

Attachment 1

Statement of Public Need

A new tower facility is required for AT&T to provide reliable wireless communications services in the vicinity of Hills Street, Oak Street, and other local roads as well as the homes and schools in the surrounding area of East Hartford. The new facility is needed by AT&T in conjunction with other existing and proposed facilities to provide service to the public. Included herein is a Radio Frequency Analysis Report detailing and depicting the "Existing Coverage" provided by AT&T's existing facilities in this area and "Proposed Coverage" from the Candidate Facilities at 465 Hills Street (Candidate A) and 56 Hills Street (Candidate B). Overall the Candidate A location would provide better overall service within AT&T's network to this area of East Hartford.

Radio Frequency Analysis Report

SR 2022 East Hartford



February 1, 2013



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1. Overview

C Squared Systems was retained by New Cingular Wireless PCS, LLC (“AT&T”) to investigate the extent of coverage that could be potentially obtained by constructing one of two proposed wireless communications facilities

- Site A: 465 Hills Street, East Hartford CT at 100 feet AGL or
- Site B: 56 Hills Street, East Hartford CT at 100 feet AGL

AT&T is licensed by the FCC to provide wireless communications services throughout the State of Connecticut including the Town of East Hartford where both of the proposed facilities are located.

This report addresses AT&T’s need for a facility in this area and analyzes two alternative sites proposed to address the coverage gaps in their wireless communications network. C Squared Systems has reviewed and conducted this coverage analysis that confirms AT&T has a gap in reliable service that exists in East Hartford, and that the Candidate A Facility provides AT&T with superior coverage along Oak Street, Hills Street and the surrounding areas and is the RF preferred Candidate. AT&T is proposing both sites referenced above with the understanding that only one would be needed to fulfill their immediate coverage needs. Included as attachments in this report are coverage maps detailing the existing network and expected coverage from the proposed facilities, along with additional terrain and network layout maps.

2. Coverage Objective

There is a significant coverage deficiency in the existing AT&T wireless communications network along Hills Street, Oak Street and the surrounding areas in East Hartford. A deficiency in coverage is evidenced by the inability to adequately and reliably transmit/receive quality calls and/or utilize data services offered by the network. Seamless reliable coverage provides users with the ability to successfully originate, receive, and maintain quality calls and/or utilize data applications throughout a service area. Overlapping coverage is required for users to be able to move throughout the service area and reliably “hand-off” between cells to maintain uninterrupted calls.

Due to terrain characteristics and the distance between the targeted coverage area and the existing sites, AT&T’s options to provide services in this area are quite limited (Maps of the terrain in this area and the distance to neighboring AT&T sites from each of the proposed sites are included as Attachments 1, 2 & 3, respectively.) AT&T’s network requires deployment of antennas throughout the area to be covered, which are connected to receivers and transmitters that operate in a limited geographic area known as a “cell.” AT&T’s wireless network, including their wireless handsets and devices, operate by transmitting and receiving low power radio frequency signals to and from these cell sites. The signals are transferred to and from the landline telephone network and routed to their destinations by sophisticated electronic equipment. The size of the area served by each cell site is dependent on several factors, including the number of antennas used, the height at which the antennas are deployed, the topography of the land, vegetative cover and

natural or man-made obstructions in the area. As customers move throughout the service area, the transmission from the portable devices is automatically transferred to the AT&T facility with the best connection to the device, without interruption in service provided that there is overlapping coverage from the cells.

In order to define the extent of the coverage gap to be filled, both propagation modeling and real-world drive testing has been conducted in the area of East Hartford. Propagation modeling uses PC software to determine the network coverage based on the specific technical parameters of each site including, but not limited to, location, ground elevation, antenna models, antenna heights, and also databases of terrain and ground cover in the area. Drive testing consists of traveling along area roadways in a vehicle equipped with a sophisticated setup of test devices and receivers that collect a variety of network performance metrics. The data are then processed and mapped in conjunction with the propagation modeling to determine the coverage gaps.

Analysis of the propagation modeling and drive testing in East Hartford reveal that AT&T’s network is unreliable throughout much of the area due to gaps in coverage, and that there is a service deficiency as a result. In order to fill in these coverage gaps and improve the network reliability to East Hartford, a new facility is needed in the area.

Table 1 below details the approximate current coverage gap in the vicinity of the proposed sites.

		Existing Coverage Gap
Population:	"In-Building" (≥ -74 dBm)	6,606
	"In-Vehicle" (≥ -82 dBm)	1,989
Area (mi²):	"In-Building" (≥ -74 dBm)	2.67
	"In-Vehicle" (≥ -82 dBm)	0.78
Roadway (mi):	Main:	0.63
	Secondary:	8.91
	Total:	9.54

Table 1: Estimated Existing Coverage Gap Statistics

Included with this report are Attachments 1-8, which are explained below to help describe AT&T's network in and around East Hartford, and the need for one of the proposed facilities.

- Attachment 1: *3D Terrain Map* details the terrain features around the area of deficient service being targeted by each of the proposed sites in East Hartford. These terrain features play a key role in determining site designs dictating the unique coverage achieved from a given location. This map is included to provide a visual representation of the terrain features that must be considered when siting a wireless facility. The lighter green and blue shades corresponding to lower elevations, whereas the yellow, orange, and red shades indicate higher elevations.
- Attachment 2: *Map of Distance to Neighbor Sites – Site A 465 Hills Street* provides an overview of AT&T's network of sites in the area, with distances shown from the proposed Site A 465 Hills Street to the existing sites in the surrounding area.
- Attachment 3: *Map of Distance to Neighbor Sites – Site B 56 Hills Street*, similar to Attachment 2, provides an overview of AT&T's network of sites in the area with distances shown from the proposed Site B 56 Hills Street to the existing sites in the surrounding area.
- Attachment 4: *Neighbor Site Data and Distance to Proposed Sites* provides site specific information on existing neighboring sites used to perform the coverage analysis provided in Attachments 5-7.
- Attachment 5: *“Existing Coverage”* depicts coverage from existing sites and demonstrates that there are currently gaps in coverage effecting service along Oak Street, Hills Street and the surrounding areas. The coverage gaps are areas where the signal strength is < -82 dBm required for reliable in-vehicle coverage, and < -74 dBm for in-building reliability. In an effort to provide the required level of coverage to these areas, AT&T is proposing to install a wireless facility at one of the two proposed locations.
- Attachment 6: *“Existing & Proposed Coverage for Site A 465 Hills Street”* shows how this proposed site would fill in the coverage gaps and improve AT&T's network in this area. As detailed in Table 2 below, Site A 465 Hills Street provides an additional 0.17 miles of main road coverage and an additional 5.18 miles of secondary road coverage compared to Site B 56 Hills Street. It also covers an additional 674 pops and 0.37 square miles at in-building levels and an additional 1008 pops and 0.42 square miles at in-vehicle levels.
- Attachment 7: *“Existing & Proposed Coverage for Site B 56 Hills Street”* shows how this proposed site would fill in the coverage gaps and improve AT&T's network in this area.
- Attachment 8: *Connecticut DOT Average Annual Daily Traffic Data* shows the available vehicular traffic volume data for the subject area from the Connecticut Department of Transportation. This data shows as many as 2,700 vehicles per day passing through the subject area on Hills Street and as many as 4,800 vehicles per day on Oak Street.

Table 2 below lists the incremental coverage statistics that were compiled for the two proposed sites: Site A 465 Hills Street at 100 feet AGL and Site B 56 Hills Street at 100 feet AGL (heights are antenna centerlines).

		Site A, 465 Hills St East Hartford, CT at 100 feet AGL	Site B, 56 Hills St, East Hartford, CT at 100 feet AGL	Difference (Site A – Site B)
Population Coverage:	"In-Building" (≥ -74 dBm)	2,764	2,090	674
	"In-Vehicle" (≥ -82 dBm)	1,785	777	1,008
<hr/>				
Area Covered (mi²):	"In-Building" (≥ -74 dBm)	1.26	0.89	0.37
	"In-Vehicle" (≥ -82 dBm)	0.78	0.36	0.42
<hr/>				
Roadway Coverage (mi):	Main:	0.58	0.41	0.17
	Secondary:	7.97	2.79	5.18
	Total:	8.55	3.20	5.35

Table 2: Coverage Statistics¹

¹ Coverage Statistics reflect "incremental" or new coverage added, based on the 850 MHz network

3. Conclusion

The 465 Hills Street (Site A) facility provides AT&T with superior coverage along Oak Street, Hills Streets and the surrounding areas and is the RF preferred Site.

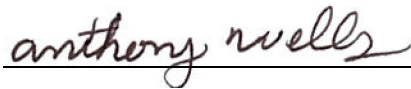
No existing structures were identified and available to provide the coverage requirements needed for this area. The location and the minimum height selected were chosen to achieve an optimal balance between meeting coverage objectives, overcoming the tree line for signal propagation, minimizing the aesthetic impact to the community, and future collocation.

As discussed in this report and depicted in the attached plots, either of the proposed AT&T sites will provide the public need for service in this area, providing an appropriate coverage footprint for the East Hartford community along with effective connectivity to the rest of AT&T existing network.

Without a site in this area, at the height requested, significant gaps in service will exist within the Town of East Hartford, and the identified public need for reliable wireless services in this area will not be met.

4. Statement of Certification

I certify to the best of my knowledge that the statements in this report are true and accurate.

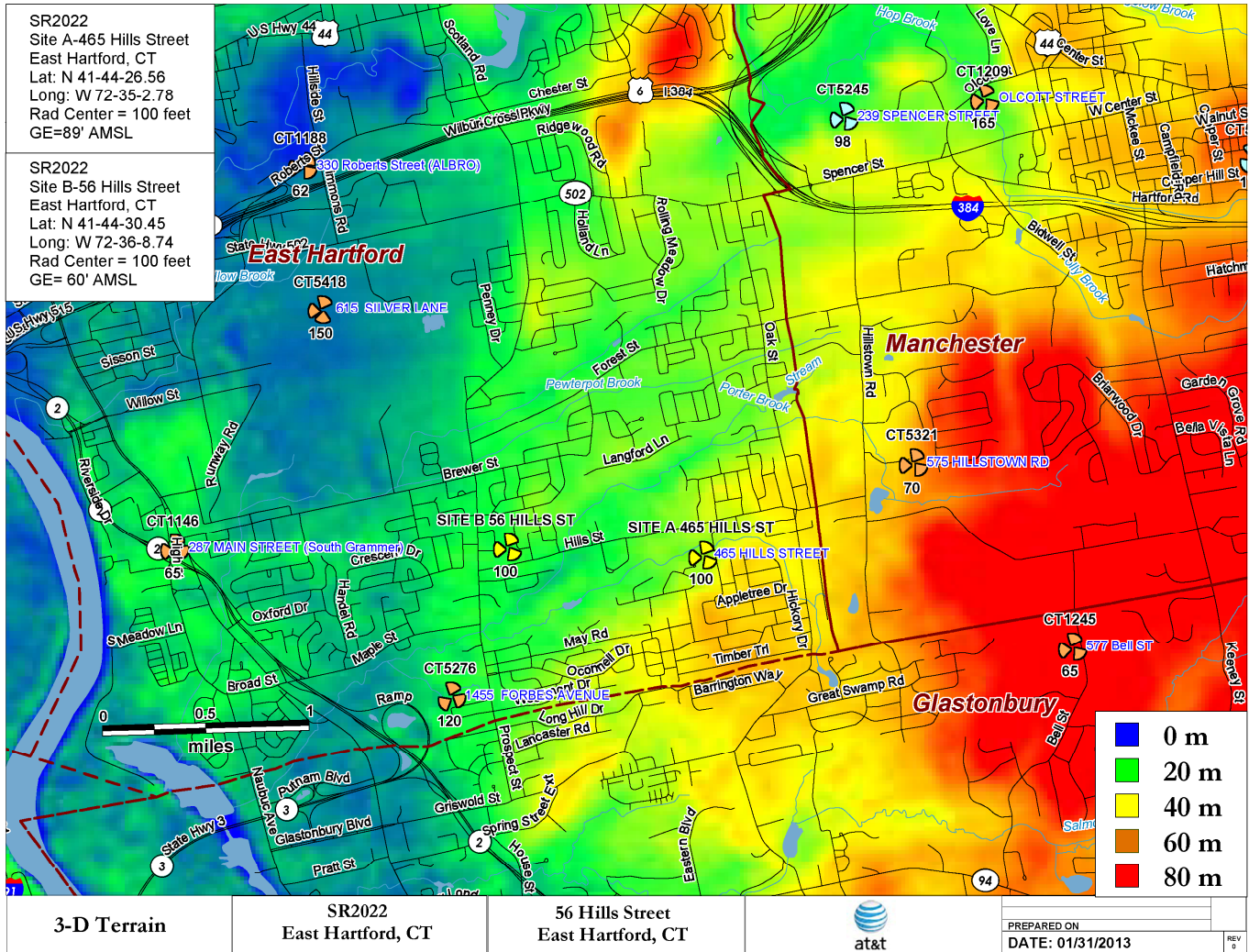


Tony Wells
C Squared Systems, LLC

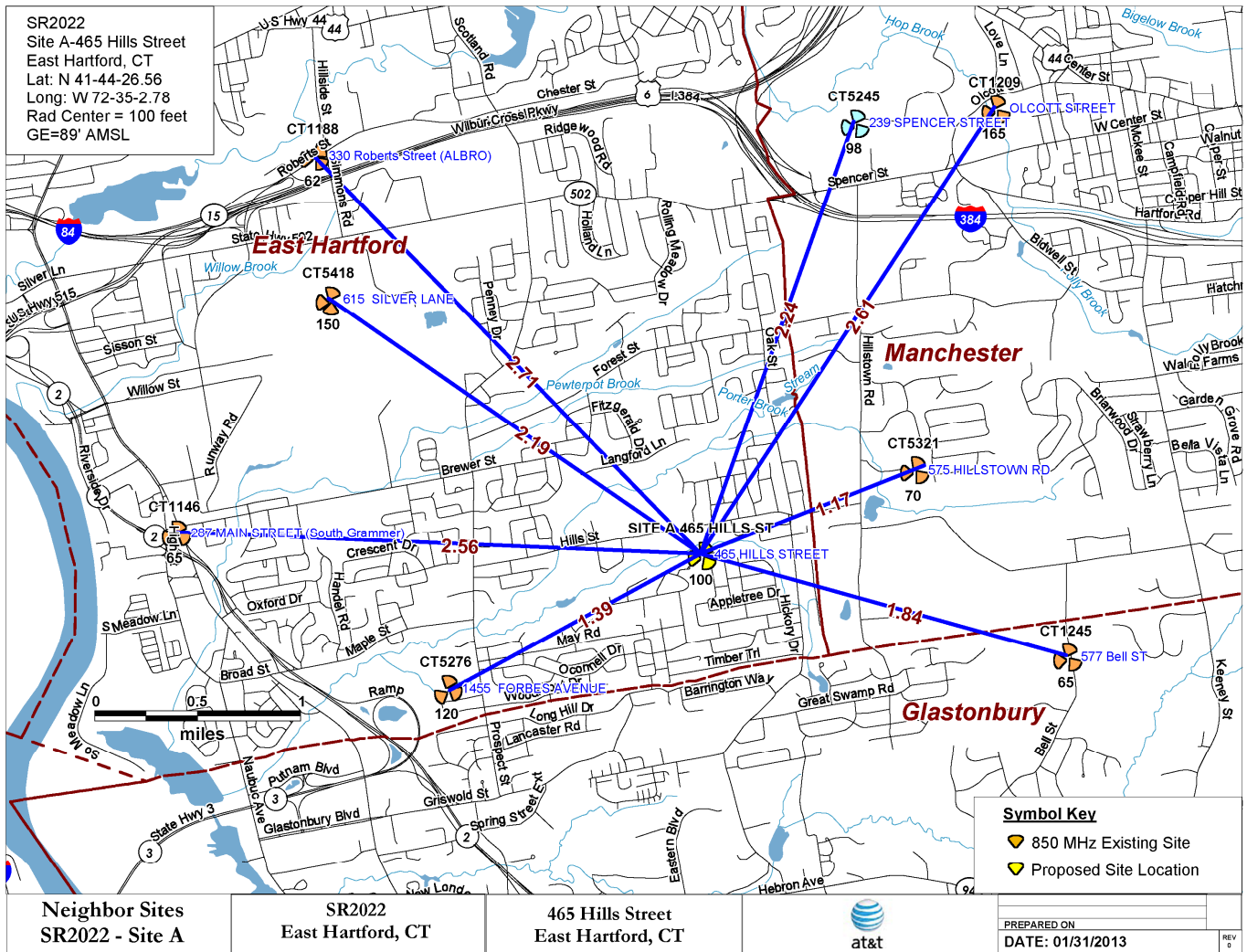
February 1, 2013

Date

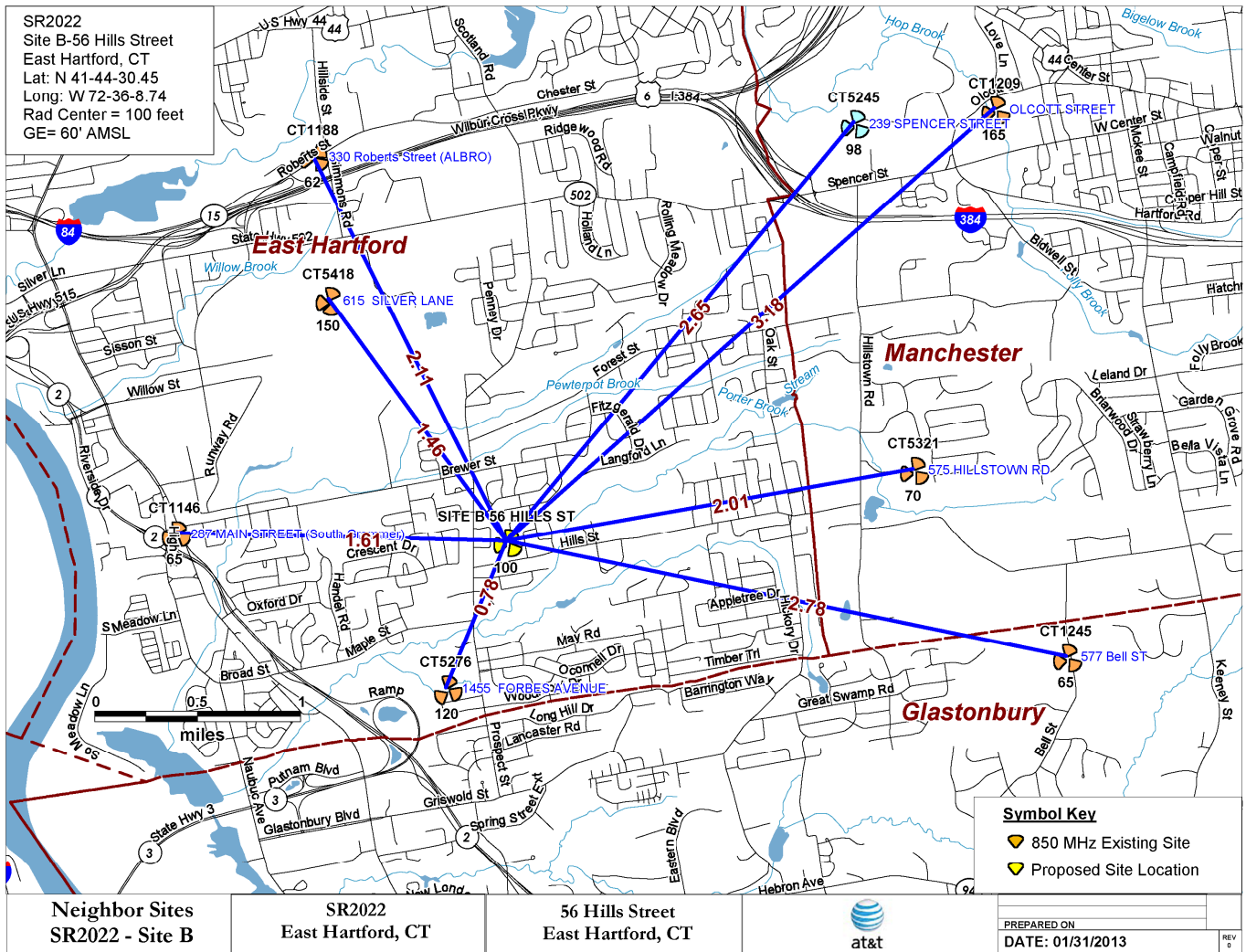
5. Attachments



Attachment 1: 3D Terrain Map



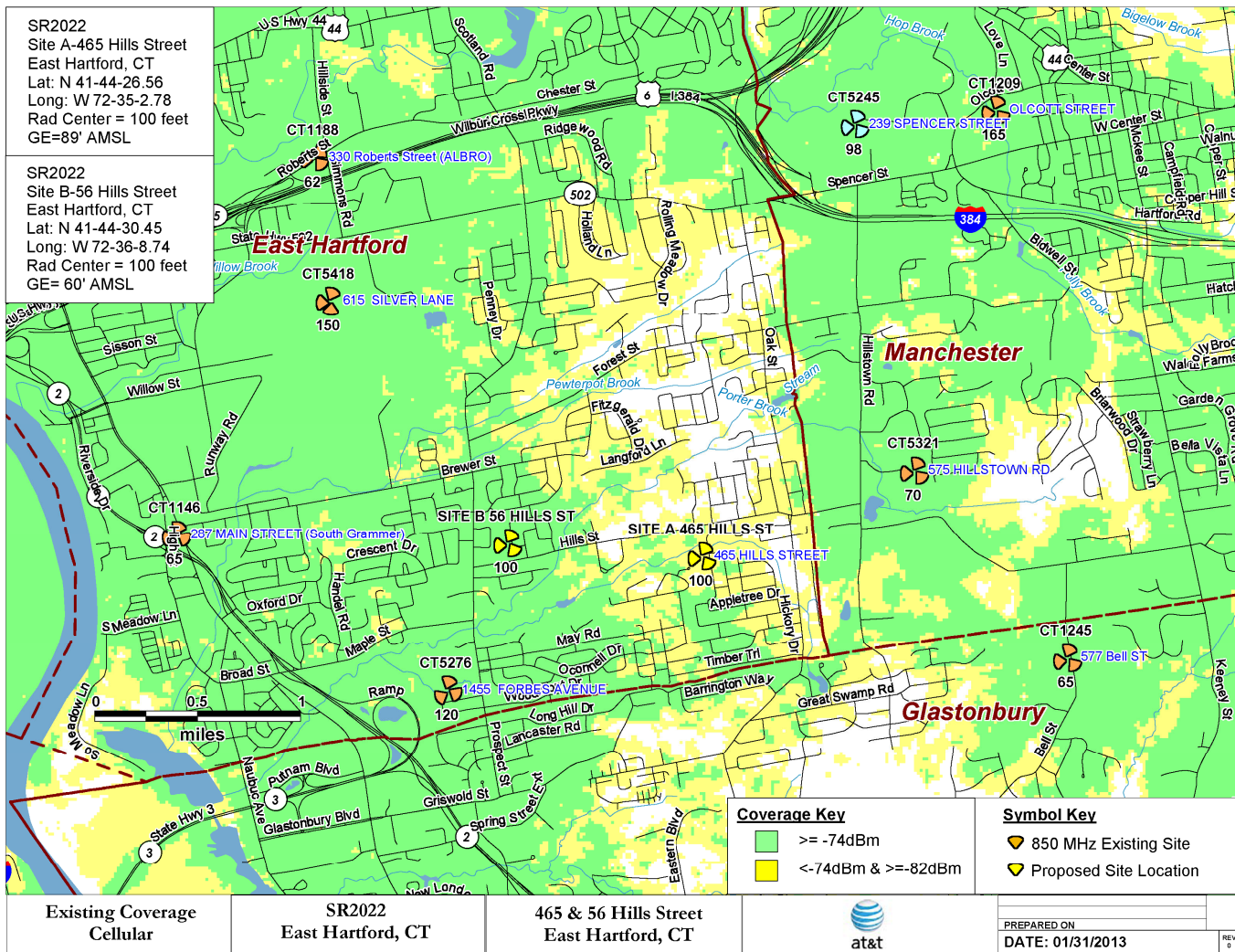
Attachment 2: Map of Distance to Neighbor Sites – Site A 465 Hills Street



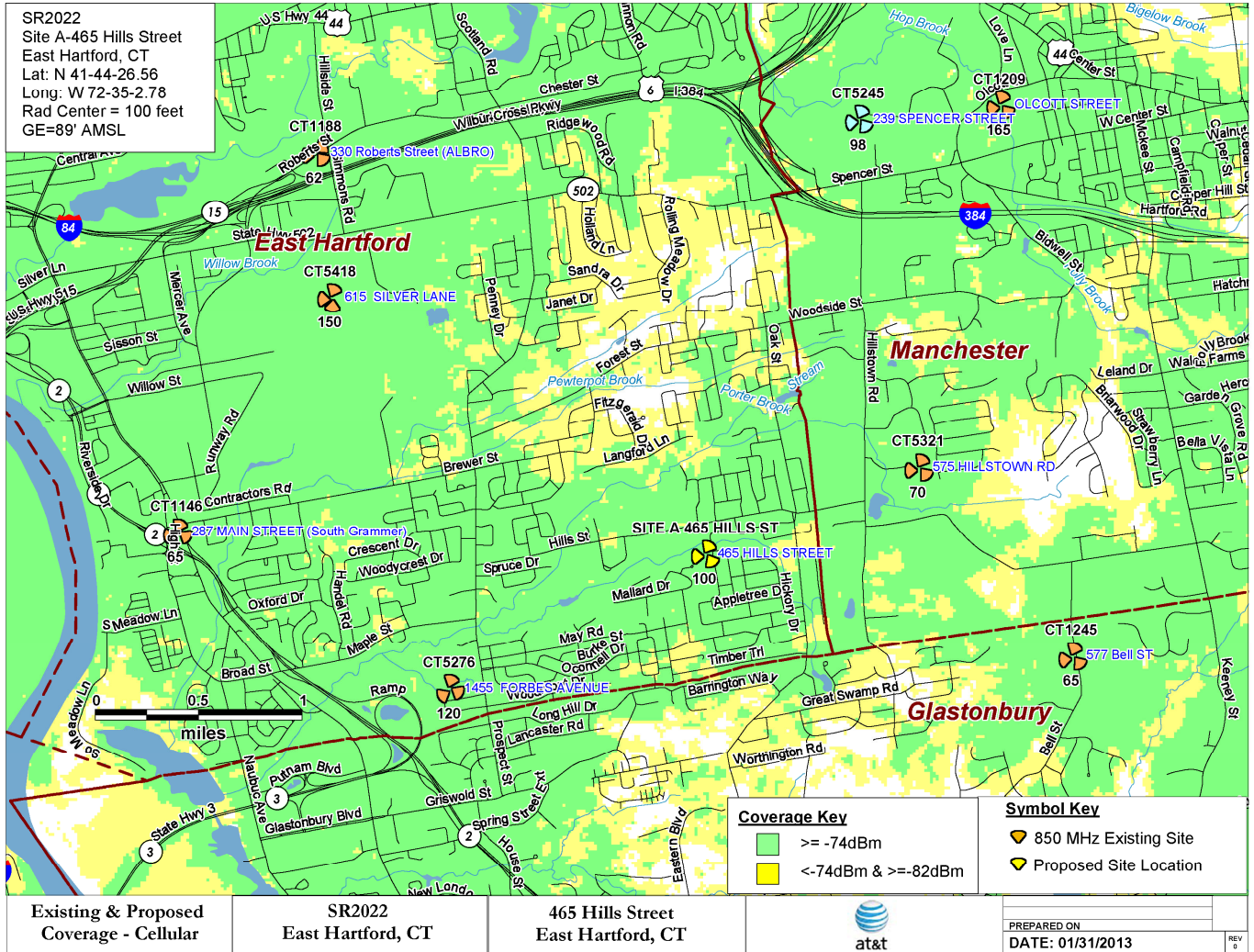
Attachment 3: Map of Distance to Neighbor Sites – Site B 56 Hills Street

Site Name	Address	Town	Structure Type	Latitude	Longitude	Antenna Centerline (feet)	Distance from Site A (miles)	Distance from Site B (miles)	Ground Elevation
CT1002	2 Prestige Park Road	East Hartford	Monopole	41.7883	-72.6005	154	3.37	3.23	63
CT1083	2108 Main St (Glby Police)	Glastonbury	Self-Supporting	41.7062	-72.6069	166	2.66	2.46	45
CT1099	99 East River Drive	East Hartford	Rooftop	41.7685	-72.6627	131	4.50	3.6	37
CT1146	287 Main Street	East Hartford	Stealth Flagpole	41.7424	-72.6337	65	2.56	1.61	64
CT1147	309 Wawarme	Hartford	Rooftop	41.7514	-72.6597	78	3.96	3.06	36
CT1188	330 Roberts Street	East Hartford	Rooftop	41.769	-72.6207	62	2.71	2.11	18
CT1196	95 Goodwin Street	East Hartford	Smokestack	41.7885	-72.6247	71	3.90	3.45	53
CT1209	Olcott Street	Manchester	CL&P structure	41.7724	-72.5564	165	2.61	3.18	85
CT1245	577 Bell St	Glastonbury	Self-Supporting	41.7336	-72.5497	65	1.84	2.78	349
CT5418	615 Silver Land	East Hartford	Stadium	41.7589	-72.6192	150	2.19	1.46	32
CT5273	2577 Main Street	Glastonbury	Self-Supporting	41.7142	-72.6133	108	2.37	2.01	26
CT5321	575 Hillstown	Manchester	CL&P structure	41.7469	-72.5641	70	1.17	1.98	167
CT5245	239 Spencer St	Manchester	Stealth Pole	41.7714	-72.5697	98	2.24	2.65	76
CT5276	1455 Forbes Avenue	East Hartford	Monopole	41.7314	-72.6081	120	1.39	0.78	68

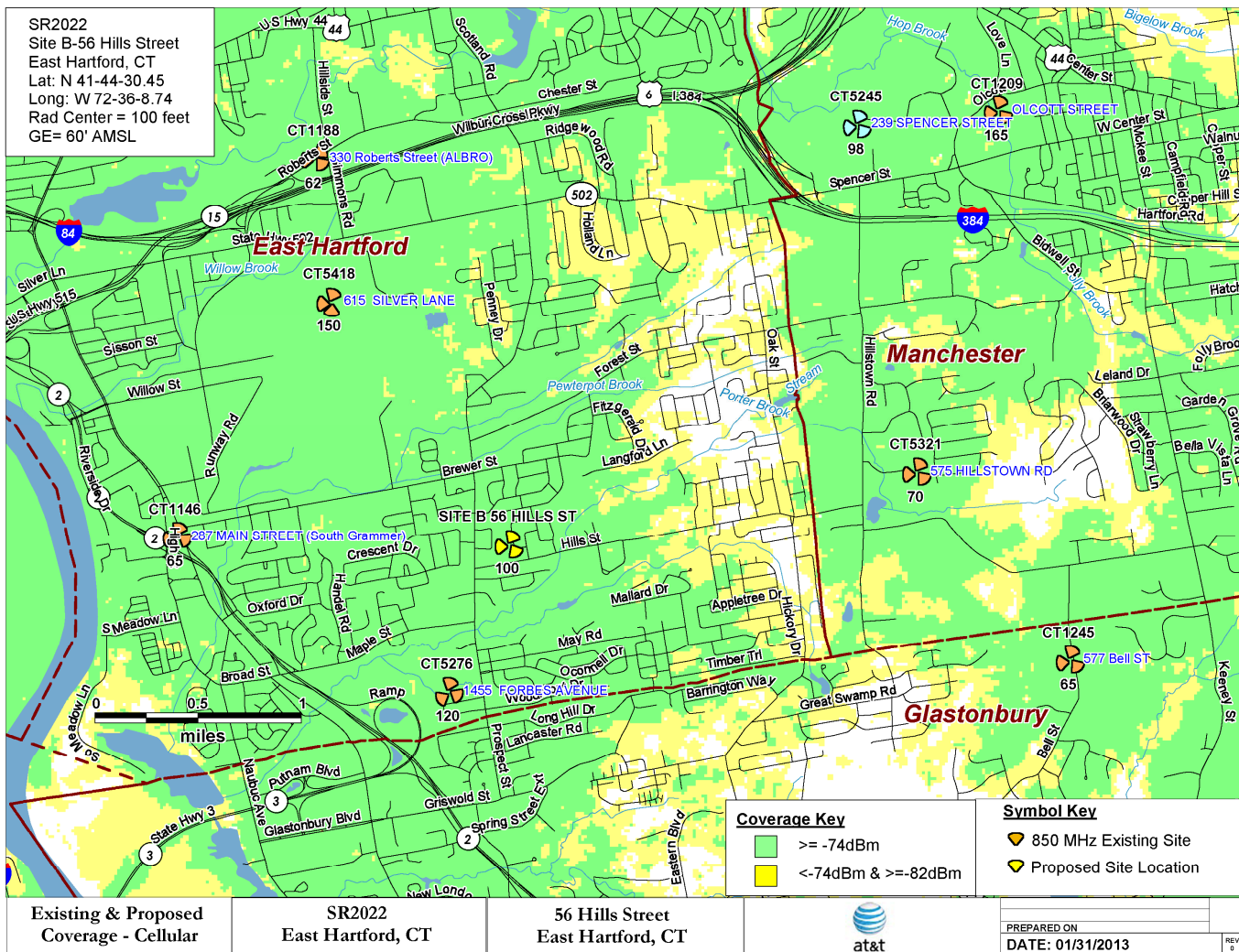
Attachment 4: Neighbor Site Data and Distance to Proposed Sites



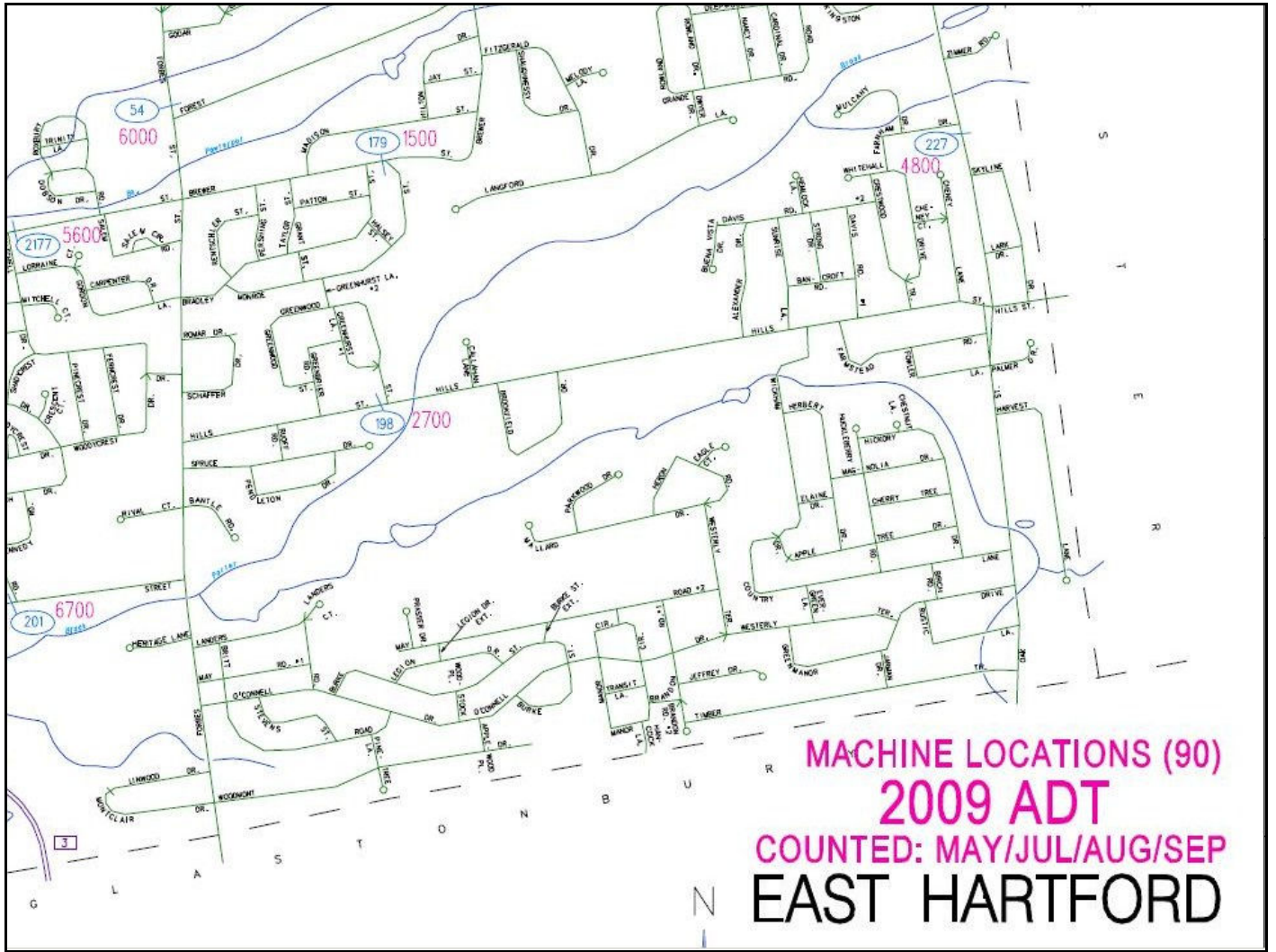
Attachment 5: "Existing Coverage" for the Current AT&T network



Attachment 6: "Existing & Proposed Coverage" for the AT&T network with Site A 465 Hills Street



Attachment 7: "Existing & Proposed Coverage" for the AT&T network with Site B 56 Hills Street



Attachment 8: CTDOT Average Annual Daily Traffic Data