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September 5, 2013

Mr. Dale Iman  
City Manager  
City of Winchester  
15 N. Cameron St.  
Winchester, VA 22601

Subject: Antenna site study for the Winchester Medical Center (Valley Health Systems) location

Dear Mr. Iman:

At the direction of City Council, Motorola has prepared a high level performance and budgetary feasibility evaluation of a transmitter site located on the Winchester Medical Center (Valley Health System) campus. None of the required approvals from landowners, federal, state, and city authorities has been obtained or is guaranteed.

Motorola has provided two 800MHz voice coverage maps that show the portable radio in-building coverage. The contracted performance standard requires 95% / 95% coverage (95% of the city area at 95% probability).

1. The first propagation study simply relocates the proposed Jefferson Street tower and equipment to the Winchester Medical Center campus. The propagation study shows coverage for 85% of the city using that configuration.
2. The second propagation study shows the minimum tower height at which the required 95% coverage can be provided. A 450 foot tower will be required.

Table 1 below provides budgetary and schedule estimates to implement the single site P25 trunked public safety radio system described in the Motorola proposal of February 29, 2012, substituting a 450 foot self-supporting tower at the Winchester Medical Center campus. These are budgetary guidelines to assist the city with the critical issues decision process, not quotes to provide services.

The relocation of the transmitter site from Jefferson Street to the Winchester Medical Center campus will require an estimated additional budget of \$778,910 plus land acquisition costs and an estimated minimum project delay (schedule extension) of 368 days if all required approvals are obtained with minimum delay and without the need for additional resources to meet regulatory requirements.

Please note that a decision to use multiple sites will increase costs substantially beyond the proposed single site design. Site connectivity (microwave), simulcast technology upgrade, site acquisition and development, and system redesign will contribute to additional cost increases. If leased sites are substituted in lieu of city owned sites, then recurring lease costs are an additional City consideration.

Thank you,

Pieter Jansen  
Project Manager  
Motorola Solutions, Inc

Table 1. Budget and Schedule Impact for Winchester Medical Center Campus Transmitter Site

Description	Estimated Additional Cost	Estimated Duration (days)	Estimated Schedule Extension	Notes
Land acquisition		120 to Denied	120	
Tower 450 ft	\$199,973	28	14	Self-Supporting Tower
Tower enhancements	\$115,847	14	14	FAA painted/Collocation/Strobe lights
FAA approval	\$5,593	90 to Denied <sup>1</sup>	90	Helipad or height restrictions may apply.
FCC Frequency relicensing	\$4,237	90 to Denied <sup>1</sup>	*	May not approve VHF and 800 MHz licenses at this height
Narrow band waiver extension(s)	\$1,637	30 to Denied <sup>1</sup>	*	FCC response is unknown.
Engineering and Project management (additional - all phases)	\$145,987	120	30*	Site plans, RF design, tower, MW, electrical, telco, grounding, CUP re-submittal.
Zoning approval, Coordination, Documentation	\$17,288	120	*	Fall zone. Increased tower lighting requirement (multiple strobe).
NEPA/SHPO approvals	\$6,780	90	60*	Tower height issues. Entrance corridor.
Site development	\$281,568	120 to Denied <sup>1</sup>	40*	Additional compound and fencing - tower base size is doubled.
<b>Budget Estimate</b>	\$778,910		368 Days	

\* Concurrent task – A task that runs concurrently with other tasks and results in partial or no additional extension to the schedule (assumes all tasks occur in their minimum time frame).

1. Denied – If regulatory approval is denied then impact on schedule and budget impact is not defined.



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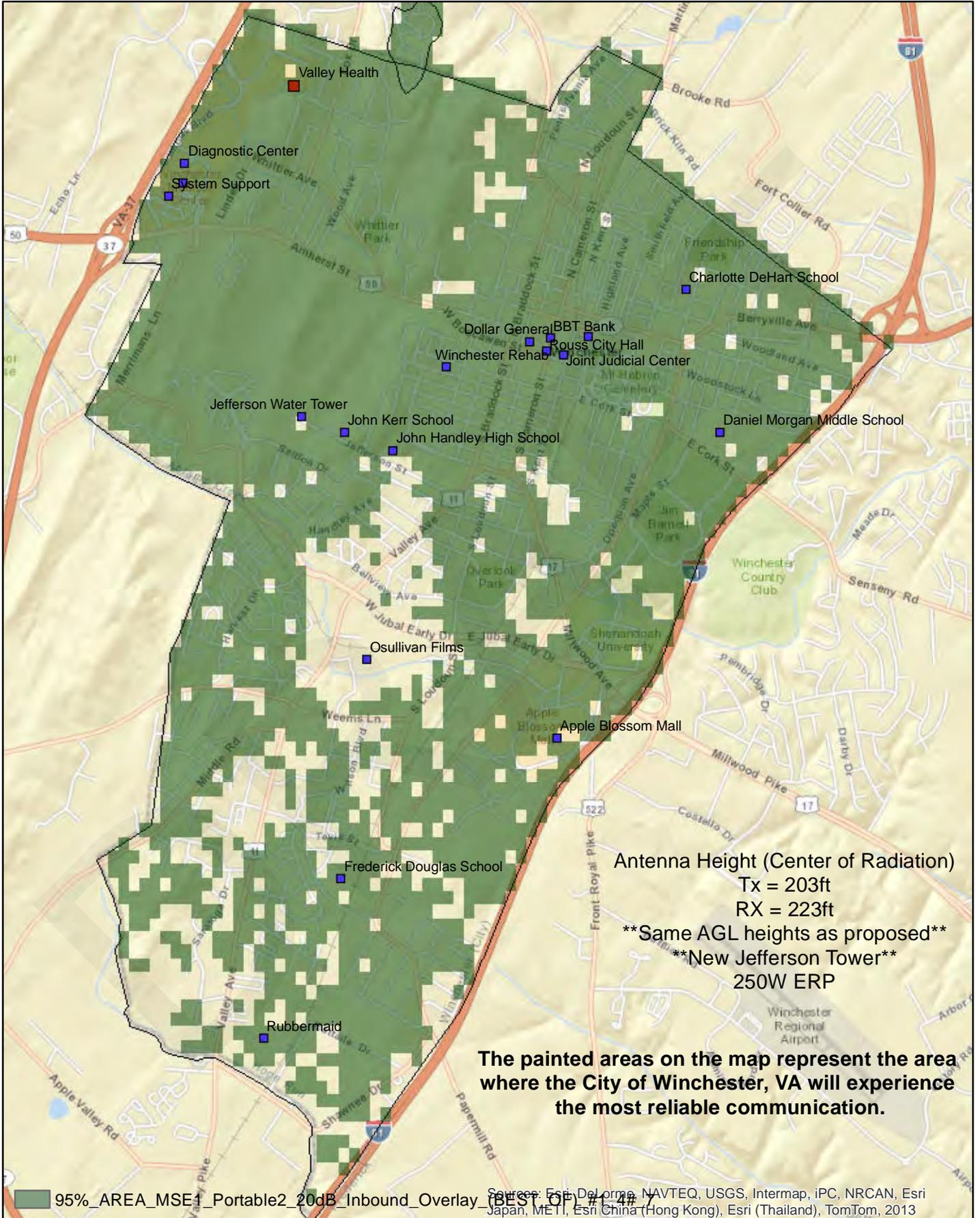
Google earth

Google earth





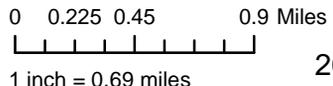
Single Site Trunked 800MHz Voice System - DAQ 3.4



Antenna Height (Center of Radiation)  
 Tx = 203ft  
 RX = 223ft  
**\*\*Same AGL heights as proposed\*\***  
**\*\*New Jefferson Tower\*\***  
 250W ERP

**The painted areas on the map represent the area where the City of Winchester, VA will experience the most reliable communication.**

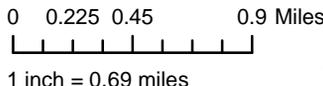
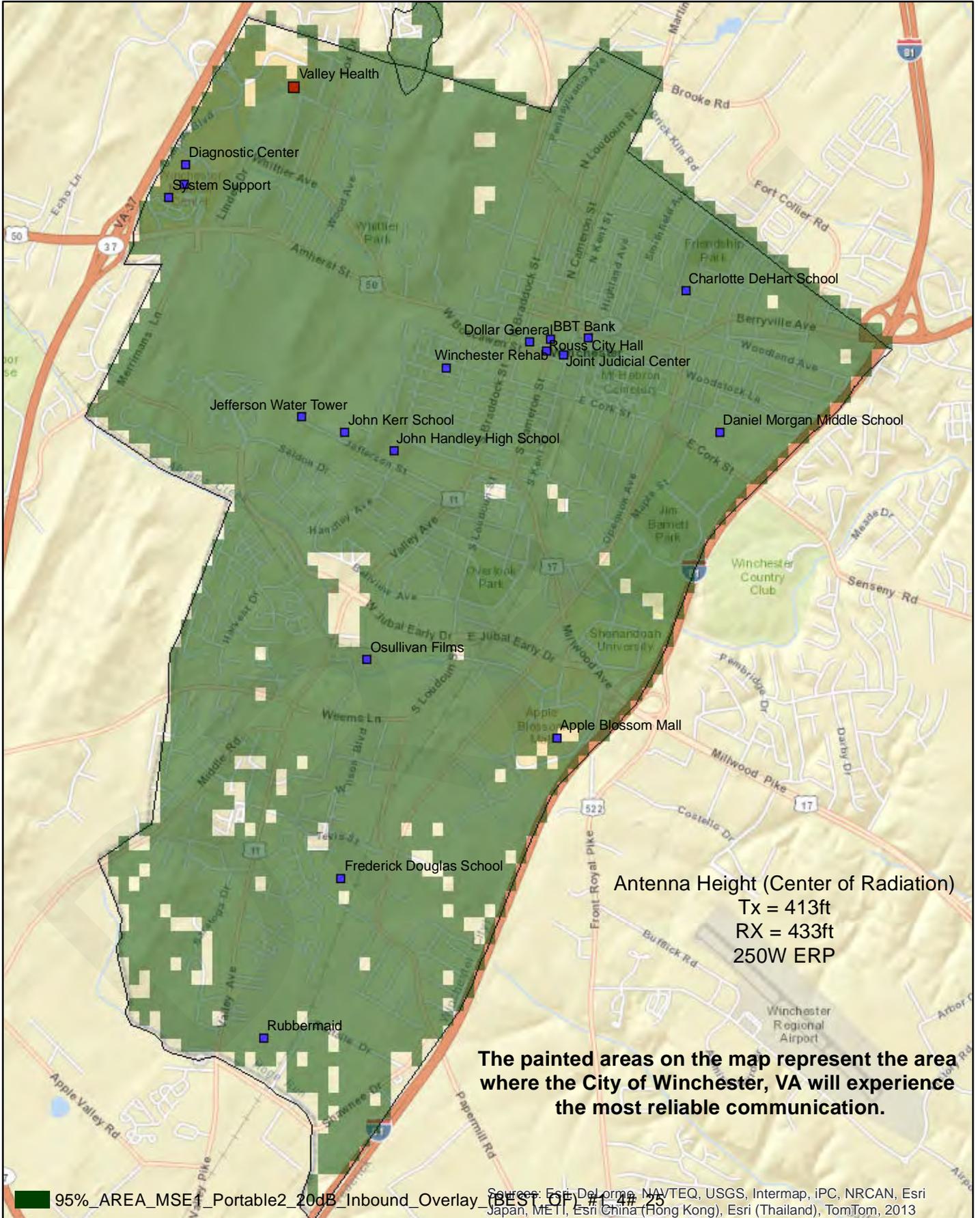
95%\_AREA\_MSE1\_Portable2\_20dB\_Inbound\_Overlay (BEST OF #14) Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013



Portable Inbound Coverage Worn on Hip w/ Swivel Case and RSM  
 20dB Building Penetration Loss Over Entire Winchester, VA Service Area crk067-11



Single Site Trunked 800MHz Voice System - DAQ 3.4



Portable Inbound Coverage Worn on Hip w/ Swivel Case and RSM  
 20dB Building Penetration Loss Over Entire Winchester, VA Service Area

crk067-11

Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013