



City of Gonzales

AGENDA
ITEM

16

CITY MANAGER DEPARTMENT

STAFF REPORT

TO: Honorable Mayor Orozco and City Council

DATE: October 7, 2019

FROM: Rene Mendez, City Manager

SUBJECT: Broadband for All Infrastructure Initiative

RECOMMENDATION

Staff recommends that the City Council:

1. Approve the Strategic Technology Enablement Public/Private Partnership 2-Year Proposal with T-Mobile to implement the City's "Universal Broadband for All" Initiative that includes the Ultimate Rollout of 2,000 hotspots (one per household) for \$12.5 per month per hotspot, for a not to exceed amount of \$300,000 annually for two years, with the performance requirements and standards articulated in the proposal contingent on (1) the technology standard being validated by a 3rd Party Network Engineer, and (2) the City Manager working with the City Attorney to finalize an agreement that implements the proposal, and authorize the City Manager with concurrence from the City Attorney to sign said agreement.
2. Direct the City Manager to bring back the necessary amendment to the FY 2019-2020 City Budget as part of the Mid-Year Review.

BACKGROUND

City's Broadband Infrastructure Strategy

On May 15, 2017, the City adopted a Broadband Infrastructure Strategy that at its core goal was to provide basic and reliable service to every household in Gonzales. The strategy clearly put forth broadband and achieving "Universal Broadband for All" as one of the cornerstones of the City's strategy to continue to improve and serve our community. It recognized that in order to be competitive and provide the necessary tools for our community to thrive in the 21st century, this was essential. While certainly a very ambitious goal, your Council has provided steady policy direction and feedback that formally came together with the adoption of the City's Broadband Infrastructure Strategy on May 15,

2017, and a subsequent update that was presented to your Council on November 20, 2017. This strategy brought together several existing and new elements.

1. Continue active participation in the Central Coast Broadband Consortium, which the City has been a very active member since its inception;
2. Actively participate in local, state and national initiatives on the need for more efforts to acquire reliable, robust and affordable broadband for the betterment of the community, and also to raise community awareness and acceptance of internet service as a needed utility for everyone;
3. Actively monitor and participate in California Public Utility Commission (CPUC) proceedings that have the potential to impact our community. For example, Gonzales:
 - a) Was the only City to appear before the CPUC to support and testify on the benefits that the Sunesys LLC, Connected Central Coast Unserved and Underserved Broadband Project that connected Santa Cruz to Soledad, would not only bring to Gonzales, but the Salinas Valley. This important project, which was completed, built the backbone to allow providers to connect and bring services to communities without having to incur large upfront infrastructure costs; and
 - b) Took a very proactive and aggressive stand on Charter Communications and several other cable television companies' proposals, to merge nationally and share systems. Unfortunately, as part of this proposal, they planned to not invest or serve the lowest 1% of the systems (which included Gonzales) because of connection problems and costs of investments, which they thought was going to be approved. However, once again Gonzales was the first and one of a couple of cities to protest this action, and urge the CPUC to not allow the 1% to be underserved by the upgrades resulting from the merger. Over the course of several hearings, Mayor Orozco, Councilmember Bonincontri and the City Manager testified in front of the CPUC and urged the blocking of the merger if small areas were allowed to be unserved or underserved.
4. Due to the formal protest, Charter initiated negotiations with City. After several negotiations, the City of Gonzales and Charter Communications agreed that in exchange for the City withdrawing its opposition to Charter's acquisition of Time-Warner and Bright House cable systems in California, Charter would upgrade its cable system serving Gonzales to full digital capability within two years of the transaction closing. As your Council is aware, the merger was approved and Charter did in fact upgrade its system here in Gonzales sooner than the required 2 years. So now instead of Gonzales residents being the forgotten 1% that are not worth serving and do not deserve high-speed internet, our residents have access to a system that is available to all at a speed competitive anywhere in the world. Spectrum (Charter) systems offer 100 Mbps down and 60 Mbps upload speeds compared to the 5 Mbps download and 1 Mbps upload that existed in Gonzales before the merger.
5. Preparing and distributing a Request for Qualifications (RFQ) for broadband services to all residents in Gonzales. Results of the RFQ were presented with a recommendation to your Council on February 5, 2018.

Results of RFQ and Next Steps:

Per the criteria utilized for the RFQ and based on the four proposals received, staff recommended, and your Council approved, rejecting all the proposals and authorized the City Manager to initiate discussions with providers to develop a proposal that would be brought to the Council for consideration. This item and the recommendation to approve the Strategic Technology Enablement Public/Private Partnership 2-

Year Proposal with T-Mobile to implement the City’s “Universal Broadband for All” Initiative is the result of the direction provided.

REVIEW AND ANALYSIS

Overall the *Partnership Structure*, as summarized in an Executive Summary (Attachment 1) encompasses the following broad elements:

- T-Mobile will invest significant funds to upgrade the existing wireless backhaul and tower RF infrastructure in the Gonzales market to serve the community at no cost to the City of Gonzales.
- T-Mobile will build out the overall wireless infrastructure to allow for the densification of users accessing and utilizing the wireless infrastructure to ultimately achieve 100Mb down and 20Mb up in each wireless at no cost to the City of Gonzales.
- Wireless connectivity for 2,000 Students/Households will be the focus of the partnership to achieve household digital equity, via the deployment of one hot spot per household.
- T-Mobile will invest \$504,000 in additional funds from its Digital Equity EmpowerED Award Program to address digital equity in Gonzales.
- City of Gonzales will take full responsibility paying T-Mobile for the complete program on a monthly or annual basis, which will be \$12.5 per month per household per hot spot device for up to 2000 hot spots.

The attached *Strategic Technology Enablement Partnership Proposal*, (Attachment 2), that will be the basis of the Agreement, details the expectations, deliverables and standards for said agreement. It leverages the strong partnership with the Gonzales Unified School District and T-Mobile to fundamentally achieve the vision of “Universal Broadband for All.”

Performance Standard: Today, the T-Mobile Network in the City of Gonzales is one of the densest (3 cellular towers with 700Mhz, 1900Mhz, 2100Mhz and shortly to be released 600Mhz, covering 8,000 individuals), and underutilized network in Northern California. The Agreement requires that T-Mobile provide its best effort in delivering Wireless Internet Services well above the FCC’s Advanced Wireless Service standard of 25 Mbps Down/ 3Mbps Up. For example, today the average speed test across the United States is 33Mbps; the proposed agreement will provide at least this level of speed which is above the federal standard and above many communities not only in the State, but the Country. In fact, current steps on the T-Mobile network indicate that Gonzales is performing above this benchmark, with current tests above 90Mbps at locations within the City of Gonzales.¹

Today, an end user should expect ample bandwidth and speed to access the Internet and perform common tasks identified by the Federal Communications Commission (FCC). This Proposal if approved will provide our students the ability to complete their homework and research projects at home and allow the entire household access to the Internet for common tasks such as email, web-browsing, streaming audio and video services.²

Customer Premise Equipment: Utilizing the EmpowerED program from T-Mobile, each household will be issued a Hotspot that supports up to 12 concurrent connections. Each device will carry a one-year manufacturer’s warranty. Additional Hotspots will be ordered and available at deployment for any hardware returns.

The *Proposal* further covers commitments and requirements in the areas of:

¹ Attachment C is coverage spectrum of current providers in Gonzales to compare the coverages and price points that currently exist.

² More detail on customer expectations can be found in the Appendix in the proposal and through the link: <https://www.t-mobile.com/responsibility/consumer-info/policies/internet-service>

- Ensuring the Best Customer Experience;
- Government Customer Care;
- Ensuring the Delivery of Service; and
- Escalation Path to resolve any issues and/or challenges that may arise.

Phased Plan Deployment

If approved, it is not envisioned that all the 2000 hot spots will be rolled out at once, instead a phased plan approach will be utilized. City staff will work with Gonzales Unified School District (GUSD) staff and T-Mobile to roll out the hot spots through the school first, and then other deployments will be scheduled and held to provide the hot spots to households that do not have children or do not have them enrolled at GUSD. The importance of the first phase being rolled out via the schools should not be understated because this partnership has always had GUSD as an active partner, and it complements the school’s intent and vision to provide a device (laptop, Chromebook, iPad, etc.,) for every child to be able to take home to do homework, projects, research, read, etc.

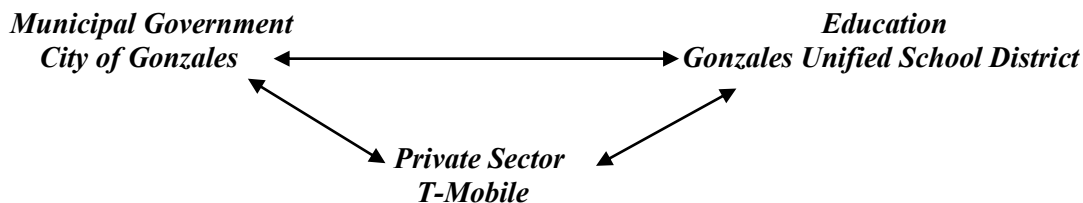
In addition, utilizing a phased approach will allow staff the opportunity to work with our partners to develop the best method of deployment, what documents would be used to assure that the persons provided the hot spot live in Gonzales, and to resolve and trouble shoot any technical issues that may arise.

If the agreement is approved, the deployment plan will include:

- Project Management Planning of the 2,000 Device Distribution driven by the City, School District, and the T-Mobile Implementation Team.
- Hotspot devices will be kitted, labeled, and programmed with CIPA certified software and tested.
- The T-Mobile team will be on hand for all deployment activities.
- The developed project plan will contain measurable benchmarks to ensure that the implementation is built to the City of Gonzales specifications.

Benefits and Perspectives

It’s important to point out that eliminating and/or significantly reducing the “digital divide” while a significant step, is just the beginning of the benefits that will be derived. In addition to the obvious benefits, imagine the possibilities and opportunities that are open up if all households in the community have a minimum baseline level of broadband? It is not hard to envision all sorts of opportunities in education, banking/financial, employment, health, essential services would suddenly be open up. To these ends, to maximize the possibilities and further develop the powerful partnership that this agreement brings together between:



Additional work will be undertaken that:

- Include inviting the AG Tech private community into the partnership
- Leverage new technology Solutions
- Integrate into the Higher Education learning experience

- Result in a Gonzales team attending an executive briefing session that would be hosted by T-Mobile in Bellevue, WA. to discuss Smart City Solutions, Internet of Things, transformation of Education with 21st Century learning, etc.

Explain Recommendation and How it Supports the Vision

Gonzales will continue to be a safe, clean, family-friendly community, diverse in its heritage, and committed to working collaboratively to preserve and retain its small-town charm.

Explain: Achieving the powerful goal to provide “Universal Broadband for All” **implements the Vision** because it will open up all sorts of opportunities in education, banking/financial, employment, health, essential government services that will not only improve services, but bring the community into the 21st-Century and beyond to enhance the quality of life into the future.

Explain how the Recommendation Directly Implements the Mission

The City Council and Staff of the City of Gonzales will realize our Vision by providing the leadership, commitment, and resources necessary to provide excellent services that enhance the quality of life of our diverse community.

Explain: Please see **Vision** above.

City services will be delivered in a cost-effective, respectful, and friendly manner to ensure the safety and well-being of the residents and the promotion of business, recreational, housing and employment opportunities in an environmentally sustainable manner.

Explain: These efforts are designed to ensure cost-effective connectivity to the internet for all to promote business, recreational, housing, and employment opportunities in Gonzales.

Strong fiscal policies allow us to provide appropriate infrastructure for:

- *Public Safety* X Yes ___ No ___ NA
- *Housing* X Yes ___ No ___ NA
- *Recreation* X Yes ___ No ___ NA
- *Environment* X Yes ___ No ___ NA
- *Education* X Yes ___ No ___ NA

Explain: Providing “Universal Broadband for All” in an affordable and cost-effective manner, will significantly enhance efforts, programs and initiatives in all these policy areas.

ALTERNATIVES

The City Council could:

1. Determine there is no need for government involvement in broadband. While this is certainly a viable option and significant improvements have already been achieved through the City’s efforts in the Sunesys LLC, Connected Central Coast Unserved and Underserved Broadband Project and the negotiations with Charter/Spectrum that resulted in a major upgrade to the Community’s ability to purchase a great level of WIFI/broadband service, a lot more can be done. The simple fact of the matter is that “digital divide” still exists and there are still many residents in our community that do not have good, reliable, affordable and useful service so they are not able to take advantage of or have basic access to the 21st Century. The City’s initiative to provide

“Universal Broadband for All” Initiative was launched to directly address this deficiency and eliminate the “digital divide”;

2. Direct staff to continue discussions with T-Mobile and provide additional parameter direction. While this is also a viable option, it is not recommended because staff has been in discussions with T-Mobile for a number of months, and are confident that the proposal recommended is extremely competitive and on the cutting edge of partnerships and efforts to eliminate the “digital divide”;
3. Direct staff to continue to explore other opportunities. Again, while this could certainly continue, work has been ongoing since 2017 and countless discussions have been held with many providers. In fact, as mentioned above, the City did release an RFQ in late 2017, and all proposals were rejected and staff was authorized to directly explore opportunities with providers and bring back a proposal for approval back when and if ready. Since that time, staff has been in discussion with several providers and the recommendation before you is the result of those efforts.

BUDGET IMPACT

The proposal if approved, would have a not to exceed fiscal impact of \$600,000 over two years or \$300,000 annually. Staff will work with the Quality of Life Advisory TUT Committee to request and hopefully receive \$150,000 per year for two years to offset 50% of the expected costs at full deployment. In addition, staff will bring back any necessary budget adjustments as part of the FY 2019-2020 Budget Hearings. For 2019-2020, the maximum cost would be \$150,000 assuming that all 2000 hotspots were deployed by the end January 2020. From a fiscal impact perspective, there are sufficient resources in the City’s General Fund Balance of \$2,153,059 (\$1 million in General Reserves and \$1.153 Undesignated Fund Balance) to cover this impact.

CONCLUSION

If approved, via this successful partnership and the financial investment from T-Mobile, your Council’s goal of “Universal Broadband for All” would be achieved. The power of this investment cannot be understated because it would immediately provide a very powerful tool to continue to transform the City into a thriving community empowered and transformed by cutting edge technology where our residents continue to thrive, learn and grow. It would provide a significant leap forward in our GONZALES WAY OF:

LOVE CARE & CONNECT

Attachments:

1. Executive Overview
2. Partnership Proposal
3. Broadband scale

ATTACHMENT 1



The City of Gonzales Gonzales Unified School District T-Mobile

Public/Private Partnership

Executive Summary

Executive Overview

Vision:

The City of Gonzales, Gonzales Unified School District and T-Mobile US will partner to form a Strategic Technology Enablement Partnership for the Gonzales community, thus achieving the mutual vision of “Broadband for All”. The students, residents, households and businesses in Gonzalez and surrounding areas will immediately benefit from Wireless Technology enablement and investment allowing Gonzales leaders to bring digital equity into their community.

Our partnership will serve as a nationwide model when working to close the digital divide in rural communities when engaging in Public and Private collaboration for the success of all Students and Households in their respective local communities.

Key Stakeholders and Participants:

City of Gonzales:

Rene Mendez	City Manager
Harold Wolgamot	Special Projects
Steve Blum	Tellus Venture Associates Consultant

Gonzales Unified School District:

Yvette Irving	Superintendent
Mary Dawson	CBO

T-Mobile:

Derek Casebolt	Western Region Government Director
Todd Wheeler	Director CA Network Engineering
Kevin Thompson	State of California Senior Manager
Tom Babineau	Senior Manager Engineering
Glenn West	Regional Public Sector Account Manager

Partnership Structure:

- T-Mobile will invest significant funds to upgrade the existing wireless backhaul and tower RF infrastructure in the Gonzales market to serve the community at no cost to the City of Gonzales or Gonzales Unified School District.
- T-Mobile will upgrade the existing infrastructure at no cost to the City of Gonzales or Gonzales Unified School District.
- In addition, T-Mobile will build out the overall wireless infrastructure to allow for the densification of users accessing and utilizing the wireless infrastructure to ultimately achieve 100Mb down and 20Mb up in each wireless data service experience at no cost to the City of Gonzales or Gonzales Unified School District.
- Providing wireless connectivity for 2,000 Students/Households will be the focus of the partnership to achieve household digital equity.
- T-Mobile will invest \$504,000 in additional funds from its Digital Equity EmpowerED Award Program to address the digital equity.
- The City of Gonzales will take full responsibility paying T-Mobile for the complete program on a monthly or annual basis.

Financial Details of Partnership:

- T-Mobile will invest funds from its Digital Equity EmpowerED Award Program to Gonzales Unified School District. A total \$252 per student will be awarded based on a successful EmpowerED Application submission, review and approval.
- Award Amount $\$252 \times 2,000 = \$504,000$ Investment
- T-Mobile EmpowerED Award distribution:
 - 2,000 Hotspot Devices provided at \$0
 - Normally \$72 each = \$144,000
 - A Check in the amount of \$360,000
 - CIPA Software to ensure Internet safety for student & households accessing internet at no additional cost.
 - Regional Wireless infrastructure to support 2,000 devices
- The T-Mobile service cost is subsidized significantly down from \$80 to \$20 per month, per Hotspot device, for Unlimited Wireless Data service with the approved EmpowerED Program.
 - Year 1 & 2 Annual cost for 2,000 devices
 - $\$20$ per month \times 12 months = \$480,000
 - Applying the \$180,000 EmpowerED Award, per year
 - Total Year 1 & 2 Annual cost to support 2,000 Households is \$300,000 per year.

Financial Sustainability

- After 24 months, the City of Gonzales has the ability to reapply to the EmpowerED program for additional investment into the Partnership by T-Mobile.

Phased Plan Approach:

Phase 1: Bridging the Digital Divide

- Project Management Planning of the 2,000 Device Distribution driven by the City, School District, and the T-Mobile Implementation Team timeline.
- Hotspot devices will be kitted, labeled, and programmed with CIPA certified software and tested.
- The T-Mobile team will be on hand for all deployment activities.
- The developed project plan will contain measurable benchmarks to ensure that the implementation is built to the City of Gonzales specifications.

Phase 2: Upgrading to a 5G Network Infrastructure and Service

- The 600Mhz spectrum owned by T-Mobile is scheduled to be cleared and on air in the second half of 2020.
- T-Mobile Engineering will coordinate the testing & turn-up and for the release of advanced Internet services to benefit the citizens of Gonzales.
- The goal of this solution is achieving higher data speeds of 100Mb Down and 20Mb Up data experience, per simultaneous user.

Phase 3: Further Developing Our Partnership

- Including the AG Tech private community into the partnership
- Leverage new technology solutions utilizing the T-Mobile network.
- Integrating into the Higher Education learning experience.
- T-Mobile would be pleased to host the City of Gonzales executive team for an executive briefing session in Bellevue, WA. to discuss Smart City Solutions, Internet of Things, transformation of Education with 21st Century learning.

In Conclusion

With this successful partnership, T-Mobile will significantly invest in the City of Gonzales to deliver its' promise of Broadband for All by the end of 2019.

It is T-Mobile's goal to assist Gonzales in transforming into a thriving community empowered and transformed by cutting edge technology where the residents of Gonzales will thrive, learn and grow as a healthy rural community.

ATTACHMENT 2



The City of Gonzales Gonzales Unified School District T-Mobile

Public/Private Partnership Proposal

City of Gonzales T-Mobile Agreement to Deliver Wireless Broadband for All

Service Today, Prepared for the Future

The T-Mobile Network in the City of Gonzales is one of the most dense (3 cellular towers with 700Mhz, 1900Mhz, 2100Mhz and shortly to be released 600Mhz, covering 8,000 individuals) and underutilized in Northern California. T-Mobile will provide its' best effort in delivering Wireless Internet Services well above the FCC's Advanced Wireless Service standard of 25 Mbps Down/ 3Mbps Up.

- Today the average speed test across the United States is 33Mbps.
- Gonzales is performing above this benchmark, with current tests above 90Mbps at locations within the City of Gonzales.

Customer Qualitative Expectations

Today, an end user should expect ample bandwidth and speed to access the Internet and perform common tasks identified by the FCC.

- Students will be able to complete their homework and research projects.
- Users will be able to access the Internet for common Internet tasks such as email, web-browsing, streaming audio and video services.
- More detail on customer expectations can be found in the Appendix and through the link:

<https://www.t-mobile.com/responsibility/consumer-info/policies/internet-service>

In April 2017, T-Mobile made its largest network investment ever, tripling its low-band spectrum holdings by purchasing spectrum sold in the US government's 600 MHz auction. Those licenses cover 100% of the US.

- Generally, 600 MHz propagates twice as far as traditional cellular services and penetrate building twice as effectively.
- The three cell towers surrounding the City of Gonzales have already been equipped with the necessary hardware to deliver 5G and LTE over this spectrum.
- The Customer Premise Equipment is 600 MHz ready.
- When the 600MHz band clears (projected in the 2nd half of 2020) this new spectrum will have a massive impact on Network breadth, penetration, and speeds at no cost to the City of Gonzales.

Customer Premise Equipment

Utilizing the EmpowerED program from T-Mobile, each household will be issued a Hotspot that supports up to 12 concurrent connections.

- The Hotspot supports all current and future spectrum bands, including the 600 MHz band.
- Each device carries a one-year manufacturer's warranty. Additional Hotspots will be ordered and available at deployment for any hardware returns.

Ensuring the Best Customer Experience

T-Mobile will ensure that the City of Gonzales' citizens have the best possible Wireless Internet experience. While Internet connectivity can be measured by a number of methods, it is the customer experience that matters most.

Given the nature of Wireless transmission, each user's experience with the network will be different based on Building Density, Distance to Tower, Network Congestion, etc. To ensure the best possible experience, T-Mobile will utilize a number of processes and procedures to ensure that we are delivering upon our partnership.

- Government Customer Care
- On Demand Portal Reporting
- Quarterly Business Reporting
- On Demand Escalation Procedures

Government Customer Care

The City of Gonzales Individual users will have direct access to T-Mobile's JD Powers award winning Government Care Group on a 24x7 basis at 1-800-937-8997.

- Individual users will be able to call directly for basic customer needs, including the ability to triage equipment issues, coverage.
- All calls will be assigned a Case ID for tracking purposes.
- End users will not have the ability to affect the account including ordering of services, equipment, or incurring any additional costs.
- Spanish Speaking Care Representatives are available 24x7.
- A high percentage of the potential issues with connectivity will be related to the signal's ability to penetrate a building. Government Customer Care will order and ship a repeater, at no cost, directly to the individual's home.

Ensuring Delivery of Service

T-Mobile will provide its' Best Effort to meet and exceed the expectations of the City and Citizens of Gonzales.

Managing over 70,000 cell sites, the Network operations team at T-Mobile has standard procedures in place to ensure the delivery of its' Cellular and Internet service.

T-Mobile will deliver a Quarterly Business Review to ensure that the City of Gonzales' residents receive the quality of service as stated above.

- End User Reporting
 - Custom reporting by address or user type
 - Quantitative Usage of Data per month
 - Zero utilization report.
 - This data is available on demand in the City's Custom Reporting Portal
- Customer Care Call Case Detail
 - Quantity of cases generated per month
 - Call type, description and resolution
 - Cell-spot repeater distribution
 - Unresolved cases
- Network & Cell Site Reporting KPI's by T-Mobile Engineering
 - Network utilization
 - Backhaul capacity
 - Cell site sector utilization
 - Outage Reporting

Escalation Path

The City of Gonzales has a team lead by Glenn West (sales) Scott Wood (engineering), Jordan Headley (implementation), and a Dedicated Expert in the Team of Experts (to be named). In the event that the T-Mobile service level does not meet the City of Gonzales' expectations, the leadership of City will have a direct relationship and escalation path with T-Mobile leadership.

Tier 1: Operations: Candace Morgan- Manager Team of Experts

- Candace.Morgan@T-Mobile.com

Tier 2: Leadership: Kevin Thompson – Senior Manager- State of CA

- Kevin.Thompson@T-Mobile.com

Tier 3: Executive: Derek Casebolt – Director, Public Sector Western USA

- Derek.Casebolt@T-Mobile.com

Finally, an authorized contact at the City of Gonzales will have a dedicated contact within the T-Mobile engineering team to ensure that T-Mobile is delivering upon the agreed qualitative and quantitative measures agreed to above and in the appendices.

Appendix A:

Speed

The term “speed” is commonly used as a shorthand way to describe the rate at which a particular broadband Internet access service can transmit data. This rate (or speed) is typically measured in the number of kilobits or megabits transmitted in one second (Kbps or Mbps). Some applications like email or basic web browsing do not require a high-data speed to function very well, while other activities like high-definition video streaming or transferring large data files are better experienced with higher data speeds.

Latency

Latency, also known as delay, is the amount of time from when a data packet is sent to when it is received. For Broadband Internet Access Services, latency is usually expressed as the round-trip time in milliseconds (“ms”) that it takes for a data packet to travel between two end points on the Internet (from point A to point B and then back to point A). Some applications, such as email, can tolerate a substantial amount of latency without any noticeable impact on the application's performance, while other applications, such as real-time video conferencing, require lower latency to function properly.

Based on analysis and projections from third-party, crowd-sourced data and subject to the factors described above and below, T-Mobile expects T-Mobile-branded customers with broadband-capable devices and qualifying service will experience the following speeds and latency on our 4G LTE network. These ranges are projections based on roughly the 25th and 75th percentiles of network tests. For speeds, peak speeds represent the 99th percentile of network speed results:

4G LTE Network:

- Download speeds: Typically, between 7 – 40 Mbps, with peaks up to 90 Mbps and minimum expected speeds of less than 0.1 Mbps
- Upload speeds: Typically, between 4 – 20 Mbps, with peaks up to 35 Mbps and minimum expected speeds of less than 0.1 Mbps
- Latency: Typically, between 30 – 55 ms

T-Mobile constantly works to improve network performance on its 4G LTE network and to pursue advanced and next-generation technologies and services. The above ranges are representative of current service plans. You may occasionally experience speeds outside the ranges included in your plan.

- In recent years, T-Mobile has aggressively built out its LTE network so nearly all of our customers have regular access to LTE speeds.

What speeds and performance can T-Mobile-branded Broadband Internet Access Services customers expect? Where are these speeds available?

Many factors affect the speed and performance that customers experience, including the programs running on the device, proximity to a cell site, the capacity of the cell site, the surrounding terrain, use inside a building or moving vehicle, radio frequency interference, how many other customers are attempting to use the same spectrum resources, the high-speed data allotment, and uses that affect your network prioritization, such as whether you are using Smartphone Mobile HotSpot (tethering) or if you are a Heavy Data User. A “Heavy Data User” uses more than 50GB of data in a billing cycle for consumer mobile plans and most government/business plans. This threshold number is periodically evaluated and may change over time. The term “Heavy Data User” does not apply to customers on a small number of business- and government-oriented plans, which are not subject to a threshold. In addition, many of our plans use video streaming optimization when connected to the cellular

network to deliver a DVD quality (up to 1.5 Mbps, typically 480p) video experience with minimal buffering while streaming. T-Mobile optimizes data streams that are identified by our packet-core network as video; video providers may also choose to establish protocols to self-optimize their video. Qualifying video providers may choose to opt-out of the Binge On program, [see listing](#). The Binge On optimization technology is not applied to the video services of these providers and high-speed data consumption will continue as if Binge On were not enabled.

Appendix B:

Quarterly Business Review Reporting

Customer Care Case Report

End User Usage Report

Network KPI's

ATTACHMENT 3

T-Mobile

