



The Commonwealth's Master Address Database

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MassIT's mission is to drive the digital business of state government to meet the continually evolving needs of constituents, schools, businesses, and local government.

PRESENTATION OVERVIEW



- **Postal VS Geographic Addresses**
- **What is the Master Address Database (MAD)**
- **Why and how we built it**
- **How you can obtain products**
- **MAD Shortcomings**
- **Maintaining the MAD**
- **Municipal and state collaboration on the MAD**

POSTAL VS. GEOGRAPHIC ADDRESSES



- **Postal and geographic addresses are different**
 - Mostly, they match up and are not distinguished in practice
 - Both are used to uniquely identify an end point for service delivery
 - There are different standards and requirements
- **Postal address**
 - Formatted per USPS Pub 28 and validated using USPS ZIP+4 data
 - Different rules for recording street names
 - Zip codes change frequently
 - Postal city does not correspond to a physical area (can't reliably map zip codes)
- **Geographic address (in the Master Address Database)**
 - Based on federal standards (adapted by MassGIS)
 - These standards eliminate ambiguity of abbreviations and provide more robust format and more detail
 - Linked to a point typically on a structure or along a specific street segment

2 2

One very important detail in understanding how MassGIS developed the master address database is that an address for postal delivery is not necessarily the same as the geographic location of the address.

This is an important distinction generally, including for the Census, but is especially important when it involves delivering emergency services.

WHAT IS THE MAD AND WHY DID WE BUILD IT?

- The MAD is:
 - A list of addresses and points representing address locations
 - The names and address ranges on streets and lines representing street locations
- The MAD was built to meet the needs of the Next Generation 9-1-1 System

Project goal: an address for every point and a point for every address

Despite its origin with the NextGen 911 project, MassGIS is building the MAD to be a comprehensive master address database for the Commonwealth

3

The MAD was created to meet the needs of the Next Generation 911 System being rolled out in this calendar year.

I don't have time to go into the details. However, in brief, this new system depends on high quality mapping for determining, for any given address or other location such as the location of a cell phone call, where the call is routed for dispatching emergency services.

One of the primary reasons for a new 911 call system is that the majority of 911 calls are now being made on cell phones. The existing E-9-1-1 system was built around knowing your location from the address associated with your phone. The address for a wired phone will still be relevant in the NextGen System. However, since cell phones don't have a fixed address, a different approach was needed. It's important to also understand that the detailed mapping displayed to emergency response dispatchers

in the NextGen system will include address locations.

In developing the MAD, the project goal was:
an address for every point and a point for every address.

The devil of course is in the details – what points need addresses
and to what level of detail do you take addressing.

THE MAD “BY THE NUMBERS”



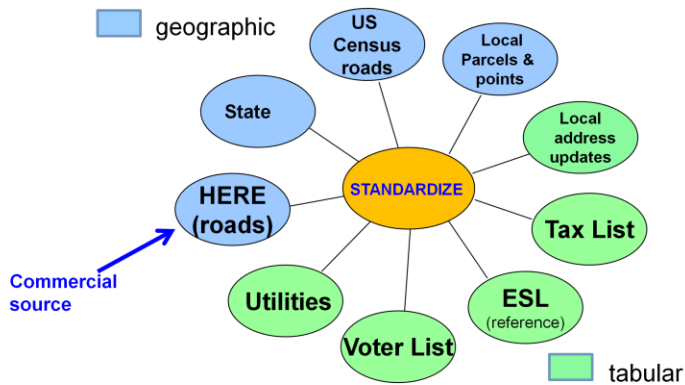
Statewide standardization of assessor parcel maps	<i>2.2 M parcels</i>
Statewide mapping of structure outlines > 150 sf complete	<i>2.4 M structures</i>
Statewide map of street segments	<i>400,200 segments</i>
Addresses processed from multiple sources	<i>10.7 M</i>
Addresses mapped to a point location	<i>3.1 M</i>
Addresses not yet mapped to a location (not all real)	<i>190,000</i>
“Sites” visited to map additional address detail	<i>6,000 sites</i>

4 4

In the last six years, we’ve done quite a bit of work...

- We managed statewide standardization of assessor parcel mapping and mapping all the structures in the state
- We transferred parcel addresses to points on those structures
- We comprehensively mapped streets statewide
- We processed and standardized over 10 million addresses from multiple sources
- Working with the regional planning agencies, we mapped sites with multiple buildings per parcel statewide. Most of those sites have been visited by staff to determine what address or addresses is associated with each building.

HOW WE BUILT THE MAD: Sources



This graphic depicts the various sources for the MAD. The key to developing the master address database is standardization.

Only by standardizing address information from multiple sources, whether street names or full addresses can you determine whether or not a street name or address is the same in two sources.

BUILDING THE MAD: Standardization



SOURCE	ORIGINAL STREET NAME	STANDARDIZED STREET NAME
CENSUS ROADS	Garden Street Ct	GARDEN STREET COURT
STATE	GARDEN ST CT	GARDEN STREET COURT
HERE	GARDEN STREET CT	GARDEN STREET COURT
MSAG	GARDEN ST CT	GARDEN STREET COURT
ASSESSOR	Garden Street Court	GARDEN STREET COURT
MSAG	E Spring St RR Xng	EAST SPRING STREET RAILROAD CROSSING

6

Here's a brief example of the standardization I'm talking about

Here you see how the street name "Garden Street Ct." appeared in five sources; each source was slightly different.

Standardization involves spelling everything out in full. We did this with a computer program we wrote. The versatility of this program is shown in the name on the last line. The program correctly spelled out an unusual but real street name from a heavily abbreviated version

MAD: Address List



FID	ADDRESS_ID	ADDRESS	ADDR_NUM	STREETNAME	REL_LOC	SITE_NAME	BUILDING	FLOOR	UNIT	NEIGHBORHD	COMMUNITY	TOWN	TOWN_ID	ZIPCODE	STATUS
4140	MAD.M	1032631	148	MAIN STREET					4		SPENCER	SPENCER	280	01562	ACTIVE
4141	MAD.M	1032630	148	MAIN STREET					3		SPENCER	SPENCER	280	01562	ACTIVE
4142	MAD.M	1032628	148	MAIN STREET					1		SPENCER	SPENCER	280	01562	ACTIVE
4143	MAD.M	1032640	148	MAIN STREET							SPENCER	SPENCER	280	01562	ACTIVE
4144	MAD.M	1032629	148	MAIN STREET					2		SPENCER	SPENCER	280	01562	ACTIVE
4145	MAD.M	1032669	150	MAIN STREET					2A		SPENCER	SPENCER	280	01562	ACTIVE
4146	MAD.M	1032675	150	MAIN STREET					ABOVE		SPENCER	SPENCER	280	01562	ACTIVE
4147	MAD.M	1032672	150	MAIN STREET					3		SPENCER	SPENCER	280	01562	ACTIVE
4148	MAD.M	1032670	150	MAIN STREET					2B		SPENCER	SPENCER	280	01562	ACTIVE
4149	MAD.M	1032674	150	MAIN STREET					4		SPENCER	SPENCER	280	01562	ACTIVE
4150	MAD.M	1032673	150	MAIN STREET					3A		SPENCER	SPENCER	280	01562	ACTIVE
4151	MAD.M	1032671	150	MAIN STREET					2C		SPENCER	SPENCER	280	01562	ACTIVE
4152	MAD.M	1029472	150C	MAIN STREET							SPENCER	SPENCER	280	01562	UNASSIGNED
4153	MAD.M	1028890	150	MAIN STREET							SPENCER	SPENCER	280	01562	ACTIVE
4154	MAD.M	1028892	150A	MAIN STREET							SPENCER	SPENCER	280	01562	UNASSIGNED
4155	MAD.M	1032676	152	MAIN STREET					3		SPENCER	SPENCER	280	01562	ACTIVE
4156	MAD.M	1027705	152	MAIN STREET							SPENCER	SPENCER	280	01562	ACTIVE
4157	MAD.M	1032678	154	MAIN STREET					2W		SPENCER	SPENCER	280	01562	UNASSIGNED
4158	MAD.M	1032679	154	MAIN STREET					LEFT		SPENCER	SPENCER	280	01562	UNASSIGNED
4159	MAD.M	1031752	154	MAIN STREET							SPENCER	SPENCER	280	01562	UNASSIGNED
4160	MAD.M	1032677	154	MAIN STREET					2E		SPENCER	SPENCER	280	01562	UNASSIGNED
4161	MAD.M	1028894	155R	MAIN STREET							SPENCER	SPENCER	280	01562	UNASSIGNED
4162	MAD.M	1032287	157	MAIN STREET	REAR						SPENCER	SPENCER	280	01562	ACTIVE
4163	MAD.M	1031753	157	MAIN STREET			SPENCER TOWN HALL				SPENCER	SPENCER	280	01562	ACTIVE
4164	MAD.M	1029890	158	MAIN STREET							SPENCER	SPENCER	280	01562	ACTIVE
4165	MAD.M	1028312	159	MAIN STREET							SPENCER	SPENCER	280	01562	ACTIVE
4166	MAD.M	1031380	160	MAIN STREET							SPENCER	SPENCER	280	01562	ACTIVE

So here's an example of a portion of our master address list for the Town of Spencer

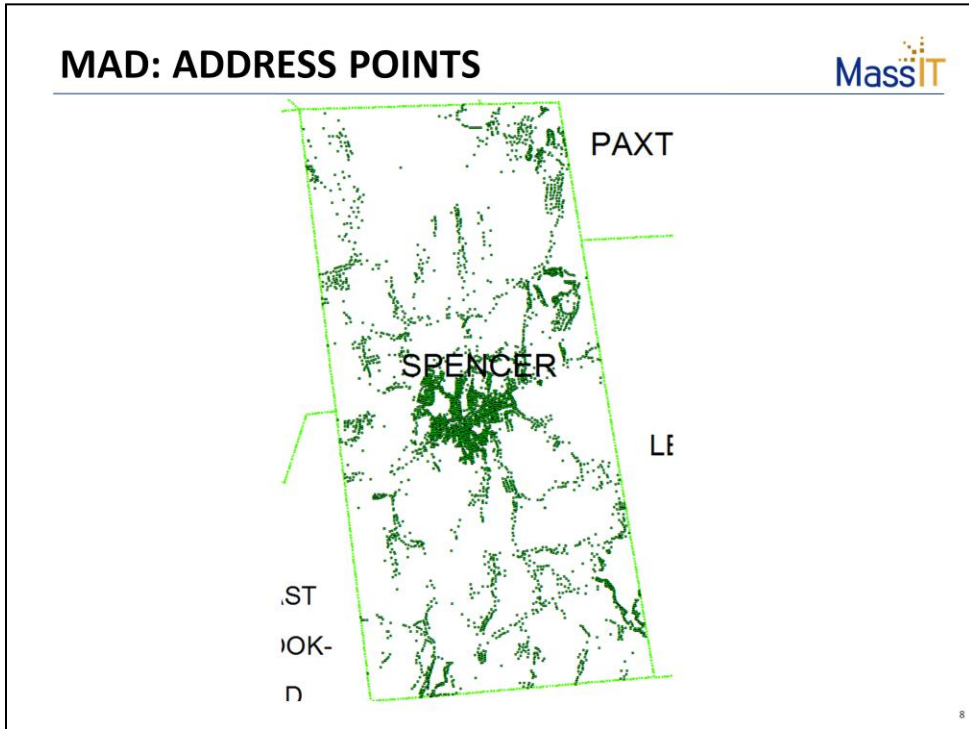
Call out:

>When we have unit information we break it out but this info is very incomplete

>Building name: "157 Main Street" which is also "Spencer Town Hall"

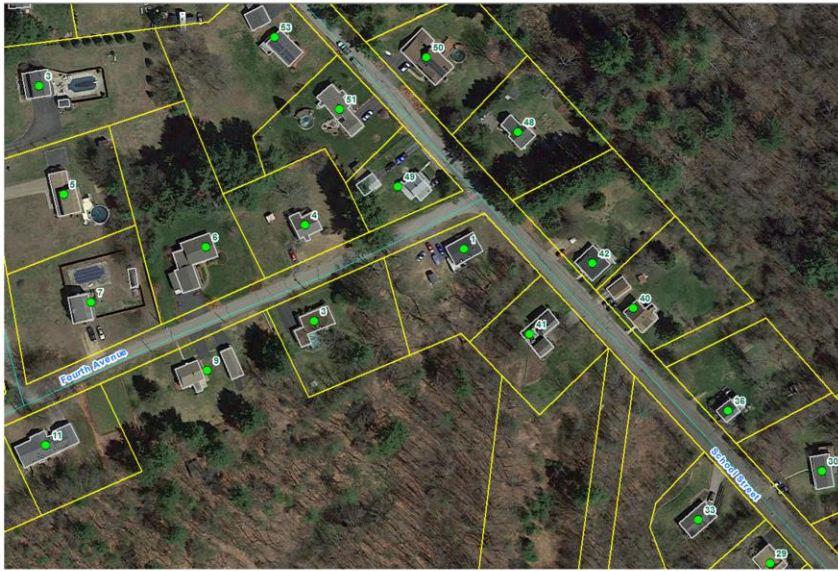
>Note STATUS: "ACTIVE", "UNASSIGNED", "NOT FOUND", and other values

MAD: ADDRESS POINTS



I've arbitrarily chosen the Town of Spencer to show some examples of what's in the MAD. However we have the same thing for every community.

MAD ADDRESS POINTS: Detail #1



9

Here you see the easy stuff: address points on single family homes

MAD ADDRESS POINTS: Detail #2



In this graphic from the down town area, things are more complicated.

Address points with the same number repeated are those where there are unit numbers that are not shown

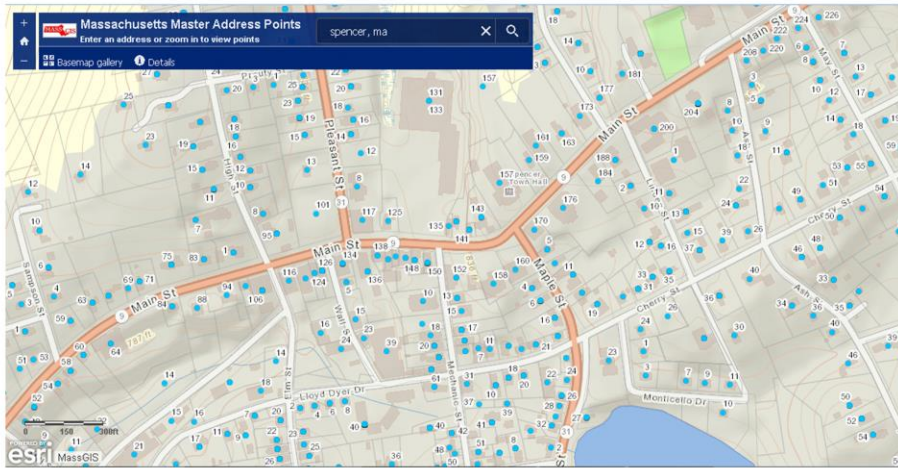
MAD ADDRESS POINTS: Detail #3



Finally, this graphic illustrates one of those multi-building sites that I mentioned. We've had people working in the field for about 18 months on these sites figuring out which building is which and which addresses go on which building. As with the last graphic, repeated house numbers indicate unit level addresses exist.

Besides residential sites such as this one, there are of course, many campuses, office parks, and medical complexes.

ON-LINE VIEWING OF MAD ADDRESS POINTS



12

This is a screen shot of the on-line map where you can view the MAD address points and their associated addresses for anywhere in the state.

At this level of zoom you only see the house #s.

When you zoom in you see the # and the street name

MAD SHORTCOMINGS

- Majority of addresses are sourced from assessing data
- Missing addresses
- Assessing data in the MAD has not yet been updated
- Unit-level addressing, especially in apartment complexes
- Struggling to obtain address updates from communities

13

The MAD is incomplete.

Common reasons for missing addresses are:

- **2 & 3 family structures: due to limitations of assessing data these often only have one address. But this is variable across communities because some assessors carry address ranges**
- **Addresses are also often missing for mixed use properties**
- **Unit-level addresses for the same house number are also problematic, especially because how they are recorded in different databases is highly variable.**
- **Finally, we know our addresses for tax exempt properties are incomplete**

HOW WE MAINTAIN THE MAD

- **Notifications from cities and towns –
*unfortunately participation lags***
- **Comcast and National Grid: new customers**
- **Verizon for new streets (while E-911 runs)**
- **Automated change detection on aerial imagery
*-only helps identify new streets and structures,
not addresses***
- **Proposed: direct input from Building
Inspectors and from 911 Liaisons**

14

Although we have contacted all communities about sending us address updates, only 80 have done so in the last six months.

If cities and towns don't notify us of new or changed addresses, those addresses will not be added to the NextGen 911 system which could lead to emergency response delays.

MUNICIPAL/STATE COLLABORATION



There are two products available for download by community

1) Address list and 2) address points for use with GIS software.

Available from: <http://tinyurl.com/MAD-downloads>

There is also an on-line map showing the points and their addresses:

Available from: <http://tinyurl.com/MAD-map-viewer>

Address standard for municipalities: www.mass.gov/itd/address-standard

(see me afterwards for a piece of paper containing these web links)

15

MassGIS' intent is for the MAD to be a Commonwealth resource developed and maintained in collaboration with cities and towns. While municipalities assign addresses, addresses are relied upon at all levels of government and are central to the functioning of the NextGen 911 System.

So the idea is that we receive address information, standardize it, research a location if its missing, and then make the information available back to communities. Obviously, ideally we will receive address updates complete with information on their geographic location.

Please see me afterword for a printed version of this Information. I also have information on our new Address Standard for Municipalities and on best practices for municipal address assignment.

NOTIFYING MASSGIS

- **Update MassGIS with new address info:**
 - **Email authoritative address updates to:**
notify911address@mass.gov

Thank you

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