Chloride Pollutant Minimization Plan for the Village of Mokena

November 12, 2022

Prepared by Village of Mokena

The Village of Mokena is a member of the
Lower Des Plaines Watershed Group

1.0 Introduction to Chloride Issue in CAWS/LDPR

This Pollutant Minimization Plan (PMP) has been prepared by Village of Mokena (Mokena) to reduce the environmental impacts from the organization's chloride related operations. Mokena is a discharger covered under the Time Limited Water Quality Standard for Chloride for the Chicago Area Waterways System and Lower Des Plaines River watersheds. This PMP has been prepared to meet the requirements laid out in the Time Limited Water Quality Standard (TLWQS) for Chloride. The term of this PMP covers the first 5-years of the TLWQS period and will be updated following the re-evaluations at Years 4 ½, 9 ½, and 14 ½.

Chloride is a permanent pollutant. It does not degrade over time and continues to accumulate in the environment. Proactive measures to reduce the amount of chloride discharged can help reduce the impacts from chloride on receiving waterways and the environment. Chloride impacts aquatic life, vegetation, and infrastructure. As the chloride concentrations increase and our waters become saltier, aquatic and plant biodiversity decreases and native species are overtaken by salt tolerant invasive species.

Chlorides are commonly found in road salt, fertilizers, water softeners, dust suppressants, and certain industrial processes. Chloride-based deicers, like rock salt, are used on parking lots, sidewalks, and roads to provide safe surfaces to the public during the winter months. These deicers are one of most common sources of chloride in the Chicago region.

The water quality standard for chloride for the Chicago Area Waterway System (CAWS) was updated as part of the rulemaking process related to changing the designated use of the CAWS. The chloride standard was updated from 1,500 mg/L during the winter and 500 mg/L during the summer to 500 mg/L all year round. The change in the chloride water quality standard took effect in 2018. Because portions of the CAWS were not going to meet this new standard due to the need to maintain public safety on roads, highways, sidewalks and parking lots during the winter months, a joint submittal and supporting individual petitions were submitted between 2015 and 2018 to the Illinois Pollution Control Board for a variance from the chloride standard. The joint petition laid out best management practices that can be achieved by the petitioners to reduce their chloride use while maintaining public safety during winter storms. In addition to the CAWS, portions of the Lower Des Plaines River watershed were included as it receives water from the CAWS.

On November 4, 2021, the IPCB issued an Opinion and Order for a Time Limited Water Quality Standard (TLWQS) for Chloride for portions of the CAWS and Lower Des Plains River watersheds. The TLWQS for Chloride watersheds are defined in the Opinion and Order as the Des Plaines River watershed from the Kankakee River to the Will County Line (except for the DuPage River watershed) and the CAWS watershed (except the North Branch Chicago River watershed upstream of the North Shore Channel and those portions of the watershed located in Indiana). This is a watershed-based approach to reduce the chloride concentrations in the CAWS and Lower Des Plaines River. The TLWQS for Chloride requires all dischargers covered under the TLWQS for Chloride to create PMPs and implement specific best management practices based on their operations to reduce their chloride discharges.

2.0 Organization Info, Facilities' Specific Info

2.1 Facility overviews/descriptions

Agency Name: The Village of Mokena		
Facility Name: Public Works Garage		Permit Number: ILG103046
Facility Address: 19004 Wolf Road		
City: Mokena	State: IL	Zip Code: 60448

The Village of Mokena Public Works Department is responsible for providing snow and ice control for 110 miles (approximately 300 lane-miles) of streets and eleven Village owned parking lots. Parking lots consist of a Village Hall, Police Station, two Public Works facilities, six total commuter lots for two Metra Train Stations, and diagonal parking along Front Street.

2.2 Chloride Sources

Chloride sources include winter road maintenance, working pads outside of salt domes, industrial users, and water softening by some residents. Mokena utilizes both anti-icing and deicing during winter storm events on Village roadways. Sidewalks adjacent and on Village owned properties are cleared and salted. Village owned parking lots are cleared by a contractor and salted by Village staff. Ice control on roadways is prioritized for intersections, school zones, and mid-block areas of steep grade. There are industrial users within the Village that require softened water that result in chlorides discharged to the sanitary system. There are also residents that choose to soften their water but this is not wide-spread in Mokena.

2.3 Level of Service for Winter Maintenance Activities

The Village of Mokena's goal is to make all streets, cul-de-sacs safe and accessible for vehicular traffic during and after a winter storm. Mokena uses level of service goals for the roadways it maintains as guidelines to implement snow and ice operations during a storm. Specific information regarding levels of service are detailed in the Snow and Ice Plan in Section I.

3.0 Chloride Monitoring Data

Chloride monitoring data will be collected for the CAWS and Lower Des Plaines River watersheds per the IPCB order. The data will be maintained by the workgroups. Chloride data for the CAWS will be collected by MWRD for the CAWS watershed and provided to the workgroups as part of the annual reporting as required by the IPCB order. The Lower Des Plaines Watershed Group also maintains a USGS monitoring station in the Des Plaines River at Channahon, IL that collects continuous conductivity data to estimate chloride concentrations.

Mokena's NPDES permit requires chloride monitoring on the effluent of the WWTP.

4.0 Chloride Reduction BMPs for POTWs, MS4s, CSOs, Industrial Sources, IDOT/Tollway

As part of the Chloride TLWQS, specific BMPs were identified for POTWs, MS4s, CSOs, Industrial Sources, and IDOT/Tollway to reduce the chloride impact on the watershed. These BMPs will be implemented over the 15-year term and additional BMPs evaluated at 5-year intervals during the 15-year term. Further details about winter maintenance practices currently being implemented by Mokena are included in the snow and ice plan, which is included as Appendix A. The BMPs identified are outlined below:

Workgroup BMP

Variance BMP	Currently Implementing	Will Implement (Target Year)	Agency Description of Current Implementation
The permittee must participate in a Chlorides workgroup for the CAWS or LDPR, depending on the watershed within which the facility's discharge is located.	**X**	N/A	Mokena has been a member of the Lower Des Plaines Watershed Group since 2017. Staff attends all meetings for this group and the Chlorides Subcommittee.

Salt Storage and Handling BMPs

Variance BMP	Currently Implementing	Will Implement (Target Year)	Agency Description of Current Implementation
Store all salt on an impermeable pad that must be constructed to ensure that minimal stormwater is coming into contact with salt unless the salt is stored in a container that ensures stormwater does not come into contact with the salt.	**X**	N/A	Mokena stores salt in two storage domes that can hold a combined 6,400 tons of rock salt (Snow and Ice Plan, Section VI).
Cover salt piles at all times except when in active use, unless stored indoors.	**X**	N/A	All salt used by Mokena is stored in salt domes. See previous BMP.
For working areas, provide berms and or sufficient slope to allow snow melt and stormwater to drain away from the area. If snow melt and stormwater cannot be drained away from the working area, channeling water to a collection point such as a sump, holding tank or lined basin for collection, discharge at a later time, use for prewetting, and use for make-up water for brine must be considered.		FY28	
MS4/CSO Only - Use deicing material storage structures for all communities covered under General Permit ILR40 for MS4 communities.	**X**	N/A	Mokena stores salt in two storage domes that can hold a combined 5,300 tons of rock salt (Snow and Ice Plan, Section VI).
Good housekeeping practices must be implemented at the site, including: • cleanup of salt at the end of each day or conclusion of a storm event; • tarping of trucks for transportation of bulk chloride; • maintaining the pad and equipment; • good practices during loading and unloading;	**X**	N/A	Mokena uses good housekeeping practices for winter road salt related work including loading, salt deliveries, and facility inspections.

Variance BMP	Currently Implementing	Will Implement (Target Year)	Agency Description of Current Implementation
• cleanup of loading and spreading equipment after each snow/ice event; • a written inspection program for storage facility, structures and work area; • removing surplus materials from the site when winter activity finished where applicable; • annual inspection and repairs completed when practical; • evaluate the opportunity to reduce or reuse the wash water.			

Winter Maintenance Operations BMPs

Variance BMP	Currently Implementing	Will Implement (Target Year)	Agency Description of Current Implementation
Calibrate all salt spreading equipment at least annually before November 30th. Records of the calibration results must be maintained for each piece of spreading equipment.	**X**	N/A	Calibration is completed by staff of Mokena each year. Details are included in Section XI of Mokena's Snow and Ice Plan.
Pre-wet road salt before use, either by applying liquids to the salt stockpile, or by applying liquids by way of the spreading equipment as the salt is deposited on the road.	**X**	N/A	Mokena uses pre-wet road salt on 3 trucks and all future trucks purchased will have this system installed. Further information regarding pre-wetting is available in Section VI of Mokena's Snow and Ice Plan.
Use equipment to measure the pavement temperature unless such equipment has already been installed on road salt spreading vehicles.	**X**	N/A	Mokena monitors pavement temperatures using portable sensors mounted on Supervisors' and administrators' vehicles. Future trucks purchased will have this system installed.
Develop and implement a protocol to vary the salt application rate based on pavement temperature, existing weather conditions, and forecasted weather conditions.	**X**	N/A	Mokena varies application rates and materials based on pavement temperatures and weather conditions. Information regarding application rates and materials is included in Section VI of Mokena's Snow and Ice Plan.

Track and record salt quantity used and storm conditions from each call-out.	**X**	N/A	Mokena maintains records of each winter storm call-out. Information regarding recordkeeping is included in Section XII of Mokena's Snow and Ice Plan.
Develop a written plan for implementation of anti-icing, with milestones. The plan should consider increased use of liquids (e.g., carbohydrate products) beginning with critical locations such as bridges over streams.	**X**	N/A	Mokena uses Anti-Icing as part of its winter operations. Information about the Anti-Icing program is outlined in Section V of Mokena's Snow and Ice Plan.
Provide employees involved in winter maintenance operations with annual training before November 30th on best management practices in the use of road salt in operations, including the practice of plowing first and applying salt only after snow has been cleared.		Will implement in FY24	Current training is outlined in Section X of Mokena's Snow and Ice Plan.
Be responsible for complying with all applicable BMPs even when deicing practices are contracted out and ensure that contractors are property trained and comply with all applicable BMPs.	**X**	N/A	
Complete an annual report, as required by paragraph 3(B) of this order, which is standardized in an electronic format and submitted to the IEPA's website and to the watershed group.		End of FY23	Mokena will complete and submit an annual report each year to IEPA and the workgroup by July 1.
Obtain and put into place equipment necessary to implement all salt spreading/deicing measure specified in this BMP, such as any new or retrofitted salt spreading equipment necessary to allow for pre-wetting and proper rates of application.	**X**	N/A	Mokena evaluates all equipment and upgrades as needed. All new equipment purchased will meet the requirements of this PMP.
MS4/CSO/IDOT/TOLLWAY Only – Install equipment to measure the pavement temperature on the winter maintenance fleet for a sufficient number of vehicles to provide sufficient information to adjust application rates for the most efficient levels. Develop and complete a plan to equip the		Plan to fully implement by end of FY28	

winter maintenance fleet before the first re-evaluation.			
MS4/CSO/IDOT/TOLLWAY Only – Before the first re-evaluation, develop a method for conducting a post-winter review to identify areas of success and areas in need of improvement. Items to be completed as part of the review must include, but are not limited to, an evaluation of each salt spreader's application rate, variations in application rates, and discussion of the variation compared to the recommended rates. Once developed, the review should occur annually in the spring/early summer following each winter season.		By end of FY24	

5.0 Plan to Implement BMPs

Mokena will implement the following BMPs to take steps towards compliance with chloride standards for the watershed.

BMP: For working areas, provide berms and or sufficient slope to allow snow melt and stormwater to drain away from the area. If snow melt and stormwater cannot be drained away from the working area, channeling water to a collection point such as a sump, holding tank or lined basin for collection, discharge at a later time, use for prewetting, and use for make-up water for brine must be considered.

Plan to Implement BMP: Mokena will budget for an evaluation of the salt work area. Staff will select an option that is cost-effective and feasible for implementation and budget for construction in future fiscal years.

Schedule for Implementation: Mokena will budget the evaluation in FY 2025 and implement the chosen option by the end of FY 2028.

BMP: Provide employees involved in winter maintenance operations with annual training before November 30th on best management practices in the use of road salt in operations, including the practice of plowing first and applying salt only after snow has been cleared.

Plan to Implement BMP: Mokena will explore options for training in FY 2023 and choose a program to implement for FY 2024.

Schedule for Implementation: Mokena will budget annually beginning in FY 2024 for a training course for all staff that operate snow plows and salting equipment.

BMP: Install equipment to measure the pavement temperature on the winter maintenance fleet for a sufficient number of vehicles to provide sufficient information to adjust application rates for the most efficient levels. Develop and complete a plan to equip the winter maintenance fleet before the first re-evaluation.

Plan to Implement BMP: Mokena will budget for and plan to purchase up to four mirror mounted pavement temperature sensors for the winter maintenance fleet each fiscal year until all vehicles are equipped. Due to the expense of equipping the entire fleet at once, up to four vehicles will be outfitted at a given time to buffer the additional expense across several years, but will still provide for pavement temperature information to make decisions regarding application rates of deicer during winter storms. Replacement trucks will be spec'd to include mirror mounted temperature sensors.

Schedule for Implementation: Start budgeting for the sensors in FY 2024. Anticipate all fleet will be equipped by end of FY 2028.

BMP: Before the first re-evaluation, develop a method for conducting a post-winter review to identify areas of success and areas in need of improvement. Items to be completed as part of the review must include, but are not limited to, an evaluation of each salt spreader's application rate, variations in application rates, and discussion of the variation compared to the recommended rates. Once developed, the review should occur annually in the spring/early summer following each winter season.

Plan to Implement BMP: Mokena's Streets/Buildings & Grounds Superintendent prepares a report after each snow event. These will be compiled and evaluated to meet this BMP.

Schedule for Implementation: Mokena plans to implement this by end of FY 2024.

6.0 Other Chloride TLWQS Required Milestones

Mokena will implement these specific milestones (not included in the above BMPs) as outlined by the Chloride TLWQS.

Milestone	Agency Completion Date	Agency Completion Details
6 MONTHS AFTER EFFECTIVE DATE: Petitioner establishes a mechanism for tracking of de-icing salt usage for each facility.	November 12, 2022	Provide details regarding documentation practices for tracking deicing salt usage
July 1st OF EVERY YEAR (BEGINNING WITH YEAR 2): Discharger must submit an Annual Report for the previous year beginning on May 1 and ending on April 30 of the following year to the Agency and the chlorides workgroup on. The report shall be on salt usage for deicing and steps taken to minimize salt use and makes the report publicly available.	By July 1 of each year, beginning in Year 2	Mokena will submit an annual report to the workgroup and IEPA.
July 1st of YEAR 3, YEAR 8 and YEAR 13: The chlorides workgroup submits a Status Report to the IEPA which includes an analysis on the following: chlorides monitoring data; report on the chloride workgroup's outreach strategy, which includes outreach efforts to	By July 1 of year 3, the workgroups will submit a Status Report to the IEPA.	

expand coverage of the TLWQS, and outreach and training for nonpoint sources; identification of any new BMPs, treatment technology or salt alternatives; identification of the impediments and potential solutions of those impediments faced by dischargers and those granted coverage under the TLWQS that prevent them from completing the training and making all capital purchases necessary to implement the required BMPs; and identification and description of any assistance (financial, technical, or otherwise) that the chloride workgroup may be able to provide.		
July 1st OF YEAR 4 ½: Chlorides workgroup submits to the Board its first proposed re-evaluation pleading consistent with the Board's order granting the TLWQS.	By November 12, 2026, the workgroups will submit a re-evaluation to the IEPA and IPCB.	

Appendix 1 – Village of Mokena Snow and Ice Plan

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2022

Village of Mokena Snow & Ice Plan

Village of Mokena

10/14/2022

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I. PURPOSE, PRIORITY, & OBJECTIVES

A. The Village of Mokena established this Snow and Ice Removal Plan to combat winter storms while maintaining public safety and preventing damage to life and property. Salting operations commence after notification of hazardous conditions and continue during plowing until it is unnecessary or ineffective. Plowing operations commence upon Streets/Buildings & Grounds Superintendent's decision.

B. In general, the priorities for plowing and/or salting operations are listed in the following order:

1. Main Arterial Roads, Central Business District Roads and School Routes

    a) Opening and maintaining the condition of these roads is the main priority in all plowing operations.

2. Secondary Streets

    a) These roads are plowed after 2" of accumulation and after plowing and salting operations have concluded along the main roads. In normal operations, only side street intersections are salted, but mid-blocks and the entire street may be salted if conditions dictate.

3. Sidewalk Circuits

    a) Sidewalks of Village owned property are cleared continuously and in conjunction with plowing operations.

4. Cul-de-sacs

    a) These are plowed after 2" of accumulation in conjunction with the plowing of side streets.

5. Parking Lots

    a) The plowing of public parking lots is performed by a Contractor. Parking lots are plowed after 2" of accumulation. Village Staff provides salt for these lots.

6. Town Clean-Up

    a) These areas are cleared of snow when the accumulation of snow creates a hazard for pedestrians using the district. The operation entails removing snow from the “transition zone” adjacent to the curb by pushing all of this snow into the parking area. Town clean-up will be scheduled after all areas have been cleared, and at the discretion of the Public Works Director or their designee.

C. Objectives

1. The objective of the Village snow removal operation is to remove snow from all streets within eight (8) hours after the conclusion of a snowfall. Should snow accumulate more than three inches (3"), the length of time to remove snow from the streets may increase dependent upon the intensity and duration of the storm.

    a) The Village snow removal operation will commence when the accumulation of snow on streets reaches two inches (2").

2. The objective of the Village ice control operation is to respond to icing conditions and slick roadways with equipment and personnel sufficient to adequately control conditions within (45) minutes during normal working hours and within (90) minutes after normal working hours. Streets should be salted within (4) hours from the time equipment and personnel have been dispatched.

    a) The Village ice control operation will commence upon notification of developing hazardous conditions by the Police Department or other Village personnel and will be based on the severity of icing conditions.

3. In the event of a police or fire emergency requiring snow removal, such operation shall have the highest priority.

II. VILLAGE ORDINANCE FOR PARKING

A. Paragraph 6-5-5: Limited Winter Parking:

1. It shall be unlawful to park any vehicle on a village street at any time if the snow on the street exceeds two inches (2") in depth. This ban on parking shall remain in effect until snow removal operations are completed. If a vehicle is parked on a street when the snow begins to fall, it shall be the owner's or driver's responsibility to remove the vehicle from the street by the time the snow has reached a depth of two inches (2"). It is further unlawful for any person, in removing snow from a private driveway or sidewalk, to deposit such snow in such a location, or in such a manner, as to obstruct the free flow of vehicular or pedestrian traffic. (Ord. 2000-O-006, 2-28-2000)

III. ROLES & RESPONSIBILITIES

A. Snow removal in the Village of Mokena is a function of the Public Works Department and is under the direction of the Public Works Director. This individual is responsible for providing overall guidance and coordination of all snow removal efforts.

B. The Streets/Buildings & Grounds Superintendent is responsible for direct supervision of the snow removal forces. Primary functions of this individual include quality control, surveillance of progress in the field, and assistance to plowing personnel.

C. The Village Mechanic and any other available personnel will perform maintenance on all snow removal equipment as a priority need during snow operations.

D. Water and Sewer Department employees will be responsible for snow plowing during each snowfall as assigned by the Streets/Buildings & Grounds Superintendent.

IV. INITIATION AND MOBILIZATION PLAN

A. Initiation of Response

1. The Streets/Buildings & Grounds Department Superintendent (Rob Skolds, 708-372-1867) is notified of impending or actual severe snow or ice storm by any of the following sources:

   a) Mokena Police Department

   b) National Weather Service Reports

   c) Other Village personnel

2. If the Streets/Buildings & Grounds Department Superintendent cannot be contacted, the following Public Works Employees, by priority, shall be contacted:

   a) Streets Supervisor: Jamie Smith – Mobile – 708-793-3968

   b) Public Works Director: Jim Kulesa – Mobile – 708-990-4227

   c) Assistant Public Works Director: Dan Peloquin – Mobile – 708-845-2346

B. Mobilization

1. The Streets/Buildings & Grounds Department Superintendent or designee shall evaluate all reports and implement the following action, if warranted:

   a) (After hours) call in necessary assigned employees.

   b) Ice or sleet storm: Prepare crews for de-icing

   c) Snow Storm: Prepare crews and trucks for plowing.

C. Contingency Provisions

1. If conditions indicate that Village personnel will be involved with snow removal operations for periods of (18) hours or longer or if supplementary personnel are required, additional qualified Village Staff will be activated at the discretion of the Streets/Buildings & Grounds Superintendent.

2. Contractual Assistance:

   a) If Village personnel and additional manpower are unable to complete snow removal operations within a reasonable time period, due to volume of snow, equipment failure, or other circumstances, the Streets/Buildings & Grounds Department Superintendent shall advise the Public Works Director of the situation and request contractual services. The Public Works Director will contact the Village Administrator and request contractual assistance. If contractual services are approved by the Village Administrator, the Public Works Director is to contact the contractors contained on the list provided in this policy.

   b) Contractors that may be used for emergencies:

      (1) Bisping Construction – 815-485-9596

      (2) Midamerica Landscape – 708-906-0933

V. ANTI-ICING

A. Anti-icing is a proactive approach to maintaining winter safety. Liquid chemical (such as sodium chloride or magnesium chloride) is applied to roads, bridge decks and parking lots *before* a forecasted storm to prevent snow and ice from bonding to the pavement.

B. Anti-icing applies stripes of liquid chemical to roads and parking lots. Liquids work better than solids at preventing and breaking the bond between ice and pavement. Also, liquids stay on the road instead of bouncing off like solid rock salt often does.

C. The Village of Mokena applies anti-icing ahead of forecasted snow or ice storms using a brine solution.

D. The Public Works Garage has a brine tank that is filled with a 33% calcium chloride solution for anti-icing use.

VI. SALTING

A. The policy of the Public Works Department is to salt main arterial streets, streets adjacent to schools, streets with curves or steep grades, and intersections on secondary roads. These streets are referred to as the salting route. If there is a salt shortage due to extreme weather factors, the Streets/Buildings & Grounds Superintendent may limit salting operations for conservation purposes. Should this occur, the Public Works Director will coordinate with the Village President, Board of Trustees and Village Manager's Office on notification to residents and business owners on limited salting operations.

B. Application rate guidelines that Mokena practices are provided in Appendix A.

C. The Village has two (2) salt domes that hold a combined 6,400 tons of salt.

1. The main working salt dome holds 4,200 tons of salt.

2. The secondary salt dome holds 2,200 tons of salt.

3. Both salt domes are closed when not actively loading/unloading salt using concrete barriers.

4. The working pad has a storm inlet that is covered during loading/unloading operations.

D. Method

1. Salting is a proactive approach used to minimize the bonding of ice to pavement and to halt the further buildup of ice and snow on roads and sidewalks. Salting of the arterial streets and intersections will occur if conditions are favorable for snow build-up or icing which could lead to hazardous vehicular travel. The amount of salt dispersed will depend upon the conditions, but will typically vary from 400-1200 lbs/lane mile. Salting operations will continue until the icing conditions are brought under control (wet pavement is maintained) or until salting is no longer effective.

E. Pre-wetting

1. Pre-wetting salt (applying a liquid de-icer) greatly enhances the ice melting performance of rock salt at lower temperatures, helps the salt stick better where applied and helps reduce the corrosiveness of rock salt. Common rock salt starts to lose melting efficiency around 20 degrees. However, treated salt remains active in temperatures that are 25 degrees or lower, when salting during nighttime hours, or when temperatures are expected to fall below 25 degrees immediately following a snow event. Salt is treated at a rate of 8-12 gallons per ton of salt, depending on conditions. The Public Works Department is equipped with three trucks with the pre-wetting operation.

F. Main Arterial Roads

1. During a salting event, arterial roads will be salted to keep roads safe and prevent ice accumulation.

G. Secondary Roads (Side Streets)

1. Under normal conditions, only side street intersections will be salted. Salt will be applied to the 100-ft length of roadway approaching and exiting each intersection. If sub-freezing temperatures are expected after a storm event, salt may be applied to the entire street to prevent icing, if needed. The supervisor on duty or the Public Works Director will make this decision if it is deemed necessary to provide safe travel.

H. Parking Lots

1. Parking lots will be salted in a manner that will keep commuters and pedestrians safe for driving and walking purposes. Depending on conditions and timing of event, parking lots may only be spot salted in the drive aisle of the parking lots.

I. Cul-De-Sacs/Dead Ends

1. Depending on conditions, cul-de-sacs will be spot salted during a salt crew call-out. Additional salting of these areas will be at the discretion of the Public Works Director or their designee.

J. School Routes

1. When needed, school route intersections and crossing guard locations shall be salted every weekday that school is in session by 7:30am whenever possible.

K. Emergency Salting Routes

1. Emergency salting routes have been established to include only the major arterial streets that must be salted to maintain basic traffic flow. The decision to switch to these routes may occur if the Village runs low on salt or is unable to procure additional salt. The decision to implement this switch will be made by the Director of Public Works and the Streets/Buildings & Grounds Superintendent.

L. Communications Protocols

1. Drivers and Equipment Operators.

a) Before leaving the yard, drivers make their initial radio contact to the Streets/Buildings & Grounds Superintendent informing him that they are in service and starting the route.

b) Drivers will next call in the completion of priority streets and cul-de-sacs on their routes and ask where any additional help is needed.

c) If the driver experiences any difficulty in completing the route, or goes out of service for any reason, the driver will communicate the same to the Streets/Buildings & Grounds Superintendent.

VII. PLOWING

A. Plowing operations will commence when 2" of snow has accumulated. Salting operations will continue along with plowing until conditions deem it unnecessary or ineffective. All plowing and salting operations are normally run with one truck per assigned section. For wide roads in the Village, two-truck tandem plowing is allowed for final clearing of the center median. When tandem plowing, only the rear truck is allowed to salt the road. Plowing operations will generally be conducted in the following order of priority:

B. Main Roads

1. Opening and maintaining the condition of arterial streets is the main priority in all plowing operations.

C. Secondary Roads (Side Streets)

1. Side Streets are plowed after 2" of accumulation. In normal operations, secondary roadway intersections will be salted, but the entire street maybe salted depending on conditions or at the discretion of the Streets/Buildings & Grounds Superintendent or their designee.

D. School Routes

1. Similar to arterial roads, opening and maintaining roads adjacent to schools is a main priority in all plowing operations.

E. Sidewalk Circuits

1. After a 2"+ snow event, sidewalks at and nearby Village owned properties are cleared by a combination of Public Services Department staff and a private contractor on an as needed basis. The Village's Streets/Buildings & Grounds Superintendent will notify the contractor as to when the service should commence.

a) Village Hall, WWTP and Police Station

F. Parking Lots

1. Parking lots are plowed after 2" of accumulation by a contractor. The Streets/Buildings & Grounds Superintendent notifies the contractor when plowing should commence.

a) Hickory Creek Commuter Parking Lot

(1) 8.4 acres

(2) Hickory Creek Drive between Henry Dr and S Vanderbilt Dr

b) Village Hall Commuter Parking Lot

(1) 0.84 acres

(2) 11004 Carpenter Street (West Lot)

c) Village Hall Staff Parking Lot

(1) 0.18 acres

(2) 11004 Carpenter Street (North Lot)

d) Front Street Commuter Parking Lot
   (1) 1 acre
   (2) Metra Lot on Front Street between Wolf Rd and Mokena St

e) Diagonal Parking adjacent to Front Street Lot
   (1) 0.16 acres

f) McGovney Street Commuter Parking Lot
   (1) 0.50 acres
   (2) Paved lot at Metra Station on McGovney St and Mokena St

g) Gravel Commuter Parking Lot on McGovney
   (1) 2 acres
   (2) Gravel lot on McGovney St between Wolf Rd and Metra Station

h) Willowcrest Lane Commuter Parking Lot
   (1) 0.84 acres
   (2) South of Willowcrest Ln and West of Wolf Rd

VIII. POST-CLEARING OPERATIONS

A. Plowing and Widening

1. When all streets have been opened to traffic, crews will return and undertake the following operations:

   a) Return to routes to widen streets, re-plow where cars have been parked, check drifting areas, and check areas brought to our attention by citizens calling in.

   b) Provide assistance to the Park District and School Districts, if assistance is needed and required.

B. Drainage

1. If weather permits, crews will begin opening storm sewer inlets for runoff water, on their assigned routes.

C. Equipment Maintenance

1. Crews will clean their equipment and repair as needed. Equipment to be left prepared for the next snow or ice storm.

2. Crews will assist the Automotive Technician in making any repairs needed.

D. Replenish salt in salt storage building if necessary.

1. Compass Minerals; 1-800-323-1641 ext 1; 990 W 109th Suite 100, Overland Park, KS 66210

IX. FORECASTING, CALL-OUTS, AND NOTIFICATIONS

A. Forecasting

1. Village Administration, Public Works Management Level Staff, and the Police Department all monitor weather and provide updates to the appropriate Staff for snow and ice removal.

2. Staff has internet access at their desks to monitor radar for assistance in making decisions regarding the forecast. These services provide advanced and ongoing warning of snow and ice conditions.

B. Call-Outs

1. The Streets/Buildings & Grounds Superintendent or their designee will determine when salting and plowing operations will commence. Police officers on the street will be gathering information on icing conditions and notifying the Public Works Department as needed during off hours, and for emergency notification purposes.

2. Department call-outs will be staffed according to the severity of the storm. Please note that additional personnel beyond that what is described in the list may be called in at any time if deemed necessary by the Supervisor on duty. The Village may utilize private contractors to assist with snow and ice removal operations in longer duration events to help keep up with snow and ice operations. Utilization of contractors will only be considered after all crew members have been assigned for snow and ice response. These shift assignments and descriptions are to be used as general guidelines only, and are as follows:

a) Normal Winter Conditions

(1) The weather pattern is unfavorable for the development of trouble conditions. Usually, no trouble is expected and no action is needed.

(2) No call-out is expected.

b) Predicted Winter Weather Level 1

(1) The weather pattern is favorable for the development of a storm with “Little or Limited” impact. The response for this type of event would most likely be limited to the salt response group on duty, but could require additional personnel.

(2) Anti-icing or salting operations expected with all areas cleared within 5 hours after the event started.

c) Predicted Winter Weather Level 2

(1) The weather pattern is favorable for the development of a storm with “Significant” impact. The response for this type of event would most likely be all crew members scheduled to work. Additional personnel may be required.

(2) Less than 8” of snowfall.

(3) Main and secondary roads will be cleared within 12 hours, and cul-de-sacs will be passable once the event has concluded. Continual clean-up of alleys, cul-de-sacs and parking lots may take an additional 6 hours. Entire removal operation to be completed within 24 hours after snow event has ended.

d) Severe Winter Weather Predicted

(1) The weather pattern is favorable for the development of a storm with “Major” impact. The response for this type of event would most likely be all Public Services Department employees operating snow removal equipment, and implementation of temporary 12 hour work shifts. The will retain services from a private contractor to assist with clean-up operations in this type of event.

(2) 8” or more snowfall.

(3) Main roads will be cleared within 12 hours after the snow event has ended. Secondary roads and cul-de-sacs will be passable within 24 hours after the snow event has ended. Additional clean-up will continue until all sections have been cleared, which will be dependent on the severity of the storm.

3. Town clean-up will occur after all roads are cleared and may take additional days depending on conditions.

C. Notification to crew members:

1. Prior to a snow and ice event or call-out, a list of crew workers assigned for duty will be posted in the lunchroom. The purpose of the list is to notify a crew worker as far in advance as possible that he will be called in as part of the next snow and ice response team for the upcoming event. Following each event, an updated notification list will be posted in the lunchroom, so that a crew worker will know if he will be part of the next snow and ice call out. Depending on the severity of the storm the staffing level for each event may change from time to time.

2. The Streets/Buildings & Grounds Superintendent or their designee will provide a weekly overtime hours worked spreadsheet by the time clock to ensure that overtime allocation is being distributed equitably amongst all crew workers. As conditions change, additional crew workers may be in called for assisting with operations even though they are not on the posted notification list.

3. Public Works personnel employed on a part-time basis will only be called in for work in events where all full-time personnel have been provided an opportunity to participate in a snow and ice event.

4. Current year routes are shown in Appendix B.

X. TRAINING

A. All Public Works Staff that operate plows and anti-icing trucks are trained within the Public Works Department. The Village is exploring formal training and refresher courses for future fiscal years.

B. Also, during the fall season, crew workers may perform “check rides” with their supervisors through their assigned plow sections during dry weather. The purpose of the check ride is to provide refresher training to drivers on the new conditions in their sections, and to identify any hazards that may impact snow and ice operations.

XI. CALIBRATION OF SALTING AND LIQUID TRUCKS

A. Equipment is calibrated annually by Village Staff.

B. Calibration for both salting and liquid application is performed according to the procedures outlined in Appendix C.

XII. INCIDENT MONITORING AND REPORTS

A. After each snowfall Staff will monitor all calls regarding snow removal and generate a report indicating and documenting incidents during each snow removal. Incidents will be recorded indicating which of the designated Routes are involved and Staff will evaluate the results. The report will include complaints as well as compliments and suggestions. Once the report is generated it will be distributed to each of the drivers to utilize as a tool for improvement in their route. Drivers accompanied by a Supervisor will visit Residents personally that have had specific complaints regarding the removal effort. This will foster a more personal relationship between our Drivers and Residents, as well as encouraging the Drivers to be more responsive to the Resident's issues. Department Managers and Supervisors will work with the Drivers utilizing the report as a reference for improvement and suggestions to individual drivers.

Appendix A – Application Rate Guidelines for Roads

How long an application will last depends on five factors: pavement temperature, application rate, precipitation, beginning concentration, and chemical type. These factors explain why one application rate will not fit all storm events.

- If your equipment is unable to deliver material at lower rates, consider exchanging the 9-inch-diameter auger for either a 6-inch or 9-inch special auger to deliver about two-thirds less material/revolution.

Anti-icing Application Rate Guidelines

These guidelines are a starting point. Reduce or increase rates incrementally based on your experience.

Condition	Gallons/Lane Mile			Other Products
	$CaCl_2$	$MgCl_2$	Salt Brine	
1. Regularly scheduled applications	15 – 25	15 – 25	20 – 40	Follow manufacturers' recommendations.
2. Prior to frost or black ice event	15 – 25	15 – 25	20 – 40	
3. Prior to light or moderate snow	15 – 25	15 – 25	20 – 50	

Pounds of Ice Melted Per Pound of Salt

Pavement Temp. ˚F	One Pound of Salt (NaCl) melts	Melt Times
30	46.3 lbs of ice	5 min.
25	14.4 lbs of ice	10 min.
20	8.6 lbs of ice	20 min.
15	6.3 lbs of ice	1 hour
10	4.9 lbs of ice	Dry salt is ineffective and will blow away before it melts anything.
5	4.1 lbs of ice	
0	3.7 lbs of ice	
-6	3.2 lbs of ice	

At temps below 15 degrees, it may be more cost-effective to use a chemical other than NaCl.

See research at www.dot.state.mn.us/maintenance/training

Deicing Application Rate Guidelines

24' of pavement (typical two-lane road)

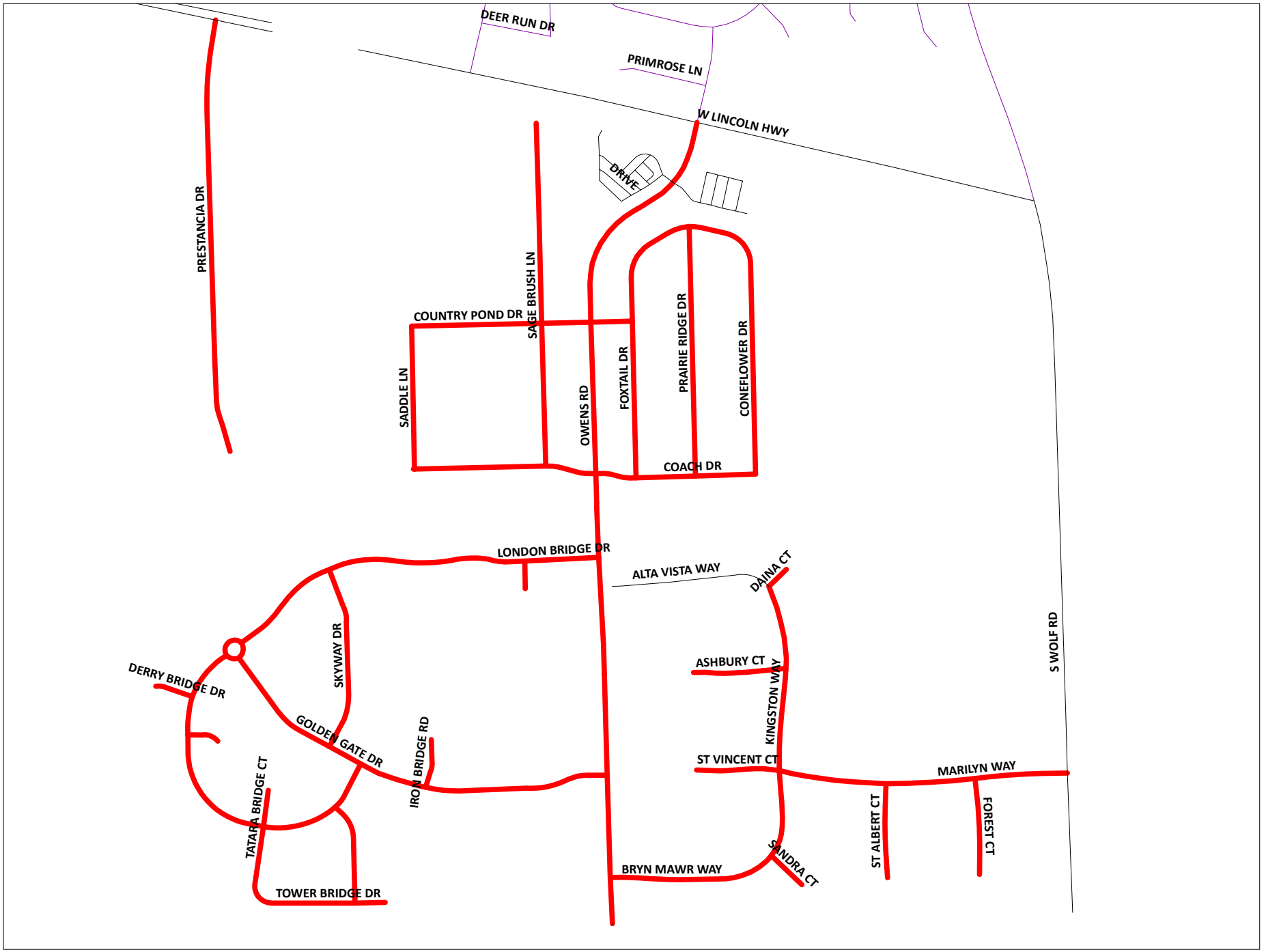
These rates are not fixed values, but rather the low end of a range to be selected and adjusted by an agency according to its local conditions and experience.

			Lbs/ two-lane mile			
Pavement Temp. (˚F) and Trend (↑↓)	Weather Condition	Maintenance Actions	Salt Prewetted/ Pretreated With Salt Brine	Salt Prewetted/ Pretreated With Other Blends	Dry Salt*	Winter Sand (abrasives)
>30° ↑	Snow	Plow, treat intersections only	80 (40/lane mile)	70	100*	Not recommended
	Frz. rain	Apply chemical	80 – 160	70 – 140	100 – 200*	Not recommended
30° ↓	Snow	Plow & apply chemical	80 – 160	70 – 140	100 – 200*	Not recommended
	Frz. rain	Apply chemical	150 – 200	130 – 180	180 – 240*	Not recommended
25 - 30° ↑	Snow	Plow & apply chemical	120 – 160	100 – 140	150 – 200*	Not recommended
	Frz. rain	Apply chemical	150 – 200	130 – 180	180 – 240*	Not recommended
25 - 30° ↓	Snow	Plow & apply chemical	120 – 160	100 – 140	150 – 200*	Not recommended
	Frz. rain	Apply chemical	160 – 240	140 – 210	200 – 300*	400
20 - 25° ↑	Snow or frz. rain	Plow & apply chemical	160 – 240	140 – 210	200 – 300*	400
20 - 25° ↓	Snow	Plow & apply chemical	200 – 280	175 – 250	250 – 350*	Not recommended
	Frz. rain	Apply chemical	240 – 320	210 – 280	300 – 400*	400
15 - 20° ↑	Snow	Plow & apply chemical	200 – 280	175 – 250	250 – 350*	Not recommended
	Frz. rain	Apply chemical	240 – 320	210 – 280	300 – 400*	400
15 - 20° ↓	Snow or Frz. rain	Plow & apply chemical	240 – 320	210 – 280	300 – 400*	500 for frz. rain
0 to 15° ↑↓	Snow	Plow, treat with blends, sand hazardous areas	Not recommended	300 – 400	Not recommended	500 – 750 spot treat as needed
< 0°	Snow	Plow, treat with blends, sand hazardous areas	Not recommended	400 – 600**	Not recommended	500 – 750 spot treat as needed

*Dry salt is not recommended. It is likely to blow off the road before it melts ice.

**A blend of 6 – 8 gal/ton $MgCl_2$ or $CaCl_2$ added to NaCl can melt ice as low as -10˚.

Appendix B – Current Year Snow Routes



ROUTE

#1

ST-6

Legend

All Others

Routes

- No Plowing
- Route 1
- Route 2
- Route 3
- Route 4
- Route 5
- Route 6
- Route 7
- Route 8
- Route 9
- Route 10
- Route 11
- Route 12

N
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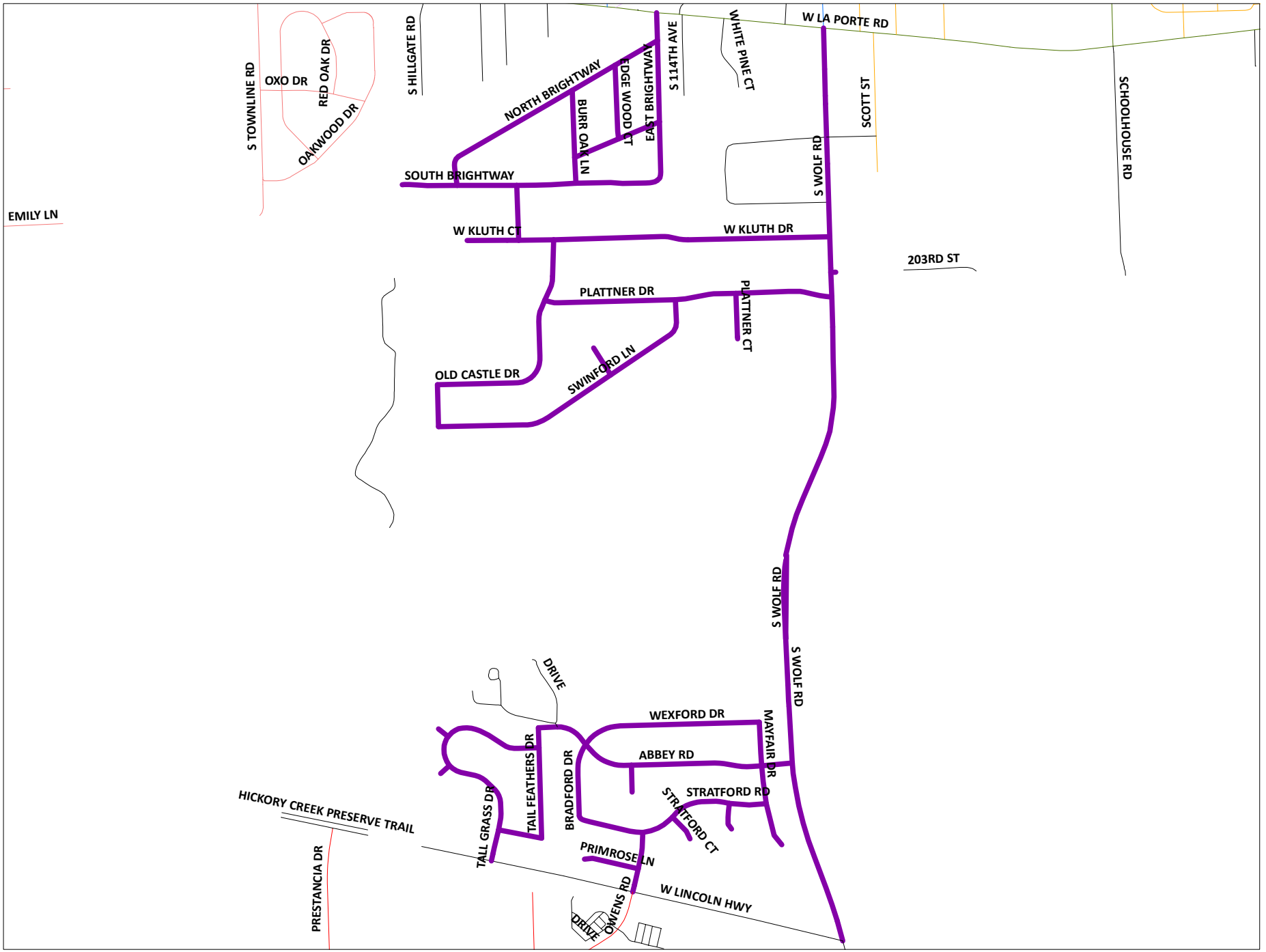
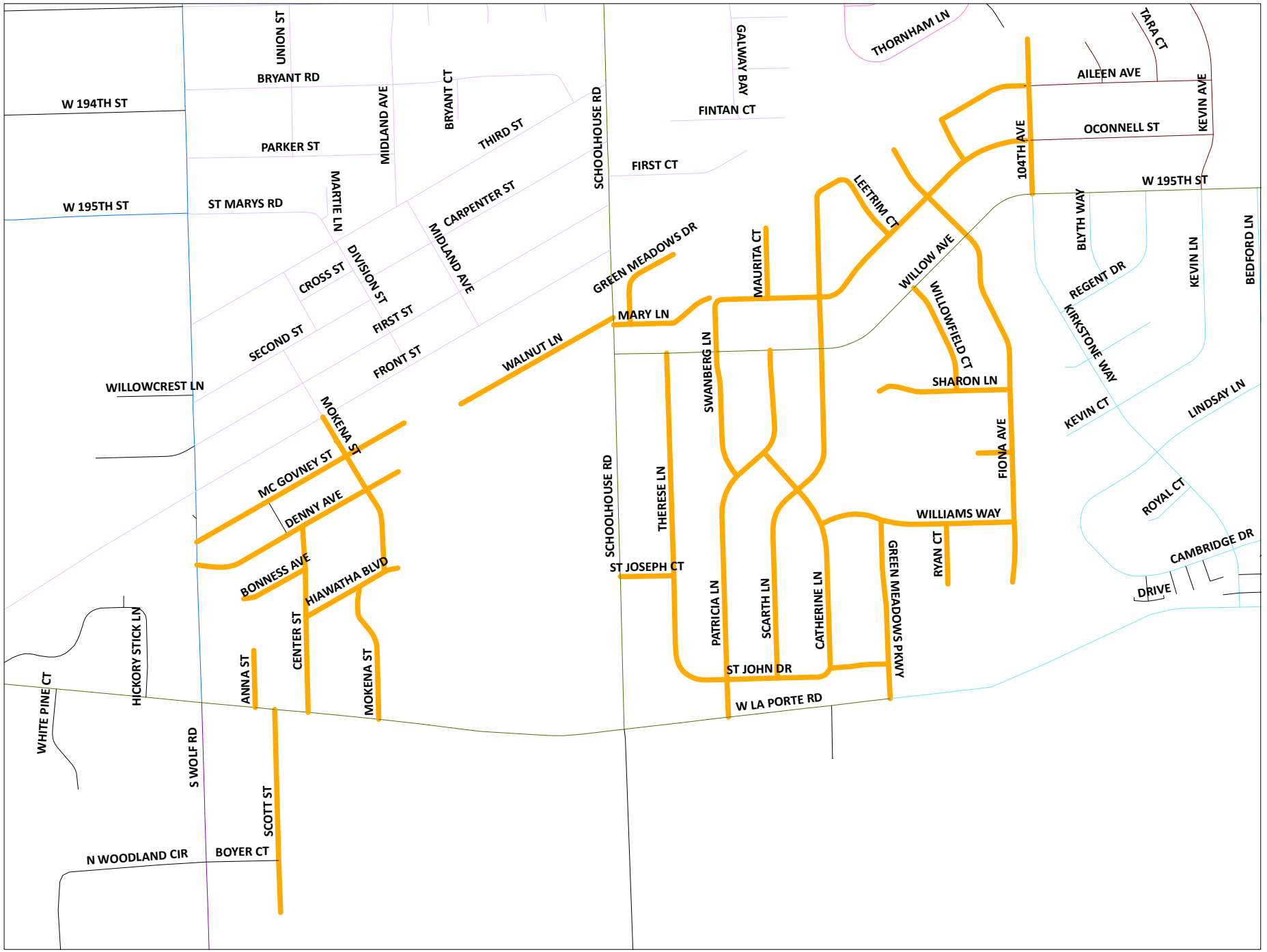
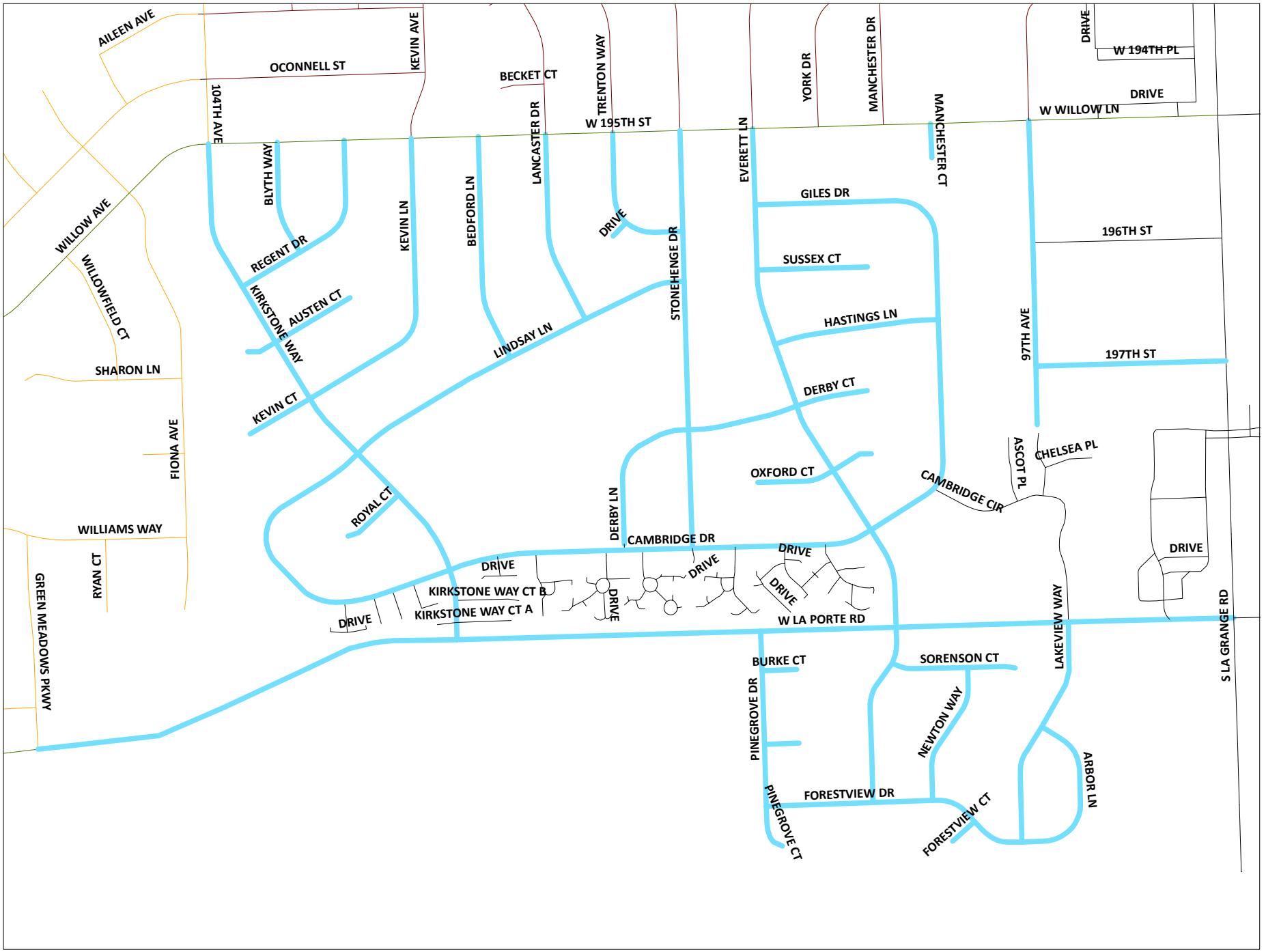

ROUTE
#2
ST-2
W LA PORTE RD
S HILLGATE RD
S 114TH AVE
WHITE PINE CT
SCOTT ST
SCHOOLHOUSE RD
S TOWNLINE RD
OXO DR
RED OAK DR
OAKWOOD DR
NORTH BRIGHTWAY
EDGE WOOD CT
EAST BRIGHTWAY
BURR OAK LN
SOUTH BRIGHTWAY
S WOLF RD
EMILY LN
W KLUTH CT
W KLUTH DR
203RD ST
PLATTNER DR
PLATTNER CT
OLD CASTLE DR
SWINFORD LN
DRIVE
WEXFORD DR
MAYFAIR DR
ABBEY RD
TAIL FEATHERS DR
BRADFORD DR
STRATFORD RD
STRATFORD CT
TALL GRASS DR
HICKORY CREEK PRESERVE TRAIL
PRIMROSE LN
PRESTANCIA DR
OWENS RD
W LINCOLN HWY
Legend
All Others
Routes
No Plowing
Route 1
Route 2
Route 3
Route 4
Route 5
Route 6
Route 7
Route 8
Route 9
Route 10
Route 11
Route 12
N
W
E
S


ROUTE
#3
ST-10
UNION ST
BRYANT RD
W 194TH ST
PARKER ST
MIDLAND AVE
BRYANT CT
THIRD ST
SCHOOLHOUSE RD
GALWAY BAY
FINTAN CT
THORNHAM LN
TARA CT
AILEEN AVE
KEVIN AVE
OCONNELL ST
104TH AVE
W 195TH ST
ST MARYS RD
MARTIE LN
CARPENTER ST
MIDLAND AVE
DIVISION ST
CROSS ST
FIRST CT
LEETRIM CT
GREEN MEADOWS DR
MAURITA CT
WILLOW AVE
BLYTH WAY
REGENT DR
KEVIN LN
BEDFORD LN
SECOND ST
FIRST ST
FRONT ST
WALNUT LN
MARY LN
WILLOWFIELD CT
KIRKSTONE WAY
WILLOWCREST LN
MOKENA ST
SWANBERG LN
SHARON LN
KEVIN CT
LINDSAY LN
MC GOVNEY ST
DENNY AVE
FIONA AVE
ROYAL CT
SCHOOLHOUSE RD
THERESE LN
WILLIAMS WAY
CAMBRIDGE DR
DRIVE
BONNESS AVE
HIAWATHA BLVD
ST JOSEPH CT
RYAN CT
PATRICIA LN
SCARTH LN
CATHERINE LN
GREEN MEADOWS PKWY
HICKORY STICK LN
CENTER ST
ANNA ST
MOKENA ST
ST JOHN DR
WHITE PINE CT
W LA PORTE RD
S WOLF RD
SCOTT ST
N WOODLAND CIR
BOYER CT
Legend
All Others
Routes
No Plowing
Route 1
Route 2
Route 3
Route 4
Route 5
Route 6
Route 7
Route 8
Route 9
Route 10
Route 11
Route 12
N
W
E
S



ROUTE

#4

ST-4

Legend

All Others

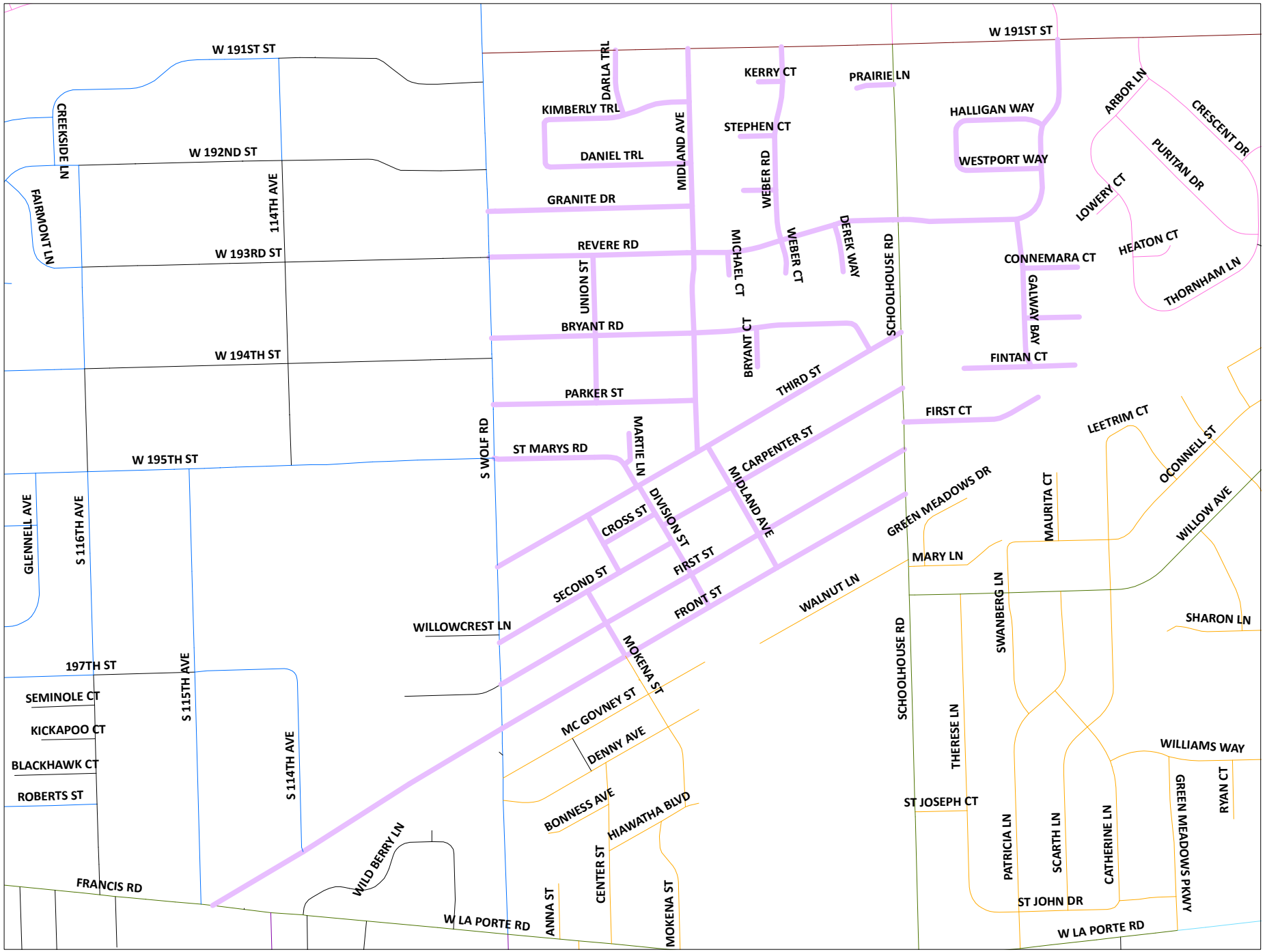
Routes

- No Plowing
- Route 1
- Route 2
- Route 3
- Route 4
- Route 5
- Route 6
- Route 7
- Route 8
- Route 9
- Route 10
- Route 11
- Route 12

N

W E

S



ROUTE

#5

ST-16

Legend

All Others

Routes

- No Plowing
- Route 1
- Route 2
- Route 3
- Route 4
- Route 5
- Route 6
- Route 7
- Route 8
- Route 9
- Route 10
- Route 11
- Route 12

N
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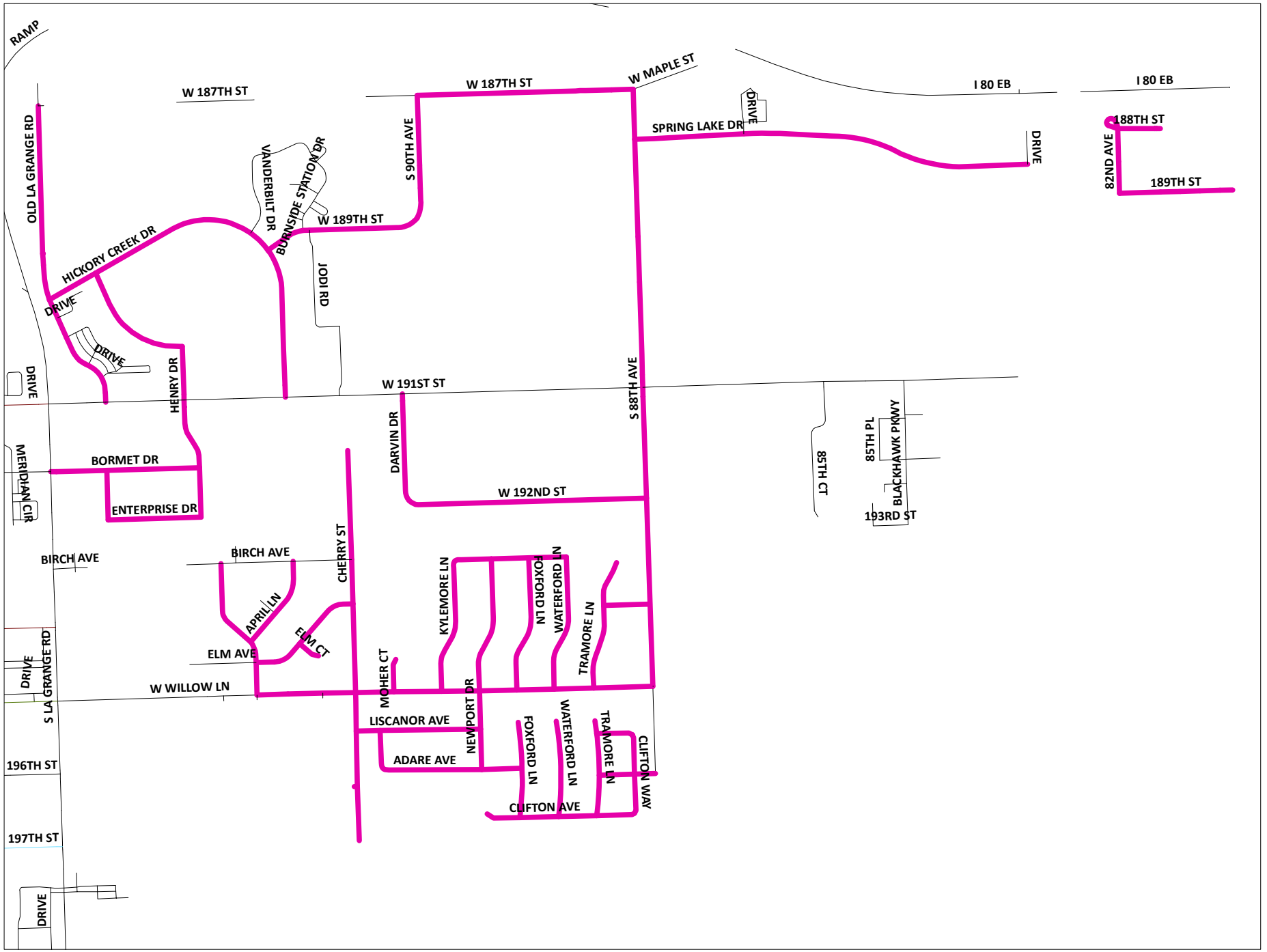


ROUTE

#6

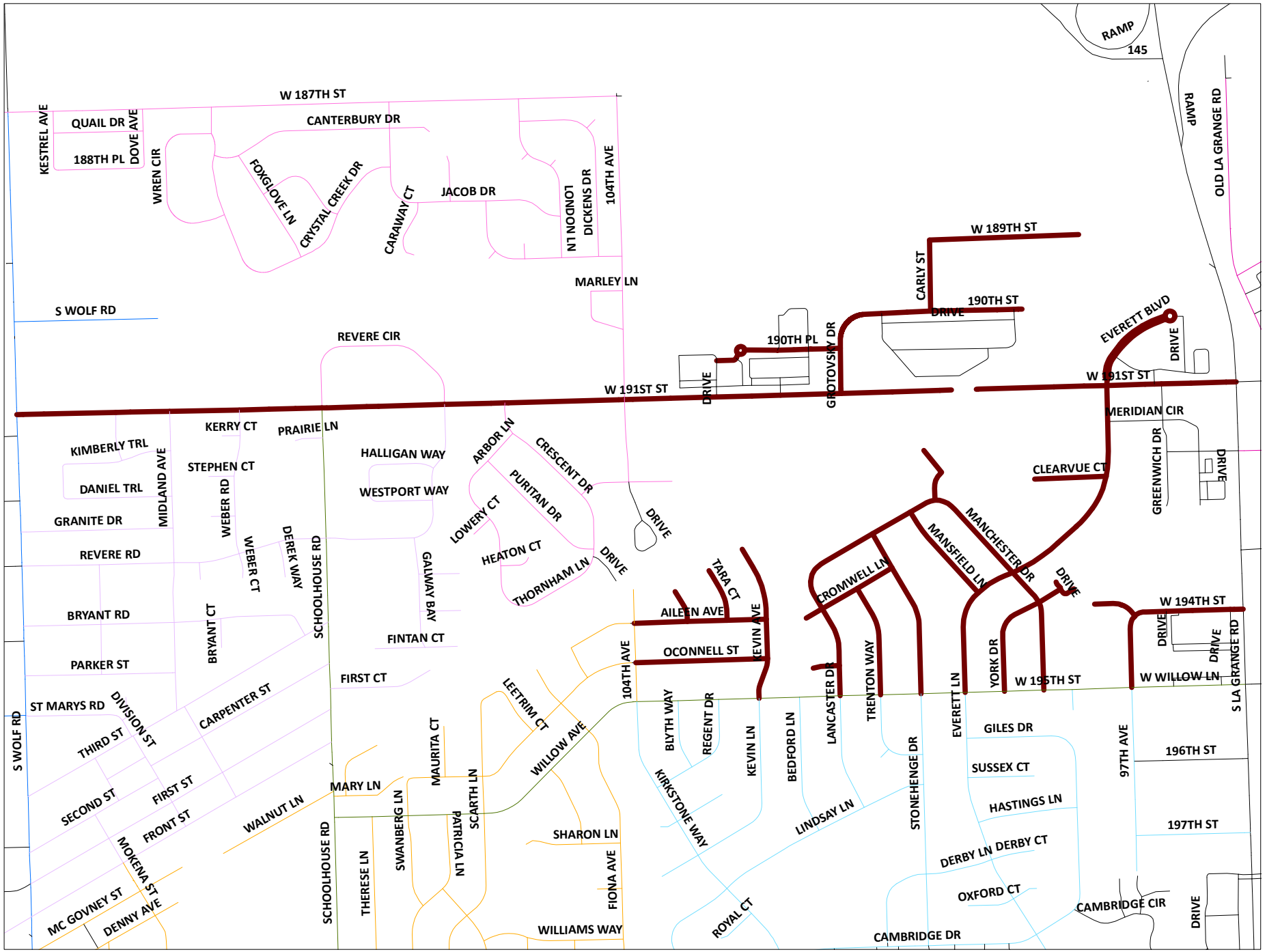
ST-20

Legend

All Others

Routes

- No Plowing
- Route 1
- Route 2
- Route 3
- Route 4
- Route 5
- Route 6
- Route 7
- Route 8
- Route 9
- Route 10
- Route 11
- Route 12



ROUTE

#7

ST-7

Legend

All Others

Routes

- No Plowing
- Route 1
- Route 2
- Route 3
- Route 4
- Route 5
- Route 6
- Route 7
- Route 8
- Route 9
- Route 10
- Route 11
- Route 12

N
W E
S

ROUTE

#8

ST-19

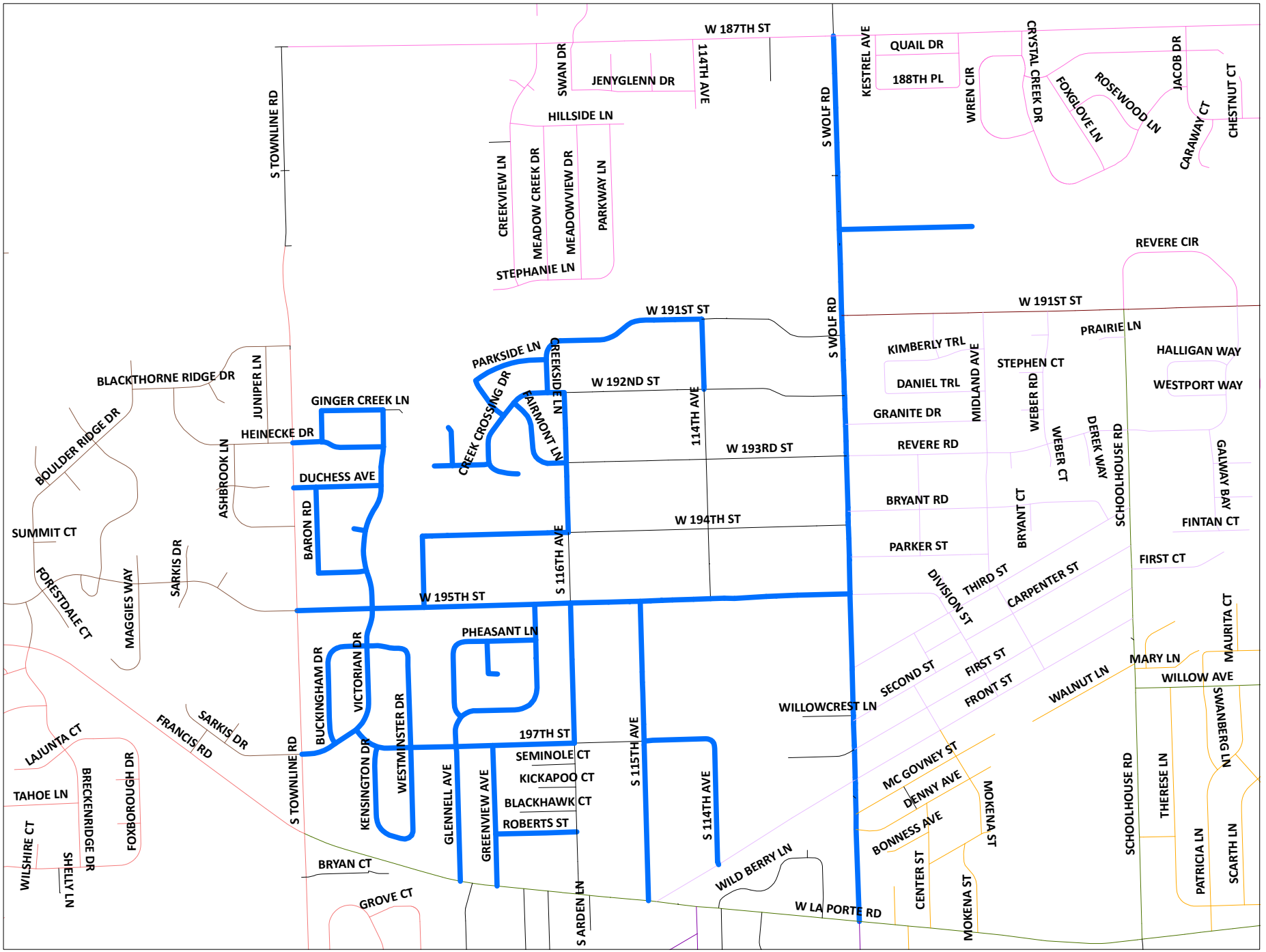
Legend

All Others

Routes

- No Plowing
- Route 1
- Route 2
- Route 3
- Route 4
- Route 5
- Route 6
- Route 7
- Route 8
- Route 9
- Route 10
- Route 11
- Route 12

N
W E
S



ROUTE

#9

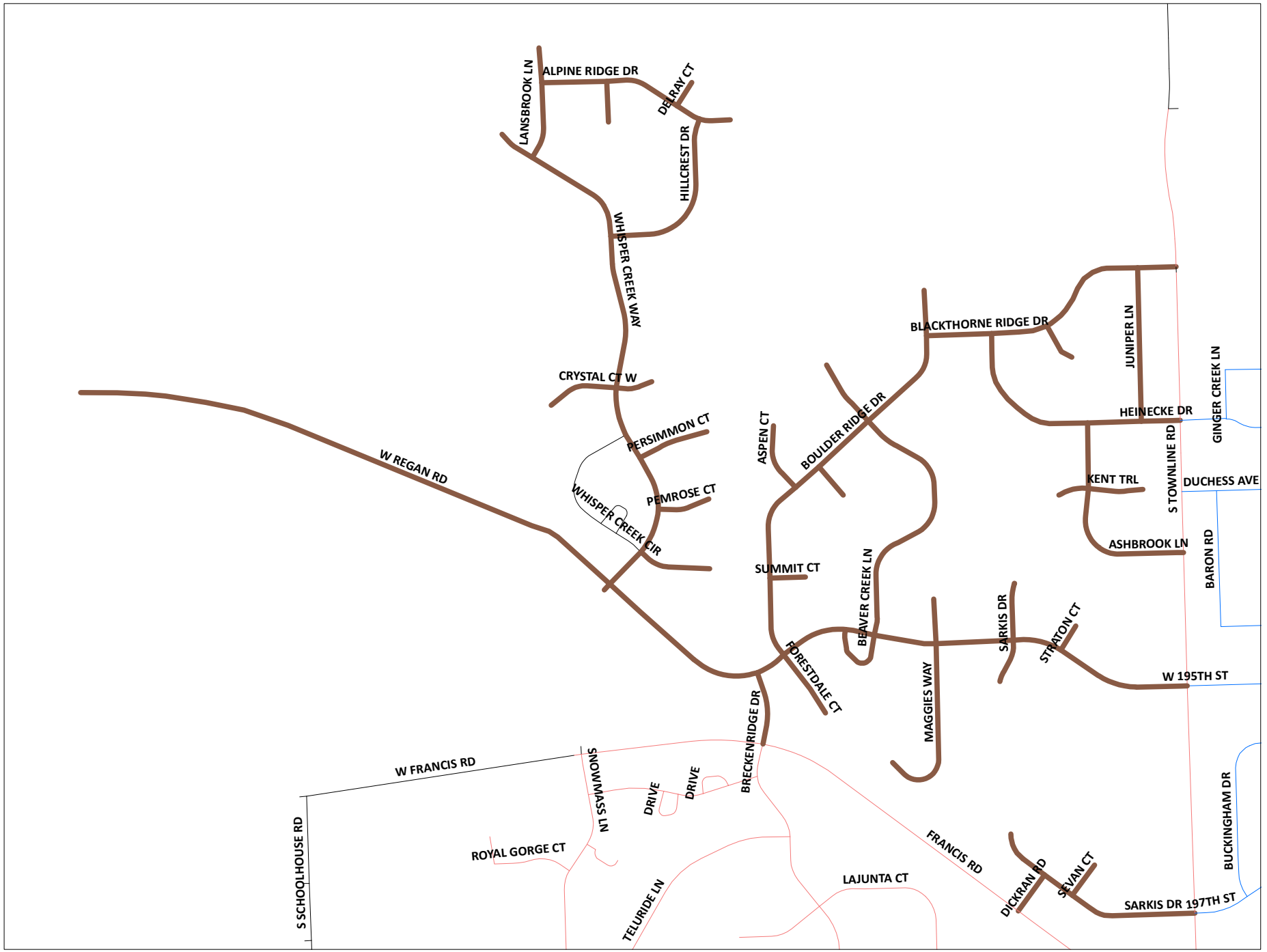
ST-17

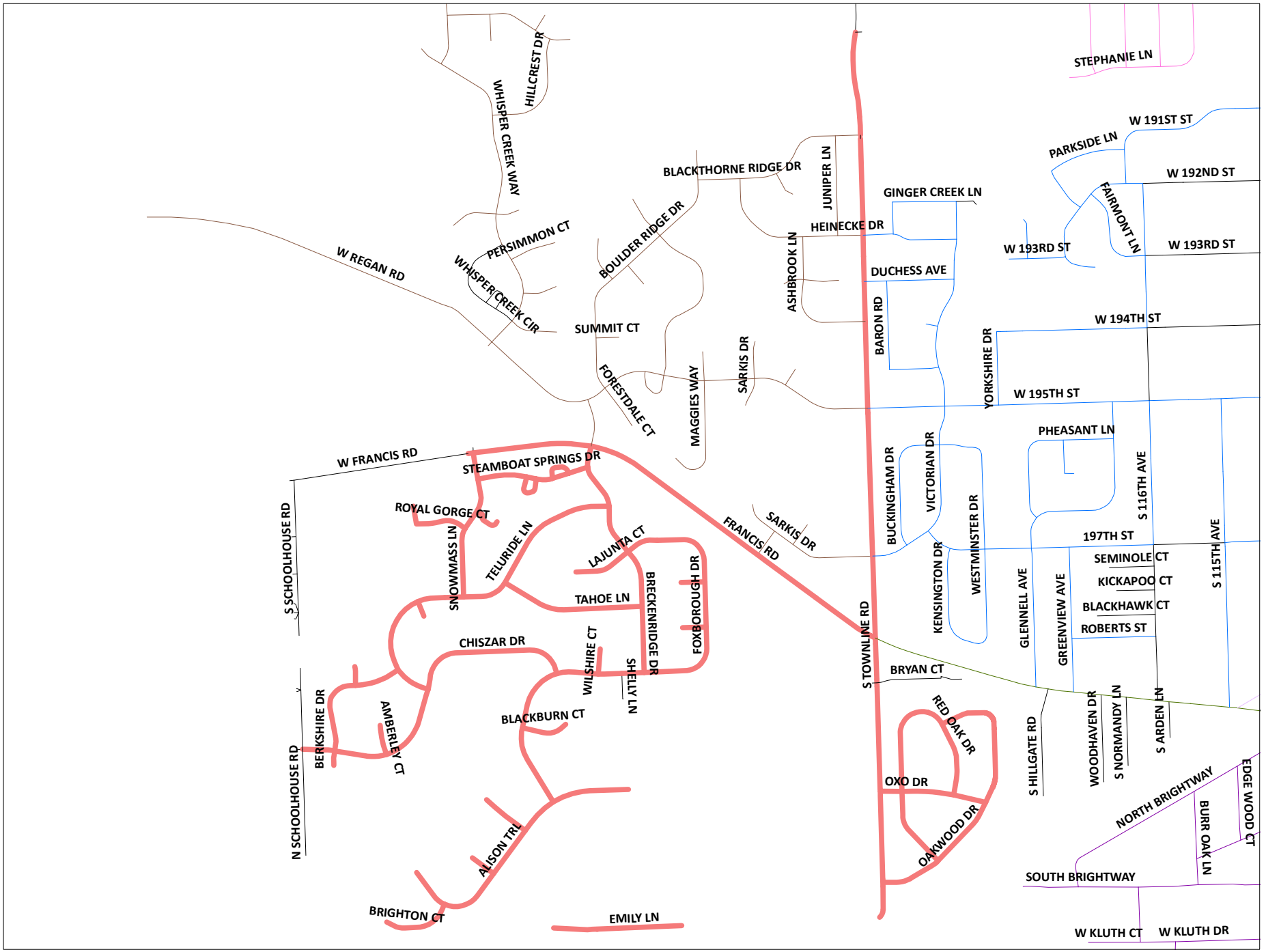
Legend

All Others

Routes

- No Plowing
- Route 1
- Route 2
- Route 3
- Route 4
- Route 5
- Route 6
- Route 7
- Route 8
- Route 9
- Route 10
- Route 11
- Route 12


ROUTE
#10
ST-21
ALPINE RIDGE DR
LANSBROOK LN
DELRAY CT
HILLCREST DR
WHISPER CREEK WAY
CRYSTAL CT W
PERSIMMON CT
PEMROSE CT
WHISPER CREEK CIR
W REGAN RD
ASPEN CT
BOULDER RIDGE DR
BLACKTHORNE RIDGE DR
JUNIPER LN
HEINECKE DR
GINGER CREEK LN
KENT TRL
S TOWNLINE RD
DUCHESS AVE
ASHBROOK LN
BARON RD
SUMMIT CT
BEAVER CREEK LN
SARKIS DR
STRATON CT
W 195TH ST
FORESTDALE CT
BRECKENRIDGE DR
MAGGIES WAY
W FRANCIS RD
SNOWMASS LN
DRIVE
DRIVE
ROYAL GORGE CT
S SCHOOLHOUSE RD
TELURIDE LN
LAJUNTA CT
FRANCIS RD
DICKRAN RD
SEVAN CT
SARKIS DR 197TH ST
BUCKINGHAM DR
Legend
All Others
Routes
No Plowing
Route 1
Route 2
Route 3
Route 4
Route 5
Route 6
Route 7
Route 8
Route 9
Route 10
Route 11
Route 12
N
W
E
S



ROUTE

#11

ST-8

Legend

All Others

Routes

- No Plowing
- Route 1
- Route 2
- Route 3
- Route 4
- Route 5
- Route 6
- Route 7
- Route 8
- Route 9
- Route 10
- **Route 11**
- Route 12

N
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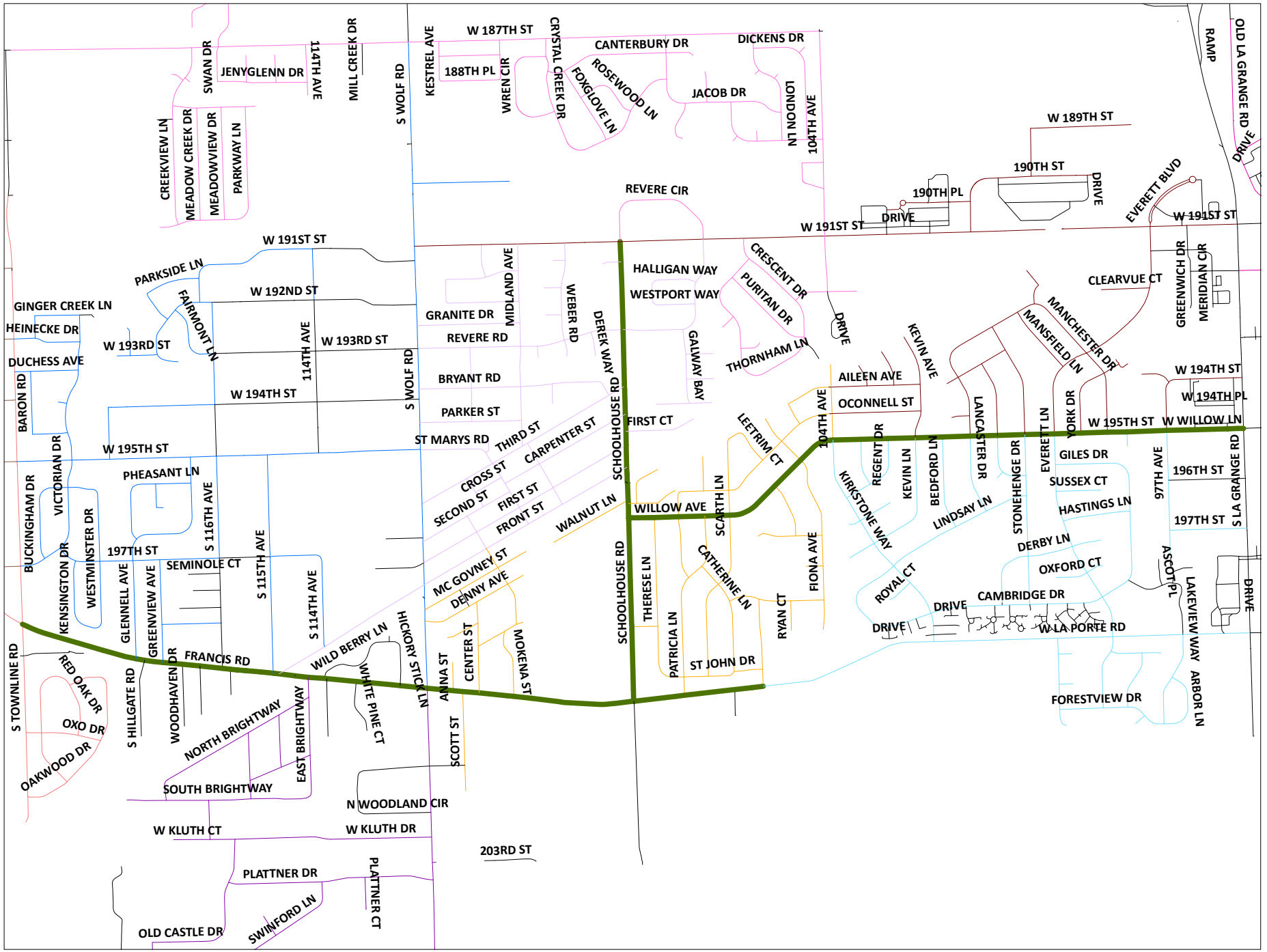
S



ROUTE

#12

WS-5

Legend

All Others

Routes

- No Plowing
- Route 1
- Route 2
- Route 3
- Route 4
- Route 5
- Route 6
- Route 7
- Route 8
- Route 9
- Route 10
- Route 11
- Route 12

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Appendix C – Calibration Procedures

Granular Salt & Liquid Calibration

LakeCounty
Division of Transportation

LakeCounty
Division of Transportation

Equipment Needed for Granular Test

- *Warm Hyd. Prior to testing*
- *Large Tarp*
- *One Loader Bucket of Dry Salt Approx. 500 lbs.*
- *Stop Watch (For Non Computer Trucks & Liquid Calibration)*
- *Paint Pen or Marking Source*
- *Two People*
- *Five Gallon Bucket (Weigh Empty and Record Weight for Later Reference*
- *Portable Scale (Weighs Up to 100 lbs.)*

FIGURE A

Prep & Set Up

- Manual Systems - each truck must be done separate due to age of hydraulic system.
- Computer Units need to be in **CALIBRATION MODE**.
- Load hopper with enough salt to run calibration test
  - Approx. 500 lbs. of dry salt must be loaded on to get accurate RPM count
- Mark auger shaft/sprocket shaft **FIGURE A** (yellow marking)
- Rate section of 1-10 (set truck RPM @ 1500 during test)
- Turn spinner off
- Make sure to load the auger with salt when counting revolutions per minute on each counter setting
- Put down a tarp to run salt onto for the test. **FIGURE B**
  - Run at least 20 revolutions (rev) and clean off spinner

LakeCounty
Division of Transportation

Run Granular Test

- Log weight of empty bucket
- collect salt from tarp into the bucket
- strike off top of bucket
- Log weight of full bucket (remember to deduct the weight of the empty bucket)
- Continue to fill full buckets
- keep count of how many full buckets
- Log weight of last bucket (this one might not be full)
- multiply weight of bucket full of salt by the number of total full buckets
- divide total weight by number of turns to get lbs. per revolution. (FIGURE C)

FIGURE B

FIGURE C

Example: Weigh salt in a 5 gal. buckets, divide Total weight by number of auger turns. That gives you pounds per rev

- Such as 200 lbs. by 10 turns gives value 20lbs. per auger rev
- *Use your chart for calibration based on RPM's and time Automatic Salters (**See Page 7**)*

- Computer Operated Salters need to be in calibration mode to run salt off
- Use same procedure except computer will provide select amount based upon speed of unit.

Equipment /Prep Needed for Liquid Test

EQUIPMENT

- Five Gallon Bucket marked in One Gal. Increments (can use five gallon salt bucket)
- Hoses to Fit over Spray Nozzles and Reach into Bucket
- Stop Watch
- Two People

PREP

- Things you will need to know prior to running test:
- Liquid sensor ounces per rev.
- The smaller spray nozzle size, the better the fan spray at lower gal. per ton.(gpt)
- Over time the spray nozzles wear out so it's best to have new nozzles at time of calibration.
- Types of spray nozzles: all brass, plastic w/stainless steel inserts; all stainless steel.

FIGURE D

1. Slide hoses over spray nozzles and run into bucket. FIGURE D and FIGURE E
2. Hoses collect fluid from nozzles into bucket marked in one gallon increments Must measure fluid amounts collected in bucket from nozzle sprayer

Set Up

FIGURE E

LakeCounty
Division of Transportation

Run Liquid Test

Run system at setting you want, measure liquid in bucket at 1500 RPM using a stop watch, try to get 1 gallon per minute; will equal 10 gal. per ton of salt.

Liquid: 10 gal. per ton

Sensor size: oz. per rev

Example:

- *400 lbs. per mile at 30 MPH will take 2 min, so it will take me 10 minutes to go 5 miles. If putting 400 lbs. of salt down a mile it will take 5 miles to reach 2000 lbs. of salt. So if we reach 1 gallon a minute at 30 MPH we will have total of 10 gal. per ton*

Spreader Drop Test Calculations Sheet

Rev. 12/11/08

Perform all **tests with engine@ 1200-1500 RPM. General Instructions**

1. Determine pounds of material dropped In one minute at each feed rate setting and enter into "Lbs per Minute"column.
2. Determine auger rpm at each Feed Rate dial setting and enter into "Auger RPM" column.
3. Pounds per revolution should be fairly consistent downentire column.

				Pounds Per Lane Mile @ X MPH					
Feed Rate Dial Setting	Auger RPM	Lbs Per Revolution	Lbs per Minute	5 MPH	10 MPH	15 MPH	20 MPH	25 MPH	30 MPH
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									

EXAMPLE

								Pounds Per Lane Mile @ X MPH									
Feed Rate Dial Setting		Auger RPM		Lbs Per Revolution		Lbs per Minute		5 MPH		10 MPH		15 MPH		20 MPH		25 MPH		30 MPH
							M		M		M		M		M		M	
4		20	x	7	=	140	12	1680	6	840	4	560	3	420	2	336	2	280
5		26	x	7	=	182	12	2184	6	1092	4	728	3	546	2	437	2	364

NOTES: