

Attachment 1

Statement of Public Need

The proposed facility will provide wireless communications service along Tolland Turnpike (State Route 74), Willington Hill Road (State Route 320), Ruby Road and surrounding areas in the Town of Willington. The facility is needed by AT&T in conjunction with other existing and proposed facilities in Willington and adjoining communities. Attached is a Radio Frequency Analysis Report providing an overview and analysis of AT&T's need in this area of the state including coverage maps and other data. As clearly demonstrated by these materials, a facility in this area of Willington is required for AT&T to serve the public in this portion of the Town.

Radio Frequency Analysis Report

SR 1107 Willington



June 20, 2012



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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: Tolland Turnpike, Willington, CT at 157 feet AGL or
- Site B: Old South Willington Road, Willington, CT at 187 feet AGL

AT&T is licensed by the FCC to provide wireless communications services throughout the State of Connecticut including the Town of Willington where one of the proposed facilities would be 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 Willington, and that the Candidate A Facility provides AT&T with superior coverage along Route 74 and is the RF preferred Candidate. As a result, 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 State Route 74 (Tolland Turnpike), State Route 320, and the surrounding areas in Willington. 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 Willington. 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 Willington 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 Willington, a new facility is needed in the area.

Table 1 below details the approximate current coverage gap in the vicinity of the proposed sites, most notable of which are the gaps along the two main roads in this area: 2.17 miles on Route 74 and 2.60 miles on Route 320.

		Existing Coverage Gap
Population:	"In-Building" (≥ -74 dBm)	3010
	"In-Vehicle" (≥ -82 dBm)	1771
Area (mi²):	"In-Building" (≥ -74 dBm)	16.91
	"In-Vehicle" (≥ -82 dBm)	10.27
Roadway (mi):	Main:	4.77
	Secondary:	26.12
	Total:	30.89

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 Willington, 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 Willington. 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 ridges and valleys 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 Tolland Turnpike* provides an overview of AT&T's network of sites in the area, with distances shown from the proposed Site A Tolland Turnpike to the existing sites in the surrounding area.
- Attachment 3: *Map of Distance to Neighbor Sites – Site B Old South Willington Road*, 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 Old South Willington Road 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 the Attachments 5-7.
- Attachment 5: *“Existing Coverage”* depicts coverage from existing sites and demonstrates that there are currently gaps in coverage effecting service along State Route 74, State Route 320, and the surrounding neighborhoods. The coverage gaps are 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 Tolland Turnpike shows how this proposed site would fill in the coverage gaps and improve AT&T's network in this area. As shown in Table 2, Site A Tolland Turnpike site provides an additional 0.44 miles of main road coverage and an additional 1.88 miles of secondary road coverage compared to the Old South Willington Road site.
- Attachment 7: *“Existing & Proposed Coverage”* for Site B Old South Willington Road shows how this proposed site would fill in the coverage gaps and improve AT&T's network in this area. If this site were to be built, AT&T could achieve the majority of its coverage objectives, but the remaining coverage gap on Route 74 west of Route 320 would likely require another site to be built. The remaining coverage gap on Route 74 east of Route 320 might also result in the need for another site.
- 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 7,800 vehicles per day passing through the subject area on Route 74 and as many as 1,700 vehicles a day on Route 320.

Table 2 below lists the coverage statistics that were compiled for the two proposed sites: Site A Tolland Turnpike at 157 feet AGL and Site B Old South Willington Road at 187 feet AGL (heights are antenna centerlines).

Of particular note is the incremental in-vehicle coverage on State Route 74 that is provided by Site A Tolland Turnpike, but not by Site B Old South Willington Road. Site A Tolland Turnpike site provides unique incremental coverage on State Route 74 of approximately 0.25 miles west of State Route 320 and 0.35 miles east of State Route 320. This incremental coverage is of particular importance as it makes in-vehicle coverage continuous on nearly 2.5 miles of State Route 74.

		Site A Tolland Turnpike, Willington, CT at 157 feet AGL	Site B Old South Willington Road, Willington, CT at 187 feet AGL
Population Coverage:	"In-Building" (≥ -74 dBm)	1785	1962
	"In-Vehicle" (≥ -82 dBm)	1450	1422
Area Covered (mi²):	"In-Building" (≥ -74 dBm)	7.49	6.22
	"In-Vehicle" (≥ -82 dBm)	6.11	4.88
Roadway Coverage (mi):	Main:	3.93	3.49
	Secondary:	13.83	11.95
	Total:	17.76	15.44

Table 2: Coverage Statistics¹

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

3. Conclusion

The Site A Tolland Turnpike facility provides AT&T with superior coverage along Route 74 and is the RF preferred Site. If Site B were to be built, AT&T could achieve the majority of its coverage objectives, but the remaining coverage gap on Route 74 west of Route 320 would likely require another site to be built and the remaining coverage gap on Route 74 east of Route 320 might also result in the need for another site.

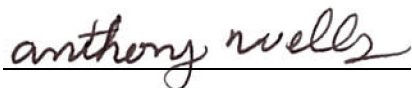
No existing structures were identified and available to provide the coverage requirements needed for this area. The location and the minimum height selected were chosen to achieve an optimal balance between meeting coverage objectives, overcoming the tree line for signal propagation, minimizing the aesthetic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

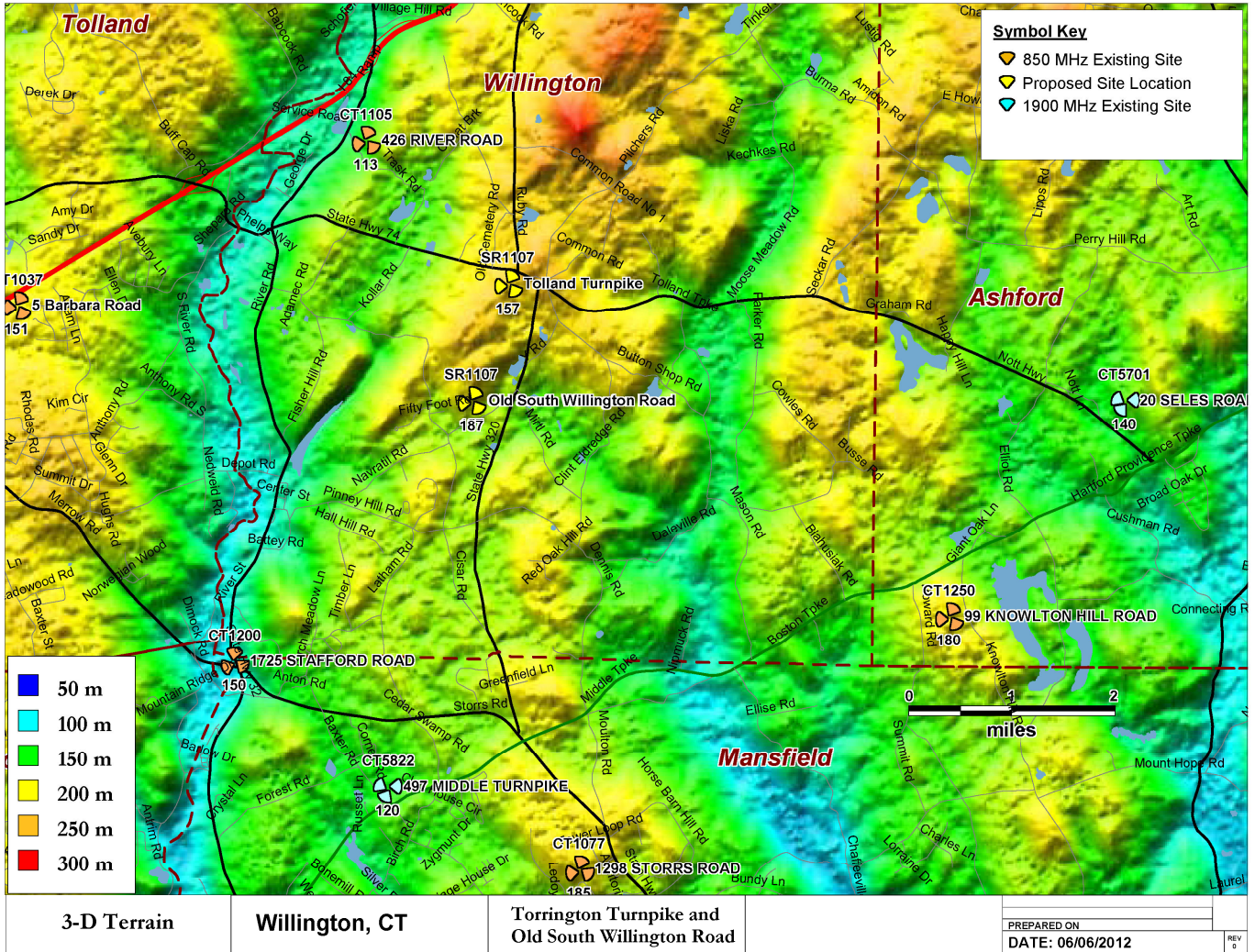


Tony Wells
C Squared Systems, LLC

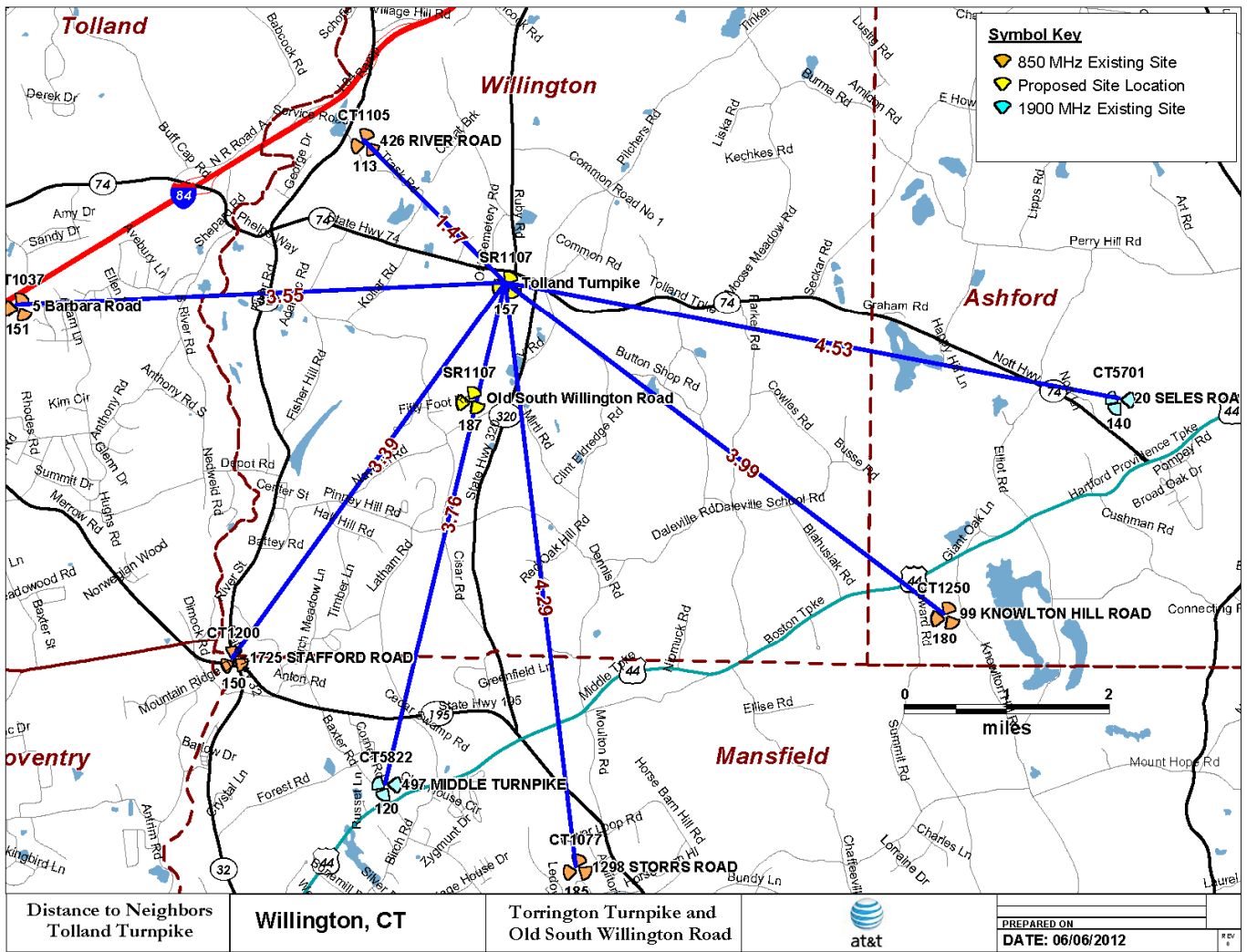
June 20, 2012

Date

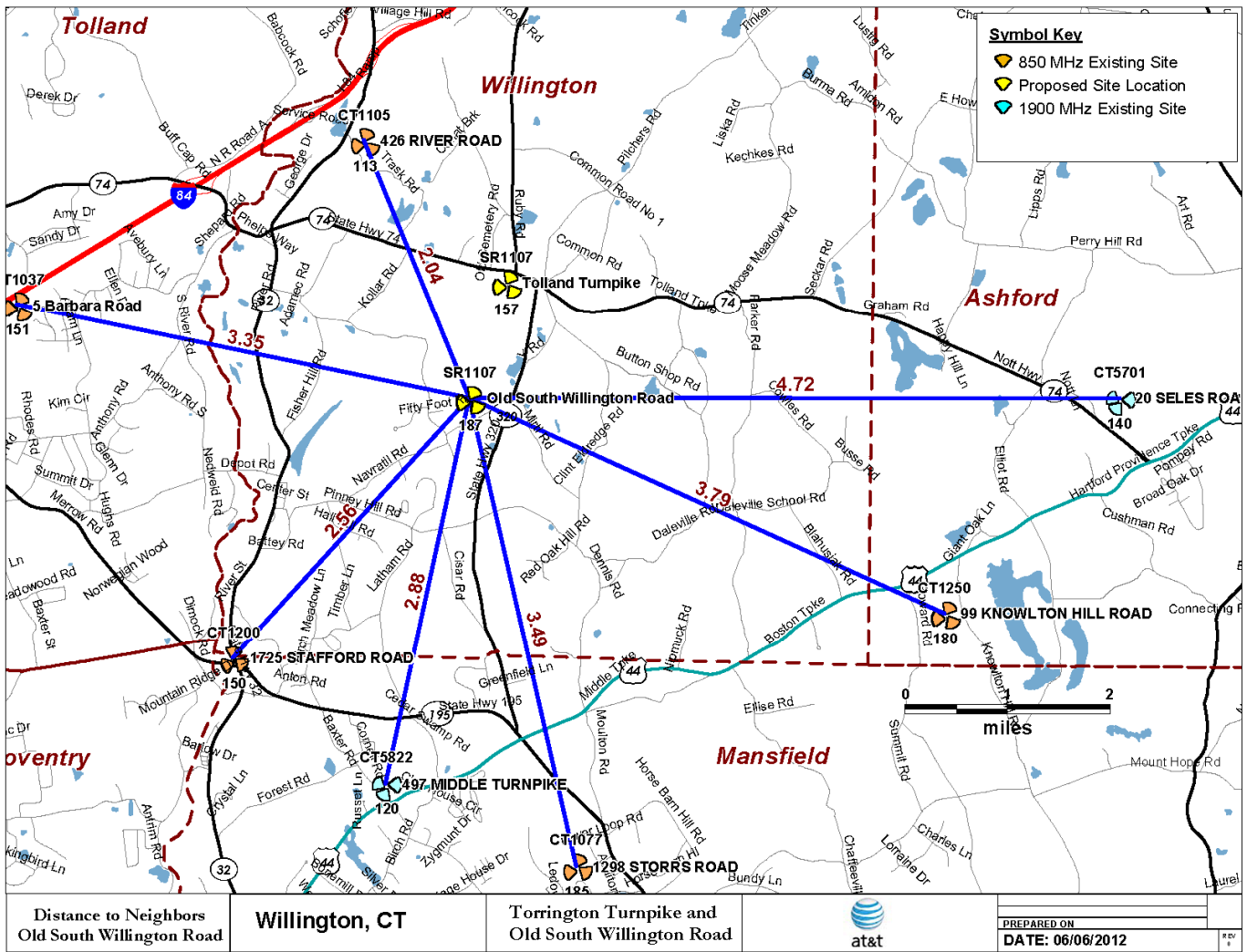
5. Attachments



Attachment 1: 3D Terrain Map



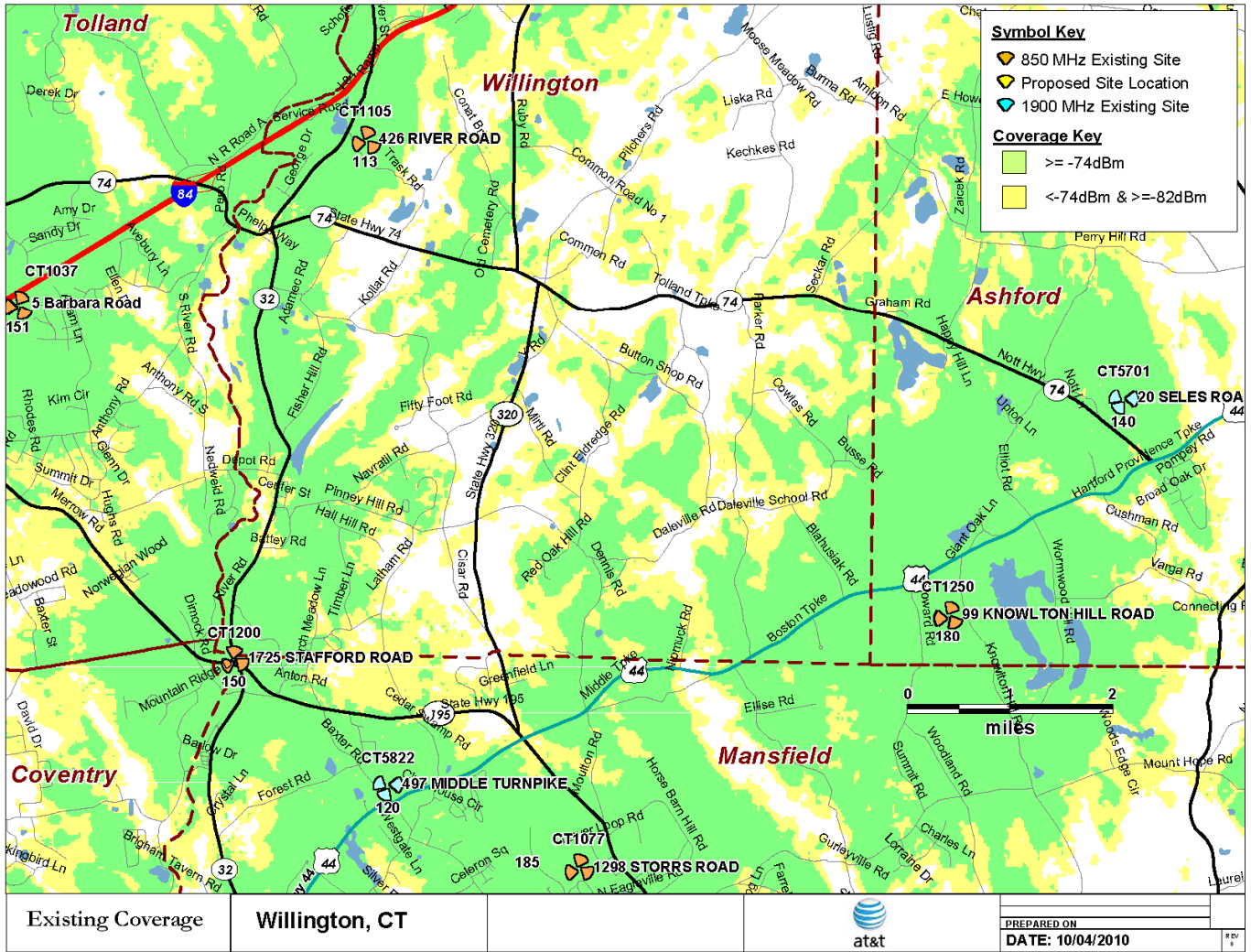
Attachment 2: Map of Distance to Neighbor Sites – Site A Tolland Turnpike



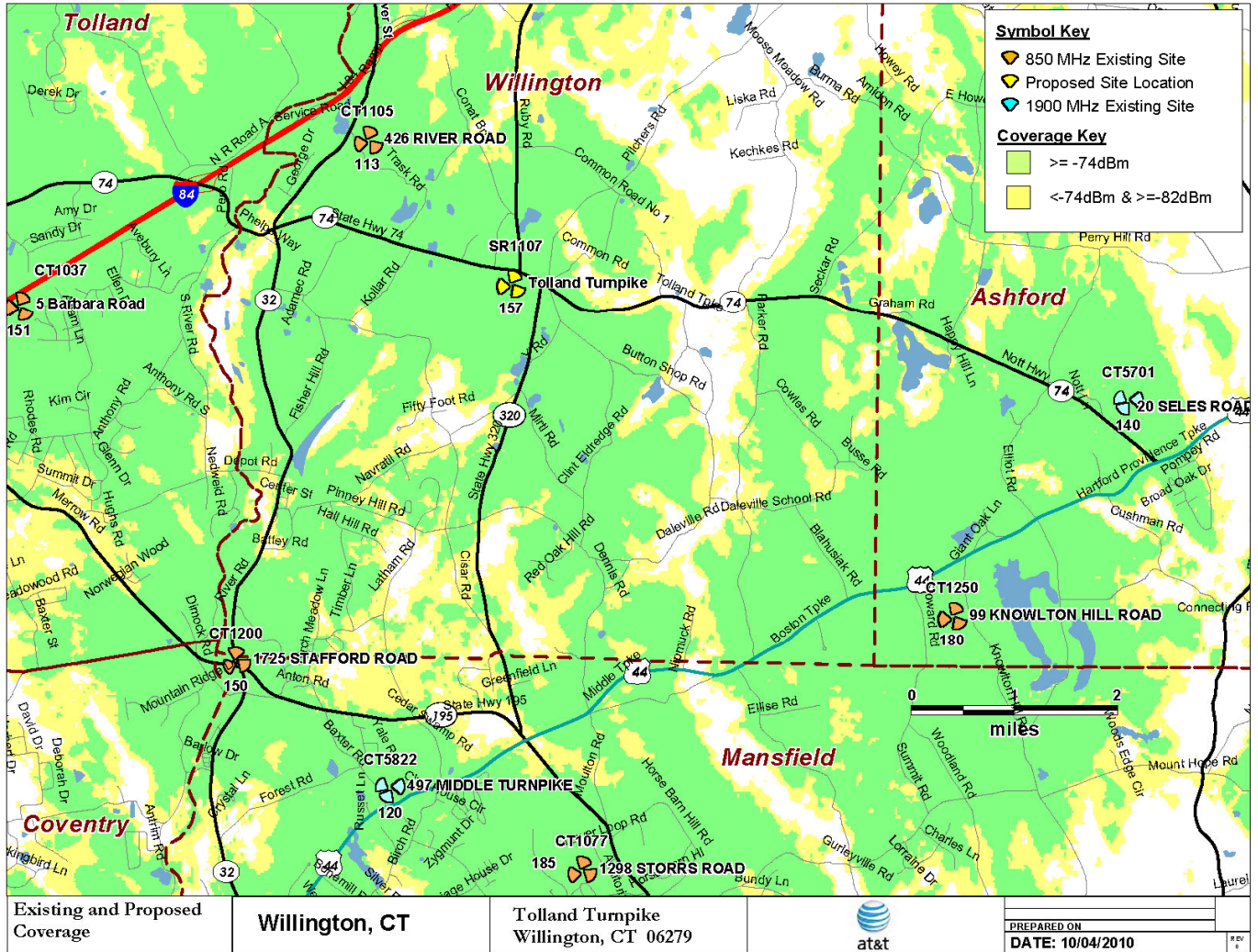
Attachment 3: Map of Distance to Neighbor Sites – Site B Old South Willington Road

Site Name	Address	Town	Latitude	Longitude	Antenna Centerline (feet)	Distance from Tolland Turnpike (miles)	Distance from Old South Willington (miles)
CT1037	5 Barbara Road	Tolland	41.8733	-72.3383	151	3.55	3.35
CT1077	1298 STORRS ROAD	STORRS	41.8140	-72.2594	185	4.29	3.49
CT1105	426 RIVER ROAD	WILLINGTON	41.8907	-72.2894	113	1.47	2.04
CT1200	1725 STAFFORD ROAD	STORRS MANSFIELD	41.8359	-72.3078	150	3.39	2.56
CT1250	99 KNOWLTON HILL ROAD	ASHFORD	41.8407	-72.2075	180	3.99	3.79
CT5701	20 SELES ROAD	ASHFORD	41.8634	-72.1828	140	4.53	4.72
CT5822	497 MIDDLE TURNPIKE	Mansfield	41.8227	-72.2863	120	3.76	2.88
Tolland Tpk	Tolland Turnpike	WILLINGTON	41.8757	72.2694	157	N/A	0.88
Old S. Willington	Old South Willington Road	WILLINGTON	41.8634	72.2745	187	0.88	N/A

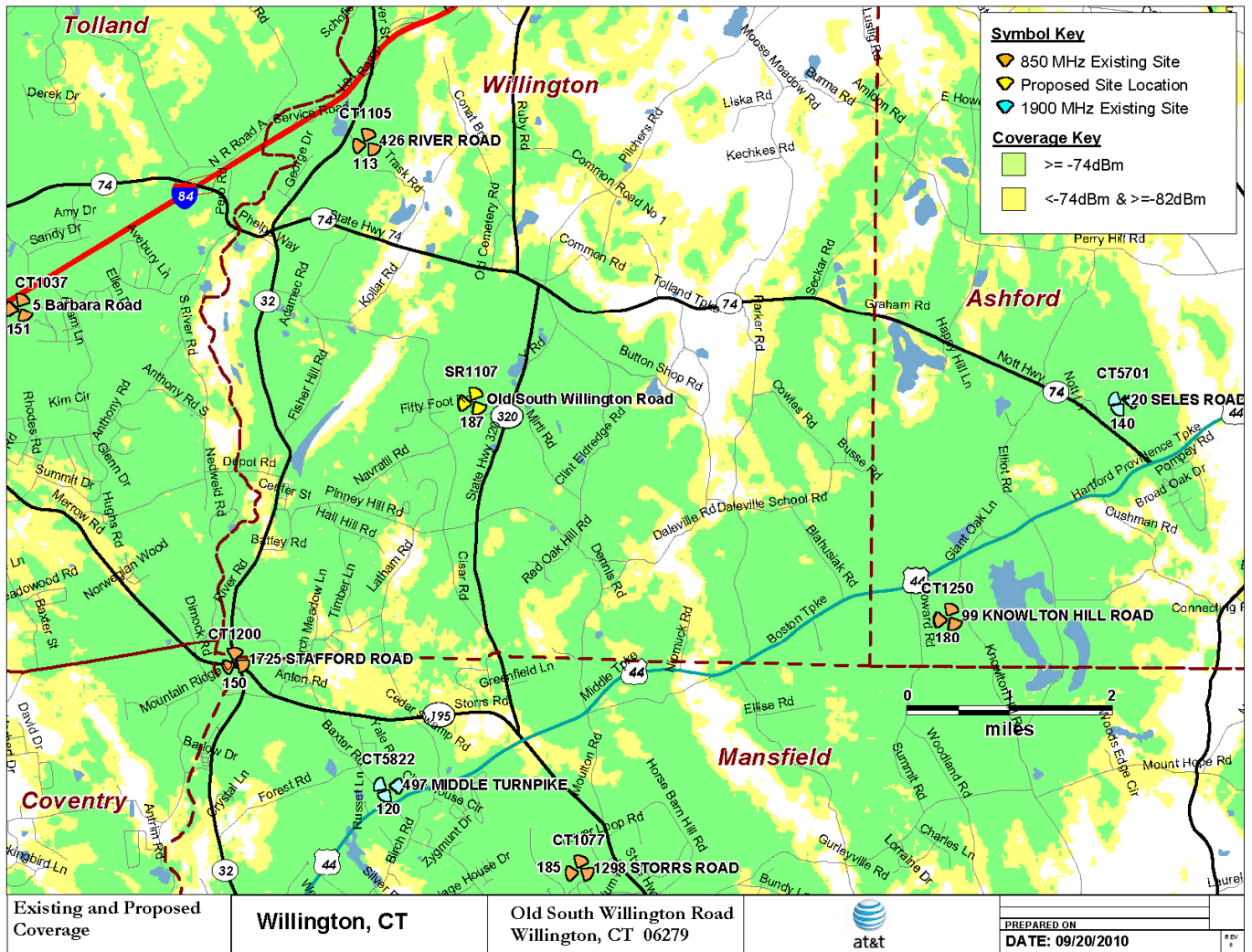
Attachment 4: Neighbor Site Data and Distance to Proposed Sites



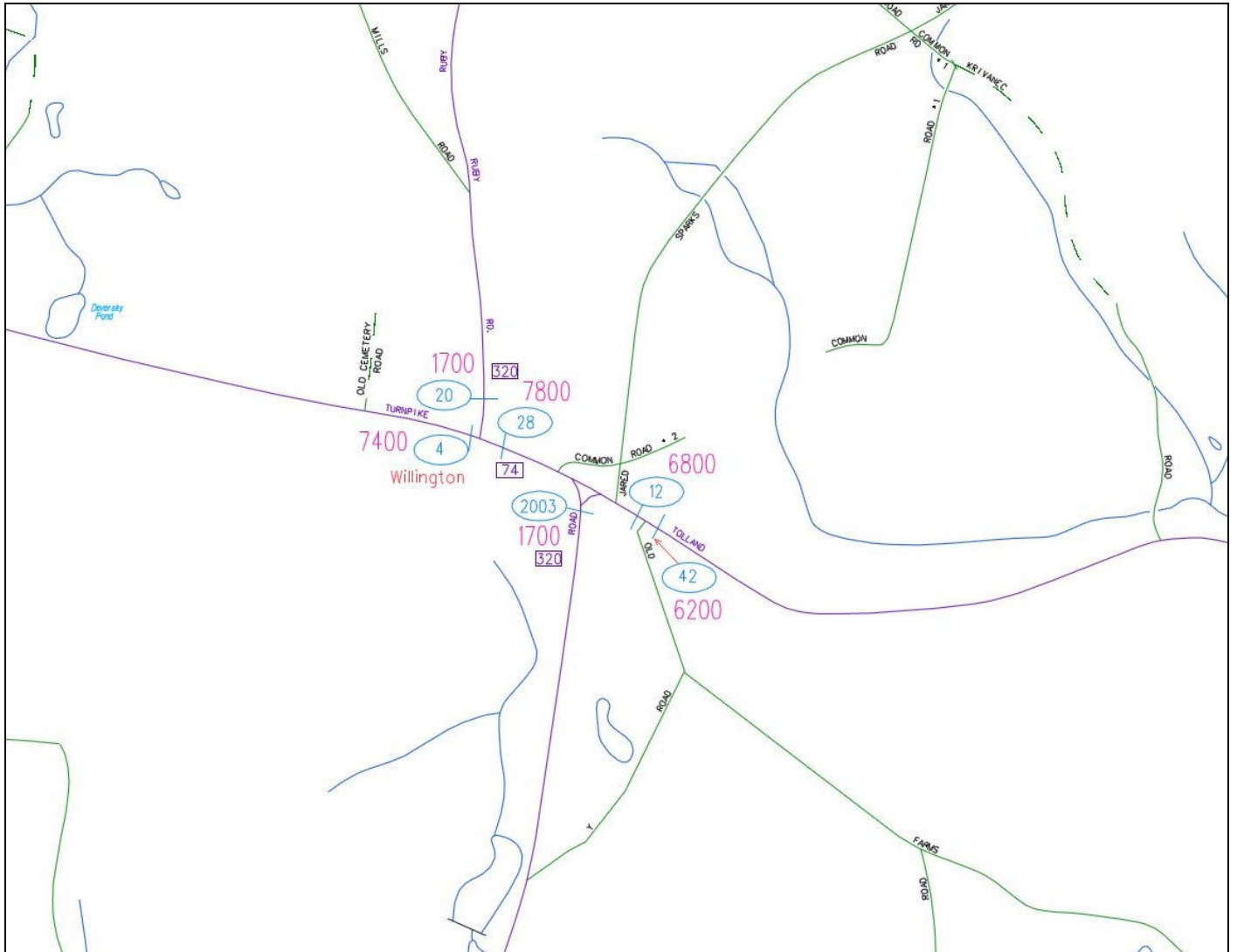
Attachment 5: "Existing Coverage" for the Current AT&T network



Attachment 6: “Existing & Proposed Coverage” for the AT&T network with Site A Tolland Turnpike



Attachment 7: “Existing & Proposed Coverage” for the AT&T network with Site B Old South Willington Road



Attachment 8: CTDOT Average Annual Daily Traffic Data