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# **White Paper: Redefining Government Communication With QR-Codes**

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## **Introduction**

Quick Response Codes, or QR-codes, may seem like just another barcode that can be used for labeling products or providing an aid in inventory systems; but in Manor Texas, they are used for much more, including citizen communication, emergency management and at historical sites. QR-codes are two dimensional barcodes that can be generated at no cost and subsequently decoded at no cost on most newer-model camera phones.

## **The Challenge**

The City of Manor was faced with the challenge of how to engage citizens, businesses and tourists by utilizing mobile technology on a very limited information technology budget.

## **The Solution**

After extensive research on barcode standards, the City of Manor elected to utilize QR-codes for document management because of the ability to decode the barcodes using a cell phone. As the document management program advanced, management soon realized that QR-codes could be used as a new method of communication with residents as well as for economic development and tourist information. QR-codes provide residents information on-demand and add an additional layer of transparency to government that never previously existed.

### ***Overview***

Manor deployed QR-coded “Digital Stop” signs throughout the community two years ago, to provide residents with on-demand information. Manor chose to configure each QR-code sign as a hyperlink to web content as opposed to embedding content within each barcode. Using an online QR-code generator (listed in the resources section), the City of Manor was able to encode specific URLs onto each QR-code. The benefit of embedding a hyperlink in a QR-code is that content can be changed at any time without having to generate a new QR-code. For example, let’s say a URL is embedded in a QR-coded sign to a website with information about one of the city’s construction projects. If any information changes during construction project, the website can be updated without modifying the original QR-code. Utilizing this system gave the City of Manor the flexibility to update information and change the placement of signs without additional cost.

### ***The Way The System Works***

After installing free decoding software (listed in the resources section), an individual can scan a City of Manor QR-code with their camera phone. They are taken directly to the linked site or prompted with the embedded URL. Although each QR-code appears to be the same image, each links to separate websites relevant to their location and placement.

# Physical Sign Configuration



Version 1.0 of the City of Manor's QR-code solution consisted of a QR-code printed on a 24" x 18" laminated aluminum (0.040 gauge) sign mounted on a standard street sign pole or mounted on a chain link fence as shown to the left.

Under the same version, the City of Manor also printed a few 48" x 48" laminated aluminum (0.040 gauge) signs for placement at high-visibility locations as you enter the city along the key highway.





Version 2.0 of the City of Manor's QR-code solution consisted of the same sign specifications as above, but also utilizes RFID tags that provide another means of receiving information.

Version 3.0 (Not yet deployed) of the City of Manor's QR-code solution utilizes the same sign specifications as the previous two versions, but adds a networked RFID reader instead of an RFID tag. More information about Version 3.0 will be forthcoming in the next few months.

## Implementation

The City of Manor QR-code campaign was implemented in multiple phases to allow management to more accurately gauge and tweak the effectiveness of the program. The preliminary step toward achieving a successful QR-code campaign was to first identify potential uses of the technology. Next the City of Manor utilized a phased deployment approach to measure and gauge sustainability at each step.

### *First Phase: Pre-deployment Education*

One month before the first stage of deployment, the City of Manor launched an educational campaign utilizing the local newspaper to tease and gauge initial interest in the technology. An example of one of the advertisements can be seen below:




Each week, additional teaser information was added to the initial advertisement, and on the final week the City of Manor provided full information about how to install the QR-code reader on a cell phone.

***Second Phase: Pilot Deployment***

This phase of deployment involved a small scale launch of the fixed-mounted QR-code solution developed by the City of Manor. The City of Manor's pilot consisted of 8 fixed-mounted QR-code signs placed throughout the community. The City of Manor initiated the pilot in coordination with the launch of our SmartPark and wireless mesh.



## City of Manor Pilot QR-Code Locations




The map displays the City of Manor, Texas, with eight red circular markers numbered 1 through 8 indicating QR-code locations. The markers are placed at various points of interest: 1. Bloor Mansion (near US Hwy 290 E), 2. Old Elevated Tank (near W Catrine Manor Rd), 3. New Elevated Tank (near Old TX-20), 4. Manor New Tech High School (near S Lexington St), 5. Manor Methodist Church (near E Parsons St), 6. Downtown District (near S Lexington St), 7. Jennie Lane SmartPark (near W Murray Ave), and 8. James Manor Grave Site (near S Lexington St). Major roads shown include US Hwy 290 E, Old TX-20, W Murray Ave, W Parsons St, W Catrine Manor Rd, and Blake Manor Rd. A legend below the map lists the locations corresponding to the markers. To the right of the legend is a QR code labeled 'CITY OF MANOR SMART TOUR'.

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<b>1. Bloor Mansion</b>	<b>6. Downtown District</b>
<b>2. Old Elevated Tank</b>	<b>7. Jennie Lane SmartPark</b>
<b>3. New Elevated Tank</b>	<b>8. James Manor Grave Site</b>
<b>4. Manor New Tech High School</b>	
<b>5. Manor Methodist Church</b>	

**CITY OF MANOR**



**SMART TOUR**

After the completion of a 6-month pilot test the City of Manor used the results of the campaign to identify potential changes that needed to be made. It was at this point that the City of Manor determined that the URL embedded into the QR-codes should generally be no more than 60 characters. This prevents pixilation of the barcode to better accommodate various camera phone resolutions (examples below). In order to keep the embedded characters at a minimum, the use of URL compression technologies such as Tiny URL can be utilized as an alternative.

### Examples of QR-codes With Varying Lengths

**18-character URL**  
<http://www.cnn.com>



**87-character URL**  
<http://www.cnn.com/2009/US/09/23/california.runners.missing/index.html?iref=mpstoryview>



#### ***Third Phase: Full QR-Code Roll Out***

This phase increased the total number of fixed-mounted QR-code signs to 24, placed on various structures throughout Manor. The City of Manor also used this phase to tag additional physical infrastructure that residents have inquired about. For instance, the sewer lift-station shown on the next page has a QR-code placed on the outside that when scanned, takes the end-user to a wiki page with a step-by-step process of how the system works.



In addition to the fixed-mounted QR-code signs, the City of Manor has also deployed QR-codes on most city vehicles (picture below). The QR-codes are 16" x 15" laminated car magnets that have been placed on each side of public works vehicles as well as the trunks of the police cars. The benefit of having QR-codes on city vehicles is that they are the most visible representation of a city on a daily basis and provides a unique branding opportunity. If an employee is pumping gas in their city vehicle, and a resident is curious about the barcode on the side of their vehicle, the employee can actually demonstrate how it works utilize his truck.



Eventually, the City of Manor will tie the QR-codes on city vehicles into a realtime work order system so that if a resident is curious about why a city vehicle is in their neighborhood, they