Kansas City Regional Trail Safety Initiative

Public Safety 9-1-1 Sign Project

White Paper

June 2010

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.

This regional effort is coordinated through Mid-America Regional Council, commonly referred to as MARC.

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 and assist in efficient call handling during emergency situations.

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
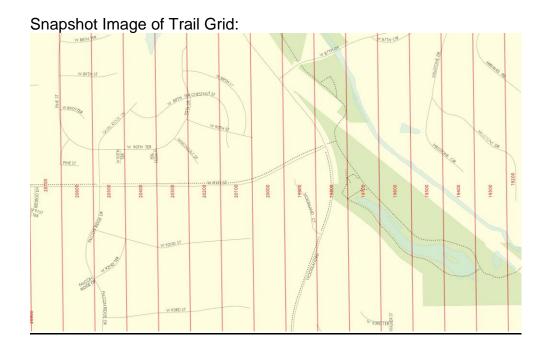6) Training of emergency personnel
7) Public education

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 the Greater Kansas City area, 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.

This comprehensive region-wide grid offers all users a consistent product from which to precisely determine sign addresses and subsequently afford public safety personnel the ability to respond to emergencies efficiently.
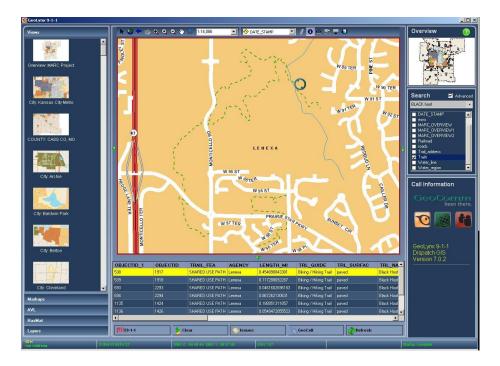
Snapshot Image of Trail Grid:

How to obtain the grid
This grid can be obtained in GIS format by contacting Saralyn Hayes, 9-1-1 Manager, MARC, at shayes@marc.org or 816-701-8314.

Mapping of Trails and Green Spaces
Since many trails are off roadways and in remote locations, integrating trail data into the 9-1-1 system is imperative. It is the responsibility of each local jurisdiction to build or obtain trail data. Required fields for each trail segment are located in Appendix I. All trail data should be provided to MARC 9-1-1 staff for incorporation into the regional 9-1-1 system.

Sign Placement Essentials

Sign placement is determined through a two-step process to ensure unique trail addressing across the region.

1- The completion of a cell phone test
2- Visual and historical study to determine possible high usage areas

Cell Phone Testing

It is paramount to the success of this initiative to remember end-users will in all likelihood 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 a 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 map grade 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.

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.

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 himself 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 request the test calls be printed to capture location detail.

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 important 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 first responding law enforcement agency. This information can be found in Appendix II.

Draft sign addresses should be provided to MARC Public Safety staff to review and compare against other sign data to ensure no duplicate addresses have been assigned by other jurisdictions. 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

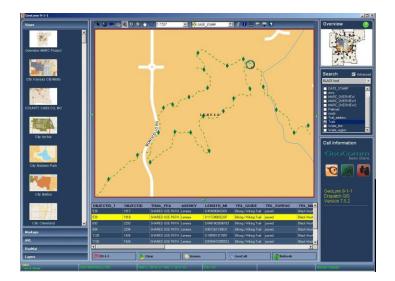Snapshot image of several completed sign addresses:

Coordinating integration of sign address into 9-1-1 systems
Once addresses have been assigned, it will be essential to partner with MARC 9-1-1as 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.

Agency 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 Public Safety staff in a timely fashion for incorporation in the regional map data used by 9-1-1 personnel.

Screen shot from 9-1-1 mapping software with trails and trail sign points

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 III.

Volunteer groups are a great resource for free or low-cost help. Many groups are constantly 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 posts.

Example of a placed sign:

Training of Emergency Personnel

MARC Public Safety 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. A training flyer for 9-1-1 personnel is provided in Appendix IV.

Public Education
It is recommended that each jurisdiction coordinate a positive campaign highlighting the adoption of a trail 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 Public Safety staff, it is recommended that each trail include the following information associated with each trail segment:

Trail Name- Name of Trail as assigned

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 - 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 ESTATES	LB	LIBERTY	SM	SMITHVILLE
ES	EXCELSIOR 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 LEAVENWORTH	MH	MISSION HILLS	VL	VILLAGE OF LOCH LLOYD
FE	FREEMAN	MW	MISSION WOODS	VR	VILLAGE OF RIVERVIEW E
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 III - Sign Specifications

Signs may be attached to existing infrastructure or posts.

Signs should adhere to the following material and design specifications:

Sign size: 6 to 8" wide x 18" tall x .080" thick.

Sign material: Prefinished white aluminum with 1" radius corners and .375" diameter holes

Sign colors: NAZDAR 59000 series:
              59204 Bright Red
              59422 Reflex Blue
              59410 Yellow
              59111 Black

Sign lettering: Arial, FHWA Series E
                         Vinyl die cut letters 1/7" tall
                         Type III- High intensity prismatic sheeting with red and blue
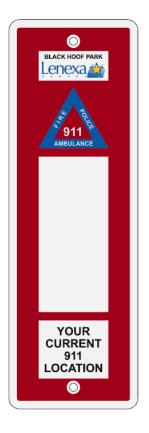   Translucent Inked Screening
                         Black die cut adhesive vinyl letters and numerals applied to sign face and covered with 3M protective overlay film (for graffiti protection)

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 can be two sided or posted in a double-sided fashion.

BLACK HOOF PARK

Lenexa

FIRE POLICE
911
AMBULANCE

YOUR
CURRENT
911
LOCATION

7/8"
copy
not included
↓

A
B
C
1
2
3

Appendix IV

GeoLynx Trail Mapping Information

Recently, two new map layers were added to the GeoLynx mapping software. The first map layer reflects trail data from parks and recreational areas. The trail is displayed as a dashed green line. The other layer added includes the location points of trail sign markers, which will give telecommunicators information to help determine the exact location of the caller (see image below).

Trail Name & Community Logo

Address & two-character Community Code

Only a few trails currently have trail sign markers. These markers contain a specific identifier using a regionwide grid system and two-character city identifier to help a caller and telecommunicator pinpoint their exact location if they should need to call 9-1-1.

Search Options:

Search by Trail Name

Use the search pane to find a location by entering the trail's name. To get a drop-down listing, click on the arrow to scroll through a list of street names and trails.

The interactive search pane must be used to locate a specific trail sign marker. The "Advanced" button must be selected [☑ Advanced] to use the search function.

It is important to select the correct layer in which to search: "Trail_address" for sign points or "Trails" for dashed trail lines.

<u>Search by Sign Information</u>
Using the address and two-character community code provided by the caller, i.e. 32171LN, type the information into the search window and hit ENTER on the keyboard. This will list the searched information in the window below the map. Double-click on the item to plot it on the GeoLynx map.

Also, by selecting the [🛈 Identify] feature from the top tool bar, each trail or sign point [◆] can be selected to bring up an information window for that location.