General QC Observations

- Site/Structure Address Points and Road Centerlines do not contain ESN values. Counties in this situation will require special attention when transitioning to a NG911 environment. Adding the numerous ESN values from the E911 environment to the 911 GIS data in these cases may not be necessary and will be dependent on the Next Generation Core Service (NGCS) provider. In some cases, a PSAP can transition from multiple ESNs to a single ESN. MSAG Communities, however, are typically required and may need to be added.
- Due to the use of the MSAG street name fields for potential ALI and MSAG synchronization there are many outside acceptable values; county does have the USPS abbreviations present in the data.
- QC Errors: 121,269
 - These can be found in the Exceptions folder: QCFallouts.csv & geodatabase
 - More details are found in the report below
- ETL Fallouts: 60
 - These can be found in the Exceptions folder | ETLFallouts.csv
 - 1 Law Boundary polygon due to self-intersections
 - 1 PSAP Boundary polygon due to self-intersections
 - 1 Provisioning Boundary polygon due to self-intersections
 - o 1 County Boundary polygon due to self-intersections
 - 56 Site/Structure Address Points due to the presence of the Address Number suffix in the Address Number field

Quality Control Notes

- Ingest check Road Centerline Range to Zero: set as default
- Ingest check Site/Structure Address Point Remove: set as default
- Road Centerline one-way check: not configured
- Road Centerline range gap check: configured
- Road Centerline line in polygon check: configured
- Site/Structure Address Point zone check: configured
- UniqueIDs *added* for QC processing:
 - Site/Structure Address Points
 - Road Centerline
- Site/Structure Address Point to Road Centerline: MSAG Community used for refinement
- MSAG to Road Centerline: No MSAG provided
- ALI to Road Centerline: MSAG Community used for refinement
- ALI to Site/Structure Address Point: MSAG Community used for refinement
- Range overlap: MSAG Community used for refinement
- Site/Structure Address Point duplicates: MSAG Community used for refinement



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Standards and Reference Documents

- Wisconsin Department of Military Affairs, Office of Emergency Communication NG9-1-1 Website | <u>https://dma.wi.gov/DMA/oec/programs/nextgen911</u>
- Wisconsin NG9-1-1 GIS Data Standards and Best Practices | <u>https://dma.wi.gov/DMA/divisions/oec/library/2020/WI_NG911_GIS_Data_Standa</u> <u>rd_and_Best_Practices_FINAL.pdf</u>
- Wisconsin Land Information Association | <u>https://www.wlia.org/</u>
- NENA Standard for NG9-1-1 GIS Data Model NENA-STA-006.1.1-2020 | https://www.nena.org/?page=NG911GISDataModel
- NENA Next Generation United States Civic Location Data Exchange Format (CLDXF) – NENA-STA-004.1-2014 | <u>https://www.nena.org/?NG911CLDXF</u>
- NENA Information Document for Development of Site/Structure Address Point GIS Data for 9-1-1 – NENA-STA-014.1-2015 | <u>https://www.nena.org/?SSAP</u>
- NENA Information Document for GIS Data Stewardship for Next Generation 9-1-1 – NENA-INF-028.1-2020 | https://www.nena.org/page/GISDataStewardship
 - At the current time only PSAP boundaries are a part of the document; Emergency Service Boundaries and Road Centerline additions are currently under development
- NENA NG9-1-1 Transition Plan Considerations Information Document NENA-INF-008.2-2014 | <u>https://www.nena.org/page/NG911_TransitionPlng</u>

Accuracy of Current GIS Data to NG9-1-1 Standards

87.88%
88.19%
89.70%
88.16%
80.00%
66.67%
0.00%
0.00%
0.00%
85.71%
80.00%
93.51%
87.84%
N/A



Remediation Recommendations

Correct Critical Errors for NG9-1-1 Call Routing and Location Validation

All accuracy information below is estimated and depends on the number of secondary errors that may occur as errors are corrected.

- 1. Add and populate all mandatory fields or migrate to the WI NG 911 Data Model and populate all mandatory fields
 - a. DiscrpAgID [srcOfData]
 - i. Site/Structure Address Points
 - ii. Road Centerline
 - iii. Provisioning Boundary
 - iv. PSAP Boundary
 - v. County Boundary
 - vi. Fire Boundary
 - vii. Law Boundary
 - viii. EMS Boundary
 - ix. Incorporated Municipality Boundary
 - b. Date Updated [LastEdit]
 - i. Site/Structure Address Points
 - ii. Road Centerline
 - iii. Provisioning Boundary
 - iv. PSAP Boundary
 - v. County Boundary
 - vi. Fire Boundary
 - vii. Law Boundary
 - viii. EMS Boundary
 - c. Country
 - i. Site/Structure Address Points
 - ii. Road Centerline
 - iii. Incorporated Municipality Boundary
 - iv. County Boundary
 - d. State
 - i. Site/Structure Address Points
 - ii. Road Centerline
 - iii. PSAP Boundary
 - iv. County Boundary
 - v. Fire Boundary
 - vi. Law Boundary
 - vii. EMS Boundary
 - viii. Incorporated Municipality Boundary
 - e. County
 - i. Site/Structure Address Points



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- ii. Road Centerline
- f. Incorporated Municipality
 - i. Site/Structure Address Points (a few)
 - ii. Road Centerline (a few)
- g. Parity
 - i. Road Centerline
- h. Address Number
 - i. Site/Structure Address Points (a few)
- i. Ranges
 - i. Road Centerline (a few)
- j. MSAG Community
 - i. Site/Structure Address Points (a few)
 - ii. Road Centerline (a few)
- k. ESN
 - i. Site/Structure Address Points
 - ii. Road Centerline
- 2. Remove leading, trailing, multiple and white spaces in all mandatory fields a. Road Centerline
 - i. MSAG Community

Mandatory fields are shown in bold font in the charts under **Field Mapping** starting on page 11.

GIS Data Accuracy will increase to 95.55% Overall Accuracy will increase to 94.91%

- 3. If not already present, add and populate a unique identifier for every layer
 - a. Site/Structure Address Points
 - b. Road Centerline

Ultimately the unique ID will be combined with a layer abbreviation, @, and the agency identifier. Examples are:

RCL1234@kenosha.state.wi.us | SSAP131044@kenosha.state.wi.us RCL1234@kenoshajs.org | SSAP131044@kenoshajs.org

- Correct all values outside of domain (pre-directional, post-type, post-directional, parity, state, country) in the Road Centerline and Site/Structure Address Point data layers
 - a. Site/Structure Address Points
 - i. Legacy Type | 142, 50, 83, AV, F, HM, JR, LA, NEST, PKY, TERR, VALE, Z
 - b. Road Centerlines
 - i. Legacy Type | AV, LA, NEST, TR, VALE, VIEW



NOTE: If the Legacy Types are outside the USPS Pub 28 but match the legacy databases the type should be placed into the Street Name until the legacy databases can be updated.

See the WI and NENA standards reference in the Standards and Reference Documents section for acceptable values.

GIS Data Accuracy will increase to 99.01% Overall Accuracy will increase to 98.22%

- 5. Ensure the Emergency Service Boundaries and PSAP Boundaries are fully covered by the Provisioning Boundary.
- 6. Correct all Emergency Service and PSAP Boundary gaps and overlaps.
- 7. Correct all Road Centerline and Site/Structure Address Points not covered by the Provisioning Boundary
- 8. Correct all range overlaps in the Road Centerlines

GIS Data Accuracy will increase to 99.35% Overall Accuracy will increase to 98.65%

- 9. Correct all remaining critical errors (NG & WI):
 - a. Range From higher than To
 - b. Range Parity
 - c. Road Centerline complex geometry
 - d. Road Centerline multipart geometry
 - e. Road Centerline line in polygon & Site/Structure Address Point zone check (Incorporated Municipality value compared to the value in the Incorporated Municipality Boundary)
 - f. Site/Structure Address Point duplicates

GIS Data Accuracy will increase to 99.46% Overall Accuracy will increase to 98.94%

10. Correct all ALI to Road Centerline Errors

- a. Correct in the following order:
 - i. No matching street name found
 - ii. Address found multiple times and Address found multiple times on the same feature
 - 1. May already be resolved by correcting road centerline overlaps
 - iii. Address is higher/lower than compatible ranges
 - iv. Address falls in a gap in the compatible ranges
 - v. Address could not be found in the compatible ranges
 - vi. Address found only in a different ESN and/or Community
 - vii. ESN only if required by current systems



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Migrate Legacy street name elements to CLDXF street name elements

- 1. Add the eight (8) CLDXF street name elements or migrate to the WI NG911 Data Model
- 2. Populate fields using values from the four (4) legacy street name elements in the following order:
 - a. Legacy Street Name Pre Directional → Street Name Pre Directional
 - b. Legacy Street Name \rightarrow Street Name (temporary)
 - c. Legacy Street Name Type \rightarrow Street Name Post Type
 - d. Legacy Street Name Post Directional → Street Name Post Directional
 - e. Utilize the Street Name (temporary) field to populate the following fields:
 - i. Street Name Pre Modifier
 - ii. Street Name Pre Type
 - iii. Street Name Pre Type Separator
 - iv. Street Name Post Modifier
 - f. Update the Street Name field to contain only the street name (no other data for other elements)

NOTES:

- CLDXF must be fully spelled out and no abbreviations.
- If values are populated into the Street Name Pre Modifier field you will need to ensure the values for all other fields are correctly populated. Pre Modifier is BEFORE the pre directional.
- Pre Types and Pre Type Separators must follow the NENA registry (e.g. AVENUE, HIGHWAY, etc.). The full list can be found here:
 - Pre Types: http://technet.nena.org/nrs/registry/StreetNamePreTypesAndStreetNameP ostTypes.xml
 - Pre Type Separators: http://technet.nena.org/nrs/registry/StreetNamePreTypeSeparators.xml
- If values are populated into the Street Name Post Modifier you will need to ensure the values for all other fields are correctly populated. Post Modifier is AFTER the post directional.
- Examples are provided in the Wisconsin NG9-1-1 GIS Standard and will be provided during the educational sessions.

Correct all non-critical errors

- 1. Correct all Site/Structure Address Points to Road Centerline errors in the following order:
 - a. No house number
 - b. No matching street name found
 - c. Address found on multiple road segments
 - i. May already be resolved by correct road centerline overlaps
 - d. Address is higher/lower than compatible ranges
 - e. Address falls in a gap in the compatible ranges
 - f. Address could not be found in the compatible ranges



- g. Wrong side
- h. Address found only in a different ESN and/or Community
 - i. ESN only if required by current systems
- 2. Correct all remaining road centerline errors including but not limited to:
 - a. Segment not broken at boundaries (Mandatory attribution)
 - b. Segment topology snapping
- 3. Correct all ALI to Site/Structure Address Points in the following order:
 - a. No matching street name found
 - b. Address found multiple times
 - i. This may be an indication of missing sub-addressing values in the ALI and may not be correctable in the synchronization process utilizing the existing ALI format.
 - c. Address found with different house suffix
 - d. Address found with different unit designation
 - e. Address is higher/lower than existing house numbers
 - f. Address lies between existing house numbers
 - g. Address found only in a different ESN and Community
 - i. ESN only if required by current systems

Maintenance Recommendations

Maintenance begins when remediation of NG9-1-1 GIS data is critical error free and at or above 98% (best practice). The process of quality control and synchronization is a vital process within maintenance. The following items should be considered in maintenance.

Road Centerlines

- Add elevation for under / overpasses; this may be limited by the local CAD vendor – ensure no conflict prior to adding
- Align the centerlines with bordering cities, counties, and states; data must be "snapped" to borders with neighboring jurisdictions
- Convert 0-0 address ranges to NULL-NULL unless the local CAD software is not compatible or when there is a ½ address which requires a 0 range
- Reach out to military installations within the jurisdiction to obtain the most recent centerline data, if applicable
- Populate validation right / left fields to indicate which centerline should be used for validation | This will be valuable if converting to a GIS based MSAG.
 - N do NOT use for validation

Site / Structure Address Points

- Align address points to structures
- Create access points when required
 - Hidden entrances, multiple entrances, etc.
- Create points for structures with units or sub-address
 - Placement based on entrance type shared/non-shared



- Non-shared: at or near each addressed unit entrance
- Shared: may require stacked points
- o Points should fall within the building footprint

Other important items

- Create basic metadata (additional guidance to be development)
- Review the NENA Information Documents and Standards for changes and updates



Data	Received	
------	----------	--

9-1-1 Layer	County Layer Name	Notes
		Added and populated UniqueID for QC processing <i>will need to be added & populated</i> <i>locally for NG911</i>
		Separated out address range prefixes and converted range values to numeric values only
Road Centerlines	ROADS_2020	IncMuni refinement used for SSAP to RCL sync and RCL range overlaps
		MSAG Community refinement used for ALI to RCL sync
		No MSAG to RCL sync due to no MSAG provided
		Added and populated UniqueID for QC processing <i>will need to be added & populated</i> <i>locally for NG911</i>
Site Structure Address Points	Addresses_2020	Separated out full address field (ADDRESS) into a house number and full street field (there is a house number suffix field, where the info is not included in the full address, so this will allow for using the house number suffix info and provide more accurate results)
		Separated out house number prefixes and converted house number values to numeric values only
		IncMuni refinement used for SSAP to RCL SSAP duplicates
		MSAG Community refinement used for ALI to SSAP sync
ESN Boundary		
ESB Fire Boundary	Kenosha_Fire_2020.shp	
ESB Law Boundary	Kenosha_Law_2020.shp	
ESB EMS Boundary	Kenosha_EMS_2020.shp	
Provisioning Boundary	KENOSHA_ProvisioningBo undary	
PSAP Boundary	Kenosha_PSAP_2020.shp	
Incorporated Municipality Boundary	CTV_Jan_2020	GEOID field used for UniqueID field for QC processing
County Boundary	KENOSHA_CountyBoundar y	
		Converted text file to Excel
ALI	Kenosha Co MSAG Extract 2-4-21.txt	Removed VOIP, wireless, cell, etc. records prior to processing
MSAG		No MSAG provided

Field Mapping

PSAP Boundary

Descriptive Name	Field Name	Field Present (Local)	Local Field Name
Discrepancy Agency ID	DiscrpAgID	No	
Date Updated	DateUpdate	No	
Effective Date	Effective	No	
Expiration Date	Expire	No	
Emergency Service Boundary NENA Globally Unique ID	ES_NGUID	Yes	GlobalID
State	State	No	
Agency ID	Agency_ID	No	
Service URI	ServiceURI	No	
Service URN	ServiceURN	No	
Service Number	ServiceNum	No	
Agency vCard URI	AVcard_URI	No	
Display Name	DsplayName	Yes	CountyName

Emergency Service Boundary – Fire

Descriptive Name	Field Name	Field Present	Local Field
		(Local)	Name
Discrepancy Agency ID	DiscrpAgID	No	
Date Updated	DateUpdate	No	
Effective Date	Effective	No	
Expiration Date	Expire	No	
Emergency Service Boundary NENA	ES NGUID	Yes	GlobalID
Globally Unique ID		Tes	GiobaliD
State	State	No	
Agency ID	Agency_ID	No	
Service URI	ServiceURI	No	
Service URN	ServiceURN	No	
Service Number	ServiceNum	No	
Agency vCard URI	AVcard_URI	No	
Display Name	DsplayName	Yes	FireJurisd

Emergency Service Boundary – Law

Descriptive Name	Field Name	Field Present (Local)	Local Field Name
Discrepancy Agency ID	DiscrpAgID	No	
Date Updated	DateUpdate	No	
Effective Date	Effective	No	
Expiration Date	Expire	No	
Emergency Service Boundary NENA Globally Unique ID	ES_NGUID	Yes	GlobalID
State	State	No	
Agency ID	Agency_ID	No	
Service URI	ServiceURI	No	
Service URN	ServiceURN	No	
Service Number	ServiceNum	No	
Agency vCard URI	AVcard_URI	No	
Display Name	DsplayName	Yes	POLbeatID



Emergency Service Boundary – EMS

Descriptive Name	Field Name	Field Present (Local)	Local Field Name
Discrepancy Agency ID	DiscrpAgID	No	
Date Updated	DateUpdate	No	
Effective Date	Effective	No	
Expiration Date	Expire	No	
Emergency Service Boundary NENA Globally Unique ID	ES_NGUID	Yes	GlobalID
State	State	No	
Agency ID	Agency_ID	No	
Service URI	ServiceURI	No	
Service URN	ServiceURN	No	
Service Number	ServiceNum	No	
Agency vCard URI	AVcard_URI	No	
Display Name	DsplayName	Yes	MedJurisdi

Provisioning Boundary | County Boundary used

Descriptive Name	Field Name	Field Present (Local)	Local Field Name
Discrepancy Agency ID	DiscrpAgID	No	
Date Updated	DateUpdate	No	
Effective Date	Effective	No	
Expiration Date	Expire	No	
Provisioning Boundary NENA Globally Unique ID	PB_NGUID	Yes	GlobalID

Road Centerlines

Descriptive Name	NENA Field Name	Field Present (Local)	Local Field Name
Discrepancy Agency ID	DiscrpAgID	No	
Date Updated (Date Edited)	DateUpdate	No	
Effective Date	Effective	No	
Expiration Date	Expire	No	
Road Centerline NENA Globally Unique ID	RCL_NGUID	Yes	JOIN_ID
Left Address Number Prefix (<i>Address Prefix Left</i>)	AdNumPre_L	No	
Right Address Number Prefix (<i>Address Prefix Right</i>)	AdNumPre_R	No	
Left FROM Address (From Address Left)	FromAddr_L	Yes	Ladd1
Left TO Address (To Address Right)	ToAddr_L	Yes	Ladd2
Right FROM Address (<i>From Address Right</i>)	FromAddr_R	Yes	Radd1
Right TO Address (<i>To Address Right</i>)	ToAddr_R	Yes	Radd2
Parity Left	Parity_L	No	
Parity Right	Parity_R	No	



Descriptive Name	NENA Field Name	Field Present (Local)	Local Field Name
Street Name Pre Modifier	St_PreMod	No	
Street Name Pre Directional	St_PreDir	No	
Street Name Pre Type	St_PreTyp	No	
Street Name Pre Type Separator	St_PreSep	No	
Street Name (Base Street Name)	St_Name	No	
Street Name Post Type	St_PosTyp	No	
Street Name Post Directional	St_PosDir	No	
Street Name Post Modifier	St_PosMod	No	
Abbreviated Pre Modifier*			
Legacy Street Name Pre Directional	LSt_PreDir	Yes	MSAGpredir
Legacy Street Name	LSt_Name	Yes	MSAGpretype & MSAGstrname
Legacy Street Name Type	LSt_Type	Yes	MSAGstrtype
Legacy Street Name Post Directional	LSt_PosDir	Yes	MSAGstrdir
Full Street Name*		No	
Abbreviated Full Street Name*		No	
ESN Left (<i>Emergency Service Number Left</i>)	ESN_L	No	
ESN Right (<i>Emergency Service</i> Number Right)	ESN_R	No	
MSAG Community Name Left	MSAGComm_L	Yes	MSAGmunileft
MSAG Community Name Right	MSAGComm_R	Yes	MSAGmuniright
Country Left	Country_L	No	
Country Right	Country_R	No	
State Left (State Name Left)	State_L	No	
State Right (State Name Right)	State_R	No	
County Left (County Name Left)	County_L	No	
County Right (County Name Right)	County_R	No	
Additional Code Left	AddCode_L	No	
Additional Code Right	AddCode_R	No	
Postal Code Left (<i>Zip Code Left</i>)	PostCode_L	Yes	ZipLeft
Postal Code Right (Zip Code Right)	PostCode_R	Yes	ZipRight
Postal Community Name Left (Municipal Zip Code Name Left)	PostComm_L	No	
Postal Community Name Right (Municipal Zip Code Name Right)	PostComm_R	No	
Incorporated Municipality Left (Municipal Name Left)	IncMuni_L	Yes	Lmunic
Incorporated Municipality Right (Municipal Name Right)	IncMuni_R	Yes	Rmunic
Unincorporated Community Left	UnincCom_L	No	
Unincorporated Community Right	UnincCom_R	No	



Descriptive Name	NENA Field Name	Field Present (Local)	Local Field Name
Neighborhood Community Left	NbrhdCom_L	No	
Neighborhood Community Right	NbrhdCom_R	No	
Road Class (Road Classification)	RoadClass	Yes	Class
One-Way (The Flow of Routing)	OneWay	Yes	OneWay ("both" values are NULL instead of "B")
Speed Limit	SpeedLimit	Yes	Speed_FT
Validation Left	Valid_L	No	
Validation Right	Valid_R	No	

Site/Structure Address Points

Descriptive Name	NENA Field Name	Field Present (Local)	Local Field Name
Discrepancy Agency ID	DiscrpAgID	No	
Date Updated (Date Edited)	DateUpdate	No	
Effective Date	Effective	No	
Expiration Date	Expire	No	
Site NENA Globally Unique ID	Site_NGUID	Yes	JOIN_ID
Road Centerline NENA Globally Unique ID *	RCL_NGUID	No	
Country	Country	No	
State (State Name)	State	No	
County (County Name)	County	No	
Additional Code	AddCode	No	
Additional Data URI	AddDataURI	No	
Incorporated Municipality (<i>Municipal Name</i>)	Inc_Muni	Yes	Muni
Unincorporated Community	Uninc_Comm	No	
Neighborhood Community	Nbrhd_Comm	No	
Address Number Prefix	AddNum_Pre	No	
Address Number	Add_Number	Yes	HOUSENUM
Address Number Suffix	AddNum_Suf	No	
Street Name Pre Modifier	St_PreMod	No	
Street Name Pre Directional	St_PreDir	No	
Street Name Pre Type	St_PreTyp	No	
Street Name Pre Type Separator	St_PreSep	No	
Street Name (Base Name)	St_Name	No	
Street Name Post Type	St_PosTyp	No	
Street Name Post Directional	St_PosDir	No	
Street Name Post Modifier	St_PosMod	No	
Legacy Street Name Pre Directional	LSt_PreDir	Yes	MSAGpredir
Legacy Street Name	LSt_Name	Yes	MSAGpretype & MSAGstrname
Legacy Street Name Type	LSt_Type	Yes	MSAGstrtype



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Descriptive Name	NENA Field Name	Field Present (Local)	Local Field Name
Legacy Street Name Post Directional	LSt_PosDir	Yes	MSAGstrdir
Abbreviated Post Modifier*	FullStNm	No	
Full Street Name*	abFullStNm	No	
ESN	ESN	No	
MSAG Community Name	MSAGComm	Yes	MSAGmuni
Postal Community Name	Post_Comm	No	
Postal Code	Post_Code	Yes	ZIPCODE
ZIP Plus 4	Post_Code4	No	
Building (Building Identifier)	Building	No	
Floor (Building Floor)	Floor	No	
Unit	Unit	No	
Room (<i>Building Room</i>)	Room	No	
Seat (Seat Identifier)	Seat	No	
Additional Location Information	Addtl_Loc	No	
Complete Landmark Name	LandmkName	No	
Mile Post	Mile_Post	No	
Place Type	Place_Type	No	
Placement Method (Location Type)	Placement	No	
Longitude	Long	No	
Latitude	Lat	No	
Elevation	Elev	No	
Structure	Structure	No	

Incorporated Municipalities

Descriptive Name	Field Name	Field Present (Local)	Local Field Name
Discrepancy Agency ID	DiscrpAgID	No	
Date Updated	DateUpdate	Yes	DOACngDate
Effective Date	Effective	No	
Expiration Date	Expire	No	
Incorporated Municipality NENA Globally Unique ID	IncM_NGUID	Yes	GlobalID
Country	Country	No	
State	State	No	
County	County	Yes	CNTY_NAME
Additional Code	AddCode	No	
Incorporated Municipality	Inc_Muni	Yes	MCD_NAME

Counties or Equivalents

Descriptive Name	Field Name	Field Present (Local)	Local Field Name
Discrepancy Agency ID	DiscrpAgID	No	
Date Updated	DateUpdate	No	
Effective Date	Effective	No	
Expiration Date	Expire	No	
County NENA Globally Unique ID	CntyNGUID	Yes	GlobalID



Country	Country	No	
State	State	No	
County	County	Yes	CountyName



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