

# Kansas City Regional Trail Safety Initiative

## Public Safety 9-1-1 Sign Project

White Paper

April 2009



### Overview:

The Kansas City Regional Trails and Marking Initiative is intended to better serve visitors to park and green spaces throughout Kansas City by providing a higher level of public safety through 9-1-1. More specifically, this initiative affords park visitors the opportunity to communicate from their personal cellular phone an exact location to a 9-1-1 dispatcher, in the event of a need for fire, police or emergency medical services. Users communicate their location by sharing with the dispatcher the unique address of the nearest trail marker sign. This is accomplished through geo-referencing specific points along trails where traditional addressing is non-existent. Public safety personnel also have trail data and sign locations mapped on their 9-1-1 equipment to view areas and features not previously available.

## Needs:

The Kansas City regional area of approximately 4,400 square miles has an expanding network of trails and green spaces that traverse nine counties, 129 cities, towns, and rural township districts. There are approximately 700 miles of existing recreational trails maintained by various jurisdictions. Uses of these trails include walking, jogging, cycling, skating, etc. as well as community festivals and charity functions. Community visioning surveys show that recreational trail systems are popular and expansion is publicly supported. At issue is the means by which a trail/green space consumer could communicate the need for emergency services and identify a location whereby resources could be directed. The primary goal of such a program is to serve the end-user of emergency services in the most effective and efficient manner. The use of location information alone provided by wireless carriers does not completely meet that goal. The addressing and signage appearance should be consistent throughout the region to facilitate public recognition of the system for emergency needs.

## Best Practices:

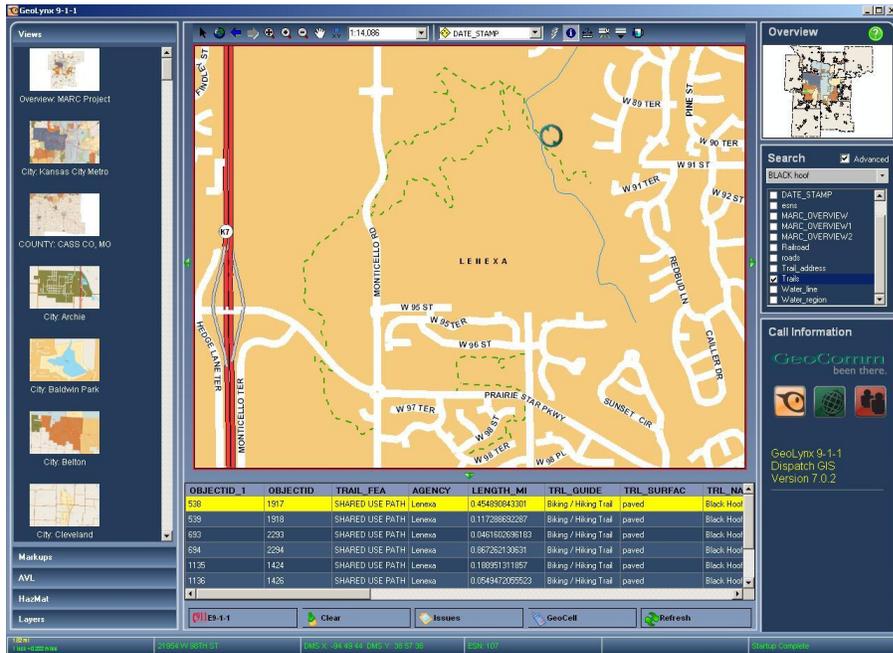
- 1) Adoption of regional trail marker address grid
- 2) Mapping of trails and green spaces
- 3) Designation of sign placement
  - a. Cell phone testing
  - b. Determining sign address
- 4) Coordinate integration of sign address data into 9-1-1 systems
- 5) Sign hardware and installation
- 6) Training of emergency personnel
- 7) Public education

### **1) Adoption of Regional Trail Marker Address Grid**

An essential component to ensuring proper trail address coordination at the regional level is the adoption and utilization of a region-wide trail addressing grid. This grid is designed to service each municipality's trail addressing needs, provide full coverage for Greater Kansas City, and produce a simple numbering system that can be displayed on small signs along trails.

The address grid is constructed of equidistant north-south lines spaced at 400 foot intervals. Each grid is assigned a unique identifying number. This unique number is independent of existing street based addressing grids, most importantly due to the non-existence of a common street based region-wide address grid.





### 3) Sign Placement Essentials

Sign placement is determined through a two-step process to ensure unique trail addressing across the region. The first of these steps is the completion of a cell phone test and the second is to assign addresses to the determined sign locations.

#### Cell Phone Testing

It is paramount to the success of this initiative to remember end-users will be contacting 9-1-1 via a cellular device. This being taken into consideration, and coupled with an effort to ensure sign placement at strategic locations, the following cell phone testing techniques are recommended.

Locations at which signs will be placed will be determined by each organizing jurisdiction. The geographic coordinates of these sign locations should be noted and stored electronically in database or spreadsheet file. Ideally, coordinates for these locations would be stored in GIS format. Optionally, geographic coordinates associated with each sign location can be more precisely determined by utilizing GPS to collect the sign location. Capturing locations with a GPS device will better ensure the accuracy of all aspects of the cell phone testing analysis and sign placement locations. It is recommended that coordinates captured via a GPS device also be stored in GIS format. Data collected may be found in Appendix II.

Next, calls to 9-1-1 should be made from cellular devices being serviced by multiple cellular providers from each candidate location. Placing calls from cellular devices with different service providers will demonstrate the distribution of 9-1-1 dispatch centers from a given location. This distribution is essential for

each agency to note as they move forward with the implementation and training phases of the project. This will be discussed in more detail later in this document.

All calls being made to 9-1-1 should be placed by a law enforcement or authorized professional to ensure no suspicion of improper utilization of 9-1-1 protocols. It is recommended that the caller identify themselves as follows. "This is (police officer or rank + full name) from ... Agency Name. We are conducting a cellular accuracy test as part of the Kansas City Regional Trail Safety Initiative. May I ask the name of the agency I am speaking to as well as the coordinates displayed for this call?" The 9-1-1 center name and the coordinates shared from the dispatcher should be noted for the location from which the call is being placed. It may also be beneficial when coordinating the test calls to consider having a print-out of calls made to very accurately capture the call data.

Upon completion of the field portion of the cell study as described above, it is recommended that documented cellular phone coordinate data be mapped using GIS technology, and analyzed to compare the location of the pre-determined/GPS location versus the coordinates determined by cellular carriers. The result of this analysis will identify those locations where less accurate coordinates are being generated by cellular carriers. These locations should be considered target locations for sign placement.



### Determining Sign Address

Upon completing the cell phone analysis phase of the project, the organizing jurisdiction is now prepared to finalize the location of signs. Once sign locations are determined, an address is necessary for each location point. In an effort to ensure consistent, systematic sign addressing for the entire region, it is recommended that each organizing agency implement the following techniques to determine the address of each sign.

First, each address administrator should visually examine the location of the existing trail and recommended trail sign location in relation to the regional trail

marking grid. It is recommended that examination and determination of addresses be assisted by utilization of GIS technology.

Second, it is paramount to note each grid is assigned a unique 3 digit number. These grids are arranged in ascending numeric order from 200 – 710, starting at the western edge of the region and moving east. This range of grid identifiers affords the ability to increase the coverage area in either direction to accommodate future growth of the region. The grid in which the sign is located determines the first three numeric components of the address. With the first three numeric values of the address determined, it is now the responsibility of the address administrator to determine the next two numeric values to include in the address. These two values are generated by visually examining the location of the sign and comparing its location to a percentage of the north/south extent of your agency's boundary. The north/south extent of your agency's boundary for which you determine the location will thus comprise the final two numeric components of the address. It is very important to take into account any future trail expansion within the same grid at different locations in the jurisdiction and the affect this may have on selecting the final two numeric values.

The final component of the sign's address will be comprised of two alpha characters that correspond to the jurisdiction and first responding law enforcement agency. This information can be found in Appendix III.

The following is an example of a completed sign address:

**32282LN**

322 = Grid number

82 = North/south percentage of the city's boundary at which the sign is located

LN = Lenexa – Local jurisdiction

Snapshot image of several completed sign addresses:

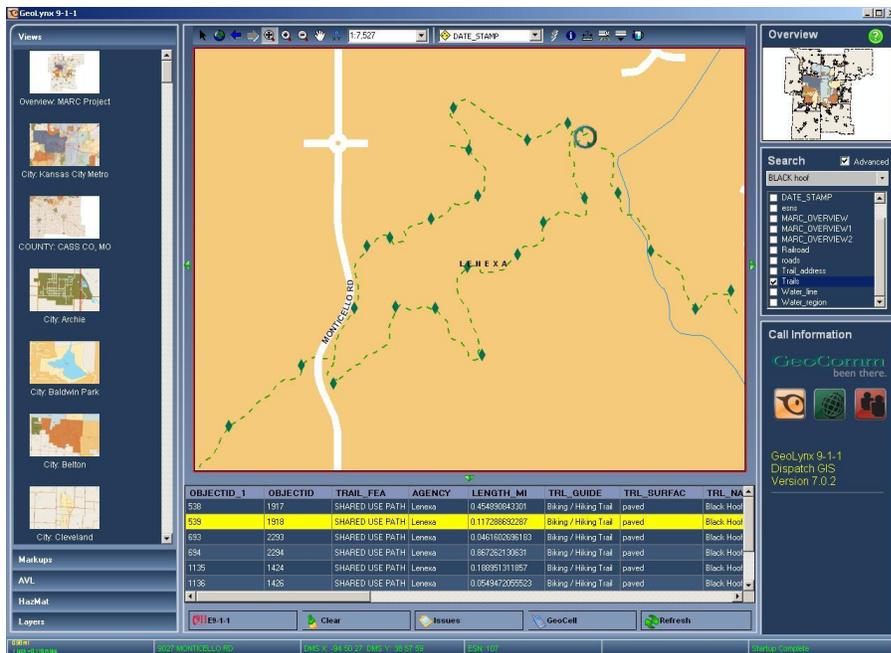


#### 4) Coordinating integration of sign address into 9-1-1 systems

Once addresses have been assigned, it will be essential to partner with MARC 9-1-1 as well as the local dispatch center in an effort to integrate trail sign address information into necessary dispatch software. This will ensure the ability of 9-1-1 staff to accurately dispatch the correct emergency personnel and equipment to the caller. It will be essential that each agency coordinate the integration of addresses with each of the 9-1-1 centers contacted during the cellular study previously discussed.

CAD mapping systems can help emergency responders locate best available trailhead or access points to efficiently respond to emergencies. Additionally, fire and medical response services can set up protocols for each location to dispatch the necessary equipment relative to the need. For example, in the case of a trail user who has become non-ambulatory due to a fall in a remote area, special equipment such as ATV's could immediately be dispatched according to pre-established protocols for the location. This saves evaluation time in deciding what equipment is needed and how such equipment can access the emergency.

It will also be essential to distribute any changes to appropriate 9-1-1 centers. Examples of changes include the addition/subtraction of signs or addition/subtraction of trails. Any changes to signs and/or trails should be provided to MARC 9-1-1 staff in a timely fashion.



## 5) Sign Hardware

Consistent sign hardware is essential to give visitors to parks and green spaces a consistent product they can identify and utilize in the event of an emergency. Design specifications for this product can be found in Appendix IV.

Volunteer groups are a great resource for free or low-cost help. Many groups are consistently looking for ways to assist with community based projects. The Lenexa pilot project received assistance from a local Boy Scout troop for installation of signs and poles.

Example of a placed sign:



## 6) Training of Emergency Personnel

MARC 9-1-1 staff has provided information to 9-1-1 personnel about trail data incorporated into the 9-1-1 system. There are additional search features available to dispatchers; therefore, training of emergency personnel is imperative to ensure the resources are fully utilized.

## 7) Public Education

It is recommended that each organizing agency coordinate with MARC's Public Outreach staff to coordinate an advertising campaign that will highlight the adoption of this program in your community. Examples of education could include community forums, city council meetings, media events, websites and city-wide newsletters.

### Appendix I - Required fields for trails mapping

When submitting a map layer depicting trails to MARC 9-1-1 staff, it is recommended that each trail include the following information associated with each trail segment:

Trail Name- Name of Trail as assigned by jurisdiction

Park Name- Name of Park as assigned by jurisdiction

Municipality – the jurisdiction in which the trail segment is located

Agency – the agency responsible for the maintenance of the trail segment

Date Modified- Date data was added or modified

Surface\_Type – What surface is the trail made of: asphalt, concrete, gravel, dirt, etc.

Surface\_Width – average width of trail segment in feet

## Appendix II – Cell Phone Study Data Collected

Carrier- What cell phone provider was used to make the test call

Towers- What cell tower did the call come from (address)

Coordinates- Using the GPS device

9-1-1 Agency- Where the 9-1-1 test call delivered to

Phase- Was the test 9-1-1 call delivered with Phase I and II data

Deviation from location- How many feet was the callers location vs. where the call plotting in the 9-1-1 dispatch center

Appendix III - Public Safety Issuing Unit Codes:

| CITY CODE | TOWN                 | CITY CODE | TOWN                 | CITY CODE | TOWN                            |
|-----------|----------------------|-----------|----------------------|-----------|---------------------------------|
| AR        | ARCHIE               | HA        | HARRISONVILLE        | OL        | OLATHE                          |
| AV        | AVONDALE             | HN        | HENRIETTA            | OR        | ORRICK                          |
| BA        | BASEHOR              | HD        | HOLT                 | OS        | OSAWATOMIE                      |
| BE        | BELTON               | HV        | HOMESTEAD VILLAGE    | OP        | OVERLAND PARK                   |
| BI        | BIRMINGHAM           | HS        | HOUSTON LAKE         | PA        | PAOLA                           |
| BS        | BLUE SPRINGS         | IT        | IATAN                | PV        | PARKVILLE                       |
| BO        | BONNER SPRINGS       | IN        | INDEPENDENCE         | PE        | PECULIAR                        |
| BK        | BUCKNER              | JA        | JACKSON COUNTY       | PC        | PLATTE CITY                     |
| BU        | BUCYRUS              | JO        | JOHNSON COUNTY       | PL        | PLATTE COUNTY                   |
| CA        | CAMDEN               | KC        | KANSAS CITY, MO      | PW        | PLATTE WOODS                    |
| CP        | CAMDEN POINT         | KK        | KANSAS CITY, KS      | PH        | PLEASANT HILL                   |
| CS        | CASS COUNTY          | KE        | KEARNEY              | PV        | PLEASANT VALLEY                 |
| CL        | CLAY COUNTY          | LA        | LAKE ANNETTE         | PR        | PRAIRIE VILLAGE                 |
| CO        | CLAYCOMO             | LL        | LAKE LOTAWANA        | PT        | PRATHERSVILLE                   |
| CV        | CLEVELAND            | LQ        | LAKE QUIVIRA         | RA        | RANDOLPH                        |
| CR        | CREIGHTON            | LT        | LAKE TAPAWINGO       | RC        | RAY COUNTY                      |
| CY        | CRYSTAL LAKES        | LW        | LAKE WAUKOMIS        | RM        | RAYMORE                         |
| DS        | DE SOTO              | WI        | LAKE WINNEBAGO       | RT        | RAYTOWN                         |
| DB        | DEARBORN             | LP        | LANSING              | RV        | RAYVILLE                        |
| DX        | DREXEL               | LA        | LAWSON               | RC        | RICHMOND                        |
| EL        | EAST LYNNE           | LC        | LEAVENWORTH COUNTY   | RG        | RIDGELY                         |
| EA        | EASTON               | LV        | LEAVENWORTH, CITY OF | RB        | RIVER BEND                      |
| ED        | EDGERTON, KS         | LW        | LEAWOOD              | RS        | RIVERSIDE                       |
| EG        | EDGERTON, MO         | LS        | LEE'S SUMMIT         | RP        | ROELAND PARK                    |
| EV        | EDWARDSVILLE         | LN        | LENEXA               | SH        | SHAWNEE                         |
| EM        | ELMIRA               | LY        | LEVASY               | SB        | SIBLEY                          |
| EE        | EXCELSIOR<br>ESTATES | LB        | LIBERTY              | SM        | SMITHVILLE                      |
| ES        | EXCELSIOR<br>SPRINGS | LI        | LINWOOD              | SH        | SPRING HILL                     |
| FW        | FAIRWAY              | LJ        | LONE JACK            | ST        | STRASBURG                       |
| FR        | FARLEY               | LO        | LOUISBURG            | SC        | SUGAR CREEK                     |
| FV        | FERRELVIEW           | MR        | MERRIAM              | TN        | TONGANOXIE                      |
| FM        | FLEMING              | MI        | MIAMI COUNTY         | TY        | TRACY                           |
| FT        | FONTANA              | MS        | MISSION              | UV        | UNITY VILLAGE                   |
| FL        | FORT<br>LEAVENWORTH  | MH        | MISSION HILLS        | VL        | VILLAGE OF LOCH LLOYD           |
| FE        | FREEMAN              | MW        | MISSION WOODS        | VR        | VILLAGE OF RIVERVIEW<br>ESTATES |
| GC        | GARDEN CITY          | MC        | MISSOURI CITY        | WL        | WEATHERBY LAKE                  |
| GD        | GARDNER              | MY        | MOSBY                | WE        | WEST LINE                       |
| GL        | GLADSTONE            | NK        | NORTH KANSAS CITY    | WS        | WESTON                          |
| GN        | GLENAIRE             | NM        | NORTHMOOR            | WW        | WESTWOOD                        |
| GV        | GRAIN VALLEY         | OG        | OAK GROVE            | WH        | WESTWOOD HILLS                  |
| GR        | GRANDVIEW            | OA        | OAKS                 | WT        | WOOD HEIGHTS                    |
| GW        | GREENWOOD            | OV        | OAKVIEW              |           |                                 |
| GC        | GUNN CITY            | OW        | OAKWOOD              |           |                                 |
| HR        | HARDIN               | OK        | OAKWOOD PARK         |           |                                 |

Appendix IV - Sign Specifications

All signs should adhere to the following material and design specifications:

Sign size: 6" wide x 18" tall x .080" thick.

Sign material: Prefinished white aluminum with .5" radius corners and .375" diameter holes

Sign colors:

NAZDAR 59000 series:

59204 Bright Red

59410 Yellow

59422 Reflex Blue

59111 Black

Sign font: Arial

Sign placement height: It is recommended that signs should be fixed on posts so the bottom of the sign is no closer than 40" from trail surface ground level and no higher than 72" from trail surface ground level.

Sign post: Existing infrastructure (sign posts, bridges, etc.) can be used to affix sign if necessary. Agencies oftentimes choose to place signs on existing infrastructure in an effort to reduce costs and reduce numbers of man-made structures in open-space environments. If new posts are being set, jurisdiction standard posts should be utilized. Signs should be posted in a double-sided fashion, if necessary.

