# GIS Implementation Framework

*New World Software - Tyler's Public Safety Division*

**Updated – 1/23/2019**

# 3 – Data Requirements

Geocoding in New World Software requires a Centerline GIS data set. An Address Point GIS data set is also recommended, if available. In addition to Geocoding data, the software requires polygon data to define response/reporting layers.

Other vector data (optional) can be stored in the Master Enterprise Geo Database for visualization on the maps in the software. Aesthetic GIS Datasets have no schema requirements.

The Tyler GIS team will provide additional data schemas in the Master Enterprise Geo Database for common names, pre-plans, and hydrant data as well as an alternate name table. For more information on the provided system generated feature classes, please contact the Tyler GIS Resource for the project.

Coordinate Systems and Projections:
- All Vector data to be utilized within the New World Software GIS configuration should be in a known Projected or Geographic Coordinate system.
- Custom Projections are not supported at this time.

Supplying GIS Data in a File or Personal Geodatabase is the recommended format due to the volatility of Shape Files in terms of Field Type stability as well as truncated Field Names

In each data set there are mandatory, data dependent proximity dispatch fields indicated. The field names listed in the schemas below are a suggestion. If there are fields represented in the current data that have different names than what are listed in the schema they are not required to be changed to the suggested field name. If the data is parsed out and populated in the field, it can be named however desired.

**Mandatory**: Required fields to be present in data set.
**Data Dependent**: Fields are only required if there is associated data. These fields should be parsed out and populated properly.

        Parsed out data examples:

| House Number | House Suffix | Pre Directional | Pre Type | Street Name | Post Type | Post Directional | Unit | Venue | Zip | Postal City |
|---|---|---|---|---|---|---|---|---|---|---|
| 163 | | E | STHY | 111 | | | A | Troy Township | 60954 | Troy |
| 805 | 1/2 | | | Windwood | Ave | | | Ann Arbor | 60901 | Ann Arbor |
| 1365 | | | | Stradford | Dr | W | | Marquette | 60914 | Marquette |

**Proximity Dispatch:** These fields are used if proximity dispatch will be used in the software. This will be defined in the contract. Please reach out to the Tyler Project Manager for questions.

## Address Point Data

**Address Point** – Optional GIS dataset for Geocoding. Multiple Address Point datasets can be used for Geocoding as sub-locators can be created and configured within the Composite locator.

Geometry: Point
Schema: **Mandatory** / **Data Dependent**

| Suggested Field Name | Data Type | Purpose |
|---|---|---|
| HouseNumber | Integer or Text | Address House Number |
| HouseSuffix | Text – 32 | Address House Number Suffix |
| PreDirectional | Text – 2 | Street Prefix Directional |
| PreType | Text – 10 | Street Prefix Type |
| StreetName | Text – 50 | Street Name |
| PostType | Text – 6 | Street Post Type |
| PostDirectional | Text – 2 | Street Post Directional |
| UNIT | Text – 32 | Street address Unit |
| Venue | Text – 32 | Unique Zone Parameter |
| Zip | Text – 20 | Zip Code |
| PostalCity | Text – 32 | Mailing / Postal City |
| JOIN_ID (Required to be 'JOIN_ID') | Long Integer | Foreign Key – NWS_ALTERNATE_NAME table |

## Network Dataset Data (Feature Dataset)

All GIS data that will participate in Routing. At least one Centerline dataset is required.

**Centerline** – required GIS dataset for GeoCoding and Routing. Multiple Centerline datasets can be used for GeoCoding as sub-locators can be created and configured within the Composite Locator. If multiple Centerline datasets are participating in Routing, they must reside within the Feature Data Set.

Within New World's Enterprise CAD is the ability to perform Proximity Dispatch, Area-Based Dispatch, or Prefer Proximity (a combination of proximity and area based). Proximity Dispatch functionality recommends closest available units to a call based upon an estimated time of arrival (ETA) in CAD Enterprise, whereas Area-Based Dispatch recommends units defined by a polygon layer. Prefer Proximity will use proximity but default to area-based if unit location data can't be resolved. Requirements for Proximity Dispatch to be used include the mobile application, AVL equipment, and the fields listed below.

Geometry: Line

Schema: **Mandatory** / **Data Dependent** / **Proximity Dispatch**

| Suggested Field Name | Data Type | Purpose |
|---|---|---|
| LeftFrom | Integer or Text | Left From Address Range |
| LeftTo | Integer or Text | Left To Address Range |
| RightFrom | Integer or Text | Right From Address Range |
| RightTo | Integer or Text | Right To Address Range |
| PreDirectional | Text – 2 | Street Prefix Directional |
| PreType | Text – 10 | Street Prefix Type |
| StreetName | Text – 50 | Street Name |
| PostType | Text – 6 | Street Post Type |
| PostDirectional | Text – 2 | Street Post Directional |
| LeftVenue | Text – 32 | Left Unique Zone Parameter |
| RightVenue | Text – 32 | Right Unique Zone Parameter |
| LeftZip | Text – 20 | Left Zip Code |
| RightZip | Text – 20 | Right Zip Code |
| LPostalCity | Text – 32 | Left Mailing / Postal City |
| RPostalCity | Text – 32 | Right Mailing / Postal City |
| MPH | Double | Segment Miles Per Hour |
| TIME | Double | Travel Time determined by MPH & SHAPE_Length |
| ONEWAY | Text – 2 | Direction of travel on digitized segment |
| Max_Height | Double | Routing restricted if Max Height of unit is > this value |
| Max_Weight | Double | Routing restricted if Max Weight of unit is > this value |
| T_ZLev & F_ZLev | Short Integer | Connectivity model restricting turns from different elevations |
| JOIN_ID (Required to be 'JOIN_ID') | Long Integer | Foreign Key – NWS_ALTERNATE_NAME table |

If proximity dispatch will be utilized, at a minimum ONEWAY and TIME fields need to be populated. Height Restrictions, Weight Restrictions and Z elevation fields are optional routing fields. The following is a breakdown of the proximity dispatch fields:

**Required Fields for Proximity Dispatch:**
**Segment Length or shape Length**-This is used for distance calculations for displaying driving directions and must be in known units for configuring the Network Dataset. New world requires units to be in feet.

**Travel Time-**This is used to find the fastest route on the map and must be in known units (typically minutes) for configuring the Network Dataset.

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The formula for calculating travel time is: [SHAPE_Length] / 5280 * 60 / [MPH]

**Speed Limit-** Not actually required in the Network Dataset, but these are a way to calculate the Travel Time Attributes, which are required for proximity dispatch

**One Way-One-Way valid values-** The two-character fields ONEWAY denotes the travel direction of the street. The field name and the one-way codes meet standardized Network Analyst naming conventions and will auto-populate into the network dataset creation wizard. The one-way codes are:

> **"FT" or "F"**—indicates a one-way street only permitting travel in the digitized direction of the edge.
> **"TF" or "T"**—indicates a one-way street only permitting travel against the digitized direction of the edge.
> **"N"**—indicates a street that does not permit travel in either direction.
> **"B" or any other value (including <null>)**—indicates a street that permits travel in either direction.

**Optional Routing Fields:**

**Height restrictions-** Restricts routing if max height of deployed unit is greater than this value. Unit will then be rerouted. This should be in **inches** to match the maintenance screens in the New World Systems software.

**Weight restrictions-** Restricts routing if max weight of deployed unit is greater than this value This should be in **pounds** to match the maintenance screens in the New World Systems software.

**T_ZLev & F_Zlev- Each should have their own field -** Defines the planarity of road segments. Can be utilized to differentiate elevation at overpasses.

Example: Underpass T_Zlev populated with 0. Overpass segment T_Zlev populated with 1. Now won't route off or onto overpass from underpass.

If not utilizing Z_Elev fields, having underpass/overpass segments overlapping will also prevent routing onto and off overpasses.

# Emergency Service Boundary Data

Polygon style Feature Classes related to Response Areas for a single service (Police, Fire, & EMS)

## Police_ORI – Jurisdictional Area/s for Law Enforcement, digitized into a single GIS data set depicting each police agency's geographical area. Each Area must contain a Unique ID and the Police ORI.

Geometry: Polygon

Schema:

| Field Name | Data Type | Purpose |
|---|---|---|
| **ID** (Required name to be 'ID') | Long Integer | Foreign Key – Area table in MSP DB |
| **DESCRIPTION** | Text – 20 | Issued Police ORI |

## Police_Response_Area/s – Police ORI data broken down into a single GIS data set identifying each agencies Police Response assignments. Each Area should have a unique simple description recognizing an agency's agreed upon naming conventions that will identify who responds first, second, or third. Each Area must also contain an ID that is unique within this dataset

Geometry: Polygon

Schema:

| Field Name | Data Type | Purpose |
|---|---|---|
| **ID** (Required name to be 'ID') | Long Integer | Foreign Key – Area table in MSP DB |
| **DESCRIPTION** | Text – 20 | Public Safety (CAD) simple naming convention |

## FDID – Jurisdictional Area/s for Fire, digitized into a single GIS data set depicting each fire agency's geographical area. Each Area must contain a Unique ID and the FDID number

Geometry: Polygon

Schema:

| Field Name | Data Type | Purpose |
|---|---|---|
| **ID** (Required name to be 'ID') | Long Integer | Foreign Key – Area table in MSP DB |
| **DESCRIPTION** | Text – 20 | Issued Fire FDID Number |

## Fire_Stations – (Optional) - FDID jurisdictional area/s broken down into Fire Stations area/s of coverage within a single GIS dataset. Each Area must contain a Unique ID and a simple description for each Fire Station

Geometry: Polygon

Schema:

| Field Name | Data Type | Purpose |
|---|---|---|
| **ID** (Required name to be 'ID') | Long Integer | Foreign Key – Area table in MSP DB |
| **DESCRIPTION** | Text – 20 | Fire Station Description |

## Fire_Response_Area/s – Fire Station/s data broken down into a single GIS data set identifying each agencies Fire Response assignments. Each Area should have a unique simple description recognizing an agency's agreed upon naming conventions that will identify who responds first, second, or third. Each Area must also contain an ID that is unique within this dataset

Geometry: Polygon

Schema:

| Field Name | Data Type | Purpose |
|---|---|---|
| **ID** (Required name to be 'ID') | Long Integer | Foreign Key – Area table in MSP DB |
| **DESCRIPTION** | Text – 20 | Fire Response Area Simple Description |

## EMS_ORI – Jurisdictional Area/s for EMS, digitized into a single GIS data set depicting each EMS agency's geographical area. Each Area must contain a Unique ID and the EMS number

Geometry: Polygon

Schema:

| Field Name | Data Type | Purpose |
|---|---|---|
| **ID** (Required name to be 'ID') | Long Integer | Foreign Key – Area table in MSP DB |
| **DESCRIPTION** | Text – 20 | Issued EMS ORI Number |

## EMS_Response_Areas – EMS ORI data broken down into a single GIS data set identifying each agencies EMS Response assignments. Each Area should have a unique simple description recognizing an agency's agreed upon naming conventions that will identify who responds first, second, or third. Each Area must also contain an ID that is unique within this dataset

Geometry: Polygon

Schema:

| Field Name | Data Type | Purpose |
|---|---|---|
| **ID** (Required name to be 'ID') | Long Integer | Foreign Key – Area table in MSP DB |
| **DESCRIPTION** | Text – 20 | Issued EMS ORI Number |