

# GISette

City of Marlborough  
Massachusetts



A quarterly newsletter to keep people informed of updates and changes to the City's Geographic Information System

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**Welcome** to the fourth edition of the *GISette*, a quarterly publication designed to keep people informed on what's happening with the city's GIS, data updates and ongoing developments. Although it is my primary consideration to convey information directly related to Marlborough's ever expanding GIS system, I will also attempt to include other items that highlight spatial resources and their impact on our everyday life.

## GIS and Mapping Related News

- The **NEW** and improved GIS website is now available internally and will be made public this summer! See page 3 for the links. This topic will be the focus of the next *GISette*.
- In the ongoing saga of FEMA's new Flood Insurance Rate Maps (FIRM), I can report that they have in fact acknowledged that some of the new maps may require additional review. FEMA has hired a number of consultants to review the maps and address the issues of inaccuracy. Some of these errors have put homeowners in the difficult position of having to prove the maps are incorrect and they are not in the potential flood zones that FEMA and the maps claim they are. Marlborough is working with one of FEMA's consultants to ensure that the correct information is used to reassess the FIRM maps that cover the city.

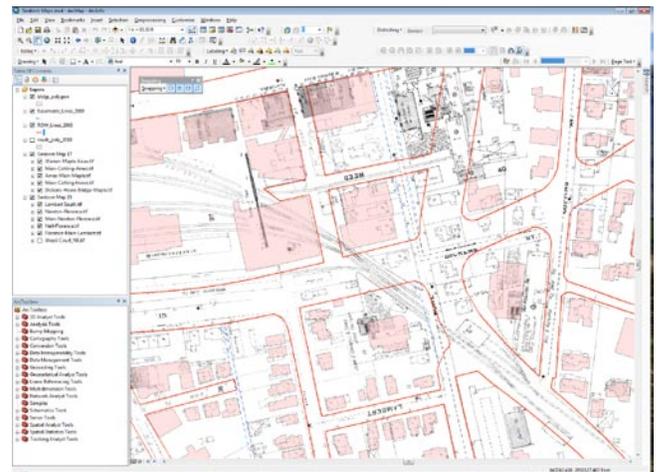
## INSIDE THIS ISSUE

- 1 Old Maps Give New Information
- 1 News
- 2 Spotlight – Marlborough's Snow Operations
- 2 Old Maps Continued
- 3 Address Points

## Old Maps Shed New Insight

*Historic maps give us new data*

Every now and again I decide I need a break from whatever it is I'm currently working on and I start to think about what might be more fun to work on. We've all been there. Inevitably, it is in these times that my list of pet projects begins to grow. Most of them never really materialize, but every once in a while, one of them gains some momentum. A few years back, the stars aligned and I decided to take some of our old and historic maps and attempt to input them into our present day GIS.



1896 Map overlaid with current streets and buildings (in red and pink)

The process involves scanning the maps into the computer and then geo-referencing them so that they line up with known landmarks. I primarily used the edges of roadways and some buildings that had stood at the time the maps were produced. To my surprise, this worked much better than I anticipated. The process is time consuming and I suspect that this will be a long and drawn out project. However, in the short time I have worked on this and the limited numbers of maps that have been scanned so far, certain patterns and information have become immediately obvious.

*Continued on page 2*

## SPOTLIGHT

### *Marlborough's Snow Operations*

It's early June, and like all good New Englanders, we look back at the difficult snow laden winter that's just passed with a certain yankee pride. We press on, because that's just what we do. But we often overlook the men and women who work tirelessly to clear all of that 'other' snow. That 'other' snow that's not in our driveways or on our front walks but everywhere else.

The snow and ice program in Marlborough is second to none. It is planned for down to the last detail months in advance and executed with military precision. *"I believe that planning is the key to our success"* says Tom Temple who runs the snow operation. GIS has helped him with that planning. *"I believe that GIS mapping has played a major role in contributing to this department's success and efficiency in our emergency snow and ice program".*

The program consists of 11 salting routes, 19 sanding routes, 5 plow sections and 5 sidewalk sections. All told, they treat over 500 streets for a rough distance of 520 lane miles and involve over a hundred personnel. Organizing the sheer volume of men and material can be a daunting task.

Mapping has been a great asset to the program. All participants receive maps of their individual routes at the beginning of the season. They know where they and everyone else is supposed to be during a storm. When problems arise, and they always do, reallocating men and equipment is made easier by the ability to see on a map where your assets are and who can cover problem areas without jeopardizing the operation as a whole. Tom has really embraced GIS and adds that *"mapping has provided us with the ability to respond immediately thus saving valuable time and treating our roads more efficiently".*

### *Old Maps (cont.)*

Most of us are probably aware of Marlborough's ties to the shoe industry. The city has been home to many large shoe institutions dating back to 1836. By the time the maps I am using were printed, 1896, the shoe industry was in its heyday. I started with the maps that cover the area downtown first. It seemed like an obvious place to start and there are many older landmarks to use as reference.

I was astonished at what I saw from the very beginning. Although there has been obvious evolution, there were still a tremendous number of buildings that haven't changed at all. Entire neighborhoods of homes still have the same footprint that they did in 1896. This made the task of lining up the maps and recognizing landmarks a fairly simple one. Because of the level of detail in the hand drawn maps, we could immediately see which buildings were homes and which were businesses, and even what type of business they were. A classic pattern emerged. There were the shoe factories themselves, now all but gone, occupying the most deliberate positions at the urban core. Surrounding those structures were the support businesses. These buildings remain for the most part. Largely private homes and apartments today, they were once cobbler's workshops, die and carpenter's shops and leather cutting facilities. Then there were the rail lines. The main rail lines ran right up behind city hall and wrapped around to the present day Walgreen's on Granger Blvd. Surrounding the rail lines were the lumber yards and coal sheds. There were meat distributors and other businesses tied to rail transportation.

So, what does this mean? What do these efforts get us? Well, it gives the obvious glimpse into how transportation and business are so closely tied. It also confirms how the urban landscape grows around the dominant institutions. We can see the factories at the center. Then we see their support services and finally just outside of those, and still largely unchanged today, we see the housing for those who worked in the industry. What this kind of analysis could also potentially give us is insight into problems we may have to deal with today that were sown for us over a hundred or more years ago. Environmental concerns were largely non-existent at that time. Chemicals and waste products were often buried or dumped and then forgotten about. Over time, as the factories moved on and the business and buildings changed uses, people were unaware of environmental issues that were potentially just under foot. By analyzing these old maps and seeing how they relate to current land use, we may be able to better understand the evolving landscape of Marlborough and even identify specific areas of critical environmental concern.

## Address Points

*The power of dots on a map*

One of the newest layers we have developed in the last six months is a master address point file for the entire city. A master address point file is pretty much what it sounds like. It is a layer in the GIS that is made up of individual dots (points). Each dot represents an address on the map. It may not sound that exciting, but it is actually a fairly big deal. Allow me to explain. If you have ever used an online mapping service like MapQuest or Google, you have probably noticed that at one time or another, the address you have entered doesn't appear in exactly the right spot. It may be down the street a bit from the actual location. It probably isn't a big deal most of the time for the average consumer. But, nonetheless, it can be annoying. Now, take locating addresses to the next level. There is an emergency situation, for example, and you need to locate every resident within a one mile radius for an evacuation. You may miss some residents because of the current system of geo-coding roadways. Geo-coding is a big name for assigning locations and has been the standard method for locating addresses for years. This is how it works: You take a roadway and divide it into sections based on address ranges. So, stretch of road 'A' starts at house number 2 on the right and ends at number 40. The same stretch of road 'A' starts at number 3 on the left and ends at number 39. This gives you a range along that stretch of road which computers then divide into even intervals based on that range. It basically cuts the section of road into 40 pieces with odds on one side and evens on the other. So, if you're looking for house number 20, it would be smack dab in the middle, right? From experience we know that isn't always the case and that's why we end up with our MapQuest directions leading us to the wrong spot on the street.

So, what if we decide to go at this from a different direction? Instead of dividing roads (lines) into parts and then assigning addresses based upon equal intervals, we use points. These points occupy an exact location on the map. They aren't tied to lines but instead occupy the point where the building actually stands. Further, they can occupy the exact location of the door on that building. Does the building have multiple addresses? No problem, you can have multiple points for one building. You can display house numbers on the front, side and rear of buildings. This time when you enter #10 Main Street into your search criteria, you are going directly to that point in space. Think back again to emergency services personnel and first responders. If they have accurate location information for every address in the city they can be more effective in an environment where seconds may make a difference. Similarly, you have a higher degree of confidence that everybody inside that one mile radius has been notified.

Development of this layer has been time consuming. Ensuring that every point is in the right location isn't an easy task, either. There will be constant updates required and as errors are encountered, they will need to be fixed. However, these efforts should realize a very quick return. And hopefully, in the near future, when you are driving through an unfamiliar neighborhood, you will find yourself ending up exactly where you want to go.

### THE NEW GIS WEBSITE IS HERE!

Some of you may have noticed a new look to Marlborough's GIS website. We have made significant changes to the site and we soon unveil it to the public at large. We are working with our IT Department to get this online this summer. The new software allows us to create 'mini' sites for specific mapping needs. Check them out at the following links:

**General Mapping Site**

**Mapping for Permit Applications**

**Utilities Mapping**



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