
SENECA NATION
TRANSPORTATION
SAFETY PLAN
2019
SENECA NATION of INDIANS
Keeper of the Western Door

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EXECUTIVE SUMMARY

Native Americans around the country are disproportionately affected by traffic crashes with adults being one and a half times more likely to die in a crash than Caucasians or African Americans, according to the Centers for Disease Prevention. To combat this trend, tribes around the country have prioritized the development of comprehensive safety plans that provide a framework for reducing transportation related fatalities and serious injuries.

Since 2014 the Seneca Nation DOT staff has undertaken efforts to improve accident data collection capabilities and in 2017 drafted the Seneca Nation Transportation Safety Plan (SNTSP). In 2018 the Seneca Nation Department of Transportation hired Valerie J. Southern, Transportation Consultants, to review the draft and suggest recommendations to include in a final draft. Valerie J. Southern also developed data based projects at four specific locations and along two traffic corridors. The recommendations and identified projects are included in this 2019 SNTSP.

The Seneca Nation is and will always be the sole owner of the land and infrastructure within its boundaries. State and agencies local have maintenance obligations on many Nation roads. This plan will serve as a tool to dictate how and to what extent the agencies and partners implement measures to improve safety for all users.

This plan establishes multi-territorial goals, objectives, and key emphasis areas that integrate safety. The SNTSP can assist in addressing safety issues throughout the Nation's transportation systems to address the unique conditions that contribute to safety problems.

The SNTSP will assist Seneca leadership in making proactive decisions for improving conditions. It will also help to align and leverage resources needed to build support, tools to analyze data, and resources to identify safety issues and select safety strategies to address the safety challenges unique to the Nation's transportation system.

INTRODUCTION

The Seneca Nation is committed to reducing and ultimately eliminating the risk of death, injuries, and/or damages subsequent of incidents throughout the local transportation system. The Nation's Department of Transportation and the Community Planning and Development Department aims to continually improve safety by identifying issues and implementing strategies developed through a Safety Management Plan. The plan is based on the identification and prioritization of safety issues with multi-disciplinary strategies resulting in a reduction of fatalities, injuries, or loss throughout the transportation networks. The transportation system is a network of infrastructure which transport people and goods from one location to another such as vehicular, transit, recreational/trail, pedestrian and other various modes of travel.

In Cattaraugus County, the County surrounding the Seneca Nation's Allegany Territory and a majority of the routes between the Allegany and Cattaraugus Territories,

- **Motor Vehicle Traffic Injuries are the third leading cause of injury related death,**
- **Motor Vehicle Traffic Injuries are the second leading cause of injury related hospitalizations,**
- **and Motor Vehicle Traffic Injuries are a leading cause of injury related emergency department visits.**

In Erie County, the predominant County surrounding the Nation's Cattaraugus Territory,

- **Motor Vehicle Traffic Injuries are a leading cause of injury related death,**
- **Motor Vehicle Traffic Injuries are the third leading cause of injury related hospitalizations,**
- **and Motor Vehicle Traffic Injuries are the third leading cause of injury related emergency department visits.**

(New York State Department of Health, Bureau of Occupational Health and Injury Prevention)

By identifying emphasis areas with opportunities to develop and implement strategies, this plan will help enhance transportation safety for those who live, work, play, and travel on Seneca Territory.

MISSION

The Seneca Nation Transportation Safety Plan aims to improve the Nation's ability to identify problems and potential solutions for the implementation of strategies that reduce the risk of serious injuries, fatalities, and damages.

VISION

The Seneca Nation shall encompass a transportation system that balances its rich culture and heritage with modern, high quality features; a system that is safe, sustainable, and accessible for all who live, work, play, and travel throughout the Seneca Nation. With safety as a priority, efforts will continue towards assuring every user they are safe traveling throughout the Nation.

GOALS

- To save lives and reduce injuries while respecting Native American culture and tradition
- Reduce transportation related incidents
- Improve the collection of consistent, timely, and accurate data
- Implementation of cost effective data driven solutions and strategies
- To achieve the highest possible level of transportation safety through communication, coordination, collaboration, and cooperation with all SNI entities, Seneca members, local community, general public, affiliated stakeholders, and key regional, state, and federal agencies.

Background

The Seneca Nation's Transportation Safety Plan and activities will encompass and benefit the Nation and traveling public, with an emphasis on Allegany and Cattaraugus Territories.

The people of the Seneca Nation today live and work on the same lands that Seneca people have inhabited for over 1,000 years. The Seneca Nation holds title to five distinct territories located in the vicinity of Western New York State, an area of the state where communities are primarily rural in geographic location and are at considerable distances from the services and amenities available in urban locales. The territories are situated among portions of five counties: Allegany, Cattaraugus, Chautauqua, Erie, and Niagara. The aggregate total of Nation restricted fee lands is 53,891.3 acres, or 84.2 square miles, but the territories are not contiguous and each is uniquely different in its geographic, economic, social, and environmental profile. The Allegany and Cattaraugus Territories are home to the Nation's administrative and community service functions; it is on these two territories where the majority of Seneca members reside. The Oil Spring Territory is the site of a historic spring, being the first recorded mention of oil in North America. Today, the territory is home to Seneca Nation and privately owned retail businesses and a Class II gaming facility. The Buffalo Creek and Niagara Falls Territories are non-residential territories with Class III gaming operations.

The Seneca Nation DOT provides oversight on maintenance, construction activities, and enhancements of roads within Nation boundaries; primarily on the Allegany and Cattaraugus Territories.

Allegany Territory

- 156.5 miles of road
- 31,171.5 acres along the Allegany River
- Adjacent to Cattaraugus County
- Holds the distinction of having three congressionally approved villages including the City of Salamanca
- Has a portion of the Southern Tier Expressway traversing it from east to west across the Territory

Cattaraugus Territory

- 62 miles of road
- Located along Cattaraugus Creek, from Gowanda, NY to the shores of Lake Erie.
- Comprises 22,011.9 acres among three counties (Cattaraugus, Chautauqua, and Erie)
- has a portion of Interstate 90 intersecting Nation lands

The two territories are 35 miles apart from each other and are situated in a rural area of New York State that has a high degree of agriculture and light-heavy manufacturing businesses. A portion of the Cattaraugus Territory falls within the Greater Buffalo Niagara Regional Transportation Council (GBNRTC) Metropolitan Planning Organization (MPO) service area.

SAFETY PARTNERS

The Seneca Nation Transportation Safety Plans have been prepared by the Nation's Department of Transportation (DOT) and the Community Planning and Development Department (CPDD). In addition to efforts by the DOT and CPDD, many other representatives play a role in the development process. Participating organizations include:

- Allegany Territory Volunteer Fire Department
- Allegany-Limestone Central School
- Allegany-Limestone Volunteer Fire Department
- Bureau of Indian Affairs (BIA)
- Cattaraugus County Department of Public Works
- Cattaraugus County Legislature
- Cattaraugus County Sheriff's Office
- Chautauqua County Department of Public Works
- Chautauqua County Legislature
- Chautauqua County Sheriff's Office
- Cattaraugus Territory Volunteer Fire Department
- City/Town of Salamanca, Council
- City of Salamanca Department of Public Works (DPW)
- City of Salamanca Mayor's Office
- City of Salamanca Police Department
- Cold Spring Fire Department
- Erie County Department of Public Works (DPW)
- Erie County Legislature
- Erie County Sheriff's Office
- Federal Lands Highway Office
- Federal Highway Administration (FHWA)
- Greater Buffalo-Niagara Regional Transportation Council (GBNRTC)
- Governor's Traffic Safety Committee (GTSC)
- Gowanda Central School District
- Lakeshore Central School District
- National Highway Traffic Safety Administration
- NITTEC Traffic Operations
- NYS Department of Transportation (NYSDOT)
- NYS Department of Motor Vehicles (NYSDMV)
- NYS Governor's Traffic Safety Committee
- Olean Area Transit System
- Randolph Central School District
- Salamanca Central School District
- Seneca Transit System (STS)
- Seneca Allegany Casino
- Seneca Gaming and Entertainment (SG&E)
- Silver Creek Central School District
- SNI Council
- SNI Community Planning and Development Department (CPDD)
- SNI Conservation Department
- SNI Department of Public Works (DPW)
- SNI Emergency Management (EMS)
- SNI Heath Department
- SNI Law Enforcement Commission
- SNI Marshals
- SNI President, Treasurer, and Clerk
- State Police
- Southern Tier West *Transportation Committee* (STW)

STEERING

The Federal Highway Administration typically recommends forming a Safety Management Steering Committee to oversee transportation safety efforts and to work between Federal Agencies and with the tribal governments. Given that the Nation operates in conjunction with so many different agencies and municipalities on state, local, and federal levels that the Nation should operate in a different way than typical Safety Management Steering Committees and will operate as follows:

All data analysis, emphasis area selection, development of safety strategies, and implementation of the final plan will be steered by the SNI DOT and CPDD. They are delegated the responsibility to ensure the intent of this plan is preserved and will monitor transportation statistics gathered throughout Seneca Territories. Also, best practices for developing problem solving strategies will be researched and shared by this group.

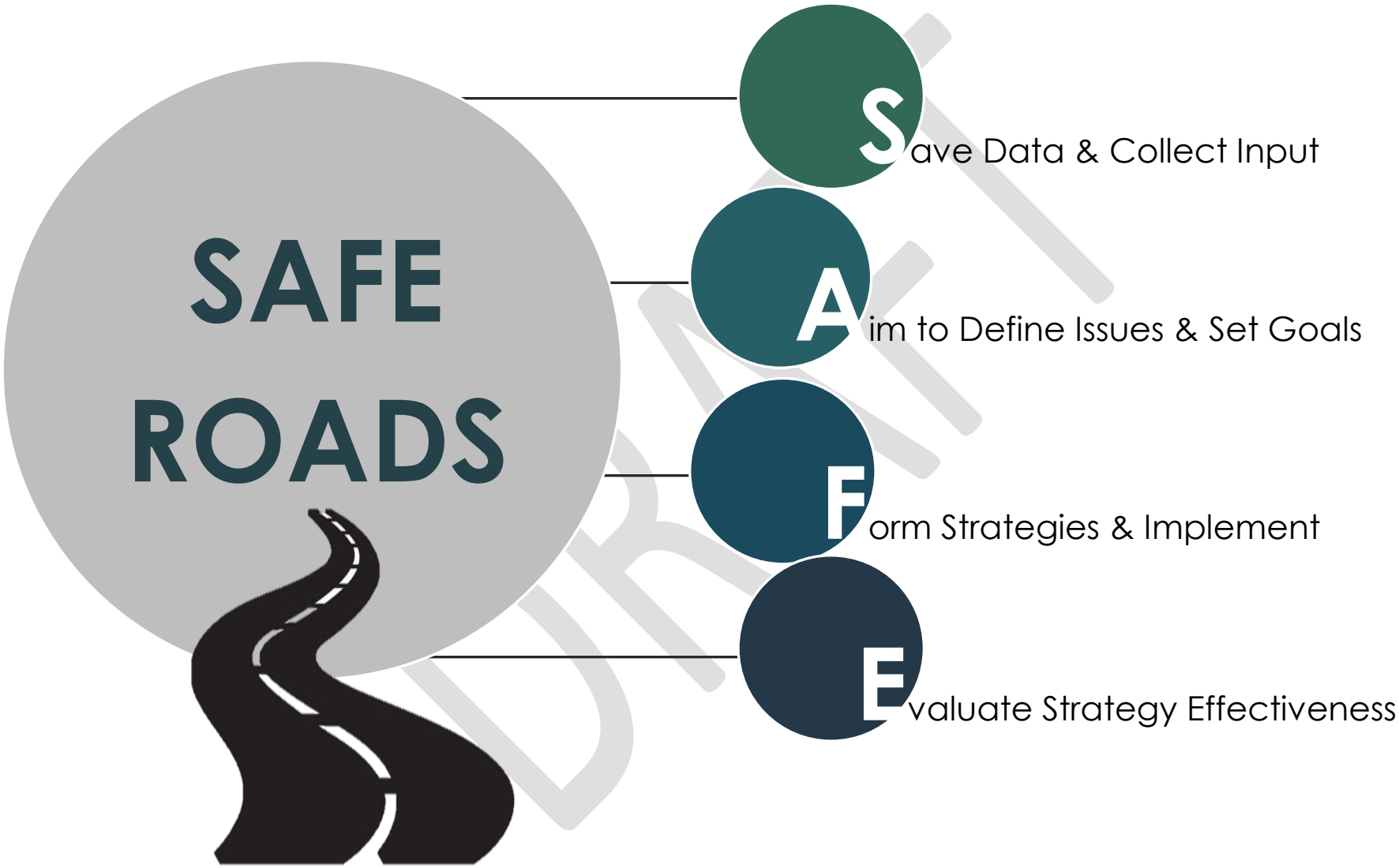
Legal Assistance: On January 17, 2017, the Seneca Nation Council passed resolution CN: R-01-14-17-05, adopting the Seneca Nation Law Enforcement Commission (the Commission). When involving law enforcement on Seneca Territories, the Commission has been given the responsibility of:

- overseeing law enforcement activities;
- providing recommendations to Council on the adoption of laws, ordinances, and policies;
- taking complaints and soliciting input from the public;
- and, coordinating activities to combat substance abuse.

When appropriate, the SNI DOT will consult and coordinate with the Commission. They will assist by assuring that appropriate policies are presented and that Nation Marshals are proactive in following through with strategies outlined in this plan.

Oversite, direction, subsequent determination, and any final decisions will be the responsibility of the Seneca Nation Council and observed by senior leadership of the FHWA.

PROCESS



1.

- Engage Safety Stakeholders in the initial planning process
- Identify safety as a major organizational goal
- Identify existing safety concerns in the system, set targets to correct safety issues

2.

- Collect and Analyze safety data
- Use data to identify locations for safety treatments
- Use safety policies from other planning documents as a guide for inclusion in the LRTP
- Include safety-related scoring and ranking in the LRTP to establish safety as a factor in project selection

3.

- Design standalone safety projects
- Integrate safety elements into other TIP projects

4.

- Continually revise strategies to meet safety goals and objectives
- Periodically assess progress toward safety performance measures
- Evaluate success in safety initiatives

DATA SUMMARY

In 2014, the Seneca Nation completed a draft Transportation Safety Plan. However, the plan was limited to a single emphasis area; data collection and analysis. Since then, various Seneca Nation departments have developed a system for tracking and recording data. A Tribal Transportation Plan Safety Fund grant for Data Collection was submitted and awarded for the purchase of tablets to be carried in SNI Marshal vehicles. The GIS division of CPDD launched a GIS based application to be integrated with the tablets so that accident and incident data can be recorded. Nation Marshals began experimenting with the system via desktop in 2015. Training and additional policies are necessary for the system to function effectively with the primary focus to improve data collection within the Seneca Nation. Once fully operable in vehicles and on desktop, this system will immensely help the Nation improve safety. Data collected will assist in the development and continual update of this plan. It will be a key component in pin-pointing deficiencies and potential emphasis areas to define goals and strategies that could alleviate serious safety issues on Seneca lands.

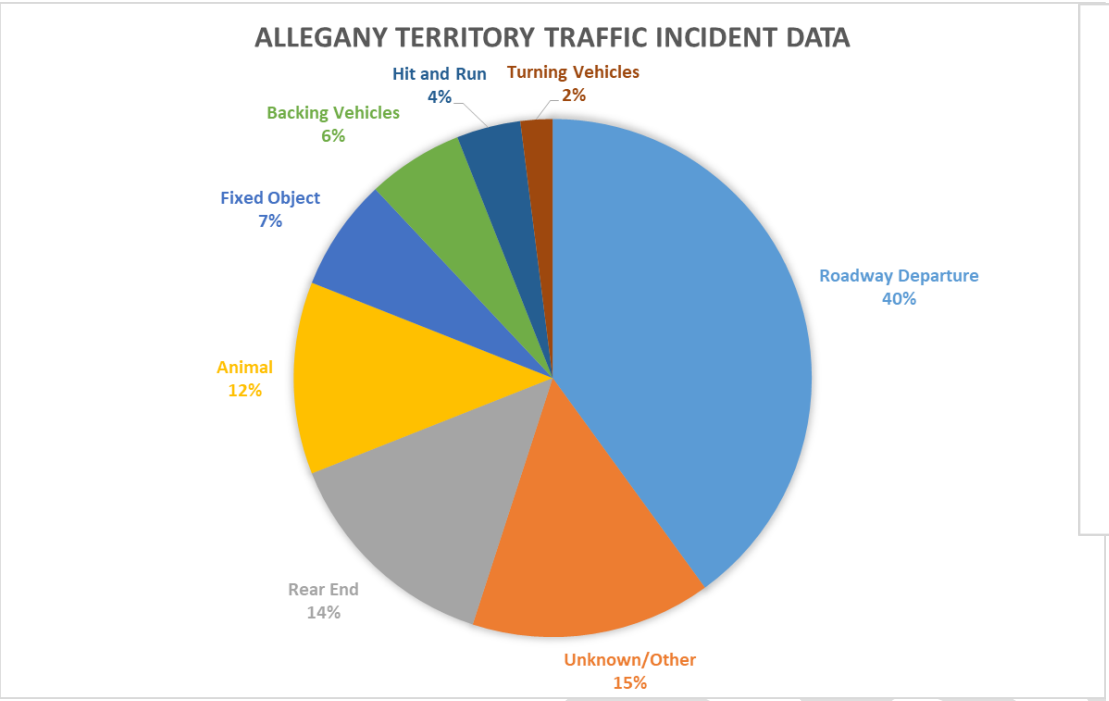
Going forward, the data collection method will involve the entry of on-site crash data by the Seneca Nation Marshals into the MVA system as described. The Seneca Nation Department of Transportation (SNDOT) will continue to enter the crash data into the National Highway Traffic Safety Administration (NHTSA) Fatality Analysis Reporting System (FARS). Today, SN FARS entries are recorded up to year 2015. The Nation is committed to keeping its FARS entries current. It is further committed to upgrading and modernizing the data collection and reporting program. The Motor Vehicle Accident (MVA) crash data collection form will be upgraded with additional data fields to more completely capture crash characteristics. An explanation of the data collection goals and strategies is provided in Emphasis Area #1 – Data Collection, Analysis, Tools, and Capabilities.

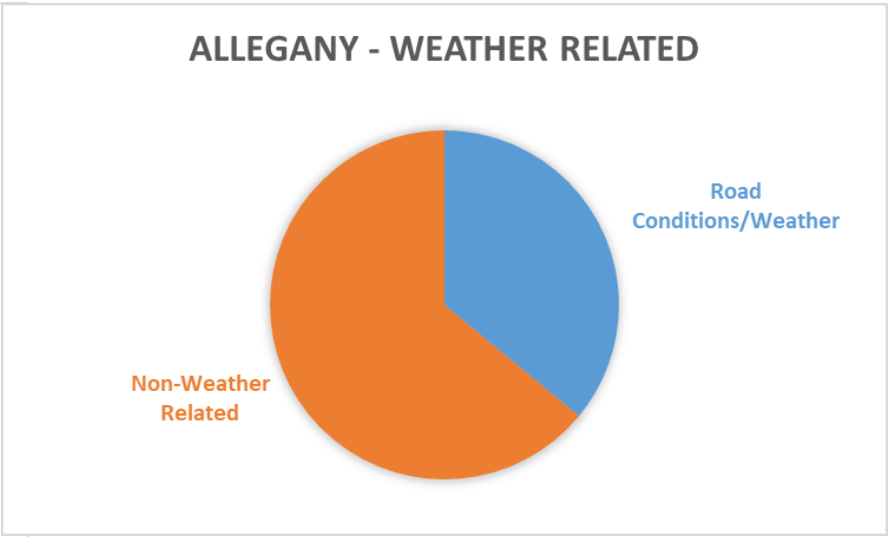
To achieve the objectives of upgrading and modernizing its data collection and reporting program, the Seneca Nation will modernize the program in two phases. The first phase will be accomplished in 1 year and represent adjustments to the MVA collection process which is currently being developed by the GIS Division in collaboration with the Marshalls and Emergency Management. The second phase will include time for the re-training of the SN Marshals and installation of tablets into all Marshal Vehicles which should be accomplished and operational by 2021.

The crash data references and analysis in this Transportation Safety Plan were drawn from seven primary sources:

1. **The Center for Disease Control and Prevention:** Federal policy center providing data, analysis and trends on motor vehicle safety in the United States, including Indian Country transportation safety reports. https:///www.cdc.gov/motorvehiclesafety/states/index.html
2. **The National Highway Safety Administration – Fatality Analysis Reporting System Map:** Federal data map with the location of all fatal crashes, including tribal, across the country from 2011-2015. https://www.nhtsa.gov/research-data/fatality-analysis-reporting-system-fars
3. **The National Highway Traffic Safety Administration – National Center for Statistics and Analysis:** Federal policy center with statistical analysis on national crash trends, alcohol impaired driving, and seat belt use and enforcement. https://www.nhtsa.gov/research-data/national-center-statistics-and-analysis-ncsa
4. **The New York State Department of Transportation, Institute for Traffic Safety Management and Research (ITSMR), Crash Data Portal:** Repository of annual traffic crash records for New York State counties, cities, and tribal lands. https://www.itsmr.org/tssr/
5. **The New York State Department of Motor Vehicles – Crash Data Summaries:** Statistical data on state traffic crashes by severity and mode from 1995 to 2014. https://dmv.ny.gov/about-dmv/statistical-summaries
6. **The Seneca Indian Nation – Motor Vehicle Accident Data Base:** Seneca Nation Safety Marshal crash data records collected through 2016.
7. **The Seneca Indian Nation – Public Commentary:** Comments, concerns, and observations of crash activity on tribal roadways from Seneca Nation residents.

ALLEGANY TERRITORY DATA





- ***Other***- *Includes data such as DWIs, Hit and Run, Trespassing, Pursuits, Drowsy Driving, Recreational Vehicle Crashes, ext.*
- ***Unknown/Other Vehicle***- *Includes all crashes in the data base that had no identified crash type.*

- *Data collected by SNI Safety Marshals throughout 2017 shows 36% of incidents occurred in correlation with inclement weather!*
- *Data collected by the National Climate Data Center between 1981-2010 shows that Western New York experiences an average snowfall of 95" over 61 days. Current data does not specify the correlation between weather and the severity of accidents. Future inclusion of crash severity and contributing factors will help to determine where to focus mediation efforts.*

Source: Allegany Territory Motor Vehicle Accidents 2014 - 2017; Seneca Nation Indians Department of Transportation

Other crash data sources and factors for the Allegany Territory provide a broader perspective of crash history during the last five years. One important source is the Institute for Traffic Safety Management and Research (ITSMR)[1] which summarizes data from the New York State Crash Data Portal for the state's counties and municipalities. ITSMR also offers limited crash history for the Allegany Territory. It reports, for example, there were 908 crashes in the territory between 2013 and 2018 of which nine were fatal. Another important data source is the National Highway Traffic Safety Administration (NHTSA) Fatality Analysis Report System (FARS). It reports there were five fatal crashes in the territory between 2011 and 2015.

While limited, the data sources inform on the nature of crashes occurring in Allegany Territory and help to identify the areas that are emphasized in the SNI Transportation Safety Plan. These emphasis areas and the data that supports them are:

Data Collection: While there are significant variations in the number of crashes reported in the Allegany Territory, the data collection emphasis area will enable the development of a SNI collection and reporting system that accurately and uniformly identifies crashes.

Intersections: The current data sources report the Allegany Territory has a significant percentage of intersection crashes such as rear end and turning movement (16 percent) and bicycle and pedestrian (2 percent).

Impaired and Distracted Driving: The data sources also report 13 percent of the crashes in Allegany Territory involved impaired and distracted driving with drug, alcohol, and other impairment factors. FARS reports all of the reported fatalities involved alcohol.

Pedestrian and Vulnerable User Safety: The data sources report 28 percent of those involved in Allegany Territory roadway crashes were older and young drivers. A smaller percentage (2 percent) involved pedestrians.

ATV/Snowmobile/Motorcycle Safety: The data sources identified 13 motorcycle crashes in Allegany Territory. All involved injuries.

Roadway Departures: Forty percent of the crashes in Allegany Territory involved roadway departures. According to FARS, they resulted in five fatalities.

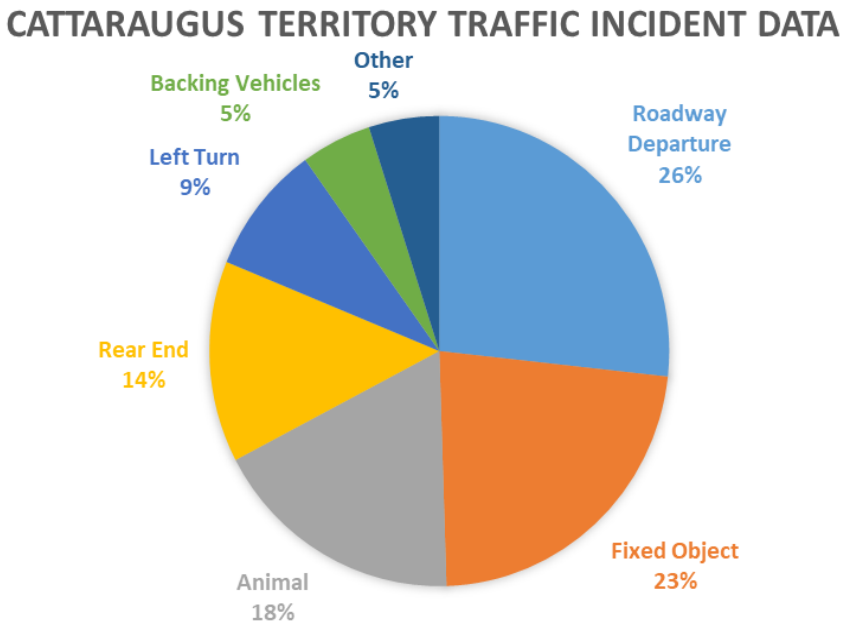
Animal and Wildlife Vehicle Collisions: Twelve percent of the crashes in Allegany Territory involved vehicle collisions with animals.

Weather Conditions: Thirty-six percent of the crashes in the territory were weather and road condition related.

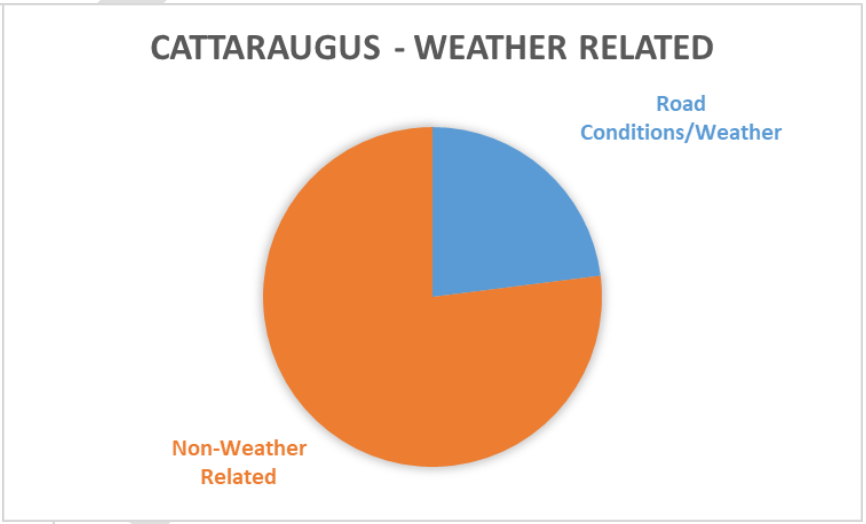
Safety Education and Awareness: Speed is a significant crash factor in Allegany Territory. Twelve percent of all crashes were speed related. According to FARS, 80 percent of the crash deaths were speed related.

[2] Allegany Territory Motor Vehicle Accidents 2014 – 2017, Seneca Nation Indians Department of Transportation.
[3] Institute for Traffic Safety Management and Research, 2013-2018.

CATTARAUGUS TERRITORY DATA



- ***Unknown/Other Vehicle***- *Includes all crashes in the data base that had no identified crash type.*



- *Data collected by SNI Marshals throughout 2016 shows 23% of incidents occurred in correlation with inclement weather!*
- *Impaired Driving includes alcohol, drug related and impaired categories*

Source: Cattaraugus Territory Motor Vehicle Accidents 2014 - 2017; Seneca Nation Indians Department of Transportation

Other crash data sources for the Cattaraugus Territory provide a broader perspective of crash history during the last five years. The sources included the Institute for Traffic Safety Management and Research (ITSMR)[2] which summarizes data from the New York State Crash Data Portal for the state's counties and municipalities. It also provides Cattaraugus Territory crash history. ITSMR reports there were 374 crashes in the territory between 2013 and 2018. Six were fatal. Another information source is the National Highway Traffic Safety Administration (NHTSA) Fatality Analysis Reporting System (FARS).[3] It reports seven fatal crashes occurred in Cattaraugus Territory between 2011 and 2015.

While limited, these data sources inform on crash history in Cattaraugus Territory and help to identify the areas to emphasize in the SNI Transportation Safety Plan. These Emphasis Areas are:

- **Data Collection:** There are significant variations in the number of crashes reported from the various data bases. This Plan emphasizes the development of a SNI crash data collection and reporting system that accurately and uniformly collects data for Cattaraugus Territory.
- **Intersections:** The data sources report a significant percentage of intersection crash types in Cattaraugus Territory such as rear end and left turns (23 percent) and bicycle/pedestrian (2 percent).
- **Impaired and Distracted Driving:** Twenty-one percent of the crashes in Cattaraugus Territory involved impaired and distracted driving with drug, alcohol, and other impairments. FARS, reports all seven of the crash fatalities involved alcohol.
- **Pedestrian and Vulnerable User Safety:** Thirty four percent of the crashes in Cattaraugus Territory involved older and young driver. A smaller percentage (2 percent) involved pedestrians.
- **ATV/Snowmobile/Motorcycle Safety:** There were 13 motorcycle crashes in Cattaraugus Territory; all involved injuries.
- **Roadway Departures:** Fifty percent of the crashes in Cattaraugus Territory involved roadway departure and fixed object categories. FARS reports all seven of the crash fatalities involved roadway departure.
- **Animal and Wildlife Vehicle Collisions:** Eighteen percent of the crashes in the territory were animal collision crash types.
- **Weather Conditions:** Twenty-three percent of crashes in Cattaraugus Territory were weather and road condition related.
- **Safety Education and Awareness:** Speed is a significant crash factor on SNI roadways in Cattaraugus Territory. Twenty percent of all crashes are speed related. FARS reports eighty percent of the crash deaths were speed related.

[2] Institute for Traffic Safety Management and Research; 2013-2018

[3] National Highway Traffic Safety Administration (NHTSA) Fatality Analysis Reporting System (FARS); 2011 -2015

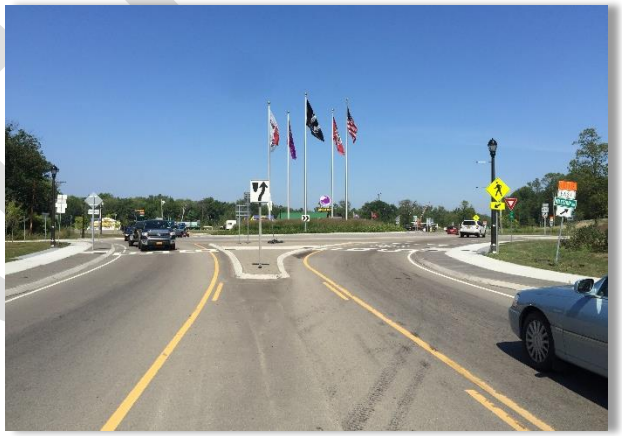
EXISTING EFFORTS

Prior to the development of this safety plan, the Seneca Nation has implemented activities, programs, and policies in an effort to address transportation safety issues.

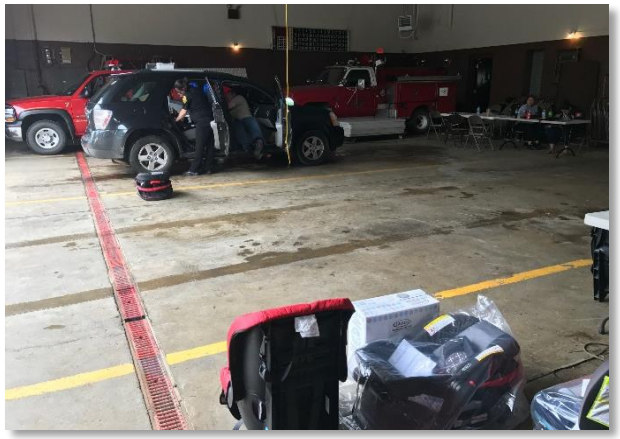
In addition to regular maintenance and capital improvement projects, some of the continuing initiatives have included:

- Driver Safety Programs
    - (Hang Up & Drive)
    - #1SECOND GONE4EVER
- Car Fit Programs (Child Passenger Safety)
- Implementing Roundabouts (5,20&438 Roundabout)
- Development of an Emergency Management Division
- Improved lighting and signage
- 438 Safety Study
- Road Safety Audits
- Law Enforcement Commission
- Speed Reduction Campaigns: Slow Down Jimtown

#1SECOND GONE4EVER



5, 20 & 438 Round-a-bout



Child Passenger Safety

EMPHASIS AREAS

The following nine safety emphasis areas represent the most common documented causes of traffic deaths and injuries on SN roadways. Over the course of implementing this Transportation Safety Plan, the attention and resources of SN government will be dedicated to addressing these areas. The objectives are to:

- Eliminate the common causes of traffic death and injury on Seneca Nation roadways;
- Ensure travel on Seneca Nation roadways is safe and accommodating for all modes of travel; and
- Educate the Seneca Nation leadership, staff, and residents on safe travel behaviors and consequences.

ISSUES

Engineering Concerns

Environmental Factors

Driver Behaviors

#1: Data Collection: Modernize the SN crash data collection and reporting program.

#2: Intersections: Redesign and reconstruct SN roadway intersections where crash injuries and deaths have been recorded; and where there are similar design characteristics at other intersections on the system.

#3: Impaired and Distracted Driving: Implement proven strategies and programs to eliminate impaired and distracted driving behaviors on SN roadways with emphasis on community education and awareness.

#4: Pedestrian and Vulnerable User Safety: Integrate into the future SN transportation network, 'smart' designs and facilities that protect pedestrians and other vulnerable users; and enable their safe access to transit, pedestrian, bicycle, human, social, commercial, government, and recreational services.

#5: ATV/Snowmobile/Motorcycle Safety: Identify locations on SN roadways and trails where ATV, snowmobile, and motorcycle crash conflicts persist; develop and implement site specific design solutions; and sponsor community safety education and awareness programs.

#6: Roadway Departures: Redesign and reconstruct locations on SN roadways with persistent roadway departure crashes; and where there are similar design characteristics at other locations on the system.

#7: Animal and Wildlife Vehicle Collisions: Identify the locations and causes of animal and wildlife conflicts with vehicles on SN roadways; develop site-specific solutions; and sponsor community safety education and awareness programs.

#8: Weather Conditions: Upgrade SNI roadway surfaces to address adverse weather conditions.

#9: Safety Education and Awareness: Include as part of the Department of Transportation's program to design, coordinate, and sponsor safety education and awareness programs and events for all members of the SN community.

Data Collection: Background

The 2014 SN Transportation Safety Plan identified data collection and analysis as the sole emphasis area. A streamlined process for collecting data consistently is imperative to accurately identify safety needs. On June 30, 2014, the SN DOT submitted a grant to the Federal Highway Administration to secure funding to develop a Data Collection Project; an improvement to the collection and maintenance of transportation/emergency data throughout the Nation. The pencil and paper system of data collection was outdated, potentially putting the Marshals in harm's way, providing little usable information to document the Nation's transportation/emergency needs, and preventing SNI personnel from interacting effectively with local, state, and federal agencies.

Since then, the SNI DOT was awarded $50,000 to implement the program to:

- The purchase of tablets for Marshals to collect on site data;
- develop a needs specific program tied to Nation GIS networks for collecting and mapping data;
- provide training for primary users to fully understand proper data collection standards;
- adopt policy and procedures for the data collection process;
- and hire a specialist to help guide departments through project related activities.

The ability to produce qualitative and effective solutions to transportation issues relies heavily on data-driven decisions. The ability to produce productive data-driven decisions relies on timely, consistent, and accurate data collection, a well-developed analysis process, accessibility, and distribution. The data presented in this report reflects data collected by Nation Marshals beginning in 2016. It is crucial to continue making improvements towards implementing the Data Collection Project. Proper training and policy implementation is needed to further initiatives for assuring data is gathered, input, analyzed, and shared consistently.

1: DATA COLLECTION

Goal

Develop a crash data collection and analysis system and program protocols that enable a systematic and uniform approach to the collection, documentation, and sharing of crash data, crash factors, and crash activity on SN roadways.

Performance Measure

- Document 100 percent of the traffic crashes on SN roadways.
- Train 15 SN Marshals and Emergency Service personnel on the use and application of the SN crash reporting program.
- Install data collection tablets in 10 SN Marshal Vehicles.

Strategies

- By 2019:
  - Modify the MVA Data Crash Reporting Form being developed by the SN GIS division to completely capture crash factors and activity on SN roadways;
  - Establish quarterly training for SN Marshals and Emergency Services personnel on the use and application of the MVA form and protocols;
  - Install SN data tablets in SN Marshal Vehicles;
  - Systematically map the crash data obtained from Safety Marshal reporting to locate where crash activity is occurring and where improvements are needed.
  - Quarterly and annually input SN crash data into FARS and the New York State Crash Portal.
  - Quarterly and annually produce a *SN Crash Data Report* for the distribution, use and education of SN leadership and the SN community.
- By 2021:
  - Adopt the GIS data collection crash reporting form; and
  - Train SN Marshals and Emergency Services personnel on the use and application of the new data collection system.

Intersections: Background

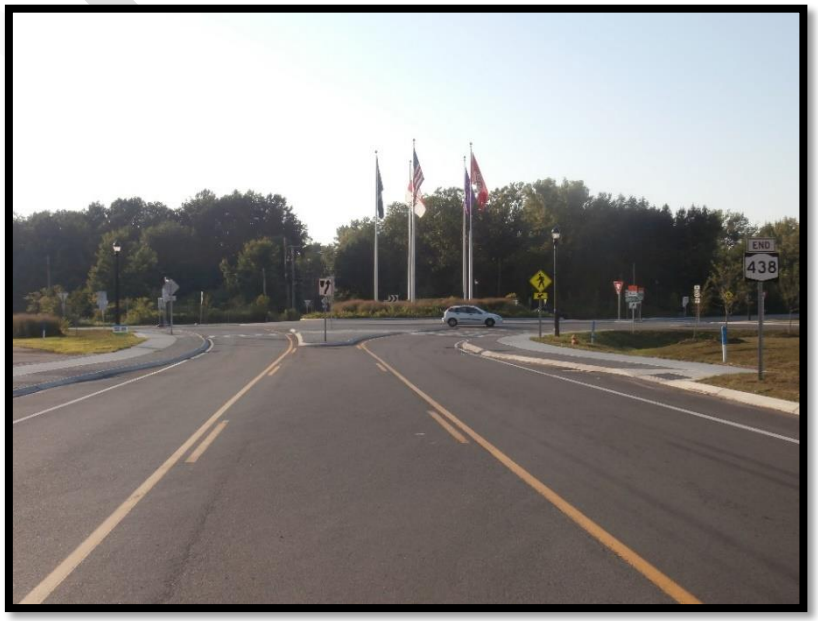
The FHWA defines intersections as "planned points of conflict among motorists, pedestrians, and bicyclists." Federal statistics show that crashes within, or near an intersection account for 23% of all traffic-related fatalities and about half of all traffic-related injuries. (flh.fhwa.dot.gov)

This issue is similar for the Seneca Nation. The following are crucial areas which pose higher risk and must be emphasized when involving intersections:

- Pre K-12 school districts
- senior care facilities
- health facilities
- developing/growing areas
- public facilities
- recreational trail
- trail crossings
- undesignated pedestrian crossings
- active at grade rail crossings

2016 data collected by SN Marshals show that accidents involving other vehicles made up 29% of the total for the Allegany Territory and 30% for the Cattaraugus Territory. Public meetings also identified intersections as major safety concerns on both Territories. Current data does not specify if intersections were the primary factor in all accidents involving two or more vehicles. Until all data is input into the GIS system, the updated traffic records system should expand to include identifiers to show specific roadway features.

The Seneca Nation will take a multifaceted approach to understanding safety concerns tied to intersections with a focus on pedestrian facilities and intersections within/near school zones. The approach will consider intersection design, various types of intersections and types of users, frequency of use, and risk assessment to implement improvements to address systematic issues.



2: INTERSECTIONS

Goal

- Eliminate fatal and serious injury crashes at SN roadway intersections.

Performance Measure

- Reduce the number of fatal and serious injury intersection crashes by 5 percent annually until they no longer occur on SN roadways.

Strategies

1. Annually map crash activity and conduct turning movement and annual average daily traffic (AADT) counts at the intersection crash locations. Identify the contributing factors for each crash.
2. Evaluate the traffic count and crash data and the contributing factors for the intersection(s).
3. Enter the SN intersection crash data into in the FHWA-BIA *Tribal Transportation Facility Inventory* for the respective roadways involved.
4. Develop safety design concepts with cost estimates for the elimination of crashes at SN road intersections and, if warranted, other locations on the network with similar characteristics. Discuss the need for these intersection safety design concepts in the current SN *Long Range Transportation Plan (LRTP)*.
5. Develop and enter priority intersection safety design projects with estimated costs and timing into the current SN *Transportation Improvement Program (TIP)* for funding.
6. If more than one intersection has persistent crash fatality or serious injury activity, develop criteria for prioritizing which intersection to fund and improve first.

Intersection Improvement Design Concepts

The following intersections have experienced persistent crash activity. A safety design concept has been developed for each. The Nation will seek funding for these improvements.

Project 1 – Broad Street/Iroquois Drive/Hoy Street
Project 2 – Versailles Plank Road/Route 438
Project 3 – Broad Street/RC Hoag Drive

Impaired/Distracted Driving: Background

The ability of an operator to maintain safe control of the vehicle being operated requires abilities generally developed over time. Vulnerable users, impairment of a driver's ability, and/or distraction from fully utilizing a driver's abilities presents a safety risk to both operator and other roadway users.

- According to NHTSA, 10,265 persons were killed in alcohol impaired driving crashes in 2015; representing a 3.2 percent increase from 2014.
- In New York State, 1,121 crash fatalities were recorded in 2015; 28 percent or 311 of these fatalities were alcohol and impaired driving related.[2]
- On SNI roadways, 193 alcohol-related, drug-related and impaired driving crashes were reported from 2013 to 2018; resulting in 18 deaths.[3]

In addition to factors which affect a user's physical abilities, other factors may adversely affect cognitive abilities. Distraction while operating a vehicle is one of the other leading causes for accidents. An extremely dangerous distracting habit sweeping across the country is the use of cell phones or other electronic devices while driving. While an issue across all demographics, new drivers are at the highest risk for cell phone related accidents.

According to the CDC *Tribal Motor Vehicle Injury Prevention Best Practices Guide*, one of most effective methods for reducing alcohol-impaired driving in Indian Country is publicized sobriety checkpoint programs. These are high visibility programs conducted by law enforcement officers who stop drivers systematically to check for alcohol impairment. Using media to publicize the checkpoints increases the public perception of an arrest risk. The programs are documented as being effective in reducing alcohol-impaired driving. [4]

Photo: Mothers Against Drunk Driving (MADD)

3: IMPAIRED/DISTRACTED DRIVING

Goal

- Eliminate serious injury and fatal crashes resulting from impaired and distracted driving on Seneca Nation roadways.

Performance Measure

- Reduce serious injury and fatal crashes resulting from impaired and distracted driving by 5 percent annually until they no longer occur on Seneca Nation roadways.

Strategies

- (By 2020) Annually report to the SN Council and Leadership on:
  - Impaired and distracted driving crash statistics on SN roadways;
  - Safety countermeasures that will require their support and the continued training of SN Marshals;
  - New initiatives that enable safe walking and shared rides on tribal lands such as protected and lighted pathways and walkways (Emphasis Area #4) and tribal-sponsored *Uber* or *Lyft* services.
- (By 2021) Sponsor impaired and distracted driving education and awareness programs tailored to the specific needs and questions of SN communities, schools, and agencies.
- (By 2025) A potential option to consider in the event that the Nation Council authorize cross-deputation of Marshals
  - train SN Marshals to:
    - Manage alcohol and drug impaired driving events on SN roadways,
    - Develop, test, and operate a SNI Sobriety Checkpoint Program, and
    - Conduct annual sobriety checkpoints on SNI roadways.

[1] NHTSA National Center for Statistics and Analysis, *Traffic Safety Facts – 2015 Motor Vehicle Crashes Overview*, Table 4, 2016.
[2] NHTSA National Center for Statistics and Analysis, *Traffic Safety Facts – 2015 Motor Vehicle Crashes*, Table 6, 2016.
[3] NYS DOT, Institute for Traffic Safety Management and Research, *Crash Data Portal, SNI Crash Data Summary*, 2013-2018.
[4] Center for Disease Control and Prevention, *Tribal Motor Vehicle Injury Prevention – Best Practices Guide*, 2016.

Pedestrian and Vulnerable User Safety:

Background

The Seneca Nation has increased its initiative to promote multimodal forms of transportation throughout Nation lands. New projects have focused on promoting pedestrian facilities and walkability by creating new routes and trails to public facilities and by continually improving public transportation access. In addition to improving pedestrian routes, the Nation is in the process of developing a trails plan.

The benefits to non-vehicular modes of transportation promotes health, the environment, and tourism however pedestrians are also more susceptible to serious injuries and fatalities when involved in a collision with a motor vehicle. Safety program planning requires attention to and services for pedestrians and other vulnerable users such as bicyclists, seniors, youth, and the disabled.

Safe travel for pedestrians and vulnerable users is a high priority for the Seneca Nation and all tribal governments. Native Americans have the highest pedestrian fatality risk of any racial group and are almost five times more likely than whites to be killed while walking in the U.S. This statistic is reinforced by the responses of 150 tribal governments to a recent national safety survey, citing pedestrian safety as their most frequently named concern.[2] Closer to home, NYS DOT crash data shows 24 pedestrian and bicycle-related crashes on Seneca Nation roadways from 2013 to 2018; resulting in two pedestrian deaths in 2016.[3]

4: PEDESTRIAN & VULNERABLE USER

Goal

- Eliminate pedestrian and vulnerable user fatality and injury crashes on Seneca Nation roadways.

Performance Measure

- Reduce pedestrian and vulnerable user fatality and injury crashes by 5 percent annually until they no longer occur on Seneca Nation roadways.

Strategies

1. Upgrade the SN data collection process to obtain and analyze pedestrian and vulnerable user crash data. (Emphasis Area #1). Identify and map these crash locations and perform traffic counts and field study to determine and document the contributing crash factors.
2. Enter the SN count and crash data into the FHWA-BIA *Tribal Transportation Facility Inventory* for the road or roadways involved.
3. After analysis, develop safety design concepts and projects with cost estimates for the crash locations and other areas on the network with similar characteristics. Discuss and identify the need for the design concepts in the current SN *Long Range Transportation Plan (LRTP)*.
4. After community and Council endorsement, insert the safety design concepts and projects into the current SN *Transportation Improvement Program (TIP)* for funding.
5. If more than one crash location exists, develop criteria for prioritizing which location to fund and improve first.
6. Sponsor community education and awareness forums on pedestrian and vulnerable user safety. (Emphasis Area #9).
7. Implement and construct the safety design projects that prioritize and accommodate pedestrians and vulnerable users.
    - The Nation has identified an area requiring infrastructure improvements for the enhanced safety and mobility of pedestrians and other vulnerable users. The Jimersontown Walkability improvement project has been conceptualized and the Nation will seek funding to complete.

[1] *StreetsBlog USA*: https://usa.streetsblog.org/2019/02/20/native-american-pedestrians-have-highest-death-rate/
[2] *Understanding Roadway Safety in American Indian Reservations - Perceptions and Management of Risk by Community, Tribal Governments, and Other Safety Leaders*, Humphrey School of Public Affairs, University of Minnesota, Quick, K. and G. Narvaez, 2018.
[3] New York State DOT, Institute for Traffic Safety Management and Research (ITSMR), Crash Data Portal - SNI Crash Data Summary, 2013 – 2018.

ATV/Motorcycle/Snowmobile Safety: Background

The Seneca Nation's Allegany and Cattaraugus Territories are abundant in rural beauty and natural geographic features. These are prime locations for on-road motorcycles, off-highway vehicles (OHV), and snowmobiles. Designated and undesignated trails spread across the landscape, intersecting with roads and creating the potential for serious and/or fatal accidents.

- In New York State, 4,750 motorcycle crashes were reported in 2014. One hundred and forty-two (142) were fatal, killing 148 drivers, passengers, and pedestrians. The common crash causes were failure to yield and unsafe speed.
- 183 snowmobile crashes were recorded in the state from 2016 to 2017 resulting in 24 fatalities and 127 injuries. Unsafe speed was the primary factor.[2]
- On SNI roadways from 2013 to 2018, 24 motorcycle crashes were recorded resulting in 22 injuries.[3]

While such modes of transportation may be encouraged for their recreational aspects, as well as tourism and economic advantages, safe and responsible use is imperative. It is common to see ATV users traveling on local roadways without helmets; and traveling at unsafe speeds in residential areas. As the Seneca Nation continues to explore its recreational capabilities, it is imperative that some safety standards are set and roadway users are educated about the potential dangers that are present.

Photo: The Frederick News-Post

5: ATV/SNOWMOBILE/MOTORCYCLE

Goal

- Eliminate serious injury and fatal ATV, snowmobile, and motorcycle crashes on Seneca Nation roadways.

Performance Measure

- Reduce serious injury and fatal ATV, snowmobile, and motorcycle crashes by 5 percent annually until they no longer occur on Seneca Nation roadways.

Strategies

- Upgrade the Nation's data collections to more directly obtain and analyze ATV, snowmobile, and motorcycle (A/S/M) crash data. (Emphasis Area #1).
- Identify and map the A/S/M crash locations. Perform traffic counts and field study at the locations to determine and document the contributing crash factors.
- Enter the count and crash data into the SN *Tribal Transportation Facility Inventory* for the road or roadways involved.
- After review of count, causal and contributing factors, develop through the Department of Transportation an educational program and campaign that targets ATV, snowmobile, and motorcycle users; promotes safe A/S/M use; educates on the locations of use and permitted speeds on trails on Nation lands; and explains the rules of the road.

[1] New York State Department of Motor Vehicles, *Summary of Motorcycle Crashes*, 2014.
[2] New York State Parks, Recreation and Historic Preservation, Snowmobile Unit, *2016-17 Accident Report Summary*, 2017.
[3] New York State Department of Transportation, Institute for Traffic Safety Management and Research, Crash Data Portal - SNI Crash Data Summary, 2013 – 2018.

Roadway Departure: Background

A roadway departure crash is a crash which occurs after a vehicle crosses an edge line or a center line, or otherwise leaves the traveled way. Numerous factors can contribute to a lane departure crash, including roadway characteristics like horizontal curvature and pavement condition. Environmental factors like rain, snow, or ice can obstruct a driver's view of the roadway and increase the difficulty of controlling vehicles. Decreased visibility of the roadway during nighttime can also be a factor to lane departure crashes. Behavioral issues, like impaired driving, distracted driving, and speeding, can reduce the driver's ability to safely operate the vehicle and stay on the roadway. Countermeasures that address keeping vehicles in the travel lane, provide for a safe recovery, and reduce crash severity are important aspects of improving lane departure safety.

Crash data for years 2015 to 2017 shows the most frequent crashes on SN roadways were roadway departures; representing 47 percent in Allegany Territory and 50 percent in Cattaraugus Territory. FARS data for year 2011 to 2015 indicates there were 11 fatal roadway departure crashes - five in Allegany Territory and six in Cattaraugus Territory.

Due to the high frequency of roadway departures, the identification of effective strategies to address departure is a crucial area of emphasis. The objective is to identify cost effective strategies that will both reduce lane departures and guide vehicles back to the lane and/or minimize the consequences should a departure take place.

Photo: USDOT FHWA, Rumble Strip Implementation Guide

6: ROADWAY DEPARTURE

Goal

- Eliminate fatal and serious injury roadway departure crashes on Seneca Nation roadways.

Performance Measure

- Reduce fatal and serious injury roadway departure crashes by 5 percent annually until they no longer occur on Nation roadways.

Strategies

- Prepare a Roadway Departure Action Plan:
    - Upgrade the SN data collection process to obtain and analyze roadway departure crash data. (Emphasis Area #1).
    - Identify and map the roadway departure crash locations. Perform traffic counts and field study at the locations to determine and document the contributing crash factors.
    - Enter the count and crash data into the Seneca Nation *Tribal Transportation Facility Inventory* for the road or roadways involved.
    - Develop an educational program and campaign that targets and explains the human behaviors related to roadway departure crashes;

- Identify safety improvement projects at locations where roadway departure crashes are prevalent. Include rumble strips, guiderail or other roadside barriers as safety countermeasures. Consider the testing of high friction surface treatments (HFSTs) on SN roadway surfaces as a lower cost option that is not as visually invasive.[4]

- Discuss the need for roadway departure safety improvement techniques and projects in the current SN *Long Range Transportation Plan (LRTP)*;

- Develop safety projects that address where roadway departure crashes are persistent. Enter the projects into the current SN *Transportation Improvement Program (TIP)* for funding.

[1] New York State Strategic Highway Safety Plan; 2017 – 2022. Lane Departure.
[2] Allegany and Cattaraugus Territory – Motor Vehicle Accidents; 2015 -2017
[3]The National Highway Traffic Safety Admin. – Fatality Analysis Reporting System Map: 2011to 2015. https://www.nhtsa.gov/research-data/fatality-analysis-reporting-system-fars
[4] HFST is an application that is installed on top of a final pavement surface. The treatment involves applying a high-quality aggregate with a binder to increase the friction of the pavement. The increased pavement friction helps drivers maintain better control under wet or dry pavement conditions.

Wildlife Vehicle Collisions: Background

The Seneca Nation's transportation network encompasses key infrastructure for moving people and products throughout Nation lands. In similar fashion, animals have trails frequently utilized to move between feeding and bedding grounds. When human and wildlife routes intersect, crashes can and do happen. In fact, 2016 – 2017 SNI data shows wildlife and vehicle crashes account for 20 percent of all crashes in Cattaraugus Territory and 32 percent of all crashes in Allegany Territory.

According to the Wildlife-Vehicle Collision Reduction Study, there are an estimated one - two million collisions between cars and large animals every year in the United States. The same study also identifies potential solutions to this problem that could be incorporated into the SNI transportation system to help reduce collisions between people and wildlife. (WVC Safety Study – Report to Congress) Countermeasures such as increased clear zones and line of sight, vegetation management, wildlife fencing, and more could all help limit the frequency and severity of WVCs.

Photo: Walton Telken Injury Attorneys

7: WILDLIFE VEHICLE COLLISIONS

Goal

- Eliminate serious injury and fatal wildlife and animal vehicle collisions on Seneca Nation roadways.

Performance Measure

- Reduce serious injury and fatal WVCs by 5 percent annually until they no longer occur on Nation roadways.

Strategies

1. Upgrade the SN data collection and reporting program to more easily identify wildlife and animal vehicle collision (WVC) crash data. (Emphasis Area #1).
2. Identify and map the top five WVC crash locations; perform counts and conduct field study at the locations to determine and document the contributing crash factors.
3. Enter the count and crash data into the SN *Tribal Transportation Facility Inventory* for the road or roadways involved.
4. Adopt and implement roadway, bridge, and culvert design standards for WAVC crash locations or other locations with similar characteristics on the SN network. Specifically:
    - Increased clear zones,
    - Use of vegetation which does not obstruct vision
    - Limited use of vegetation which encourages wildlife habitat near roadways,
    - Gradual slopes and/or shallow ditching,
    - Increased culvert/bridge sizes to allow for animal crossings, and
    - Perimeter fencing at high risk areas.
5. Provide safety education and awareness on animal, wildlife and vehicle collisions. (Emphasis Area #9).

[1]Seneca Indian Nation Motor Vehicle Accident Summary, Allegany Territory and Cattaraugus Territory, 2015 - 2017.

Weather Conditions: Background

Weather plays a significant role for the Seneca Nation. In Erie County, New York – just south of where the Seneca Nation is geographically located - the annual snowfall average is 101 inches. In Cattaraugus County, the county adjacent to the Seneca Nation's Allegany Territory – the annual snowfall is 95 inches. This is far greater than the US snowfall average of 26 inches.[1]" Winter weather can begin as early as October and often lasts until April.

According to 2014 to 2017 crash data, 36 percent of roadway crashes in the Allegany Territory and 23 percent of crashes in the Cattaraugus Territory were weather condition related.[2] Poor weather is a well understood condition of living in the region.

Maintaining roadway conditions are also a constant struggle and mitigation practices such as plowing and salting result in continual pavement condition issues like potholes. Of approximately 33,000 traffic fatalities each year, one-third involve poor road conditions.[3]

8: WEATHER CONDITIONS

Goal

- Eliminate serious injury and fatal crashes related to weather conditions on Seneca Nation roadways.

Performance Measure

- Reduce the number of weather-related serious injury and fatal crashes by 5 percent annually until they no longer exist.

Strategies

- Upgrade the SN data collection process to obtain and analyze weather-related crash data as planned in Emphasis Area #1 (Data Collection.)
- Identify and map weather-related crash locations. Perform traffic counts and field study at the locations to determine and document contributing crash factors.
- Enter the volume and crash data into the Seneca Nation *Tribal Transportation Facility Inventory* for the road or roadways involved.
- Identify safety improvement projects at locations where weather-related crashes are prevalent. Consider safety countermeasures such as rumble strips, guardrails, alterations to roadway operation or configuration, and placement of high friction surface treatments (HFSTs).[4] Coordinate this work with those in Emphasis Area #8 (Roadway Departures.)
- Insert narrative and supporting documentation in the current SN *Long Range Transportation Plan (LRTP)* that explains the need for location-specific capital improvement projects that address weather-related crashes.
- After LRTP endorsement, develop the roadway safety projects. Enter them into the current SN *Transportation Improvement Program (TIP)* for funding.
- Annually report to the SN Council and Leadership on the location and frequency of weather-related crashes and the capital projects underway by tribal government to eliminate them.
- Develop in the community programs in Emphasis Area #9 (Safety Education and Awareness) discussion forums and educational materials on safe driving in inclement weather.

[1] Climate References: https://www.usclimatedata.com/climate/salamanca/new-york/united-states/usny3088 and https://www.bestplaces.net/climate/county/new_york/erie

[2] Allegany Territory and Cattaraugus Territory Motor Vehicle Accidents 2014 – 2017, Seneca Nation Indians Department of Transportation.

[3] Federal Highway Administration's (FHWA) 2011 annual survey of state transportation officials, based on level of smoothness of pavement surfaces, as reported by TRIP, a national transportation research group ("Bumpy Roads Ahead: America's Roughest Rides and Strategies to Make Our Roads Smoother," 2013)

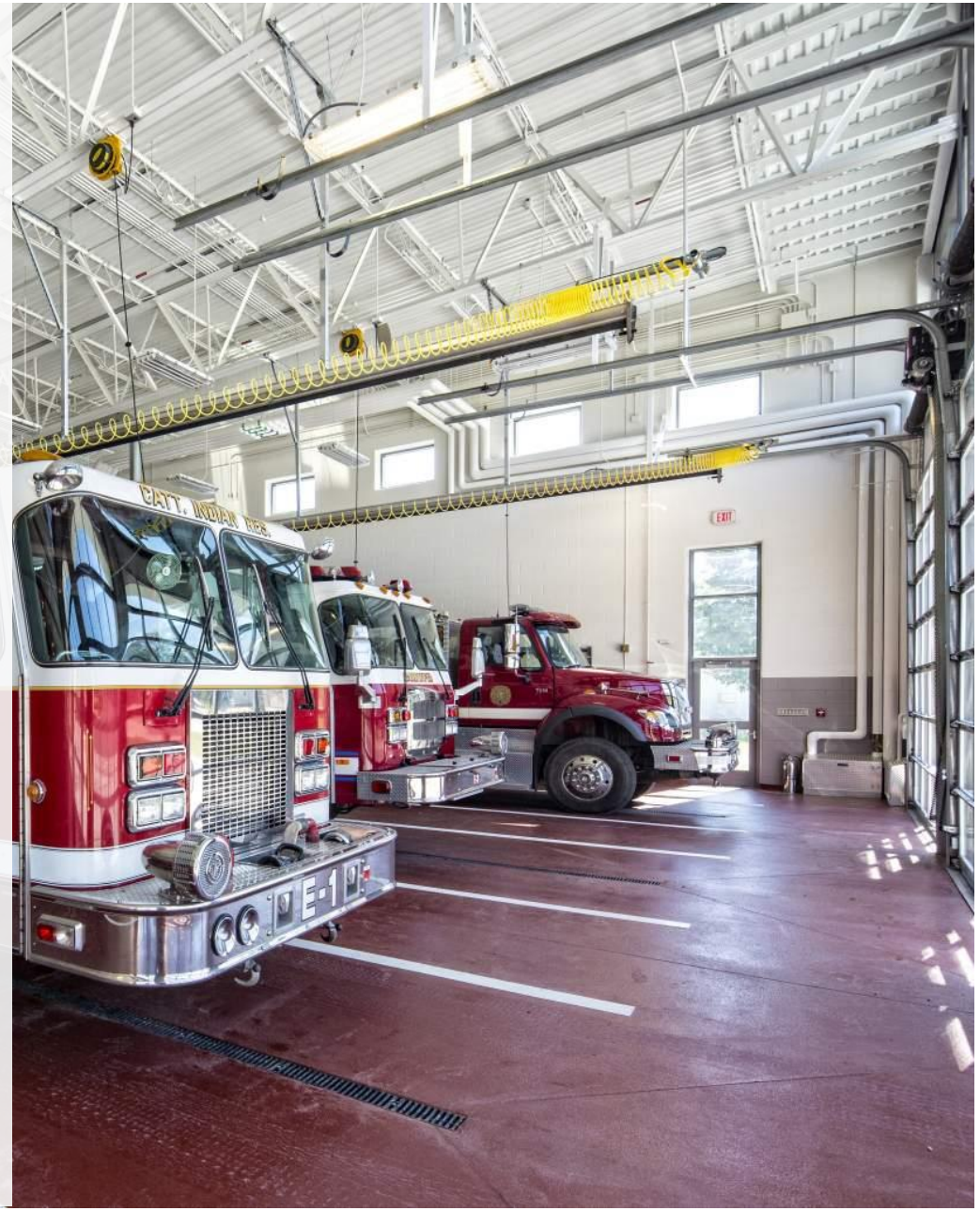
[4] HFST is an application that is installed on top of a final pavement surface. The treatment involves applying a high-quality aggregate with a binder to increase the friction of the

Safety Education and Awareness: Background

An important component of the SN Transportation Safety Plan will be the ability to consistently communicate its purpose, objectives and successes to the community it is intended to serve. Partnerships and communications within the SN community and with other interests and agencies that prioritize traffic safety education and awareness will be needed. This type of long-term communications, commitment, and partnership:

- Raises awareness on roadway safety issues and educational needs;
- Influences the behavioral change desired from drivers, pedestrians, bicyclists, and other users of area roadways and transportation infrastructure;
- Brings urgent and timely safety information and issues to the SNI leadership and community; and
- Informs the public of its responsibility and role in achieving the SNI safety program goals.

A short-term or one-time safety information and education program will have little impact on user behavior and in the development of program partnerships. The program must represent a sustained commitment and long-term effort.



9: SAFETY EDUCATION AND AWARENESS

Goal

- Eliminate traffic crashes and serious injuries on Seneca Nation roadways through sustained education, awareness, and outreach to users of the system.

Performance Measure

- Continually prepare quarterly and annual community safety education and awareness programs.

Strategies

- Explore the potential of hiring a Safety Coordinator should long term funding become available

- Include/continue as part of the Department of Transportation's program:
  - Outline the quarterly and annuals goals, objectives, activities, and strategies of the SN Safety Education and Awareness Program;
  - Continue to develop and sustain partnerships with tribal, local, regional, state, and federal safety coordinators, safety officers, safety advocates, EMS personnel, and transportation engineers and planners from government and public and private interests
  - Distribute newsletters and design social media events and campaigns that inform and educate on the frequency of crash and serious injury activity on SN roadways and ways to reduce and eliminate this activity.
  - Present topical educational forums to area neighborhoods, schools, and agencies that inform on:
    - Alcohol Impaired, Drug Impaired, and Distracted Driving
    - Aggressive Driving and Speeding
    - Seat Belt Use and Child Restraints
    - Motorcycle, ATV, and Snowmobile Safety
    - Wildlife, Animal, and Vehicle Collisions
    - The Rules of the Road
    - Older Driver Needs
    - Pedestrian and Bicycle Safety
    - The SNI Transportation Safety Plan

- Report to the SN Council and Leadership on the status of the SN Safety Education and Awareness portion of the DOT program with description on the level of community involvement, the types of activities sponsored, program accomplishments, and next steps.

References

Center for Disease Control and Prevention

National Highway Safety Administration – Fatality Analysis Reporting System Map

National Highway Traffic Safety Administration – National Center for Statistics and Analysis

New York State Department of Health, Bureau of Occupational Health and Injury Prevention

New York State Department of Motor Vehicles – Crash Data Summaries

New York State Department of Transportation, Institute for Traffic Safety Management and Research (ITSMR), Crash Data Portal

New York State's Strategic Highway Safety Plan (SHSP)

Oneida Healthcare Center, Oneida, NY, USA.

Seneca Indian Nation – Motor Vehicle Accident Data Base

Seneca Indian Nation – Public Commentary

Strategic Highway Safety Plan for Indian Lands

Tribal Transportation Safety Management System Steering Committee, Tribal Transportation Strategic Safety Plan: www.tribalsafety.org

US Department of Transportation, Federal Highway Administration, Office of Federal Lands Highway

Wildlife-Vehicle Collision Reduction Study: Report to Congress

Priority Safety Improvement Projects

Attachments

Corridors:

A. Route 438 Corridor

B. Broad Street Corridor

Specific Locations:

C. Broad Street/Iroquois Drive/Hoy Street/Messenger Street Intersection **(Priority #1)**

D. Route 438/Versailles Plank Road Intersection **(Priority #2)**

E. US Route 219 – State Route 417 Killbuck (Mikey's Emporium)

F. Broad Street/RC Hoag Drive Intersection

Overall Seneca Nation Transporation Network:

G. Seneca Nation Overall Lighting Safety Improvement

A. Route 438 Corridor *(Cattaraugus Territory)*

- *Transportation Safety Improvement Project Corridor*

Route 438

The SR 438 (4 Mile Level Road) from Versailles Plank Road to Brant Reservation Road was selected as the location for the development of a Corridor Safety Plan. The section is 1.83 (approx. 9600 feet) miles in length. The roadway is two lanes, approximately 22 feet wide, with two (2) to four (4) foot paved shoulders on each side. The estimated average annual daily traffic (AADT) is 6400[4]. The posted speed on the corridor is 45 mph.

There is a total of five intersecting roadways in this section; Versailles Plank Road, Thomas Indian School Drive, Iroquois Drive, Delaware Road and Brant Reservation Road. In addition to the intersecting roadways, there are also a total of 66 driveways with a density of 36 driveways per mile.

Crash History

The five (5) year crash data[5] for the SR 438 corridor was obtained from the New York State Department of Transportation Data Portal. A summary of the five-year crash data is presented in Table 1.

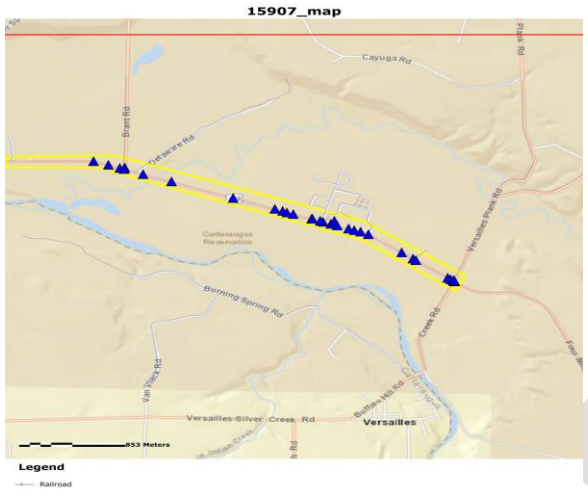
Table 1. SR 438 (4 Mile Level Road) Five Year Crash Data

Year	Right Angle	Rear End	Head On	Fixed Object	Left Turn	Animal	Side Swipe	Other	Total
2014	2	1	1	1	1				6
2015	3	2		2	1		1		9
2016		1		3	1	1		1	7
2017	1			4	1				6
2018[1]		1	1	1			1		4
Total	**6**	**5**	**2**	**11**	**4**	**1**	**2**	**1**	**32**

[4] AADT is estimated from 2013 counts by factoring at a rate of 2 percent per year.
[5]Accident Location Information System (ALIS); 12/1/2013 – 11/30/2018

1) 2018 – Crash History for2018 through 11/30/2018

As shown in Table 1, there have been a total of 32 crashes on the SR 438 corridor from Versailles Plank Road to Brant Reservation Road. Of these crashes, 11 (34%) involve hitting a "Fixed Object"; six (19%) involve "Right Angle"; five (16%) were "Rear End"; four (13%) were "Left Turn"; two (6%) were "Head On" and "Side Swipe"; one (3%) involved a "Right Turn"; and one was classified as "Other".



Fifty-nine percent (19) of the crashes involved injuries. Of these crashes, there were 21 possible injuries; four non-incapacitating injuries; and one incapacitating injury. One of the crashes involved a single fatality.

Contributing Factors

A review of the crash records suggests the following factors contributed to the crash history along the SR 438 (4 Mile Level Road) corridor. These factors include:

- Roadway Width - the existing roadway width is approximately 22 feet; or 11 feet per lane;
- Shoulder Width – the existing paved shoulder width varies between two feet and four feet.
- Lighting – Ten (10) of the 32 crashes were during periods of darkness or early dawn. Even though there are spot locations where a luminaire has been placed, a single luminaire does not create the lighting uniformity required to provide adequate visibility.
- Driveways – There are a total of 66 driveways serving the various properties along the corridor. Each of these driveways create traffic movements resulting in conflicts with vehicles on the roadway. These conflicts lead to rear-end, left turn and right-angle crashes.
- Weather – There were four (4) crashes which noted Snow/Ice on the roadway. This represents 13 percent of the total crashes during the five-year period.

Crash Modification Factors

To mitigate the Contributing Factors, crash modification factors (CMFs) were identified for each contributing factor. The crash modification factors are as follows:

Modify Lane Width

According to the Highway Safety Manual (HSM)[6], widening lanes on rural two-lane roads reduces a specific set of related crash types, namely single-vehicle run-off-the-road crashes and multiple-vehicle head on, opposite direction sideswipe and same direction sideswipe collisions. For the 438 corridor, there are 15 recorded crashes of this type. The crash modification factor for increasing the lane width from 11 to 12 feet is 0.95, or a 5 percent reduction in crashes related to lane width[7]. Therefore, it is expected that widening the roadway will result in a reduction of 0.75 (15 * 0.05 = 0.75) crashes over the five-year period.

Modify Shoulder Width

According to the Highway Safety Manual (HSM), widening shoulders on rural two-lane roads reduces the same related crash types as widening lanes; i.e. namely single-vehicle run-off-the-road crashes, multiple-vehicle head on, opposite direction sideswipe and same direction sideswipe collisions. For the 438 corridor, there are 15 recorded crashes of this type during the five-year period. The crash modification factor for increasing the shoulder width from two (2) feet to eight (8) feet is 0.67, or a 33 percent reduction in the five (5) year crash history[8]. Therefore, it is expected that widening the roadway to include eight (8) foot shoulders will result in a reduction of 4.95 (15 * 0.33 = 4.95) crashes over the five-year period.

Improve Corridor Lighting

According to the Highway Safety Manual (HSM), lighting is often provided where road users need to make a decision. These locations include driveways and intersections. The density of driveways along the 438 corridor is very high; 36 per mile. Roadway lighting would improve driver visibility and help them make appropriate decisions regarding access and turns at these locations. According to the Highway Safety Manual[9], the crash modification factor for all nighttime crashes is 0.80, or a 20 percent reduction in nighttime crashes. Based on the crash history, there are ten (10) nighttime crashes which would result in a reduction of 2 (10 * 0.2 = 2) crashes during the five-year period.

[6] Highway Safety Manual (HSM), First Edition, Volume 3, AASHTO, 2010.
[7] See Table 13-2. Highway Safety Manual (HSM) Volume 3, 2010.
[8] See Table 13-7. Highway Safety Manual (HSM) Volume 3, 2010.
[9] See Table 13-56. Highway Safety Manual (HSM), Volume 3, 2010.

Driveway Density

The reduction in driveway density along the 438 corridor has the potential to significantly reduce driveway related crashes; right angle, rear end, head on, right angle, left turn, and sideswipe. Currently there are 36 driveway per mile along the corridor. The base condition for the crash modification factor is five (5) driveways per mile. A significant reduction in the associated crash types could be realized with a reduction in driveway density. A fifty percent reduction, or 18 driveways per mile, would result in a crash modification factor of 0.73[10], or a reduction of 27 percent in associated crashes. For the 438 corridor, that would be 8.6 (32 * 0.27 = 8.64) crashes during a five-year period.

Weather

Typically, jurisdictions impacted by extreme weather conditions have a strategy for maintaining their roadways. The strategy typically defines the priority for snow plowing and other roadway maintenance activity. The Highway Safety Manual[11] suggests that raising the priority of a specific roadway by one level will result in a CMF of 0.73 for all snow related non injury crashes and 0.89 for snow related injury crashes. The five-year crash history for the 438 corridor indicates there were two (2) "snow/ice" related injury crashes and two (2) "snow/ice" non injury crashes. Application of the respective CMF to these crashes indicates a reduction of 0.22 snow related injury crashes and 0.54 snow related non-injury crashes.

Summary of Estimated Crash Reduction

Based on the foregoing analysis, the following reduction in five-year crash history is estimated:

- Widen Roadway Lane Width to 12-foot lanes – 0.15 crashes per year
- Widen Shoulders to eight (8) feet – 0.99 crashes per year
- Improve Corridor lighting – 0.4 crashes per year
- Driveway Density – 1.7 crashes per year
- Weather Related – 0.04 snow related injury crashes per year and 0.11 snow related non injury crashes per year.

Therefore, the total crash reduction expected with the proposed project is 3.28 crashes per year or a total of 16.4 crashes over the five-year period.

[10] See Figure 13-11. Highway Safety Manual (HSM), Volume 3, 2010.
[11] See Table 13-60. Highway Safety Manual (HSM), Volume 3, 2010.

Proposed Project

To address the issues related to the crash history the following project is proposed:

- Reconstruct 438 from Versailles Plank Road (approximately) to Brant Reservation Road; approximately 9,700 lineal feet (1.83 miles) to include widening to 52 feet to provide two 12 foot through lanes (one in each direction), a 12-foot center two way left turn lane; eight (8) foot shoulders on each side; drainage; street lighting; and channelization.
- Roadway improvements also include widening the bridge over Clear Creek from 22 feet to 44 feet.
- Additional features include emergency response preemption signal at the fire station; transit stops and shelters; clear zone compliance; and traffic calming provisions to reduce speeds through the Seneca Nation Administrative and Recreational facilities.
- Estimated Cost[12] = $10.6 Million which includes Engineering and Contingency.

Implementation Strategy

- Seneca Nation Tribal Council Project Approval
- Complete Project Scoping, Preliminary Engineering and Partnership arrangements;
- Complete ROW evaluation and analysis;
- Complete Environmental Review including NEPA Requirements and NEPA Class of Action Approvals;
- Prepare Final Design and Project Plans, Specifications, and Cost Estimates;
- Advertise, Let and Award Project
- Project Construction
- Construction Inspection
- Final Inspection and Project Closeout.

Funding Strategy

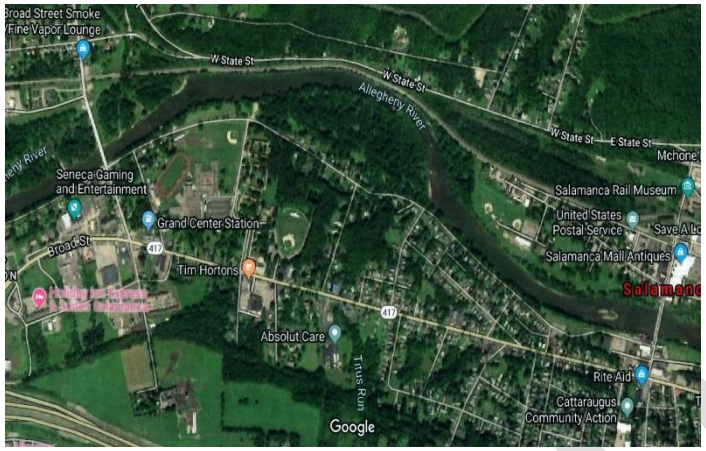
- Pursue BUILD Grant – debrief previous TIGER grant with grantor
- Pursue TTP funding
- Pursue FHWA Traffic Safety (HSIP) Funds

[12] http://www.cityofws.org/portals/0/pdf/transportation/forms-reports/studies/lewisville_roads_study_app_d.pdf Widening cost based on conversion from 26 feet to 52 feet. COLA adjustment 3.9 percent between 2008 and 2019. Bridge widening cost based on $140 per sf; Lighting based on 70 foot spacing @ $7500 per pole; traffic signal $250,000; Engineering 25%; and contingency 15%.

B. Broad Street Corridor *(Allegany Territory)*

- *Transportation Safety Improvement Project Corridor*

Broad Street



The Broad Street Corridor runs east/west along Route 417 through the center of Salamanca on the Allegany Territory from Main Street on the east, to the Seneca Allegany Resort and Casino on the west. The SN Department of Transportation utilized transportation consultant Valerie J. Southern to review the five-year crash history along the corridor, from Main Street to RC Hoag Drive, and identify potential crash reduction measures to improve traffic safety along the corridor. The consultant proposed the construction of a roundabout at the Broad Street/Iroquois Drive/Hoy Street/Messenger Street intersection to mitigate an extensive crash history at that intersection as the number one priority project for the Seneca Nation (Outlined in Attachment C). This project, Broad Street corridor, can be viewed as an alternative to or in conjunction with the proposed Broad Street/Iroquois Drive intersection project.

The section of Broad Street under consideration, Main Street to RC Hoag Drive, is 1.70 (approx. 9000 feet) miles in length. (The additional section of Broad Street from RC Hoag Drive to the Seneca Allegany Casino was recently modified in 2018 with crosswalk improvements, turning lanes, and a landscaped median however pavement surface was not fully addressed and should be considered). In the absence of clearly delineated pavement markings, the roadway is effectively operating as a two (2) lane roadway even though the travel way varies in width between 30 feet (Park – Division) to 46 feet (State Park to High Street, Franklin to Hancock, and Eagle to Iroquois). The roadway also widens to provide dedicated turn lanes at the critical intersections of Main Street, Eagle Street, Iroquois Drive, Center Street, and RC Hoag Drive.

A pedestrian pathway is provided on both sides of Broad Street along the entire corridor with the exception of a missing section on the southern side of the road from McDonald's to Burger King, running parallel to Mill/Hetzel Street. In general, the pathway is separated from the travel way by a 10 to 30-foot grass landscape strip. Marked pedestrian crosswalks on Broad Street are provided at the following locations:

- Main Street
- East leg of Park
- West leg of Division

- East leg of Cleo – aligns with Holy Cross RC Church entrance
- West leg of Eagle street
- West leg of Iroquois Drive
- East and West leg of Center Street
- East Leg of RC Hoag Drive
- West leg of the Broad Street/Ohi:yo' Way connector

These crosswalks are supported with traffic signals at Main Street, Eagle Street, and Center Street. A pedestrian HAWK beacon was installed at the Broad Street/Ohi:yo' Way connector in 2018. There are, however, no pedestrian signals provided at the other locations.

There is a total of 20 intersections on Broad Street between Main Street and RC Hoag Drive, including both intersections. In addition, to the 20 intersections there are also 139 individual curb cuts (driveways) serving the adjacent properties.

A summary of the intersections along the corridor, as well as the roadway cross section between intersections, is summarized in Table 1.

Table 1. Intersections

	Intersection[1]		Cross Section	
#	From	To	Width	# of Lanes
1	Main Street	Park Avenue	40 feet	4
2	Park Avenue	Division Avenue	30 feet	2
3	Division Avenue	Front Avenue	36 feet	3
4	Front Avenue	Academy Street	36 feet	2
5	Academy Street	Kent Boulevard	36 feet	2
6	Kent Boulevard	State Park Avenue	36 feet	2
7	State Park Avenue	High Street	46 feet	4
8	High Street	Cleo Street	42 feet	4
9	Cleo Street	Pimlico Avenue	44 feet	4
10	Pimlico Avenue	Swan Street	44 feet	4
11	Swan Street	Franklin Street	45 feet	4
12	Franklin Street	Hancock Street	46 feet	4
13	Hancock Street	Hubbel Street	45 feet	
14	Hubbel Street	Eagle Street	45 feet	4
15	Eagle Street	Iroquois Drive	46 feet	4

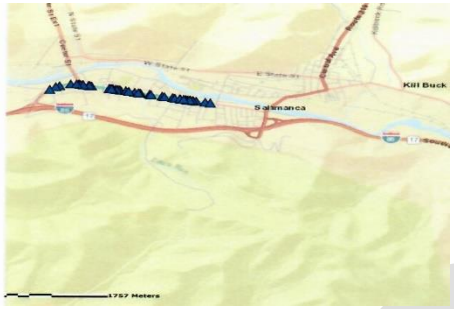
16	Iroquois Drive	Donald Drive	45 feet	4
17	Fern Avenue	Center Street	45 – 58 feet	4
18	Center Street	Hetzel Street	36 feet – 14-foot shoulders	3
19	Hetzel Street	RC Hoag Drive	36 feet – 14-foot shoulders	3

1) The intersections of Main Street and RC Hoag Drive are not considered in the crash history analysis for the Broad Street corridor.

Traffic control along the Broad Street corridor includes traffic signals at Main Street, Eagle Street/Veterans Memorial Park, and Center Street. Stop signs are placed on the minor intersecting side streets. Street lighting is provided along the corridor but fails to meet national standards for roadway and pedestrian lighting.

The posted speed limit along the entire Broad Street corridor is 30 mph.

Crash History



The five (5) year crash data[13] for the Broad Street (SR 417) corridor was obtained from the New York State Department of Transportation Data Portal for the five-year period between January 1, 2014 and December 31, 2018. A summary of the five-year crash data is presented in Table 2.

As shown in Table 2, there have been a total of 89 crashes on the Broad Street corridor from Main Street to RC Hoag Drive. Of these crashes, 40 (45%) involved "Rear End"; fifteen (17%) involved "Left Turns"; nine (10%) were "Right Angle" and "Fixed Object"; seven (8%) were "Side Swipe"; three (3%) were "Right Turn"; two (2%) were "Parked" vehicles; and one (1%) each was "Over Turn", "Pedestrian", "Animal", and "Other" types of crashes.

Table 2. Broad Street (SR417) Five Year Crash Data

Year	Rear End	Left Turn	Right Angle	Fixed Object	Side Swipe	Right Turn	Over Turn	Parked	Ped	Animal	Other	Total
2014	3	4	1	1	1			1			1	12
2015	12	1	2		1							16
2016	10	5	1	3	2		1		1	1		24
2017	6	3	5			2						16
2018	9	2		5	3	1		1				21
Total	**40**	**15**	**9**	**9**	**7**	**3**	**1**	**2**	**1**	**1**	**1**	**89**

[13]Accident Location Information System (ALIS); 1/1/2014 – 12/31/2018

Fifteen percent (14) of the crashes involved injuries. Of the 89 crashes, there was a total of 19 injuries including 13 possible injuries, four (4) non-incapacitating injuries; and one (1) incapacitating injury.

A summary of the five-year crash history for each intersection on the Broad Street corridor is presented in Table 3.

Table 3. Summary of Five-Year Crash History on Broad Street

		5 Year Crash History					
Rank	**Intersection[1]**	**2014**	**2015**	**2016**	**2017**	**2018**	**Total Crashes**
1	Iroquois Drive/Messenger Street/Hoy Street	2	7	5	4	4	22
2	Center Street	2	2	5	3	6	18
3	Eagle Street	3	1	3	1		8
4	Academy Drive	1		3		1	5
5	Division Avenue	1	1	1	1		4
	Fern Avenue		1	1		2	4
	Franklin Street			1	1	2	4
	Park Avenue				2	2	4

Table 3. Summary of Five-Year Crash History on Broad Street. Continued.

		5 Year Crash History					
Rank	**Intersection[1]**	**2014**	**2015**	**2016**	**2017**	**2018**	**Total Crashes**
9	Pimlico Avenue		1		2		3
10	Donald Drive	1		1			2
	Cleo Street	1	1				2
	Hancock Street	1			1		2
	High Street		1			1	2

	State Park Avenue		1			1	2
	Hubbel Street			2			2
	Front Avenue			1		1	2
	Hetzel Street			1	1		2
18	Kent Boulevard					1	1
	Total Crashes	**12**	**16**	**24**	**16**	**21**	**89**

1) Crashes at Main Street and RC Hoag Drive were not included in the crash summary.

Contributing Factors

A review of the crash records suggests the following factors contributed to the crash history along the Broad Street (SR 417) corridor. These factors include:

- Driveways – There are a total of 139 driveways serving the various properties along the corridor. This results in a driveway density of 81.76 driveways per mile. Each of these driveways create traffic movements resulting in conflicts with vehicles on the roadway. These conflicts result in rear-end, left turn, right turn and right-angle crashes.
- Lighting – Fifteen (17%) of the 89 crashes occurred during periods of darkness or early dawn.
- Roadway Delineation – the channelization along the corridor is inadequate. It appears channelization has been obliterated through roadway patching and general "wear and tear" on the pavement surface. Lack of channelization may lead to driver confusion regarding lane configuration which impacts the number of side swipe crashes, rear end, left and right turn crashes, and crashes with parked vehicles.
- Roadway Departure – As shown in the crash summary, there were a total of nine (9) "Fixed Object" crashes identified along the Broad Street corridor. Fixed object crashes occur when vehicles depart from the travel way. It appears a reduction in roadway departure crashes could be achieved through the improvement of the curb delineating the roadway and elimination of excessive driveways. A six (6) inch curb is considered a "barrier" to vehicles running off the road for speeds up to 40 miles per hour. Since the speed limit on the Broad Street corridor is 30 mph, appropriate continuous six (6) inch curbing would be considered a barrier and keep vehicles within the travel way. Reduction in the number of driveways would also eliminate breaks in the curb and provide a more consistent barrier.
- Weather – There were twelve (12) crashes which noted Snow/Ice on the roadway. This represents 13 percent of the total crashes during the five-year period.

Crash Modification Factors

To address the Contributing Factors, crash modification factors, where available, were identified for each contributing factor. The crash modification factors are as follows:

Driveway Density

The reduction in driveway density along the Broad Street corridor has the potential to significantly reduce driveway related crashes; rear end, right angle, left turn, and sideswipe. Currently there are 82 driveways per mile along the corridor. The base condition, with a crash modification factor of 1.00 is five (5) driveways per mile. A significant reduction in the associated crash types could be realized with a reduction in driveway density.

According to the Highway Safety Manual[14],

> "Access Management is a set of techniques designed to manage the frequency and type of conflict points at public intersections and at residential and commercial access points. The management of access, namely the location, spacing and design of private and public intersections, is an important element in roadway planning and design. Access management provides or manages access to land development while simultaneously preserving traffic safety, capacity and speed on the surrounding road system thus addressing congestion, capacity loss, and crashes on the nation's roadways while balancing mobility and access across various facility types.

Although there isn't enough data to quantify the impact of access management near driveways and intersections, it is intuitive and generally accepted that reducing the number of access points within the functional areas of intersection or driveways reduces the potential for crashes. Restricting access to commercial properties near intersections by closing private driveways on major roads or moving them to a minor-road approach reduces conflicts between through and turning traffic. According to the HSM[15], the reduction in conflicts may lead to reductions in rear-end crashes related to speed changes near the driveways, and angle crashes related to vehicles turning into and out of driveways. It is generally accepted that access points located within 250 feet upstream or downstream of an intersection is undesirable. According to the HSM[16], "Driveways should not be situated within the functional boundary of at-grade intersections.

[14] See Section 13.14 Crash Effects of Roadway Access Management. Highway Safety Manual (HSM), Volume 3, 2010.
[15] Ibid.
[16] Ibid.

Left Turn Lanes

The application of designated left turn lanes on approach to an intersection or driveway have been shown to have a significant impact on the reduction of all crash types. The provision of a two way left turn lane along the Broad Street corridor would be expected to provide a similar benefit in crash reduction because of the driveway density along the corridor. According to Table 14-12[17], implementation of two way left turn lane along the corridor transitioning to a designated left turn pocket at the signalized intersections is estimated to reduce all crash types along the corridor by 47 percent. Based on the five-year crash history on Broad Street of 89 crashes, this treatment would result in a reduction of 42 (89 * 0.47 = 42) crashes in the Broad Street corridor during a five-year period.

Improve Corridor Lighting

Lighting is often provided where road users need to make a decision. These locations include driveways and intersections. The density of driveways along the Broad Street corridor is very high; 82 per mile. Roadway lighting would help driver visibility and help them make appropriate decisions regarding access and turns at these locations. According to the Highway Safety Manual[18], the crash modification factor (CMF) for all nighttime crashes is 0.80 or a 20 percent reduction in nighttime crashes. Based on the crash history, there are 15 nighttime crashes on the Broad Street corridor, which would result in a reduction of 3 (15 * 0.2 = 3) crashes during the five-year period.

Roadway Departure

The installation of vertical curbs is identified by the HSM[19] as a treatment for roadway departure crashes. However, there are no identified CMF's associated with this application.

Weather

Typically, jurisdictions impacted by extreme weather conditions have a strategy for maintaining their roadways. The strategy typically defines the priority for snow plowing and other roadway maintenance activity. The HSM[20] suggests that raising the priority of a specific roadway by one level will result in a CMF of 0.73 for all snow related non injury crashes and 0.89 for snow related injury crashes. The five-year crash history for the Broad Street

[17] Ibid.
[18] See Table 13-56. Highway Safety Manual (HSM), Volume 3, 2010.
[19] See Section 13A.3.2.3. Highway Safety Manual (HSM), Volume 3, 2010.
[20] See Table 13-60. Highway Safety Manual (HSM), Volume 3, 2010.

corridor indicates there were two (2) "snow/ice" related injury crashes and ten (10) "snow/ice" non injury crashes. Application of the respective CMF to these crashes indicates a reduction of 0.22 snow related injury crashes and 2.7 snow related non-injury crashes during a five-year period.

Summary of Estimated Crash Reduction

Based on the foregoing analysis, the following reduction in five-year crash history is estimated:

- Driveway Density – no CMF data available.
- Install two-way left turn lane along the corridor transitioning to a dedicated left turn lane at intersections – 8.4 crashes per year.
- Improve Corridor lighting – 0.6 crashes per year.
- Roadway Departure – no CMF data available.
- Weather Related – 0.04 snow related injury crashes per year and 0.54 snow related non injury crashes per year.

Therefore, the total crash reduction expected with the proposed project is 9.58 crashes per year or a total of 47.9 crashes over the five-year period.

Proposed Project

To address the issues related to the crash history, the following project is proposed:

- Reconstruct Broad Street from Main Street to RC Hoag Drive; approximately 9,000 lineal feet (1.70 miles) to include widening, where necessary, to 46 feet to provide two 12 foot through lanes (one in each direction), a 12-foot center two way left turn lane; five (5) foot bicycle path on each side; curb and gutter; storm drainage; street lighting; and channelization.
- Reconstruct the traffic signals at Center Street and Eagle Street.
- Connect the existing multi-use trail (connecting RC Hoag to the Seneca Allegany Casino) to the existing walkway northeast of McDonalds.
- Install HAWK Signals at the existing mid-block crosswalks at Park Avenue, Division Avenue, and Cleo Street. It is recommended the pedestrian crossing currently located on the east side of Park Avenue be relocated to the west side to avoid conflict with Main Street turn lane channelization.
- Relocate pedestrian crosswalks at Center Street to reduce Broad Street crossing times.
- Consolidate, eliminate, and relocate existing site driveways to eliminate conflicts and improve roadway capacity.
- Evaluate snow removal policy for the Broad Street corridor.The estimated cost[21] of this project is $12,749,038.

[21] http://www.cityofws.org/portals/0/pdf/transportation/forms-reports/studies/lewisville_roads_study_app_d.pdf Widening cost based on 46 feet. COLA adjustment 3.9 percent between 2008 and 2019. Lighting based on 100 foot spacing @ $7500 per pole. Engineering at 25% and a contingency 15%.

Implementation Strategy

- Seneca Nation Tribal Council Project Approval
- Complete Project Scoping, Preliminary Engineering and Partnership arrangements;
- Complete ROW evaluation and analysis;
- Complete Environmental Review including NEPA Requirements and NEPA Class of Action Approvals;
- Prepare Final Design and Project Plans, Specifications, and Cost Estimates;
- Advertise, Let and Award Project
- Project Construction
- Construction Inspection
- Final Inspection and Project Closeout.

Funding Strategy

- Pursue TTP funding
- Pursue FHWA Traffic Safety (HSIP) Funds

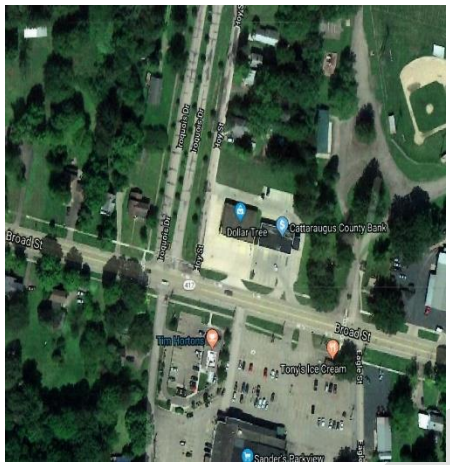
[9] http://www.cityofws.org/portals/0/pdf/transportation/forms-reports/studies/lewisville_roads_study_app_d.pdf Widening cost based on 46 feet. COLA adjustment 3.9 percent between 2008 and 2019. Lighting based on 100 foot spacing @ $7500 per pole. Engineering at 25% and a contingency 15%.

C. Broad Street/Iroquois Drive/Hoy Street/Messenger Street Intersection *(Allegany Territory)*

- *Priority #1 - Transportation Safety Improvement Project Location:*

Four specific locations were identified for safety improvements on Seneca Nation roadways. Broad Street – Iroquois Drive/Hoy Street/Messenger Street intersection was identified as the location with the most crucial need for safety improvements due to the significant amount of accidents recorded there.

Broad Street



Broad Street, also known as State Route 417, runs east/west through the City of Salamanca from the east city limit to the Seneca Allegany Resort and Casino on the west. At the intersection of Iroquois Drive/Hoy Street/Messenger Street, Broad Street is approximately 44 feet wide with curb, gutter and sidewalk on both sides. There is also a ten (10) – sixteen (16)-foot landscape strip between the sidewalk and the travel way on each side. The roadway is channelized into one lane in each direction with a right turn drop lane west bound at Iroquois Drive and eastbound at Eagle Street. East of Eagle Street and west of Iroquois Drive/Hoy Street, Broad Street is channelized into four (4) lanes; two in each direction.

Traffic control includes a traffic signal at the Broad Street/Center Street intersection, approximately 1500 feet to the west and Broad Street/Eagle Street intersection approximately 450 feet to the east. There are stop signs posted on the side streets and intersecting driveways. There is an informal street light system which is inconsistent with street lighting standards provided on both sides of Broad Street along the corridor. The posted speed on Broad Street is 30 mph.

Iroquois Drive/Hoy Street/Messenger Street

Iroquois Drive

Iroquois Drive is a local access street in the city of Salamanca which runs north/south between Broad Street on the south and Front Avenue on the north. Approximately 500 feet north of Broad Street, Iroquois Drive runs east/west for approximately 225 feet to the west before continuing to the north and 300 feet to the east where it terminates at a major parking lot. Iroquois Drive provides access to Salamanca Senior High School, Seneca Intermediate School, and the Cattaraugus County Health Department.

Iroquois Drive is a one-way couplet separated by a 15-foot landscaped median at the intersection with Broad Street. Each leg of the couplet is approximate 24 feet wide without channelization. The total width of Iroquois Drive at Broad Street is 64 feet. Traffic control includes a stop sign on Iroquois Drive at the intersection with Broad Street. There is a formal street lighting system along Iroquois Drive. The speed limit on Iroquois Drive is not posted.

Hoy Street

Hoy Street is a two-way local access street in the city of Salamanca which runs north/south, parallel to Iroquois Drive, between Broad Street and the east leg of Iroquois Drive, approximately 570 feet north of Broad Street. Hoy Street provides access to the back side of the Dollar Tree/Cattaraugus County Bank shopping center and three single family residences, as well as the Cattaraugus County Health Department. Hoy Street is approximately 16 feet wide. The speed limit on Hoy Street is not posted.

Messenger Street

Messenger Street is a two-way local access street in the city of Salamanca which runs north/south from an intersection with Broad Street to a point 775 feet to the south. Messenger Street provides access to Tim Horton's, a drive through restaurant facing Broad Street, the Park View shopping center, and four residential properties which line the street. The roadway is approximately 24 feet wide. Traffic control includes a stop sign at the intersection with Broad Street. There is limited street lighting along the corridor.

Crash History

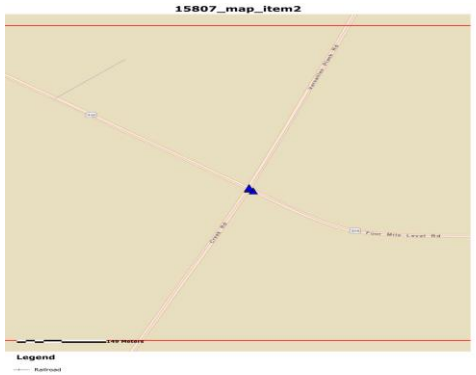
The five (5) year crash data[22] for the Broad Street (417) – Iroquois Drive/Hoy Street/Messenger Street intersection was obtained from the New York State Department of Transportation Data Portal. A summary of the five-year crash data is presented in Table 1.

Table 1. Broad Street – Iroquois Drive/Hoy Street/Messenger Street

Year	Right Angle	Rear End	Left Turn	Fixed Object	Right Turn	Head On	Sideswipe	Total
2014		1	2					3
2015	1	2					1	4
2016		1	1		1		1	4
2017	1	2				1		4
2018[1]		2	1	2				5
Total	**2**	**8**	**4**	**2**	**1**	**1**	**2**	**20**

[22]Accident Location Information System (ALIS); 7/1/2014 – 11/30/2018

1) Five Year Crash Data provided for the period of July 1, 2014 – 11/30/2018



As shown in Table 1, there have been a total of 20 crashes at the Broad Street – Iroquois Drive/Hoy Street/Messenger Street intersection during the five-year period from July 1, 2014 to November 30, 2018. Of these crashes, eight (40%) involved "Rear End"; four (20%) were "Left Turn"; two (10%) were "Right Angle", "Fixed Object" and "Sideswipe"; and one (5%) was "Right Turn ", and "Head-On".

Fifteen percent (3) of the crashes involved injuries. Of these crashes, there were five (5) possible injuries and one (1) non-incapacitating injury.

Contributing Factors

A review of the crash records suggests the following factors contributed to the crash history at the Broad Street (417) - Hoy Street/Iroquois Drive/Messenger Street. These factors include:

- Failure to Yield Right of Way – Seven (35%) of the crashes, included failure to yield right of way;
- Driver Inattention – Five (25%) of the crashes noted driver inattention as contributing factor
- Following too Close – Four (20%) of the crashes noted "following too close" as a contributing factor
- Sight Distance – Two (10%) crashes noted view obstruction as a contributing factor
- Alcohol – Two (10%) crashes noted alcohol as a contributing factor.
- Lighting – Five (25%) of the 20 crashes occurred during periods of darkness.
- Weather – Two (10%) of the 20 crashes were impacted by snow/ice on the roadway. These crashes however did not result in injuries.

Crash Modification Factors

To address the Contributing Factors, crash modification factors were identified to address each contributing factor. The crash modification factors are as follows:

Convert to a Roundabout

Because the intersection configuration includes multiple roadways with offsets, the installation of a roundabout appears to be the best approach to addressing the intersection crashes at this location.

According to the Highway Safety Manual[23] converting an intersection with minor-road stop control to a single lane modern roundabout will have a significant impact on eliminating all crash types at the intersection. As shown in Table 14-4[24], the crash modification factor (CMF) is 0.29 for all crash types. This translates into a reduction of 71 percent of the crashes. According to the NYSDOT Data Portal, there are 20 recorded crashes at the Broad Street (417) - Hoy Street/Iroquois Drive/Messenger Street intersection from 7/1/2014-11/30/2018. With the installation of a modern roundabout it is estimated that 14.2 (20 * 0.71 = 14.2) crashes would be eliminated over the five-year period. According to the City of Salamanca Police Department, a total of 31 crashes were recorded from 1/1/2009-4/25/2019. According to this ~10 year data it is estimated that 22 (31*0.71=22.01) crashes would be eliminated!

Convert to All-Way Stop Control

The provision of "all way stop" at the Broad Street/Iroquois Drive intersection would require a considerable realignment of the four (4) intersecting streets; Iroquois Drive (2 legs), Hoy Street, and Messenger Street. This concept would also be counter to efficient traffic flow along the Broad Street corridor. Therefore, it is eliminated from further consideration.

Provide Left Turn Lanes

According to the Highway Safety Manual (HSM), the provision of left turn lanes on two approaches to a four-legged intersection will have a significant impact on the five-year crash history. As shown in Table 14-12[25] the installation of a left turn lane on both uncontrolled approaches has a CMF of 0.53 for all crash and severity types. This would result in a reduction of 9.4 (20 * 0.47 = 9.4) crashes at the intersection during the five-year period. (14.57

Provide Intersection Lighting

According to the Highway Safety Manual (HSM), lighting is often provided where road users need to make a decision. These locations include driveways and intersections. According to the Highway Safety Manual[26], the CMF for the provision of intersection lighting is 0.62 for nighttime injury crashes. Based on the crash history at this location, there were no injury crashes during hours of darkness at the Broad Street. Iroquois Drive/Hoy Street/Messenger Street intersection.

[23] Highway Safety Manual, 1st Edition, Volume 3, AASHTO, 2010.
[24] Table 14-4. Highway Safety Manual, Volume 3, 2010.
[25] Table 14-12. Highway Safety Manual, Volume 3, 2010.
[26] See Table 13-56. Highway Safety Manual (HSM), Volume 3, 2010.

Provide Flashing Beacons

Flashing beacons can help alert drivers to the presence of un-signalized intersection that may be unexpected or not readily visible. Overall, the CMF[27] for provision of flashing beacon is 0.95 for all crash types and injury severities. This would result in a reduction of 1 (20 * 0.05 = 1) crash during the five-year period.

Summary of Estimated Crash Reduction

Based on the foregoing analysis, the following reduction in five-year crash history is estimated:

- Convert to Modern Roundabout – 2.84 crashes per year
- Provide Left Turn Lanes – 1.88 crashes per year
- Provide Flashing Beacons – 0.2 crashes per year

Again, there are two alternative concepts for consideration: one concept is the modern roundabout which will result in a reduction of 2.84 crashes per year at the Broad Street intersection. The other concept is the combination of "Stop Ahead" pavement marking, flashing beacons, and provision of left turns. The potential crash reduction of these measures would be 2.08 (1.88 + 0.2 = 2.08) crashes per year. The roundabout is the preferred option.

Intersection configuration, offset intersections, would introduce complications to the application of the second concept. The provision of a modern roundabout would provide reasonable access for all intersecting streets. Some minor alignment changes would be required to address the proximity of Hoy Street and the inbound leg of Iroquois Drive.

Proposed Project

To address the issues related to the crash history the following project is proposed:

- Reconstruct the Broad Street - Iroquois Drive/Hoy Street/Messenger Street to provide a dual lane roundabout;
- Realign Hoy Street to intersect with Iroquois Drive north of Broad Street;
- Install intersection lighting 300 feet in advance of the intersection.
- Estimated Cost = $823,000

[27] See Table 14-18. Highway Safety Manual (HSM), Volume 3, 2010.

Implementation Strategy

- Seneca Nation Tribal Council Project Approval
- Complete Project Scoping, Preliminary Engineering and Partnership arrangements;
- Complete ROW evaluation and analysis;
- Complete Environmental Review including NEPA Requirements and NEPA Class of Action Approvals;
- Prepare Final Design and Project Plans, Specifications, and Cost Estimates;
- Advertise, Let and Award Project
- Project Construction
- Construction Inspection
- Final Inspection and Project Closeout.

Funding Strategy

- Pursue TTP funding
- Pursue FHWA Traffic Safety (HSIP) Funds

D. Route 438/Versailles Plank Road Intersection *(Cattaraugus Territory)*

- *Priority #2 - Transportation Safety Improvement Project Location:*

The SN Department of Transportation identified the intersection of Route 438 (4 Mile Level Road) and Versailles Plank Road as the second location for a safety improvement project. The intersection includes two lanes, one lane in each direction, on Route 438 (4 Mile Level Road), and two lanes, one in each on Versailles Plank Road. The estimated average annual daily traffic (AADT) on 438 is 6400[28]. No traffic volumes were available for Versailles Plank Road. Traffic control includes a substandard flashing beacon mounted overhead in the center of the intersection and dual stop signs mounted on Versailles Plank Road on both sides of the intersection. The posted speed on 438 is 45 mph. There were no posted speed limits observed on Versailles Plank Road.

Sight distance of the intersection is constrained on the north leg by trees that line the corridor on the west side. There is a series of wood bollards which line the intersection radius on the south west corridor. While intended to protect the property on the southwest corner of the intersection, they create hazard to the traveling public by being a fixed object with no break away provisions within the roadway clear zone.

Crash History

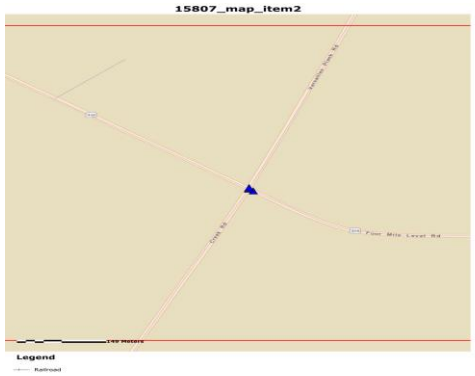
The five (5) year crash data[29] for the Route 438/Versailles Plank Road intersection was obtained from the New York State Department of Transportation Data Portal. A summary of the five-year crash data is presented in Table 1.

Table 1. 438 (4 Mile Level Road)/Versailles Plank Road Intersection Five Year Crash Data

Year	Right Angle	Rear End	Left Turn	Fixed Object	Animal	Unknown	Total
2014	3	1					4
2015		1		1			2
2016	1					1	2
2017	2	1	1				4
2018[1]	6				1		7
Total	**12**	**3**	**1**	**1**	**1**	**1**	**19**

2) 2018 – Crash History for2018 through 11/30/2018

[28] AADT is estimated from 2013 counts by factoring at a rate of 2 percent per year.
[29]Accident Location Information System (ALIS); 12/1/2013 – 11/30/2018



As shown in Table 1, there have been a total of 19 crashes at the Route 438/Versailles Plank Road intersection during the five-year period from December 1, 2013 to November 30, 2018. Of these crashes, 12 (63%) involved "Right Angle"; three (16%) were "Rear End"; and one (5%) each were "Fixed Object", "Animal" and "Unknown".

Forty-seven percent (9) of the crashes involved injuries. Of these crashes, there were 14 possible injuries and two (2) non-incapacitating injuries.

Contributing Factors

A review of the crash records suggests the following factors contributed to the crash history at the Route 438 (4 Mile Level Road)/Versailles Plank Road intersection. These factors include:

- Disregard Traffic Control Device – Of the 19 crashes, five (26%) involved the disregarding of the existing traffic control;
- Failure to Yield Right of Way – Five (26%) of the crashes, included failure to yield right of way;
- Speed - Two (11%) of the crashes noted speed as a contributing factor
- Following too Close – Two (11%) of the crashes noted "following too close" as a contributing factor
- Sight Distance – One (5%) crash noted sight distance as being a contributing factor
- Alcohol – One (5%) crash noted alcohol as a contributing factor.
- Lighting – Three (16%) of the 19 crashes occurred during periods of darkness.
- Weather – Three (16%) of the 19 crashes were impacted by snow/ice on the roadway. None of these crashes had injuries.

Crash Modification Factors

To address the Contributing Factors (CF), crash modification factors (CMFs) were identified for each CF. The crash modification factors are as follows:

Convert to Modern Roundabout

According to the Highway Safety Manual[30] (HSM), converting an intersection with minor-road stop control to a single lane modern roundabout will have a significant impact on eliminating all crash types at the intersection. As shown in Table 14-4[31], the crash modification factor (CMF) is 0.29 for all crash types. This translates into a reduction of 71 percent of the crashes. For the Route 438/Versailles Plank Road intersection, there are 19 recorded crashes, with the installation of a modern roundabout it is estimated that 13.5 (19 * 0.71 = 13.49) crashes would be eliminated over the five-year period.

[30] Highway Safety Manual, 1st Edition, Volume 3, AASHTO, 2010.
[31] See Table 14-4. Highway Safety Manual (HSM) Volume 3, 2010

Convert to All-Way Stop Control

The HSM identifies conversion of a minor road stop on a four-legged intersection to an "all-way stop" control as a significant modifier of crash history. As shown in Table 14-5[32], the CMF is 0.52 for all crash types and severities. For the 19 crashes at the Route 438/Versailles Plank Road intersection, there would be a reduction of 9.12 (19 * 0.48 = 9.12) crashes over the five-year period.

Provide Left Turn Lanes

According to the Highway Safety Manual (HSM), the provision of left turn lanes on rural road approaches without stop control will have a significant impact on the five-year crash history. As shown in Table 14-11[33], the installation of a left turn lane on a single uncontrolled approach has a CMF of 0.72 for all crash and severity types. This would result in a reduction of five (5) crashes at the intersection during the five-year period. If left turn lanes are constructed on both uncontrolled approaches, the CMF becomes 0.52 for all crash types and injury severities. This would result in a reduction of 9.12 (19 * 0.48 = 9.12) crashes during the five-year period.

Provide Intersection Lighting

According to the Highway Safety Manual (HSM), lighting is often provided where road users need to make a decision. These locations include driveways and intersections. According to the Highway Safety Manual[34], the CMF for the provision of intersection lighting is 0.62 for nighttime injury crashes. Based on the crash history, there are two (2) nighttime injury crashes which would result in a reduction of 0.76 (2 * 0.38 = 0.76) nighttime injury crashes during the five-year period.

Provide Stop Ahead Pavement Markings

The provision of "stop ahead" pavement markings helps alert the motorist to the existence of an intersection. This is particularly true in rural areas at un-signalized intersections and a crash history which suggests motorist are not alert to the presence of the intersection. The crash history, failure to yield the right of way and disregarding of traffic control devices, suggests drivers may not be aware of the presence of an intersection. As shown in Table 14-21[35], the CMF with provision of "Stop Ahead" pavement markings for a stop-controlled intersection for all crash types and severities is 0.69. Applying this CMF to the 438/Versailles Plank Road intersection crash data suggest a reduction of 5.89 (19 * 0.31 = 5.89) crashes during the five-year period.

[32] See Table 14-5. Highway Safety Manual (HSM), Volume 3, 2010.
[33] See Table 14-11. Highway Safety Manual (HSM), Volume 3, 2010.
[34] See Table 13-56. Highway Safety Manual (HSM), Volume 3, 2010.
[35] See Table 14-21. Highway Safety Manual (HSM). Volume 3, 2010.

Provide Flashing Beacons

Flashing beacons can help alert drivers to the presence of un-signalized intersection that may be unexpected or not readily visible. At the Route 438/Versailles Plank Road intersection, there is an existing flashing beacon centered over the intersection. The beacon may not be easily visible by approaching drivers for several reasons. Enhancement of the beacon would be desirable to improve intersection safety. Overall, the CMF for provision of flashing beacon is 0.95[36] for all crash types and injury severities. This would result in a reduction of 0.95 (19 * 0.05 = 0.95) crashes during the five-year period.

Summary of Estimated Crash Reduction

Based on the foregoing analysis, the following reduction in five-year crash history is estimated:

- Convert to Modern Roundabout – 2.7 crashes per year
- Convert to All Way Stop Control – 1.8 crashes per year
- Provide "Stop Ahead" Pavement Markings – 1.18 crashes per year
- Provide Flashing Beacons – 0.19 crashes per year
- Provide Left Turn Lanes – 1.8 crashes per year
- Provide Intersection Lighting – 0.15 crashes per year

There are two possible concepts to consider for intersection improvement. One concept involves the construction of a modern roundabout which would result in a reduction of 2.7 crashes per year. The second concept would employ a combination of improvements to include provision of "Stop Ahead" pavement markings; enhancement of the existing flashing beacon, and the provision of left turn lanes on the major roadway, Route 438 (4 Mile Level Road). It is assumed that intersection lighting would be provided under both concepts. There wasn't enough traffic volume data to warrant consideration of the "All Way Stop" concept.

The resultant crash reduction associated with each concept is 2.85 (2.7 + 0.15 = 2.85) for the modern roundabout and 3.32 (1.18 + 0.19 +1.8 + 0.15 = 4.31) for the alternative project which included a combination of the different elements.

Therefore, it is recommended the combination of measures would provide the best overall crash reduction. In addition, the current intersection approach speed on Route 438 (45 mph) would be a safety issue for the installation of a roundabout at this location.

[36] See Table 14-22. Highway Safety Manual (HSM). Volume 3, 2010.

Proposed Project

To address the issues related to the crash history the following project is proposed:

- Reconstruction and widening of Route 438 to provide left turn lanes on approach to the Versailles Plank intersection;
- Provide "Stop Ahead" pavement markings on Versailles Plank Road to enhance driver awareness of the approaching stop condition at Route 438;
- Replace the existing single flashing beacon with mast arm signal heads for all approaches to the intersection;
- Provide intersection lighting for the extent of the left turn channelization on Route 438 and for 300 feet in advance of the intersection on Versailles Plank Road.
- Estimated Cost = $722,000[37].

Implementation Strategy

- Seneca Nation Tribal Council Project Approval
- Complete Project Scoping, Preliminary Engineering and Partnership arrangements;
- Complete ROW evaluation and analysis;
- Complete Environmental Review including NEPA Requirements and NEPA Class of Action Approvals;
- Prepare Final Design and Project Plans, Specifications, and Cost Estimates;
- Advertise, Let and Award Project
- Project Construction
- Construction Inspection
- Final Inspection and Project Closeout.

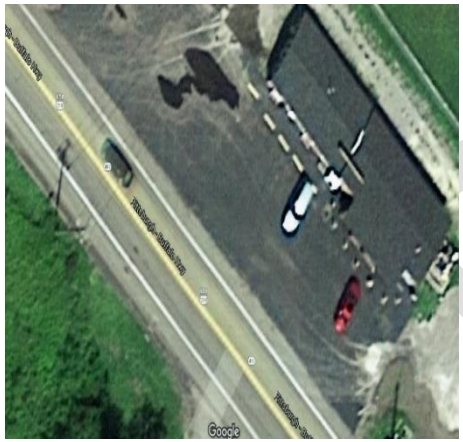
Funding Strategy

- Pursue TTP funding
- Pursue FHWA Traffic Safety (HSIP) Funds

[37] http://www.cityofws.org/portals/0/pdf/transportation/forms-reports/studies/lewisville_roads_study_app_d.pdf Left Turn Lane widening $340 per foot = $297,000. COLA adjustment 3.9 percent between 2008 and 2019; Stop Ahead pavement markings $2000. Lighting based on 70 foot spacing @ $7500 per pole; Flashing Beacon improvements = $56,000; Engineering 25%; and contingency 15%.

E. US Route 219/NYS Route 417 Killbuck - Mikey's Emporium *(Cattaraugus Territory)*

- *Transportation Safety Improvement Project - Location #3:*



US Route 219, also known as NYS Route (SR) 417 and Pittsburgh-Buffalo Highway, runs northwest/southeast through the hamlet of Kill Buck, New York, east of Salamanca on the Allegany Territory. Mikey's Emporium is approximately 800 feet south east of the US 219/Depot Street/Hardscrabble Road intersection.

Along the Mikey's Emporium frontage, US Route 219/SR 417 is approximately 36 feet wide with two 11-foot lanes, one in each direction and a seven (7) foot shoulder on both sides. There is no street lighting along this section of US 219/SR 417. The parking lot for Mikey's Emporium opens directly onto US Route 219/SR 417 with uncontrolled access onto the highway.

Traffic control includes stop signs on Depot Street and Hardscrabble Road at the intersection with US Route 219/SR 417. The posted speed on US 219 across Mikey's frontage is 55 miles per hour. The speed limit drops to 40 mph at the US 219/Hardscrabble Road intersection, west of Mikey's, as the roadway enters the Hamlet of Kill Buck.

Crash History

The five (5) year crash data on US Route 219/SR 417, across the Mikey's Emporium frontage, was obtained from the New York State Department of Transportation Data Portal[38]. A summary of the five-year crash data, January 1, 2014 – December 31, 2018, is presented in Table 1.

Table 1. US Route 219 - State Route 417 - /Hardscrabble Road/Depot Street

Year	Rear End	Left Turn	Fixed Object	Animal	Total
2014	2	1	2		5
2015					
2016				1	1
2017	1			1	2
2018			1		1
Total	**3**	**1**	**3**	**2**	**9**

[38] New York State Accident Location Information System (ALIS); 1/1/2014 – 12/31/2018

As shown in Table 1, there have been a total of nine (9) crashes on US 219/SR417 across the Mikey's Emporium frontage, 350 feet to 1200 feet east of the US 219 – SR 417/Hardscrabble Road – Depot Street intersection during the five-year period from January 1, 2014 to December 31, 2018. Of these crashes, three (3) (33%) involved "Rear End"; three (3) (33%) were "Fixed Object"; two (22%) were "Animal", and one (11%) was "Left Turn".

Fifty-six percent (5) of the crashes involved injuries. There was a total of nine (9) injuries which included five (5) "non-incapacitating injuries" and four (4) "possible Injury" crashes.

Contributing Factors

A review of the crash records indicates the following factors contributed to the crash history at this location. These factors include:

- Roadway Width - the existing roadway width is approximately 22 feet; or 11 feet per lane;
- Shoulder Width – the existing paved shoulder width is approximately seven feet;
- Driver Inattention – Three (33%) of the nine (9) crashes noted driver inattention as a contributing factor;
- Following too Close – Three (33%) of the nine (9) crashes noted "following too close" as a contributing factor;
- Lighting – Three (33%) of the nine (9) crashes occurred during periods of darkness;
- Weather – Two (18%) of the nine (9) crashes were impacted by snow/ice on the roadway.

Crash Modification Factors

To address the Contributing Factors, crash modification factors were identified for each contributing factor. The crash modification factors (CMF) are as follows:

Modify Lane Width

According to the Highway Safety Manual (HSM)[39], widening lanes on rural two-lane roads reduces a specific set of related crash types, namely single-vehicle run-off-the-road crashes, multiple-vehicle head on, opposite direction sideswipe and same direction sideswipe collisions. For the US219/SR417 corridor, there are three (3) recorded crashes of this type; single-vehicle-run-off-the road. The crash modification factor (CMF) for increasing the lane width from 11 to 12 feet is 0.95, or a five (5) percent reduction in crashes related to lane width[40] during the five-year period. Therefore, it is expected that widening the roadway will result in a reduction of 0.15 (3 * 0.05 = 0.15) crashes over the five-year period.

[39] Highway Safety Manual (HSM), First Edition, Volume 3, AASHTO, 2010.
[40] See Table 13-2. Highway Safety Manual (HSM) Volume 3, 2010.

Modify Shoulder Width

According to the Highway Safety Manual (HSM)[41], widening shoulder on rural two-lane roads reduces the same related crash types as widening lanes; i.e. single-vehicle run-off-the-road crashes, multiple-vehicle head on, opposite direction sideswipe and same direction sideswipe collisions. For the US219/SR417 corridor, there are three (3) recorded crashes of this type during the five-year period. The crash modification factor for increasing the shoulder width from seven (7) feet to eight (8) feet is 0.93, or a 7.0 percent reduction in the five (5) year crash history[42]. Therefore, it is expected that widening the roadway to include eight (8) foot shoulders will result in a reduction of 0.21 (3 * 0.07 = 0.21) crashes over the five-year period.

Provide Left Turn Lanes

According to the Highway Safety Manual (HSM)[43], the provision of left turn lanes on rural road approaches without stop control will have a significant impact on the five-year crash history. As shown in Table 14-11, the installation of a left turn lane on a single uncontrolled approach has a CMF of 0.72 for all crash and severity types. This results in a reduction of 28 percent of the crashes over the five-year period; or 2.52 (9 * 0.28 = 2.52) crashes.

Improve Corridor Lighting

According to the Highway Safety Manual (HSM), lighting is often provided where road users need to make a decision. These locations include driveways and intersections. The density of driveways along the US219/SR417 corridor is relatively low; eight (8) per mile. Roadway lighting would help driver visibility and help them make appropriate decisions regarding access and turns at these locations. According to the Highway Safety Manual[44], the crash modification factor for all nighttime crashes is 0.80 or a 20 percent reduction in nighttime crashes. Based on the crash history, there are three (3) nighttime crashes which would result in a reduction of 0.6 (3 * 0.2 = 0.6) crashes during the five-year period.

Weather

Typically, jurisdictions impacted by extreme weather conditions have a strategy for maintaining their roadways. The strategy typically defines the priority for snow plowing and other roadway maintenance activity. The Highway Safety Manual[45] suggests that raising the priority of a specific roadway by one level will result in a CMF of 0.73 for all snow related non injury crashes and 0.89 for snow related injury crashes. The five-year crash history for

[41] Ibid.
[42] See Table 13-7. Highway Safety Manual (HSM) Volume 3, 2010.
[43] Highway Safety Manual (HSM), First Edition, Volume 3, AASHTO, 201
[44] See Table 13-56. Highway Safety Manual (HSM), Volume 3, 2010.
[45] See Table 13-60. Highway Safety Manual (HSM), Volume 3, 2010.

the US219/SR417 corridor indicates there were two (2) "snow/ice" crashes during the five-year period. Of these crashes one (1) was "injury" related and one was "property damage only". Application of the respective CMF to these crashes, indicates a reduction of 0.11 (1 * 0.11 = 0.11) snow related injury crashes and 0.27 (1 * 0.27 = 0.27) snow related non-injury crashes during the five-year period.

Access Management

The driveway density along the US219/SR417 corridor is eight access points per mile, which is within the acceptable standard of 5 driveways per mile. However, the existing access to Mikey's Emporium is currently uncontrolled. There was no crash history identified in the data base related to the current open access, however in the future this could become a problem with vehicles entering the Mikey's site at a relatively high speed (55 mph). If a problem develops, the SNI Department of Transportation should consider reconfiguring the access to limit access to a single enter and exit driveway to the site. Obviously, this would have impacts to the existing parking configuration on the Mikey's site but would facilitate safer and more efficient access.

Summary of Estimated Crash Reduction

Based on the foregoing analysis, the following reduction in five-year crash history is estimated:

- Modify Lane Width – 0.03 crashes per year
- Modify Shoulder Width – 0.04 crashes per year
- Provide Left Turn Lane – 0.50 crashes per year
- Improve Corridor Lighting – 0.12 crashes per year
- Weather Related – 0.08 crashes per year

Total Crash Reduction = 0.77 crashes per year.

Proposed Project

To address the issues related to the five-year crash history along the Mikey's Emporium frontage, the following project is proposed:

- Reconstruct US219/SR417 from Hardscrabble Road/Depot Street to a point approximately 1000 feet south and east of the intersection. The reconstructed roadway will provide a 52-foot-wide roadway cross section with three (3) -12-foot lanes; one lane in each direction with a center two way left turn lane; and an eight-foot shoulder on each side.
- In addition, the project should include drainage, street lighting, and channelization.
- Estimated Cost = $694,015[46].

[46] [46] http://www.cityofws.org/portals/0/pdf/transportation/forms-reports/studies/lewisville_roads_study_app_d.pdf Widening cost based on conversion from 26 feet to 52 feet. COLA adjustment 3.9 percent between 2008 and 2019. Lighting based on 70 foot spacing @ $7500 per pole. Engineering at 25% and a contingency 15%.

Implementation Strategy

- Seneca Nation Tribal Council Project Approval
- Complete Project Scoping, Preliminary Engineering and Partnership arrangements;
- Complete ROW evaluation and analysis;
- Complete Environmental Review including NEPA Requirements and NEPA Class of Action Approvals;
- Prepare Final Design and Project Plans, Specifications, and Cost Estimates;
- Advertise, Let and Award Project
- Project Construction
- Construction Inspection
- Final Inspection and Project Closeout.

Funding Strategy

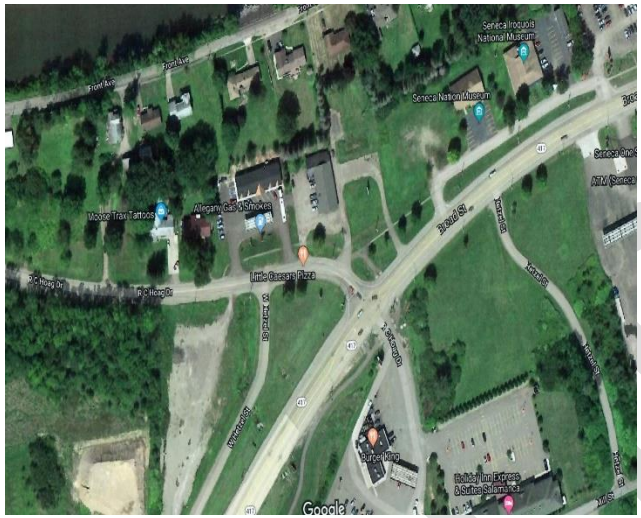
- Pursue TTP funding
- Pursue FHWA Traffic Safety (HSIP) Funds

F. Broad Street/RC Hoag Intersection *(Allegany Territory)*

- *Transportation Safety Improvement Project - Location #4:*

Under Amendment #1 of the consultant contract with Valerie J. Southern Transportation Consultant, LLC, the SNI Department of Transportation directed VJS TC to evaluate the five year crash history at two additional locations on the SNI Roadway Network: the Broad Street corridor between Main Street and RC Hoag Drive and the Broad Street/RC Hoag Drive intersection. This project description evaluates the five-year crash history at the Broad Street/RC Hoag Drive intersection and proposes a specific infrastructure improvement to address the crash history.

Broad Street/RC Hoag Drive Intersection



Broad Street, also known as New York State Route 417, runs east/west through the city of Salamanca from the east City limit to the Seneca Allegany Resort and Casino on the west. At the intersection with RC Hoag Drive, Broad Street is approximately 62 to 75 feet wide with three (3) travel lanes; one lane in each direction plus a center left turn lane. The paved shoulders are 12 feet to 24 feet wide though the intersection.

East of the intersection with RC Hoag Drive, the center lane is a two way left turn lane whereas west of the intersection, the center lane is a 75-foot long dedicated left turn pocket. The left turn lane and median improvements were recently constructed as part of the Gateway Project.

There is a designated pedestrian walkway on the south side of Broad Street west of the intersection which continues to the Seneca Allegany Resort and Casino. East of the intersection, on the north side, there is a separated pedestrian pathway which continues to the Center Street intersection. On the south side, pedestrians and bicycles are required to walk on the paved shoulder until the separated pedestrian walkway begins approximately 1,200 feet east of the RC Hoag Drive intersection.

Traffic control on Broad Street includes a substandard span wire flashing beacon at the Broad Street/RC Hoag Drive intersection. The beacon flashes yellow for Broad Street traffic and red for the RC Hoag Drive traffic. The flashing beacon is supported by stop signs on the RC Hoag Drive approaches to the intersection. There is a full traffic signal at the Center Street intersection approximately 1700 feet to the east and stop signs on the minor intersecting streets and Interstate 86 ramps.

There is an informal street light system through the RC Hoag Drive intersection which is inconsistent with current street lighting standards.

The posted speed on Broad Street is 30 mph.

RC Hoag Drive

RC Hoag Drive is a two-way, two lane local access roadway in the city of Salamanca which generally runs in an east/west direction from Center Road on the west to Mill Street on the east. As RC Hoag Drive approaches the Broad Street intersection, the roadway takes a dramatic turn to the south, running north/south across Broad Street.

West of Center Road, the roadway becomes Red House Road (Old Route 17) which runs for approximately 3.25 miles to the south and west where it terminates at the Allegheny River. South of Broad Street, RC Hoag Drive provides access to the Burger King Restaurant and the Holiday Inn Express & Suites – Salamanca before terminating at the intersection with Mill Street, approximately 600 feet south of Broad Street.

On the north, the roadway is approximately 36 feet wide with two 11-foot lanes and seven (7) foot paved shoulders on both sides. On the south, the roadway is approximately 38 feet wide without channelization.

Traffic control includes span mounted flashing beacons and stops on RC Hoag Drive at Broad Street and stop signs on the minor intersecting side streets along the RC Hoag Drive corridor.

Crash History

Note: Five Year Crash Data wasn't available at the writing of this project summary. A summary of the five-year crash data is presented in Table 1.

Table 1. Broad Street/RC Hoag Drive Intersection

Year	Right Angle	Rear End	Left Turn	Fixed Object	Right Turn	Head On	Sideswipe	Total
2014								
2015								
2016								
2017								
2018								
Total								

Proposed Project

To address the issues related to the crash history the following project is proposed:

- Reconstruct the Broad Street/RC Hoag Drive intersection to provide a dual lane roundabout;
- Install street lighting which meets current standards;
- Construct curb gutter and sidewalk 300 feet in advance of intersection;
- Utility modifications;
- Install RRFB Pedestrian crossings and signals on all approaches to the intersection.
- Estimated Cost[47] = $1,493,485.

Implementation Strategy

- Seneca Nation Tribal Council Project Approval
- Complete Project Scoping, Preliminary Engineering and Partnership arrangements;
- Complete ROW evaluation and analysis;
- Complete Environmental Review including NEPA Requirements and NEPA Class of Action Approvals;
- Prepare Final Design and Project Plans, Specifications, and Cost Estimates;
- Advertise, Let and Award Project
- Project Construction
- Construction Inspection
- Final Inspection and Project Closeout.

Funding Strategy

- Pursue TTP funding
- Pursue FHWA Traffic Safety (HSIP) Funds

[47] [47] http://www.cityofws.org/portals/0/pdf/transportation/forms-reports/studies/lewisville_roads_study_app_d.pdf Widening cost based on installation of a dual lane roundabout; COLA adjustment 3.9 percent between 2008 and 2019. Lighting based on 70 foot spacing @ $7500 per pole; 1200LF of curb gutter and sidewalk; Utility adjustments; RRFB Pedestrian Signals at $15,000 per each. Engineering 25%; and contingency 15%.

G. Seneca Nation Overall Lighting Survey

- *Transportation Safety Improvement Project/Plan – General Lighting Study:*

The Seneca Nation Lighting Improvement Plan report is currently being developed and will be available as section of the SNTSP June 2019!

Seneca Nation of Indians

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