Wasatch Front Regional Council

Regional Broadband Plan

June 19, 2014

Contents

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Broadband Providers

Fixed Wireline	Fixed Wireless	Mobile Wireless
All West	Blue Zone Utah	AT&T
Beehive	Catapulsion	Sprint
CentraCom	Connext	T-Mobile
Century Link	Digis	Verizon
Comcast	Hughes	
Integra	Leap	
MegaPath	Skycasters	
Syringa	Starband	
UTOPIA	Utah Broadband	
Veracity	Webwave	
XO Communications	Wildfire	
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Executive Summary

The purpose of this project is to conduct a regional broadband needs assessment and develop a strategic plan for the five-county Wasatch Front Regional Council (WFRC) region. This region includes Davis, Morgan, Salt Lake, Tooele and Weber Counties.

This project will be used to advise the Governors Office of Economic Development (GOED), Utah Broadband Advisory Council (UBAC), as well as state and local officials, broadband providers and users to help facilitate improvements in the adoption (use) and deployment (service and access) of broadband infrastructure in the WFRC region.

Process

The WFRC Regional Broadband Plan was developed with guidance and input from a regional Broadband Planning Council. This Council included participants from 16 business, institutional, government and community sectors, with representation from across the five counties in the WFRC region.

Community input was provided through two series of workshops in each of the five counties, as well as surveys conducted by WFRC and the Utah Broadband Project.

The first series of workshops was held in early September 2013, and focused on a broadband needs assessment for each county, using a strengths, weaknesses, opportunities and challenges (SWOC) analysis. A second series of workshops was held in late October 2013, reviewing the results of the SWOC exercises held previously, and focusing on prioritizing the emerging topics and themes.

Additional input came through a focus group of broadband providers, as well as surveys conducted by WFRC and the Utah Broadband Project.

Priorities

In early December 2013 the Broadband Planning Council guided the development of five priorities and associated goals to be addressed in the plan:

- ***Infrastructure*** – Expand broadband infrastructure and improve infrastructure deployment through better coordination, communication and cooperation.
- ***Demand*** – Pursue and promote creative strategies, partnerships and best practices to meet growing broadband demand and improve broadband services.
- ***Economic Development*** – Focus on broadband infrastructure, service and innovation to support business opportunities, job creation and employment flexibility, which in turn help support and strengthen the economy of the region.
- ***Community Development*** – Improve the quality of life within communities by fostering broadband availability, use and access.
- ***Broadband Awareness*** – Increase and promote opportunities to learn about the benefits and use of broadband. Expand training in the use of hardware, software, Internet applications and services for a wide variety of purposes. Focus resources within

employment and population centers, especially those defined in the Wasatch Choice for 2040 Vision[1].

Strategies

Implementation strategies were developed for each of the five priorities and are presented in the Recommendations section of the plan.

One of the important findings was the need for improved coordination and communication across the spectrum of broadband deployment and adoption. Collaboration and partnerships are clear opportunities for improvements in the way state and local governments, and broadband providers approach the planning, construction and regulatory processes. Many strategies are suggested to improve current practices, and acknowledge an evolving role for government and providers to facilitate improved services.

[1] The Wasatch Choice for 2040 is a regional vision, plan and toolkit to help communities proactively consider how population growth, mobility, housing and jobs can be shaped in the coming decades to maintain a high quality of life for residents in the Greater Wasatch Area. More information is available at http://envisionutah.org/wasatch-choice-2040.

Introduction

Regional Broadband Plan Purpose & Objectives

This Regional Broadband Plan is part of a statewide effort called the Utah Broadband Project. The Utah Broadband Project is a joint effort between the Utah Governor's Office of Economic Development (GOED), the Public Service Commission (PSC) and the Department of Technology Services' Automated Geographic Reference Center (AGRC) to develop a statewide map of available broadband services and a plan to increase broadband deployment and adoption in the State of Utah. Similar programs have been undertaken in all 50 states through the State Broadband Initiative (SBI) program, which is being administered by the National Telecommunications and Information Administration (NTIA) and funded through the American Recovery and Reinvestment Act of 2009.

In 2013, the Utah Broadband Project partnered with each of Utah's seven Associations of Governments (AOG) to form regional broadband planning councils with the goal of assessing broadband availability and needs on a local level. These councils were tasked with identifying regional issues, priorities and goals related to broadband deployment and adoption, and creating community awareness about broadband-related issues.

This Regional Broadband Plan was compiled based on feedback and discussions held during meetings with local communities and the Regional Broadband Planning Council. The plan focuses on broadband issues and needs for the Wasatch Front Regional Council region. The region includes Davis, Morgan, Salt Lake, Tooele and Weber Counties.

This Regional Broadband Plan provides guidance for the advancement of broadband services and infrastructure, and will help enhance broadband usage and demand in the region. The plan also provides a framework to advise the State of Utah, local government officials, broadband providers and other stakeholders about broadband related topics and issues.

Background

What is Broadband?

"Broadband" is a term used to describe bandwidth or capacity—the amount of data that can be transmitted through a connection—to access high-speed Internet and other online services. The greater the bandwidth, the more information a user can send or receive at any given time.

Broadband is used for all sorts of daily activities in many people's lives—for work, for information, for services and for entertainment—and is rapidly becoming a basic necessity for most individuals and businesses in our community.

Broadband services are provided in different forms:

- "Fixed Wireline" service is wired directly to a home or business using traditional fiber optic, cable, copper and other types of data and phone transmission lines.
- "Fixed Wireless" service is transmitted wirelessly from a fixed station to a fixed receiver located within a home or business.
- "Mobile Wireless" service is transmitted from a linked network of stationary broadcast towers to enabled mobile devices such as smart phones, tablets and computers.

Why is Broadband Important?

Broadband is important for individuals:

- It provides access to education, communication, public safety, entertainment, and other services.
- It provides access to information and assistance—such as health care, commerce and public services—where a physical disability or travel distance may be a barrier.

Broadband is important for businesses:

- It provides opportunities to compete and extend business services.
- It supports entrepreneurs and other home-based occupations.
- It can help reduce costs and improve efficiency through Internet use.
- It allows expanded teleworking opportunities for employees.

Broadband is important for government agencies and institutions:

- It improves access, efficiency, and transparency.
- It provides services and resources that can increase quality of life.

How Is Broadband Used?

The following illustrations show some of the ways broadband is used, from education and healthcare, to transportation, telecommuting and commerce.







Over the past two decades, broadband has transformed our lives. For many people it is an essential tool for daily activities. Some experts say that current innovation has only scratched the surface of possibilities.

Does Broadband Speed Matter?

Broadband "speed" is used to describe data transmission rates, and is generally referenced as mega-bits per second (mbps). A faster broadband speed equals a higher rate of transmitting data.

Broadband user speeds can vary greatly among individuals, businesses and institutions:

- Businesses and institutions with a higher volume of users, patrons or customers may require higher speeds to reduce interruptions and delays.
- Growing "cloud" services for remote storage and sharing of data often requires quick and uninterrupted access.
- High volume data, such as streaming video and audio, are rapidly increasing broadband demand in entertainment, communication, social media, education, healthcare, businesses and public services.

Broadband speed is sometimes a matter of convenience, but when it affects the health, safety or welfare of users, it becomes a necessity.

Speed is affected by transmission technologies, traffic and volume of users, as well as capacity of end user devices. Speed can also be regulated by broadband service providers to allow for varying rate structures based on demand for services.

Speed varies between receiving (downloading) and sending (uploading) data. When only a single speed is provided, it is usually referring to a download speed. Download speeds have traditionally been more important. However, many of the higher volume uses noted above, including communication, remote storage and access are rapidly expanding demand on upload speeds as well.

Planning Process

Regional Broadband Plan

The approach to the project was based on recommendations from the NTIA Broadband Adoption Toolkit, and the Utah Broadband Planning Council Toolkit prepared by GOED. The Regional Broadband Plan was developed using the following sources of input, review and coordination:

- Regional Broadband Planning Council, which served as an advisory group, providing industry and geographic representation
- Community stakeholder needs assessment workshops in early September 2013, to conduct a regional needs assessment
- The 2013 Broadband Tech Summit held in late October 2013, provided a statewide education and information program, led by GOED with participants and stakeholders from around the state
- Focus group meeting with broadband service providers to review needs assessment, develop priorities and gather provider input.
- Community stakeholder prioritization workshops in late October 2013 to review themes and develop priorities.

Regional Broadband Planning Council

The regional Broadband Planning Council was organized in July 2013 to help guide the development of the WFRC Regional Broadband Plan. Participants included representatives from all five counties in the Wasatch Front Regional Council region. Representatives were selected from 17 broad industry sectors.

The regional Broadband Planning Council roles and responsibilities included:

- participating in discussion and dialogue at monthly meetings
- identifying and inviting stakeholders to community workshops
- identifying themes and topics for the 2013 Broadband Tech Summit
- assisting with prioritization and plan development
- reviewing progress, draft and final documents
- providing timely input
- representing geographic and county-wide interests, and broad industry sectors, rather than specific organizations and agencies

Community Meetings & Workshops

County Council of Government Meetings

The Regional Broadband Project was introduced throughout August 2013 at Council of Government meetings throughout the five WFRC counties. The introduction included an overview and timeline of the project, review of major milestones, a call for regional Broadband Planning Council participants and notice of community workshops.

Community Stakeholder Needs Assessment Workshops

The first set of community stakeholder workshops was held on the following dates in each county:

- September 4, 2013 in Morgan County and Weber County
- September 5, 2013 in Davis County and Salt Lake County
- September 9, 2013 in Tooele County

Results of the workshops are summarized in the Regional Community Input section of this document.

Community Stakeholder Prioritization Workshops

The second set of community stakeholder workshops was held on the following dates in each county:

- October 29, 2013 in Tooele County
- October 30, 2013 in Weber County and Morgan County
- October 31, 2013 in Davis County and Salt Lake County

Results of the workshops are summarized in the Regional Community Input section of this document.

Surveys

Regional Industry Sector Survey

An online survey was conducted by WFRC to provide broad community input about broadband use and awareness, and assess some of the limitations and challenges experienced by users.

The survey was distributed beginning on August 26, 2013, and was closed on September 16, 2013. Results of the survey are summarized in the Regional Community Input section of the plan. A copy of the survey is included in Appendix F.

Regional Nonadoption Survey

A survey was conducted by GOED, with assistance from a research team at Utah State University, to assess residential broadband needs, and particularly to identify the reasons broadband has not been adopted by some households.

The survey was completed in the spring of 2014. Results of the key findings of the survey are summarized in the Regional Community Input section of the plan. More detailed information is included in Appendix H and Appendix I.

Provider Outreach & Focus Group

A focus group meeting was conducted with broadband providers on October 9, 2013. The purpose of the focus group meeting was to allow providers to review the results of the needs assessment workshops and survey results, and share perspectives and resources to address issues identified. Results of the focus group meeting are summarized in the Regional Community Input section of the plan.

Broadband providers were also invited to participate in community workshops and attend Broadband Planning Council meetings.

2013 Broadband Tech Summit

A statewide 2013 Broadband Tech Summit was held on October 24, 2013 at Utah Valley Convention Center in Provo. Major themes and discussion from the Summit is summarized in the Regional Community Input section of this document.

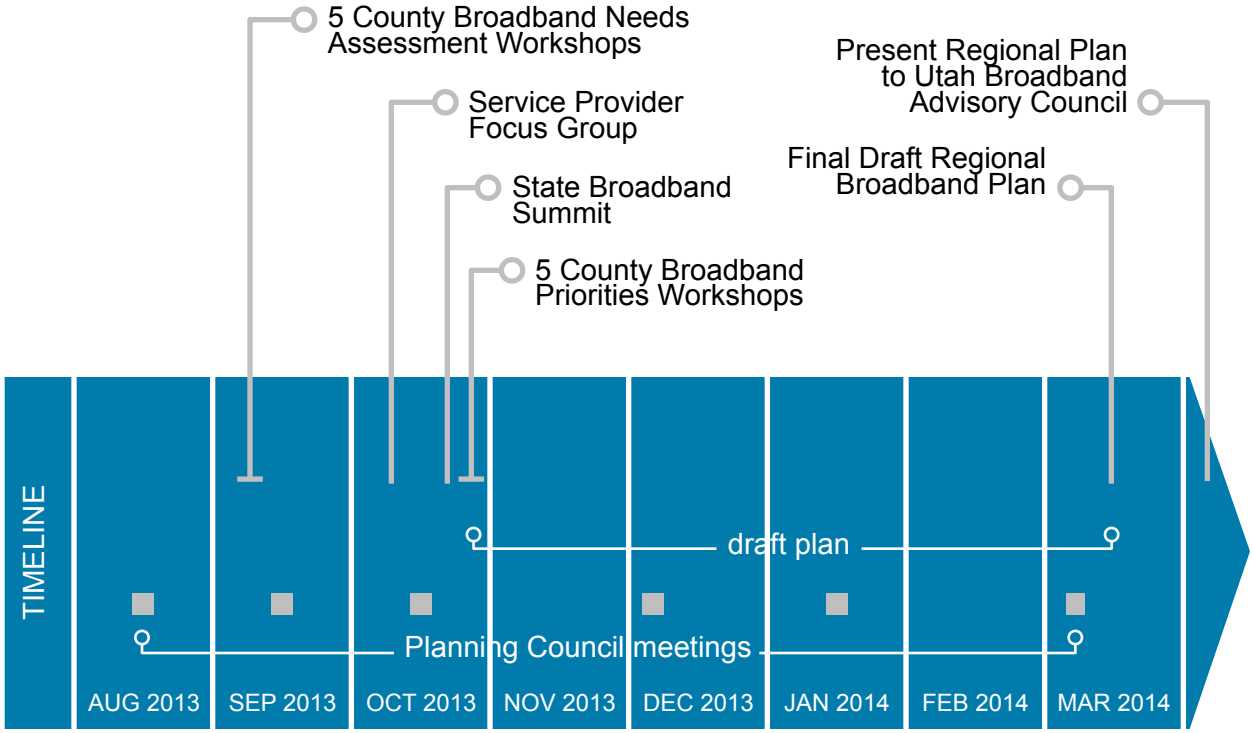
Statewide Association of Governments Coordination

A state AOG coordinator was selected to support the concurrent planning initiatives in each of the seven Utah regions. WFRC participated in periodic AOG coordination conference calls throughout the duration of the project, which provided a forum to raise questions, compare processes and results, and create guidelines for a common plan outline and formats.

A coordination meeting with all seven AOGs was held at the Mountainland Association of Governments office in Orem on November 4, 2013.

Planning Timeline Summary

The following timeline illustrates and summarizes the overall process and major milestones of the Regional Broadband Project.



Regional Overview

Community & Regional Characteristics

The information in the following table is provided to illustrate 2012 demographic, education, income and employment characteristics for each county in the WFRC region, and for the region as a whole.

Demographic Information & Characteristics by County and Region

	Davis	Morgan	Salt Lake	Tooele	Weber	Region
Population & Age						
Total Population	315,809	9,821	1,063,842	59,870	236,640	1,685,982
Male	50.3%	50.6%	50.3%	50.6%	50.2%	50.4%
Female	49.7%	49.4%	49.7%	49.4%	49.8%	49.6%
Households	94,149	2,804	341,841	18,218	79,601	536,613
Persons per Household	3.23	3.38	2.98	3.15	2.87	3.12
Median Age	29.2	32.0	30.8	29.6	30.7	30.5
Persons under 5	9.5%	8.7%	8.4%	9.2%	8.6%	8.9%
Persons under 18	33.8%	34.3%	28.8%	35.3%	29.7%	32.4%
Persons 65 and over	8.7%	11.3%	9.1%	7.9%	10.6%	9.5%
Ethnicity						
White	93.1%	97.9%	89.1%	94.8%	93.1%	93.6%
Black or African American	1.3%	0.2%	1.9%	0.8%	1.6%	1.2%
American Indian & Native Alaskan	0.6%	0.4%	1.3%	1.2%	1.2%	0.9%
Asian	1.9%	0.5%	3.6%	0.8%	1.5%	1.7%
Native Hawaiian & Pacific Islander	0.7%	0.1%	1.6%	0.4%	0.3%	0.6%
Two or More Races	2.4%	0.9%	2.5%	2.0%	2.4%	2.0%
Hispanic or Latino (any race)	8.7%	2.5%	17.5%	11.9%	17.2%	11.6%
Education Attainment (age 25 & older)						
High School Graduate	95.2%	97.3%	88.7%	90.9%	88.8%	92.2%
Bachelor Degree & Higher	34.1%	29.1%	30.8%	19.8%	22.2%	27.2%
Income & Employment						
Per Capita Income (median)	$25,896	$25,091	$25,905	$22,734	$23,241	$24,573
Household Income (median)	$69,355	$77,159	$59,626	$61,933	$54,923	$64,599
Percentage Below Poverty Level	7.6%	5.1%	12.0%	8.4%	12.2%	9.1%
November 2012 Unemployment	5.2%	5.1%	5.2%	6.1%	6.3%	5.6%
November 2013 Unemployment	3.9%	3.7%	3.8%	5.1%	4.5%	4.2%

Source: Information and statistics are from 2012 data of the United States Census Bureau, U.S. Department of Commerce, http://quickfacts.census.gov/qfd/states/49000.html, downloaded January 8, 2014, with the exception of unemployment figures, which are from the Utah Department of Workforce Services, https://jobs.utah.gov/wi/pubs/une/season.pdf, downloaded January 10, 2014.

Regional Maps

The maps on the following pages are provided for reference. They illustrate various types of geographic and broadband information available as a resource to communities, individuals and organizations. These maps may be useful to identify what types of broadband and other infrastructure are available, and how that infrastructure serves locations where people live and work. The information presented here is for the entire WFRC region.

Map 1: Geography & Terrain. This map illustrates the boundaries of the 5 counties within the Wasatch Front Regional Council region, as well as major geographic features.

Map 2: Land Ownership. This map illustrates the major land ownership categories for the region, including federal, state, and tribal lands.

Map 3: Population Density. This map illustrates residential population densities for the region, and highlights urban, rural and unpopulated areas in the region.

Map 4: Major Infrastructure. This map illustrates major infrastructure for the region, including natural gas pipelines, major electrical transmission lines, and major highways.

Map 5: Fixed Transit & Wasatch 2040 Regional Growth Centers. This map illustrates operating fixed rail transit lines, as well as future centers of community and economic development based on the Wasatch Choice for 2040 regional plan. These centers are areas that should be well served by broadband.

Map 6: Fixed Broadband Maximum Advertised Speeds. This map illustrates the maximum advertised broadband download speed of any residential broadband service provider, including both wireline and fixed wireless service.

Map 7: Mobile Broadband Maximum Advertised Speeds. This map illustrates the maximum advertised broadband speed of any mobile broadband service provider.

Map 8: Number of Fixed Broadband Providers ≥ 3 mbps. This map illustrates the number of residential fixed broadband providers offering service at 3 mbps and greater download speeds.

Map 9: Number of Fixed Broadband Providers ≥ 10 mbps. This map illustrates the number of residential fixed broadband providers offering service at 10 mbps and greater download speeds.

Map 10: Number of Fixed Broadband Providers ≥ 25 mbps. This map illustrates the number of residential fixed broadband providers offering service at 25 mbps and greater download speeds.

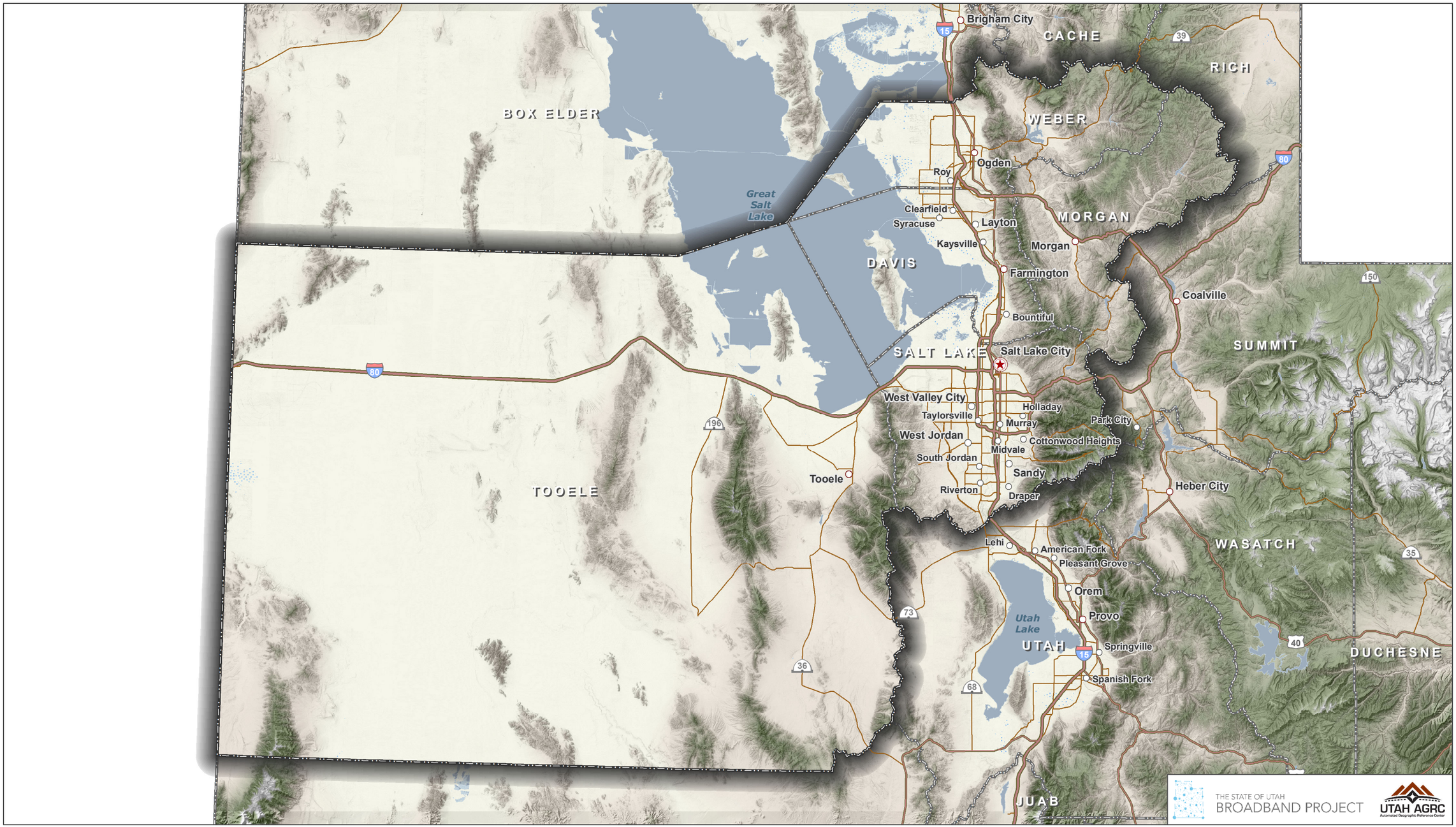
Additional Map Resources

County-by-county versions of Maps 3, 4, 8, 9 and 10 can be found in the Appendix.

Extensive broadband map information—including both interactive and static maps—is available on the Utah Broadband Project website. Information is detailed enough to view at various scales, such as a region, a city, district, or neighborhood. Some information is even available for individual property locations.

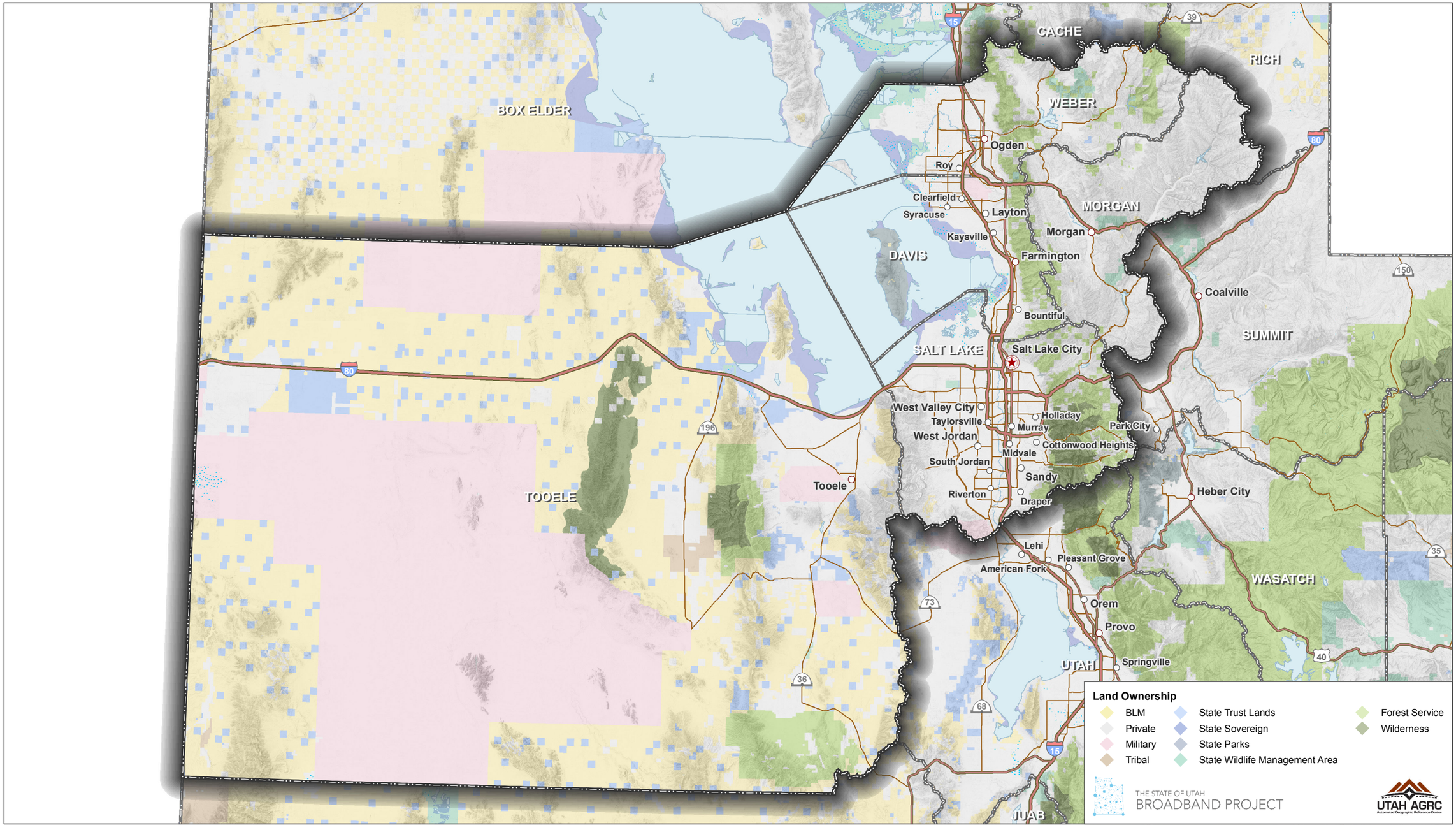
The Utah Broadband Project interactive broadband map is available at http://broadband.utah.gov/map/. Other static maps and map resources are available at http://broadband.utah.gov/about/about-the-interactive-map/mapresources/.

Map 1: Geography & Terrain



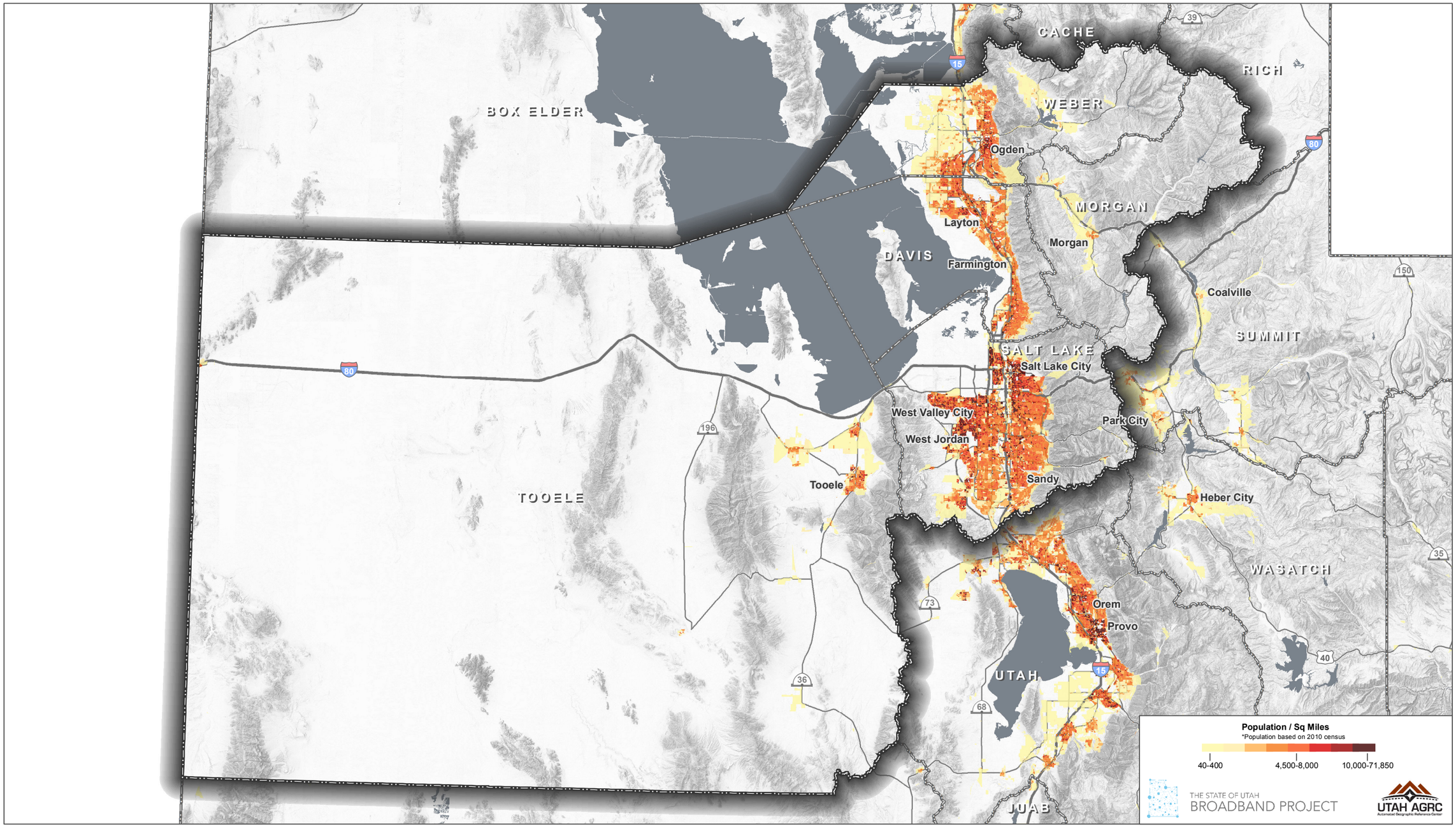
Source: Utah Automated Geographic Reference Center (AGRC). Information current as of February 7, 2014.

Map 2: Land Ownership



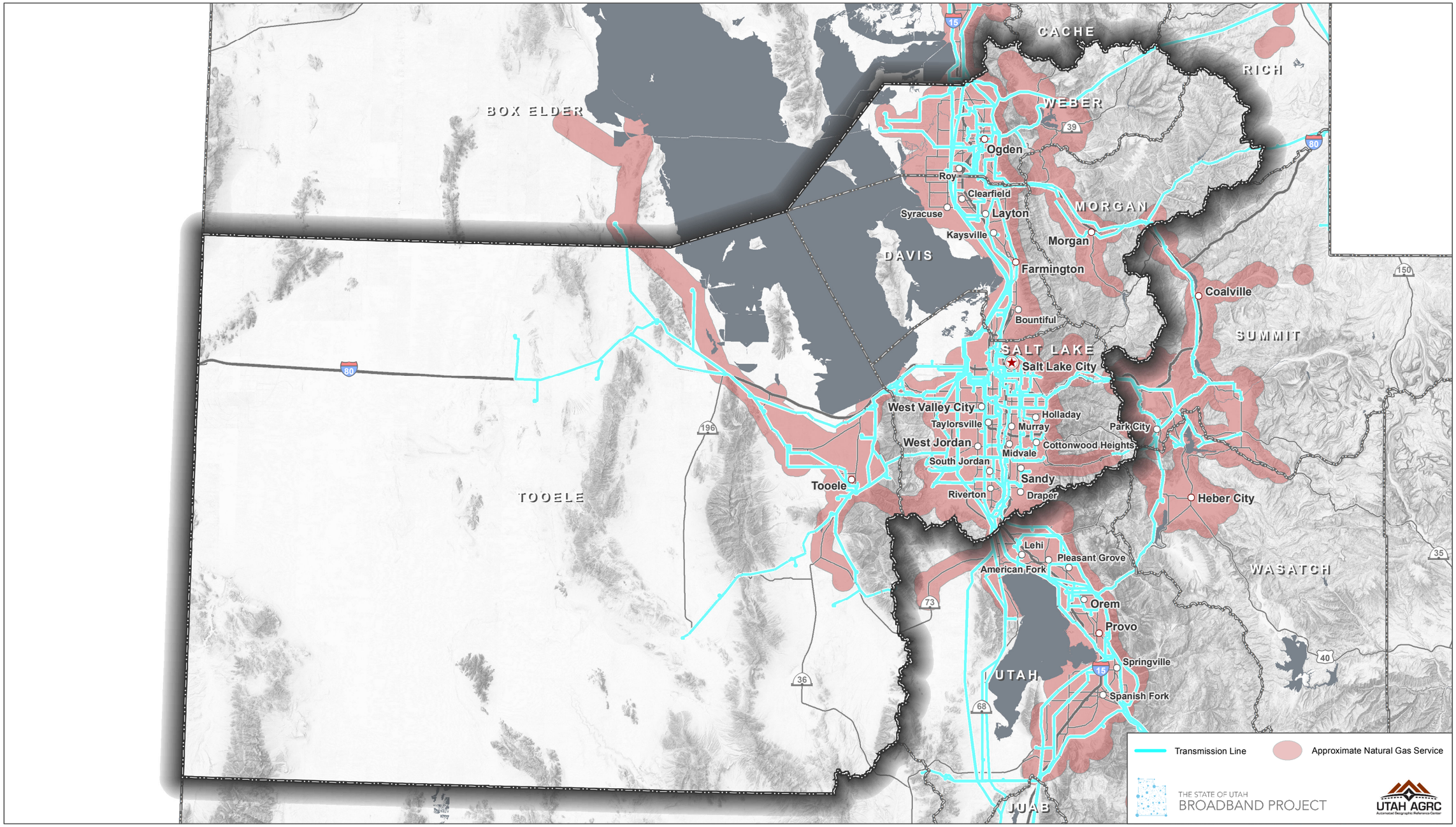
Source: Utah Automated Geographic Reference Center (AGRC). Information current as of February 7, 2014.

Map 3: Population Density



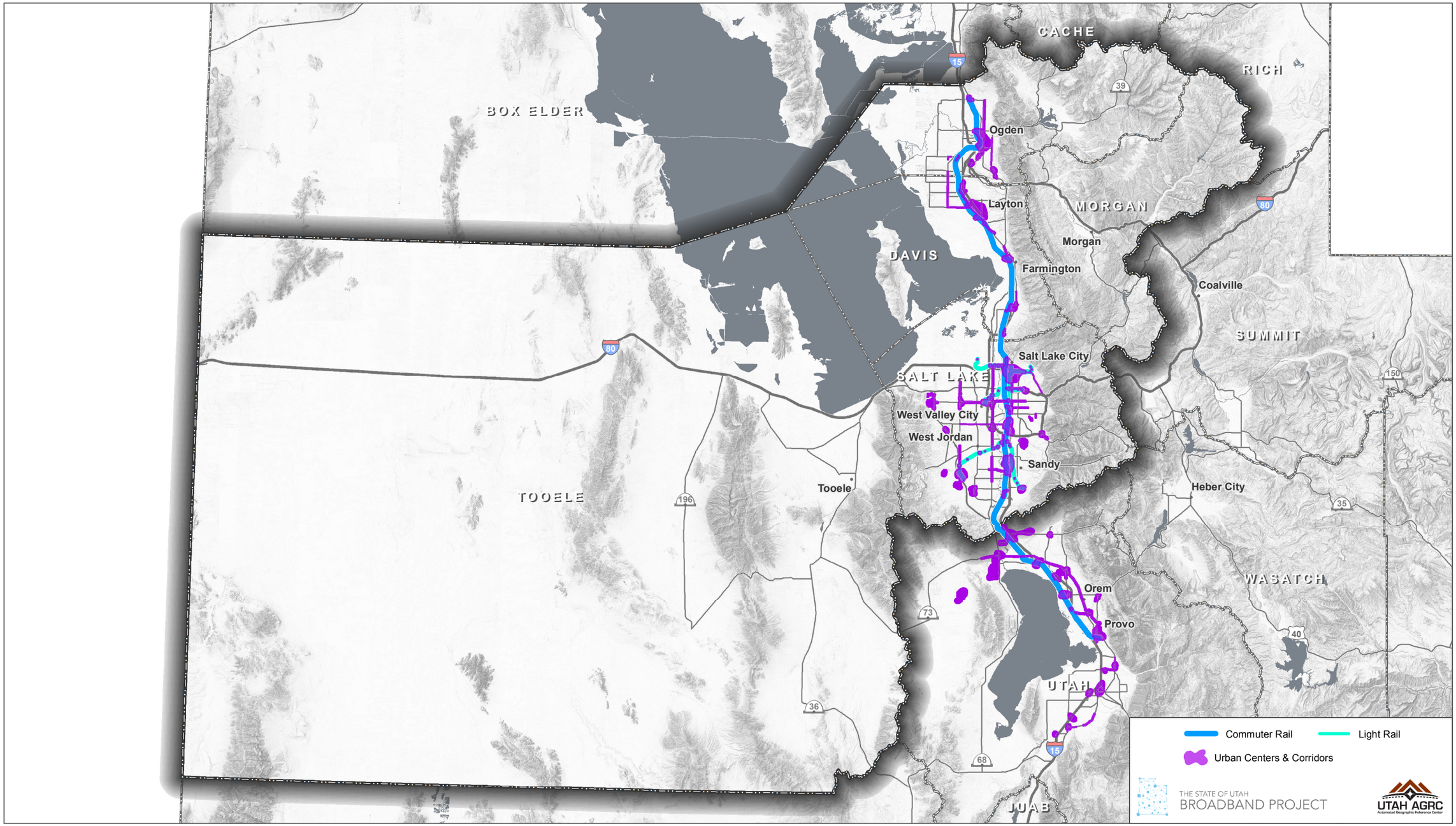
Source: Utah Automated Geographic Reference Center (AGRC). Information current as of February 7, 2014.

Map 4: Major Infrastructure



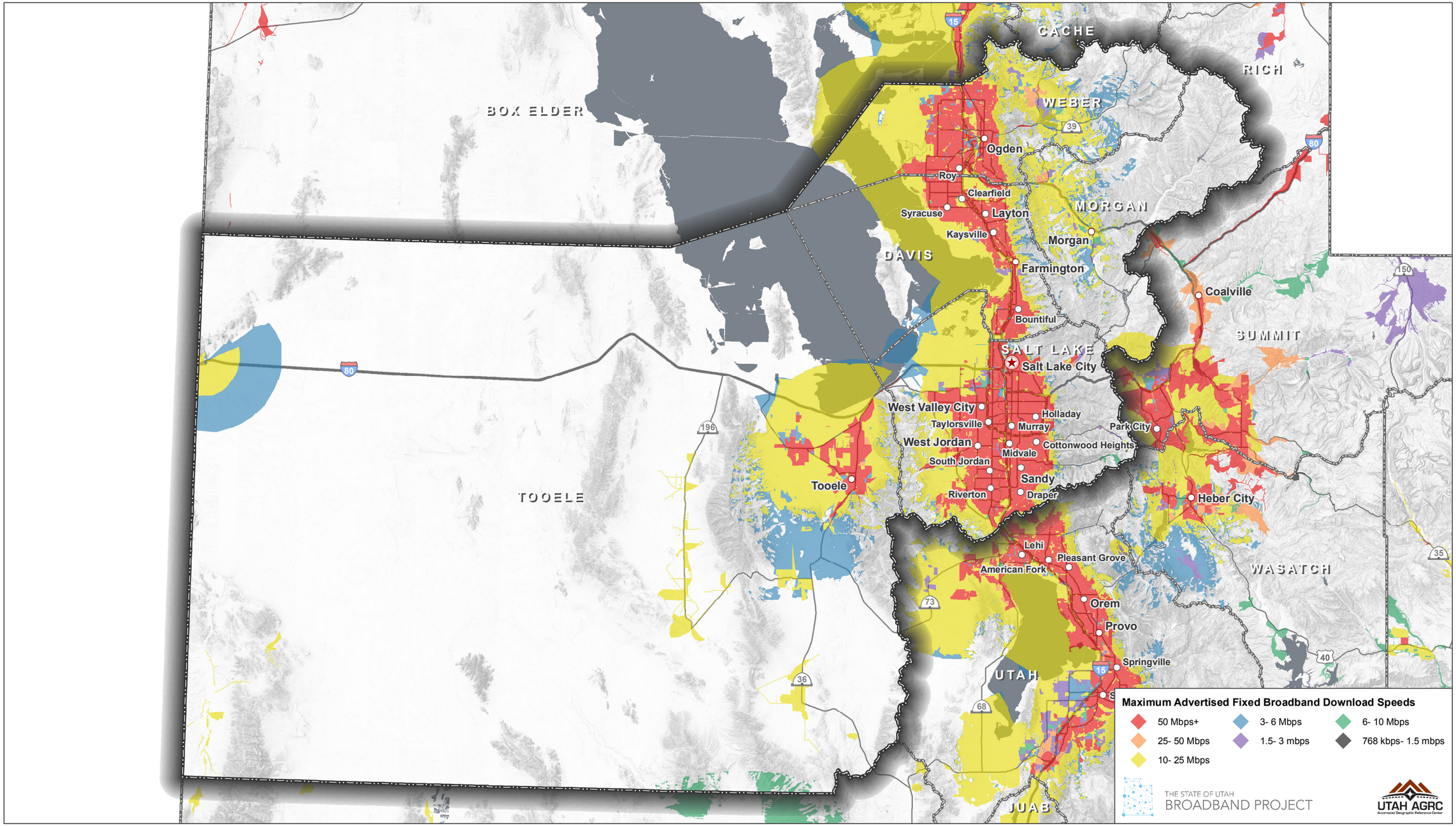
Source: Utah Automated Geographic Reference Center (AGRC). Information current as of February 7, 2014.

Map 5: Fixed Transit & Wasatch 2040 Regional Growth Centers



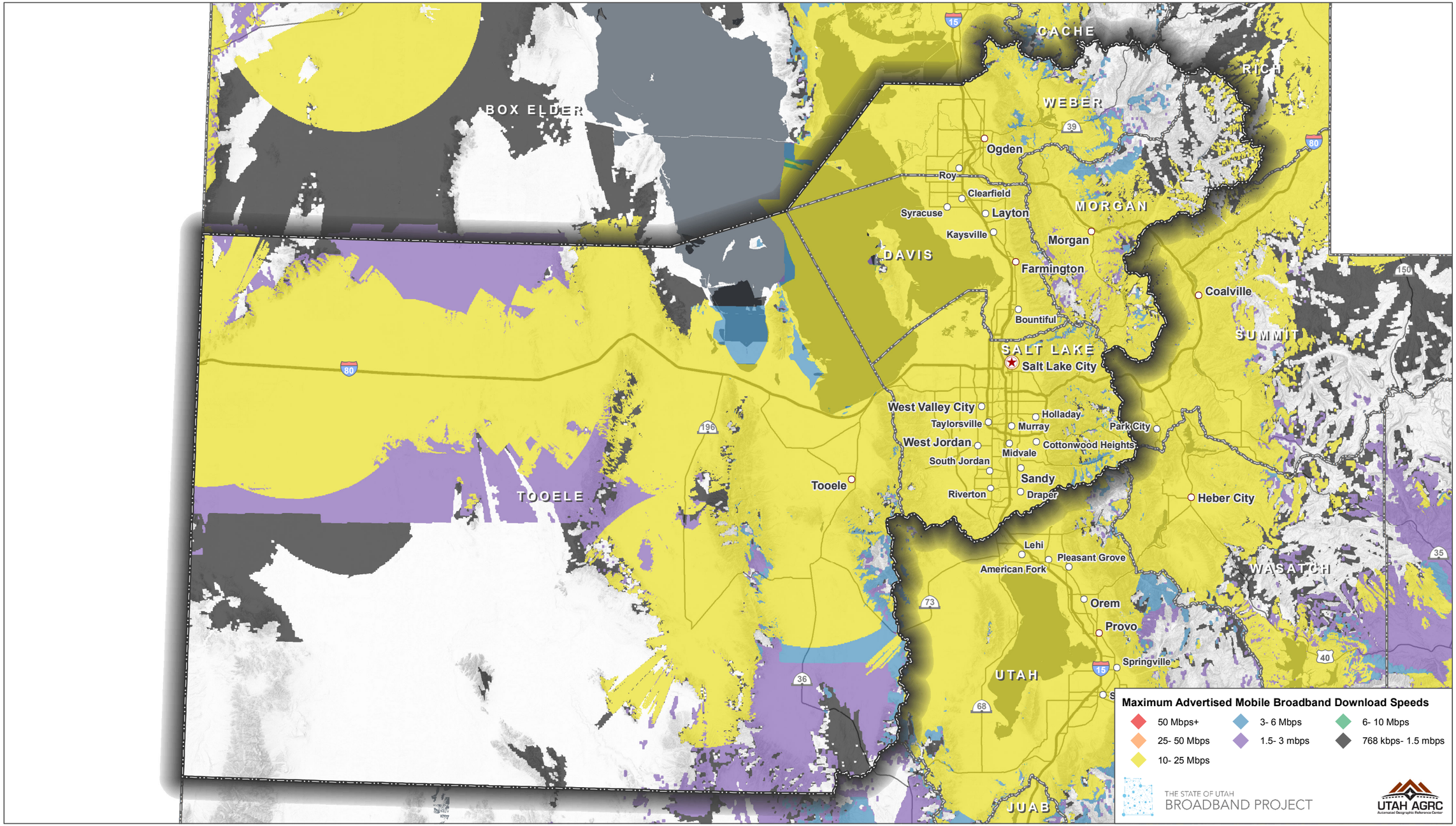
Source: Utah Automated Geographic Reference Center (AGRC). Information current as of February 7, 2014.

Map 6: Fixed Broadband Maximum Advertised Speeds



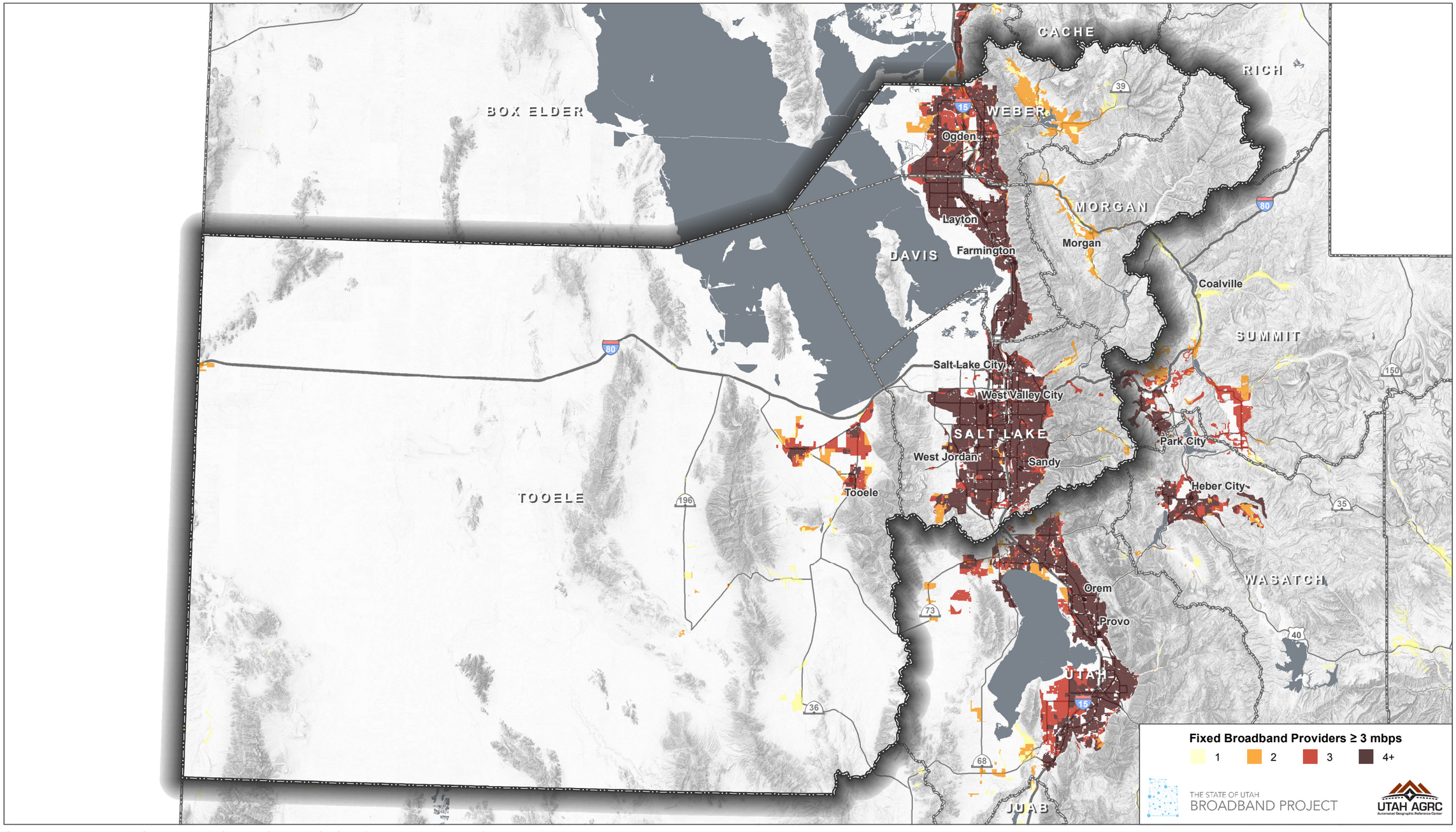
Source: Utah Automated Geographic Reference Center (AGRC). Information current as of February 7, 2014.

Map 7: Mobile Broadband Maximum Advertised Speeds



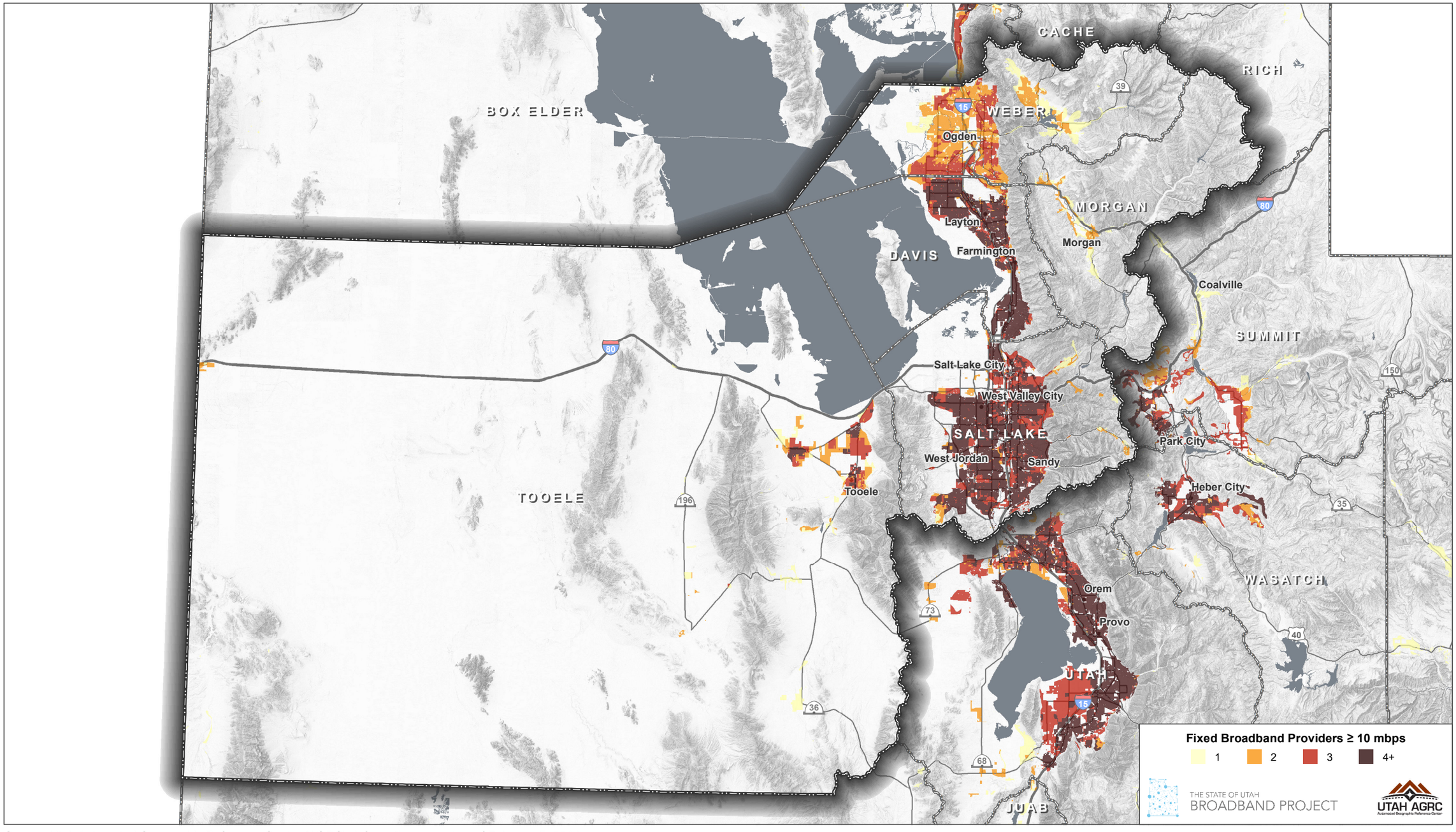
Source: Utah Automated Geographic Reference Center (AGRC). Information current as of February 7, 2014.

Map 8: Number of Fixed Broadband Providers ≥ 3 mbps



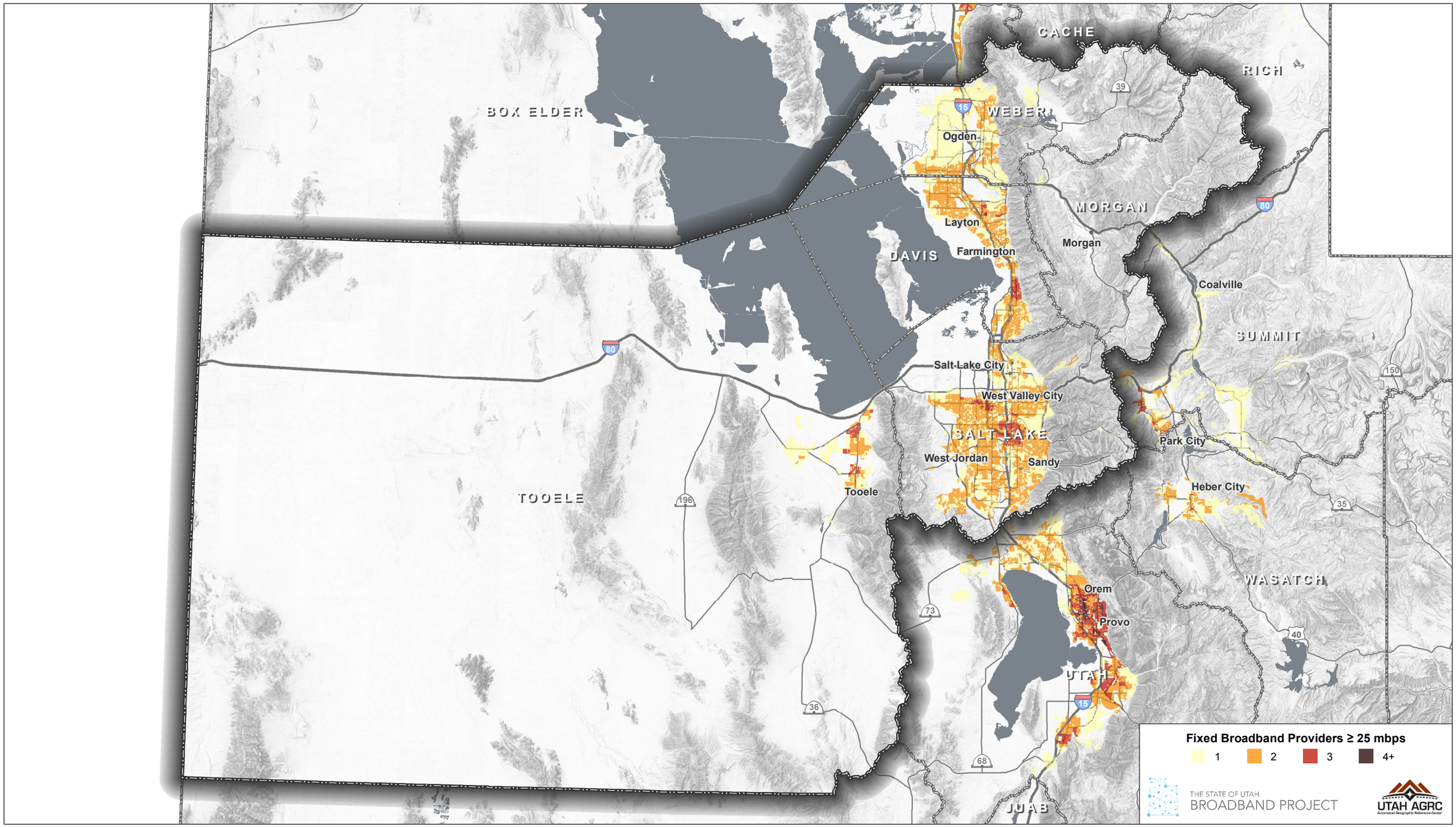
Source: Utah Automated Geographic Reference Center (AGRC). Information current as of February 7, 2014.

Map 9: Number of Fixed Broadband Providers ≥ 10 mbps



Source: Utah Automated Geographic Reference Center (AGRC). Information current as of February 7, 2014.

Map 10: Number of Fixed Broadband Providers ≥ 25 mbps



Source: Utah Automated Geographic Reference Center (AGRC). Information current as of February 7, 2014.

Regional Community Input

Broadband Planning Council

The regional Broadband Planning Council served as an advisory body, to help review the input received, provide feedback, raise issues and help prioritize strategies to address goals. The Broadband Planning Council was purposefully composed of members that represented different sectors (health, education, transportation, utilities, libraries, local government, etc.), and each county in the WFRC region. Broadband providers were invited to participate in meetings with the Broadband Planning Council to provide technical information, and to contribute additional perspectives, ideas and resources.

The following is a short summary of each Broadband Planning Council meeting:

Meeting 1 – August 12, 2013

Introduction and overview of regional broadband project:

- Review and discuss project purpose
- Review and discuss role of regional Broadband Planning Council
- Review and discuss project planning process and timeline
- Review and discuss plan for outreach in five counties for the needs assessment workshops

Meeting 2 – September 16, 2013

Needs Assessment and Community Survey Results:

- Review and discuss needs assessment results from five county workshops
- Review and discuss the role of state and local government
- Review and discuss regional plan framework
- Review and discuss community survey and outreach
- Review and discuss the 2013 Broadband Tech Summit topics
- Review schedule and major project milestones.

Meeting 3 – October 14, 2013

Emerging Themes and Priorities:

- Review and discuss community survey summary
- Review provider focus group summary
- Review and discuss emerging themes
- Participate in a regional priorities exercise
- Review peer regional initiatives for seven AOGs
- Review schedule and major project milestones

Meeting 4 – December 2, 2013

Regional Broadband Plan Development:

- Provide ground rules for Broadband Planning Council and provider input
- Review and discuss the 2013 Broadband Tech Summit themes
- Review and analyze regional priorities
- Review and discuss Regional Broadband Plan outline and structure
- Review schedule and major project milestones
- Develop assignments for review and input on plan outline prior to next meeting

Meeting 5 – January 13, 2014

Draft Document Review:

- Present and discuss draft Regional Broadband Plan
- Review and discuss regional and county maps
- Review and discuss five regional priorities and recommendations
- Review schedule and major project milestones
- Develop assignments for review and input on draft plan prior to next meeting

Meeting 6 – March 10, 2014

Final Document Review:

- Review results of Demand Study and Mobile Drive Study
- Review draft Regional Broadband Plan including new information
- Review Regional Broadband Project timeline
- Review Utah Broadband Project Timeline through 2014 and beyond

Community Outreach

A key component of the community input for the Regional Broadband Plan was to hold community oriented stakeholder workshops. Workshops were held in each of the five counties in the WFRC region to provide convenient access for participants. The workshops in each county followed a similar format and process.

Outreach and workshop notices were shared with the Broadband Planning Council for distribution among their organizations and peer networks. The WFRC provided advance notice to an extensive email list of community leaders and organizations. The Consultants provided advance notice through media outlets, business and trade organizations and personal networks.

Needs Assessment Workshops

The initial series of workshops was held in early September 2013:

- September 4, 2013 in Morgan County and Weber County
- September 5, 2013 in Davis County and Salt Lake County
- September 9, 2013 in Tooele County

Each workshop included a project overview and needs assessment exercise. The needs assessment exercise consisted of a “strengths, weaknesses, opportunities and challenges” (SWOC) assessment.

Key Questions & Discussion Topics:

Strengths/Weaknesses/Opportunities/Challenges:

- What do you see as strengths of broadband use and/or service in your community?
- What do they see as weaknesses of broadband use and/or service in your community?
- Are there opportunities for improvement or innovation in broadband use and/or service in your community in the future?
- Are there challenges to broadband use and/or service that you can foresee?

What is the Appropriate Role of State and Local Government:

- No role – broadband is entirely a private sector enterprise

- Equalize access – regulate and fill in gaps until private sector can “catch up”
- Regulate infrastructure through zoning and municipal codes
- Manage and coordinate infrastructure installation with major street/highway/utility/right-of-way projects
- Local governments provide broadband (i.e. - fiber optic) infrastructure but let private enterprise provide specific services
- Broadband is public infrastructure (like roads and utilities) and should be the domain of state and/or local government
- Other roles

In this exercise, each participant individually identified one or two key issues for each category, written on a “sticky note.” Individual responses were gathered, then organized by similar topics and themes. The collective results were reviewed and discussed. This technique works well in gathering individual ideas and provides balance of input to avoid individual bias. Since many local government representatives attended, the role of government in broadband adoption and deployment was also discussed.

Davis County Summary

- Good service is available, but access is not a level playing field.
- Need to find more options to improve infrastructure.
- Broadband is essential for economic development.
- Greater state support is needed to allow communities to define their own deployment methods.
- Government role: broadband is not yet fully endorsed as a basic necessity, but government should help facilitate expansion of infrastructure and let providers compete for services.

Morgan County Summary

- Need increased competition in rural areas.
- Economic development is inhibited by poor broadband service.
- Need to improve coverage to remote areas for current and future businesses.
- Cost of infrastructure and service are challenges.
- Government role: broadband is a basic necessity, so government should be involved. Incentives to develop infrastructure may be a practical tool.

Salt Lake County Summary

- Broadband access and speed are generally good. Existing demand is high.
- Broadband is a basic need for economic development.
- Local political support from municipalities seems to be good.
- Disparity in cost, and inequities exist for access, especially for lower income households.
- Changing technology and responsiveness is a challenge.
- Partnering is important to build and expand infrastructure.
- Government role: explore hierarchical system similar to transportation (e.g. state addresses highways, local connections are made to those highways). Improve coordination and collaboration.

Tooele County Summary

- Great infrastructure investment in fiber to county facilities is provided through partnership with Beehive Broadband.
- Residential service is too slow to access educational services and resources.
- Rural access is poor.
- Economic development is poor without broadband.
- Broadband is a basic necessity.
- Cost for service and infrastructure can be prohibitive.
- Government role: coordinate and collaborate.

Weber County Summary

- Competition and coverage by broadband providers is generally good in more urban areas.
- Rapidly changing technology can be a future challenge.
- Cost of infrastructure and services is an issue.
- Rural areas are poorly served by fixed broadband providers.
- Government role: coordinate and collaborate.

Prioritization Workshops

A second series of community workshops was held in late October in each of the five counties:

- October 29, 2013 in Tooele County
- October 30, 2013 in Weber County and Morgan County
- October 31, 2013 in Davis County and Salt Lake County

Each workshop included a project update and an exercise to identify local broadband issues and priorities based on the prior needs assessment.

Prior to this workshop, the combined results SWOC exercises were reviewed and categorized.

Summary of Strengths

- growing online services
  - business
  - entertainment
  - education
  - health care
  - public safety
- expandability
- broadband service options available
- competition among providers
- innovation
- strong existing demand
- tech savvy population

Summary of Weaknesses

- limited access and coverage
- unfair competition
- confusing and inconsistent provider information
- awareness about broadband options and bandwidth needs
- communication and training about broadband and technology use
- cost and equity (low income options)
- meeting expectations (getting what is paid for)
- insufficient broadband speed
  - remote locations
  - weather impacts

Summary of Opportunities

- economic and business development
- partnerships
- communication
- focus on different sector needs
  - commercial use
  - government use
  - personal/home use
- redundancy
  - providers
  - services
  - paths
- awareness about broadband options and services

Summary of Challenges

- developing infrastructure
  - access to remote locations
  - cost
  - lack of coordination
  - lack of policy and regulation
- changing technology
- financing for public providers
  - competition
  - interaction
- liability of illegal access (security & hacking)
- population growth
- liability of inconsistent service and access
- restrictive regulations

Using these combined results from the SWOC analysis, participants were asked to prioritize issues in each category for their community. A colored “dot” exercise was used to record input from participants.

For the exercise, each of the preceding categories was printed on a large, poster-sized sheet. Following a brief overview of the themes and topics, participants were asked to identify their individual priorities in each category by placing colored dots on the posters next to their priority topics and themes—with red being highest priority, yellow second highest priority, green being third highest priority and blue being lowest priority. Each dot was weighted, and the weighted average of the results for each county is shown in the charts below, followed by a summary of results for all of the counties combined.

Davis County Priorities

Chart 1: Davis County Strengths

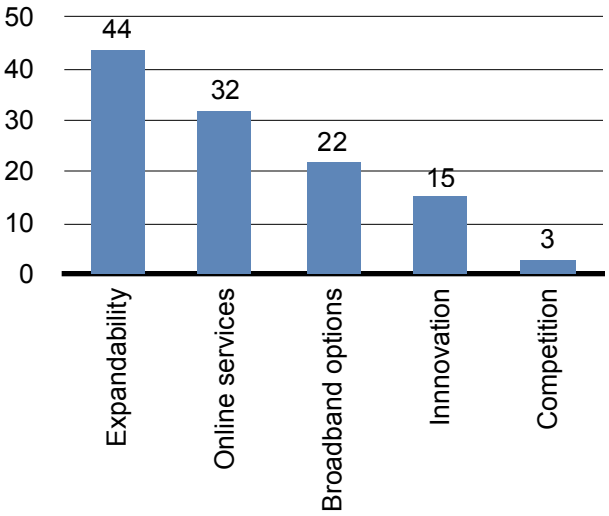


Chart 2: Davis County Weaknesses

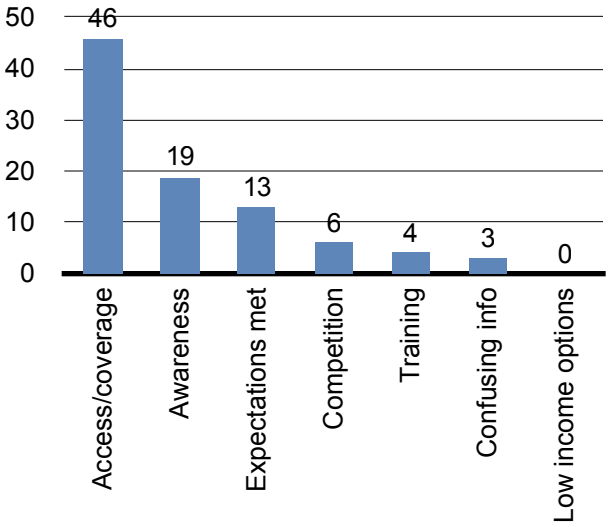


Chart 3: Davis County Opportunities

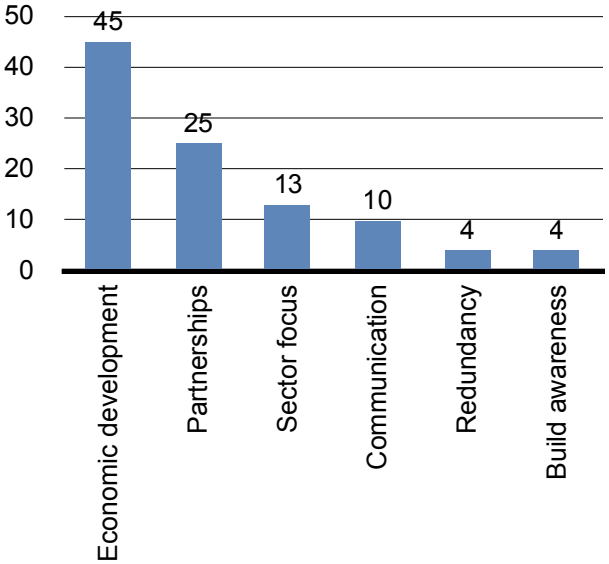
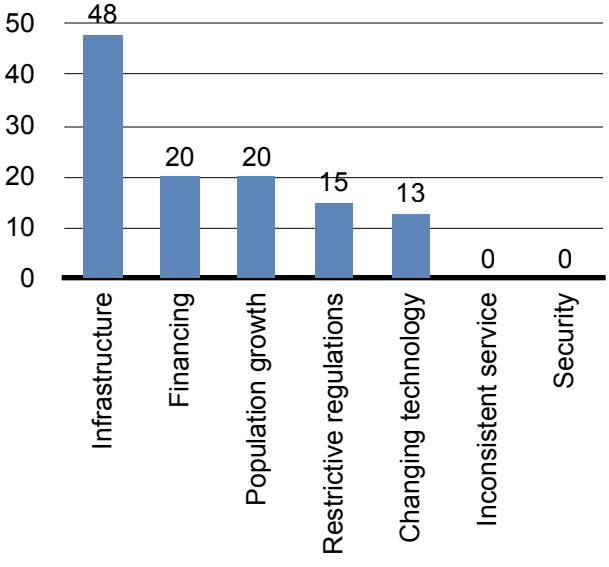


Chart 4: Davis County Challenges



Morgan County Priorities

Chart 5: Morgan County Strengths

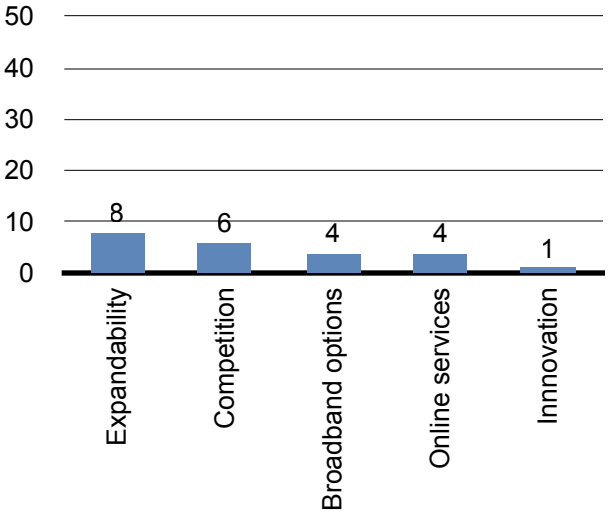


Chart 6: Morgan County Weaknesses

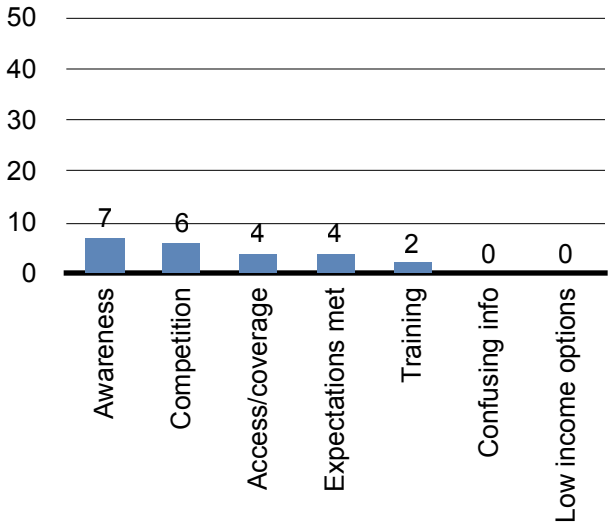


Chart 7: Morgan County Opportunities

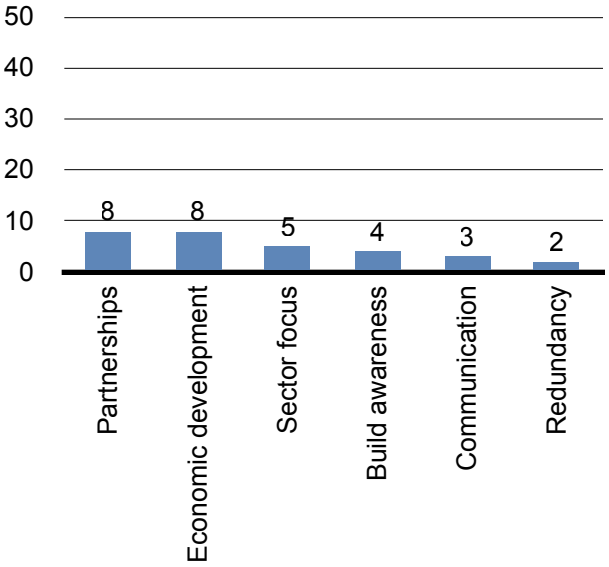
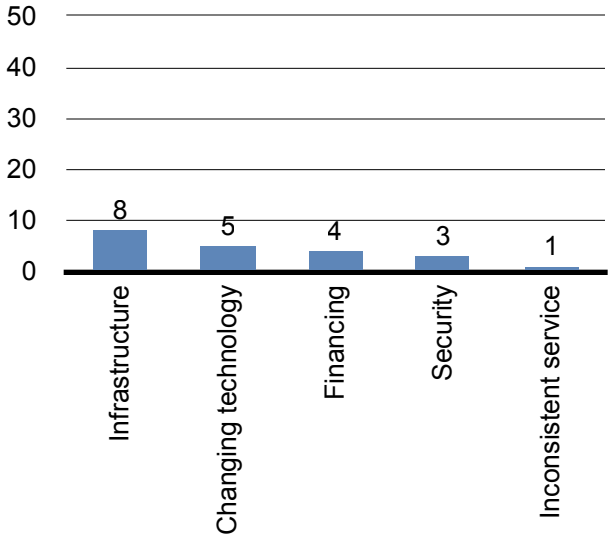


Chart 8: Morgan County Challenges



Salt Lake County Priorities

Chart 9: Salt Lake County Strengths

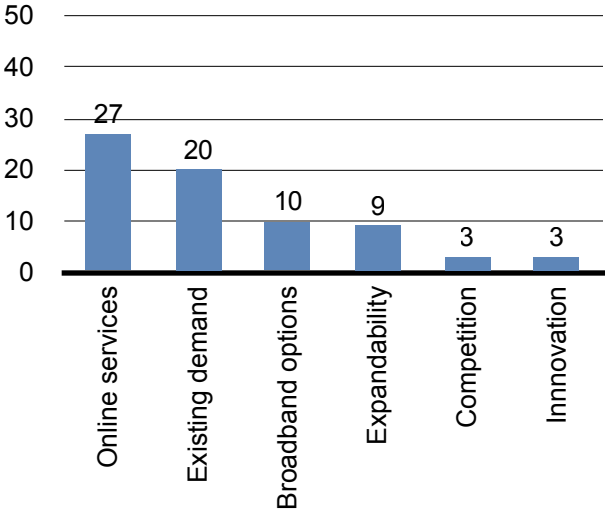


Chart 10: Salt Lake County Weaknesses

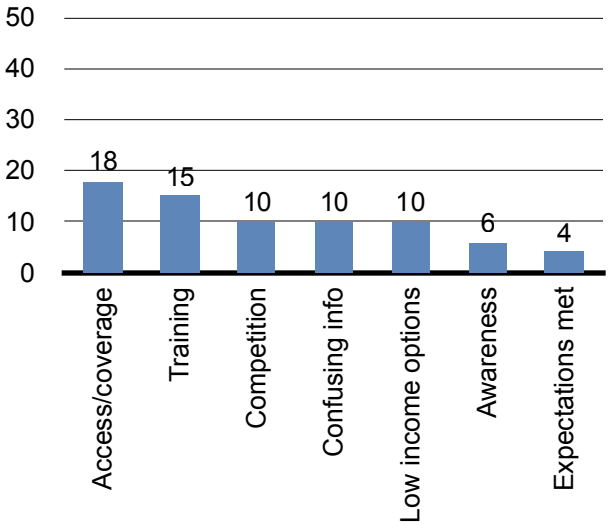


Chart 11: Salt Lake County Opportunities

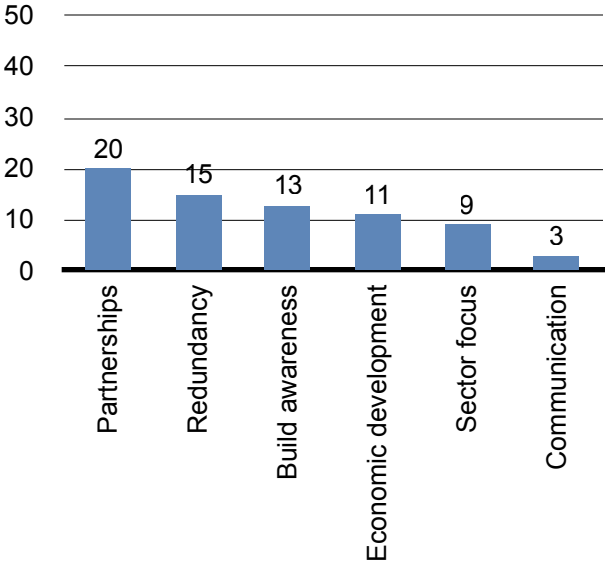
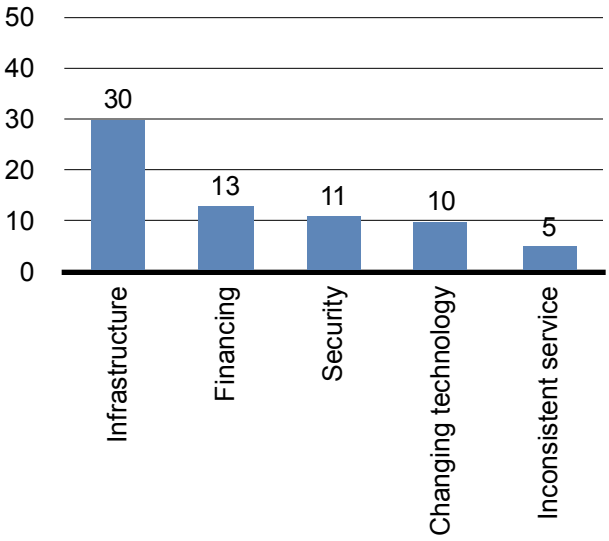


Chart 12: Salt Lake County Challenges



Tooele County Priorities

Chart 13: Tooele County Strengths

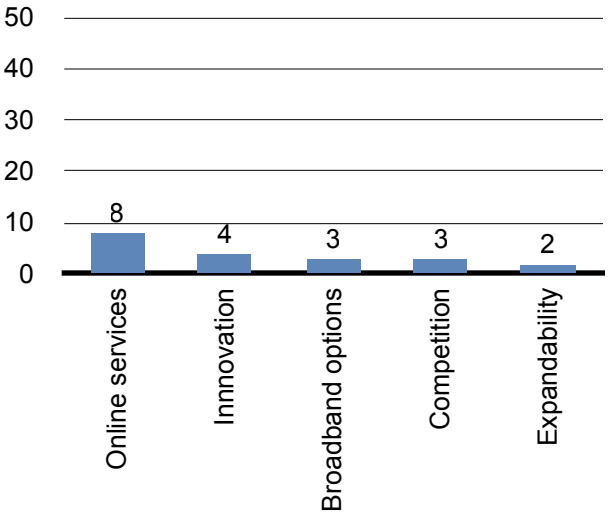


Chart 14: Tooele County Weaknesses

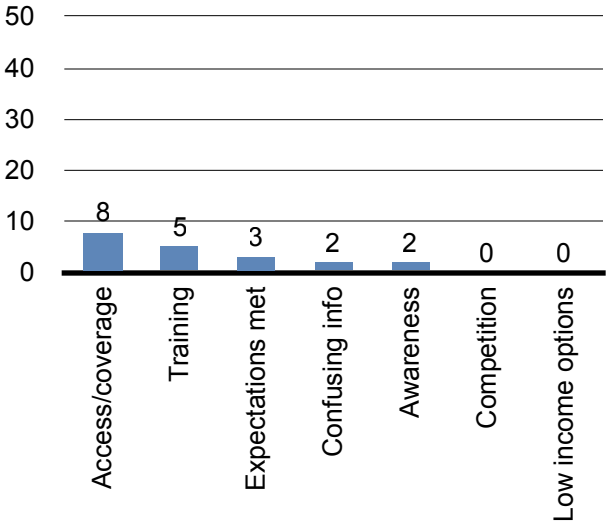


Chart 15: Tooele County Opportunities

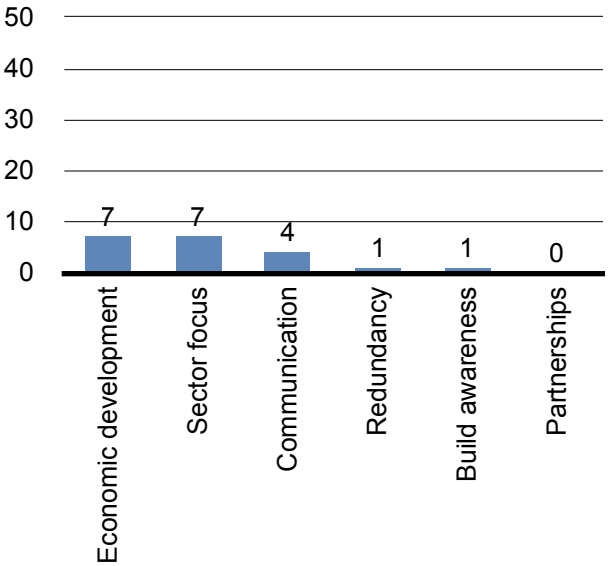
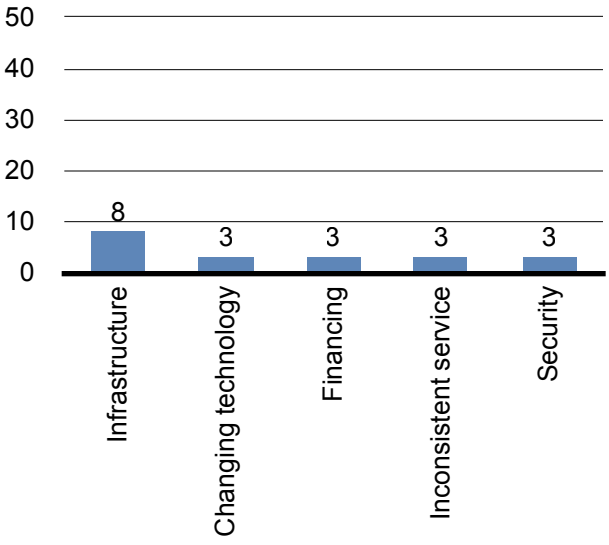


Chart 16: Tooele County Challenges



Weber County Priorities

Chart 17: Weber County Strengths

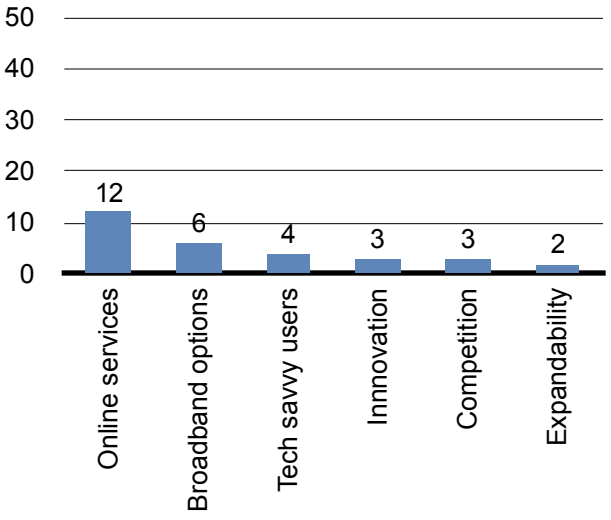


Chart 18: Weber County Weaknesses

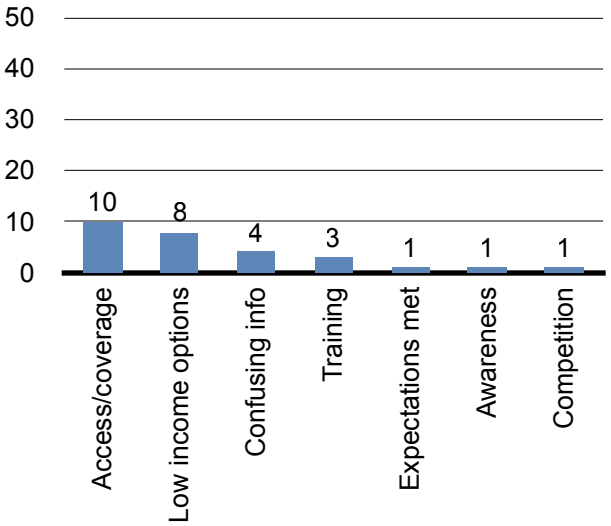


Chart 19: Weber County Opportunities

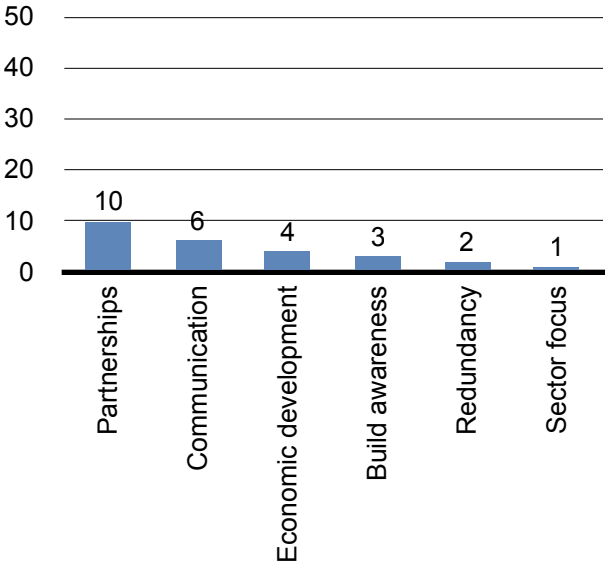
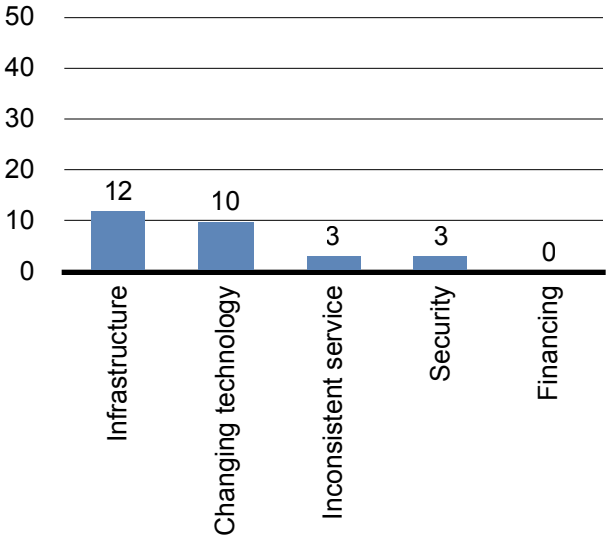


Chart 20: Weber County Challenges



Summary of Regional Priorities

For all the counties combined, the cumulative priorities are summarized below.

Chart 21: Summary of Strengths

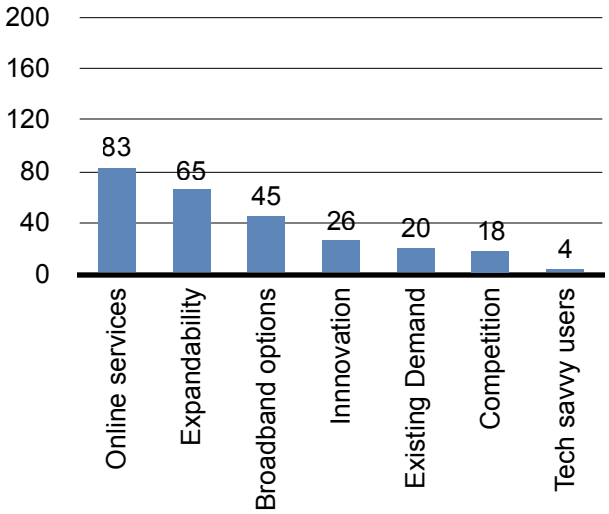


Chart 22: Summary of Weaknesses

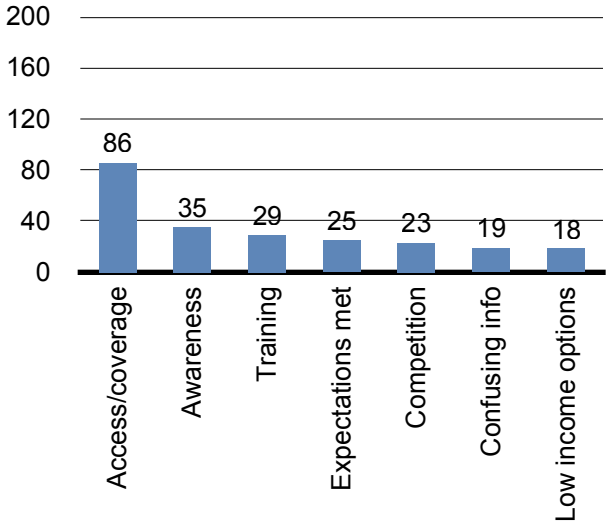


Chart 23: Summary of Opportunities

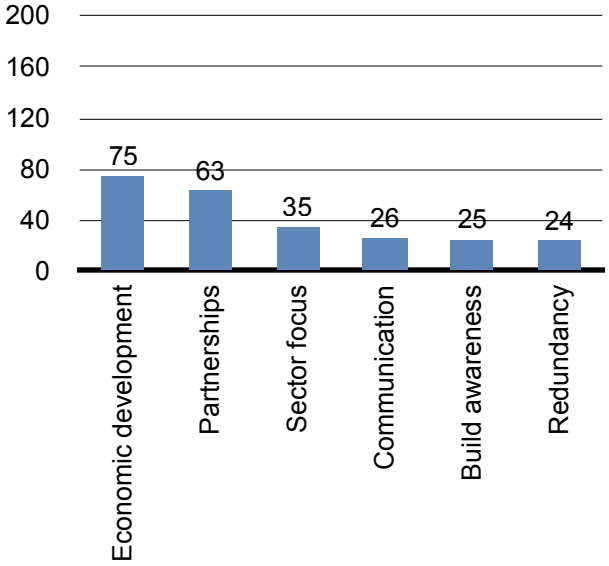
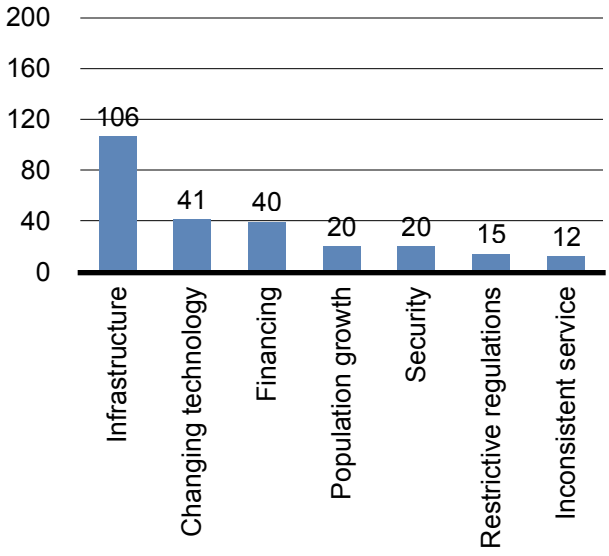


Chart 24: Summary of Challenges



Regional Industry Sector Survey

A community needs assessment survey was prepared and distributed throughout the WFRC region. WFRC provided the survey online, and distributed notice through an extensive email list of community leaders and organizations. The Consultants provided advance notice through media outlets, business and trade organizations representing various business sectors, and through personal networks and social media. The survey was also shared with the regional Broadband Planning Council for distribution among respective organizations and peer networks.

A total of 133 responses were received, and analyzed by industry sector. The majority of participants completed the entire survey. Some respondents completed only the first few questions but did not follow through to the end. The survey questions were open ended and the highest common responses were categorized and are summarized below.

Chart 25: Participants

The following chart summarizes the sectors or interests of survey participants.

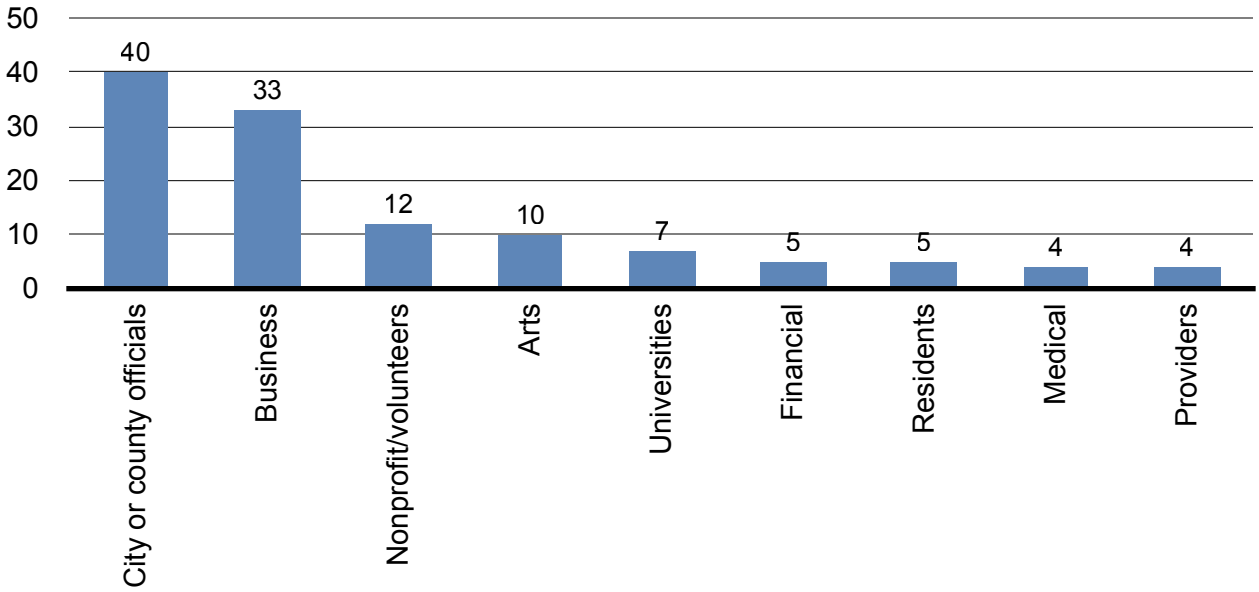


Chart 26: Broadband Use

Question: How do you use broadband within your organization?

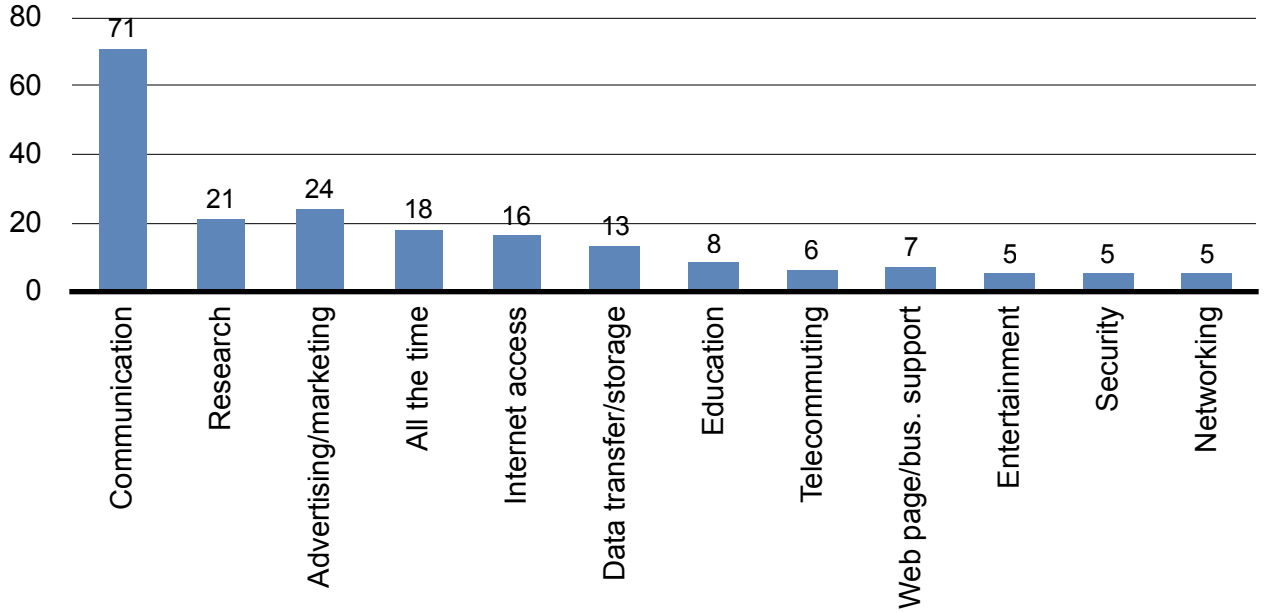


Chart 27: Broadband Applications

Question: During the last year, how did broadband help you succeed?

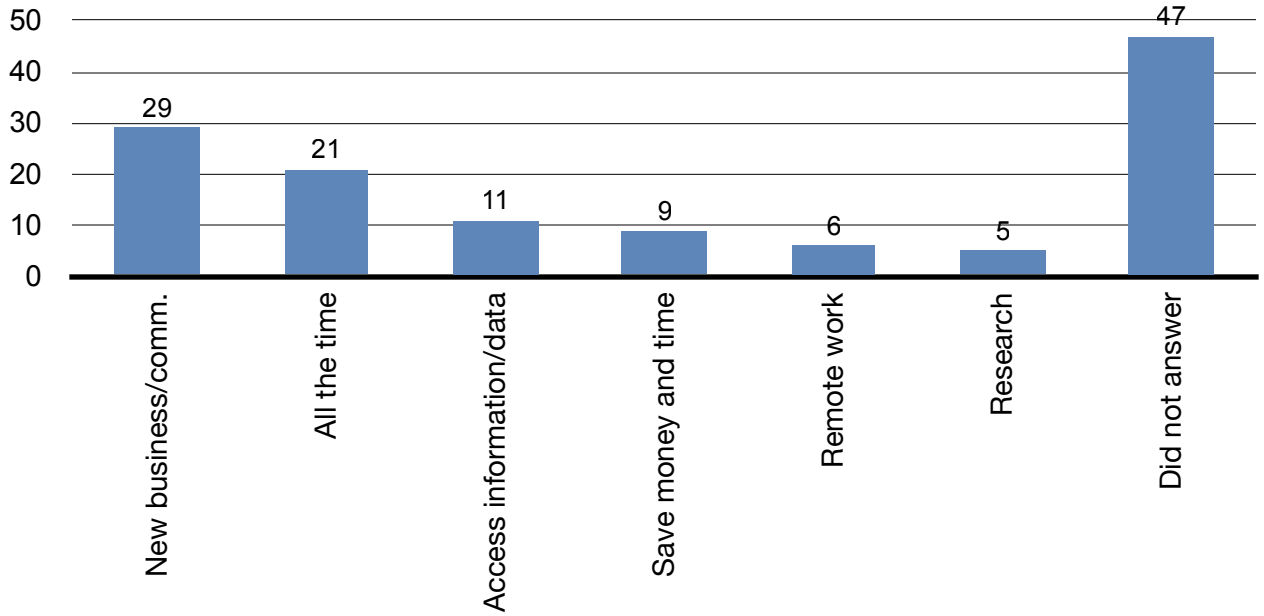


Chart 28: General Broadband Issues

Question: During the last year, what was the most frequent broadband issue you had?

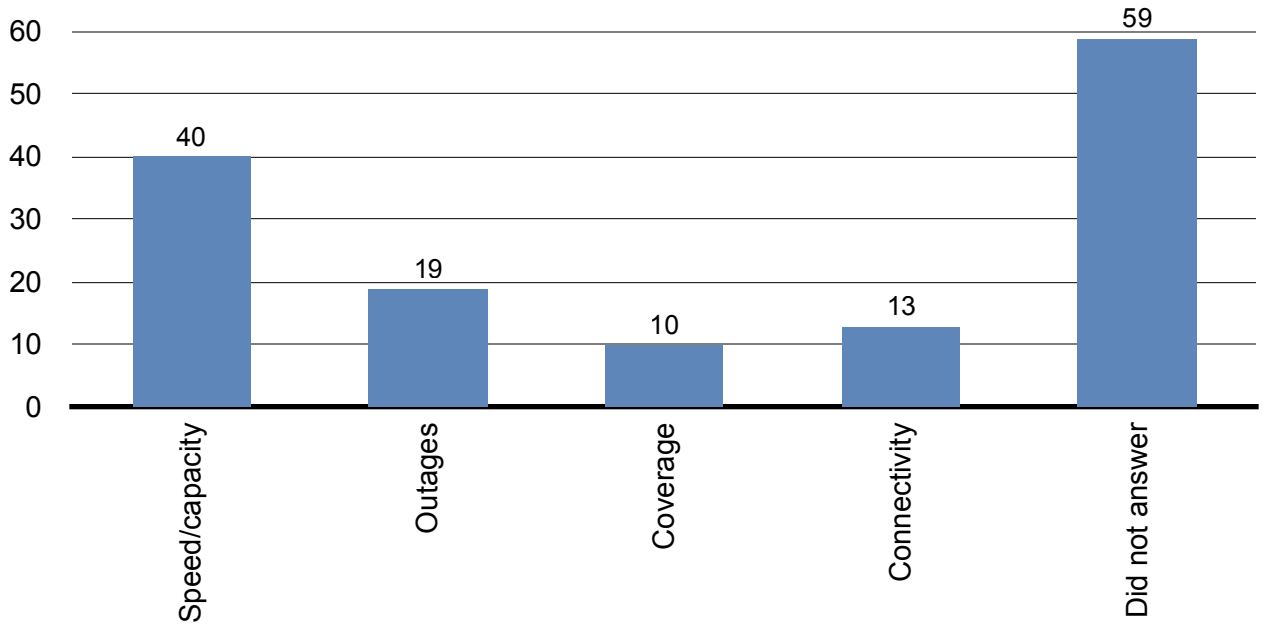


Chart 29: Specific Broadband Disruptions

Question: During the last year, what was the biggest broadband issue you had that caused problems in completing a project or making a connection?

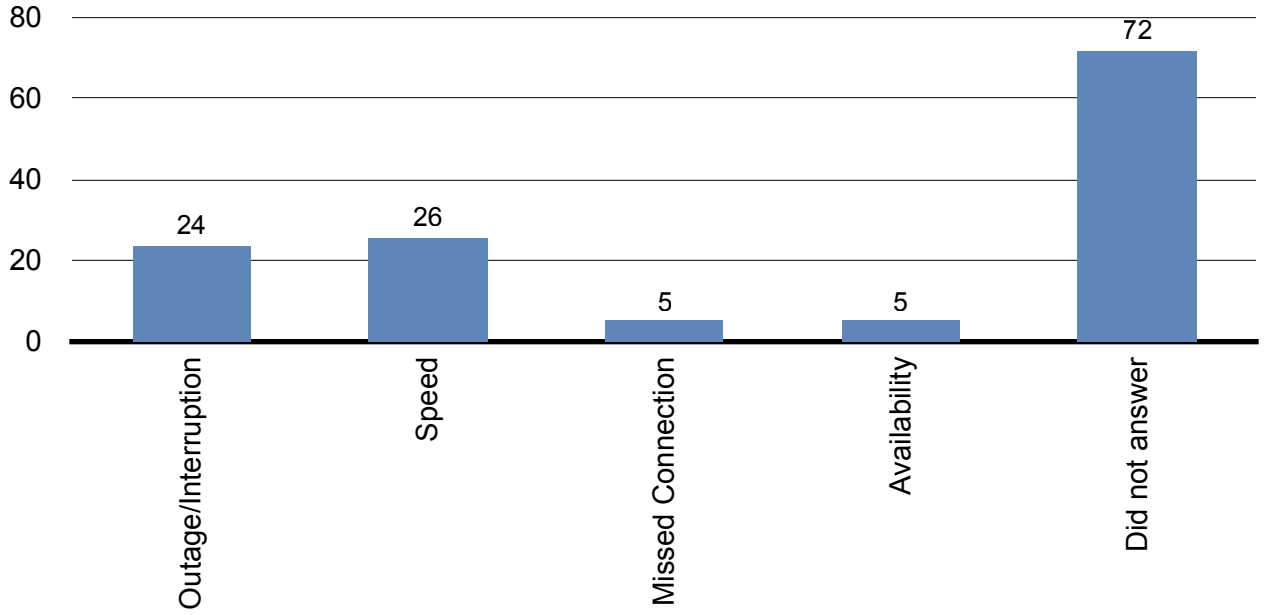


Chart 30: Current and Future Needs

Question: What are your current key needs for broadband and how do you see that changing in the future?

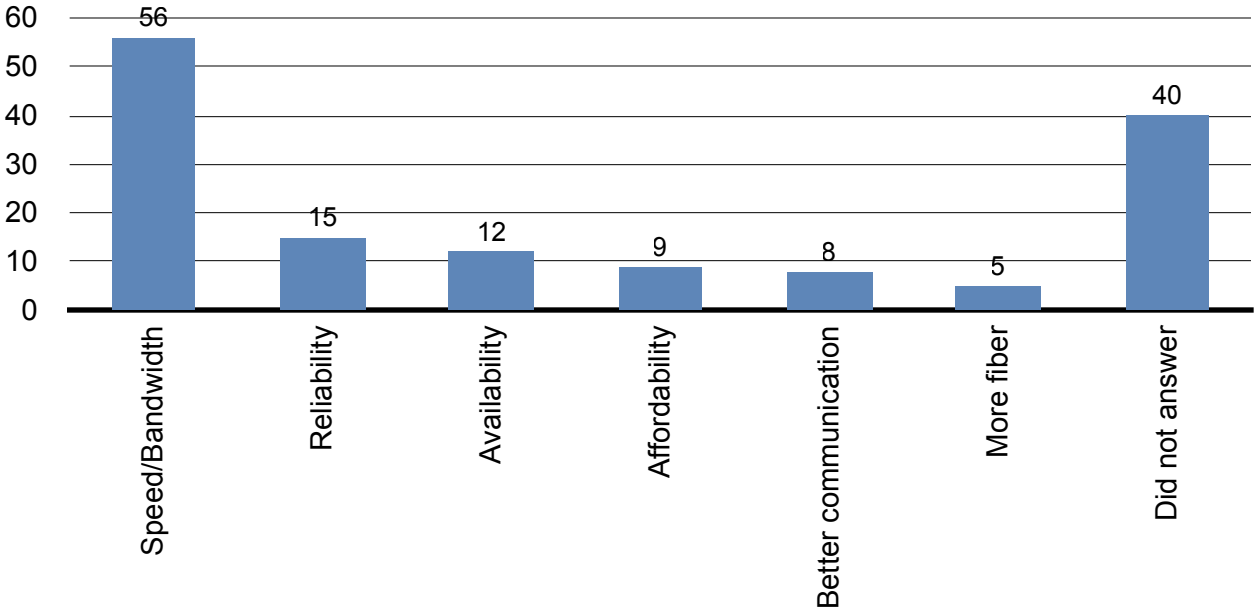


Chart 31: Business and Client Issues

Question: What is the most important broadband related issue for your business and your clients?

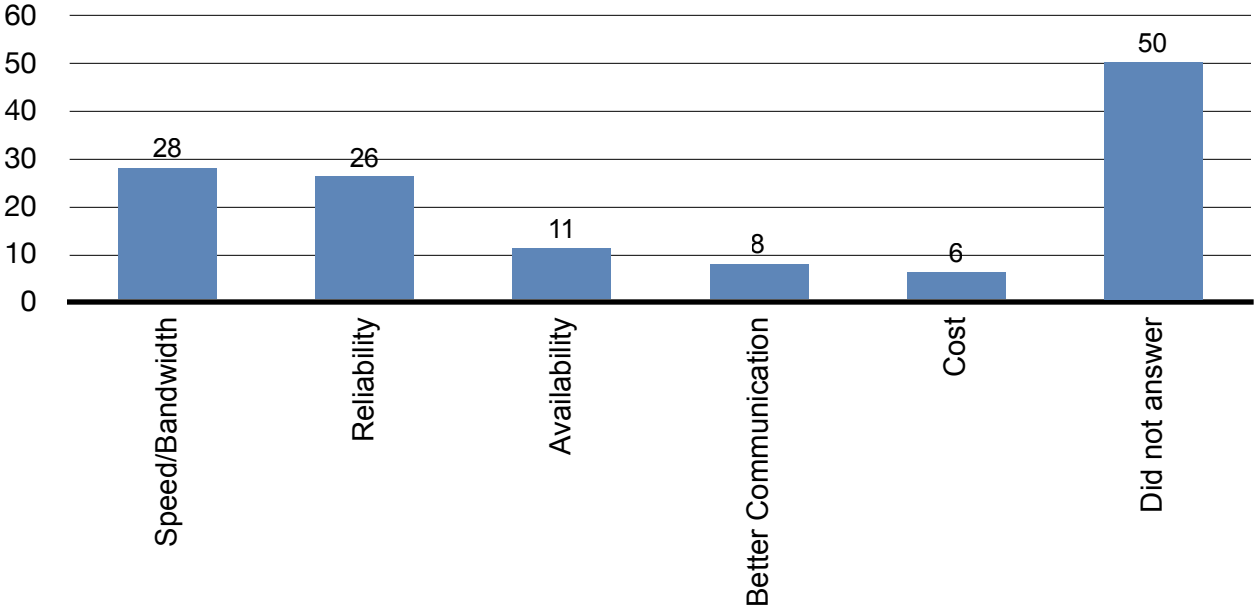
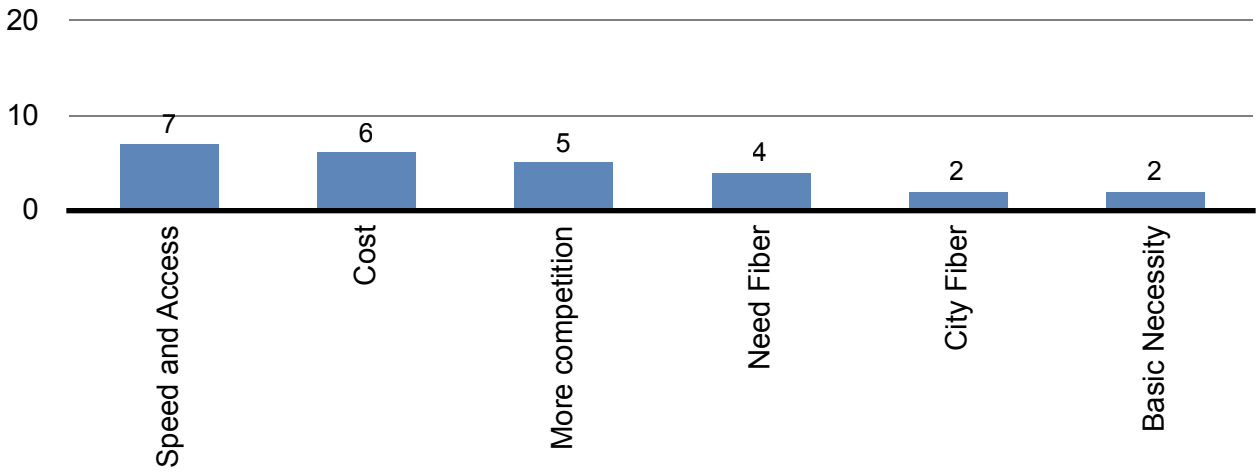


Chart 32: Additional Input

Question: Is there anything else you would like to share?



The survey provided an additional opportunity for input in the planning process. Though not statistically significant, the responses provided useful insights and mostly reinforced the information obtained through the needs assessment workshops, and the results of the Residential Non-Adoption Survey summarized below.

Regional Nonadoption Survey

A survey of Utah residents was conducted in early 2014 to assess some of the primary reasons for nonadoption of broadband. Following is a summary of key findings for the Wasatch Front Region. A one-page infographic of survey results can be found in Appendix H, and a more detailed report of survey findings can be found in Appendix I.

Key Findings

Nonadopters of broadband in the Wasatch Front Region access the Internet infrequently

How often do you access the Internet?

Several Times Each Day	12%
Once a Day	10%
3-5 Days a Week	25%
1-2 Days a Week	0%
Every Few Weeks	27%
Do Not Access	27%

Among the region's nonadopters, gender, marital status, race, and education statistics mirror the state average. The region's nonadopters were slightly older than the state average, with an average age of 50.7 years. Respondents in the region also had lower total household incomes.

Reasons for Nonadoption

Lack of Availability and Knowledge

All counties, except for Morgan, have coverage for at least 88 percent of households at download speeds of 25 Mbps or higher. Morgan has coverage for only 11.95 percent at those speeds. Despite the region's higher than average household income, 37.3 percent of respondents did not have computer equipment in the home.

Do you know how many ISP's are in your area?

Yes	14%
No	86%

Lack of Interest or Need

The key reason for nonadoption of broadband in the Wasatch Front region is a lack of interest or need. Almost half of respondents said they did not need high-speed Internet or were not interested in getting access in their homes.

What is the main reason you do not have high speed Internet access at home?

Don't Need It/Not Interested	48%
Too Expensive	21%
Can Use It Elsewhere	9%
Not Available in My Area	9%
Computer Is Inadequate	6%
Other	6%

Knowledge and Expertise

Respondents were asked to rate their computer skills on a scale of zero to 10, with 10 being very highly skilled. In the Wasatch Front region, 23.1 percent of respondents ranked their computer skills at a zero. Almost half of respondents said training on the computer/Internet would make them more likely to adopt high-speed Internet access in their homes.

What would make you more likely to have high speed Internet access in your home?

Training on Computers/Internet	43%
More Options	34%
Having It Available	34%
Lower Price	34%
Other	46%

Provider Input

Through the Utah Broadband Project, 26 companies were identified that provide broadband services in the five county WFRC region. These companies included fixed wireline and wireless providers, as well as mobile broadband providers.

In addition to invitations to participate in regional Broadband Planning Council meetings and community stakeholder workshops, the Consultants facilitated a focus group with broadband providers on October 9, 2013. The purpose of this meeting was to share with broadband providers the results of the needs assessment workshop and community survey, and gather

additional information and perspectives. Six individuals, representing four companies, attended the focus group meeting.

Participants completed an exercise similar to the SWOC analysis used in the Needs Assessment Workshop, and were also asked to discuss the role of state and local government. Providers were also asked to share their expectations for the Regional Broadband Plan.

The following is a brief summary of the input received from participants.

Summary of Strengths

- reliability
- rapid technological improvements
- 95% broadband coverage across the state
- growing fiber access
- good competition

Summary of Weaknesses

- rural coverage
- infrastructure demand/capacity
- lack of north/south long haul diversity
- overbuilding and unfair competition by government-led providers
- speeds

Summary of Opportunities

- government should help providers deploy infrastructure, but not compete
- improved education on what speeds are really needed
- local IP peering fabric
- economic development
- better communication and coordination of road projects and conduit permitting
- many customers are willing to pay more for better services

Summary of Challenges

- growing infrastructure at the rate of new technology demands
- duplication of efforts by government and private sector; government should not overbuild
- creating a minimum standard across the state
- technology can improve speeds via existing infrastructure
- perception of what speeds and bandwidth are needed

Additional Discussion

Broadband Speeds and Standards

Residential demand mainly consists of:

- gamers
- movie and media downloads and streaming
- communication; Facebook, email, etc.
- home businesses

Perception of bandwidth needs is very different from actual needs. Setting governmental goals is unnecessary—the standard is what the market demands. The current rule of thumb is:

- 3-10 mbps for home use
- 10-25 mbps for streaming, including two-way communication and education
- 25 mbps and up for businesses and institutions

- not consistent, and some would debate these

Government Role

- avoid duplication
- find ways to eliminate red tape
- provide more and better coordination
- deploy conduit with every road project
- including wireless co-location on government facilities
- notify and cooperate; announce new fiber builds

Provider Expectations for the Regional Broadband Plan

- Increase broadband awareness, perhaps using the Utah Leagues of Cities and Towns (ULCT) as a resource.
- Promote economic development.
- Emphasize small city service and access.
- Create best practice guide for government coordination.
- Improve awareness in rural areas.
- Expand lower income education about available assistance and public computing locations.

2013 Broadband Tech Summit

A statewide Utah Broadband Tech Summit was held on October 24, 2013 at the Utah Valley Convention Center in Provo City. The WFRC and Consultants facilitated and participated in breakout sessions on various topics throughout the Summit.

The following is a brief summary of major topics and themes.

- ***economic development***
  - broadband access is critical
  - need better broadband mapping for business
- ***education***
- ***emergency management***
- ***partnerships***
  - state coordination agency to share best practices
  - better coordination with local governments
  - build local relationships
- ***security and crime***
  - money, mayhem, mischief—the “3 m’s” behind security issues
- ***speed and capacity***
  - high bandwidth improves latency
  - sliced bandwidth can be used to extend capacity
- ***technology and innovation***
  - next generations applications are emerging
  - smart appliances are coming to market
  - 3D web content is expanding
  - hollow core fiber is an emerging broadband technology
  - Utah is a national leader of innovation in technology, services and applications

Additional summaries and presentations from the Utah Broadband Tech Summit are available through the Utah Broadband Project website http://www.broadband.utah.gov/2013/11/27/2013-broadband-tech-summit-videos-available/.

Regional Priorities & Recommendations

General Findings

After the completion of the public outreach, there was considerable information gathered about the needs within the WFRC region. In addition, there are some conclusions that can be made, as follows:

- The more urbanized areas of the region are served reasonably well, though some users experience speed and service interruption issues.
- Higher broadband speeds are increasing with increased customer demand.
- Actual broadband needs vary among individuals and businesses. A target or standard has been discussed and debated, but is not established as part of this plan.
- Rural areas struggle to achieve the same service levels as urban areas, which is mostly a function of density and the inability of market based delivery systems to serve lower numbers of customers.
- There are considerable differences of opinion about the role of government.
- Some communities are using partnerships more effectively than others to improve broadband service.
- Coordination is lacking between the many different government levels, providers, and the development community.

Overview of Recommendations

Through the regional community assessment and prioritization process, this Regional Broadband Plan emphasizes the following five regional priorities:

- infrastructure
- demand
- economic development
- community development
- broadband awareness

The Recommendations section for each of these topics provides general background, overall goal and recommended strategies to address each issue, including possible roles and responsibilities for various stakeholders. Because rural areas of the WFRC region sometimes have different needs than the more urbanized areas, a Rural Emphasis commentary is also included. Each recommendation section concludes with ideas for future funding opportunities and areas to focus resources.

Infrastructure

Infrastructure includes wireline broadband (fiber, cable, copper phone line, etc.), fixed wireless broadband (fixed point-to-point wireless) and mobile wireless broadband (fixed transmission to mobile device, WiFi, etc.) installations. There is an ongoing need for expansion and capacity increases.

Background & Facts

- Wireline infrastructure is the backbone of all broadband services; even fixed and mobile wireless systems tie back to a wireline system.

- Trenching issues are complicated by multiple providers, and exacerbated by a lack of local government coordination.
- Locating wireless transmission towers and systems can be a challenging aesthetic issue for communities.
- The need for broadband infrastructure will continue to increase.
- Utah has one of the first, and largest, publicly supported multi-jurisdictional open access fiber deployments in the country[2], the Utah Telecommunications Open Infrastructure Agency (UTOPIA), which presently operates in 10 municipalities. Smaller municipal broadband networks also exist, such those in Spanish Fork and Provo (iProvo was recently sold to Google Fiber, which began sales and operation in January 2014). Though publicly-supported networks are sometimes controversial, they are undoubtedly a contributor to Utah's technology savvy population and business-friendly environment.

Overall Goal

Expand broadband infrastructure and improve infrastructure deployment through better coordination, communication and cooperation.

Recommendations

Wireline infrastructure. Improve coordination of public and private construction opportunities with streets, utilities and other major public works projects.

Wireless infrastructure. Promote best practices for tower installations including stealth (hidden or disguised tower and equipment installations) approaches.

Broadband Providers. Explore the creation of a sub-committee within the Utah Broadband Advisory Council to improve communication among broadband providers to promote best practices for infrastructure deployment:

- Create a web site of local and state-wide construction schedules and trenching opportunities, with short-term (up to 1 year) and longer term (1-3 year) schedules.
- Focus on relationships, partnerships and communication with local government, including elected officials who regulate policy, and staff (such as public works and engineering) who manage projects.
- Encourage local government to include broadband infrastructure in their comprehensive plans and as a routine coordination item for capital facilities projects.

State Government. Explore opportunities and incentives to help expand infrastructure and higher speed connectivity, especially in rural areas:

- Consider grant funding programs—including federal funding partnerships—and other financing programs with private providers.
- Add broadband and related infrastructure goals as elements to be addressed in local government comprehensive plans.
- Explore ways to address regulatory barriers to sharing highway, electrical transmission, natural gas, water, and other major utility easements and right of way corridors for fiber network expansion in ways that don't compromise the safety or security of those systems.
- Remove regulations that restrict local municipal efforts to address local broadband needs—whether through private providers, public-private partnerships, or publicly funded broadband networks.

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[2] Horrigan, J. & Satterwhite, E. (2012). TechNet's 2012 State Broadband Index. 16. Downloaded February 15, 2012, from http://www.technet.org/wp-content/uploads/2012/12/TechNet_StateBroadband3a.pdf.

Local Government. Cities and counties can increase coordination, communication and collaboration through improved processes and techniques:

- Include broadband network and service information as part of routine comprehensive and small area plan updates. Utilize the Utah Broadband Project and AGRC resources to provide detailed information about networks and services available, as well as future plans from providers.
- Create and maintain a list of local broadband providers, districts and utilities—use Utah Broadband Project resources as a starting point.
- Consider an annual or periodic meeting with broadband providers to determine lead time needs for trench coordination and potential cost sharing policies prior to undertaking major capital projects. Consider inviting Blue Stakes, trench and wireline installation companies, and any agencies/departments that build significant projects.
- Coordinate with city departments, developers and districts on major projects. Set up a reporting schedule and project mapping system.
- Request fiber build schedules from providers. Consider cost sharing policies.
- Request and coordinate project schedules from UDOT and/or county road departments
- Review permitting processes to expedite broadband deployment.
- Evaluate public structures for potential wireless service installations.
- Consider broadband along with other utilities for new residential and commercial subdivisions.
- Update zoning laws to respond to new wireline and wireless broadband infrastructure needs.
- Encourage broadband services that promote open access that do not limit competition.
- Local government economic development agencies can benefit from working with private business to promote awareness and address ongoing issues of broadband access, speed and reliability.

Business. Business trade associations and broadband providers can benefit from working together with local government economic development agencies to improve awareness and address ongoing issues of broadband access, speed and reliability.

Users. Communicate with local leaders and broadband providers about infrastructure needs. Encourage public dialogue about infrastructure development in the community. Participate in community planning processes to expand awareness of and incorporation of broadband related infrastructure issues.

Rural Emphasis

Many rural areas lag in infrastructure and have reduced competition among private broadband providers. Yet broadband offers alternatives to traveling long distances for goods and services, and offers new economic development opportunities. Partnering to expand fiber in highway corridors, funding and financing assistance to expand infrastructure to public facilities, focusing on emerging economic development opportunities and serving areas of clustered residential growth are areas for continued exploration and development.

Future Funding

The following are recommended areas of focus for broadband infrastructure funding as future resources are available:

- Utilizing the ideas and resources from this and other regional broadband plans, develop a Utah Best Practice for expanding broadband availability in communities. This could also be accomplished, perhaps with funding assistance, by encouraging cities and counties to

develop best practices and then promoting those through county and municipal education programs.
- Develop a funding assistance program, utilizing loans and grants, to promote broadband infrastructure development in underserved areas.
- Work with the planning coordinator of the Governor's Office of Management & Budget to create a template for a broadband element of a community comprehensive plan. Include this information in the Utah planning resource library http://www.planning.utah.gov/library.htm.

Demand

The use of broadband and related technology has grown exponentially over the past two decades. Education, business transactions, communication, digital media products, data storage and processing, entertainment, government and institutional services are all driving forces behind current innovation. Broadband delivers high speed data across a growing network of fiber and wireless systems to meet increasing needs. It is considered an essential service for most businesses and individuals throughout the region. Broadband demand will continue to grow and will require an ongoing market response.

Background & Facts

- Broadband adoption in Utah was the highest in the nation in 2010, with service to 80% of households in the state[3]. By comparison, adoption was 59% in 2007, demonstrating the rapid expansion and increasing demand.
- Utah ranked 9th in the nation among states in TechNet's 2012 State Broadband Index[4]—a survey and ranking of states using combined indicators of broadband adoption, network quality, and economic structures.
- Over 5% of the Utah's total workforce are working in information and computer technology (ICT) occupations[5].
- Most employers and jobs require broadband access in the workplace for communication, data storage and other essential services.
- Several countries have declared broadband access to be a fundamental human or civil right. Among these are Costa Rica, Estonia, Finland, France, Greece and Spain[6]. Many more countries, including the United States, consider unrestricted access and use of the Internet to be a fundamental freedom of speech issue.

Overall Goal

Pursue and promote creative strategies, partnerships and best practices to meet growing broadband demand and improve broadband services.

Recommendations

Growing Demand. Address growing demand through improvements to infrastructure (see preceding Infrastructure section of this document), increased competition, new partnerships, community participation, and additional training and education opportunities.

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[3] Horrigan, J. & Satterwhite, E. (2012). TechNet's 2012 State Broadband Index, 27. Downloaded February 15, 2012, from http://www.technet.org/wp-content/uploads/2012/12/TechNet_StateBroadband3a.pdf.

[4] Ibid., 7.

[5] Ibid., 16.

[6] Wikipedia. *Right to Internet access*. Downloaded February 17, 2012 from http://en.wikipedia.org/wiki/Right_to_Internet_access.

Service Interruptions. Address service interruptions by encouraging redundancy, encouraging communication between providers as well as between government agencies and providers. Reducing business and institutional service interruptions should be of greatest importance.

Some areas of the state experience service reduction and interruption with seasonal population fluctuations, largely related to outdoor recreation and tourism. In these areas, communities should work closely with providers to address demand surges. Such surges can affect public safety and commerce, since emergency services and businesses are using the same crowded networks during these peak period. The Wasatch canyons resort centers throughout Salt Lake, Davis and Weber Counties are examples of recreation areas that are being proactive, through partnerships with providers, to insure that adequate facilities exist to address increased seasonal demand and new mobile technology.

Public Safety. In addition to business and personal use, broadband is also an important communication and information service component for emergency service and public safety agencies. Often these agencies are competing for the same bandwidth. This can create interruptions in service due to system overload. Additionally, natural or man-made disasters affect service. These interruptions must be considered and mitigation efforts addressed.

Work has commenced to plan and create a dedicated national and statewide network for emergency services and disaster response. As demand grows on public broadband networks, creating a dedicated broadband and communications network should be a high priority.

Consistent Speeds. Reduce speed variability by expanding redundancy, reducing costs, providing financial assistance, encouraging communication between providers as well as between government and providers. Address “symmetry” of broadband services to meet growing demand for upload speeds, in addition to download speeds.

Future needs. Maintain knowledge about trends and anticipate future demand to assure that today’s infrastructure can accommodate tomorrow’s needs, and incorporate new innovations.

Broadband Providers. Broadband providers in the WFRC region are constantly responding to changes in the marketplace. Service levels and costs can vary significantly from city to city and even among neighborhoods. Providers should strive for consistency within each municipality, improve communication among peer providers, and be open and responsive to building relationships and partnerships with state and local agencies to further broadband access.

Rural Emphasis

Actively explore partnerships and funding programs to expand access to meet demand in rural locations.

Future Funding

The following are recommended areas of focus for funding to address broadband demand as future resources are available:

- Coordinate the development and expansion of an emergency response communication network across the state and WFRC region. Incorporate ideas and resources from the State Communication Interoperability Plan (for more information about the State Communication Interoperability Plan, see Homeland Security in Appendix G).
- Utilizing the ideas and resources from this and other regional broadband plans, create a best practice guide for developing community partnerships to address broadband services, and related tools and resources.

Economic Development

Economic Development is the consistent and collaborative actions of the nation, state, and local communities to improve safe, healthy and sustainable living standards through job creation. Economic development promotes economic growth and stability.

Background & Facts

- Utah, and the United States generally, are engaged in substantial structural changes from an industrial economy to an information and advanced manufacturing economy.
- Job growth is occurring in information based technologies and products.
- Broadband access is one of the most important factors in the decision to choose a particular business location.
- Telecommuting has many associated benefits that include improved air quality, flexibility, quality of life, employee job satisfaction and productivity.
- Perceptions about broadband availability and capacity may be different when compared to actual data from the providers.
- Mobile wireless broadband coverage has grown to include most areas of the state.
- Fixed wireless broadband is expanding competition, and filling gaps in service areas where costs for wireline infrastructure have been cost-prohibitive.

Overall Goal

Focus on broadband infrastructure, service and innovation. This supports business opportunities, job creation and employment flexibility, which in turn supports and strengthens the economy of the region.

Recommendations

Economic development. Recognize that broadband is essential to businesses and employees. Work to improve the overall economy through increased collaboration with public and private economic development organizations—from state and local economic development agencies, to trade and business associations. Expand marketing of broadband as an economic development resource.

Focus broadband service, access and speed improvements in growth centers identified in the Wasatch Choice for 2040 Vision (see Map 5 in the Regional Maps section of this document).

Broadband Information and Education. Reduce conflicting or confusing information about availability, speed, and pricing. Improve information and advertising to allow provider comparisons.

Expand Infrastructure. This can be best accomplished through coordination and collaboration of providers, and state and local government agencies (see preceding Infrastructure section of this document).

Access in Employment Centers. Expand availability and service options, and encourage cooperation to increase speeds in economic mixed use centers, and other major employment centers. Begin designating potential economic centers using objective criteria such as transit availability, road access and capacities, adjacent housing, emerging centers and government readiness.

Access for Home Businesses. Using local business license information, map home business locations and compare to broadband access. Use annual home business license renewal to survey and assess adequacy of service and access. Continue to expand services, including

upload and download symmetry, to meet growing home business demands (see preceding Demand section of this document).

Rural Emphasis

Promote rural economic development partnerships. Focus on closing gaps in broadband access and speed in rural areas to help support and promote unique rural economic development opportunities.

Future Funding

The following are recommended areas of focus for funding to address economic development broadband tools as future resources are available:

- Explore funding options to more broadly market broadband infrastructure as an economic development resource.
- Create a best practice guide for expanding broadband within regional employment and population centers, and work with local economic development agencies to incorporate ideas and resources into local economic development strategic plans.
- Develop a funding assistance program, utilizing loans and grants, to promote broadband development in conjunction with rural economic development opportunities.
- Utilizing the ideas and resources from this and other regional broadband plans, develop a best practice guide for creating redundant infrastructure to avoid service interruptions.

Community Development

Broadband is a basic need within communities, and an important contributor to quality of life. The use of broadband is a common facet of daily activities, and supports all types of communication, recreation, social and cultural development, entertainment, commerce and public services.

Background & Facts

- Broadband availability benefits the health, safety and welfare of individuals.
- Broadband supports communication, social and cultural interaction and recreation within communities.
- Neighborhoods with excellent broadband connectivity and provider choices are more desirable.
- Communication tools can be used to offset senior isolation among aging populations.
- Online resources and services expand opportunities for government transparency and civic engagement.

Overall Goal

Improve the quality of life within communities by fostering broadband availability, use and access.

Recommendations

Focused Infrastructure Enhancements. Focus resources within employment and population growth centers, especially as defined in the Wasatch Choice for 2040 Vision.

Public Facilities. For some households—including lower income households—that may not have computers and/or broadband service, public facilities are a vital resource. Within the WFRC region, public and institutional libraries have adequate broadband service. However, libraries are not always convenient or accessible, and hours of operation are often limited. During peak use times, there can be long waits for available computers.

Communities can further expand community broadband and Internet access to meet demand by considering how schools, community and senior centers, recreation centers, municipal buildings and other public facilities may expand access to public broadband services.

Public Wireless (WiFi) Access. Explore opportunities to expand public WiFi at key locations in the community and neighborhoods. Fixed WiFi in parks and public spaces is a valuable resource. Mobile WiFi already exists on FrontRunner commuter rail, and expanding mobile WiFi on public transit including TRAX light rail, express busses, streetcar and other busses will enhance services and commuting services to incentivize all forms of public transit. Consideration should be given to how limited/filtered service may address safety and security. Consider partnering with providers for WiFi service in public facilities.

The Utah Broadband Project recently launched a webpage that lists locations throughout the state, where computer access and Wi-Fi is available for the free public use. This information can be found at http://broadband.utah.gov/public-wifi-access. The project team encourages cities and counties who have additional public access locations to submit them for publication on this site. A growing number of businesses including restaurants, hotels, banks, retailers and others offer complimentary Wi-Fi access. Communities may wish to collect and publish this information as a community and business resource.

Emergency Preparedness and Response. In addition to business and personal use, broadband is also a basic and important component of emergency services and disaster response. Unfortunately, service interruptions by natural or man-made disasters must be anticipated.

Community emergency preparedness and response plans should include clear direction to address service interruptions, whether short-term or prolonged, as well as guidelines for system response and overload during an incident, and steps to restore capacity if necessary following a disruption (see additional ideas for public safety in the preceding Demand section of this document).

Social Networks. Community organizations and social service providers can offer education about opportunities for communication and social networking tools and services available through broadband and related technology and services. Applications can assist individuals and groups with a variety of needs and activities, but the volume of technology and services may be difficult to research and select.

Rural Emphasis

Rural needs can best be met through broadband training, improved access through public facilities for lower income and other households without broadband service, promoting remote access for healthcare delivery, funding and financing programs for broadband expansion, and improved coordination and collaboration.

Future Funding

The following are recommended areas of focus for funding to address community development broadband tools as future resources are available:

- Utilizing the ideas and resources from this and other regional broadband plans, develop a best practice guide and resources to expand public WiFi in communities.
- Explore funding opportunities to expand fixed and mobile WiFi in public facilities, including expanded mobile services in connection with all forms of public transit.
- Develop maps and other tools that show locations where public access to computers and other broadband services and resources are available. Promote these tools and resources through libraries, education and social service facilities and outreach programs.
- Coordinate the development emergency preparedness plans for the state and for local communities to address preparedness and recovery of broadband services during a disaster. Incorporate ideas and resources from the State Communication Interoperability Plan (for more information about the State Communication Interoperability Plan, see Homeland Security in Appendix G).

Broadband Awareness

Many people need education and training about the use of broadband and related Internet and communication services. Technology and services are changing quickly, and even knowledgeable people can have a difficult time keeping up with new innovations. Understanding how to use and promote broadband, and related services and technology, can provide many benefits to individuals, businesses, institutions and communities.

Background & Facts

- A 2013 report indicates over 300 mobile apps are created each day[7], or about one new app every 5 minutes.
- Technological changes are not easily internalized without training.
- Some individuals are not yet aware or convinced of the benefits and opportunities available through broadband use.
- The costs for hardware and broadband subscription services may be beyond an individual's budget.
- Some individuals are concerned about latent access to negative influences—such as pornography, gambling, gaming, etc.—that may unintentionally reach their households through broadband and Internet services.

Overall Goal

Increase and promote opportunities to learn about the benefits and use of broadband. Expand training in the use of hardware, software, Internet applications and services for a wide variety of purposes. Focus resources within employment and population centers, especially those defined in the Wasatch Choice for 2040 Vision.

Recommendations

Broadband Awareness Training. Community organizations, public facilities and broadband providers can offer training for people of all ages and incomes about how to use broadband and related technology and services. Education opportunities should be publicized widely.

Training and promotion should more openly include education and awareness about filtering systems and services that provide effective means to block access to personally offensive materials available on the Internet.

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[7] Wolonick, J. (March 7, 2013). Where is the booming app market going? *USA Today*. Downloaded February 20, 2014 from http://www.usatoday.com/story/tech/2013/03/07/booming-app-market-minyanville/1970245/.

Affordability. More openly promote and expand more affordable hardware and subscription services that provide broadband access to lower income households. Advertise such opportunities in non-conventional ways such as at grocery stores, laundry facilities, bus stops, etc., and through lower income social service organizations.

Public Awareness. Consider a public relations campaign. Develop a statewide campaign to promote availability and accessibility of existing programs and services, and to address specific issues that currently limit broadband adoption by individuals and households.

Rural Emphasis

Create and expand training and education opportunities through local schools, libraries, and community and senior centers. Explore education partnerships with broadband providers.

Future Funding

The following are recommended areas of focus for funding to address broadband awareness as future resources are available:

- Develop a curriculum program for educating potential users about the tools, resources and benefits of broadband service. Distribution education resources through public and private institutions and agencies.
- Develop a public awareness campaign that focuses on the benefits and availability of broadband, and include information about affordable options for broadband service and public computer access.

Conclusion

The use of broadband, along with related technologies and services, has become commonplace throughout the WFRC region in both urban and rural areas. Service in urban areas is generally better than in rural areas, both in terms of coverage and available speed (see Maps 6, 8, 9 and 10 in the Regional Overview section of this document). It is remarkable how rapidly broadband use has grown from an optional “luxury” to a basic necessity for work and personal use. There are many indicators of how dependent on broadband our society has become, from positive associations such as entertainment and business transactions, to negative associations such as growing mobile device usage while driving.

The findings of the WFRC Regional Broadband Plan have reinforced these trends. Users are concerned about speeds, service interruptions, costs, and coverage because broadband access is integral to their employment, personal and community life, and a myriad of daily activities. Every day new apps provide a new way to gather data, learn, streamline a task, improve communication and entertain. For many people, mobile phones and devices do the job of several previous devices and simplify their technical needs. Customers are demanding more services online and private industry providers and entrepreneurs are meeting the challenge.

The nature of this trend means that some people may be left behind, unable to keep up with the rapidly changing broadband environment. Nevertheless, many educational opportunities are available for people to to learn how to use the Internet, broadband and technology tools, and what benefits these tools and resources offer.

The recommendations of this plan—including goals and implementation strategies—focus on five key priorities:

- infrastructure
- demand
- economic development
- community development
- broadband awareness

One of the conclusions of this plan is that broadband access has become a basic necessity. Other community needs—from telephone service and streets, to water and sewer functions that a local government might provide—have gone through similar transitions in the past. Many roads and public highways were once private toll roads. Many public water and sewer systems were once part of a private utility district.

Not all local government have accepted this new technology as a public necessity, which poses many challenges. And even among communities that have great interest in broadband services, few have developed a comprehensive policy or a process to integrate broadband infrastructure seamlessly into their everyday development approval systems, or as a component of major capital projects. Coordination between entities—providers, different levels of government, developers—is often sporadic.

This plan includes recommendations to fundamentally change the way communities approach, facilitate, expand, and improve broadband infrastructure and service. Long term benefits can include significant improvements in all five priority areas detailed in this plan.

Appendix

Appendix A: Davis County Maps

Appendix B: Morgan County Maps

Appendix C: Salt Lake County Maps

Appendix D: Tooele County Maps

Appendix E: Weber County Maps

Appendix F: Regional Industry Sector Survey

Appendix G: Best Practice Resources

Appendix H: Utah Broadband Nonadopters – Wasatch Front Regional Council Infographic

Appendix I: Utah Broadband Nonadopters – Regional Report: Wasatch Front Regional Council

Appendix A: Davis County Maps

Map A-1: Davis County Population Density. This map illustrates residential population densities for the county, and highlights urban, rural and unpopulated areas.

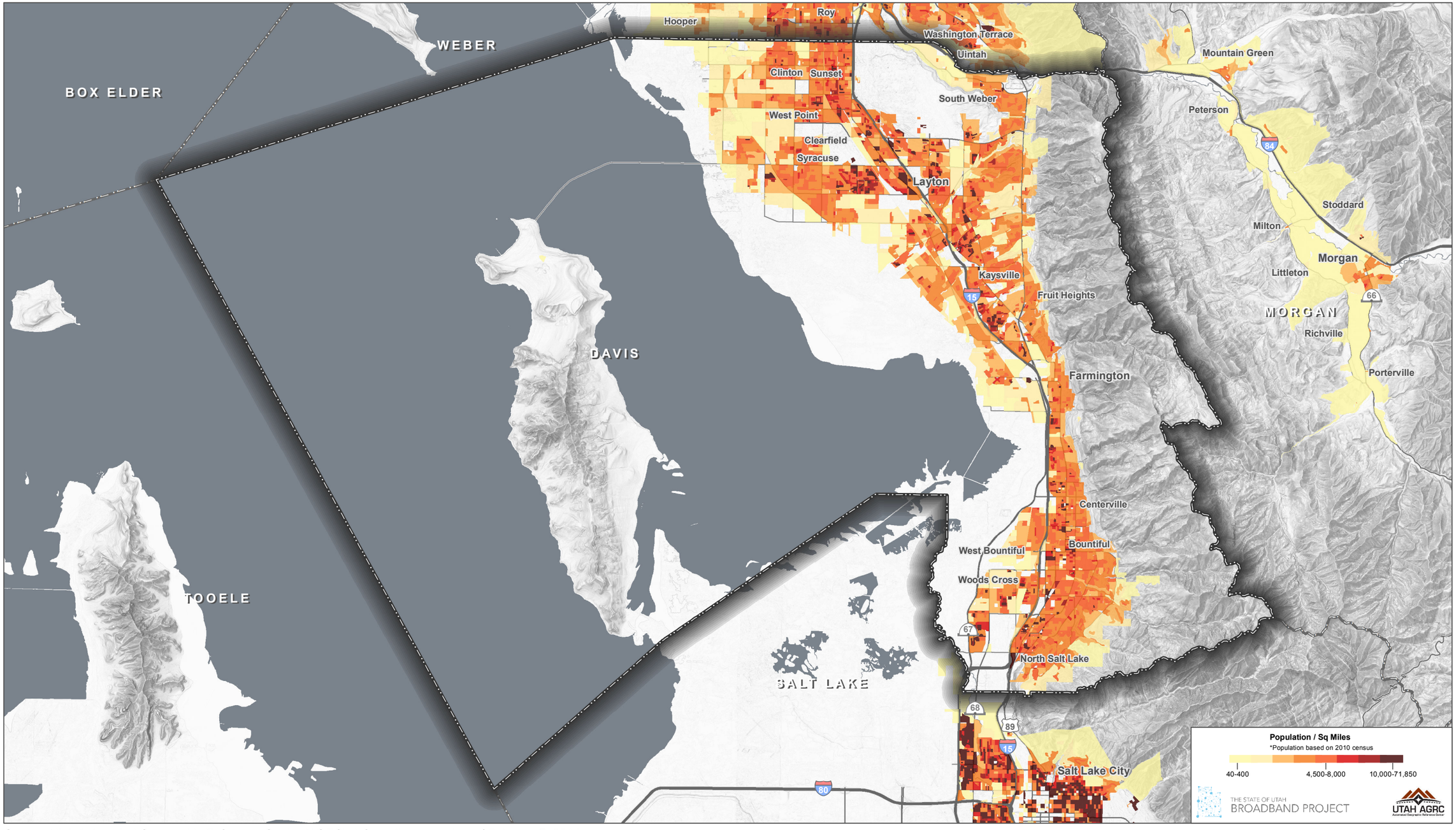
Map A-2: Davis County Major Infrastructure. This map illustrates major infrastructure for the county, including natural gas pipelines, major electrical transmission lines, and major highways.

Map A-3: Davis County Number of Fixed Broadband Providers ≥ 3 mbps. This map illustrates the number of residential fixed broadband providers offering service at 3 mbps and greater download speeds.

Map A-4: Davis County Number of Fixed Broadband Providers ≥ 10 mbps. This map illustrates the number of residential fixed broadband providers offering service at 10 mbps and greater download speeds.

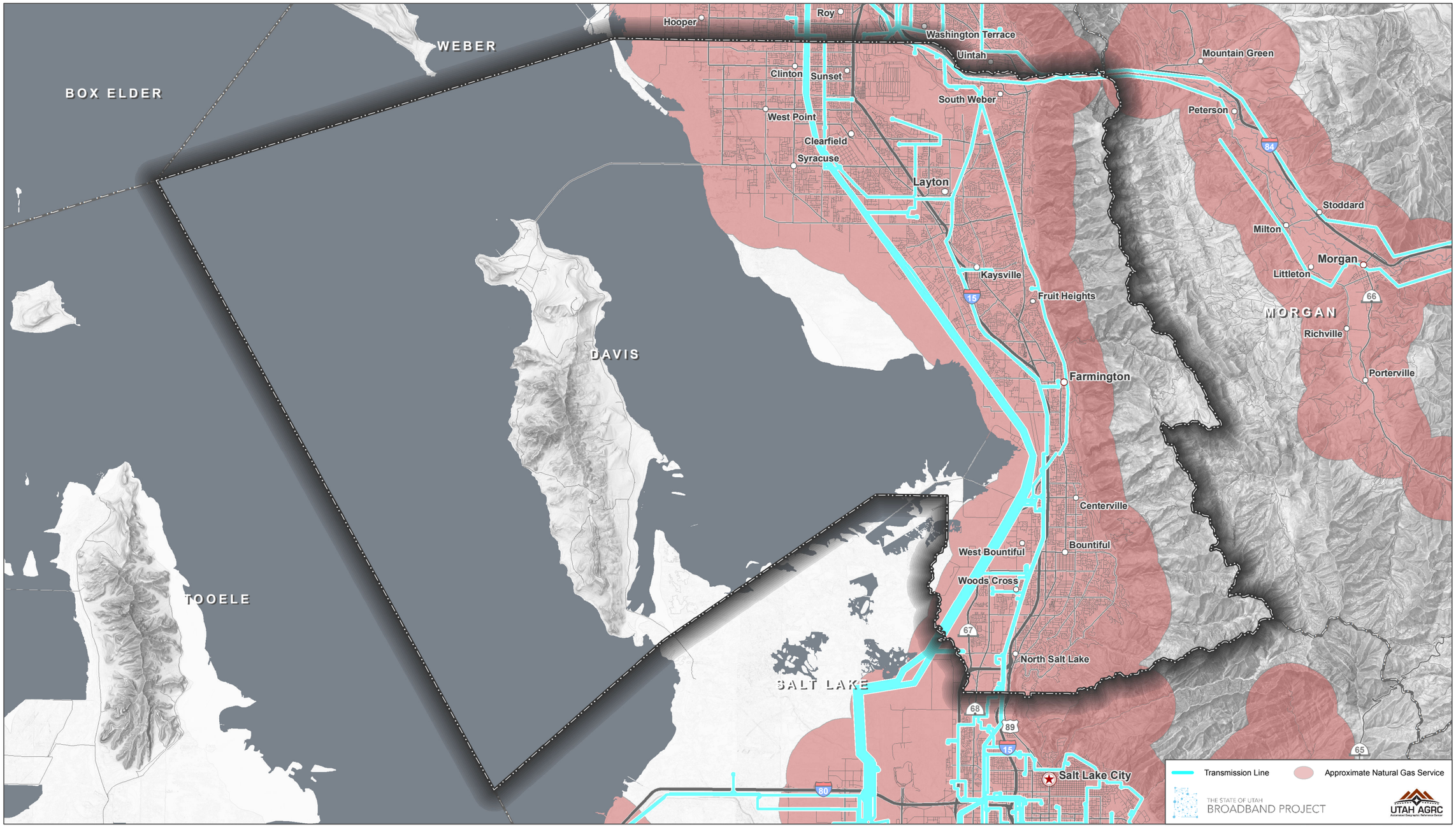
Map A-5: Davis County Number of Fixed Broadband Providers ≥ 25 mbps. This map illustrates the number of residential fixed broadband providers offering service at 25 mbps and greater download speeds.

Map A-1: Davis County Population Density



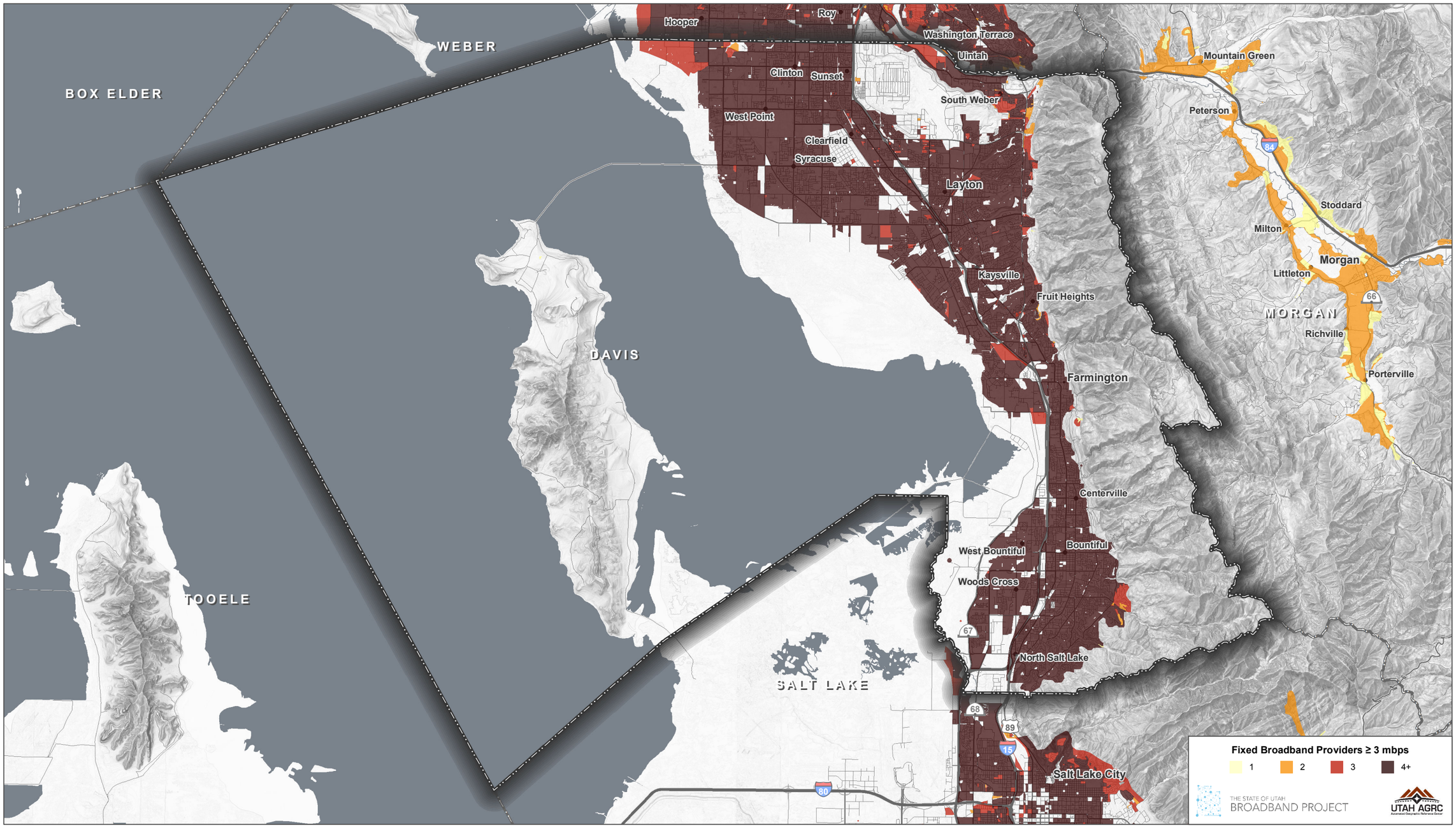
Source: Utah Automated Geographic Reference Center (AGRC). Information current as of February 7, 2014.

Map A-2: Davis County Major Infrastructure



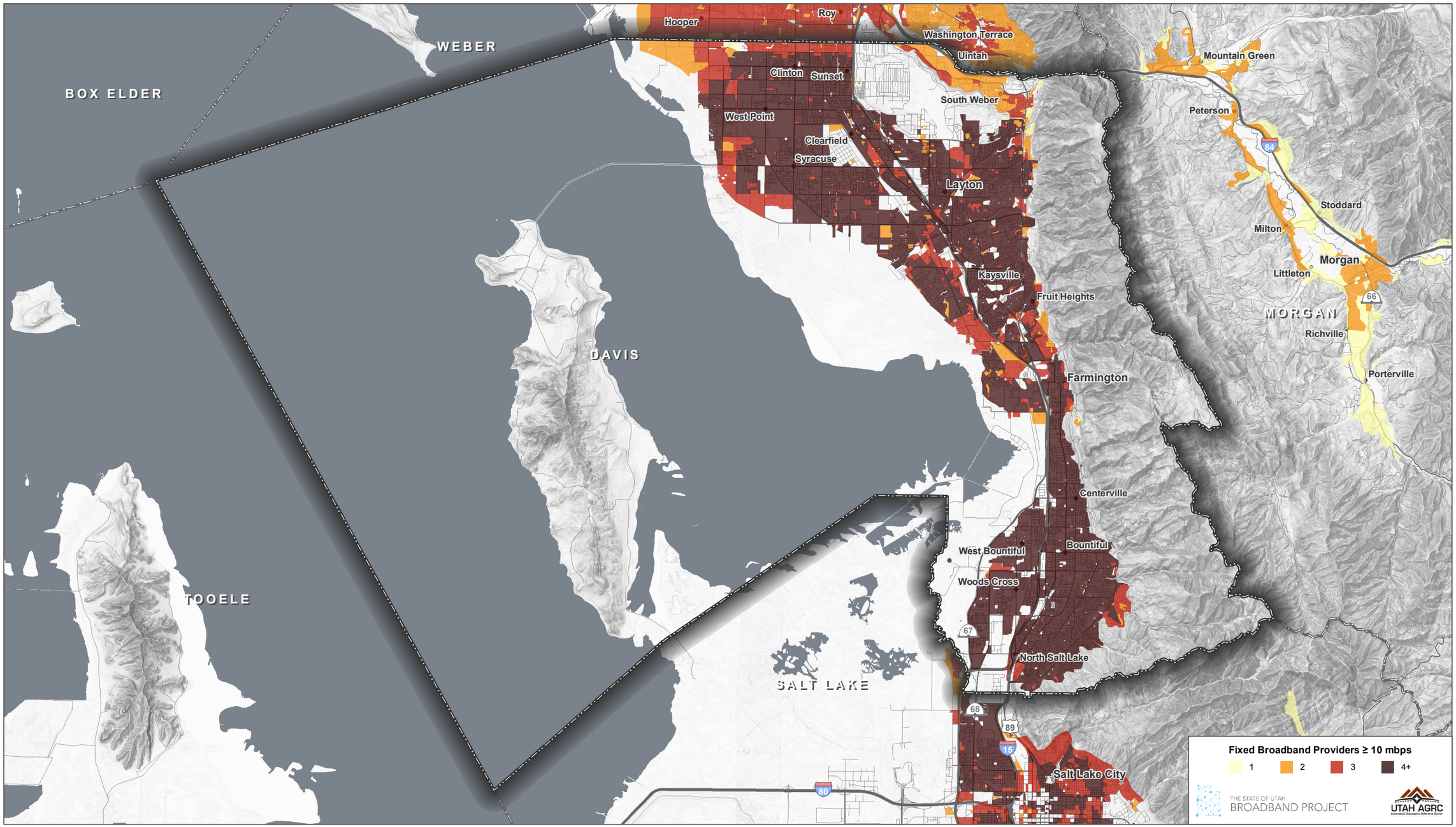
Source: Utah Automated Geographic Reference Center (AGRC). Information current as of February 7, 2014.

Map A-3: Davis County Number of Fixed Broadband Providers ≥ 3 mbps



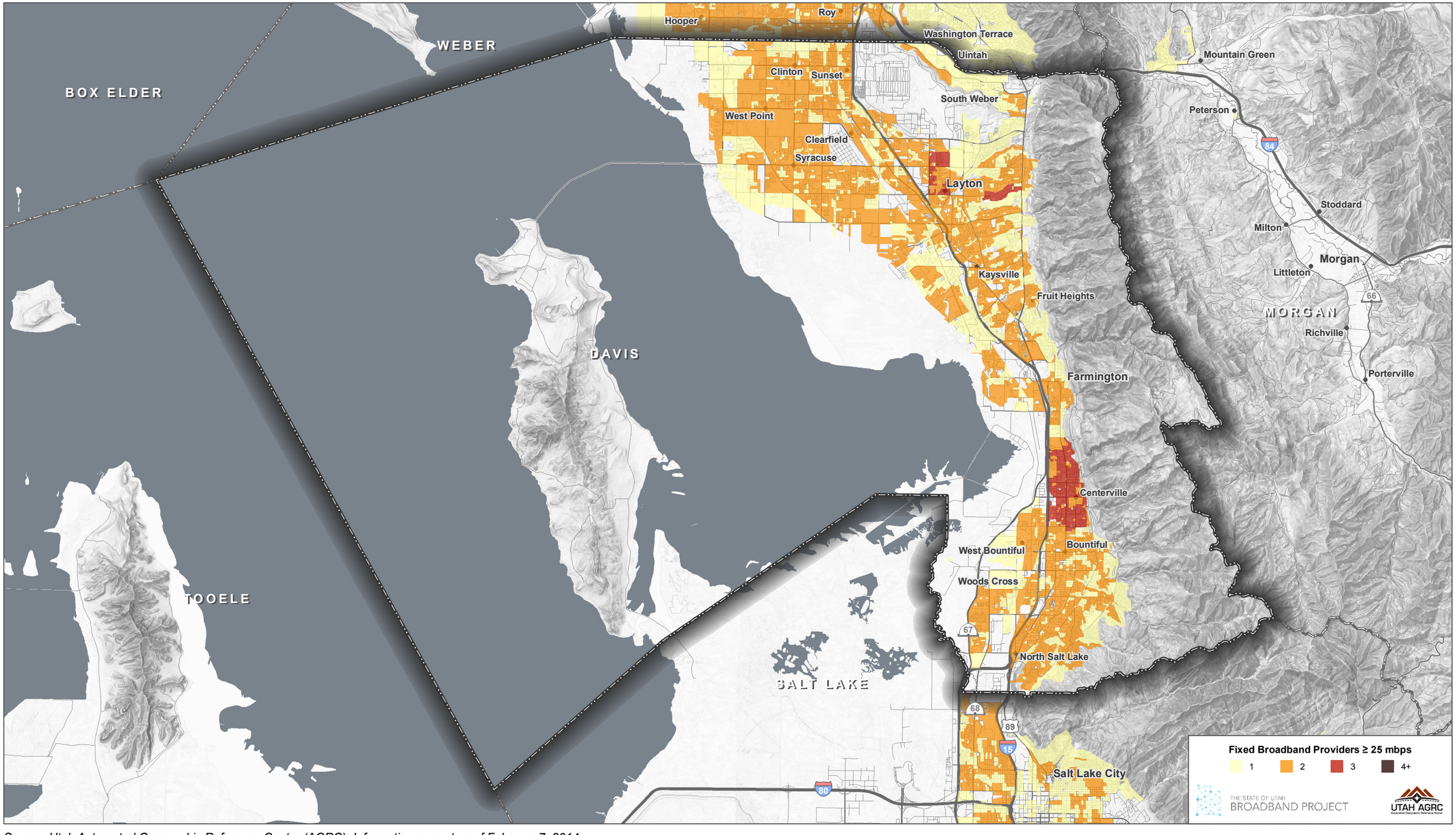
Source: Utah Automated Geographic Reference Center (AGRC). Information current as of February 7, 2014.

Map A-4: Davis County Number of Fixed Broadband Providers ≥ 10 mbps



Source: Utah Automated Geographic Reference Center (AGRC). Information current as of February 7, 2014.

Map A-5: Davis County Number of Fixed Broadband Providers ≥ 25 mbps



Source: Utah Automated Geographic Reference Center (AGRC). Information current as of February 7, 2014.

Appendix B: Morgan County Maps

Map B-1: Morgan County Population Density. This map illustrates residential population densities for the county, and highlights urban, rural and unpopulated areas.

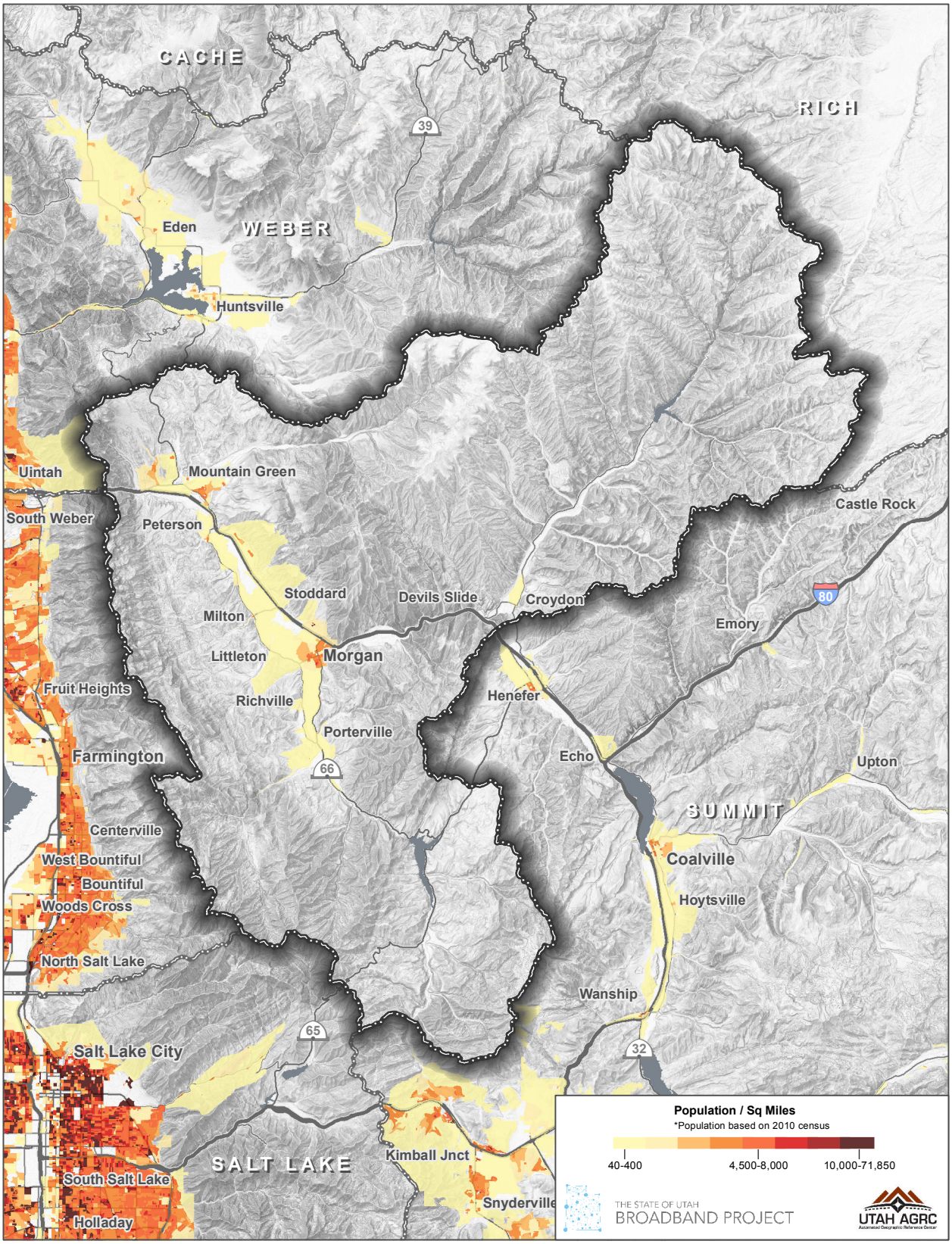
Map B-2: Morgan County Major Infrastructure. This map illustrates major infrastructure for the county, including natural gas pipelines, major electrical transmission lines, and major highways.

Map B-3: Morgan County Number of Fixed Broadband Providers ≥ 3 mbps. This map illustrates the number of residential fixed broadband providers offering service at 3 mbps and greater download speeds.

Map B-4: Morgan County Number of Fixed Broadband Providers ≥ 10 mbps. This map illustrates the number of residential fixed broadband providers offering service at 10 mbps and greater download speeds.

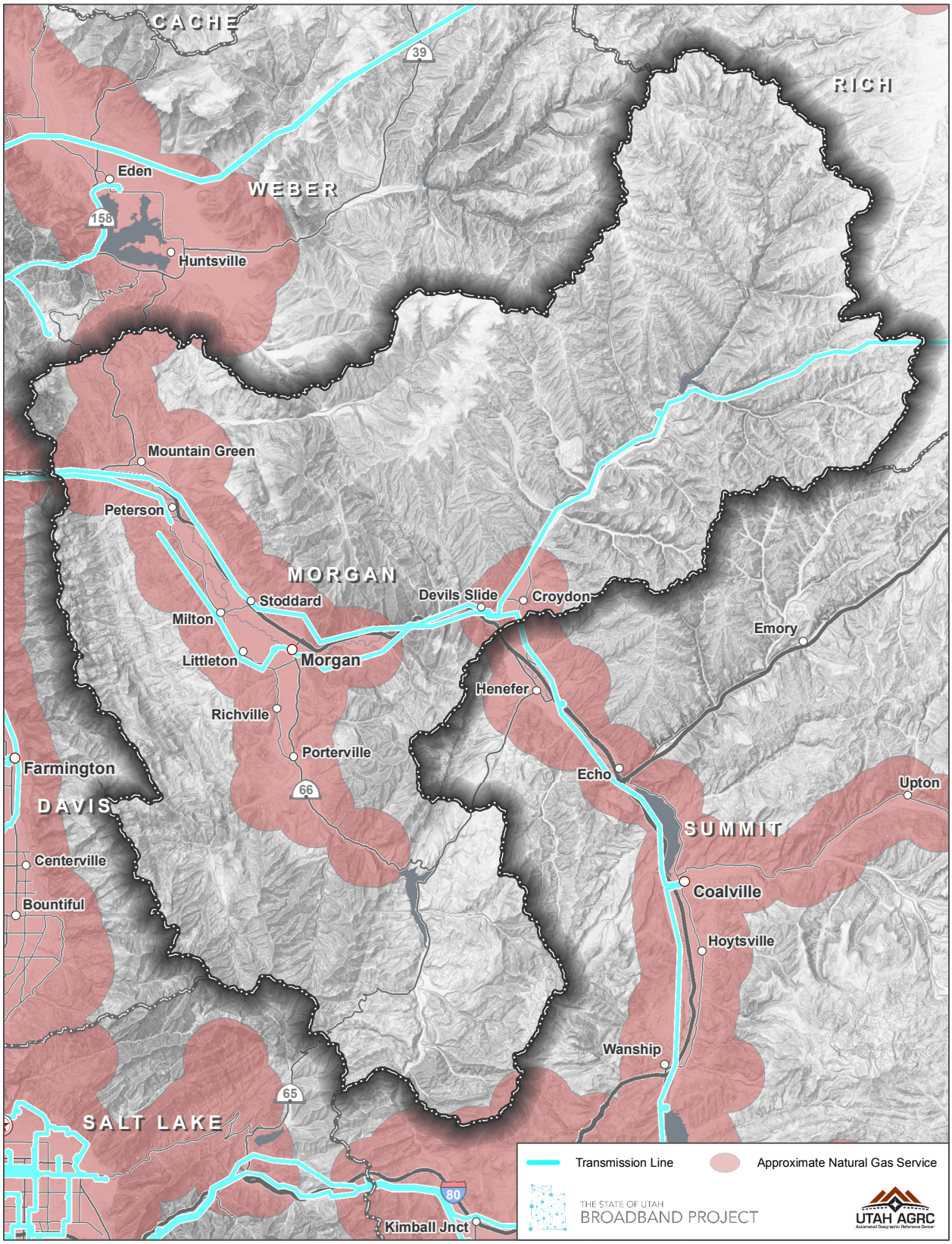
Map B-5: Morgan County Number of Fixed Broadband Providers ≥ 25 mbps. This map illustrates the number of residential fixed broadband providers offering service at 25 mbps and greater download speeds.

Map B-1: Morgan County Population Density



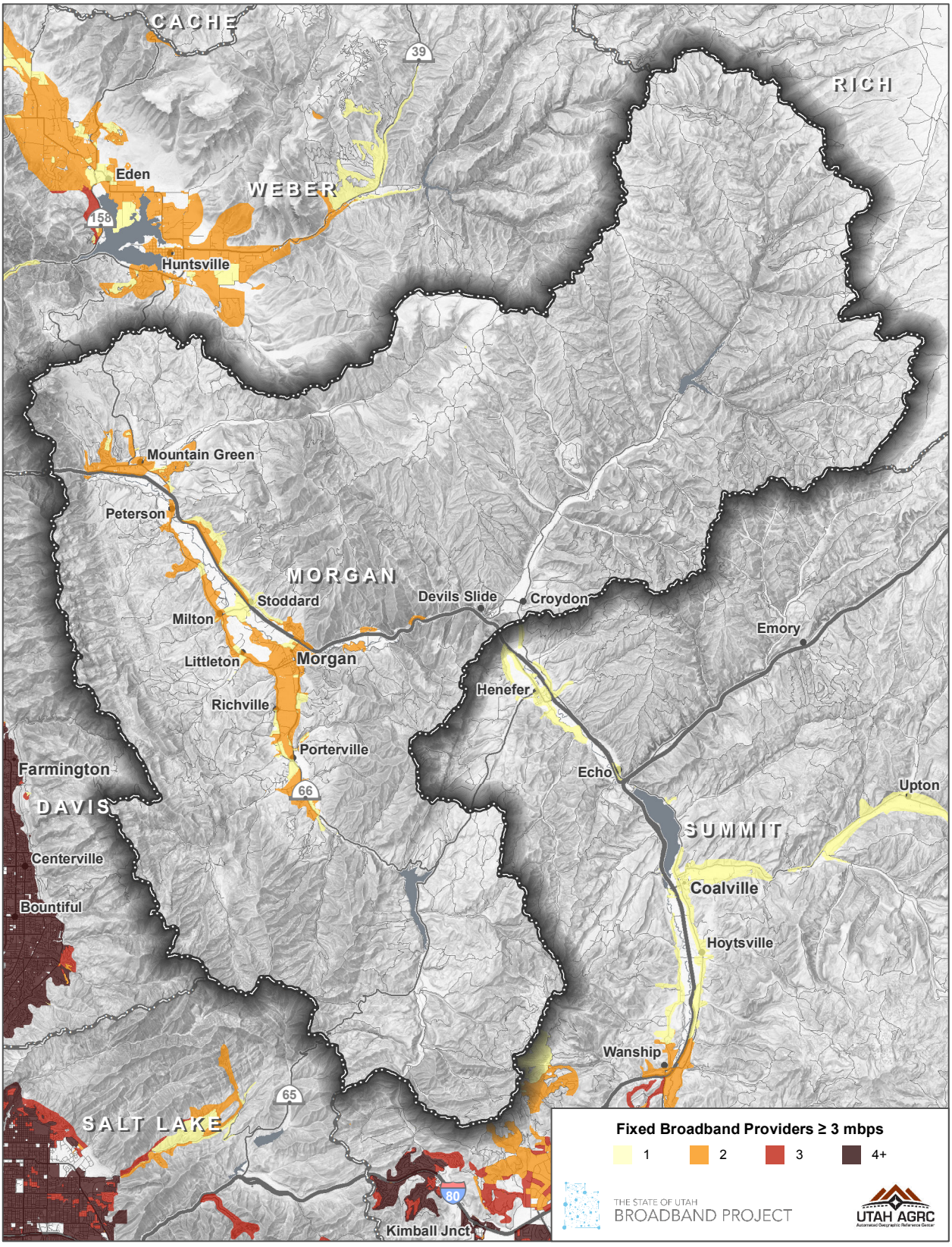
Source: Utah Automated Geographic Reference Center (AGRC). Information current as of February 7, 2014.

Map B-2: Morgan County Major Infrastructure



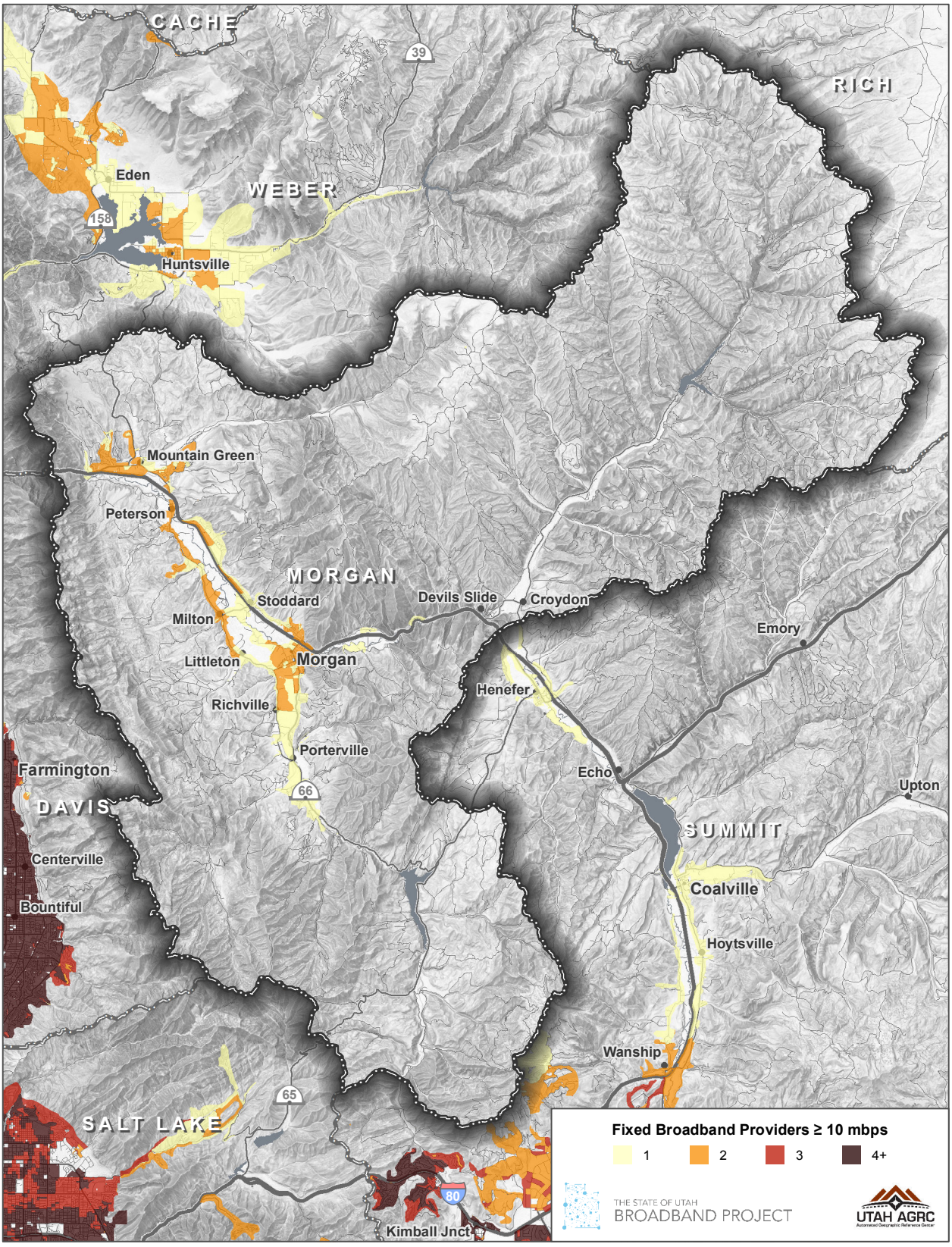
Source: Utah Automated Geographic Reference Center (AGRC). Information current as of February 7, 2014.

Map B-3: Morgan County Number of Fixed Broadband Providers ≥ 3 mbps



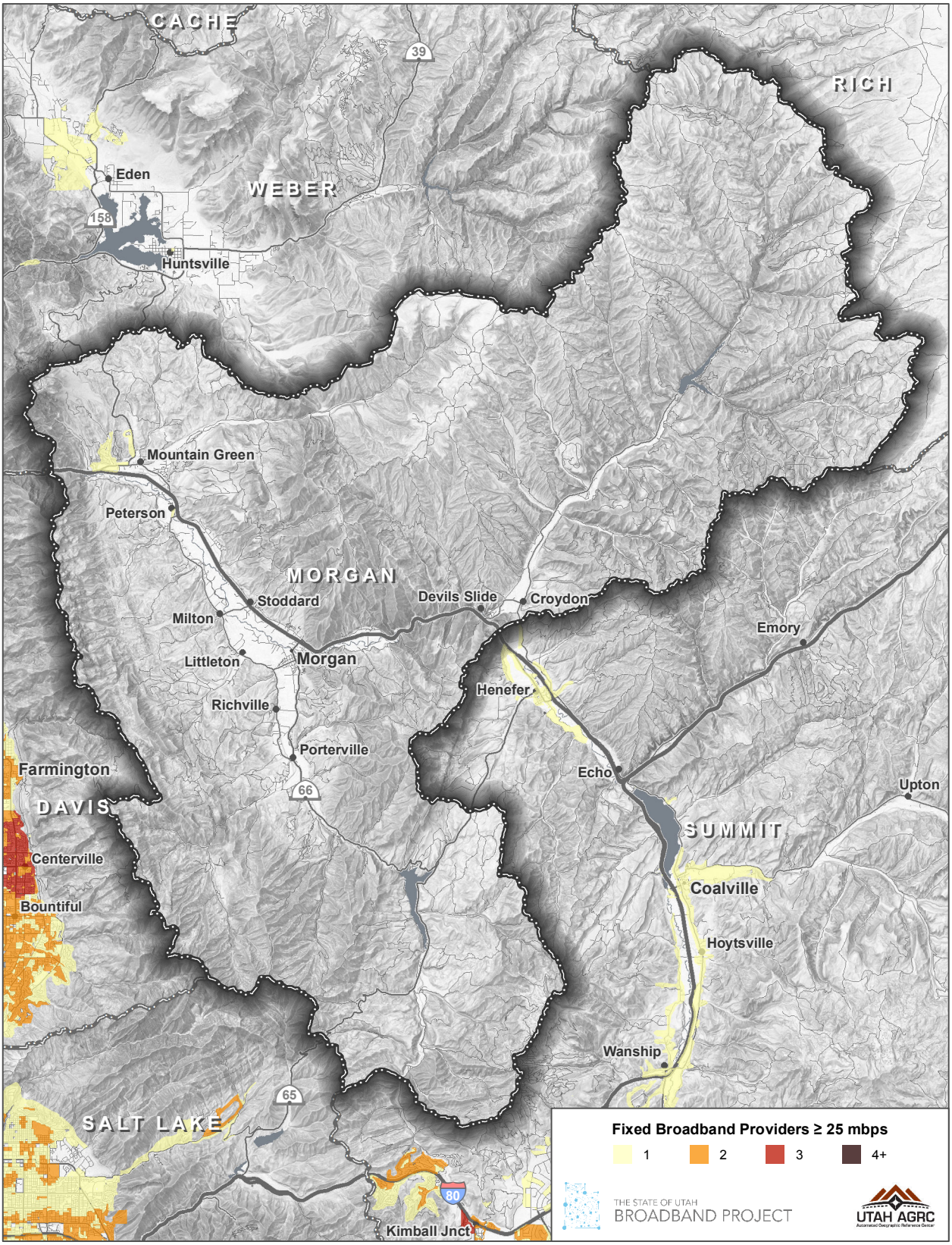
Source: Utah Automated Geographic Reference Center (AGRC). Information current as of February 7, 2014.

Map B-4: Morgan County Number of Fixed Broadband Providers ≥ 10 mbps



Source: Utah Automated Geographic Reference Center (AGRC). Information current as of February 7, 2014.

Map B-5: Morgan County Number of Fixed Broadband Providers ≥ 25 mbps



Source: Utah Automated Geographic Reference Center (AGRC). Information current as of February 7, 2014.

Appendix C: Salt Lake County Maps

Map C-1: Salt Lake County Population Density. This map illustrates residential population densities for the county, and highlights urban, rural and unpopulated areas.

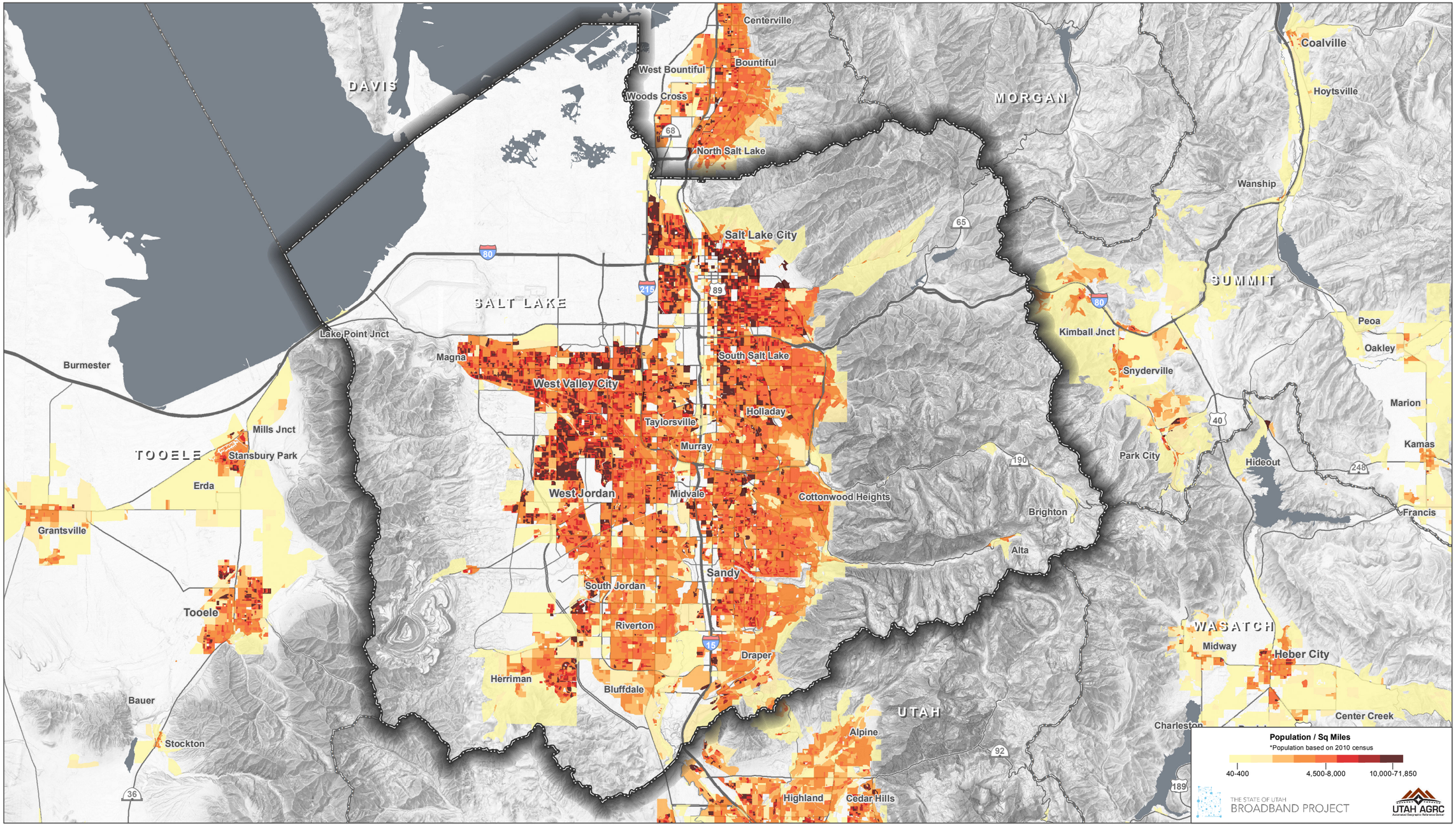
Map C-2: Salt Lake County Major Infrastructure. This map illustrates major infrastructure for the county, including natural gas pipelines, major electrical transmission lines, and major highways.

Map C-3: Salt Lake County Number of Fixed Broadband Providers ≥ 3 mbps. This map illustrates the number of residential fixed broadband providers offering service at 3 mbps and greater download speeds.

Map C-4: Salt Lake County Number of Fixed Broadband Providers ≥ 10 mbps. This map illustrates the number of residential fixed broadband providers offering service at 10 mbps and greater download speeds.

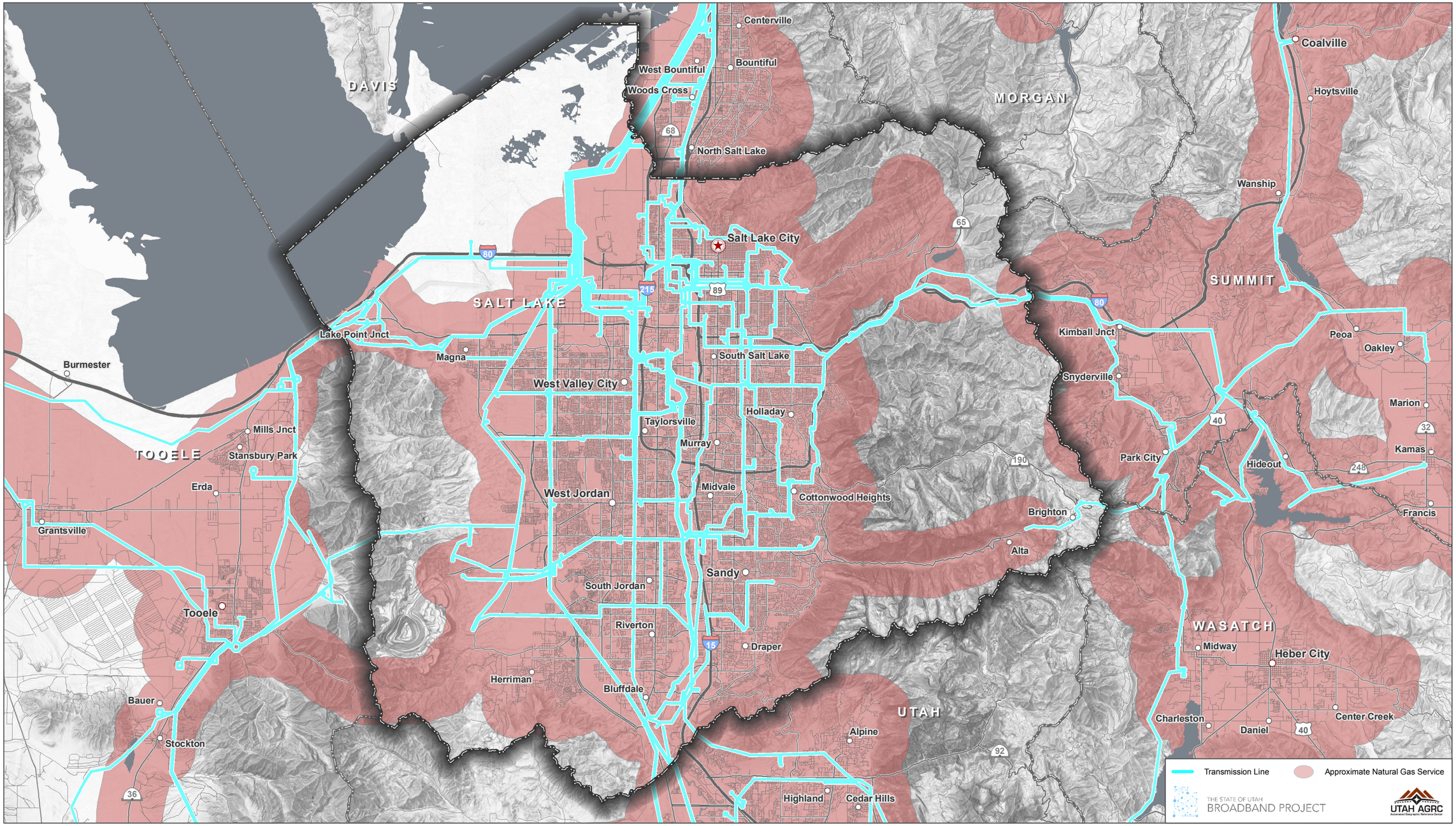
Map C-5: Salt Lake County Number of Fixed Broadband Providers ≥ 25 mbps. This map illustrates the number of residential fixed broadband providers offering service at 25 mbps and greater download speeds.

Map C-1: Salt Lake County Population Density



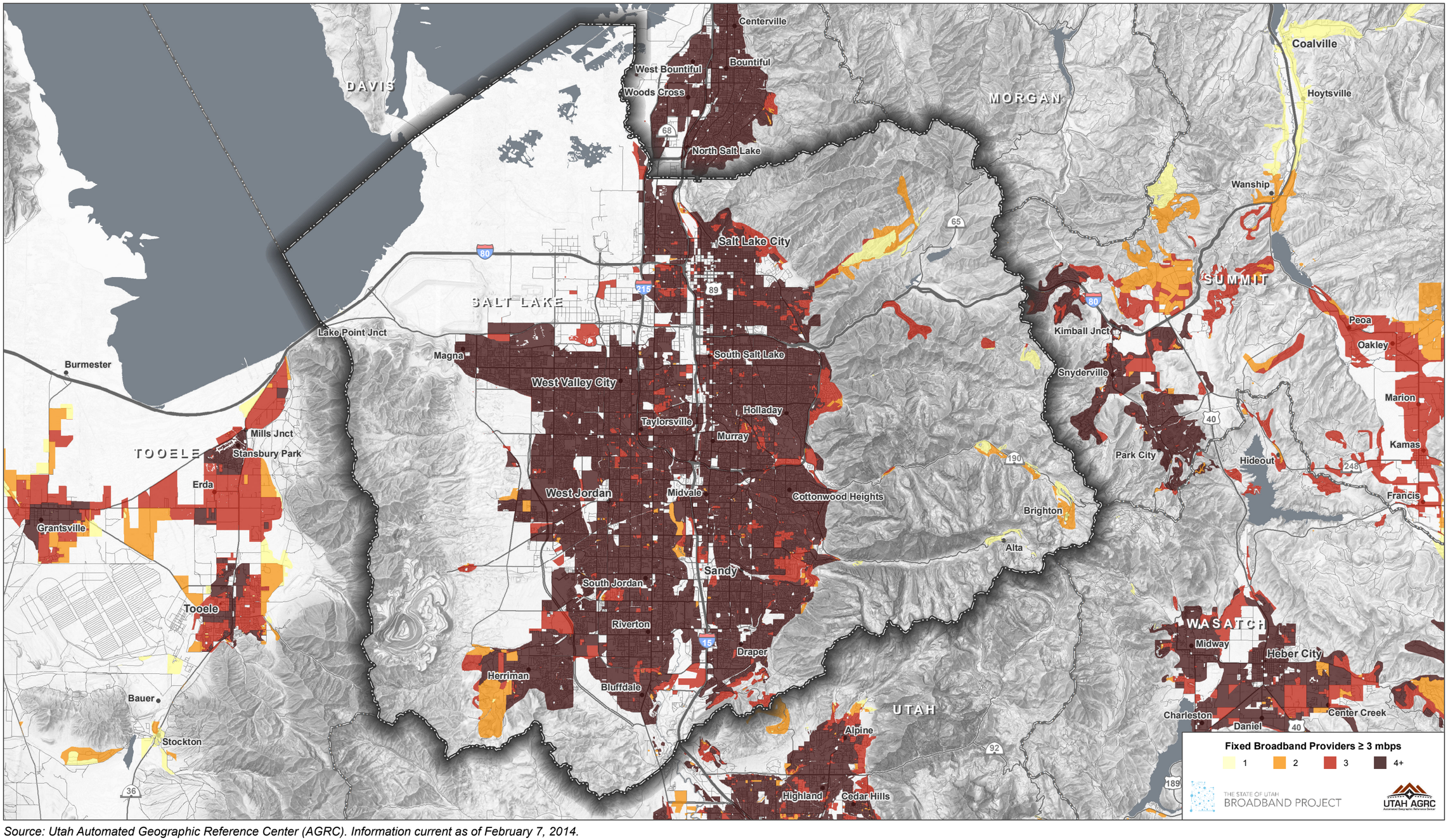
Source: Utah Automated Geographic Reference Center (AGRC). Information current as of February 7, 2014.

Map C-2: Salt Lake County Major Infrastructure



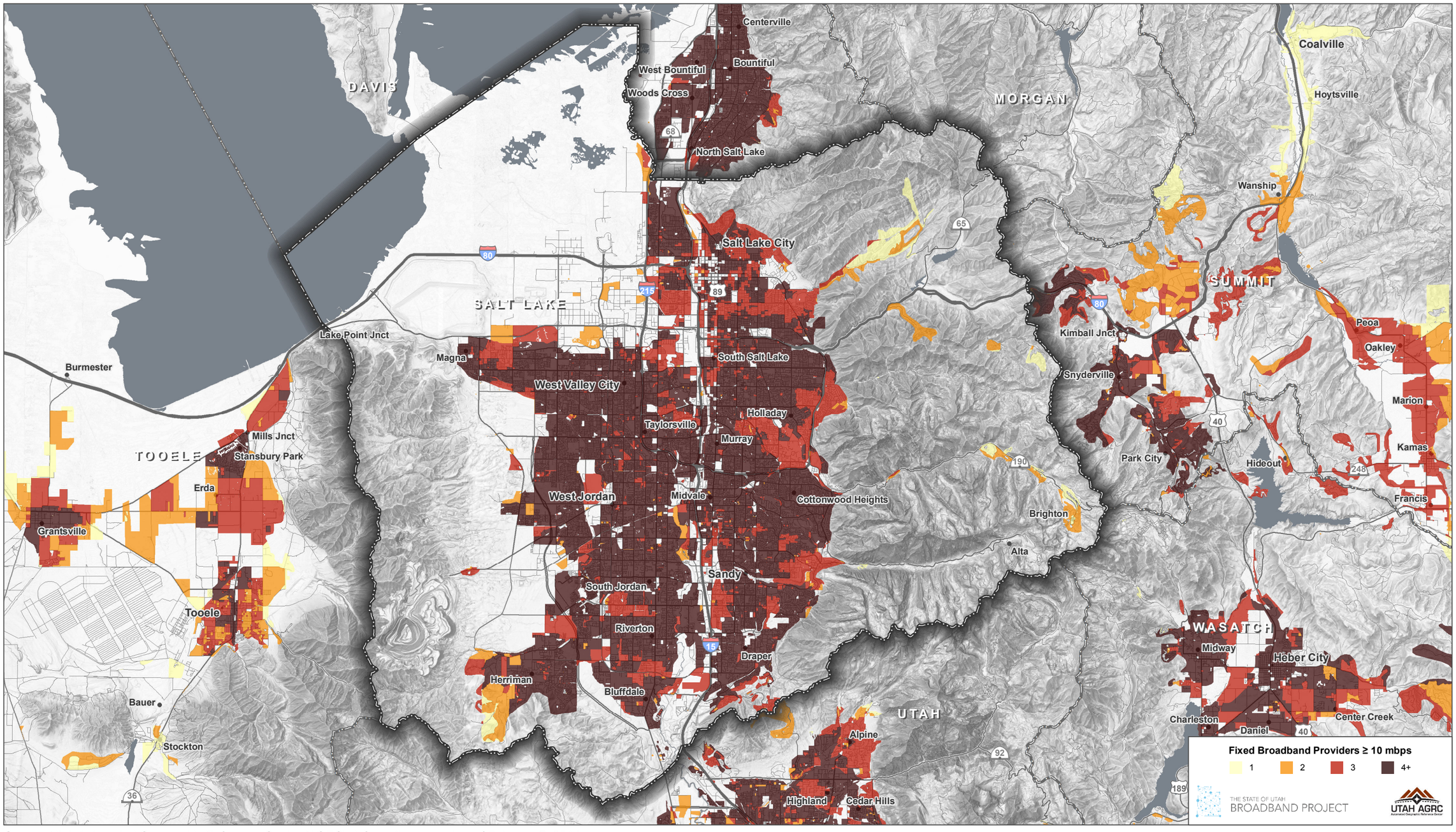
Source: Utah Automated Geographic Reference Center (AGRC). Information current as of February 7, 2014.

Map C-3: Salt Lake County Number of Fixed Broadband Providers ≥ 3 mbps



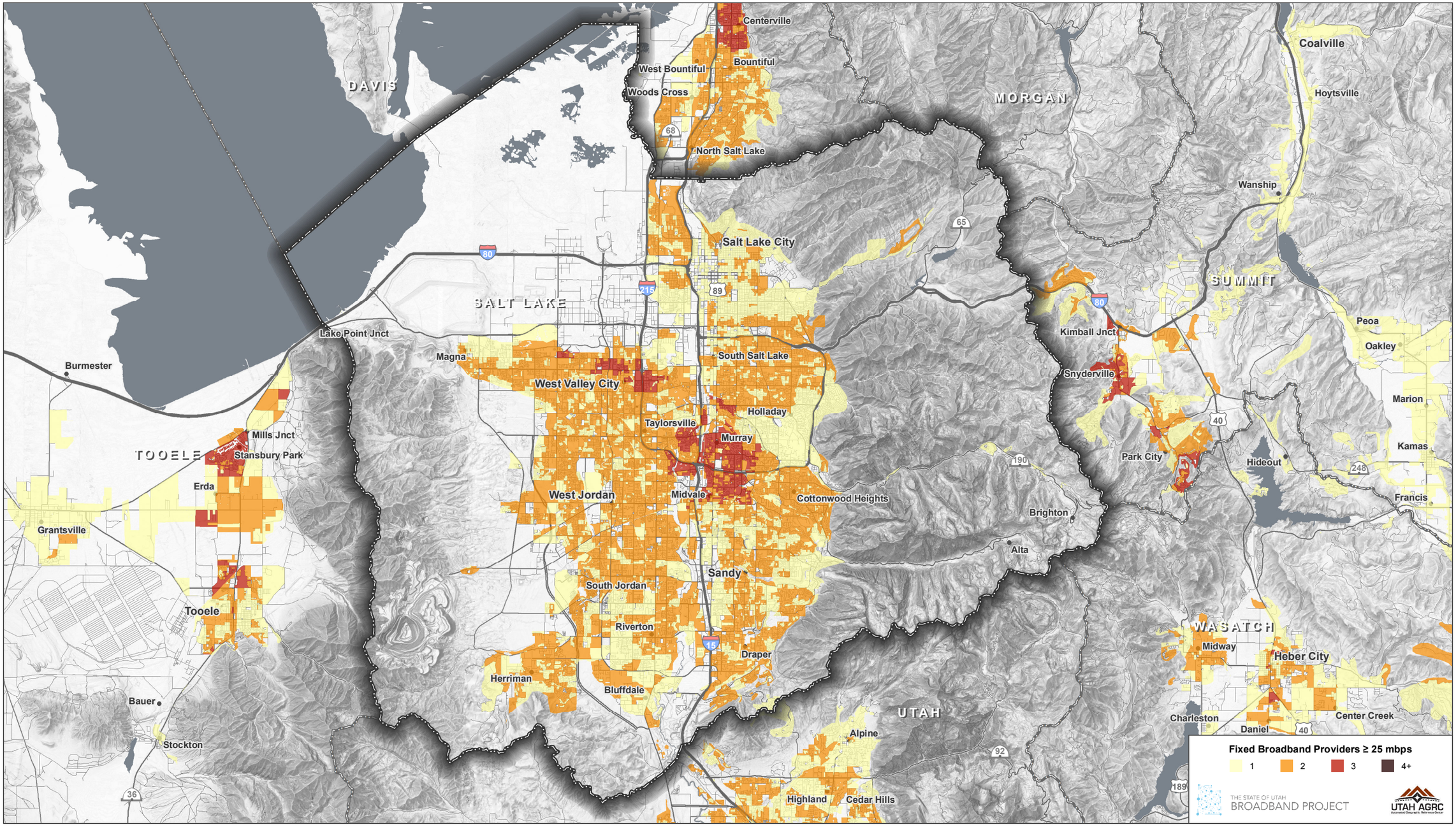
Source: Utah Automated Geographic Reference Center (AGRC). Information current as of February 7, 2014.

Map C-4: Salt Lake County Number of Fixed Broadband Providers ≥ 10 mbps



Source: Utah Automated Geographic Reference Center (AGRC). Information current as of February 7, 2014.

Map C-5: Salt Lake County Number of Fixed Broadband Providers ≥ 25 mbps



Source: Utah Automated Geographic Reference Center (AGRC). Information current as of February 7, 2014.

Appendix D: Tooele County Maps

Map D-1: Tooele County Population Density. This map illustrates residential population densities for the county, and highlights urban, rural and unpopulated areas.

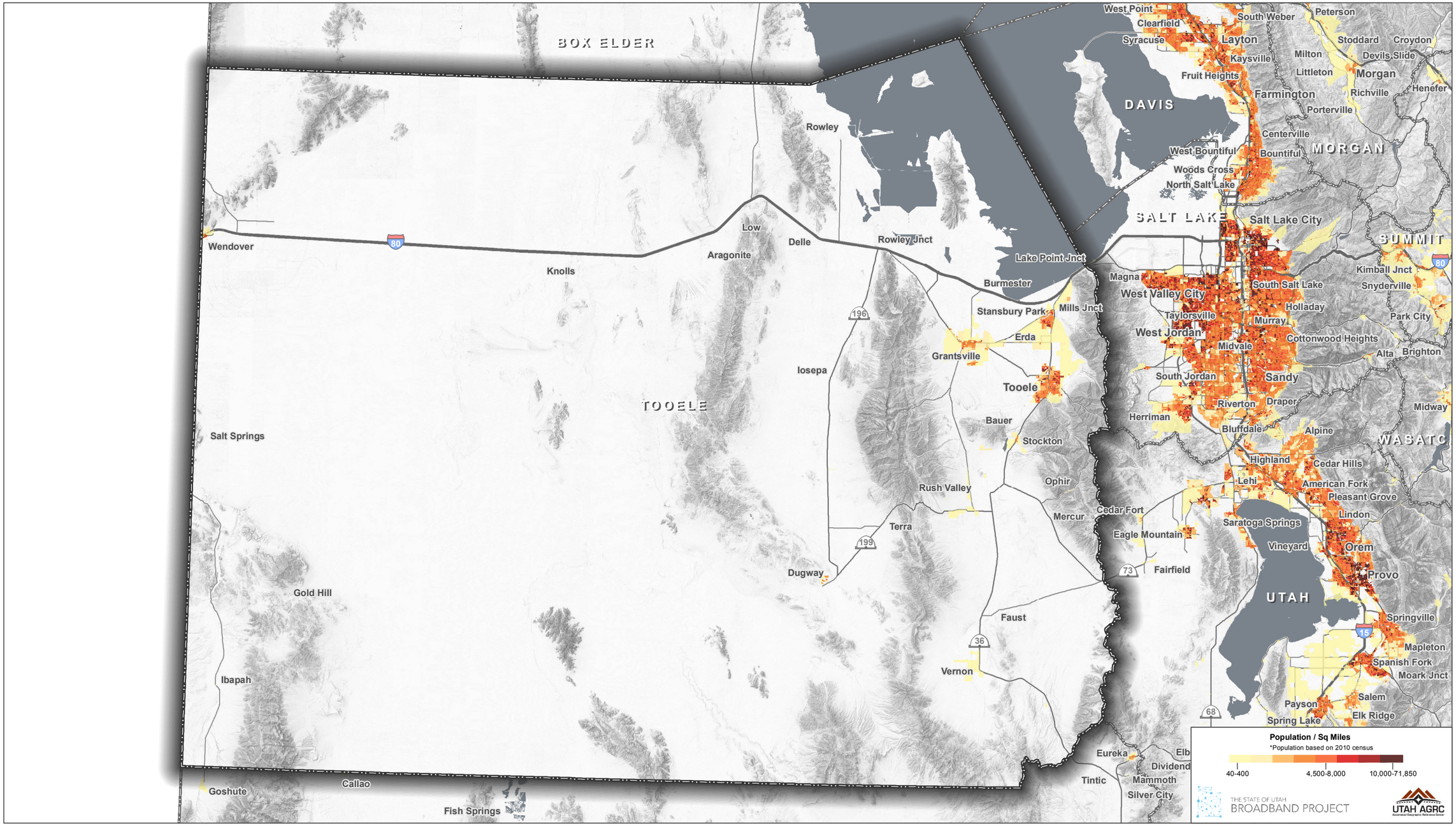
Map D-2: Tooele County Major Infrastructure. This map illustrates major infrastructure for the county, including natural gas pipelines, major electrical transmission lines, and major highways.

Map D-3: Tooele County Number of Fixed Broadband Providers ≥ 3 mbps. This map illustrates the number of residential fixed broadband providers offering service at 3 mbps and greater download speeds.

Map D-4: Tooele County Number of Fixed Broadband Providers ≥ 10 mbps. This map illustrates the number of residential fixed broadband providers offering service at 10 mbps and greater download speeds.

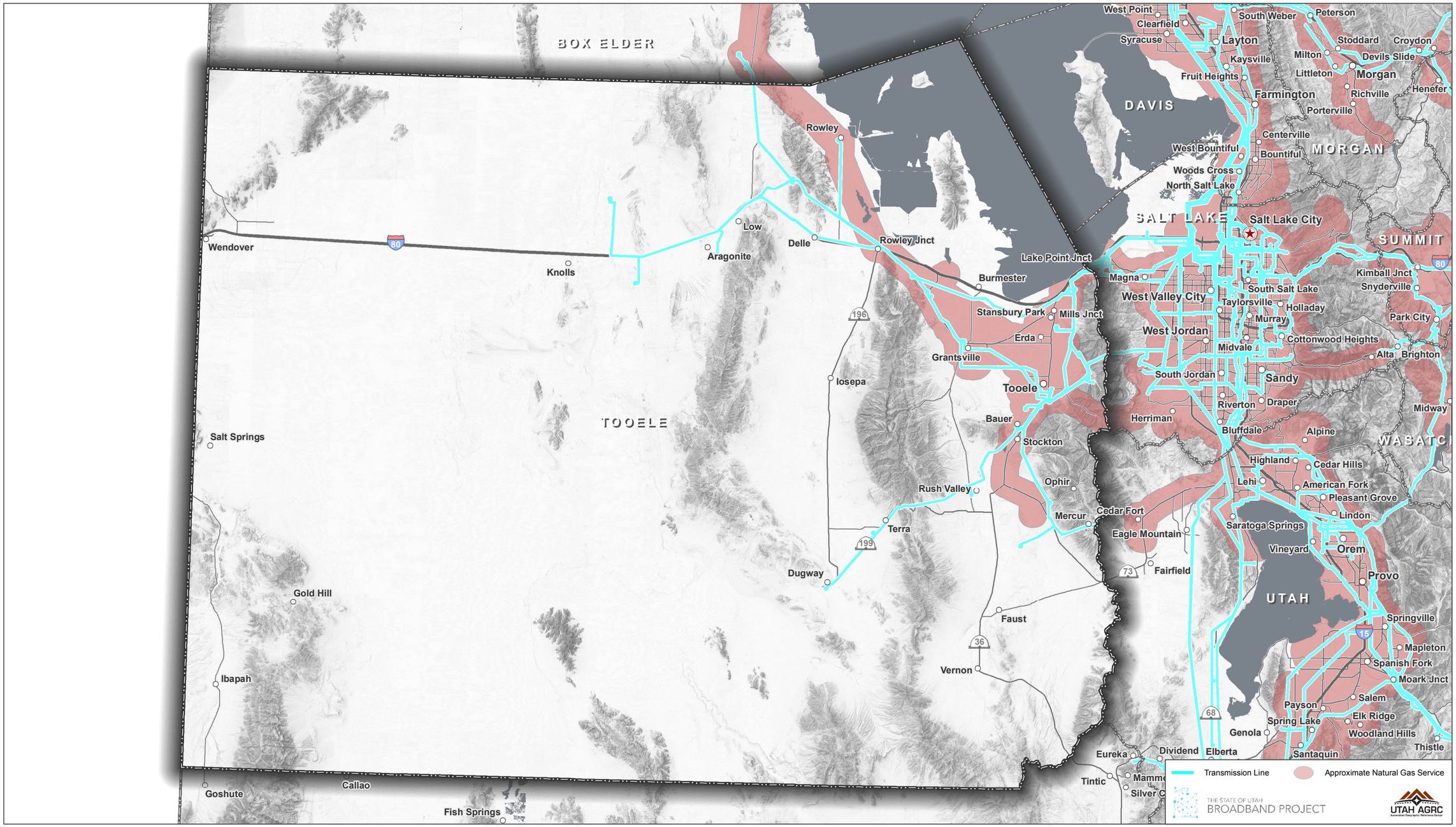
Map D-5: Tooele County Number of Fixed Broadband Providers ≥ 25 mbps. This map illustrates the number of residential fixed broadband providers offering service at 25 mbps and greater download speeds.

Map D-1: Tooele County Population Density



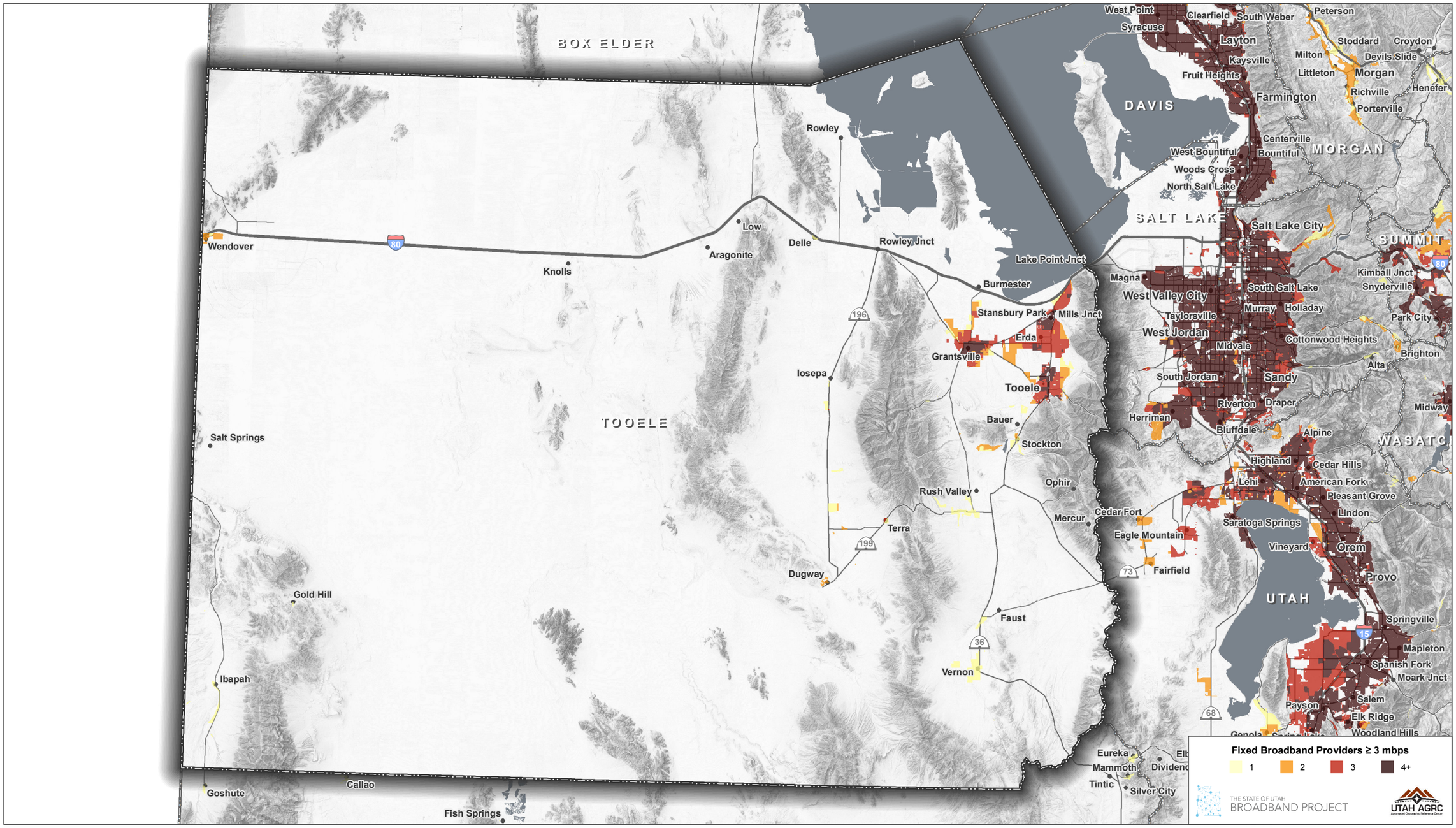
Source: Utah Automated Geographic Reference Center (AGRC). Information current as of February 7, 2014.

Map D-2: Tooele County Major Infrastructure



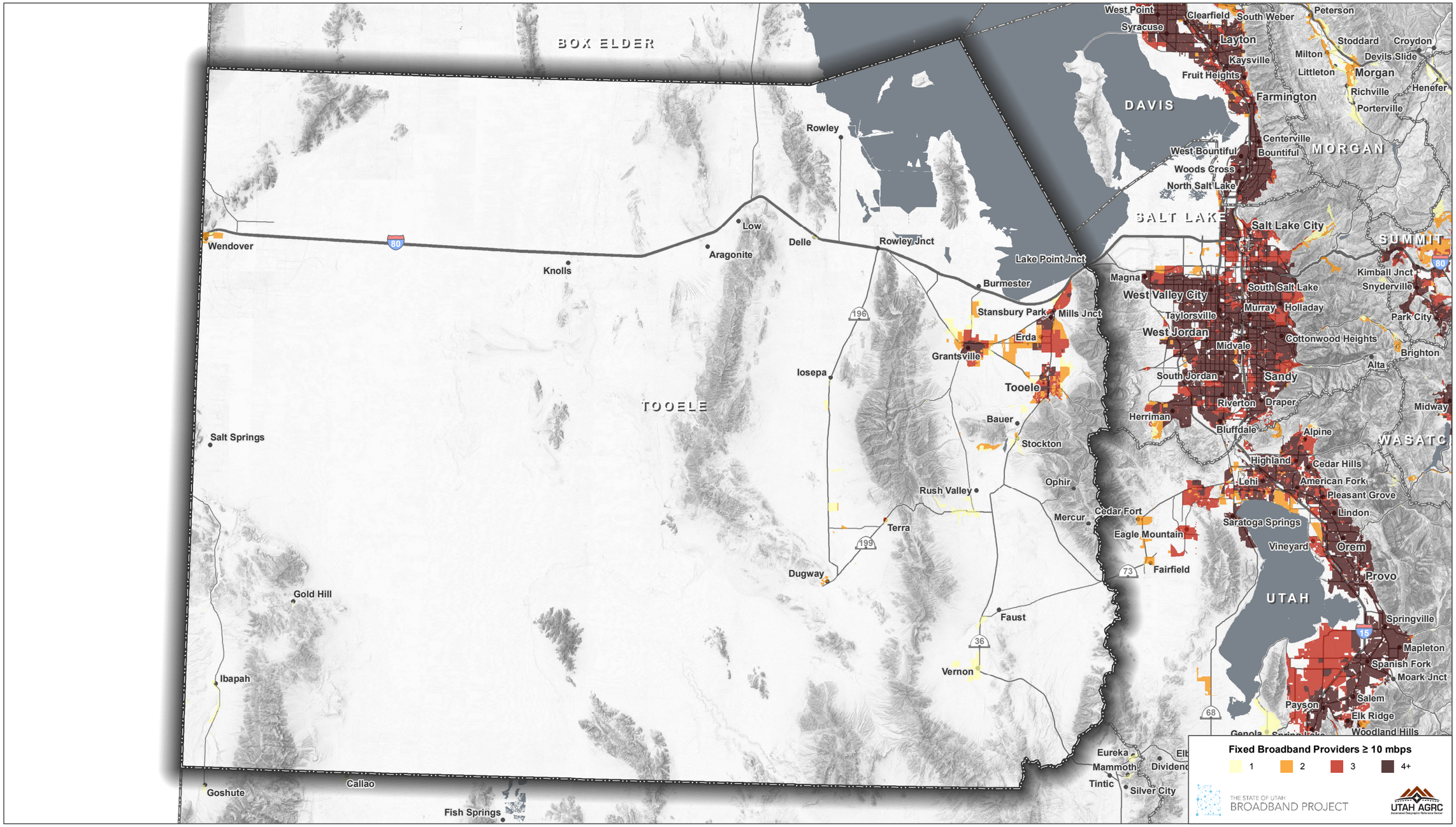
Source: Utah Automated Geographic Reference Center (AGRC). Information current as of February 7, 2014.

Map D-3: Tooele County Number of Fixed Broadband Providers ≥ 3 mbps



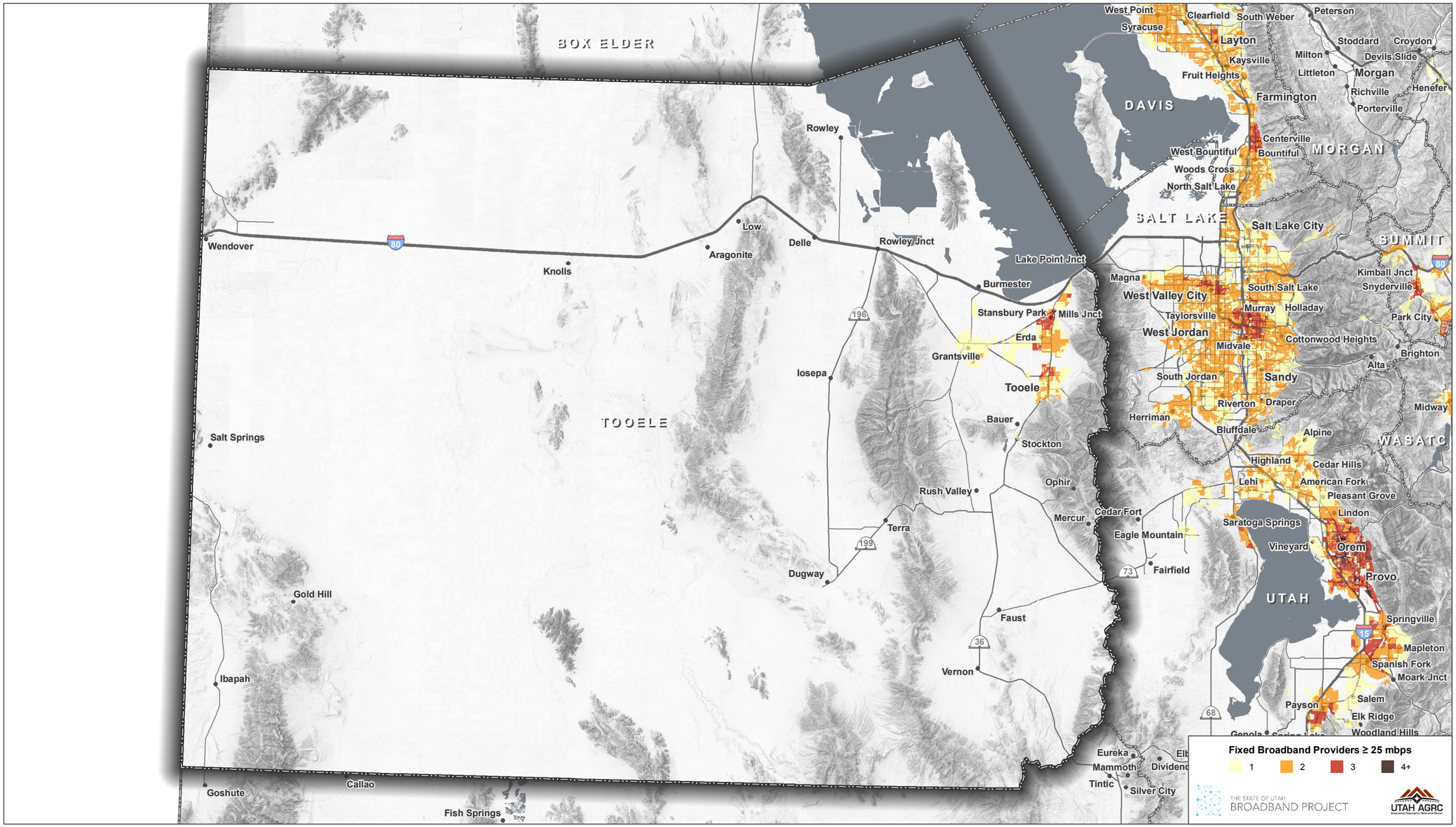
Source: Utah Automated Geographic Reference Center (AGRC). Information current as of February 7, 2014.

Map D-4: Tooele County Number of Fixed Broadband Providers ≥ 10 mbps



Source: Utah Automated Geographic Reference Center (AGRC). Information current as of February 7, 2014.

Map D-5: Tooele County Number of Fixed Broadband Providers ≥ 25 mbps



Source: Utah Automated Geographic Reference Center (AGRC). Information current as of February 7, 2014.

Appendix E: Weber County Maps

Map E-1: Weber County Population Density. This map illustrates residential population densities for the county, and highlights urban, rural and unpopulated areas.

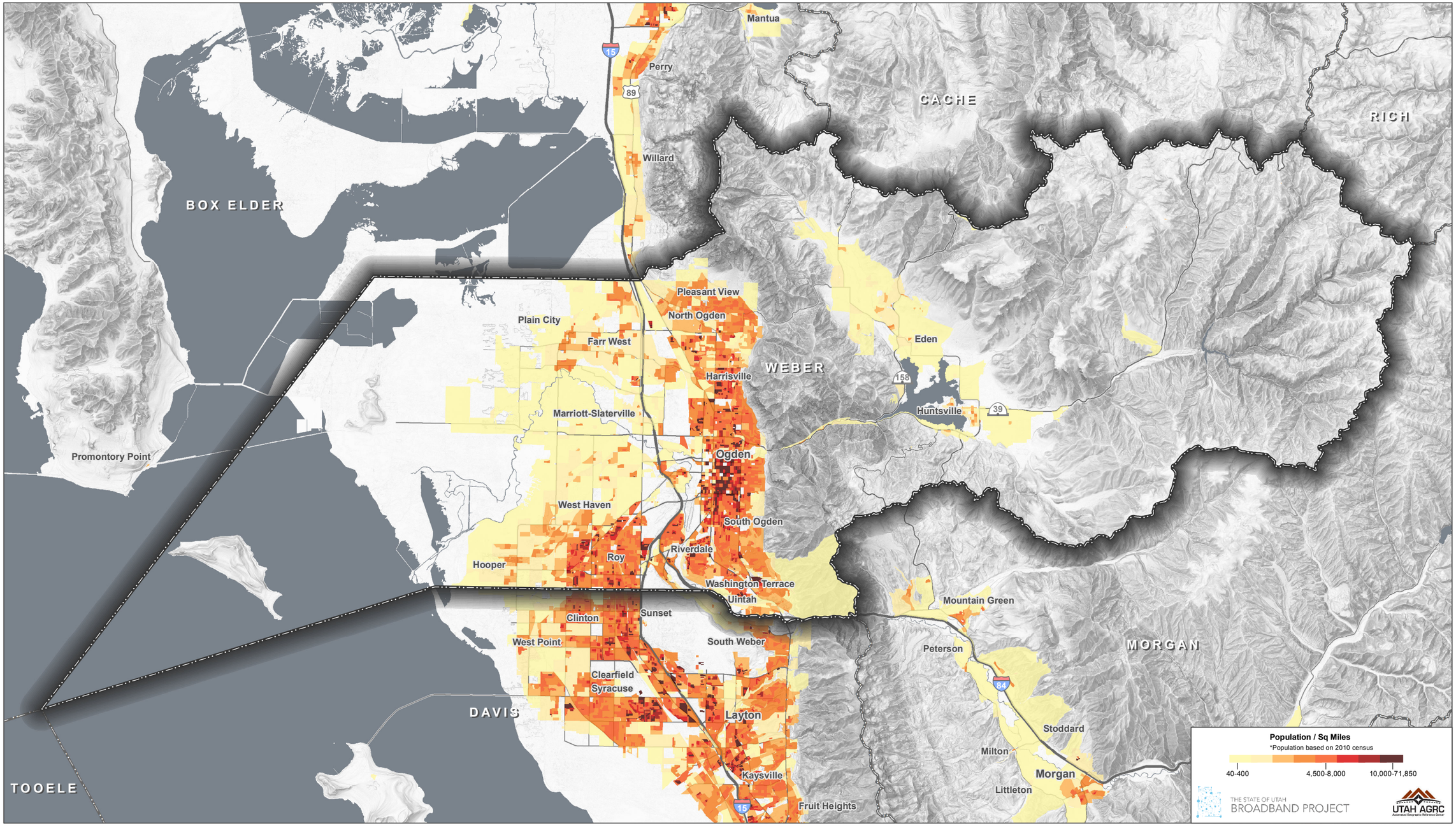
Map E-2: Weber County Major Infrastructure. This map illustrates major infrastructure for the county, including natural gas pipelines, major electrical transmission lines, and major highways.

Map E-3: Weber County Number of Fixed Broadband Providers ≥ 3 mbps. This map illustrates the number of residential fixed broadband providers offering service at 3 mbps and greater download speeds.

Map E-4: Weber County Number of Fixed Broadband Providers ≥ 10 mbps. This map illustrates the number of residential fixed broadband providers offering service at 10 mbps and greater download speeds.

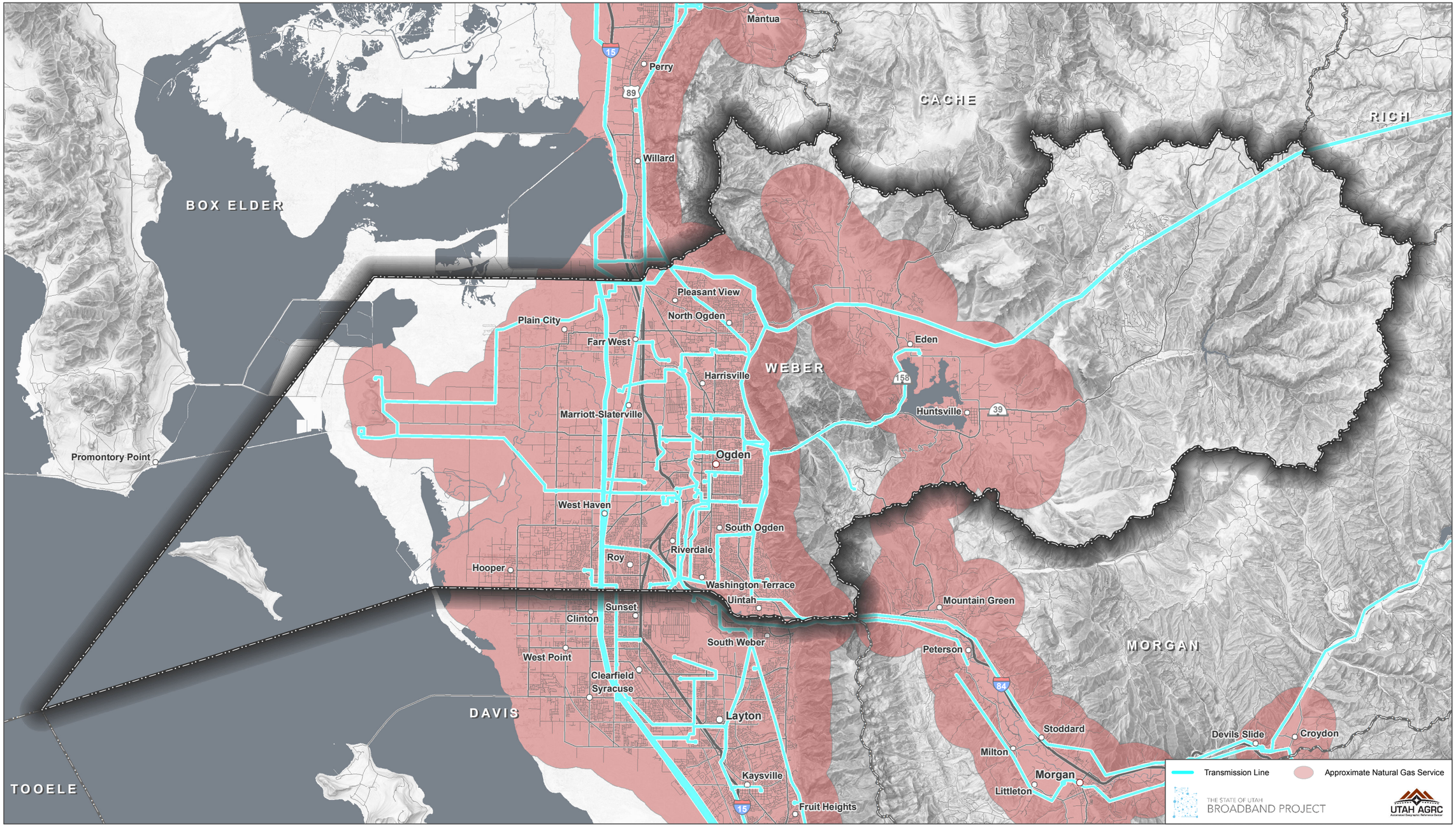
Map E-5: Weber County Number of Fixed Broadband Providers ≥ 25 mbps. This map illustrates the number of residential fixed broadband providers offering service at 25 mbps and greater download speeds.

Map E-1: Weber County Population Density



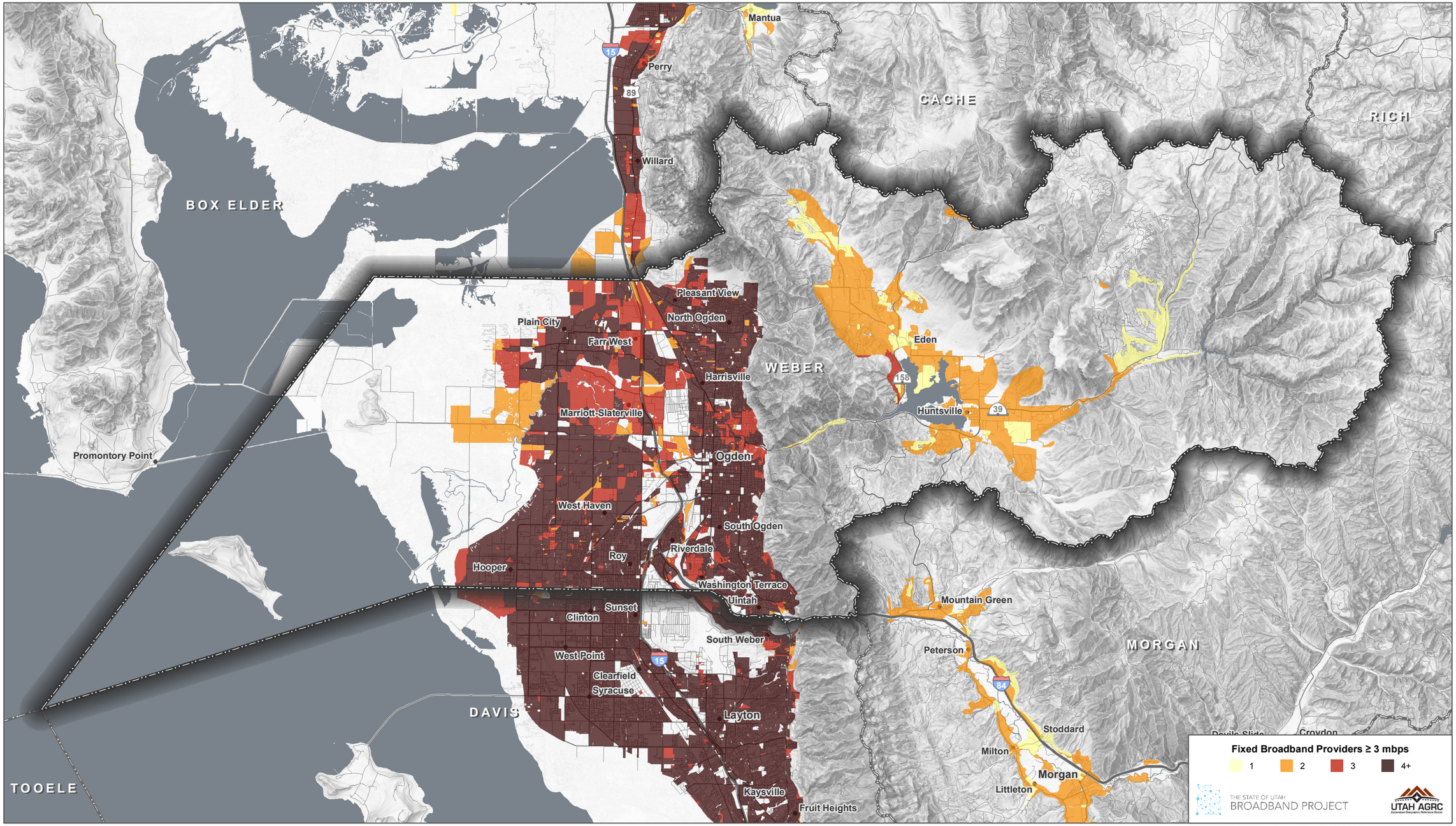
Source: Utah Automated Geographic Reference Center (AGRC). Information current as of February 7, 2014.

Map E-2: Weber County Major Infrastructure



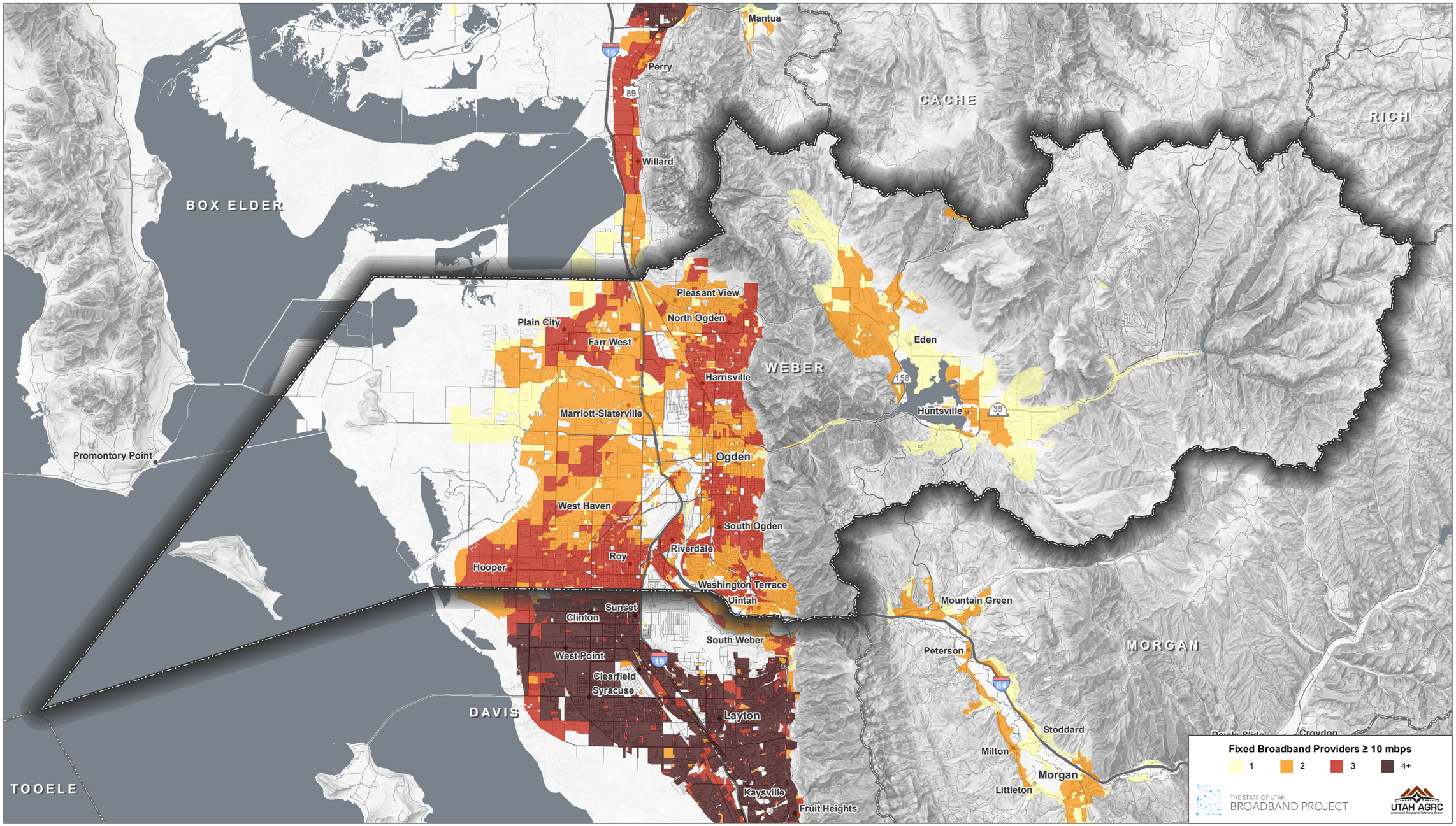
Source: Utah Automated Geographic Reference Center (AGRC). Information current as of February 7, 2014.

Map E-3: Weber County Number of Fixed Broadband Providers ≥ 3 mbps



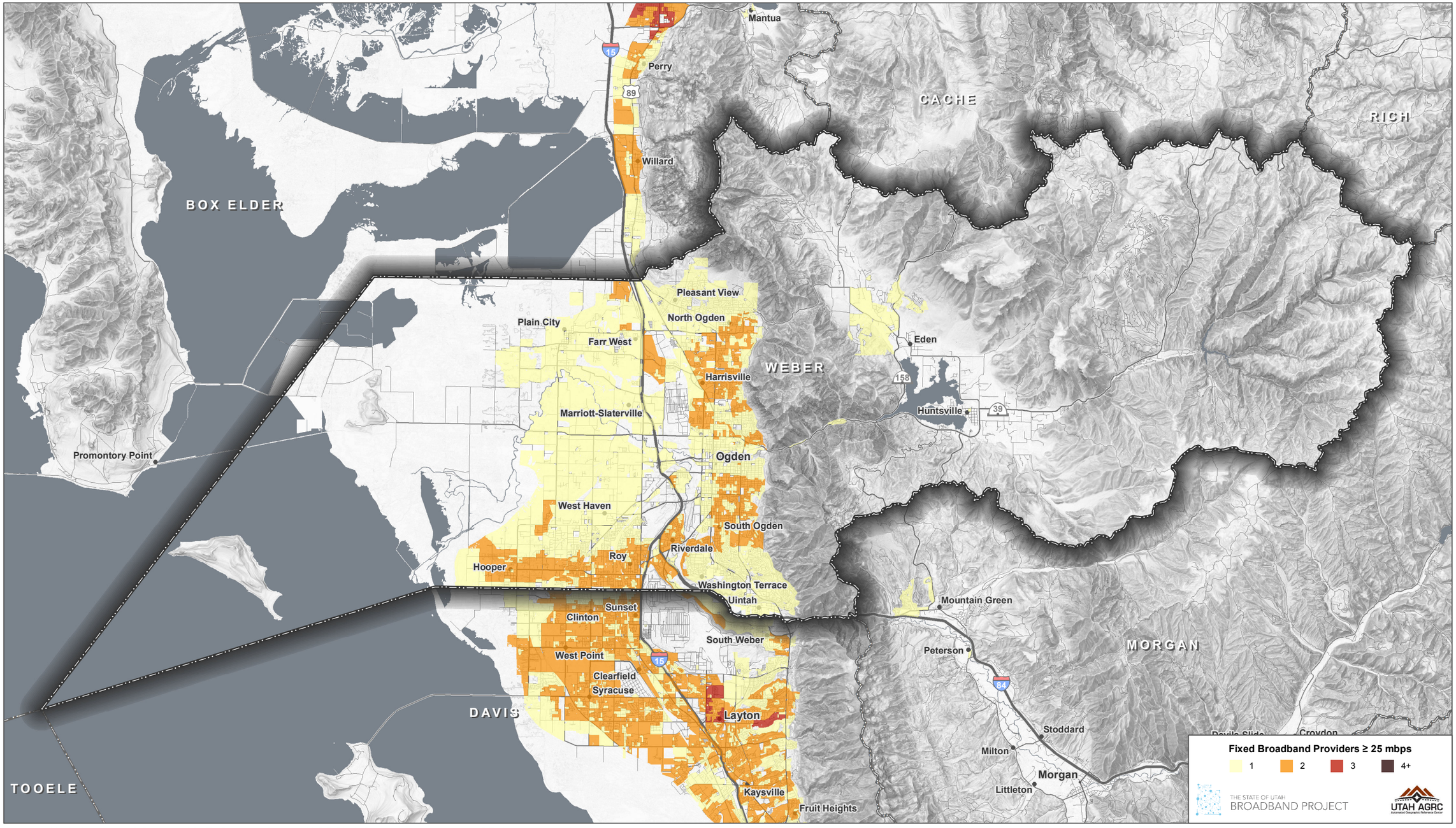
Source: Utah Automated Geographic Reference Center (AGRC). Information current as of February 7, 2014.

Map E-4: Weber County Number of Fixed Broadband Providers ≥ 10 mbps



Source: Utah Automated Geographic Reference Center (AGRC). Information current as of February 7, 2014.

Map E-5: Weber County Number of Fixed Broadband Providers ≥ 25 mbps



Source: Utah Automated Geographic Reference Center (AGRC). Information current as of February 7, 2014.

Appendix F: Regional Industry Sector Survey

Industry Sector Survey | Wasatch Front Regional Broadband Project

Wasatch Front Regional Council

The Broadband Project will result in the creation of a Broadband Planning Council and a Broadband Plan for the five-county Wasatch Front Regional Council region that includes Davis, Morgan, Salt Lake, Tooele, and Weber Counties. Similar efforts are underway throughout the State. The Project seeks to improve Broadband use and access.

This survey will only take a few minutes to complete. If you prefer, you may complete this survey online using the following link: http://www.surveymonkey.com/s/2WQJQ8Z.

Thank you for your participation.

Question	Answer
1 Please provide your name, title, organization name, and email address.	Name _____ Title _____ Organization _____ Email Address _____
2 How do you use the broadband/internet within your organization?	
3 During the last year, how did broadband/ internet help you succeed?	
4 During the last year, what was the most frequent broadband/internet issue you had?	
5 During the last year, what was the biggest broadband/internet issue you had that caused problems in completing a project or making a connection?	

Question	Answer
6 What are your current key needs for broadband/internet service and how do you see that changing in the future?	
7 What is the most important broadband/ internet related issue for your business and your clients?	
8 Is there anything else you would like to share?	

For more information on Regional Broadband Plan, please visit http://www.wfrc.org.
For more information on the Utah Broadband Project, please visit http://broadband.utah.gov.

Please return your completed survey by Monday, September 16, 2013 to:

Soren Simonsen, Consultant
Community Studio

Mail: PO Box 526082
Salt Lake City, UT 84152-6082

Email: soren@communitystudio.us

Fax: 801-483-1254 (no cover sheet necessary)

Appendix G: Best Practice Resources

Fiber to the Home Council

The mission of Fiber to the Home Council (FTTH) is to promote greater fiber availability. The web site is full of information, and includes a best practice approach for a comprehensive plan that addresses how to increase broadband in a community.

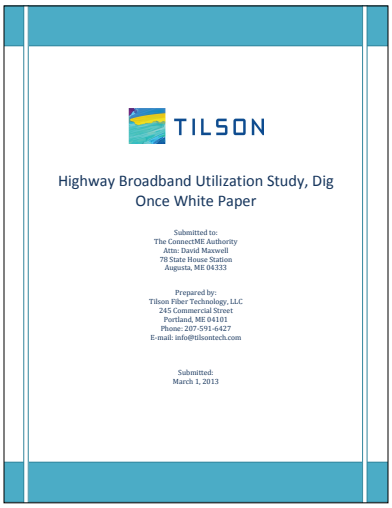
Visit http://www.ftthcouncil.org for more information.

Download “Becoming a Fiber-Friendly Community” at http://www.ftthcouncil.org/d/do/1215.

State of Maine, Highway Broadband Utilization Study, Dig Once White Paper.

This site includes information regarding a State Highways Dig Once program. This could be an important resource for the Utah Department of Transportation, as well as county and municipal road departments.

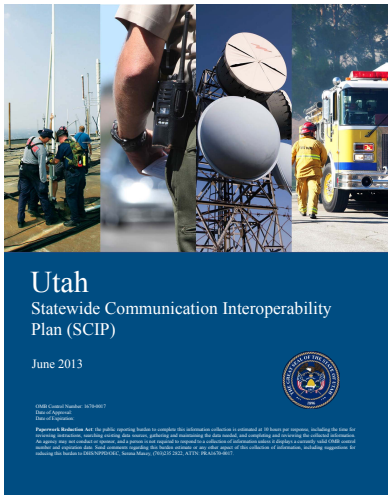
Download a copy of the white paper at http://www.maine.gov/connectme/digonce/docs/Highway%20Broadband%20Utilization%20Study.pdf.



Homeland Security

The U.S. Department of Homeland Security provides resources and plans for interoperability of broadband services during emergencies, including a public safety network. Visit http://www.dhs.gov/statewide-communication-interoperability-plans for more information on this program.

Utah recently completed a Statewide Communication Interoperability Plan. Download a copy of the plan at http://siec.utah.gov/scip/documents/UT_RevisedSCIP_20130624_Draftv2.pdf.



Emergency Preparedness

Complex issues emerge when Broadband systems go down or are overloaded during an emergency. Firstnet is a national emergency communications network, with which Utah participates.

Visit http://broadband.utah.gov/tag/firstnet/ for more information.

Communities in Utah with “Dig Once” Policies

Few communities are making consistent, coordinated efforts to expand broadband infrastructure in their jurisdiction. Some exceptions include:

St. George. St. George addresses "cable/tv" in one of their checklists and they have incorporated a coordination/notification system for trenching.

For more information visit http://www.sgcity.org/, or contact Wes Jenkins by email wes.jenkins@sgcity.org.

Layton City. Layton City is coordinating the installation of conduit with new road construction, signal installation and re-construction projects. The Engineering Division indicates reports that broadband providers—including Century Link, Comcast, and UTOPIA—operate under a similar framework as the other utilities such as Questar and Rocky Mountain Power in the construction phase of new development. Broadband providers receive final subdivision plans and are invited to pre-construction meetings to coordinate fiber install in new subdivisions.

The city also coordinates the extension of fiber optic services to new large-scale commercial, mutli-family, and industrial developments.

For more information visit http://www.laytoncity.org/, or contact Peter Matson by email pmatson@laytoncity.org.

Appendix H: Utah Broadband Nonadopters

Wasatch Front Regional Council Infographic

The following infographic was prepared to illustrate some of the key reasons for nonadoption of broadband for households in the Wasatch Front Region.

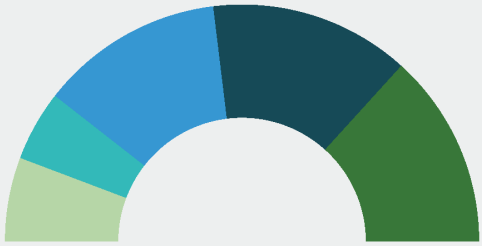
UTAH BROADBAND NONADOPTERS

THE STATE OF UTAH
BROADBAND PROJECT
BROADBAND.UTAH.GOV

WASATCH FRONT REGIONAL COUNCIL

The Wasatch Front Regional Council, which includes Weber, Morgan, Davis, Tooele and Salt Lake Counties, is the most highly populated area of the state, with an estimated population of 1,635,054.

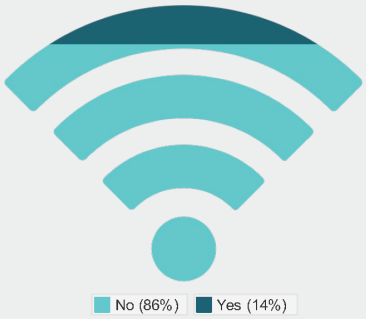
NONADOPTERS OF BROADBAND IN THE WASATCH FRONT REGION ACCESS THE INTERNET INFREQUENTLY



Several Times Each Day (12%) | Once a Day (10%)
3-5 Days a Week (25%) | 1-2 Days a Week (0%)
Every Few Weeks (27%) | Do Not Access (27%)

Among the region's nonadopters, gender, marital status, race and education statistics mirror the state average. The region's nonadopters were slightly younger than the state average, with an average age of 50.7 years. Respondents in the region also had lower total household incomes.

DO YOU KNOW HOW MANY ISP'S ARE IN YOUR AREA?

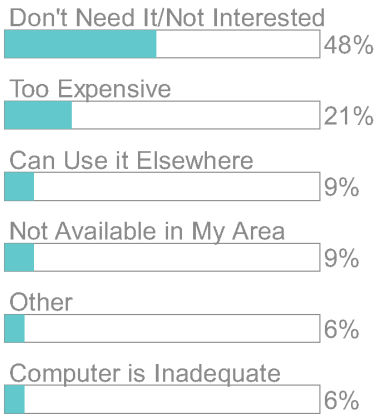


No (86%) | Yes (14%)

All counties, except for Morgan, have coverage for at least 88 percent of households at download speeds of 25 Mbps or higher. Morgan has coverage for only 11.95 percent at those speeds. Despite the region's higher than average household income, 37.3 percent of respondents did not have computer equipment in the home.

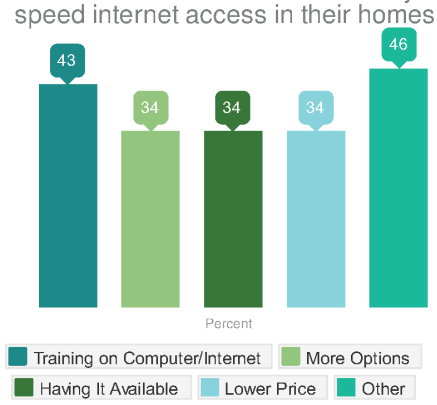
LACK OF INTEREST OR NEED

The key reason for nonadoption of broadband in the Wasatch Front region is a lack of interest or need. Almost half of respondents said they did not need high-speed Internet or were not interested in getting access in their homes.



KNOWLEDGE AND EXPERTISE

Respondents were asked to rate their computer skills on a scale of zero to 10, with 10 being very highly skilled. In the Wasatch Front region, 23.1 percent of respondents ranked their computer skills at a zero. Almost half of respondents said training on the computer/Internet would make them more likely to adopt high-speed internet access in their homes.



What would make you more likely to have high-speed Internet access in your home?

Appendix I: Utah Broadband Nonadopters

Regional Report: Wasatch Front Regional Council

The following report explains the findings of a survey of residents in the Wasatch Front Region, exploring the reasons for nonadoption of household broadband.

Ryan M. Yonk Ph.D
Institute of Policy Analysis
Department of Policitcal Science

Randy T Simmons Ph.D
Institute of Political Economy
Department of Economics and Finance

UTAH BROADBAND NONADOPTERS

REGIONAL REPORT: WASATCH FRONT REGIONAL COUNCIL

NONADOPTERS OF BROADBAND:

WASATCH FRONT REGIONAL COUNCIL

THE STATE OF UTAH
BROADBAND PROJECT
BROADBAND.UTAH.GOV

Regional Report
June 2014

Principal Investigators:

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Institute of Policy Analysis
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Strata Policy

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Strata Policy

WASATCH FRONT REGIONAL COUNCIL

UNDERSTANDING NONADOPTION

Beginning with the passage of the Telecommunications Act of 1996, which directed the Federal Communications Commission (FCC) and state commissions to promote the universal deployment of both basic and advanced telecommunications capability, national policy has evolved to where universal Internet availability has become a stated national goal. Subsequent acts and directives from successive presidents have more specifically directed several agencies to encourage expanded broadband deployment and to increase their efforts aimed at promoting broadband adoption. For example, in 2004, a directive was issued from then President Bush for universal affordable broadband technology by 2007. These efforts have intensified under the current administration as programs funded under both the Universal Service Fund (USF) programs and the American Recovery and Reinvestment Act have contributed to increased infrastructure and promotion. [1]

Universal access to and use of broadband speed Internet is seen as a critical economic development factor, and one of the primary drivers of improved and enhanced employment and learning opportunities, medical services and a wider scope of entertainment and recreation.

The Pew Research Center's Internet and American Life Project has tracked the expansion of Internet use in the United States across time, space and among traditionally lower use groups. Despite this work, relatively little has been done to thoroughly examine those who continue to choose not to adopt despite widespread availability and ongoing reductions in relative cost.

In this study we explore only those who report not having broadband speed Internet, which we found is better described as high-speed Internet, available in their home. These 'nonadopters' represent the remaining part of the broadband gap that had been explored in our earlier work and in a plethora of previous literature on broadband adoption. This survey, in fact, was a direct result of our earlier work which along

with the U.S. Census's work, failed to find a substantial rural urban broadband gap in Utah.

The purpose of this exploration is to better understand the nonadopter, who they are, their reason(s) for nonadoption, what skills and experience in using the Internet they have, and what would influence them to become an adopter of high-speed Internet. The answers to these questions will provide the information policymakers and broadband providers need to consider as they grapple with the issue of if and how nonadopters can become adopters.

What Influences Broadband Nonadoption

Literature exploring Internet adoption rates has generally advanced four theories for why individuals do not have in-home high-speed Internet service. These four theories present substantially different public policy prescriptions for correcting the problem. For policymakers, determining which of the competing theories (or which combination of them) best explains consumer behavior has substantial real-world policy impacts. The survey questions and the analysis of respondent's answers builds from these theories.

Questions of Price

The first and most common explanation of nonadoption is that of price sensitivity on the part of consumers. The literature on this subject asserts that due to relatively high, though falling, prices for these services, many consumers are simply unable to afford in-home high-speed Internet.

The usual policy prescriptions suggested by advocates of this theory are relatively straightforward and begin with the ex ante expectation that a reduction in price is necessary. A possible but controversial policy alternative that follows from this assumption would consider subsidizing either (or both) the development costs for deployment and the end user's cost.

Questions of Availability

The second, and formerly the most common theory that spurred our earlier work on this subject is that of availability. This theory suggests that nonadoption is a result

of lack of deployment and availability and that most nonadopters will be clustered where deployment has not yet or will not occur because of questions of scale and profitability. For example, in one estimate Jon Peha of Carnegie Mellon University finds that "roughly one-third of households in rural America cannot subscribe to broadband Internet services at any price."[2]

Again possible policy prescriptions from this theory are relatively straightforward, incentivizing and subsidizing deployment. One policy approach that is commonly advocated by proponents of this theory mimics the goals if not the approach of the rural telecommunications and electrification policy that brought these services to rural areas through subsidies and incentives paid for through surcharges on existing service.

Questions of Knowledge and Expertise

Unlike the first two theories of nonadoption, some have advanced the idea that the primary problem facing nonadopters is a lack of knowledge and skill on the part of the nonadopter in using and experiencing high-speed Internet and computing in general. Proponents of this approach point to lower levels of adoption among senior citizens and the increase in adoption after training or experience as evidence of its efficacy.

Here the policy prescriptions are more complex and are focused on education, outreach and individual assistance to push forward adoption by those who lack the skills. These programs are costly both in terms of fiscal and human resources. Those who advocate them have often suggested that partnerships between the public sector and non-profits could provide these nonadopters with skill training and assistance and look to the programs deployed at senior centers as prototypes for how these programs might be designed.

Questions of Demand and Preference

The fourth theory of nonadoption suggests that rather than structural impediments to adoption, like price, availability or knowledge and expertise issues, there are those whose consumer preferences simply align away from a desire to adopt. In fact the Pew Research Center, which has conducted numerous surveys about adoption, found that in the United States, 15 percent of American adults do not use the Internet.

They found that a third of those non-users (34 percent) "think the Internet is just not relevant to them," and expressed a lack of interest or need in getting online. Of Internet non-users, 92 percent are not interested in starting to use the Internet or email in the future.[3]

Further, both a study from the Government Accounting Office completed in 2010 and one by Gregg LaRose[4] suggest lower income, less educated and elderly individuals are much less likely to want broadband access. These studies suggest that the gap in adoption of service is not an issue of supply; it's an issue of demand.

Here the policy implications are both clear and disheartening to the policymaker wishing to increase adoption. If individuals have no interest in a product it is nearly impossible to create demand absent some coercive requirement to purchase.

Expanding access to information, education, medical reference and employment is in the interest of public welfare. While these are compelling reasons for providing universal access to broadband Internet in the U.S., understanding why nonadopters don't adopt is of critical importance. If price is simply too high or service is simply not available, clear though controversial policy alternatives exist. If individuals lack knowledge or expertise training programs can be provided, but if there simply is no demand, these high-cost programs and subsidies will do little to sway nonadopters. Even in these cases if the driving purpose of broadband deployment to a given group is enhancement of educational goals or increased access to medical information, broadband community anchor institutions such as public schools, libraries or medical centers could be provided more cost effectively than community-wide deployment.

In the following analysis, we provide the results of the survey described earlier and explore which of the theories we find evidence for from our interviews with nonadopters across the state.

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NONADOPTERS OF BROADBAND IN THE WASATCH FRONT REGIONAL COUNCIL

The Wasatch Front region, which includes Weber, Morgan, Davis, Tooele and Salt Lake Counties, is the most highly populated area of the state, with an estimated population of 1,635,054.

Nonadopters of broadband in the Wasatch Front region access the Internet infrequently.

About how often do you access the Internet?

Several Times	11.5%
Once a Day	9.6%
3-5 Days a Week	25.0%
1-2 Days a Week	0.0%
Every Few Weeks	27.3%
Do not access	26.5%

Nonadopters have a higher income and are older than the state average.

Among the region's nonadopters, gender, marital status, race and education statistics mirror the state average. The region's nonadopters were slightly older than the state average, with an average age of 57.5 years and had slightly higher total household income ($56,268 compared to the state average of $51,347).

Key Findings: Reasons for Nonadoption

1. Lack of Interest or Need

The key reason for nonadoption of broadband in the region is a lack of interest or need. In the Wasatch Front region, almost half of respondents said they did not need high-speed Internet or were not interested in getting access in their homes.

What is the main reason you do not have high-speed Internet access at home?

Don't Need it/Not Interested	48.1%
Too Expensive	21.2%
Computer is Inadequate	9.2%
Other	9.2%
Not Available in My Area	6.2%
Can Use it Elsewhere	6.2%

2. Knowledge and Expertise

Respondents were asked to rate their computer skills on a scale of zero to 10, with zero being no computer skills and 10 being very highly skilled. In the Wasatch Front region, 23.1 percent of respondents ranked their computer skills at a zero. Almost half of respondents said training on the computer/Internet would make them more likely to adopt high-speed Internet access in their homes.

What would make you more likely to have high-speed Internet access in your home?

Training on the Computer/ Internet	49.2%
More Options	41.9%
Other	34.6%
Having it Available	33.5%
Lower Price	28.8%

3. High Cost

About one-fifth of respondents in the Wasatch Front region said the high cost of broadband is the main reason for nonadoption. Almost 29 percent of respondents in the Wasatch Front region said that if high-speed Internet were to cost less, they would be more likely to get access in their homes.

4. Lack of Availability and Knowledge

All counties, except for Morgan, have coverage for at least 88 percent of households at download speeds of 25 Mbps or higher. Morgan has coverage for only 11.95 percent

at those speeds. Despite the region's higher than average household income, 37.3 percent of respondents did not have computer equipment in the home.

Do you know how many providers of high-speed Internet service are in your area?

No	85.8%
Yes	14.2%

Conclusion: The key reason for nonadoption in the Wasatch Front region is that nonadopters express a lack of interest or need for having in-home access to high-speed Internet.

WASATCH FRONT REGIONAL COUNCIL

The Wasatch Front region, which includes, Weber, Morgan, Davis, Tooele and Salt Lake Counties is the most highly populated area of the state, with an estimated population of 1,635,054.[5] The bulk of the population of this region is concentrated along the Western foothills of the Wasatch Mountain Range and concentrated along the I-15 corridor from Ogden to southern Salt Lake County. This region shares a largely urban and suburban character and a dominant position in the population of the state. Areas of Morgan and Tooele counties demonstrate a decidedly more suburban and somewhat rural character but are increasingly tied directly to the economic, social and cultural realities of nearby urbanized areas.

Demographic Picture

The respondents' demographic information in the Wasatch Front region generally did not vary widely from the state average. In this region, slightly more respondents were female (52.7 percent) than the state average (47.6 percent). Respondents in the Wasatch Front region were also older than the state average, with a mean age of 57.5 years compared to the state mean age of 56.2 years. Both the region and the state as a whole saw a wide distribution of age for respondents. Despite the older average age of respondents in the Wasatch Front region, the area had a lower percentage of respondents with household members between 46 and 60 years old. Throughout the Wasatch Front region, the percentage of respondents who were married was 46.9 percent, similar to the state average of 48 percent.

Total household income for respondents in the Wasatch Front region was higher than the state average. In the region, mean total household income was $56,268 compared to the state's mean of $51,347. Although average income is higher in the Wasatch Front region, the standard deviation for this region's income is also higher, meaning that respondents' income is more varied here than in the state as a whole.

Employment status among respondents mirrors the state average. The two largest groups of nonadopters by employment status are those who are retired and those who are employed full-time. 45 percent of respondents were retired, similar to the state average of 42.8 percent. The second biggest category of non-respondents was full-time employed, with 30.4 percent of respondents in the Wasatch Front region,

the same as the state average of 30.4 percent. This employment information supports our earlier explanation that most nonadopters are older, since older people typically make up those who are retired.

Race statistics show a majority of respondents are white, both in the Wasatch Front region and in the state overall. Education statistics are also similar between the region and the state, with the largest categories of nonadopters being those who completed high school or obtained a GED and those who completed some college. In the Wasatch Front region, 31.1 percent of respondents completed high school or a GED, compared to 28 percent of the state overall. The smallest education category for nonadopters both in the region and the state was some high school, with five percent of the region's respondents and 4.2 percent of the state's overall respondents.

Low Internet Access Rates Among Nonadopters

Respondents were asked how often they access the Internet, and 26.5 percent of respondents in the Wasatch Front region said they never access the Internet. Just over 27 percent said they access the Internet once every few weeks and about 25 percent said they access it about three to five days a week. Those numbers correspond with the state's overall breakdown of Internet access frequency. Similarly, most respondents do not pay for a data plan on their cell phone. Clearly, the frequency of Internet access among nonadopters is low, although it is not clear whether that is due to lack of interest or desire to access the Internet, limited computer skills, the high cost of Internet access or limited access to technology. All of these are likely playing a role, although probably not with equal influence. We examine the role each of these reasons below.

Reasons for Nonadoption: Lack of Interest or Need

The key reason found for nonadoption at both the state level and in the Wasatch Front region was a lack of interest or need. Although other factors are also contributing to nonadoption, this was found to be the strongest influence. In the Wasatch Front region, almost half of respondents said they did not need high-speed Internet or

were not interested in getting it. That number was similar, although slightly lower, for the state as a whole, at 44 percent.

Respondents were also asked if they are interested in obtaining a faster connection, and lack of interest was expressed once again. In the Wasatch Front region, 67.7 percent of respondents were not interested in having a faster high-speed connection now or in the future. At the state level, that number was slightly lower but still over 60 percent. This means well over half of respondents both at the regional and state level are not interested in obtaining high-speed Internet.

Finally, respondents were asked about what would make them more likely to have high-speed Internet access in their homes. Almost half of respondents in the area said that training on the computer or Internet would make them more likely to get high-speed Internet access.

This suggests that the lack of interest in high-speed Internet may be related to the low level of computer and Internet skills among nonadopters. When asked what would make them more likely to adopt high-speed Internet, about 42 percent said having more options for providers, 33.5 percent said availability, and 28.8 percent said a lower price.

With these results, little can be done to increase adoption rates for broadband if lack of interest is the root of the problem. Interestingly, despite the low level of interest, nonadopters in the region said they would see benefits from access to high-speed home Internet service in terms of work productivity (46.5 percent), their children's education (55.4 percent), their own education (28.5 percent), staying connected to family/friends (4.6 percent) and shopping (34.2 percent). These benefits, however, have not translated into interest in obtaining access to high-speed Internet. Because increasing demand is difficult, we turn to other reasons for nonadoption that policymakers may be able to more effectively address.

Reasons for Nonadoption: Knowledge and Expertise

When respondents were asked about their computer use and expertise, results found evidence that a lack of expertise about computers in general, and the Internet

specifically, is likely playing a key role in nonadoption both in the Wasatch Front region and in the state.

Respondents were asked to rate their computer skills on a scale of zero to 10, with zero being no computer skills and 10 being very highly skilled. In the Wasatch Front region, 23.1 percent of respondents ranked their computer skills at zero. Over 64 percent of respondents ranked their computer skills at a five or lower. Likewise, most respondents have not participated in a class, seminar or other programs to improve their computer or Internet skills. This means well over half of respondents in the region are not highly skilled at using a computer. These lack of skills are probably contributing to nonadoption of high-speed Internet in the Wasatch Front region.

When respondents in the Wasatch Front region were asked what would make them more likely to have high-speed Internet access in their homes, nearly 50 percent answered training on computer and Internet use. Providing training and educational programs geared toward increasing computer literacy and Internet skills may be one of the most effective ways to increase adoption rates for broadband.

Reasons for Nonadoption: Price

Another key reason cited for nonadoption at both the state and regional level is that high-speed Internet services are too expensive. About one-fifth of respondents in the Wasatch Front region and at the state level said that the high cost of broadband is the main reason for nonadoption.

Respondents were asked how much high-speed Internet costs, and their responses were widely distributed: 19.8 percent of respondents in the Wasatch Front region and 14.23 percent of those at the state level answered over $90 per month. On the other end of the spectrum, 15.7 percent of respondents in the region said that high-speed Internet costs $25 or less per month. A 2011 study by Ryan Yonk and Randy Simmons, at Southern Utah University and Utah State University respectively, found that broadband customers statewide were actually paying, on average, between $42 and $43 per month for high-speed Internet service.[6]

When asked what a reasonable monthly price would be, almost half of respondents at the state level said high-speed Internet should cost less than $25 per month. In the

Wasatch Front region only 37.2 percent believed high-speed Internet should cost less than $25 per month and 28.2 percent answered that $26-$30 would be reasonable. This tolerance for slightly higher prices may be explained by the fact that household incomes are higher in the region than the state average. For comparison, in 2011, Yonk and Simmons found that rural respondents in Utah were willing to pay an average of $33.13 per month for high-speed Internet services compared to non-rural respondents who were willing to pay $34.75.[7]

Just over 28 percent of respondents in the Wasatch Front region said that if high-speed Internet were to cost less, they would be more likely to get access in their homes. Reducing the cost of high-speed Internet services may be necessary to increase adoption rates. Although these policies are not recommended, subsidizing either the supply or the demand side of the high-speed Internet market may be one way to achieve this.

Reasons for Nonadoption: Not Available

Another reason found for nonadoption is the technology necessary to access high-speed Internet may not be available. Respondents were asked whether they have computer equipment in their homes. Surprisingly, 37.3 percent of respondents in the Wasatch Front region did not have computer equipment in their home, while 42.7 percent answered that they did, the remaining 10 percent did not respond. This is surprising because over two-thirds of respondents state-wide had a computer in their home. Because the Wasatch Front region is more urban than much of the state and has higher household incomes, we would expect a higher rate of home computers than the state average, but that is not what the data shows. The relatively low rate of computers in homes is likely contributing to nonadoption since computers are the most common type of hardware used to access high-speed Internet.

In examining reasons for nonadoption, respondents seem to suffer from a lack of knowledge. Both the Wasatch Front region and the State of Utah had approximately 60 percent of respondents answer that high-speed Internet is not available in their area. This information is most likely inaccurate, however, because about 85 percent of respondents in both the region and the state did not know how many providers were

available in their area. This means there may be providers of high-speed Internet available that respondents simply don't know about.

Data for broadband coverage shows that coverage in the Wasatch Front region is generally very good. All counties in the region have coverage for 99 percent of households at download speeds of 10 Mbps or higher. All counties except for Morgan have coverage for at least 88 percent of households at download speeds of 25 Mbps or higher. Morgan County has coverage for only 11.95 percent of households at download speeds of 25 Mbps or higher. This analysis did not evaluate specific upload speeds by county, which was done in order to facilitate an enhanced evaluation of download speeds by county. With this information, most respondents in the Wasatch Front region are not aware that high-speed Internet availability is generally good in their area.

As far as availability goes, policymakers could help solve the knowledge problem by educating people about the high-speed Internet options available in their area. As for the lack computers in the home, this is a more difficult policy question to solve because it is not clear if people are not purchasing computers because they cannot afford them, because they don't know how to use them, or because they are simply not interested in using them. Morgan County could consider enacting policies to incentivize increased broadband coverage at higher speeds, to help the county catch up with the rest of the region and the state.

Endnotes

1 In the US, a broadband Internet connection is defined as a connection with capabilities of at least 768 kbps. Other countries have different definitions. Canada uses 1.5 Mbps.

2 Federal Communications Commission WC Docket No. 07-38 via http://www.rupri.org/Forms/RuralBroadbandFinal.pdf

3 Zickuhr, Kathryn. 2013, September 25. Who's Not Online and Why. Pew Research Internet Project. Retrieved from: http://www.pewinternet.org/2013/09/25/whos-not-online-and-why/

4 LaRose, R., Gregg, J. L., Strover, S., Straubhaar, J., & Carpenter, S. (2007). Closing the rural broadband gap: Promoting adoption of the Internet in rural America. Telecommunications Policy

5 According to the US Census.

6 Yonk, Ryan and Simmons, Randy T. Utah Broadband Access. P. 24. Retrieved from: http://broadband.utah.gov/wp-content/uploads/sites/2/2013/05/Utah-Broadband-Access-Submitted-Report-Final.pdf

7 Yonk and Simmons, et al.

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