HIGHLANDS RANCH METROPOLITAN DISTRICT
STUDY SESSION ADDENDA

May 20, 2016

Addendum documents can also be viewed at
http://highlandsranch.org
or
http://intranet.highlandsranch.org/default.aspx

- Xcel gas pipeline & regulator station presentation
- AT&T Highlands Ranch Metro District Upgrades
- Diamond K Playground Renovation
Highlands Ranch Metro District Upgrades

Jennifer Price – External Affairs, AT&T Colorado
Ken Malm – AT&T Network
August 2016
Data usage on AT&T’s network has increased more than 150,000% since 2007.
People are choosing wireless technologies faster than ever before

- Nearly 30x the size of the entire global Internet in 2000.
  - 2014: Grew by 69%
  - Mobile Network Connection Speeds
  - Global Mobile Data Traffic

- Increased 20% in 2014 and are expected to increase more than two-fold by 2019.

- When you look at the first five years the iPhone and Android devices were available, customers adopted those devices three times faster than the Internet and ten times faster than PCs.

- iPhone & Android Devices: 3x Faster
- Internet: 10x Faster
- PCs: 1x Faster

- While it took smartphones nearly a decade to reach 40 million owners, tablets crossed that threshold in only two years since the launch of the first iPad.
People are choosing wireless technologies faster than ever before

– Nearly half (47.4%) of American homes no longer use traditional plain old telephone service, and instead choose to be wireless-only.¹

– In Colorado, 50.5% of homes were wireless-only and 5.5% were landline-only as of December 2014.²

¹ Homes reporting some landline usage – 46.7% in Colorado – include VOIP users. The CDC did not specifically study the percentage of landlines users relying on VOIP vs. traditional landline service.
Individuals and households are not the only ones who are going wireless.

Businesses increasingly depend on strong wireless service to carry them and their employees through the work day.

According to a 2014 poll, small businesses saved $67.5 billion by using mobile apps, tablets and smartphones in their day-to-day business activities.¹

Public safety is improved by the power of mobile communications as a critical tool for first responders in emergency situations.

According to the FCC, nearly 70 percent of 911 calls are made from wireless phones and that percentage is expected to continue growing.²

Mobile phones provide caller location and callback information, enabling quick and accurate emergency reporting.
Families choose wireless, and seniors are adopting wireless technologies

Nearly 60% of U.S. seniors go online, up from just 14% in 2000. This represents the greatest rate of change compared with all other age groups.¹

84% of seniors who use smartphones describe them as ‘freeing.’²

In 2015, 35% of seniors used social media, compared to 2% in 2005.³

According to a 2014 study, 77% of older adults age 65+ have a cell phone.⁴
Building networks to meet consumer demand – we want to invest in Highlands Ranch to help add capacity

• Carriers continually invest in networks to keep feeding demand
• AT&T has invested more than $575 million in Colorado wireless networks (2013-15)
• In 2015, AT&T alone made 648 wireless network upgrades in Colorado-- adding cell sites, increased network capacity and enhanced distributed antenna systems (DAS).
• These investments drive a wide range of upgrades to reliability, coverage, speed and overall performance for residents and businesses. They also enhance critical services that support public safety and first responders.
Highlands Ranch Overview
June 2016
Primary goals of a Highland Ranch cell site:

**Capacity:** How many people are using my cell site?
- Consumer demand in a certain area has grown and additional capacity is needed for better service quality.
- Lower capacity means fewer users may access services.
- Lower capacity can also lead to more dropped calls, inability to place calls and slower data speeds.
- Pole diameter limitations can limit available capacity and quality of service.

**Coverage:** Do I have “bars” or signal on my phone?
- Cellular service is generally considered to be a low power, “line of sight” technology.
- Location, height, terrain, buildings, trees, etc. all have an impact on cell phone coverage.
- Without coverage, increased dropped calls and the inability to place calls may occur more frequently.
- Pole height can limit available coverage and quality of service.

**Quality of Service:** A balance between Coverage and Capacity lead to a higher quality of service:
- Fewer dropped calls.
- Higher success rate to place calls.
- Higher quality voice calls.
- Higher data speeds.
Standard cell site has 12 antennas
HR Pole sites are limited to 3 antennas
Can hide 12 antennas on rooftops (Yosemite & Parkland, Lone Tree)
Wireless Technology

– Cell sites are often supporting various generations of wireless technology. As new generations of technology are deployed, customers migrate over to the newer technology over time requiring their continued support. These cell sites help provide you with the fast network coverage you’ve come to expect from AT&T.
AT&T Highlands Ranch Area sites

HRMD sites limited by 19” diameter

Other stealth poles have HRMD influence on limited diameter

24+” diameter needed to add technologies and/or capacity to existing site.
9623 Lucent Blvd
Capacity project on hold pending ability to expand pole diameter to 24+”
Coverage limited by 45 ft height
HR Town Center
Eldorado Elementary School
Saddle Ranch Elementary School
Bear Canyon Elementary School
Ranch View Middle School
Thunder Ridge High School
9623 Lucent Blvd

Capacity project on hold pending ability to expand pole diameter to 24+”

Coverage limited by 45 ft height

HR Town Center

Eldorado Elementary School

Saddle Ranch Elementary School

Bear Canyon Elementary School

Ranch View Middle School

Thunder Ridge High School
VIEW 2

EXISTING CONDITIONS

(1) PROPOSED 30° CANISTER

PHOTOGRAPHIC SIMULATION
2420 Dad Clark Dr

Capacity project on hold pending ability to expand pole diameter to 24+”

Coverage limited by 45 ft height

RTD Park-n-Ride

Sand Creek Elementary
2420 Dad Clark Dr

Capacity project on hold pending ability to expand pole diameter to 24+”

Coverage limited by 42 ft height

RTD Park-n-Ride

Sand Creek Elementary
Pole or Canister design in Highlands Ranch

Existing AT&T antenna in HR Poles:
- Non-standard, lower quality of performance antenna
- Limited Radio Frequency characteristics (beam shaping)
- **Does not support next frequencies for capacity add**
- Additional compromises when using diplexers, splitters and combining to use this configuration.
- Number of coaxial cables needed to connect cellular radios to these antennas is also limited by the pole design.

Example AT&T proposed antenna in HR Poles:
- Increased depth requires larger diameter
- More standard quality of performance antenna
- More Radio Frequency characteristics (beam shaping)
- **Will support next frequencies for capacity add**
- Additional compromises when using diplexers, splitters and combining to use this configuration.
- Number of coaxial cables needed to connect cellular radios to these antennas is also limited by the pole design.
Recommendations:

Immediate need:
• 24+” Canister to allow for antenna that will support needed technology & capacity additions
• Fewer dropped calls per number of users
• Better call quality
• Higher data speeds

Future planning:
• 24+” pole and canister
  • Recommend 26”
  • Additional antenna choices for improved coverage and/or quality
  • Additional coaxial cable choices for improved coverage and/or quality
• 50 ft. tip height uniformity
  • Up from 45 ft
  • Additional coverage vs quality choices
  • Additional antenna choices
• Height, antenna and coaxial cable flexibility can help reduce the inherent compromises of the pole or stealth design
Thank you.
DIAMOND K
PLAYGROUND RENOVATION
FALL/WINTER 2016
Current Diamond K Playground

- Built in 1989 (27 yrs. old)
- Playground safety standards outdated
- Not many accessible play features
Goals

Playground to be:

- accessible and safe
- updated equipment
- physically challenging
- mentally stimulating
- site compatible
- designed for social interaction
- “fun for all” (inclusive play)
- meet budget ($80,000 major repair fund)
Referenced projects we visited

1. Golden Heights Park
   Quaker St. and 2nd Place
   Golden, Co 80401

2. Kyffin Elementary School
   205 Flora Way
   Golden, Co 80401

3. O’Connell School
   1275 S. Teller St.
   Lakewood, Co 80226
Interactive/Sensory Play
Sensory Elements
Spring Toys
Climbers
Swings
Future Ramp/EWF Surfacing
Proposed 2-5/5-12 Playground

Diamond K Park -C
Proposed Swings/Spring toys
Proposed Playground

Diamond K Park -C
Aerial Plan View
Questions and Comments
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### Schedule B

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