ENGINEERING STATEMENT

I. Introduction

1. This Engineering Statement has been prepared on behalf of NY3G Partnership ("NY3G") in response to the April 27, 2005 Engineering Statement submitted by Trans Video Communications (hereafter "TVC Engineering Statement").

2. In its Reply Comments and associated Engineering Report filed in this proceeding on February 8, 2005, NY3G demonstrated that a "split-the-football" approach to the impasse between NY3G and TVC would result in a service "exclusion zone" in New York City of at least 7.8 km on both sides of the GSA border, denying service on the F group channels to over seven million consumers in Manhattan and large portions of Brooklyn and Queens.[1] See attached Exhibit 1.

3. In its response, TVC argues that the use of low-power, directional base stations would mitigate the size of the exclusion zone. TVC further contends that by factoring in coordination between the co-channel licensees and signal attenuation, the exclusion zone would "virtually disappear." TVC Engineering Statement, at ¶ 2.

4. TVC's engineering analysis is fundamentally flawed. The technical assumptions for its imagined low-power system design are unrealistic, and TVC's proposed reliance on coordination to resolve interference concerns cannot work given the substantial overlap in the densely populated service areas. TVC's calculated attenuation factor

[1] For purposes of these calculations, NY3G assumes that TVC's F group stations have protected service areas.

(erroneously derived from NY3G's comments regarding "reliable service") ignores the additional 20 dB of design margin necessary to provide in-building service and the fact that the GSA border occurs near the East River, which would not obstruct signals crossing into adjacent GSAs. Moreover, as demonstrated in the independently prepared analysis by Wi-Com Consulting, Inc., TVC ignores base station-to-base station interference and the limiting effect of the FCC's height benchmarking requirement on base station operations. Thus, TVC fails to rebut NY3G's demonstration that applying the "split-the-football" methodology to the F group channels in New York City would result in the creation of a service exclusion zone of at least 7.8 kilometers on each side of the GSA border.

I. TVC's proposed low-power, directional system is unrealistic.

5. To demonstrate the enormity of the exclusion zone problem in New York City, NY3G calculated the size of the zone, assuming that base stations and CPE devices would radiate <u>at most an EIRP of 0.1 watts towards the GSA</u>. NY3G Engineering Statement, at ¶ 7. To emphasize that its use of 0.1 watt EIRP was intended solely for purposes of providing a conservative estimate of the size of the exclusion zone, NY3G pointed out that actual available vendor equipment would transmit at more than 400 times that level (40 watts EIRP) and that "[w]hile higher-powered directional base stations could be deployed such that pattern nulls are placed towards the GSA, <u>the nulls would still likely have EIRP values in excess of 0.1 watts</u>." *Id*. at n. 9 (emphasis added). In fact, under these more realistic parameters (40 watts maximum EIRP base stations and minus 20 dB for the pattern null aimed towards the GSA border), the EIRP radiating in the direction of the GSA border would be 0.4 watts and the exclusion zone would be 15.6 kilometers on each side of the GSA border. See attached Exhibit 2. Similarly, a realistic

CPE device would likely transmit using at least 0.25 watts EIRP, also implicating an exclusion zone larger than the conservative estimate by NY3G.[2]

6. Although NY3G made clear that its hypothetical, low EIRP assumption was not intended as a parameter of a realistic system design, TVC nonetheless assumes that such a system is, in fact, feasible and erroneously bases interference calculations on that assumption. For example, TVC proposes the use of a directional antenna on the low-power base station having a null towards the GSA border of 0.001 watts (-30dBW). TVC Engineering Statement, at ¶¶ 3-4.

7. TVC's system is completely unrealistic. NY3G calculates that, under TVC's imagined low-power system, service to a CPE device from a base station would extend on average to one kilometer on the antenna nose (where the maximum EIRP is 0.1 watts) and on average to 0.2 kilometers in the null (where the null EIRP is 0.001 watts). Thus, unobstructed, the cell size of TVC's proposed base station would be approximately 0.75 square kilometers. However, in light of the dense urban environment of Manhattan and in order to achieve reliable service to hand-held CPEs used at street level and in upper floors of buildings, an actual cell site footprint may be a quarter or less of this size. In assuming that such a low-power system could be practical, TVC ignores the fact that an additional 20 dB of predicted outdoor receive signal strength (67 dBu) is required in order to achieve reliable in-building service.[3] Under TVC's assumptions, no in-building

[2] As TVC acknowledges (at ¶ 6), mobile CPEs are problematic because they necessarily use omnidirectional transmitters and could be physically located anywhere.

[3] The additional 20 dB of signal strength is a conservative estimate, and it would not be unreasonable to design a system requiring an additional 10 to 20 dB (77 to 87 dBu) in order to achieve reliable service throughout Manhattan.

service could be provided reliably unless the building was essentially adjacent to, and in the main radiation lobe of, the base station antenna.

8. TVC also suggests that coordination between co-channel licensees can effectively reduce interference.[4] Given the degree of overlap in the service areas and the potential millions of CPE devices involved, however, such coordination would be infeasible. Moreover, any agreement to accept interference along the GSA Border would lower service reliability and would cause major service disruptions.

II. TVC improperly assesses a "Manhattan metro attenuation factor" to predict a signal strength at the GSA border.

9. Based on NY3G's statement that "[a]ctual reliable service from a base station that operates with 0.1 watts EIRP in New York City is expected to be less than 2 kilometers" (NY3G Engineering Statement, at ¶ 4), TVC concludes incorrectly that NY3G used an attenuation factor of 11.8 dB or -1.51 dB/km. TVC's calculation is premised on the free space 47 dBu field strength propagation distance of 7.8 km. TVC Engineering, at ¶ 2 n.*. However, the FCC's signal strength standard at the GSA border (47 dBu) is used to assess unwanted signal interference levels into an adjacent-market GSA and is not used

[4] As an example, TVC's suggests that the co-channel licensees could agree to use CPE devices that transmit only when receiving a base station signal strength equal to or greater than 47 dBu. This proposal, however, is flawed and impractical. For example, a customer using a CPE device in an upper floor of a tall building could be receiving an acceptable (47 dBu) signal from a directional base station (main lobe of its antenna oriented west away from TVC's GSA) to the east of the customer. The customer, however, would nonetheless be transmitting a line-of-sight signal across the East River into TVC's GSA. In fact, this would be a common scenario for the directional base station antenna system envisioned by TVC and for the anticipated service in Manhattan, where customers are likely to be in high office buildings.

for the determination of reliable service.[5] As discussed above, TVC has failed to consider that an additional 20 dB of design margin (67 dBu) or more would be necessary in order to provide reliable in-building service. Moreover, TVC has ignored the fact that, given the presence of the East River, there are a number of locations in the TVC GSA in both Brooklyn and Queens where there would be an unobstructed, line-of-sight to the upper floors of numerous tall buildings in Manhattan, where potential CPE devices and base stations could and would likely be used. Application of a -1.51 dB/km attenuation factor under such circumstances would be grossly inappropriate.

III. TVC's discussion of existing high-powered operations is irrelevant.

10. In a footnote in the NY3G Engineering Statement, NY3G states that an exclusion zone problem would also exist for high-powered operations in the Middle Band Segment ("MBS") under the new rules. NY3G Engineering Report, at ¶ 6 n.8 (power flux density standard at the GSA border would prevent use of omnidirectional base stations transmitting at higher than 38 watts EIRP within 7.8 km of GSA border). TVC disputes NY3G's conclusion by purportedly demonstrating, based on the existing operating parameters for the F group stations of NY3G and TVC, that there would be no exclusion zone. TVC Engineering Statement, at ¶¶ 9-13. Even assuming TVC's calculations are correct,[6] they are irrelevant. Under the new rules, NY3G would be permitted to move its

[5] Reliability of service to any urban area is based on a number of factors, including the following:

a. the type of service provided (e.g., fixed, portable, mobile, handheld, street-level, in-building);
b. the desired reliability of the service type (e.g., 99.999% for mobile); and
c. morphology, base antenna height, and building penetration loss.

[6] NY3G notes several errors in TVC's calculations. First, TVC (at ¶ 10) discusses a "47 dBu BRS limit at a GSA border" when discussing the high-powered service of WMY-

transmitting facilities anywhere within its GSA so long as the new facilities comply with the FCC's power limitations at the GSA border. Accordingly, TVC's static analysis is useless.

IV. Conclusion

11. TVC's engineering analysis is fundamentally flawed and should be disregarded. Its imagined low-power design is unrealistic, and its proposed reliance on coordination provides no real solution for resolving interference concerns. Its calculation of an attenuation factor is unsound, failing to consider the technical requirements for in-building service and the geography of New York City. At bottom, TVC fails to rebut NY3G's demonstration that applying the "split-the-football" methodology to the F group channels in New York City would result in the creation of a service exclusion zone of at least 7.8 kilometers on each side of the GSA border.

By: /s/
Darryl K. DeLawder, President
DeLawder Communications, Inc.

Date: May 31, 2005

467. The 47 dBu standard for low-powered service is not applicable in the MBS (where a -73 dBW/m^2 power flux density standard is used at the GSA Border). Second, TVC cites (at ¶ 11) the measured height of 1.5 meters AGL (the height used for the LBS and UBL) as the measured height limit for WMY-467. For the high-powered MBS, however, the correct height to a protected point is 9.1 meters AGL, not 1.5 meters.

Exhibit 1.

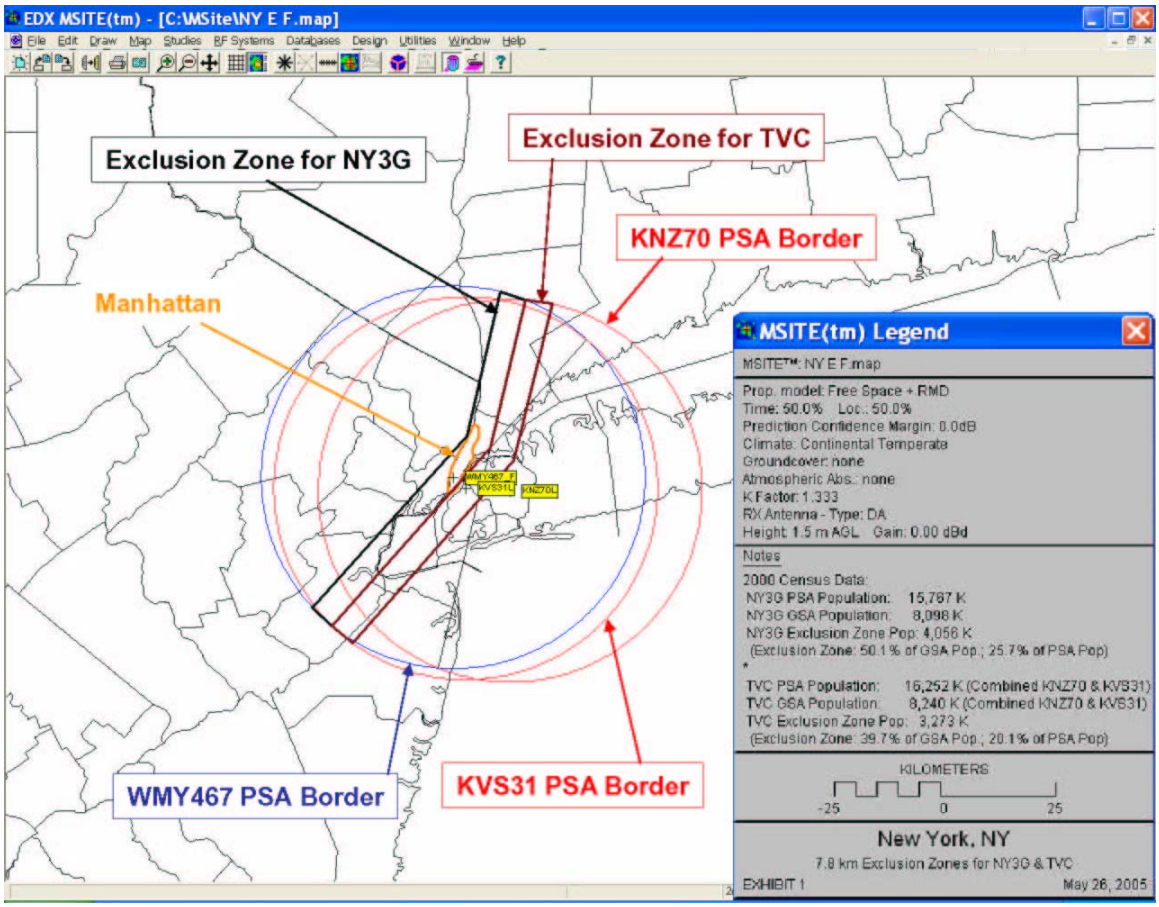
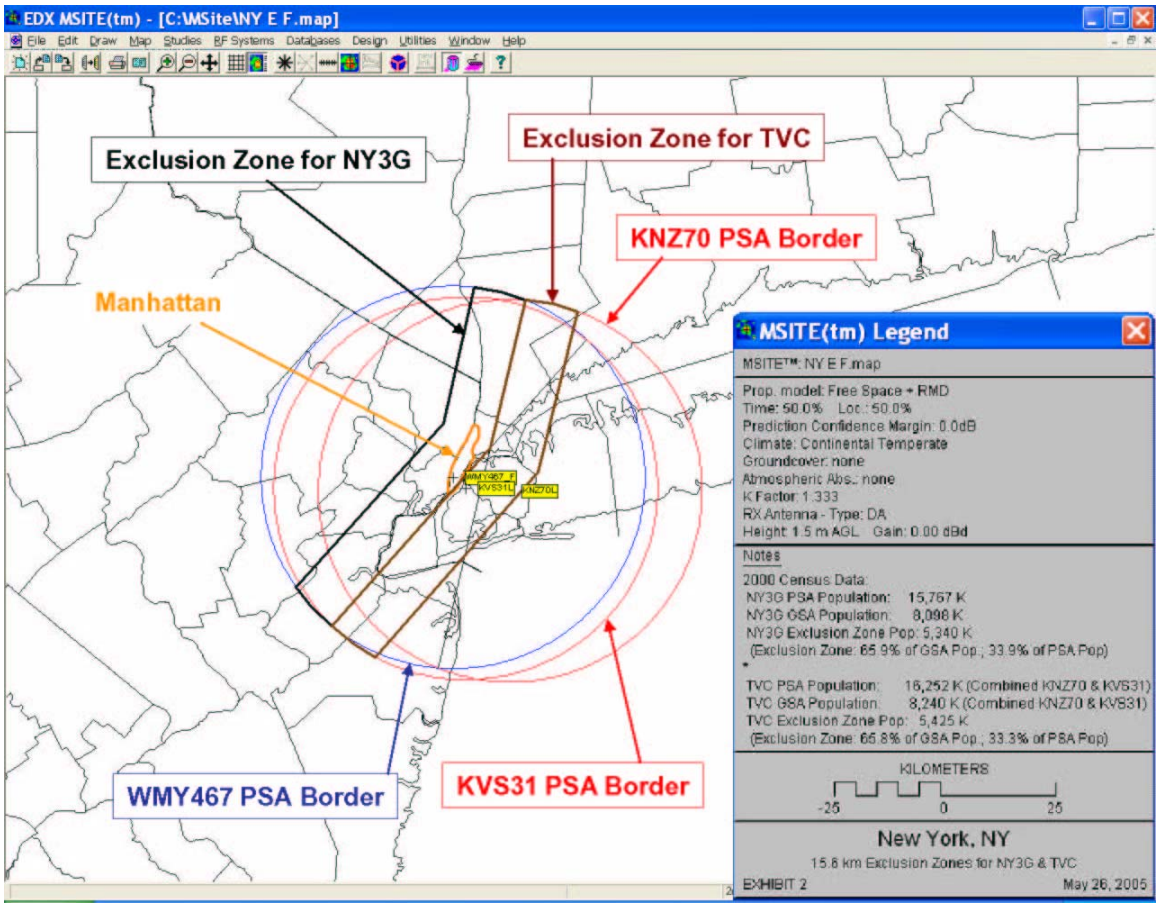

EDX MSITE(tm) - [C:\MSite\NY E F.map]
Exclusion Zone for NY3G
Exclusion Zone for TVC
KNZ70 PSA Border
Manhattan
WMY467 PSA Border
KVS31 PSA Border
MSITE(tm) Legend
MSITE™: NY E F.map
Prop. model: Free Space + RMD
Time: 50.0% Loc.: 50.0%
Prediction Confidence Margin: 0.0dB
Climate: Continental Temperate
Groundcover: none
Atmospheric Abs.: none
K Factor: 1.333
RX Antenna - Type: DA
Height: 1.5 m AGL Gain: 0.00 dBd
Notes
2000 Census Data:
NY3G PSA Population: 15,787 K
NY3G GSA Population: 8,098 K
NY3G Exclusion Zone Pop: 4,056 K
(Exclusion Zone: 50.1% of GSA Pop.; 25.7% of PSA Pop)
TVC PSA Population: 16,252 K (Combined KNZ70 & KVS31)
TVC GSA Population: 8,240 K (Combined KNZ70 & KVS31)
TVC Exclusion Zone Pop: 3,273 K
(Exclusion Zone: 39.7% of GSA Pop.; 20.1% of PSA Pop)
KILOMETERS
-25
0
25
New York, NY
7.8 km Exclusion Zones for NY3G & TVC
EXHIBIT 1
May 26, 2005

Exhibit 2.


EDX MSITE(tm) - [C:\MSite\NY E F.map]
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Exclusion Zone for TVC
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Notes
2000 Census Data:
NY3G PSA Population: 15,767 K
NY3G GSA Population: 8,098 K
NY3G Exclusion Zone Pop: 5,340 K
(Exclusion Zone: 65.9% of GSA Pop.; 33.9% of PSA Pop)
TVC PSA Population: 16,252 K (Combined KNZ70 & KVS31)
TVC GSA Population: 8,240 K (Combined KNZ70 & KVS31)
TVC Exclusion Zone Pop: 5,425 K
(Exclusion Zone: 65.8% of GSA Pop.; 33.3% of PSA Pop)
KILOMETERS
-25
0
25
New York, NY
15.6 km Exclusion Zones for NY3G & TVC
EXHIBIT 2
May 26, 2005