash analysis using a standard of three years of before and three years of after data for the following crash types (with breakouts by all severities, fatal/injury crashes only, and fatal/suspected serious injury crashes only and groupings by urban/rural context, number of legs, and left-turn phasing (where it is consistent)).
    - Total crash rate (i.e., all crash types)
    - Number of left-turn crashes per year
    - Total number of crashes per year
- Investigate whether there would be sufficient data for reference sites for developing one or more CMFs.

Basic Safety Analysis

The project team has used the data collected and described in the previous section to complete a simple before-after safety analysis of FYA installations. This basic safety analysis compares observed crashes in the before and after periods to assess the safety effectiveness of FYAs. As such, it assumes that the change in the safety performance from the before to the after period is solely attributable to installing FYA control. This assumption is likely not accurate and other factors (e.g., driver behavior, weather, changes in traffic volumes, and other time trends), may also influence safety performance. However, this analysis may provide an indication of the general trends of safety performance related to FYA installation in Missouri. Comparing the results of this analysis to other similar studies provides additional confidence in its results.

Analysis Process

This basic safety analysis considers safety performance at the individual approach and intersection-wide levels. The approach-level analysis considers only intersection approaches with FYA installations and likely provides a more precise estimate of the safety effect of the

change. However, the project team was not able to reliably assign traffic volumes at the approach level within the task's available resources, so an intersection-level analysis was also conducted to account for the potential trends in traffic volumes.

Crash Assignment

The project team assigned crashes to individual approaches using crash data provided by MoDOT. The project team first identified left-turn opposite-direction (LTOD) crashes within the crash database. These are the crashes most likely to be influenced by FYA installations. They were also the only crash types the project team was able to reliably assign to an individual approach without reviewing crash narratives, which is beyond the current scope of the project. The LTOD crashes were then assigned to individual approaches based on the direction of travel of the left-turning vehicle involved in the crash.

Analysis Parameters

The project team used the following general parameters in conducting the safety analysis:

- **Time period** – Crash data from a maximum of 3 years before and 3 years after FYA installation is used. The installation year is excluded. Sites with less than 3 years after data are still included, so long as there is one complete calendar year of crash data available (i.e., the FYA must have been installed in 2017 or earlier). The relatively narrow before-after period helps limit the influence of external time-related trends (e.g., changes in traffic volumes/patterns, driver behavior, vehicle fleet mix).

- **Crash types** – This analysis focuses on left-turn opposite-direction (LTOD) crashes. These are the crashes most likely to be influenced by FYA installations. Pedestrian crashes are also reviewed.

- **Before-after left-turn phasing** – The left-turn phasing before and after FYA installation can have a significant effect on safety performance. Therefore, all analyses are conducted by grouping together approaches, or intersections, with similar before-after left-turn phasing patterns (e.g., all approaches where the left-turn phasing was protected-permissive in the before and after periods are grouped together).

Performance Measures and Methodology

The following metrics are calculated for each analysis grouping:

- **Crash frequency** – Calculated as crashes/year in the before and after periods. This information is shown to provide context as to the magnitude of change seen and analyzed.

- **Crash Modification Factor (CMF)** – Calculated according to the metrics outlined in the industry standard reference *Observational Before-After Studies in Road Safety* (*Hauer,*

1997). The accompanying 95 percent confidence interval is also calculated. Applying this methodology here is more statistically rigorous than simply dividing the after-crash frequency by the before crash frequency; however, it is not as rigorous as the Empirical Bayes (EB)-based analysis described later in this memorandum, which is the preferred method for calculating CMFs.

Results

The following sections summarize the results of the intersection and approach-level analyses.

Approach-Level Analyses

Most of the analyses conducted for this project are at the approach level. This provides for a greater sample size (i.e., there are more approaches than intersections), as well as a more precise examination of the safety performance of FYA installations with respect to LTOD crashes. The analyses are conducted according to the parameters previously described and are summarized according to the following factors

- All locations
- Urban vs. rural locations
- Number of through lanes crossed by left-turning traffic
- Speed limit of opposing traffic

The project team also considered the number of left-turning lanes on the approach with FYA. According to MoDOT policy however, there was only one left-turning lane on all approaches with FYA installations.

All Locations

Table 5 summarizes the number of LTOD crashes by severity across all approaches in the database.

Table 5. LTOD crashes by severity (all locations)

Before-After Phasing[1]	n[2]	LTOD Crashes by Severity									
		Before Period					After Period				
		K	A	B	C	O	K	A	B	C	O
PM to PM	64	1	0	0	16	33	0	0	1	5	19
PM to PP	69	0	0	0	16	28	0	0	4	16	27
PP to PM	12	0	0	0	0	1	0	0	0	1	0
PP to PP	476	2	0	33	333	505	0	5	21	260	408
PT to PM	5	0	0	0	0	1	0	0	0	0	4
PT to PP	116	0	0	2	24	30	0	1	7	64	105

[1]PM = permissive; PP = protected-permissive; PT = protected
[2]n = number of approaches

The number of fatal and injury A and B crashes is relatively small across all phasing pairs and time periods. As a result, the analysis is completed for fatal and injury crashes combined (i.e., KABC crashes) and property damage only (O) crashes. These combinations provide a look at the influence of FYA installations on crashes of different severity levels.

Table 6 summarizes LTOD crash frequency by left-turn phasing type across all locations.

Table 6. LTOD crash frequency by left-turn phasing (all locations)

Phasing[1]	LTOD Crashes									
	Before Period					After Period				
	KABC	O	Years	KABC Crashes/ Year	O Crashes/ Year	KABC	O	Years	KABC Crashes /Year	O Crashes/ Year
PM	33	61	399	0.08	0.15	7	23	233	0.03	0.10
PP	368	506	1464	0.25	0.35	378	540	1842	0.21	0.29
PT	26	31	363	0.07	0.09	N/A				

[1]PM = permissive; PP = protected-permissive; PT = protected

LTOD crash frequency is highest at locations with protected-permissive phasing, followed by locations with permissive phasing. Locations with protected-only left-turn phasing have the lowest LTOD crash frequency. Crash frequencies are about 16 percent-63 percent lower after FYA installation, not accounting for any change in phasing across the before and after periods. The subsequent analyses will further explore the effects of different factors, including before-after phasing combinations, on FYA safety performance.

Table 7 summarizes the results of the before-after analysis across all approaches in the database. The table also provides 95% confidence intervals, in accordance with typical industry practice, to assess the statistical significance of the results.

Table 7. Before-after analysis results (all locations)

Before-After Phasing[1]	n[2]	Before Period			After Period			CMF	95% Confidence Interval
		LTOD Crashes	Years	Crash Frequency[3]	LTOD Crashes	Years	Crash Frequency[3]		
KABC Crashes									
PM to PM	64	17	192	0.09	6	182	0.03	*0.35*	*0.10 - 0.75*
PM to PP	69	16	207	0.08	20	189	0.11	1.29	0.59 - 2.26
PP to PM	12	0	36	0.00	1	36	0.03	N/A	N/A
PP to PP	476	368	1428	0.26	286	1322	0.22	**0.84**	**0.71 - 0.97**
PT to PM	5	0	15	0.00	0	15	0.00	N/A	N/A
PT to PP	116	26	348	0.07	72	331	0.22	**2.80**	**1.69 - 4.19**
O Crashes									
PM to PM	64	33	192	0.17	19	182	0.10	*0.59*	*0.31 - 0.97*
PM to PP	69	28	207	0.14	27	189	0.14	1.02	0.55 - 1.63
PP to PM	12	1	36	0.03	0	36	0.00	N/A	N/A
PP to PP	476	505	1428	0.35	408	1322	0.31	**0.87**	**0.76 - 0.99**
PT to PM	5	1	15	0.07	4	15	0.27	2.00	0.02 - 8.13
PT to PP	116	30	348	0.09	105	331	0.32	**3.56**	**2.27 - 5.14**

[1]PM = permissive; PP = protected-permissive; PT = protected

[2]n = number of approaches

[3]crashes/year

Bold cells indicate CMFs for which the 95% confidence interval does not cross 1.0. *Italics indicate CMFs for which the 95% confidence interval does not cross 1.0; however, the sample size is relatively small.*

Left-turn opposite-direction crashes decreased by about 13 percent (O crashes) to 16 percent (KABC) after FYA was installed at approaches with protected-permissive phasing in the before and after periods. They also appear to have decreased by a greater magnitude at locations where permissive phasing was present in the before and after periods. However, the sample size is relatively small at these locations.

Conversely, LTOD crashes increased at locations where the signal phasing was changed from protected only left-turns to protected-permissive left-turns. Based on the analysis results presented in the table and the existing literature, this increase in crashes appears to be related to the change in left-turn phasing (i.e., installing a FYA does not appear to make up for the increase in crashes that results from adding the permissive phase to an approach that did not previously have one).

Results were inconclusive for other phasing combinations due to the small sample sizes in the database.

Urban Intersections

Table 8 summarizes the results of the before-after analysis across approaches at urban intersections in the database.

Table 8. Before-after analysis results (urban intersections)

Before-After Phasing[1]	n[2]	Before Period			After Period			CMF	95% Confidence Interval
		LTOD Crashes	Years	Crash Frequency[3]	LTOD Crashes	Years	Crash Frequency[3]		
KABC Crashes									
PM to PM	60	16	180	0.09	6	170	0.04	*0.37*	*0.11 - 0.80*
PM to PP	57	12	171	0.07	15	155	0.10	1.27	0.5 - 2.41
PP to PM	12	0	36	0.00	1	36	0.03	N/A	N/A
PP to PP	413	357	1239	0.29	276	1152	0.24	**0.83**	**0.70 - 0.96**
PT to PM	2	0	6	0.00	0	6	0.00	N/A	N/A
PT to PP	95	26	285	0.09	61	271	0.23	**2.38**	**1.41 - 3.58**
O Crashes									
PM to PM	60	33	180	0.18	19	170	0.11	*0.59*	*0.31 - 0.97*
PM to PP	57	22	171	0.13	21	155	0.14	1.01	0.5 - 1.69
PP to PM	12	1	36	0.03	0	36	0.00	N/A	N/A
PP to PP	413	483	1239	0.39	392	1152	0.34	**0.87**	**0.76 - 0.99**
PT to PM	2	1	6	0.17	4	6	0.67	2.00	0.02 - 8.13
PT to PP	95	30	285	0.11	99	271	0.37	**3.36**	**2.13 - 4.86**

[1]PM = permissive; PP = protected-permissive; PT = protected

[2]n = number of approaches

[3]crashes/year

Bold cells indicate CMFs for which the 95% confidence interval does not cross 1.0. *Italics indicate CMFs for which the 95% confidence interval does not cross 1.0; however, the sample size is relatively small.*

Urban locations make up approximately 86 percent of the sites in the database. As a result, the findings at urban locations are similar to those presented for all locations. Left-turn opposite-direction crashes decreased by about 13 percent (O crashes) to 17 percent (fatal and injury crashes) after FYA was installed at approaches with protected-permissive phasing in the before and after periods. They also appear to have decreased by a greater magnitude at locations where permissive phasing was present in the before and after periods. However, the sample size is relatively small at these locations.

Conversely, LTOD crashes increased at locations where the signal phasing was changed from protected only left-turns to protected-permissive left-turns. Results were inconclusive for other phasing combinations due to the small sample sizes in the database.

Rural Intersections

Table 9 summarizes the results of the before-after analysis across approaches at urban intersections in the database.

Table 9. Before-after analysis results (rural intersections)

Before-After Phasing[1]	n[2]	Before Period			After Period			CMF	95% Confidence Interval
		LTOD Crashes	Years	Crash Frequency[3]	LTOD Crashes	Years	Crash Frequency[3]		
KABC Crashes									
PM to PM	4	1	12	0.08	0	12	0.00	N/A	N/A
PM to PP	12	4	36	0.11	5	34	0.15	1.06	0.15 - 2.84
PP to PM	0	0	0	0.00	0	0	0.00	N/A	N/A
PP to PP	63	11	189	0.06	10	170	0.06	0.93	0.31 - 1.87
PT to PM	3	0	9	0.00	0	9	0.00	N/A	N/A
PT to PP	21	0	63	0	11	60	0.18	N/A	N/A
O Crashes									
PM to PM	4	0	12	0	0	12	0.00	N/A	N/A
PM to PP	12	6	36	0.17	6	34	0.18	0.91	0.19 - 2.19
PP to PM	0	0	0	0.00	0	0	0.00	N/A	N/A
PP to PP	63	22	189	0.12	16	170	0.09	0.77	0.36 - 1.35
PT to PM	3	0	9	0.00	0	9	0.00	N/A	N/A
PT to PP	21	0	63	0	6	60	0.10	N/A	N/A

[1]PM = permissive; PP = protected-permissive; PT = protected

[2]n = number of approaches

[3]crashes/year

The sample size of rural intersection approaches is relatively small. For four of the six possible phasing combinations do not have any crashes in the before period. Left-turn opposite-direction crashes decreased by about 23 percent (O crashes) to 7 percent (fatal and injury crashes) after FYA was installed at approaches with protected-permissive phasing in the before and after periods. The 95 percent confidence intervals for these results do cross 1.0, indicating the results are not statistically significant at that level; however, the trends are similar to what was seen in the comprehensive dataset.

Number of Through Lanes

The number of opposing through lanes crossed by left-turning traffic influences the number of potential conflict points a left-turning vehicle must cross to complete its maneuver. The project team examined the safety performance of approaches based on the number of through lanes crossed. Results are shown in this section for left-turns crossing either one or two lanes. There were only three approaches that crossed three opposing through lanes, so results for this analysis are not included here due to the small sample size.

One Opposing Through Lane

Table 10 summarizes the results of the before-after analysis of approaches where left-turning vehicles cross only one opposing through lane.

Table 10. Before-after analysis results (one opposing through lane)

Before-After Phasing[1]	n[2]	Before Period			After Period			CMF	95% Confidence Interval
		LTOD Crashes	Years	Crash Frequency[3]	LTOD Crashes	Years	Crash Frequency[3]		
KABC Crashes									
PM to PM	45	7	135	0.05	4	128	0.03	0.53	0.09 - 1.34
PM to PP	41	9	123	0.07	6	118	0.05	0.63	0.16 - 1.42
PP to PM	9	0	27	0.00	1	27	0.04	N/A	N/A
PP to PP	172	39	516	0.08	34	462	0.07	0.95	0.56 - 1.43
PT to PM	4	0	12	0.00	0	12	0.00	N/A	N/A
PT to PP	28	3	84	0.04	10	81	0.12	2.59	0.39 - 6.85
O Crashes									
PM to PM	45	23	135	0.17	16	128	0.13	0.70	0.33 - 1.22
PM to PP	41	19	123	0.15	8	118	0.07	*0.42*	*0.15 - 0.83*
PP to PM	9	0	27	0.00	0	27	0.00	N/A	N/A
PP to PP	172	79	516	0.15	50	462	0.11	**0.70**	**0.47 - 0.97**
PT to PM	4	1	12	0.08	1	12	0.08	0.50	0.00 - 2.51
PT to PP	28	1	84	0.01	5	81	0.06	2.59	0.03 - 10.35

[1]PM = permissive; PP = protected-permissive; PT = protected

[2]n = number of approaches

[3]crashes/year

Bold cells indicate CMFs for which the 95% confidence interval does not cross 1.0. *Italics indicate CMFs for which the 95% confidence interval does not cross 1.0; however, the sample size is relatively small.*

The crash frequency at sites where left-turning vehicles only cross one opposing through lane is relatively low compared to all sites (e.g., the before crash frequency for O crashes is about 0.14 crashes/year at these sites, compared to about 0.27 crashes/year at all locations). As a result,

while similar trends are seen as compared to all results, many of the resulting CMFs cross 1.0 due to the small sample size.

Left-turn opposite-direction O crashes decreased by about 30 percent after FYA was installed at approaches with protected-permissive phasing in the before and after period. This is a greater effect than was seen at all sites (i.e., 13 percent). However, the confidence interval overlaps the CMF for all sites. The effect on fatal and injury crashes at these same sites is less (i.e., about 5 percent reduction compared to 16 percent reduction at all sites); however, the confidence interval includes the CMF for all sites and has a wide range due to the small sample size.

Two Opposing Through Lanes

Table 11 summarizes the results of the before-after analysis of approaches where left-turning vehicles cross two opposing through lanes.

Table 11. Before-after analysis results (two opposing through lanes)

Before-After Phasing[1]	n[2]	Before Period			After Period			CMF	95% Confidence Interval
		LTOD Crashes	Years	Crash Frequency[3]	LTOD Crashes	Years	Crash Frequency[3]		
KABC Crashes									
PM to PM	17	10	51	0.20	2	48	0.04	*0.19*	*0.02 - 0.58*
PM to PP	28	7	84	0.08	14	71	0.20	2.07	0.64 - 4.33
PP to PM	3	0	9	0.00	0	9	0.00	N/A	N/A
PP to PP	300	324	900	0.36	250	848	0.29	**0.82**	**0.69 - 0.96**
PT to PM	1	0	3	0.00	0	3	0.00	N/A	N/A
PT to PP	86	21	258	0.08	62	244	0.25	**2.98**	**1.69 - 4.63**
O Crashes									
PM to PM	17	10	51	0.20	3	48	0.06	*0.29*	*0.04 - 0.77*
PM to PP	28	9	84	0.11	19	71	0.27	2.25	0.83 - 4.35
PP to PM	3	1	9	0.11	0	9	0.00	N/A	N/A
PP to PP	300	418	900	0.46	349	848	0.41	0.88	0.76 - 1.01
PT to PM	1	0	3	0.00	3	3	1.00	N/A	N/A
PT to PP	86	29	258	0.11	99	244	0.41	**3.49**	**2.2 - 5.07**

[1]PM = permissive; PP = protected-permissive; PT = protected

[2]n = number of approaches

[3]crashes/year

Bold cells indicate CMFs for which the 95% confidence interval does not cross 1.0. *Italics indicate CMFs for which the 95% confidence interval does not cross 1.0; however, the sample size is relatively small.*

Results for these locations are similar to what was seen at all locations. Left-turn opposite-direction crashes decreased by about 12 percent (O crashes) to 18 percent (fatal and injury crashes) after FYA was installed at approaches with protected-permissive phasing in the before

and after periods. They also appear to have decreased by a greater magnitude at locations where permissive phasing was present in the before and after periods. However, the sample size is relatively small at these locations.

Conversely, LTOD crashes increased at locations where the signal phasing was changed from protected only left-turns to protected-permissive left-turns. Results were inconclusive for other phasing combinations due to the small sample sizes in the database.

Effect of Speed Limit

The project team also evaluated how the safety performance of FYA installations may vary based on the posted speed limit of the approach. To provide the largest possible sample size and minimize confounding factors related to phasing changes in the before and after periods, this analysis considers only sites for which the left-turn phasing is protected-permissive in the before and after periods. Table 12 summarizes the results of this analysis.

Table 12. Before-after analysis results based on posted speed limit

Posted Speed Limit[1]	n[2]	Before Period			After Period			CMF	95% Confidence Interval
		LTOD Crashes	Years	Crash Frequency[3]	LTOD Crashes	Years	Crash Frequency[3]		
KABC Crashes									
20-30 MPH	34	7	102	0.07	2	90	0.02	*0.28*	*0.02 - 0.87*
35-40 MPH	196	169	588	0.29	138	541	0.26	0.88	0.70 - 1.09
45-50 MPH	97	94	291	0.32	75	284	0.26	0.81	0.58 - 1.07
55+ MPH	15	3	45	0.07	3	40	0.08	0.84	0.06 - 2.63
O Crashes									
20-30 MPH	34	15	102	0.15	9	90	0.10	0.64	0.22 - 1.26
35-40 MPH	196	260	588	0.44	206	541	0.38	0.86	0.71 - 1.02
45-50 MPH	97	117	291	0.40	95	284	0.33	0.82	0.62 - 1.06
55+ MPH	15	2	45	0.04	4	40	0.10	1.50	0.08 - 4.90

[1]Left-turn signal phasing is protected-permissive in the before and after periods for all approaches

[2]n = number of approaches

[3]crashes/year

Bold cells indicate CMFs for which the 95% confidence interval does not cross 1.0. *Italics indicate CMFs for which the 95% confidence interval does not cross 1.0; however, the sample size is relatively small.*

For most posted speed limits, the installation of FYA left-turn phasing is correlated with a reduction in crashes of about 12 percent to 19 percent. There are a few instances higher or lower than this, but they are based on extremely small sample sizes. There is no clear trend in the results based on the posted speed limit.

Intersection-Level Analyses

Intersection-level evaluations were completed for pedestrian crashes, as well as LTOD crashes.

LTOD Crashes

As noted previously, the project team was not able to reliably assign traffic volumes to approaches within the project scope. Therefore, the project team conducted intersection-level analyses to examine the safety performance of FYA installations while accounting for traffic volumes. For this analysis, only intersections where all approaches with FYA had the same phasing in the before and after periods were considered. It also only considers LTOD crashes on approaches with FYA. Table 13 summarizes the results of this analysis.

The following limitations of the analysis should be kept in mind when reviewing the results in Table 13:

- The AADT volumes used in this analysis are for entire approaches and do not consider specific changes in left-turning volumes.

Table 13. Before-after analysis results for intersections

Before-After Phasing[1]	n[2]	Before Period			After Period			CMF	95% Confidence Interval
		LTOD Crashes[3]	AADT	Crash Frequency[4]	LTOD Crashes[3]	AADT	Crash Frequency[4]		
KABC Crashes									
PM to PM	9	9	584,271	0.33	6	568,436	0.23	0.64	0.15 - 1.45
PM to PP	12	8	540,636	0.22	6	432,580	0.21	0.97	0.18 - 2.41
PP to PM	0	0	0	0	0	0	0.00	N/A	N/A
PP to PP	179	356	12,725,240	0.66	261	11,767,892	0.53	0.86	0.72 - 1.01
PT to PM	2	0	52,096	0	2	53,844	0.33	N/A	N/A
PT to PP	47	21	2,807,012	0.15	64	2,677,299	0.48	**3.19**	**1.78 - 5.02**
O Crashes									

Before-After Phasing[1]	n[2]	Before Period			After Period			CMF	95% Confidence Interval
		LTOD Crashes[3]	AADT	Crash Frequency[4]	LTOD Crashes[3]	AADT	Crash Frequency[4]		
PM to PM	9	10	584,271	0.37	6	568,436	0.23	0.57	0.14 - 1.27
PM to PP	12	15	540,636	0.42	3	432,580	0.10	*0.24*	*0.04 - 0.60*
PP to PM	0	0	0	0	0	0	0.00	N/A	N/A
PP to PP	179	494	12,725,240	0.92	375	11,767,892	0.76	**0.82**	**0.66 - 0.99**
PT to PM	2	0	52,096	0	2	53,844	0.33	N/A	N/A
PT to PP	47	43	2,807,012	0.3	98	2,677,299	0.73	**2.33**	**1.53 - 3.30**

[1]PM = permissive; PP = protected-permissive; PT = protected

[2]n = number of intersections

[3]only includes crashes on approaches with FYA

[4]crashes/year

Bold cells indicate CMFs for which the 95% confidence interval does not cross 1.0. *Italics indicate CMFs for which the 95% confidence interval does not cross 1.0; however, the sample size is relatively small.*

Factoring in traffic volumes, the results for intersections are similar to what was seen at the approach level, with LTOD crashes decreasing when phasing was protected-permissive in the before and after periods but increasing when the phasing is converted from protected to protected-permissive. For all other sites, the sample sizes are small.

Pedestrian Crashes

One objective of the project was to evaluate whether FYA installation affected pedestrian crashes. Table 14 summarizes the available pedestrian crash data. Similar to the previous LTOD crashes analysis, only intersections where all approaches with FYA had the same phasing in the before and after periods were considered. The table includes all pedestrian crashes at these intersections involving a left-turning vehicle from one of the approaches with FYA signal operation.

Table 14. Pedestrian crashes

Before-After Phasing[1]	n[2]	Pedestrian Crashes	
		Before Period	After Period
PM to PM	9	0	0
PM to PP	12	0	0
PP to PM	0	0	0
PP to PP	179	3	2

Before-After Phasing[1]	n[2]	Pedestrian Crashes	
		Before Period	After Period
PT to PM	2	0	0
PT to PP	47	0	0

[1]PM = permissive; PP = protected-permissive; PT = protected

[2]n = number of intersections

There were only five reported pedestrian crashes that fit the parameters of this analysis. All five crashes took place at locations with protected-permissive phasing in the before and after periods. The number of crashes decreased from three crashes in the before period to two crashes in the after period. However, this sample size is too small to draw any meaningful conclusions from. Previous work has indicated that the FYA operation may not significantly affect safety performance with respect to pedestrian crashes (*Van Houten, et al., 2012*).

Summary

Below are the key findings from this analysis:

- LTOD crash frequency is highest at locations with protected-permissive phasing, followed by locations with permissive phasing. Locations with protected-only left-turn phasing have the lowest LTOD crash frequency.
- Holding left-turn signal phasing constant, installing FYA operation for left-turns appears to reduce LTOD crashes.
- At sites where the left-turn phasing is protected-permissive in the before and after periods, a 13 percent-18 percent reduction in O LTOD and a 14 percent-16 percent reduction in KABC LTOD crashes could be expected (based on the CMFs in Table 7 and Table 13).
- This trend is present across urban and rural locations, approaches where the left-turning vehicle must cross 1 or 2 opposing lanes, and through a range of speed limits. The magnitude of the effect varies across situations, especially when sample sizes are small, but the overall trend is generally consistent.
- A reduction in LTOD crashes could also likely be expected when the left-turn phasing is permissive only; however, the sample size of some of these instances is small and results vary widely.
- The safety benefit of FYA phasing is not significant enough to overcome the negative effect of converting an approach from protected-only left-turn phasing to protected-permissive or permissive phasing operation.
- There were not enough reported pedestrian crashes to conduct a statistically significant before-after analysis.

Table 15 compares the results in Table 13 to previous research. Note that the other studies shown in the table were typically conducted using an EB or other more rigorous methodology. They often are also looking at all left-turn crashes, and not just LTOD crashes.

Table 15. CMFs from past studies compared to this study

Study	CMFs			
	PP to PP	PT to PP	PM to PP	PM to PM
Schattler, et al. (2016)	0.62 (KABCO)	N/A		
Simpson and Troy (2015)[1]	0.84 (KABCO)/ 0.75 (KABC)	3.68 (KABCO)/ 4.78 (KABC)	0.60 (KABCO)/ 0.60 (KABC)	0.50 (KABCO)/ 0.35 (KABC)
Shea and Medina (2018)[1]	0.98 (KABCO)	N/A		
Srinivasan, et al. (2020)	0.51 – 0.85 (KABCO)[2]	N/A		
Srinivasan, et al. (2011)[1]	0.81 (KABCO)	2.24 (KABCO)	0.64 (KABCO)	N/A
This Study	0.86 (KABC)/ 0.82 (O)	3.19 (KABC)/ 2.33 (O)	0.97 (KABC)/ 0.24 (O)	0.64 (KABC)/ 0.57 (O)

[1]CMFs are for all left-turn crashes, not just LTOD crashes
[2]CMFs differ based on number of legs at intersection and number of approaches FYA installed on.

The findings from this study are generally consistent with those from other studies in terms of the overall magnitude and direction of the resulting CMFs. This is particularly true for locations where left-turn phasing remained protected-permissive across both periods or where it changed from protected only to protected-permissive phasing. These are the two groups with the largest sample sizes in this study. The results for the permissive to protected-permissive phasing pairing are the most different when comparing this study to others; however, the sample size in all studies, including this one, were relatively small.

Economic Analysis

The project team evaluated the benefit-cost ratio (B/C) of installing FYA. This was completed following guidance in FHWA's *Highway Safety Benefit-Cost Analysis Guide* (Lawrence, et al., 2018) and provided by MoDOT. This analysis was completed using the following parameters:

- **Crash costs** – Crash costs were provided by MoDOT as follows:
  - **KABC Crashes** – $466,373/crash
  - **O Crashes** – $10,500/crash
- **FYA Installation cost** - $2,819.43/approach (provided by MoDOT)
- **Lifespan of FYA** – 10 years (provided by MoDOT)
- **Discount Rate** – 7 percent (taken from USDOT guidance for RAISE grants (USDOT, 2022))
- **Traffic Volume & Other Trends** – This analysis assumes that traffic volumes, and other trends that may affect crashes (e.g., changes in vehicle fleet, weather, driver behavior)

are constant throughout the course of the 10-year analysis period and, thus, the resulting crash reduction is the same across all years.

The results of this analysis are shown in Table 16. Note that the analysis was only conducted for before-after phasing pairs for which a CMF was available in Table 13. This analysis also only considers safety benefits and does not consider other potential benefits (e.g., changes in delay).

Table 16. Benefit-cost analysis results

Before-After Phasing[1]	Before Period LTOD Crashes/Year[2]		CMFs[3]		Crash Reduction (Crashes/Year)		Lifespan Benefit[4]	B/C
	KABC	O	KABC	O	KABC	O		
PM to PM	0.089	0.17	*0.64*	*0.57*	*0.032*	*0.074*	*$109,860.44*	*38.97*
PM to PP	0.077	0.14	*0.97*	*0.24*	*0.0023*	*0.10*	*$15,177.01*	*5.38*
PP to PP	0.26	0.35	0.86	0.82	0.036	0.064	$122,873.27	43.58
PT to PP	0.075	0.086	3.19	2.33	-0.16	-0.11	$(544,412.92)	-193.09

[1]PM = permissive; PP = protected-permissive; PT = protected
[2]Calculated from Table 7
[3]Taken from Table 13
[4]Attachment "A" includes the annual benefit calculated for each before-after phasing pair
Italicized text indicates CMF used in B/C calculations is based on a small sample size and the resulting confidence intervals vary widely

This analysis estimates that the lifecycle benefits of installing FYA on an intersection approach are expected to be approximately 5 to 44 times greater than the installation cost, assuming that the phasing is not changed from protected only left-turn phasing. As previously noted, changing from protected-only left-turn phasing to some type of permissive phasing is expected to result in an increase in crashes, and thus a negative benefit.

These results are slightly lower than the results of the benefit-cost evaluation found in FHWA's *Safety Evaluation of Flashing Yellow Arrow at Signalized Intersections* (Srinivasan, et al., 2020). This study estimated benefit-cost ratios from about 56:1 to 84:1 for sites where the phasing is protected-permissive in the before and after periods and 89:1 when the phasing was permissive in the before and after periods.

Additional Analysis Viability Assessment

One objective of this project was to assess whether a more rigorous EB-based before-after study should be completed. An EB-based before-study could provide more accurate CMFs than

those summarized in the previous tables, which are based on a simple before-after study. Completing an EB-based before-after study requires building a database of treatment sites (i.e., the sites with FYA analyzed in this memorandum) and reference sites (i.e., sites with similar characteristics and signal phasing operations, but without FYA indication). It would also require being able to assign traffic volumes to individual approaches at all treatment and reference sites. This work is beyond the resources currently available to this project.

The project team's understanding is that the primary goal of this work was to determine whether FYA installation in Missouri has had a safety benefit. As previously stated, holding left-turn signal phasing constant (or at least not converting a protected phase to any kind of permissive phasing), installing FYA operation for left-turns appeared to have reduced LTOD crashes in Missouri. Further, Table 15 shows that the findings from this study are generally consistent with those from other studies in terms of the overall magnitude and direction of the resulting CMFs. Given this consistency with previous work, completing an EB-based before-after study does not appear to be necessary to determine whether there is a safety benefit to FYA installation in Missouri. Such an analysis could still be useful for developing a more accurate CMF for economic evaluation and project prioritization. This summary was reviewed with MoDOT staff in a meeting on November 17, 2022. At this meeting, MoDOT staff agreed that the primary goal had been accomplished with this analysis and determined not to move forward with an EB-based before-after study.

Conclusion

Holding left-turn signal phasing constant, installing FYA operation for permissive left-turns appears to reduce LTOD crashes. At sites where the left-turn phasing is protected-permissive in the before and after periods, an 18 percent reduction in O LTOD crashes and a 14 percent reduction in KABC LTOD crashes could be expected (based on the CMFs in Table 7 and Table 13). This trend is present across urban and rural locations, approaches where the left-turning vehicle must cross 1 or 2 opposing lanes, and through a range of speed limits. The magnitude of the effect varies across situations, especially when sample sizes are small, but the overall trend is generally consistent.

Further, this analysis estimates that the lifecycle benefits of installing FYA on an intersection approach are expected to be approximately 5 to 44 times greater than the installation cost, assuming that some form of permissive left-turn phasing (i.e., protected-permissive, or permissive) is already present and that a protected phase (i.e., protected only or protected-permissive) is not removed.

The safety benefit of FYA phasing is not significant enough to overcome the negative effect of converting an approach from protected-only left-turn phasing to protected-permissive or permissive phasing operation.

Based on these results, the FYA could be expected to have a safety benefit for LTOD crashes at locations where it is being used to replace circular green permissive left-turn indications (e.g., a five-section doghouse style signal for protected-permissive phasing, a standard three-section signal for permissive left-turns). Replacing a protected left-turn signal phase with a permissive left-turn signal phase, even a protected-permissive phasing operation, would be expected to result in increased LTOD crashes, even if a FYA is installed as part of the phasing conversion.

These results are based on a simple before-after analysis. Further analyses considering traffic volumes at the approach level and other trends could provide a more accurate estimate of FYA safety performance. However, the results from this analysis are generally consistent with what has been observed in previous studies of FYA safety performance in other states.

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Appendix A - FYA Locations and Installation Dates

SIGNAL ID	DISTRICT	COUNTY	ROUTE	CROSS STREET	LATITUDE	LONGITUDE	EASTBOUND INSTALLATION DATE	WESTBOUND INSTALLATION DATE	NORTHBOUND INSTALLATION DATE	SOUTHBOUND INSTALLATION DATE
6855	NW	BUCHANAN	MO 6 E	CST VILLAGE DR S	39.77699	-94.79996	10/26/2015	10/26/2015	10/26/2015	10/26/2015
5104	NW	BUCHANAN	MO 6 E	CST WOODBINE RD S	39.77699	-94.79670	10/27/2015	10/27/2015	10/27/2015	10/27/2015
7765	NW	BUCHANAN	MO 6 E	RP IS29S TO MO6 S	39.77696	-94.79433		11/10/2015		
6856	NW	BUCHANAN	MO 6 E	RP MO6 TO IS29N N	39.77702	-94.79301	11/10/2015			
4995	NW	BUCHANAN	LP 29 S	CST BLACKWELL RD E	39.81394	-94.81519			6/6/2019	6/6/2019
7377	NW	BUCHANAN	LP 29 S	CST NORTHRIDGE DR E	39.81101	-94.81521				5/1/2019
4998	NW	BUCHANAN	US 169 S	CST NORTH VILLAGE DR E	39.81202	-94.80661	11/16/2016	11/16/2016	11/16/2016	11/16/2016
5030	NW	BUCHANAN	US 169 S	CST GENE FIELD RD E	39.79209	-94.81052	7/1/2016	7/1/2016		
4999	NW	BUCHANAN	US 169 S	CST FARAON ST E	39.76965	-94.80352	11/15/2016	11/15/2016	11/15/2016	11/15/2016
7375	NW	BUCHANAN	US 169 S	RT YY E	39.75525	-94.80367	9/12/2016	9/12/2016	9/12/2016	9/12/2016
7735	NW	BUCHANAN	US 169 S	RP US36W TO US169 N	39.74729	-94.80217			9/26/2018	
7376	NW	BUCHANAN	US 169 S	RP US169 TO US36E E	39.74653	-94.80206				9/27/2018
3681	NW	DEKALB	US 69 S	LP 35 S	39.75516	-94.23430			7/16/2019	
11105	NW	DEKALB	US 69 S	LP 35 N	39.75357	-94.23432				7/16/2019
3682	NW	DEKALB	US 69 S	OR 36 E	39.75288	-94.23427			7/16/2019	7/16/2019
2387	NW	DEKALB	US 69 S	BU 36 E	39.74849	-94.23510	8/14/2019	8/14/2019	8/14/2019	8/14/2019

SIGNAL ID	DISTRICT	COUNTY	ROUTE	CROSS STREET	LATITUDE	LONGITUDE	EASTBOUND INSTALLATION DATE	WESTBOUND INSTALLATION DATE	NORTHBOUND INSTALLATION DATE	SOUTHBOUND INSTALLATION DATE
5002	NW	HARRISON	US 136 E	CST 38TH ST S	40.26520	-94.01588	5/11/2018	5/11/2018		
6895	NW	HARRISON	US 136 E	CST 39TH ST S	40.26518	-94.01471	5/9/2018	5/9/2018		
5026	NW	HARRISON	US 69 S	US 136 E	40.26528	-94.02686		5/24/2018	5/24/2018	5/24/2018
16366	NW	LIVINGSTON	US 65 S	.241 mile(s) before CST HARVEST DR E	39.82664	-93.54761			4/26/2018	
14906	NW	CAPE GIRARDEAU	MO 190 E	CRD HORNET RD S	39.81912	-93.55714	8/20/2013	8/20/2013	8/20/2013	8/20/2013

Northeast District

SIGNAL ID	DISTRICT	COUNTY	ROUTE	CROSS STREET	LATITUDE	LONGITUDE	EASTBOUND INSTALLATION DATE	WESTBOUND INSTALLATION DATE	NORTHBOUND INSTALLATION DATE	SOUTHBOUND INSTALLATION DATE
14465	NE	LINCOLN	MO 47 S	CST ELLIS AVE S	38.98261	-90.99027	12/28/2011	12/28/2011	12/28/2011	12/28/2011
10955	NE	LINCOLN	MO 47 S	RT J S	38.97706	-91.00249	9/14/2012	9/14/2012	9/14/2012	9/14/2012
13445	NE	LINCOLN	RT U E	RP RTU TO US61S S	38.90854	-90.92483		9/19/2018		
13446	NE	LINCOLN	RT U E	RP US61N TO RTU E	38.90856	-90.92227	9/19/2018			
4924	NE	MACON	US 63 S	CST MAFFRY AVE S	39.74598	-92.46603			6/30/2019	6/30/2019
4923	NE	MACON	US 63 S	CST ELM ST E	39.74480	-92.46511			8/4/2020	7/20/2019
1730	NE	MARION	US 61 S	CST STARDUST DR E	39.72198	-91.39196	7/29/2013	7/29/2013	7/29/2013	7/29/2013
946	NE	MARION	US 61 S	CST PLEASANT ST E	39.71300	-91.39162	9/25/2012		9/25/2012	9/25/2012
945	NE	MARION	US 61 S	RT MM E	39.70577	-91.38906	8/27/2013	8/27/2013	8/27/2013	8/27/2013
1826	NE	RANDOLPH	US 24 E	RP US24 TO US63S S	39.44381	-92.42565		12/22/2020		
1827	NE	RANDOLPH	US 24 E	RP US24 TO US63N N	39.44489	-92.42251	12/15/2020	12/15/2020		
1828	NE	RANDOLPH	US 24 E	OR 63 S	39.44536	-92.42109	12/15/2020	12/15/2020		
12265	NE	WARREN	MO 47 S	CST WARRIOR AVE E	38.79594	-91.14863	12/1/2018	12/1/2018		

Kansas City District

SIGNAL ID	DISTRICT	COUNTY	ROUTE	CROSS STREET	LATITUDE	LONGITUDE	EASTBOUND INSTALLATION DATE	WESTBOUND INSTALLATION DATE	NORTHBOUND INSTALLATION DATE	SOUTHBOUND INSTALLATION DATE
14896	KC	CASS	MO 7 S	CST COUNTRY CLUB DR E	38.79112	-94.26196			9/12/2013	9/12/2013
6875	KC	CASS	MO 7 S	CST ELM ST E	38.65692	-94.32880	1/1/2010	1/1/2010		
15126	KC	CASS	MO 7 S	CRD 275TH ST E	38.61736	-94.34935			6/12/2013	
4255	KC	CASS	MO 58 E	CST SCOTT AVE S	38.81472	-94.53478	9/25/2019	9/25/2019		9/25/2019
4254	KC	CASS	MO 58 E	CST SCOTT AVE S	38.81498	-94.53399			9/26/2019	
1606	KC	CASS	MO 58 E	RT Y S	38.81424	-94.52574	9/28/2009	9/28/2009	9/28/2009	9/28/2009
4257	KC	CASS	MO 58 E	CST TOWNE CENTER DR S	38.81381	-94.51714	9/28/2009	9/28/2009		
4259	KC	CASS	MO 58 E	CST NORTH AVE E	38.81357	-94.51222	9/28/2009	9/28/2009		
216	KC	CASS	MO 58 E	CST POWELL PKWY S	38.81341	-94.50724	9/28/2009	9/28/2009		
217	KC	CASS	MO 58 E	CRD PECULIAR DR S	38.81336	-94.50597		9/30/2009		
218	KC	CASS	MO 58 E	RP IS49S TO MO58 S	38.81337	-94.50501		9/30/2009		
219	KC	CASS	MO 58 E	RP MO58 TO IS49N N	38.81330	-94.50287	9/30/2009			
221	KC	CASS	MO 58 E	OR 49 S	38.81322	-94.50178	9/30/2009	9/30/2009		
220	KC	CASS	MO 58 E	CST BEL-RAY BLVD N	38.81298	-94.49746	9/29/2009	9/29/2009		
215	KC	CASS	MO 58 E	CST CLINT DR E	38.81283	-94.49398	9/29/2009	9/29/2009		
2100	KC	CASS	RT C S	RT J S	38.72334	-94.45413	5/24/2011			
2103	KC	CASS	RT C S	RT J S	38.72282	-94.45587		5/24/2011		

SIGNAL ID	DISTRICT	COUNTY	ROUTE	CROSS STREET	LATITUDE	LONGITUDE	EASTBOUND INSTALLATION DATE	WESTBOUND INSTALLATION DATE	NORTHBOUND INSTALLATION DATE	SOUTHBOUND INSTALLATION DATE
1605	KC	CASS	MO 291 S	.001 mile(s) after CST WALMART DR E	38.66518	-94.36696			5/4/2016	5/4/2016
1565	KC	CLAY	US 69 S	SP 10 E	39.36307	-94.23612			5/3/2017	5/3/2017
2031	KC	CLAY	US 69 S	CST TRACY AVE E	39.35307	-94.24058			2/23/2021	2/23/2021
1163	KC	CLAY	US 69 S	CST WORNALL RD E	39.34515	-94.24417			2/24/2021	2/24/2021
1564	KC	CLAY	US 69 S	CST CROWN HILL RD S	39.34078	-94.24912			5/2/2017	5/2/2017
1563	KC	CLAY	US 69 S	CST MCCLEARY RD S	39.33324	-94.26382			3/9/2021	
16956	KC	CLAY	US 69 S	.099 mile(s) after CST GROVE ST S	39.20529	-94.48582				11/3/2014
1139	KC	CLAY	MO 10 E	CST JESSE JAMES RD S	39.33798	-94.24916	1/1/2018	1/1/2018	1/1/2018	1/1/2018
1138	KC	CLAY	MO 10 E	SP 10 E	39.33845	-94.24639	1/1/2018	1/1/2018		
6316	KC	CLAY	MO 1 S	CST NE 80TH ST E	39.23854	-94.53960			5/26/2017	5/26/2017
223	KC	CLAY	MO 1 S	CST 73RD TER E	39.22640	-94.54749			5/26/2017	5/26/2017
232	KC	CLAY	MO 1 S	CST 72ND ST E	39.22416	-94.54840				5/26/2017
234	KC	CLAY	MO 1 S	CST 64TH ST E	39.20977	-94.54845			5/26/2017	5/26/2017
230	KC	CLAY	MO 1 S	CST NE 53RD ST E	39.19015	-94.54873			8/4/2014	8/4/2014
1603	KC	CLAY	MO 1 S	CST CLAY EDWARDS DR E	39.14763	-94.55597				1/1/2015
331	KC	CLAY	MO 269 S	RP MO210W TO MO269 W	39.15143	-94.53656			7/11/2017	
335	KC	CLAY	MO 269 S	RP MO269 TO MO210E E	39.14990	-94.53585				7/11/2017

SIGNAL ID	DISTRICT	COUNTY	ROUTE	CROSS STREET	LATITUDE	LONGITUDE	EASTBOUND INSTALLATION DATE	WESTBOUND INSTALLATION DATE	NORTHBOUND INSTALLATION DATE	SOUTHBOUND INSTALLATION DATE
15035	KC	CLAY	MO 92 E	CST N COUNTRY AVE S	39.36785	-94.37642	9/30/2013	9/30/2013	9/30/2019	9/30/2019
2029	KC	CLAY	MO 92 E	CST PLATTE CLAY WAY S	39.36792	-94.36729	11/4/2013	11/4/2013		
1575	KC	CLAY	MO 92 E	MO 33 S	39.36789	-94.36221	11/4/2013	11/4/2013	11/4/2013	11/4/2013
16817	KC	CLAY	US 169 S	CST HOSPITAL DR E	39.37817	-94.58312	12/24/2019		12/24/2019	12/24/2019
4287	KC	CLAY	MO 33 S	CST 19TH ST E	39.35327	-94.36077		11/16/2020		
16226	KC	CLAY	MO 291 S	CST NE 104TH ST E	39.27904	-94.46617		8/14/2017	8/14/2017	8/14/2017
6073	KC	CLAY	MO 291 S	CST NE 96TH ST E	39.26763	-94.45195	11/15/2013	11/15/2013	11/15/2013	11/15/2013
256	KC	CLAY	MO 291 S	CST GLENN HENDREN DR E	39.26202	-94.44666				1/1/2014
15076	KC	CLAY	MO 291 S	CST COLLEGE ST E	39.24781	-94.44615	5/1/2017	5/1/2017		
1583	KC	JACKSON	US 40 E	CST STADIUM DR E	39.06253	-94.47824		9/21/2020		
824	KC	JACKSON	US 40 E	.001 mile(s) before PVT BLUE RIDGE MALL E	39.04596	-94.44039		9/9/2020		
14925	KC	JACKSON	US 40 E	.1 mile(s) before CST LARSON AVE S	39.04476	-94.43682	10/11/2013	10/11/2013	10/11/2013	10/11/2013
842	KC	JACKSON	US 40 E	CST WASHINGTON ST S	39.03579	-94.41989		9/9/2020		
16	KC	JACKSON	US 40 E	CST HOCKER RD S	39.03545	-94.41096		9/22/2020		
846	KC	JACKSON	US 40 E	CST CLIFF AVE S	39.03360	-94.36474		7/1/2017		
4322	KC	JACKSON	US 40 E	CST VALLEY VIEW PKWY E	39.03203	-94.35844			9/23/2020	9/23/2020
7858	KC	JACKSON	US 40 E	CST LITTLE BLUE PKWY S	39.02983	-94.35355				8/31/2018

SIGNAL ID	DISTRICT	COUNTY	ROUTE	CROSS STREET	LATITUDE	LONGITUDE	EASTBOUND INSTALLATION DATE	WESTBOUND INSTALLATION DATE	NORTHBOUND INSTALLATION DATE	SOUTHBOUND INSTALLATION DATE
856	KC	JACKSON	US 40 E	RT AA E	39.00993	-94.26695	9/9/2020	9/9/2020		
110	KC	JACKSON	US 40 E	CST ADAMS DAIRY PKWY N	39.01314	-94.25360	9/17/2020	9/17/2020	9/17/2020	9/17/2020
15369	KC	JACKSON	US 40 E	RT AA E	39.01950	-94.19797			12/19/2013	12/19/2013
4473	KC	JACKSON	MO 7 S	CRD TWYMAN RD S	39.13683	-94.29151			4/26/2016	
4464	KC	JACKSON	MO 7 S	RP MO7 TO US24E E	39.13551	-94.29077				4/26/2016
685	KC	JACKSON	MO 7 S	CST PINK HILL RD E	39.05280	-94.27079			4/4/2017	4/4/2017
695	KC	JACKSON	MO 7 S	CST ROANOKE DR E	39.04578	-94.27107			3/31/2017	3/31/2017
696	KC	JACKSON	MO 7 S	CST DUNCAN RD E	39.03829	-94.27143			3/31/2017	3/31/2017
4803	KC	JACKSON	MO 7 S	CST CLUB DR E	39.03553	-94.27155			4/5/2017	4/5/2017
694	KC	JACKSON	MO 7 S	CST SHAW PKWY E	39.03182	-94.27170			4/6/2017	4/6/2017
688	KC	JACKSON	MO 7 S	OR 70 E	39.02776	-94.27184			4/7/2017	4/7/2017
687	KC	JACKSON	MO 7 S	CST RD MIZE ROAD E	39.02374	-94.27203			4/10/2017	4/10/2017
692	KC	JACKSON	MO 7 S	CST VESPER ST E	39.02053	-94.27220			4/14/2017	4/14/2017
691	KC	JACKSON	MO 7 S	CST MAIN ST E	39.01823	-94.27234			4/13/2017	
859	KC	JACKSON	MO 7 S	PVT CONSUMER LN E	39.00701	-94.27270			4/12/2017	4/12/2017
700	KC	JACKSON	MO 7 S	CST VICTOR DR E	39.00473	-94.27283	7/23/2020	7/23/2020	4/13/2017	4/13/2017
701	KC	JACKSON	MO 7 S	CST CLARK RD E	39.00098	-94.27292	7/23/2020	7/23/2020	4/17/2017	4/17/2017
1695	KC	JACKSON	MO 7 S	CST MORELAND SCHOOL RD E	38.98749	-94.27351	7/22/2020	7/22/2020	4/17/2017	4/17/2017

SIGNAL ID	DISTRICT	COUNTY	ROUTE	CROSS STREET	LATITUDE	LONGITUDE	EASTBOUND INSTALLATION DATE	WESTBOUND INSTALLATION DATE	NORTHBOUND INSTALLATION DATE	SOUTHBOUND INSTALLATION DATE
1592	KC	JACKSON	MO 7 S	CST SW LAKE VILLAGE DR E	38.98204	-94.27385			4/18/2017	4/18/2017
16121	KC	JACKSON	MO 7 S	.001 mile(s) before RP MO7 TO US50W W	38.89398	-94.26465			11/23/2016	
16120	KC	JACKSON	MO 7 S	.006 mile(s) before RP US50E TO MO7 E	38.89258	-94.26466				11/23/2016
748	KC	JACKSON	US 24 E	CST E WINNER RD E	39.10667	-94.48522		9/1/2020		
759	KC	JACKSON	US 24 E	CST NORTHERN BLVD S	39.10271	-94.45233	9/15/2020	9/15/2020	9/15/2020	9/15/2020
779	KC	JACKSON	US 24 E	CST LIBERTY ST S	39.10143	-94.41669	9/24/2020	9/24/2020		
775	KC	JACKSON	US 24 E	CST NOLAND RD S	39.10125	-94.41279	9/16/2020	9/16/2020	9/16/2020	9/16/2020
778	KC	JACKSON	US 24 E	CST DICKINSON RD S	39.10216	-94.40334		9/16/2020		
776	KC	JACKSON	US 24 E	CST LEES SUMMIT RD S	39.10509	-94.39401	9/2/2020	9/2/2020		
777	KC	JACKSON	US 24 E	CST INDEPENDENCE AVE E	39.10754	-94.39207	9/3/2020	9/3/2020		
782	KC	JACKSON	US 24 E	RP MO291N TO US24 N	39.11745	-94.38413	9/2/2020			
4316	KC	JACKSON	US 24 E	CST DOVER DR S	39.11847	-94.37872	9/8/2020	9/8/2020		
787	KC	JACKSON	US 24 E	CST JENNINGS RD S	39.11957	-94.37433	9/8/2020	9/8/2020		
786	KC	JACKSON	US 24 E	CST SUSQUEHANNA RIDGE E	39.12130	-94.36875	9/8/2020	9/8/2020		
784	KC	JACKSON	US 24 E	CST KENTUCKY RD E	39.12775	-94.35690	1/1/2018	1/1/2018	1/1/2018	1/1/2018
5716	KC	JACKSON	MO 150 E	CST WHITE AVE S	38.85803	-94.52421			1/1/2018	1/1/2018
7480	KC	JACKSON	MO 150 E	CST HORRIDGE RD S	38.85419	-94.43570	7/5/2011	7/5/2011		

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13927	KC	JACKSON	MO 150 E	CST SW PRYOR RD S	38.85369	-94.41721	9/15/2011	9/15/2011		
6113	KC	JACKSON	MO 150 E	CST SW REGATTA DR S	38.85319	-94.39512	7/5/2011	7/5/2011		
2653	KC	JACKSON	MO 150 E	CST SW WINDEMERE DR S	38.85294	-94.38739	6/1/2012	6/1/2012		
4324	KC	JACKSON	MO 150 E	CST SW CHEDDINGTON DR S	38.85282	-94.38369	6/1/2012	6/1/2012		
4585	KC	JACKSON	MO 150 E	OR 291 S	38.85263	-94.37939	3/1/2014	3/1/2014	3/1/2014	
6965	KC	JACKSON	RT RA S	CST SE TODD GEORGE PKWY S	38.90317	-94.33979			10/22/2018	
4336	KC	JACKSON	RT RA S	RP RTRA TO US50E E	38.90126	-94.33986				10/22/2018
16965	KC	JACKSON	RT RA S	OR 50 E	38.90042	-94.33991	12/14/2020		12/14/2020	12/14/2020
1209	KC	JACKSON	MO 12 E	CST E WINNER RD E	39.09561	-94.46442	3/2/2021	3/2/2021		
1591	KC	JACKSON	MO 12 E	CST ASH AVE S	39.09529	-94.45627	3/3/2021	3/3/2021		
1210	KC	JACKSON	MO 12 E	CST FOREST AVE S	39.09452	-94.43632	3/4/2021	3/4/2021		
1020	KC	JACKSON	MO 78 E	CST TELEVISION PL E	39.08121	-94.48710	9/1/2020	9/1/2020		
1025	KC	JACKSON	MO 78 E	CST CRYSLER AVE S	39.07980	-94.43228			9/14/2020	9/14/2020
8535	KC	JACKSON	MO 78 E	PVT HYVEE S	39.07846	-94.39440		9/1/2020		
2008	KC	JACKSON	MO 78 E	CST HUB DR S	39.07785	-94.38123	9/14/2020	9/14/2020		
1029	KC	JACKSON	MO 78 E	CST R D MIZE RD S	39.07770	-94.37660		9/21/2020		
4367	KC	JACKSON	MO 78 E	CST SWOPE DR S	39.07826	-94.36935	8/16/2010	8/16/2010		
4393	KC	JACKSON	MO 78 E	CST SPECK RD S	39.07958	-94.36241	7/27/2010	7/27/2010		

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4805	KC	JACKSON	MO 78 E	CST HOLKE RD E	39.08319	-94.34328	8/24/2010	8/24/2010	8/24/2010	8/24/2010
1043	KC	JACKSON	MO 291 S	CST NE MULBERRY ST E	38.93935	-94.35978	6/23/2017	6/23/2017		
16228	KC	JACKSON	MO 291 S	CST NE DEERBROOK ST E	38.93545	-94.35996	8/15/2017	8/15/2017		
1054	KC	JACKSON	MO 291 S	CST NE TUDOR RD E	38.93158	-94.36012	8/15/2017	8/15/2017		
1050	KC	JACKSON	MO 291 S	CST NE CHIPMAN RD E	38.92439	-94.36043	9/30/2018	9/30/2018		
1052	KC	JACKSON	MO 291 S	CST SE 3RD ST E	38.91487	-94.36222	9/29/2018	9/29/2018	9/29/2018	9/29/2018
1045	KC	JACKSON	MO 291 S	CST SE 5TH ST E	38.91023	-94.36256			8/11/2018	8/11/2018
1044	KC	JACKSON	MO 291 S	CST SE BAYBERRY LN E	38.90705	-94.36278			9/27/2018	9/27/2018
5780	KC	JACKSON	MO 291 S	OR 50 E	38.90381	-94.36303	9/13/2017	9/13/2017	9/13/2017	9/13/2017
1047	KC	JACKSON	MO 291 S	CST SE HAMBLEN RD S	38.90325	-94.36304			9/29/2018	
807	KC	JACKSON	N BROADWAY BLVD S	CST TRUMAN RD E	39.09569	-94.58863				9/8/2011
1114	KC	JACKSON	NE COLBERN RD E	OR 470 E	38.94625	-94.36332	8/8/2018	8/8/2018		
5743	KC	JACKSON	MAIN ST E	OR 49 S	38.88891	-94.52569		1/1/2018		
745	KC	JACKSON	E WINNER RD E	CST MANCHESTER AVE S	39.10562	-94.49126	6/1/2014	6/1/2014		
747	KC	JACKSON	CE WINNER RD E	US 24 W	39.10650	-94.48779		9/2/2020		

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7015	KC	JACKSON	WOODS CHAPEL RD S	OR 70 E	39.03200	-94.30517		11/18/2016		
5749	KC	JACKSON	BLUE RIVER RD N	CST HICKMAN MILLS DR E	38.97051	-94.54649				9/22/2010
16435	KC	JACKSON	SW STONEY CREEK DR N	MO 150 E	38.85339	-94.40480	5/18/2018	5/18/2018	5/18/2018	5/18/2018
7795	KC	JACKSON	SE TODD GEORGE PKWY S	OR 50 E	38.90395	-94.33972	1/1/2018	1/1/2018	1/1/2018	1/1/2018
19	KC	JOHNSON	RT DD E	CST RIDGEVIEW DR S	38.74475	-93.71168	11/13/2018	11/13/2018	11/13/2018	11/13/2018
1106	KC	JOHNSON	BU 13 S	CST N MAGUIRE ST N	38.77591	-93.73636			11/13/2018	
1111	KC	JOHNSON	BU 13 S	RP BU13 TO US50E E	38.77476	-93.73602				11/13/2018
1745	KC	JOHNSON	BU 13 S	RT DD E	38.74557	-93.73495			11/11/2018	11/11/2018
2642	KC	PETTIS	US 50 E	CST W MAIN ST E	38.71448	-93.28176			6/5/2017	
634	KC	PETTIS	US 50 E	CST S GRAND AVE S	38.70452	-93.23650	3/14/2017	3/14/2017		
635	KC	PETTIS	US 50 E	CST S KENTUCKY AVE S	38.70428	-93.23047	3/10/2017	3/10/2017		
637	KC	PETTIS	US 50 E	CST W BROADWAY BLVD E	38.70421	-93.22843	3/9/2017	3/9/2017		
1146	KC	PETTIS	US 50 E	CST S LAMINE AVE S	38.70416	-93.22725	3/8/2017	3/8/2017		
4415	KC	PETTIS	US 50 E	CST ENGINEER AVE S	38.70363	-93.21353	3/1/2017	3/1/2017		
11088	KC	PLATTE	MO 92 E	SP 92 E	39.37585	-94.79322		7/7/2015		

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4390	KC	PLATTE	MO 92 E	CST FOURTH ST S	39.36727	-94.77964	11/2/2016	11/2/2016		
6173	KC	PLATTE	MO 92 E	CST MARSHALL ST E	39.36613	-94.77471	4/27/2017	4/27/2017		
1130	KC	PLATTE	MO 92 E	CST PRAIRIE VIEW RD S	39.35842	-94.76975	5/9/2017	5/9/2017		
11087	KC	PLATTE	MO 92 E	CST U S HWY 71 OLD E	39.35391	-94.76705	4/3/2017	4/3/2017		
1127	KC	PLATTE	MO 92 E	CST PRAIRIE VIEW RD S	39.35327	-94.76447	3/11/2021			
12795	KC	PLATTE	MO 45 S	RT H S	39.42277	-94.90063	4/25/2017	4/25/2017		
12865	KC	PLATTE	MO 45 S	MO 273 S	39.39908	-94.86311			4/20/2017	4/20/2017
15385	KC	PLATTE	MO 45 S	.236 mile(s) before CST N NATIONAL DR E	39.20990	-94.70484			7/6/2020	7/6/2020
4381	KC	PLATTE	MO 45 S	CST RISS LAKE RD S	39.21053	-94.66416			4/26/2017	4/26/2017
1135	KC	PLATTE	MO 45 S	CST N KLAMM RD S	39.21048	-94.65838	1/1/2013	1/1/2013	1/1/2013	1/1/2013
6177	KC	PLATTE	MO 45 S	CST N LUCERNE AVE S	39.21048	-94.65249			7/14/2015	
12868	KC	PLATTE	MO 273 S	SP 92 E	39.37806	-94.79607				4/25/2017
16897	KC	PLATTE	MO 9 S	CST MATTOX RD S	39.17726	-94.64665	1/1/2014	1/1/2014		
15330	KC	PLATTE	N TIFFANY SPRINGS PKWY E	OR 29 S	39.27255	-94.67140			3/10/2021	3/10/2021
4208	KC	SALINE	US 65 S	CST FAIRGROUND RD E	39.09396	-93.21277			1/1/2017	
1049	KC	JACKSON	MO 291 S	CST NE SWANN RD E	38.92757	-94.36025	6/8/2021			

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1085	KC	JACKSON	BANNISTER RD E	CST NW COLBERN RD E	38.94419	-94.40985		1/1/2017		
1084	KC	JACKSON	BANNISTER RD E	CST NW COLBERN RD E	38.94426	-94.40800	1/1/2017			
1578	KC	JACKSON	US 40 W	CST LITTLE BLUE PKWY S	39.03030	-94.35325			8/31/2018	

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2704	CD	BOONE	MO 163 S	CST PROVIDENCE RD S	38.96949	-92.33365			3/7/2019	
2703	CD	BOONE	MO 163 S	RP IS70E TO MO163 E	38.96863	-92.33368				3/7/2019
16738	CD	BOONE	MO 163 S	.001 mile(s) before CST FOREST AVE E	38.96302	-92.33386				3/1/2018
16315	CD	BOONE	MO 163 S	CST TURNER AVE E	38.94393	-92.33448			7/10/2017	7/10/2017
16316	CD	BOONE	MO 163 S	CST BURNAM RD E	38.94171	-92.33341			6/10/2017	
1886	CD	BOONE	MO 163 S	RT K E	38.89239	-92.33598			10/27/2014	10/27/2014
607	CD	BOONE	MO 740 E	PVT CARRIE FRANCKE DR E	38.93795	-92.34335		10/20/2020		
604	CD	BOONE	MO 740 E	PVT MICK DEAVER DR S	38.93632	-92.33107	3/9/2010	3/9/2010	3/9/2010	3/9/2010
606	CD	BOONE	MO 740 E	PVT CHAMPIONS DR E	38.93511	-92.32675	10/7/2010	10/7/2010	3/10/2010	3/10/2010
599	CD	BOONE	MO 740 E	MO 763 S	38.93469	-92.32302				11/13/2011
2646	CD	BOONE	MO 740 E	CST ASHLAND RD S	38.93306	-92.31549	3/17/2010	3/17/2010		
600	CD	BOONE	MO 740 E	CST OLD HWY 63 S	38.93203	-92.31144				3/22/2010
2841	CD	BOONE	MO 740 E	CST AUDUBON DR S	38.93159	-92.29834	3/18/2010	3/18/2010		
7525	CD	BOONE	MO 740 E	RP US63S TO MO740E E	38.93193	-92.29590		3/16/2010		
7526	CD	BOONE	MO 740 E	RP US63N TO MO740 E	38.93226	-92.29359	3/16/2010			
14015	CD	BOONE	RT AC E	CST GRAY OAK DR E	38.91324	-92.31881			6/22/2011	6/22/2011

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3974	CD	BOONE	RT AC E	RP US63S TO RTAC S	38.91289	-92.29453		10/27/2010		
3973	CD	BOONE	RT AC E	CST GRINDSTONE PKWY E	38.91283	-92.29275	10/27/2010			
12457	CD	BOONE	MO 763 S	CST RANGE LINE ST S	39.00085	-92.32359			12/8/2010	12/8/2010
12465	CD	BOONE	MO 763 S	CST SMILEY LN E	38.99309	-92.32384			12/9/2010	12/9/2010
12458	CD	BOONE	MO 763 S	CST RAIN FOREST PKWY E	38.98880	-92.32483	2/14/2011	2/14/2011	2/14/2011	2/14/2011
12459	CD	BOONE	MO 763 S	CST BLUE RIDGE RD E	38.98276	-92.32615			6/10/2009	6/10/2009
611	CD	BOONE	MO 763 S	CST BIG BEAR BLVD E	38.97706	-92.32642	1/5/2011	1/5/2011	1/5/2011	1/5/2011
609	CD	BOONE	MO 763 S	CST VANDIVER DR E	38.97099	-92.32573	1/6/2011			
2864	CD	BOONE	MO 763 S	RT B S	38.95628	-92.32153			4/27/2010	4/27/2010
2842	CD	BOONE	MO 763 S	CST WALNUT ST E	38.95247	-92.32172	4/8/2010		4/8/2010	4/8/2010
572	CD	BOONE	MO 763 S	CST UNIVERSITY AVE E	38.94640	-92.32199	4/27/2010	4/27/2010	4/27/2010	4/27/2010
574	CD	BOONE	MO 763 S	CST ROLLINS ST E	38.94214	-92.32210	4/13/2010		4/13/2010	4/13/2010
16749	CD	BOONE	MO 763 S	PVT HOSPITAL DR E	38.93752	-92.32214			7/5/2012	7/5/2012
1911	CD	BOONE	RT WW E	CST BROADWAY E	38.94647	-92.29464		6/14/2018		
6427	CD	BOONE	RT WW E	CST BROADWAY E	38.94634	-92.29259	6/27/2018			
1912	CD	BOONE	RT WW E	CST KEENE ST S	38.94626	-92.29118	6/13/2018			
6956	CD	BOONE	RT WW E	CRD DANIEL BOONE BLVD S	38.93592	-92.26794	7/9/2019	7/9/2019	7/9/2019	7/9/2019

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5455	CD	BOONE	RT TT E	CST PARK DE VILLE DR S	38.95503	-92.38471	10/20/2010	10/20/2010	10/20/2010	10/20/2010
1546	CD	BOONE	RT TT E	CST FAIRVIEW RD S	38.95469	-92.38071	10/7/2010	10/7/2010	10/7/2010	10/7/2010
16725	CD	BOONE	RT B S	.003 mile(s) after CST WACO RD E	39.01150	-92.27209	12/5/2017	12/5/2017	12/5/2017	12/5/2017
2634	CD	BOONE	RT B S	RP US63N TO RTB N	38.98920	-92.28518			4/5/2017	
2633	CD	BOONE	RT B S	RP RTB TO US63S S	38.98740	-92.28625				4/5/2017
1623	CD	BOONE	RT B S	CST VANDIVER DR E	38.97316	-92.30248		4/5/2017	4/5/2017	4/5/2017
1548	CD	BOONE	RT B S	CST HERIFORD RD E	38.96809	-92.30733		4/5/2017	4/5/2017	4/5/2017
3218	CD	CALLAWAY	BU 54 E	RT Z E	38.86131	-91.94395	4/19/2011	4/19/2011	4/19/2011	4/19/2011
2699	CD	CALLAWAY	BU 54 E	CST DOUGLAS BLVD E	38.86423	-91.94392	4/20/2011	4/20/2011	4/20/2011	4/20/2011
2645	CD	CALLAWAY	BU 54 E	CST INDUSTRIAL DR E	38.87103	-91.94380	4/26/2011	4/26/2011	4/26/2011	4/26/2011
1541	CD	CALLAWAY	RT F E	CST WESTMINSTER AVE S	38.84681	-91.95418	4/19/2011	4/19/2011	4/19/2011	4/19/2011
7625	CD	CAMDEN	MO 5 S	RT F S	38.14841	-92.77450	8/3/2016	8/3/2016	8/3/2016	8/3/2016
12935	CD	CAMDEN	US 54 E	RP MO5N TO US54 E	38.01522	-92.73478	5/22/2013			
6955	CD	CAMDEN	US 54 E	CST JACK CROWELL RD S	38.01626	-92.73239	10/24/2012	10/25/2012		
14305	CD	CAMDEN	NICHOLS RD N	RP US54E TO NICHOLS RD E	38.12371	-92.68305				8/6/2012
14306	CD	CAMDEN	NICHOLS RD N	RP US54W TO NICHOLS RD W	38.12437	-92.68425			3/5/2013	

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12555	CD	CAMDEN	E OSAGE BEACH PKWY N	CST PASSOVER RD S	38.14024	-92.63439			5/18/2007	5/19/2007
14309	CD	CAMDEN	W OSAGE BEACH PKWY N	CST JEFFRIES RD S	38.13149	-92.64971			2/18/2010	
16949	CD	CAMDEN	MO 242 E	RT MM E	38.19060	-92.64110		4/2/2012		
3969	CD	COLE	RT C E	RT CC S	38.54641	-92.22708	7/21/2016	7/21/2021		
6932	CD	COLE	RT C E	RP RTC TO MO179SS	38.54635	-92.22536		12/8/2014		
6931	CD	COLE	RT C E	RP MO179N TO RTC E	38.54680	-92.22302	12/8/2014			
1532	CD	COLE	RT C E	CST IDLEWOOD RD S	38.55077	-92.21222				12/8/2014
3155	CD	COLE	RT C E	CST SOUTHRIDGE DR E	38.55504	-92.19984	10/25/2018	10/25/2018	10/25/2018	10/25/2018
620	CD	COLE	RT C E	OR 54 E	38.55415	-92.19842	10/24/2018	10/24/2018	10/24/2018	10/24/2018
1237	CD	COLE	MO 179 S	CST INDUSTRIAL DR E	38.59493	-92.22580	10/7/2010	10/7/2010	10/7/2010	10/7/2010
2697	CD	COLE	MO 179 S	OR 50 E	38.58337	-92.23154			8/18/2010	8/18/2010
2698	CD	COLE	MO 179 S	RP MO179 TO US50E E	38.58103	-92.23131				10/4/2010
657	CD	COLE	MO 179 S	BU 50 E	38.58024	-92.23120			10/8/2010	
6995	CD	COLE	BU 50 E	.01 mile(s) before CST STONERIDGE PKWY S	38.58201	-92.22426		10/9/2007		
6996	CD	COLE	BU 50 E	PVT SEAY PLACE E	38.58216	-92.22096		2/15/2010		

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6997	CD	COLE	BU 50 E	CST ST MARYS BLVD E	38.58194	-92.21572	4/18/2011			4/18/2011
3976	CD	COLE	BU 50 E	CST SOUTHWEST BLVD S	38.58085	-92.20045	12/22/2010			
1531	CD	COLE	BU 50 E	CST KANSAS ST S	38.57800	-92.18995	5/18/2010	5/18/2010		
639	CD	COLE	BU 50 E	CST DELAWARE ST S	38.57778	-92.18548	5/25/2010	5/25/2010	5/25/2010	5/25/2010
641	CD	COLE	BU 50 E	CST W DUNKLIN ST E	38.57777	-92.18363				5/19/2010
11086	CD	COLE	BU 50 E	RP BU50 TO US54E E	38.57856	-92.18239	5/18/2010	5/18/2010	5/18/2010	
621	CD	COLE	ELLIS BLVD E	OR 54 E	38.55322	-92.19626	10/25/2018	10/25/2018	10/25/2018	10/25/2018
2298	CD	COLE	W MCCARTY ST E	CST INDUSTRIAL DR E	38.58340	-92.18390		4/21/2014		
6945	CD	COLE	W TRUMAN BLVD E	RP US50W TO TRUMAN BLVD E	38.58410	-92.25695	6/18/2013			
5084	CD	COLE	W TRUMAN BLVD E	OR 50 E	38.58471	-92.25665	6/18/2013	6/18/2013		
5080	CD	COLE	S COUNTRY CLUB DR S	OR 50 E	38.58146	-92.25791			6/18/2013	6/18/2013
1717	CD	COLE	S COUNTRY CLUB DR S	OR 50 E	38.58095	-92.25815				6/18/2013
1793	CD	COLE	EASTLAND DR S	RP US50W TO EASTLAND DR N	38.55133	-92.14769			4/23/2014	

SIGNAL ID	DISTRICT	COUNTY	ROUTE	CROSS STREET	LATITUDE	LONGITUDE	EASTBOUND INSTALLATION DATE	WESTBOUND INSTALLATION DATE	NORTHBOUND INSTALLATION DATE	SOUTHBOUND INSTALLATION DATE
1795	CD	COLE	EASTLAND DR S	RP EASTLAND DR TO US50E E	38.55054	-92.14912				4/23/2014
16948	CD	COLE	LAFAYETTE ST S	RP US50W TO LAFAYETTE ST N	38.56912	-92.16740			10/18/2017	
16947	CD	COLE	LAFAYETTE ST S	RP LAFAYETTE ST TO US50E E	38.56860	-92.16799				10/18/2017
2445	CD	CRAWFORD	MO 19 S	RT DD S	38.07426	-91.40724		10/31/2012	10/31/2012	10/31/2012
1298	CD	DENT	MO 19 S	MO 32 E	37.63584	-91.53561	8/12/2014	8/12/2014	8/12/2014	8/12/2014
2438	CD	DENT	MO 32 E	CST S ASKINS ST S	37.63609	-91.54603	8/28/2013	8/28/2013		
2440	CD	DENT	MO 32 E	RT J E	37.63594	-91.54028	9/18/2013	9/18/2013		9/18/2013
7535	CD	GASCONADE	MO 19 N	MO 28 E	38.34508	-91.49465		11/1/2017		
7566	CD	GASCONADE	MO 19 N	MO 28 E	38.35542	-91.48170	7/15/2010	7/15/2010	7/15/2010	7/15/2010
1529	CD	GASCONADE	MO 28 E	CST FIRST ST S	38.34501	-91.50053	11/7/2017	11/7/2017	11/7/2017	11/7/2017
11315	CD	LACLEDE	MO 5 S	RT YY S	37.69870	-92.66789	4/22/2013	4/22/2013	4/22/2013	4/22/2013
6827	CD	LACLEDE	MO 5 S	CST BRICE ST E	37.69170	-92.66775	9/10/2013	9/11/2013	9/12/2013	9/13/2013
6831	CD	LACLEDE	MO 5 S	CST COMMERCIAL ST E	37.68052	-92.66382			2/1/2014	2/2/2014
6834	CD	LACLEDE	MO 5 S	CST VANCE RD E	37.67328	-92.65435	9/10/2013	9/11/2013	9/12/2013	9/13/2013
6835	CD	LACLEDE	MO 5 S	RP IS44W TO MO5 W	37.67021	-92.65044			7/31/2013	
6836	CD	LACLEDE	MO 5 S	RP MO5 TO IS44E E	37.66886	-92.64964				4/28/2014

SIGNAL ID	DISTRICT	COUNTY	ROUTE	CROSS STREET	LATITUDE	LONGITUDE	EASTBOUND INSTALLATION DATE	WESTBOUND INSTALLATION DATE	NORTHBOUND INSTALLATION DATE	SOUTHBOUND INSTALLATION DATE
6837	CD	LACLEDE	MO 5 S	MO 32 E	37.66655	-92.64948			1/1/2014	1/1/2014
6838	CD	LACLEDE	MO 5 S	CST EVERGREEN PARKWAY E	37.66360	-92.64945	1/13/2013	1/13/2013	1/13/2013	1/13/2013
6839	CD	LACLEDE	MO 5 S	CST BLAND RD E	37.66208	-92.64941	2/1/2014	2/1/2014	2/1/2014	2/1/2014
4407	CD	MILLER	MO 52 W	BU 54 E	38.34686	-92.58140	10/12/2011	10/12/2011		10/12/2011
5079	CD	MONITEAU	US 50 E	MO 5 S	38.65217	-92.78383	1/28/2010	1/28/2010	1/28/2010	
3983	CD	MONITEAU	BU 50 E	MO 87 S	38.62754	-92.56652	9/9/2014	9/9/2014	9/9/2014	9/9/2014
1867	CD	MORGAN	MO 5 S	RT O E	38.19908	-92.83385	7/18/2017	7/18/2017	7/18/2017	7/18/2017
6485	CD	PHELPS	US 63 S	.003 mile(s) before CST BISHOP AVE S	37.96072	-91.76607				8/18/2020
4027	CD	PHELPS	US 63 S	CST PINE ST S	37.95939	-91.77071	3/16/2018	3/16/2018	3/16/2018	3/16/2018
927	CD	PHELPS	US 63 S	CST VICHY RD S	37.95806	-91.77348			3/16/2018	
919	CD	PHELPS	US 63 S	RT E S	37.95516	-91.77707			4/19/2010	
923	CD	PHELPS	US 63 S	RT BB E	37.95152	-91.77713	5/14/2015	5/14/2015	5/14/2015	5/14/2015
925	CD	PHELPS	US 63 S	CST FORT WYMAN DR E	37.93855	-91.77733			5/18/2015	5/18/2015
2053	CD	PHELPS	US 63 S	CST LANNING LN E	37.93137	-91.77855		5/18/2015	5/18/2015	5/18/2015
2441	CD	PHELPS	MO 72 E	CST ROLLA ST S	37.94243	-91.77226	7/29/2014	7/29/2014	7/29/2014	7/29/2014
2442	CD	PHELPS	MO 72 E	CST SALEM AVE E	37.93811	-91.75345	7/31/2014	7/31/2014	7/31/2014	7/31/2014
54	CD	PHELPS	MO 72 E	RT O S	37.93533	-91.74797	7/30/2014	7/30/2014	7/30/2014	7/30/2014

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7385	CD	PHELPS	RT V E	RP RTV TO IS44E E	37.97869	-91.71899	11/19/2013			
5117	CD	PULASKI	SP 44 E	CST BOSA DR E	37.80822	-92.14356			4/12/2017	4/12/2017
5118	CD	PULASKI	SP 44 E	CST GATEWAY CIR S	37.79865	-92.13913	2/1/2017		2/1/2017	2/1/2017
14005	CD	PULASKI	RT H S	OR 44 E	37.80789	-92.22349			3/14/2012	3/14/2012
5945	CD	PULASKI	RT H S	LP 44 E	37.80376	-92.22128				9/30/2013

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16780	SL	FRANKLIN	MO 185 S	CST W SPRINGFIELD RD E	38.20822	-91.17217	12/4/2017	12/4/2017	12/4/2017	12/4/2017
17016	SL	FRANKLIN	MO 185 S	RT AF S	38.22356	-91.15392			8/13/2012	8/13/2012
3204	SL	FRANKLIN	MO 185 S	CST E SPRINGFIELD RD S	38.22285	-91.15228	12/4/2017	12/4/2017	12/4/2017	12/4/2017
2478	SL	FRANKLIN	MO 47 S	CST THIRD ST E	38.55309	-91.00139	2/5/2013	2/5/2013	2/5/2013	2/5/2013
2479	SL	FRANKLIN	MO 47 S	CST FIFTH ST E	38.55219	-91.00203			2/5/2013	2/5/2013
2480	SL	FRANKLIN	MO 47 S	CST EIGHTH ST E	38.55037	-91.00340	2/5/2013	2/5/2013	2/5/2013	2/5/2013
13645	SL	FRANKLIN	MO 47 S	CST BLUE JAY DR E	38.54836	-91.00598			2/5/2013	
2481	SL	FRANKLIN	MO 47 S	CST FOURTEENTH ST E	38.54531	-91.00631	2/5/2013	2/5/2013	2/5/2013	2/5/2013
2482	SL	FRANKLIN	MO 47 S	CST HERITAGE HILL DR S	38.54368	-91.00610			2/5/2013	
2724	SL	FRANKLIN	MO 47 S	CST STEUTERMANN RD E	38.53403	-91.00590	2/5/2013	2/5/2013	2/5/2013	2/5/2013
7245	SL	FRANKLIN	MO 47 S	CRD CLEARVIEW RD E	38.48219	-91.00510			10/26/2015	10/26/2015
1198	SL	FRANKLIN	MO 47 S	RT A S	38.46021	-91.00465	10/26/2015	10/26/2015	10/26/2015	10/26/2015
1515	SL	FRANKLIN	MO 47 S	RT V E	38.45475	-91.00224	10/26/2015		10/26/2015	10/26/2015
7256	SL	FRANKLIN	MO 47 S	CST MAIN ST E	38.44581	-90.99825	10/26/2015	10/26/2015	10/26/2015	10/26/2015
15370	SL	FRANKLIN	MO 47 S	OR 44 E	38.36618	-90.98146	3/18/2014	3/18/2014	3/18/2014	3/18/2014
15371	SL	FRANKLIN	MO 47 S	RP IS44W TO MO47 W	38.36215	-90.97956			3/18/2014	
15372	SL	FRANKLIN	MO 47 S	RP IS44E TO MO47 E	38.36133	-90.97841				3/18/2014

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14075	SL	FRANKLIN	RT AF S	MO 185 S	38.22356	-91.15392			8/13/2012	8/13/2012
394	SL	FRANKLIN	US 50 E	CST FRANK ST S	38.43965	-91.01223	10/26/2015	10/26/2015	10/26/2015	10/26/2015
395	SL	FRANKLIN	US 50 E	CST OAK ST S	38.44235	-91.00652	10/26/2015	10/26/2015	10/26/2015	10/26/2015
396	SL	FRANKLIN	US 50 E	MO 47 S	38.44215	-90.99030		10/26/2015		
1199	SL	FRANKLIN	US 50 E	CST PRAIRIE DELL ST S	38.43213	-90.97283	10/26/2015	10/26/2015		
16762	SL	FRANKLIN	US 50 E	CST DENMARK ST S	38.43297	-90.96554	5/30/2019	5/30/2019	5/30/2019	5/30/2019
5523	SL	FRANKLIN	MO 100 E	CST HIGH ST S	38.54425	-91.02532	5/4/2015	5/4/2015	5/4/2015	5/4/2015
476	SL	FRANKLIN	MO 100 E	RT A S	38.54196	-91.01758	2/24/2015	2/24/2015		
2583	SL	FRANKLIN	MO 100 E	CST WASHINGTON CORNER S	38.53868	-91.00963	2/24/2015	2/24/2015	2/24/2015	2/24/2015
381	SL	FRANKLIN	MO 100 E	CST WASHINGTON HTS DR S	38.53892	-90.99869		7/28/2010		
383	SL	FRANKLIN	MO 100 E	CST INTERNATIONAL ST S	38.53874	-90.98761	7/27/2010	7/27/2010	7/27/2010	7/27/2010
7265	SL	FRANKLIN	MO 100 E	CST VERNACI DR S	38.53713	-90.98113	8/3/2010	8/3/2010		
382	SL	FRANKLIN	MO 100 E	CST FIFTH ST E	38.53582	-90.97753	8/5/2010	8/5/2010		8/5/2010
14675	SL	FRANKLIN	MO 30 E	CST BARDOT ST S	38.33922	-90.98166	11/27/2012	11/27/2012	11/27/2012	11/27/2012
5448	SL	FRANKLIN	LP 44 E	CST LAMAR PKWY S	38.48439	-90.76839	11/27/2017	11/27/2017		
417	SL	FRANKLIN	LP 44 E	CST VIADUCT ST S	38.48470	-90.75954	11/27/2017	11/27/2017	11/27/2017	11/27/2017
419	SL	FRANKLIN	LP 44 E	CST N PAYNE ST S	38.48440	-90.75563		11/27/2017		
1941	SL	FRANKLIN	LP 44 E	RT OO S	38.48409	-90.74140	11/27/2017	11/27/2017		

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1509	SL	JEFFERSON	RT Z E	CST MAIN ST E	38.28805	-90.39875	12/11/2019	12/11/2019	12/11/2019	
5254	SL	JEFFERSON	US 61 S	CST STARLING AIRPORT RD S	38.45307	-90.36195		10/26/2015	10/26/2015	10/26/2015
423	SL	JEFFERSON	US 61 S	CST TENBROOK RD S	38.44858	-90.36924	10/26/2015	10/26/2015	10/26/2015	10/26/2015
427	SL	JEFFERSON	US 61 S	CST ARNOLD TENBROOK RD S	38.43447	-90.37570			10/26/2015	10/26/2015
10677	SL	JEFFERSON	US 61 S	CST E CHURCH RD E	38.43223	-90.37854			10/26/2015	10/26/2015
1484	SL	JEFFERSON	US 61 S	MO 231 S	38.40497	-90.37697				10/26/2015
3781	SL	JEFFERSON	US 61 S	CRD RIVER ST E	38.36888	-90.37609	10/26/2015	10/26/2015	10/26/2015	10/26/2015
3017	SL	JEFFERSON	US 61 S	RT Z E	38.29117	-90.39608	10/26/2015	10/26/2015	10/26/2015	10/26/2015
1481	SL	JEFFERSON	US 61 S	CST RIVERVIEW PLAZA DR E	38.25485	-90.39318	2/5/2013	2/5/2013		2/5/2013
1480	SL	JEFFERSON	US 61 S	CST EAST 6TH ST E	38.22695	-90.38554	2/5/2013	2/5/2013	2/5/2013	
3711	SL	JEFFERSON	US 61 S	CST BAILEY RD E	38.21906	-90.38516		2/5/2013	2/5/2013	2/5/2013
403	SL	JEFFERSON	US 61 S	CST BEFFA ST E	38.21555	-90.38713			2/5/2013	2/5/2013
5464	SL	JEFFERSON	RT A E	.002 mile(s) before RP MO21N TO RTA E	38.24975	-90.55863	6/27/2013			
5465	SL	JEFFERSON	RT A E	CST BUSINESS 21 S	38.24963	-90.55695	6/27/2013	6/27/2013	6/27/2013	6/27/2013
16746	SL	JEFFERSON	RT A E	CST POUNDS RD S	38.21383	-90.41883	4/23/2018	4/23/2018		
1510	SL	JEFFERSON	RT A E	CST COLLINS DR S	38.21347	-90.41218	2/5/2013	2/5/2013		
4133	SL	JEFFERSON	RT A E	CST BRADLEY ST S	38.21309	-90.40882	2/5/2013	2/5/2013		

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399	SL	JEFFERSON	RT A E	CST GANNON DR E	38.21358	-90.40330	2/5/2013	2/5/2013		2/5/2013
1200	SL	JEFFERSON	RT A E	CST MILL ST S	38.21204	-90.39631	2/5/2013	2/5/2013		
7869	SL	JEFFERSON	MO 141 S	.042 mile(s) after CST LONE STAR DR E	38.44421	-90.37528	4/9/2013			
3559	SL	JEFFERSON	IMPERIAL MAIN ST E	RP IMPERIAL MAIN ST TO IS55S S	38.36967	-90.38389		11/27/2017		
3560	SL	JEFFERSON	IMPERIAL MAIN ST E	RP IS55N TO IMPERIAL MAIN ST E	38.36945	-90.38162	11/27/2017			
16747	SL	JEFFERSON	OLD HWY 21 S	CRD LONEDELL RD E	38.45201	-90.44427			1/11/2018	1/11/2018
3561	SL	JEFFERSON	W OR 55 S	CRD IMPERIAL MAIN ST E	38.36974	-90.38522	11/27/2017	11/27/2017		
4988	SL	ST. CHARLES	LP 70 E	OR 70 E	38.76696	-90.49555		7/10/2017		
16759	SL	ST. CHARLES	RT N E	CST PERRY CATE BLVD S	38.76674	-90.84340	1/3/2019			
16783	SL	ST. CHARLES	RT N E	CST LAKE ST LOUIS BLVD E	38.76145	-90.80071	3/1/2017	3/1/2017	3/1/2017	3/1/2017
15375	SL	ST. CHARLES	RT N E	CST BRYAN RD S	38.76933	-90.74073				7/27/2015
2723	SL	ST. CHARLES	MO 79 S	CST T R HUGHES BLVD S	38.82514	-90.66388			6/28/2017	
1747	SL	ST. CHARLES	MO 79 S	OR 70 E	38.79962	-90.65336			11/10/2020	
15565	SL	ST. CHARLES	RT Z S	CST INTERSTATE DR E	38.80171	-90.85513	2/26/2015	2/26/2015	2/26/2015	2/26/2015
30	SL	ST. CHARLES	RT M S	RT P E	38.82986	-90.69952	8/11/2013	8/11/2013	8/11/2013	8/11/2013
11575	SL	ST. CHARLES	RT K S	CST MAIN ST S	38.80335	-90.70015	10/12/2009	10/12/2009	10/12/2009	10/12/2009

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5911	SL	ST. CHARLES	RT K S	OR 70 W	38.80298	-90.70016			10/12/2009	
435	SL	ST. CHARLES	RT K S	OR 70 E	38.80199	-90.70021				10/13/2009
2503	SL	ST. CHARLES	RT K S	CST MEXICO LOOP RD E	38.78964	-90.69949	6/29/2010	6/29/2010	6/29/2010	6/29/2010
5354	SL	ST. CHARLES	RT K S	CRD CLEAR CREEK DR E	38.78727	-90.69981			6/30/2010	6/30/2010
3214	SL	ST. CHARLES	RT K S	CST WINDING WOODS DR E	38.78372	-90.69979			7/7/2010	7/7/2010
1471	SL	ST. CHARLES	RT K S	CST FEISE RD E	38.78023	-90.69986			7/8/2010	7/8/2010
2289	SL	ST. CHARLES	RT K S	PVT TARGET E	38.77741	-90.69992	7/13/2010	7/13/2010	7/13/2010	7/13/2010
5139	SL	ST. CHARLES	RT K S	.001 mile(s) after CST HUTCHINGS FARM DR E	38.77412	-90.70000	7/14/2010	7/14/2010	7/14/2010	7/14/2010
2291	SL	ST. CHARLES	RT K S	PVT DARDENNE ELEMENTARY SCHOOL E	38.77142	-90.70005	2/5/2013	2/5/2013		2/5/2013
3509	SL	ST. CHARLES	RT K S	CST FALLON PKWY E	38.76264	-90.70016	2/5/2013	2/5/2013	2/5/2013	2/5/2013
2307	SL	ST. CHARLES	RT K S	CRD CHRISTINA MARIE DR E	38.75937	-90.70020			2/5/2013	2/5/2013
7875	SL	ST. CHARLES	RT K S	RT N E	38.75695	-90.70022	2/5/2013	2/5/2013		
2310	SL	ST. CHARLES	RT K S	CST WATERFORD CROSSING DR E	38.74568	-90.69853		2/5/2013	2/5/2013	2/5/2013
1959	SL	ST. CHARLES	RT K S	CRD O FALLON RD E	38.73425	-90.69127				2/5/2013
3203	SL	ST. CHARLES	RT K S	CST WATERBURY FALLS DR S	38.72457	-90.69784	2/5/2013	2/5/2013	2/5/2013	2/5/2013
3927	SL	ST. CHARLES	RT K S	CST CRUSHER DR E	38.72166	-90.69997	2/5/2013	2/5/2013	2/5/2013	2/5/2013

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4228	SL	ST. CHARLES	RT K S	OR 64 E	38.71769	-90.70217			2/5/2013	2/5/2013
4235	SL	ST. CHARLES	RT K S	RP IS64W TO RTK N	38.71497	-90.70346			2/5/2013	
3840	SL	ST. CHARLES	MO 94 E	CST TOMPKINS ST S	38.78409	-90.50234	9/18/2014	9/18/2014	9/18/2014	9/18/2014
1627	SL	ST. CHARLES	MO 94 E	RP MO370W TO MO94 W	38.80514	-90.47509	2/6/2018			
1643	SL	ST. CHARLES	MO 94 E	CST LITTLEHILLS EXPWY E	38.80737	-90.47480	8/27/2019	8/27/2019	8/27/2019	8/27/2019
16165	SL	ST. CHARLES	FAIRGROUNDS RD S	OR 70 W	38.77132	-90.50013			7/10/2017	
431	SL	ST. CHARLES	MID RIVERS MALL DR S	OR 70 E	38.80155	-90.62000			12/3/2017	12/3/2017
437	SL	ST. CHARLES	PITMAN AVE E	CST LUETKENHAUS BLVD S	38.81210	-90.84255	3/9/2017			
11515	SL	ST. CHARLES	SONDEREN ST S	CST SONDEREN LP S	38.80424	-90.69525				10/15/2018
449	SL	ST. CHARLES	N OR 70 E	CST ZUMBEHL RD S	38.78823	-90.53302			12/29/2016	12/29/2016
16778	SL	ST. CHARLES	N OR 70 W	.271 mile(s) before CST MAIN ST E	38.79975	-90.61585	12/5/2017			
7206	SL	ST. CHARLES	N OR 94 W	CST OLD MO 94 E	38.75347	-90.55393			4/23/2015	
14627	SL	ST. CHARLES	N OR 94 W	RT N E	38.73889	-90.63356			9/20/2011	
3610	SL	ST. CHARLES	N OR 64 E	.002 mile(s) after CST MASTERCARD BLVD E	38.74840	-90.75065			11/6/2013	11/6/2013
14629	SL	ST. CHARLES	S OR 94 E	CRD KISKER RD S	38.74007	-90.61784				5/13/2012

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3232	SL	ST. CHARLES	S OR 70 E	CST WOODLAWN AVE S	38.79840	-90.70517	5/1/2015	5/1/2015	5/1/2015	5/1/2015
143	SL	ST. LOUIS	US 61 S	CST LITZSINGER RD E	38.62566	-90.40592	9/22/2020	9/22/2020	9/22/2020	
4151	SL	ST. LOUIS	US 61 S	CST LINDBERGH BLVD E	38.56672	-90.40677	5/22/2012	5/22/2012	5/22/2012	
4148	SL	ST. LOUIS	US 61 S	CST KIRKWOOD COMMONS E	38.56361	-90.40685			5/13/2012	5/13/2012
4174	SL	ST. LOUIS	US 61 S	US 50 W	38.56008	-90.40703			5/14/2012	
2035	SL	ST. LOUIS	US 61 S	.002 mile(s) before PVT LAKEVIEW PLAZA S	38.50021	-90.33380	5/13/2012	5/13/2012		5/13/2012
526	SL	ST. LOUIS	US 61 S	CRD MEHL AVE S	38.49945	-90.33499			5/13/2012	
5926	SL	ST. LOUIS	US 61 S	PVT KELLER PLAZA DR E	38.49854	-90.33850			5/13/2012	5/13/2012
4703	SL	ST. LOUIS	US 61 S	CRD MATTIS RD E	38.49433	-90.34476	5/13/2012		5/13/2012	5/13/2012
5928	SL	ST. LOUIS	US 61 S	CRD BUTLER HILL RD E	38.48543	-90.34878				5/13/2012
1246	SL	ST. LOUIS	US 61 S	CRD MERAMEC BOTTOM RD E	38.46479	-90.35712	5/13/2012	5/13/2012	5/13/2012	5/13/2012
1682	SL	ST. LOUIS	US 67 S	.024 mile(s) before CRD ROBBINS MILL RD E	38.82215	-90.24294	8/15/2013	8/15/2013	8/15/2013	8/15/2013
161	SL	ST. LOUIS	US 67 S	CRD OLD JAMESTOWN RD S	38.82306	-90.24973	7/29/2013	7/29/2013	7/29/2013	7/29/2013
16755	SL	ST. LOUIS	US 67 S	PVT SUNSWEPT PARK DR E	38.81259	-90.29242			12/2/2016	12/2/2016
1501	SL	ST. LOUIS	US 67 S	.003 mile(s) before PVT FLOWER VALLEY S	38.81070	-90.29617	5/13/2012	5/13/2012	5/13/2012	5/13/2012
2161	SL	ST. LOUIS	US 67 S	PVT COUGAR DR S	38.80742	-90.30221			5/13/2012	

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1680	SL	ST. LOUIS	US 67 S	CST TROTTER WAY S	38.80615	-90.30458	5/13/2012	5/13/2012	5/13/2012	5/13/2012
1679	SL	ST. LOUIS	US 67 S	.002 mile(s) after PVT TARGET S	38.80361	-90.30943	5/13/2012	5/13/2012	5/13/2012	5/13/2012
163	SL	ST. LOUIS	US 67 S	CST NORTH WATERFORD DR E	38.80154	-90.31323			5/13/2012	5/13/2012
164	SL	ST. LOUIS	US 67 S	CST NEW FLORISSANT RD NORTH S	38.80012	-90.31591			5/13/2012	5/13/2012
166	SL	ST. LOUIS	US 67 S	CST ST JEAN ST S	38.79873	-90.32562				5/13/2012
2036	SL	ST. LOUIS	US 67 S	CST ST FERDINAND ST S	38.79923	-90.32823		5/13/2012	5/13/2012	5/13/2012
171	SL	ST. LOUIS	US 67 S	CST CHARBONIER RD E	38.79680	-90.33888			5/26/2010	5/26/2010
168	SL	ST. LOUIS	US 67 S	CST MANRESA LN E	38.79040	-90.34590			5/25/2010	5/25/2010
170	SL	ST. LOUIS	US 67 S	CST CHEZ PAREE DR E	38.78778	-90.34928			5/24/2010	5/24/2010
169	SL	ST. LOUIS	US 67 S	CST ELMGROVE AVE E	38.78443	-90.35449	8/23/2010	8/23/2010		
146	SL	ST. LOUIS	US 67 S	CST LADUE RD E	38.65507	-90.40541	1/14/2019	1/14/2019	1/14/2019	1/14/2019
144	SL	ST. LOUIS	US 67 S	CST CONWAY RD E	38.64316	-90.40555			9/27/2016	9/27/2016
1437	SL	ST. LOUIS	MO 21 S	PVT LUTHERAN HIGH SCHOOL E	38.54820	-90.33279			2/5/2013	
5909	SL	ST. LOUIS	MO 21 S	.007 mile(s) before CRD REAVIS RD E	38.54408	-90.33297				2/5/2013
40	SL	ST. LOUIS	MO 21 S	CST GREEN PARK RD E	38.53076	-90.34489			2/5/2013	2/5/2013
733	SL	ST. LOUIS	MO 21 S	CRD BAPTIST CHURCH RD S	38.52015	-90.36227	2/5/2013	2/5/2013		2/5/2013

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2017	SL	ST. LOUIS	MO 21 S	CRD EAST CONCORD RD E	38.51876	-90.36434				2/5/2013
734	SL	ST. LOUIS	MO 21 S	CRD CONCORD SCHOOL RD E	38.51734	-90.36608	2/5/2013		2/5/2013	2/5/2013
732	SL	ST. LOUIS	MO 21 S	CST KENNERLY RD E	38.50863	-90.37671			2/5/2013	2/5/2013
743	SL	ST. LOUIS	MO 21 S	CRD TOWNE SOUTH RD E	38.50407	-90.37987	2/5/2013	2/5/2013	2/5/2013	2/5/2013
736	SL	ST. LOUIS	MO 21 S	CRD BAUER RD E	38.49887	-90.38101			2/5/2013	2/5/2013
738	SL	ST. LOUIS	MO 21 S	CRD BUTLER HILL RD E	38.49520	-90.38155			2/5/2013	2/5/2013
737	SL	ST. LOUIS	MO 21 S	CRD OLD TESSON FERRY RD S	38.49311	-90.38189			2/5/2013	2/5/2013
740	SL	ST. LOUIS	MO 21 S	PVT CEDAR PLAZA SHOPPING CTR E	38.48726	-90.38327			2/5/2013	2/5/2013
742	SL	ST. LOUIS	MO 21 S	PVT MEDICAL CENTER RD E	38.48335	-90.38476	2/5/2013		2/5/2013	2/5/2013
741	SL	ST. LOUIS	MO 21 S	CRD SUSON HILLS DR E	38.47942	-90.39271	2/5/2013		2/5/2013	2/5/2013
2018	SL	ST. LOUIS	MO 21 S	CRD HAGEMANN DR S	38.47347	-90.39923			2/5/2013	2/5/2013
3018	SL	ST. LOUIS	MO 21 S	.006 mile(s) after CRD WALDEN RIDGE E	38.47006	-90.40089			10/3/2013	
4173	SL	ST. LOUIS	US 50 E	US 67 S	38.55878	-90.40706	5/13/2012			
4157	SL	ST. LOUIS	US 50 E	PVT SUNSET PLAZA E	38.55359	-90.40703	2/3/2012	2/3/2012	2/3/2012	2/3/2012
4156	SL	ST. LOUIS	US 50 E	CST E WATSON RD E	38.55109	-90.40705	2/3/2012	2/3/2012	2/3/2012	2/3/2012
4155	SL	ST. LOUIS	US 50 E	CST EDDIE AND PARK RD E	38.54684	-90.40381	2/3/2012	2/3/2012		
4154	SL	ST. LOUIS	US 50 E	CST DENNY RD E	38.53658	-90.38933	11/15/2010	11/15/2010		

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4145	SL	ST. LOUIS	US 50 E	MO 30 E	38.53300	-90.38470	11/16/2010	11/16/2010	11/16/2010	11/16/2010
4147	SL	ST. LOUIS	US 50 E	CRD ROXANNA DR S	38.52821	-90.37549	11/22/2010	11/22/2010		
516	SL	ST. LOUIS	US 50 E	PVT HACKBERRY DR S	38.52618	-90.36595	11/3/2010	11/3/2010		
5921	SL	ST. LOUIS	US 50 E	CRD BAPTIST CHURCH RD S	38.52522	-90.36148	11/23/2010	11/23/2010		
11445	SL	ST. LOUIS	US 50 E	.011 mile(s) after CST FLORI DR S	38.51924	-90.34311	5/22/2012			
4144	SL	ST. LOUIS	US 50 E	.022 mile(s) before CRD EAST CONCORD RD E	38.51495	-90.34260	5/22/2012	5/22/2012		
159	SL	ST. LOUIS	US 50 E	CRD UNION RD S	38.50952	-90.33211	5/22/2012	5/22/2012		
5233	SL	ST. LOUIS	US 50 E	CRD CORDES DR S	38.50745	-90.32861	5/22/2012	5/22/2012		
512	SL	ST. LOUIS	MO 109 S	OR 44 E	38.50527	-90.62365	11/30/2015	11/30/2015	11/30/2015	11/30/2015
11765	SL	ST. LOUIS	MO 109 S	CST THE LEGENDS PKWY E	38.49416	-90.62948	5/29/2015			
5877	SL	ST. LOUIS	RT D E	CST FERGUSON AVE S	38.67462	-90.30913	12/15/2021	12/15/2021	12/15/2021	12/15/2021
5823	SL	ST. LOUIS	MO 340 E	CST FROESEL DR E	38.59555	-90.58580	10/26/2015	10/26/2015	10/26/2015	10/26/2015
1379	SL	ST. LOUIS	MO 340 E	CST MARSH AVE E	38.59818	-90.58574	10/26/2015	10/26/2015		
5825	SL	ST. LOUIS	MO 340 E	CST KEHRS MILL RD E	38.62160	-90.58208			8/11/2011	8/11/2011
5826	SL	ST. LOUIS	MO 340 E	CST COUNTRY RIDGE DR E	38.62466	-90.58070	10/26/2015	10/26/2015	10/26/2015	10/26/2015
5827	SL	ST. LOUIS	MO 340 E	CST CLARKSON WOODS DR E	38.62905	-90.57886	10/26/2015	10/26/2015		
2020	SL	ST. LOUIS	MO 340 E	CST SWINGLEY RIDGE RD E	38.65473	-90.55648			10/26/2015	10/26/2015

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5832	SL	ST. LOUIS	MO 340 E	CST APPALACHIAN TRL E	38.66239	-90.54335	10/26/2015	10/26/2015	10/26/2015	10/26/2015
1266	SL	ST. LOUIS	MO 340 E	CST LADUE BLUFFS CROSSING DR E	38.66966	-90.53453	10/26/2015	10/26/2015		
703	SL	ST. LOUIS	MO 340 E	CST RIVER VALLEY DR S	38.68023	-90.50551	10/26/2015	10/26/2015		
5835	SL	ST. LOUIS	MO 340 E	CST WOODS MILL RD S	38.67997	-90.49922	7/24/2012	7/24/2012	7/24/2012	
5258	SL	ST. LOUIS	MO 340 E	CST WOODCHASE LN S	38.68026	-90.49666	10/26/2015	10/26/2015	10/26/2015	10/26/2015
711	SL	ST. LOUIS	MO 340 E	CST CREVE COEUR MILL RD S	38.68231	-90.48749	10/26/2015			
5833	SL	ST. LOUIS	MO 340 E	CST FERNVIEW DR S	38.68256	-90.48049		10/26/2015		
709	SL	ST. LOUIS	MO 340 E	CRD FEE RD E	38.68119	-90.47698	10/26/2015	10/26/2015		
708	SL	ST. LOUIS	MO 340 E	CRD TIMBER RUN DR S	38.67936	-90.47134	3/21/2014	3/21/2014		
5836	SL	ST. LOUIS	MO 340 E	CST MASON RD S	38.67816	-90.46880	10/26/2015	10/26/2015	10/26/2015	10/26/2015
712	SL	ST. LOUIS	MO 340 E	CST HERITAGE PL E	38.67673	-90.46549	10/26/2015	10/26/2015		
705	SL	ST. LOUIS	MO 340 E	CST QUESTOVER LA S	38.67529	-90.46211	10/26/2015	10/26/2015		
707	SL	ST. LOUIS	MO 340 E	CST TEMPO DR S	38.67383	-90.45843	10/26/2015	10/26/2015		
5347	SL	ST. LOUIS	MO 340 E	CST CROSS CREEK DR S	38.67316	-90.45468			10/26/2015	10/26/2015
716	SL	ST. LOUIS	MO 340 E	CST OLD BALLAS RD E	38.67095	-90.43854	10/26/2015	10/26/2015	10/26/2015	10/26/2015
717	SL	ST. LOUIS	MO 340 E	CRD CRAIG RD S	38.67124	-90.43543	10/26/2015	10/26/2015	10/26/2015	
7115	SL	ST. LOUIS	MO 340 E	CST WEST OAK CENTER DR S	38.67114	-90.43362		10/26/2015	10/26/2015	10/26/2015

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722	SL	ST. LOUIS	MO 340 E	CST MOSLEY RD S	38.67145	-90.42956		10/26/2015		
13255	SL	ST. LOUIS	MO 340 E	PVT MARY MEADOWS S	38.67359	-90.42452	2/5/2013	2/5/2013		
13825	SL	ST. LOUIS	MO 340 E	CST NORTH GRAESER RD S	38.67335	-90.42195	2/5/2013	2/5/2013	2/5/2013	2/5/2013
715	SL	ST. LOUIS	MO 340 E	CST N SPOEDE RD S	38.67320	-90.41490	2/5/2013	2/5/2013		
718	SL	ST. LOUIS	MO 340 E	CST OLD OLIVE STREET RD E	38.67321	-90.41337	2/5/2013	2/5/2013		
3184	SL	ST. LOUIS	MO 340 E	.007 mile(s) before CST PAVILLION DR S	38.67316	-90.40976	2/5/2013			
5838	SL	ST. LOUIS	MO 340 E	CO OLD OLIVE STREET RD TO MO340W E	38.67303	-90.39984	2/5/2013			
5259	SL	ST. LOUIS	MO 340 E	CST ROAD6 S	38.67295	-90.39785		2/5/2013		
5343	SL	ST. LOUIS	MO 340 E	CST WARSON RD S	38.67262	-90.39482	6/20/2013	6/20/2013		
5345	SL	ST. LOUIS	MO 340 E	CST OLD BONHOMME RD E	38.67306	-90.38986	2/5/2013	2/5/2013		
5344	SL	ST. LOUIS	MO 340 E	CST INDIAN MEADOWS DR E	38.67413	-90.38359	2/5/2013	2/5/2013	2/5/2013	2/5/2013
5346	SL	ST. LOUIS	MO 340 E	CST DIELMAN RD S	38.67412	-90.37613	2/5/2013	2/5/2013	2/5/2013	2/5/2013
728	SL	ST. LOUIS	MO 340 E	CST PRICE RD S	38.67403	-90.36675		2/5/2013		
7106	SL	ST. LOUIS	MO 340 E	CST HILLTOP DR S	38.67405	-90.36445		2/5/2013	2/5/2013	2/5/2013
5793	SL	ST. LOUIS	MO 340 E	CST WOODSON RD S	38.67409	-90.35663	6/7/2010	6/7/2010	6/7/2010	6/7/2010
5794	SL	ST. LOUIS	MO 340 E	CST 82ND BLVD S	38.67366	-90.34869	6/8/2010			
5795	SL	ST. LOUIS	MO 340 E	CST 81ST ST S	38.67335	-90.34544	6/8/2010	6/8/2010		

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5796	SL	ST. LOUIS	MO 340 E	CST NORTH & SOUTH RD S	38.67220	-90.33634	6/9/2010	6/9/2010	6/9/2010	6/9/2010
5797	SL	ST. LOUIS	MO 340 E	CST HANLEY RD S	38.67167	-90.33162	6/10/2010	6/10/2010	6/10/2010	6/10/2010
5798	SL	ST. LOUIS	MO 340 E	CST MIDLAND BLVD E	38.67115	-90.32611	2/5/2013	2/5/2013	2/5/2013	2/5/2013
5800	SL	ST. LOUIS	MO 340 E	CST PENNSYLVANIA AVE S	38.66585	-90.31613	2/5/2013	2/5/2013		
5801	SL	ST. LOUIS	MO 340 E	CST OLIVE BLVD E	38.66329	-90.31089	2/5/2013	2/5/2013	2/5/2013	
349	SL	ST. LOUIS	MO 366 E	CST SUNSET OFFICE DR E	38.55514	-90.41037	10/27/2015	10/27/2015		
359	SL	ST. LOUIS	MO 366 E	RP US67 TO MO366E E	38.55540	-90.40773		10/27/2015		
2069	SL	ST. LOUIS	MO 366 E	RP MO366E TO US67 N	38.55550	-90.40621	10/27/2015			
360	SL	ST. LOUIS	MO 366 E	CST STURDY DR S	38.55632	-90.39511	10/27/2015	10/27/2015		
5413	SL	ST. LOUIS	MO 366 E	CST GLENWOOD DR E	38.55685	-90.38765	10/27/2015	10/27/2015		
352	SL	ST. LOUIS	MO 366 E	CST OLD SAPPINGTON RD S	38.55722	-90.38158		10/27/2015		
351	SL	ST. LOUIS	MO 366 E	PVT CRESTWOOD PLAZA S	38.55841	-90.37768		10/27/2015		
357	SL	ST. LOUIS	MO 366 E	CST CRESTVIEW LN S	38.5597414616382y	-90.37442		10/27/2015		
356	SL	ST. LOUIS	MO 366 E	PVT WATSON INDUSTRIAL RD E	38.56062	-90.37225	10/27/2015	10/27/2015		
348	SL	ST. LOUIS	MO 366 E	CST GRANT RD S	38.56235	-90.36799	10/27/2015	10/27/2015	10/27/2015	10/27/2015
5653	SL	ST. LOUIS	MO 366 E	CST SO ELM AVE S	38.56486	-90.35908	10/27/2015	10/27/2015	10/27/2015	10/27/2015
353	SL	ST. LOUIS	MO 366 E	CST CHESHIRE LN S	38.56614	-90.35119	10/27/2015	10/27/2015	10/27/2015	10/27/2015

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1660	SL	ST. LOUIS	MO 366 E	PVT MACKENZIE POINTE E	38.58143	-90.32088	10/27/2015			
1458	SL	ST. LOUIS	RT AC S	.002 mile(s) after CST POHLMAN RD E	38.78356	-90.27917			12/1/2016	12/1/2016
5874	SL	ST. LOUIS	RT AC S	CST LUCAS & HUNT RD S	38.74251	-90.25222			11/7/2016	
504	SL	ST. LOUIS	RT N S	CST EVANS LN E	38.72512	-90.30391			11/2/2016	11/2/2016
3623	SL	ST. LOUIS	RT U S	RP RTU TO IS70W W	38.71150	-90.28537			11/1/2017	
264	SL	ST. LOUIS	MO 180 E	CST FEE RD S	38.74041	-90.40376	10/26/2015	10/26/2015	10/26/2015	
2994	SL	ST. LOUIS	MO 180 E	.011 mile(s) after PVT SCHNUCKS/HOME DEPOT S	38.73916	-90.40158	10/26/2015	10/26/2015		
265	SL	ST. LOUIS	MO 180 E	RP US67S TO MO180E E	38.73802	-90.39965		10/26/2015		
285	SL	ST. LOUIS	MO 180 E	RP US67N TO MO180E E	38.73745	-90.39865	10/26/2015			
268	SL	ST. LOUIS	MO 180 E	CST ADIE RD S	38.73476	-90.39396	10/26/2015	10/26/2015	10/26/2015	
267	SL	ST. LOUIS	MO 180 E	CST CYPRESS RD S	38.73282	-90.39053	10/26/2015	10/26/2015		
1685	SL	ST. LOUIS	MO 180 E	CST ST TIMOTHY S	38.73144	-90.38801	10/26/2015	10/26/2015		
284	SL	ST. LOUIS	MO 180 E	CST ASHBY RD S	38.73020	-90.38583	10/26/2015	10/26/2015		
276	SL	ST. LOUIS	MO 180 E	CST SAN CARLOS LN E	38.72880	-90.38339	10/26/2015	10/26/2015		
275	SL	ST. LOUIS	MO 180 E	CST ST GREGORY CT S	38.72659	-90.37946	10/26/2015	10/26/2015	10/26/2015	10/26/2015
274	SL	ST. LOUIS	MO 180 E	CST WISMER RD S	38.72286	-90.37289	10/26/2015			
273	SL	ST. LOUIS	MO 180 E	CST LYNN TOWN DR S	38.72076	-90.36897	10/26/2015	10/26/2015		

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272	SL	ST. LOUIS	MO 180 E	.002 mile(s) before CST EDMUNDSON RD S	38.71853	-90.36476	10/26/2015			
261	SL	ST. LOUIS	MO 180 E	RT EE S	38.71587	-90.35979	10/26/2015	10/26/2015	10/26/2015	10/26/2015
3499	SL	ST. LOUIS	MO 180 E	PVT ST JOHN CROSSINGS S	38.71231	-90.35322		10/26/2015		
271	SL	ST. LOUIS	MO 180 E	CST BROWN RD S	38.71073	-90.35029	10/26/2015	10/26/2015		
270	SL	ST. LOUIS	MO 180 E	CST MC KIBBON AVE S	38.70823	-90.34574	10/26/2015	10/26/2015		
94	SL	ST. LOUIS	MO 367 S	CST COMET DR E	38.75444	-90.23880	5/23/2012	5/23/2012	5/23/2012	5/23/2012
5901	SL	ST. LOUIS	MO 367 S	CST NORTHUMBERLAND DR E	38.74692	-90.23976	5/23/2012		5/23/2012	
5873	SL	ST. LOUIS	MO 367 S	CST ST CYR RD E	38.73521	-90.24127	5/23/2012	5/23/2012	5/23/2012	5/23/2012
3931	SL	ST. LOUIS	RT AB E	OR 270 E	38.65549	-90.44991	12/14/2017			
2419	SL	ST. LOUIS	RT AB E	RP RTAB TO IS270W W	38.65549	-90.44896		12/14/2017		
1262	SL	ST. LOUIS	MO 231 S	CRD HOFFMEISTER AVE E	38.53341	-90.27536	10/26/2015	10/26/2015	10/26/2015	10/26/2015
1387	SL	ST. LOUIS	MO 231 S	CRD RIPA AVE E	38.52431	-90.27727			9/1/2018	9/1/2018
10685	SL	ST. LOUIS	MO 231 S	CRD KINGSTON DR E	38.51215	-90.29056			10/26/2015	
301	SL	ST. LOUIS	MO 231 S	CRD JEFFERSONIAN DR E	38.51076	-90.29199			10/26/2015	10/26/2015
10686	SL	ST. LOUIS	MO 231 S	CRD SAPPINGTON BARRACKS RD E	38.50237	-90.29782	10/26/2015	10/26/2015	10/26/2015	10/26/2015
3083	SL	ST. LOUIS	MO 231 S	OR 255 S	38.49740	-90.30059			10/26/2015	
3087	SL	ST. LOUIS	MO 231 S	CRD POTTLE AVE E	38.48519	-90.30427			10/26/2015	10/26/2015

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3088	SL	ST. LOUIS	MO 231 S	CRD YAEGER RD E	38.47770	-90.30440	10/26/2015	10/26/2015	10/26/2015	10/26/2015
3089	SL	ST. LOUIS	MO 231 S	PVT COPPERGATE SQUARE DR E	38.47302	-90.30442			10/26/2015	10/26/2015
3094	SL	ST. LOUIS	MO 231 S	CRD CLIFF CAVE RD E	38.47030	-90.30494			10/26/2015	10/26/2015
3095	SL	ST. LOUIS	MO 231 S	CRD GEBHARDT DR E	38.46820	-90.30556	10/26/2015		10/26/2015	10/26/2015
13955	SL	ST. LOUIS	MO 231 S	.003 mile(s) before PVT OAKVILLE MIDDLE SCHOOL E	38.46066	-90.30607			8/11/2011	8/11/2011
3867	SL	ST. LOUIS	MO 231 S	CRD ERB RD E	38.45553	-90.30631			10/26/2015	
2753	SL	ST. LOUIS	MO 231 S	.023 mile(s) after CRD CHRISTOPHER DR S	38.45076	-90.30691				10/26/2015
2754	SL	ST. LOUIS	MO 231 S	CRD BEAR CREEK DR E	38.44289	-90.31938		10/26/2015	10/26/2015	10/26/2015
5255	SL	ST. LOUIS	MO 231 S	.002 mile(s) before CRD WINDING CREEK WAY S	38.44129	-90.32136			10/26/2015	10/26/2015
2813	SL	ST. LOUIS	MO 231 S	CRD TOLLGATE RD E	38.43736	-90.32575	10/26/2015	10/26/2015	10/26/2015	10/26/2015
306	SL	ST. LOUIS	MO 267 S	CRD BUCKLEY RD S	38.51911	-90.30662		8/22/2012	8/22/2012	8/22/2012
14475	SL	ST. LOUIS	MO 141 S	CST CORPORATE WOODS TRL E	38.78784	-90.45780	1/29/2019	1/29/2019	1/29/2019	1/29/2019
10593	SL	ST. LOUIS	MO 141 S	CST ST CHARLES ROCK RD E	38.77915	-90.45948			1/29/2019	1/29/2019
12719	SL	ST. LOUIS	MO 141 N	CRD RIDER TRAIL SOUTH W	38.76259	-90.45545	1/29/2019			
10591	SL	ST. LOUIS	MO 141 N	CRD LAKEFRONT DR W	38.76635	-90.45614	1/29/2019			
1629	SL	ST. LOUIS	MO 141 N	CST MISSOURI BOTTOM RD E	38.79385	-90.45079			7/8/2019	

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1495	SL	ST. LOUIS	MO 100 E	CST RUCK RD E	38.58958	-90.59883	5/1/2019	5/1/2019		5/1/2019
1645	SL	ST. LOUIS	MO 100 E	.001 mile(s) before PVT BEST BUY S	38.59270	-90.57729	2/3/2012	2/3/2012		
184	SL	ST. LOUIS	MO 100 E	PVT BALLWIN PLAZA S	38.59280	-90.56447	2/3/2012	2/3/2012		
189	SL	ST. LOUIS	MO 100 E	CST NEW BALLWIN RD S	38.59286	-90.55761	5/3/2012	5/3/2012		
185	SL	ST. LOUIS	MO 100 E	CST HOLLOWAY RD S	38.59296	-90.54644	2/3/2012			
3479	SL	ST. LOUIS	MO 100 E	CST BALLPARK DR S	38.59297	-90.54333	2/3/2012	2/3/2012		
3986	SL	ST. LOUIS	MO 100 E	CST SEVEN TRAILS DR S	38.59298	-90.53771	2/3/2012	2/3/2012		
187	SL	ST. LOUIS	MO 100 E	CST GRANDPAS S	38.59297	-90.52996	2/3/2012	2/3/2012		
183	SL	ST. LOUIS	MO 100 E	CST BAXTER RD S	38.59320	-90.52078	2/3/2012	2/3/2012		
186	SL	ST. LOUIS	MO 100 E	CST HENRY AVE S	38.59309	-90.51608	2/3/2012	2/3/2012	2/3/2012	2/3/2012
2166	SL	ST. LOUIS	MO 100 E	CST OLD MERAMEC STATION RD S	38.59290	-90.51169	2/3/2012	2/3/2012		
1686	SL	ST. LOUIS	MO 100 E	CST ENCHANTED PKWY S	38.59263	-90.50192	2/3/2012	2/3/2012		2/3/2012
191	SL	ST. LOUIS	MO 100 E	PVT KNOLLHAVEN DR S	38.59313	-90.49962	2/3/2012	2/3/2012		
195	SL	ST. LOUIS	MO 100 E	CRD BRAESHIRE DR S	38.59407	-90.49620	2/3/2012	2/3/2012		
190	SL	ST. LOUIS	MO 100 E	CRD WEIDMAN RD S	38.59547	-90.49109	2/3/2012	2/3/2012		
192	SL	ST. LOUIS	MO 100 E	PVT MANCHESTER MEADOWS S	38.59661	-90.48516		2/3/2012		

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194	SL	ST. LOUIS	MO 100 E	CST MASON RD S	38.59606	-90.47954	2/3/2012	2/3/2012		
202	SL	ST. LOUIS	MO 100 E	CST BLASE AVE S	38.60261	-90.43887	10/27/2015	10/27/2015		
203	SL	ST. LOUIS	MO 100 E	CST LINDEMANN RD S	38.60166	-90.43464	1/22/2013	1/22/2013		
204	SL	ST. LOUIS	MO 100 E	CST BOPP RD S	38.60109	-90.43204	1/22/2013	1/22/2013		
5913	SL	ST. LOUIS	MO 100 E	CST WOODGATE DR S	38.59942	-90.42444	10/27/2015			
1624	SL	ST. LOUIS	MO 100 E	CST GEYER RD S	38.59880	-90.41583	10/27/2015	10/27/2015	10/27/2015	10/27/2015
206	SL	ST. LOUIS	MO 100 E	CST NO WOODLAWN AVE S	38.60077	-90.39683	4/13/2012	4/13/2012		
3659	SL	ST. LOUIS	MO 100 E	CST LACLEDE STATION RD S	38.61327	-90.32850	7/28/2017	7/28/2017	7/28/2017	7/28/2017
2923	SL	ST. LOUIS	MO 30 E	CRD SAPPINGTON RD S	38.53623	-90.38002		10/26/2015	10/26/2015	10/26/2015
2950	SL	ST. LOUIS	MO 30 E	CST EDDIE AND PARK RD E	38.54204	-90.36307	10/26/2015			
3868	SL	ST. LOUIS	MO 30 E	.01 mile(s) before CRD MUSICK RD S	38.54568	-90.35204		1/9/2020		
3349	SL	ST. LOUIS	MO 30 E	CST GRANT RD E	38.54711	-90.34770	10/26/2015	10/26/2015	10/26/2015	10/26/2015
2943	SL	ST. LOUIS	MO 30 E	CST LACLEDE STATION RD S	38.54871	-90.34294	10/26/2015			
2944	SL	ST. LOUIS	MO 30 E	CRD VALCOUR AVE S	38.55067	-90.33625	10/26/2015	10/26/2015		
2947	SL	ST. LOUIS	MO 30 E	CRD WEBER RD E	38.55508	-90.31452	10/26/2015	10/26/2015		
3279	SL	ST. LOUIS	MO 30 E	CRD HEEGE RD E	38.55895	-90.30236		10/26/2015		
2949	SL	ST. LOUIS	MO 30 E	CRD SEIBERT AVE W	38.55973	-90.30108	6/1/2015			

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656	SL	ST. LOUIS	MO 115 S	RP MO115N TO IS170E E	38.72017	-90.33266			1/11/2022	
3167	SL	ST. LOUIS	MO 115 S	CST CLEARVIEW DR S	38.70704	-90.31458			12/21/2016	12/21/2016
1394	SL	ST. LOUIS	MO 115 S	CST ARLMONT DR S	38.70698	-90.31136			12/21/2016	12/21/2016
102	SL	ST. LOUIS	MO 115 S	.002 mile(s) after PVT NOR-MANDY MIDDLE SCHOOL S	38.70732	-90.30792			12/22/2016	12/22/2016
5876	SL	ST. LOUIS	AIRFLIGHT DR S	RP AIRFLIGHT DR TO LAMBERT INTL BLVD E	38.73974	-90.36619			11/27/2017	
544	SL	ST. LOUIS	AIRPORT RD E	RP IS170W TO AIRPORT RD E	38.74965	-90.33726	11/27/2017			
3784	SL	ST. LOUIS	REAVIS BARRACKS RD E	RP BARRACKS RD TO IS55S S	38.53328	-90.31241		11/27/2017		
10695	SL	ST. LOUIS	REAVIS BARRACKS RD E	RP IS55N TO BARRACKS RD E	38.53266	-90.31107	11/27/2017			
649	SL	ST. LOUIS	BAYLESS AVE E	RP BAYLESS AVE TO IS55S S	38.54734	-90.29067		8/29/2012		
648	SL	ST. LOUIS	BAYLESS AVE E	RP IS55N TO BAYLESS AVE N	38.54683	-90.28972	8/29/2012			
5643	SL	ST. LOUIS	BELLEFONTAINE RD S	RP IS270E TO BELLEFONTAINE RD E	38.76943	-90.22086				11/27/2017
4038	SL	ST. LOUIS	CYPRESS RD S	RP CYPRESS RD TO IS70E E	38.74241	-90.38589			1/13/2016	1/13/2016

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16764	SL	ST. LOUIS	DES PERES RD S	PVT DAYLIGHT LN E	38.60661	-90.45340			5/17/2017	5/17/2017
4071	SL	ST. LOUIS	DES PERES RD S	.005 mile(s) before RP MO100W TO DES PERES RD S	38.60489	-90.45501			5/17/2017	5/17/2017
4069	SL	ST. LOUIS	DES PERES RD S	RP MO100E TO DES PERES RD S	38.60051	-90.45534			11/27/2017	
3247	SL	ST. LOUIS	ELM AVE S	RP IS44W TO ELM AVE N	38.58084	-90.35963			11/27/2017	
4705	SL	ST. LOUIS	KEHRS MILL RD E	CST WILD HORSE CREEK RD E	38.65751	-90.61839	7/1/2013			
260	SL	ST. LOUIS	LADUE RD E	RP LADUE RD TO IS170E E	38.65336	-90.35467	12/5/2014	12/5/2014		
4817	SL	ST. LOUIS	LILAC AVE S	RP IS270W TO LILAC AVE W	38.76784	-90.20282			11/27/2017	
4816	SL	ST. LOUIS	LILAC AVE S	RP IS270E TO LILAC AVE E	38.76664	-90.20302				11/27/2017
5924	SL	ST. LOUIS	MASON RD S	OR 64 E	38.64001	-90.48083				6/9/2016
5927	SL	ST. LOUIS	MASON RD S	OR 64 E	38.63934	-90.48080			6/9/2016	
1150	SL	ST. LOUIS	MERAMEC BOTTOM RD E	RP MERAMEC BOTTOM RD TO IS55S S	38.46197	-90.37533		11/27/2017		
1151	SL	ST. LOUIS	MERAMEC BOTTOM RD E	RP IS55N TO MERAMEC BOTTOM RD E	38.46161	-90.37309	11/27/2017			

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15355	SL	ST. LOUIS	MCKNIGHT RD S	RP MCKNIGHT RD TO IS170W W	38.66143	-90.35717			9/1/2014	
76	SL	ST. LOUIS	BIG BEND RD E	RP IS44E TO BIG BEND BLVD E	38.56789	-90.39292	11/27/2017			
5939	SL	ST. LOUIS	PEAR TREE DR E	RP IS70E TO PEAR TREE DR E	38.73849	-90.36832		11/27/2017		
5930	SL	ST. LOUIS	SO BERRY RD S	RP SO BERRY RD TO IS44E E	38.57550	-90.37728				6/18/2019
3248	SL	ST. LOUIS	SO ELM AVE S	RP IS44E TO SO ELM AVE E	38.57985	-90.35951				11/27/2017
5525	SL	ST. LOUIS	N OR 270 E	CST WEST FLORISSANT AVE S	38.77171	-90.27995			11/27/2017	11/27/2017
16763	SL	ST. LOUIS	N OR 44 E	CST WORKMAN RD S	38.50477	-90.66714	1/19/2018			
5526	SL	ST. LOUIS	S OR 270 E	CST WEST FLORISSANT AVE S	38.76986	-90.28009	11/27/2017	11/27/2017	11/27/2017	
3206	SL	ST. LOUIS	S OR 70 E	CST EDMUNDSON RD S	38.73852	-90.36414		11/27/2017		
11925	SL	ST. LOUIS	W OR 367 S	CRD PARKER RD E	38.79575	-90.23058		11/27/2017		
11929	SL	ST. LOUIS	W OR 367 S	OR 270 E	38.77929	-90.23746		11/27/2017		
11928	SL	ST. LOUIS	E OR 367 N	OR 270 E	38.77903	-90.23640	11/27/2017			
11930	SL	ST. LOUIS	E OR 367 N	CRD REDMAN RD E	38.78550	-90.23391	11/27/2017			
5940	SL	ST. LOUIS	S NEW BALLAS RD S	CST CONWAY RD E	38.64161	-90.44347		7/1/2015		7/1/2015
5863	SL	ST. LOUIS CITY	RT D E	CST KIENLEN AVE S	38.67048	-90.28982	10/21/2013	10/21/2013	10/21/2013	10/21/2013

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4593	SL	ST. LOUIS CITY	RT D E	CST HODIAMONT AVE S	38.67002	-90.28898	10/21/2013	10/21/2013		
4596	SL	ST. LOUIS CITY	RT D E	CST CLARA AVE S	38.66500	-90.27967			4/9/2018	
4597	SL	ST. LOUIS CITY	RT D E	CST BELT AVE S	38.66312	-90.27617	4/9/2018	4/9/2018		
4598	SL	ST. LOUIS CITY	RT D E	CST UNION BLVD S	38.66091	-90.27202			10/21/2013	10/21/2013
4600	SL	ST. LOUIS CITY	RT D E	CST KINGSHIGHWAY BLVD S	38.65990	-90.26211	4/9/2018	4/9/2018	4/9/2018	4/9/2018
4613	SL	ST. LOUIS CITY	RT D E	CST NEWSTEAD AVE S	38.65437	-90.24662	7/8/2015	7/8/2015	7/8/2015	7/8/2015
4617	SL	ST. LOUIS CITY	RT D E	CST VANDEVENTER AVE S	38.64879	-90.23389			1/27/2016	1/27/2016
4619	SL	ST. LOUIS CITY	RT D E	CST GRAND BLVD S	38.64588	-90.22730			4/9/2018	4/9/2018
4622	SL	ST. LOUIS CITY	RT D E	CST 14TH ST S	38.63477	-90.19803	2/29/2016	2/29/2016		
4558	SL	ST. LOUIS CITY	MO 100 E	CST KNOX AVE S	38.62223	-90.29007		11/27/2017		
4559	SL	ST. LOUIS CITY	MO 100 E	CST SULPHUR AVE S	38.62264	-90.28637	11/27/2017	11/27/2017		
7166	SL	ST. LOUIS CITY	MO 100 E	CST SUBLETTE AVE S	38.62332	-90.28061		11/27/2017		
4560	SL	ST. LOUIS CITY	MO 100 E	CST MACKLIND AVE S	38.62390	-90.27572	11/27/2017	11/27/2017		
7185	SL	ST. LOUIS CITY	MO 100 E	CST BARRON AVE S	38.62425	-90.27281		11/27/2017		
4564	SL	ST. LOUIS CITY	MO 100 E	CST TOWER GROVE AVE S	38.62701	-90.25689	2/4/2013	2/4/2013		
4565	SL	ST. LOUIS CITY	MO 100 E	CST BOYLE AVE S	38.62738	-90.25421	2/4/2013	2/4/2013		
4566	SL	ST. LOUIS CITY	MO 100 E	CST N SARAH ST S	38.62790	-90.25020	11/27/2017	11/27/2017		
4570	SL	ST. LOUIS CITY	MO 100 E	CST GRAND BLVD S	38.62601	-90.23670	1/1/2014	1/1/2014		1/1/2014

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4571	SL	ST. LOUIS CITY	MO 100 E	CST COMPTON AVE S	38.62450	-90.22946	10/21/2010	10/21/2010		10/21/2010
4572	SL	ST. LOUIS CITY	MO 100 E	CST JEFFERSON AVE S	38.62224	-90.21857	1/1/2014	1/1/2014	1/1/2014	1/1/2014
4575	SL	ST. LOUIS CITY	MO 100 E	CST 18TH ST S	38.62007	-90.20813	1/1/2014	1/1/2014	1/1/2014	1/1/2014
4576	SL	ST. LOUIS CITY	MO 100 E	CST 14TH ST S	38.61932	-90.20453	1/1/2014	1/1/2014	1/1/2014	1/1/2014
4578	SL	ST. LOUIS CITY	MO 100 E	CST S 7TH BLVD S	38.61756	-90.19568	1/1/2014	1/1/2014		
13275	SL	ST. LOUIS CITY	MO 100 E	CST 4TH ST N	38.61706	-90.19294	12/14/2017			
4193	SL	ST. LOUIS CITY	MO 30 E	CST RIVER DES PERES BLVD E	38.56313	-90.29587	3/8/2018	3/8/2018	3/8/2018	3/8/2018
4197	SL	ST. LOUIS CITY	MO 30 E	CST GERMANIA AVE E	38.56429	-90.29420	3/8/2018		3/8/2018	3/8/2018
4426	SL	ST. LOUIS CITY	MO 30 E	CST CHRISTY BLVD S	38.57668	-90.27580	3/8/2018	3/8/2018		
4404	SL	ST. LOUIS CITY	MO 30 E	CST BATES ST E	38.57786	-90.27202	3/8/2018	3/8/2018		
4443	SL	ST. LOUIS CITY	MO 30 E	CST MORGANFORD RD S	38.58120	-90.26731		5/30/2017		
4425	SL	ST. LOUIS CITY	MO 30 E	CST CHEROKEE ST E	38.59519	-90.24050		10/17/2017		
4447	SL	ST. LOUIS CITY	MO 30 E	CST UTAH ST E	38.59673	-90.23821	6/15/2017	6/15/2017		
4448	SL	ST. LOUIS CITY	MO 30 E	CST WYOMING ST E	38.59830	-90.23613	6/15/2017	6/15/2017		
4405	SL	ST. LOUIS CITY	MO 30 E	CST CALIFORNIA AVE S	38.60271	-90.22816	6/15/2017	6/15/2017		
4450	SL	ST. LOUIS CITY	MO 30 E	CST MAGNOLIA AVE E	38.60342	-90.22651	6/16/2017	6/16/2017		
6465	SL	ST. LOUIS CITY	MO 30 E	CST MC NAIR AVE S	38.60682	-90.21794		6/16/2017		
4372	SL	ST. LOUIS CITY	MO 30 E	CST RUSSELL BLVD E	38.60848	-90.21235			6/19/2017	6/19/2017

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5882	SL	ST. LOUIS CITY	MO 115 S	CST CLARA AVE S	38.68291	-90.26639			5/13/2015	
4645	SL	ST. LOUIS CITY	MO 115 S	CST BELT AVE S	38.68168	-90.26379			6/19/2015	6/19/2015
4663	SL	ST. LOUIS CITY	MO 115 S	PVT SCHNUCKS PLAZA S	38.68010	-90.26016			6/18/2015	
5883	SL	ST. LOUIS CITY	MO 115 S	CST UNION BLVD S	38.67928	-90.25825	3/12/2015	3/12/2015	3/12/2015	3/12/2015
4648	SL	ST. LOUIS CITY	MO 115 S	CST KINGSHIGHWAY BLVD S	38.67640	-90.25192			6/11/2015	6/11/2015
4650	SL	ST. LOUIS CITY	MO 115 S	CST SHREVE AVE S	38.67373	-90.24576			1/7/2019	1/7/2019
5865	SL	ST. LOUIS CITY	MO 115 S	CST TAYLOR AVE S	38.67107	-90.23936			1/7/2019	
5866	SL	ST. LOUIS CITY	MO 115 S	CST NEWSTEAD AVE S	38.66978	-90.23647	1/7/2019	1/7/2019	1/7/2019	1/7/2019
5869	SL	ST. LOUIS CITY	MO 115 S	CST PRAIRIE AVE S	38.66274	-90.22035			2/4/2019	
4661	SL	ST. LOUIS CITY	MO 115 S	CST GRAND BLVD S	38.66115	-90.21677	1/7/2019	1/7/2019	1/7/2019	1/7/2019
4643	SL	ST. LOUIS CITY	MO 115 S	CST GARRISON AVE S	38.66028	-90.21476				1/7/2019
4660	SL	ST. LOUIS CITY	MO 115 S	CST GLASGOW AVE S	38.65959	-90.21319			1/7/2019	1/7/2019
4659	SL	ST. LOUIS CITY	MO 115 S	CST FARRAR ST E	38.65868	-90.21135			1/7/2019	
16775	SL	ST. LOUIS CITY	BOYLE AVE S	RP IS64W TO BOYLE AVE N	38.63163	-90.25314			11/24/2015	
16777	SL	ST. LOUIS CITY	CARRIE AVE E	RP CARRIE AVE TO IS70W W	38.68448	-90.21903	5/24/2018			
9074	SL	ST. LOUIS CITY	WASHING-TON AVE E	OR 44 W	38.62965	-90.18619		6/23/2016		

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2784	SL	ST. LOUIS CITY	GRAND BLVD S	CST LAFAYETTE AVE E	38.61706	-90.23936			10/3/2017	10/3/2017
2785	SL	ST. LOUIS CITY	GRAND BLVD S	CST DE TONTY ST E	38.61615	-90.23946				10/3/2017
1755	SL	ST. LOUIS CITY	JEFFERSON AVE S	.009 mile(s) after RP JEFFERSON AVE TO IS64W W	38.62789	-90.21747			6/9/2014	
16776	SL	ST. LOUIS CITY	CST CASS AVE W	.001 mile(s) after CST TUCKER BLVD S	38.64062	-90.19191			1/6/2014	1/6/2014
4618	SL	ST. LOUIS CITY	RT D E	CST SPRING AVE S	38.64680	-90.22939			1/27/2016	

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5613	SW	BARRY	US 60 E	CST LOWES LN S	36.91370	-93.89624	7/29/2020	7/29/2020	7/29/2020	7/29/2020
2797	SW	BENTON	MO 7 S	CST ROUTE 7 E	38.25309	-93.36703	12/20/2019	12/20/2019	12/20/2019	12/20/2019
4203	SW	CEDAR	US 54 E	MO 82 E	37.86310	-94.02222	6/19/2019	6/19/2019		6/19/2019
1898	SW	CEDAR	US 54 E	CST PARK ST S	37.86297	-94.01840	6/4/2019	6/4/2019		
3419	SW	CEDAR	US 54 E	MO 32 E	37.86275	-94.01232	6/4/2019	6/4/2019	6/4/2019	6/4/2019
7495	SW	CHRISTIAN	MO 14 E	BU 65 S	37.00432	-93.20589	5/13/2020	5/13/2020		
7095	SW	CHRISTIAN	BU 65 S	CST S 17TH ST S	37.00459	-93.22158	5/13/2020	5/13/2020	5/13/2020	5/13/2020
3389	SW	CHRISTIAN	RT J E	CRD N 17TH ST S	37.07006	-93.22377			6/20/2016	6/20/2016
16416	SW	CHRISTIAN	RT CC E	CST N 22ND ST S	37.07026	-93.23267	12/14/2017	12/14/2017	12/14/2017	12/14/2017
8587	SW	CHRISTIAN	US 160 E	CRD TRACKER RD E	37.06559	-93.30343	5/19/2020	5/19/2020		5/19/2020
2157	SW	CHRISTIAN	US 160 E	CST KATHRYN ST E	37.06012	-93.30355	5/19/2020	5/19/2020	5/19/2020	5/19/2020
1074	SW	CHRISTIAN	US 160 E	CST NORTHVIEW RD E	37.05459	-93.30372			5/20/2020	5/19/2020
1072	SW	CHRISTIAN	US 160 E	CST WASSON DR E	37.04737	-93.30342	5/19/2020	5/19/2020	5/19/2020	5/19/2020
2130	SW	CHRISTIAN	US 160 E	RT EE E	36.92739	-93.28429	5/11/2015	5/12/2015		
865	SW	GREENE	MO 13 S	CST ATLANTIC ST E	37.23358	-93.31129			6/22/2020	6/22/2020
866	SW	GREENE	MO 13 S	.004 mile(s) after CST NICHOLS ST E	37.21889	-93.31199			7/1/2018	7/1/2018

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7928	SW	GREENE	RT YY E	CST DIVISION ST E	37.22426	-93.22609		9/3/2018		
8495	SW	GREENE	RT YY E	RP US65N TO RTYY E	37.22421	-93.22448	9/3/2018			
794	SW	GREENE	LP 44 E	CST BROADWAY AVE S	37.21421	-93.30307	7/1/2018	7/1/2018		
797	SW	GREENE	LP 44 E	CST MAIN AVE S	37.21543	-93.29626	7/1/2018	7/1/2018		
795	SW	GREENE	LP 44 E	CST CAMPBELL AVE N	37.21543	-93.29402	7/1/2018			
796	SW	GREENE	LP 44 E	CST BOONVILLE AVE S	37.21542	-93.29237	7/1/2018	7/1/2018	7/1/2018	7/1/2018
799	SW	GREENE	LP 44 E	CST JEFFERSON AVE S	37.21536	-93.28948		7/1/2018		
801	SW	GREENE	LP 44 E	CST BENTON AVE S	37.21516	-93.28767	7/1/2018	7/1/2018	7/1/2018	7/1/2018
802	SW	GREENE	LP 44 E	CST FREMONT AVE S	37.21472	-93.27086	7/1/2018	7/1/2018		
891	SW	GREENE	MO 744 E	CST BROADWAY AVE S	37.24080	-93.30202	7/27/2015	7/27/2015	7/27/2015	7/27/2015
16067	SW	GREENE	MO 744 E	CST PACKER RD S	37.23917	-93.23384	10/5/2016	10/5/2016	10/5/2016	10/5/2016
2128	SW	GREENE	MO 744 E	CST MAYFAIR AVE S	37.23901	-93.22918	4/4/2015			
15838	SW	GREENE	MO 744 E	.009 mile(s) before RT OO E	37.24738	-93.18351	5/5/2016	5/5/2016		
16418	SW	GREENE	BU 65 S	CST FRISCO S	37.20969	-93.22826	4/25/2018	4/25/2018	4/25/2018	4/25/2018
790	SW	GREENE	BU 65 S	CST BELCREST AVE S	37.20995	-93.23431	7/1/2018	7/1/2018		
793	SW	GREENE	BU 65 S	CST N PRINCE LN S	37.21001	-93.23634	7/1/2018	7/1/2018		
836	SW	GREENE	BU 65 S	CST CINDERELLA ST E	37.18589	-93.26223	7/1/2018	7/1/2018	7/1/2018	7/1/2018
7459	SW	GREENE	BU 65 S	CST CHEROKEE ST E	37.17823	-93.26240			7/1/2018	7/1/2018

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7461	SW	GREENE	BU 65 S	CST SEMINOLE ST E	37.17433	-93.26248	7/1/2018	7/1/2018	7/1/2018	7/1/2018
11077	SW	GREENE	RT EE E	CST N ALLIANCE AVE S	37.22724	-93.37903	9/28/2017	9/28/2017	9/28/2017	9/28/2017
14026	SW	GREENE	RT H S	LP 44 W	37.24893	-93.26182				12/12/2016
16415	SW	GREENE	MO 125 S	.001 mile(s) before RP MO125 TO IS44E E	37.27174	-93.11341				1/15/2018
811	SW	GREENE	RT D E	CST VENTURA AVE S	37.18087	-93.24307	8/29/2018	8/29/2018		
7945	SW	GREENE	US 60 E	RT M E	37.14570	-93.42896			12/5/2017	12/5/2017
8505	SW	GREENE	US 160 E	RT Z S	37.29892	-93.43308	8/18/2020	8/18/2020	8/18/2020	8/18/2020
8506	SW	GREENE	US 160 E	CST MILLER RD S	37.29871	-93.42395	4/30/2020	4/30/2020	4/30/2020	4/30/2020
14989	SW	GREENE	US 160 E	RP US160E TO IS44E E	37.24467	-93.34836	3/2/2016			
11295	SW	GREENE	US 160 E	CST WEAVER RD E	37.12462	-93.29656		7/25/2012		
15956	SW	GREENE	MO 413 N	PVT UNKNOWN S	37.18071	-93.36182	7/10/2018	7/10/2018		
8666	SW	GREENE	MO 413 S	CST MOORE RD S	37.18303	-93.34534			7/1/2018	7/1/2018
6235	SW	JASPER	RT FF E	CST INDIANA AVE S	37.05497	-94.50526	2/1/2020	2/1/2020	2/1/2020	2/1/2020
4384	SW	JASPER	RT FF E	CST CONNECTICUT AVE S	37.05488	-94.49641	6/1/2020	6/1/2020	6/1/2020	6/1/2020
2026	SW	JASPER	RT FF E	CST PROSPERITY RD S	37.05449	-94.42466	3/1/2020	3/1/2020	3/1/2020	3/1/2020
15405	SW	JASPER	RT HH E	CST HAZEL AVE S	37.14026	-94.31965	1/26/2015	1/26/2015	1/26/2015	1/26/2015
1349	SW	JASPER	MO 66 E	RT P E	37.08464	-94.54902	10/1/2018	10/1/2018	10/1/2018	10/1/2018

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2505	SW	JASPER	MO 66 E	PVT WALMART S	37.08466	-94.54601	4/10/2019			
6264	SW	JASPER	MO 66 E	CST MAIDEN LANE S	37.08458	-94.53110	12/2/2019	12/2/2019	12/2/2019	12/2/2019
5683	SW	JASPER	MO 66 E	CST S GENEVA AVE S	37.08420	-94.47497			11/14/2014	11/14/2014
1344	SW	JASPER	MO 66 E	CST NORTHPARK LN S	37.08406	-94.46830	11/14/2014			
1343	SW	JASPER	MO 66 E	CST DUQUESNE RD S	37.08385	-94.45912			5/14/2020	5/14/2020
13487	SW	JASPER	MO 66 E	.051 mile(s) after CRD GARDEN GROVE S	37.08367	-94.44885		11/14/2014		
13488	SW	JASPER	MO 66 E	CRD TRAVIS ACRES S	37.08359	-94.44093	11/14/2014			
13489	SW	JASPER	MO 66 E	CRD KENSER RD S	37.08354	-94.43633	11/14/2014	11/14/2014	11/14/2014	11/14/2014
3848	SW	JASPER	MO 66 E	.006 mile(s) after RP MO66 TO MO249S S	37.08333	-94.42615		11/14/2014		1/1/2001
3849	SW	JASPER	MO 66 E	RP MO249N TO MO66 E	37.08330	-94.42403	11/14/2014			
1270	SW	JASPER	MO 43 S	CRD FOUNTAIN RD E	37.12821	-94.51135			11/17/2016	11/17/2016
2508	SW	JASPER	LP 49 S	RT TT E	37.09817	-94.47669			4/1/2015	4/1/2015
3371	SW	JASPER	LP 49 S	CST TURKEY CREEK BLVD E	37.09368	-94.47689				3/31/2015
1908	SW	JASPER	LP 49 S	PVT MALL E	37.09092	-94.47695			4/1/2015	4/1/2015
14839	SW	JASPER	E ZORA ST E	CRD W ZORA ST E	37.11369	-94.51024		8/7/2014		
14838	SW	JASPER	E ZORA ST E	CST UNKNOWN E	37.11365	-94.50788	8/7/2014	8/7/2014		

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15295	SW	LAWRENCE	MO 39 S	LP 44 E	37.09376	-93.82594	4/12/2016	4/12/2016	4/12/2016	4/12/2016
11945	SW	LAWRENCE	MO 39 S	MO 265 S	37.09390	-93.80476			12/19/2013	
11946	SW	LAWRENCE	MO 39 S	LP 44 E	37.09295	-93.80262				12/19/2013
1421	SW	LAWRENCE	MO 39 S	BU 60 E	36.97067	-93.71802	12/11/2018	12/11/2018	12/11/2018	12/11/2018
6133	SW	NEWTON	MO 86 E	LP 49 S	36.86829	-94.38916				1/11/2017
15697	SW	NEWTON	US 60 E	CRD ADAMS DR S	36.84100	-94.40232			11/2/2015	11/2/2015
15698	SW	NEWTON	US 60 E	CST HEARTHSIDE DR S	36.84194	-94.38649	11/2/2015	11/2/2015	11/2/2015	11/2/2015
7335	SW	STONE	MO 76 E	MO 265 S	36.67532	-93.32637	11/20/2014	11/20/2014	11/20/2014	11/20/2014
7336	SW	TANEY	US 65 S	MO 265 S	36.56963	-93.25023	8/24/2016	8/24/2016		
5693	SW	TANEY	RT F E	MO 76 E	36.71105	-93.22194		6/30/2016		
5694	SW	TANEY	RT F E	MO 76 W	36.71152	-93.21969	6/30/2016			
15975	SW	TANEY	RT F E	OR 65 S	36.71181	-93.21827	6/30/2016	6/30/2016	7/1/2016	6/30/2016
8000	SW	TANEY	BEE CREEK RD S	CST BRANSON HILLS PKWY E	36.66938	-93.22014				7/23/2020
13785	SW	TANEY	BRANSON HILLS PKWY E	OR 65 S	36.66938	-93.22392	7/23/2020	7/23/2020		
13795	SW	TANEY	BRANSON HILLS PKWY E	CRD BEE CREEK RD S	36.66939	-93.22245		7/23/2020		

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6268	SW	VERNON	US 54 E	RT BB S	37.83723	-94.35934	8/19/2020	8/19/2020	8/19/2020	8/19/2020
4202	SW	VERNON	US 54 E	CST WASHINGTON ST S	37.83712	-94.35540	8/19/2020	8/19/2020		8/19/2020
7352	SW	CHRISTIAN	MO 14 E	CRD 25TH ST S	37.02334	-93.23810	5/4/2021			
7346	SW	CHRISTIAN	MO 14 E	RT M E	37.04369	-93.32666	3/29/2021	3/29/2021	3/29/2021	3/29/2021
7347	SW	CHRISTIAN	MO 14 E	CRD GREGG RD S	37.04354	-93.31748	4/8/2021	4/8/2021	4/8/2021	4/8/2021
7350	SW	CHRISTIAN	MO 14 E	CST TRUMAN BLVD S	37.04358	-93.31058	4/13/2021	4/13/2021	4/13/2021	4/13/2021
2129	SW	CHRISTIAN	US 160 E	CST SOUTH ST E	37.03998	-93.30233	10/16/2020	10/16/2020	10/16/2020	10/16/2020
14575	SW	GREENE	US 60 E	CST N OAKWOOD AVE S	37.13573	-93.45242		5/24/2021		
8539	SW	GREENE	US 60 E	MO 174 E	37.12761	-93.46214	4/25/2021	4/25/2021	4/25/2021	
7351	SW	STONE	MO 76 E	CST BUSINESS 13 S	36.69707	-93.36926	5/25/2021	5/25/2021		5/25/2021

Southeast District

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51	SE	CAPE GIRARDEAU	US 61 S	MO 177 S	37.44280	-89.63642			7/16/2015	
3319	SE	CAPE GIRARDEAU	US 61 S	LP 55 S	37.42978	-89.63857			3/18/2016	
3321	SE	CAPE GIRARDEAU	US 61 S	OR 55 S	37.42789	-89.64141			3/18/2016	
3310	SE	CAPE GIRARDEAU	US 61 S	.005 mile(s) before CST WALTON DR E	37.36458	-89.63417			4/11/2019	4/11/2019
17025	SE	CAPE GIRARDEAU	US 61 S	CST VETERANS MEMORIAL DR S	37.34691	-89.59816			11/9/2020	11/9/2020
13425	SE	CAPE GIRARDEAU	MO 25 S	.003 mile(s) after CST SCHOOL LN E	37.36593	-89.66002			5/2/2019	
3429	SE	CAPE GIRARDEAU	MO 74 E	CST MT AUBURN RD S	37.28791	-89.56922	8/1/2017	8/1/2017		
2178	SE	CAPE GIRARDEAU	MO 74 E	CST SILVER SPRINGS RD S	37.28973	-89.56624	8/1/2017	8/1/2017		
1704	SE	CAPE GIRARDEAU	MO 74 E	CST WEST END BLVD S	37.29517	-89.53774	8/1/2017	8/1/2017		
4713	SE	CAPE GIRARDEAU	MO 74 E	CST FOUNTAIN ST S	37.29494	-89.52330	8/1/2017			
1398	SE	DOUGLAS	MO 5 S	MO 14 E	36.96120	-92.67301	8/1/2012	8/1/2012	8/1/2012	8/1/2012
4835	SE	DUNKLIN	MO 25 S	RT E	36.25122	-90.03315	10/20/2017		10/20/2017	10/20/2017
1296	SE	HOWELL	US 63 S	.001 mile(s) before US 160 W	36.74271	-91.87711	7/17/2013	7/17/2013	7/17/2013	7/17/2013
1295	SE	HOWELL	US 63 S	.001 mile(s) before CST BROADWAY E	36.73183	-91.87738	7/17/2013	7/17/2013	7/17/2013	7/17/2013

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1294	SE	HOWELL	US 63 S	.002 mile(s) before RT K E	36.72576	-91.87752	7/17/2013	7/17/2013	7/17/2013	7/17/2013
3793	SE	HOWELL	US 63 S	.001 mile(s) before US 160 E	36.71796	-91.87275			7/17/2013	7/17/2013
15205	SE	HOWELL	US 63 S	CST RAMSEUR FARM RD E	36.71678	-91.85987	7/17/2013	7/17/2013	7/17/2013	7/17/2013
2063	SE	HOWELL	US 63 S	MO 17 S	36.71654	-91.85080	7/17/2013	7/17/2013	7/17/2013	7/17/2013
15206	SE	HOWELL	US 63 S	CST LANTON RD S	36.71632	-91.84147	7/17/2013	7/17/2013	7/17/2013	7/17/2013
3803	SE	HOWELL	US 63 S	BU 63 S	36.71595	-91.83128	7/17/2013	7/17/2013	7/17/2013	7/17/2013
92	SE	HOWELL	BU 63 S	CST GIRDLEY ST E	36.75349	-91.87242	6/27/2018	6/27/2018		
1297	SE	HOWELL	BU 63 S	US 160 E	36.74260	-91.87216	3/1/2011	3/1/2011	3/1/2011	3/1/2011
2422	SE	HOWELL	BU 63 S	CST WASHINGTON AVE S	36.73112	-91.85250	8/2/2010	8/2/2010	8/2/2010	8/2/2010
3802	SE	HOWELL	US 160 E	CST BRUCE SMITH PKWY S	36.71240	-91.87515	7/17/2013	7/17/2013	7/17/2013	7/17/2013
3801	SE	HOWELL	US 160 E	PVT SOUTHERN HILLS DR S	36.71422	-91.87436	7/17/2013	7/17/2013	7/17/2013	7/17/2013
3800	SE	HOWELL	US 160 E	CST WORLEY DR S	36.71610	-91.87355	7/17/2013	7/17/2013	7/17/2013	7/17/2013
5395	SE	MADISON	MO 72 E	.002 mile(s) after OR 67 S	37.56275	-90.31980		11/18/2018		
4795	SE	NEW MADRID	US 61 S	.006 mile(s) before CST PLANTATION BLVD E	36.86657	-89.58104			9/9/2012	9/9/2012
4796	SE	NEW MADRID	US 61 S	CST STALLCUP E	36.86170	-89.58355			9/9/2012	9/9/2012
1225	SE	NEW MADRID	US 61 S	RP US60W TO US62 W	36.85660	-89.58284			8/29/2013	
4783	SE	NEW MADRID	US 61 S	BU 60 E	36.85468	-89.58242				8/29/2013

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15335	SE	NEW MADRID	US 61 N	.001 mile(s) before CST LARCEL DR E	36.85323	-89.58213			11/14/2014	11/14/2014
6037	SE	PEMISCOT	MO 84 E	RP MO84 TO IS55S S	36.23172	-89.73224		8/11/2011		
6036	SE	PEMISCOT	MO 84 E	RP IS55N TO MO84 E	36.23105	-89.73073	8/11/2011			
3439	SE	PERRY	MO 51 S	RP MO51 TO IS55N N	37.71040	-89.89146			9/3/2015	
3440	SE	PERRY	MO 51 S	RP MO51 TO IS55S S	37.70875	-89.89227				9/3/2015
4847	SE	SCOTT	US 61 S	CST SMITH AVE E	36.88557	-89.58131				5/15/2014
4846	SE	SCOTT	US 61 S	CST TANNER ST E	36.88176	-89.58042			10/18/2012	10/18/2012
5025	SE	SCOTT	US 61 S	CST LAKE ST E	36.88083	-89.58026			11/1/2012	11/1/2012
4798	SE	SCOTT	US 61 S	CST HELEN AVE E	36.87123	-89.57836			4/17/2013	4/17/2013
956	SE	SCOTT	MO 114 E	CST NEW MADRID S	36.87631	-89.58900	12/21/2011	12/21/2011	12/21/2011	12/21/2011
4849	SE	SCOTT	MO 114 E	CST N KINGSHIGHWAY S	36.87674	-89.58755	12/21/2011	12/21/2011	12/21/2011	12/21/2011
5160	SE	SCOTT	US 62 E	CST PINE ST S	36.88051	-89.57437	9/24/2012	9/24/2012	9/24/2012	9/24/2012
4850	SE	SCOTT	US 62 E	CST INGRAM RD S	36.88166	-89.57055	4/18/2013	4/18/2013		
4851	SE	SCOTT	US 62 E	CST SELMA AVE S	36.88332	-89.56489	9/24/2012	9/24/2012	9/24/2012	9/24/2012
1221	SE	ST. FRANCOIS	MO 47 S	CST RAIDER RD S	37.92237	-90.54040			9/25/2012	9/25/2012
6296	SE	ST. FRANCOIS	MO 47 S	RT K E	37.92220	-90.53902			9/25/2012	
6096	SE	ST. FRANCOIS	MO 47 S	RT K E	37.92207	-90.53771				9/25/2012

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1287	SE	TEXAS	US 63 S	MO 17 S	37.31962	-91.95874			5/1/2016	5/1/2016
3810	SE	TEXAS	US 63 S	CST HOLDER DR E	37.31249	-91.96037			5/1/2016	5/1/2016
7197	SE	WRIGHT	MO 95 S	RP MO95 TO US60W W	37.14810	-92.26269			6/1/2014	
2117	SE	WRIGHT	MO 95 S	RP MO95 TO US60E E	37.14663	-92.26269				6/1/2014