VOLUME III

COMPREHENSIVE PLAN

Title 31

COMPREHENSIVE PLAN

Chapter 31.04
Comprehensive Plan

§ 31.04.010. Adoption.

The 2020 One Grand Junction Comprehensive Plan, City of Grand Junction, Colorado, in the form of the document attached to the ordinance codified in this chapter, and as recommended for adoption by the Grand Junction Planning Commission, is hereby adopted.

(Ord. No. 5243, 12/18/2024;Ord. No. 5239, 11/20/2024; Ord. No. 5238, 11/6/2024; Ord. No. 5227, 8/9/2024; Ord. No. 5224, 7/17/2024; Ord. No. 5211, 4/3/2024; Ord. No. 5192, 12-6-2023; Ord. 4986, 3-17-21; Ord. 4971, 12-16-20)

Chapter 31.08
Grand Junction Circulation Plan

Article I
General Provisions

§ 31.08.010. Adoption.

The Grand Junction Circulation Plan is adopted as part of the Comprehensive Plan.

(Ord. 4808, 7-18-18)

§ 31.08.020. Vision.

The community envisions a safe, balanced and environmentally sensitive multi-modal, urban transportation system that supports greater social interaction, facilitates the movement of people and goods, and encourages active living, mobility independence, and convenient access to goods and services for all users.

A multi-modal transportation system should accommodate pedestrians, bicyclists, motorists, movers of goods, and transit; and should be safe and navigable for all users. It must provide

transportation options to all users including those with limited mobility such as children, seniors, and persons with disabilities.

(Ord. 4808, 7-18-18)

§ 31.08.030. Purpose.

(a) The Grand Junction Circulation Plan ("Circulation Plan") is a strategic document adopted by both the City of Grand Junction and Mesa County. This document moves forward the transportation principles, strategies and vision to create an urban area-wide multi-modal circulation plan as identified in: the Grand Junction Comprehensive Plan adopted in 2010; the 2010 Circulation Plan; and the 2001 Urban Trails Plan.

(b) It supports the Grand Valley 2040 Regional Transportation Plan's sound planning principles and best practices including:

(1) Reducing congestion;

(2) Easing commutes;

(3) Improving roadway safety;

(4) Enhancing sidewalks, bike, and multi-use trails; and

(5) Maintaining an efficient and effective transportation system.

(c) It builds on the transportation goals found in the Grand Junction Comprehensive Plan, including:

(1) Designing streets and walkways as attractive public spaces;

(2) Constructing streets to include enhanced pedestrian amenities; and

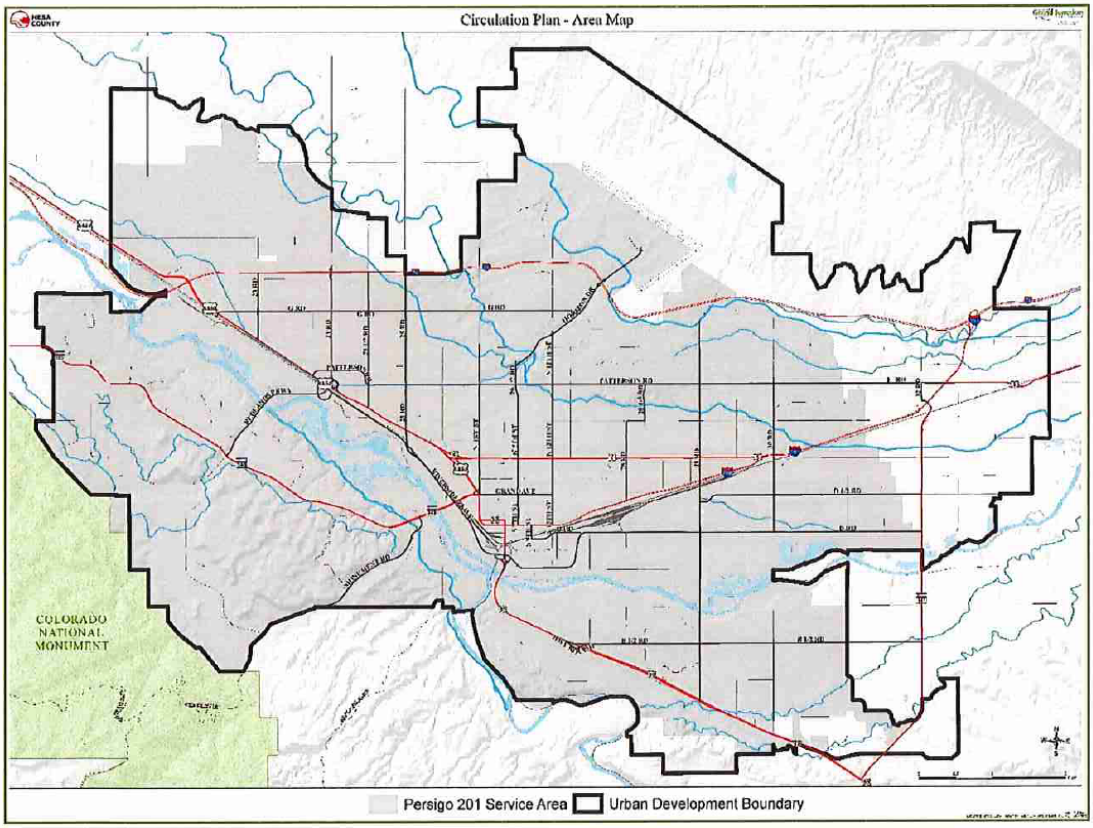
(3) Developing a well-balanced transportation system that supports automobile, local transit, pedestrian, bicycle, and freight movement while protecting environmental conditions of air, water and natural resources.

(d) The Circulation Plan will be used by elected officials and staff to guide the assignment of financial resources for infrastructure construction, future development and dedication of other funds for transportation purposes.

(Ord. 4808, 7-18-18)

§ 31.08.040. Planning area.

This Circulation Plan is applicable to transportation corridors within the Urban Development Boundary as defined by the Grand Junction Comprehensive Plan Future Land Use Map. Minor exceptions occur where a particular corridor falls both within and outside of the Urban Development Boundary and whereby consistency of standards along the length of the corridor would be beneficial to the traveling public.



(Ord. 4808, 7-18-18)

§ 31.08.050. Executive summary.

The Circulation Plan establishes a comprehensive approach to transportation planning through the following four sections (Plan Elements). Conceptual and corridor maps have been created to aid decision makers and City and County staff to improve the transportation systems. See GJMC § 31.08.150, Appendix A – Maps, for full-page maps.

(Ord. 4808, 7-18-18)

§ 31.08.060. Plan elements.

(a) The Network Map identifies important corridors and linkages connecting centers, neighborhoods and community attractions.

(b) The Street Functional Classification Map identifies the functional classification of the roadway corridors that connect neighborhoods, employment centers and local attractions and amenities. Many of these corridors are also major truck routes providing heavy truck movement and access to the Grand Junction community. There are over 50 proposed changes since the map was last adopted by City Council and Mesa County Board of County Commissioners in 2010. These changes include adding road segments, reclassifying some existing road segments and removing others from the map.

(c) The Active Transportation Corridors Map replaces the Urban Trails Master Plan/Map and identifies major corridors important for nonmotorized travel by providing critical, continuous and convenient connections for bicyclists and pedestrians. The corridors are broadly defined and could accommodate active transportation as part of the road network or as separated paths. This Circulation Plan identifies corridors important for active transportation and does not attempt to identify trails that are predominately recreational in nature. In the city limits, it proposes using trails on, along, adjacent to or near canals, ditches and drainages for nonmotorized route connections only where there is not another safe or better alternative for nonmotorized transportation on the road network.

(d) Specific Strategies and Policies. Goals and policies identified in the Grand Junction Comprehensive Plan and strategies and policies identified in the Circulation Plan will help the community achieve its vision of becoming the most livable city west of the Rockies. A balanced transportation system will be achieved through the following strategies and policies that are further described in the Circulation Plan.

(1) Adopt a Complete Streets Policy for Grand Junction and develop and adopt a Complete Streets Policy for Mesa County.

(2) Develop or revise policies for support of an integrated transportation system.

(3) Provide conceptual and corridor maps that will be used by decision makers and staff to improve transportation systems.

(4) Improve interconnectivity between Grand Valley Transit and centers, neighborhoods and community attractions.

(5) Improve the Urban Trails System on and connecting to active transportation corridors.

(i) Provide guidance on incentives for trail construction;

(ii) Provide guidance on standards for trail construction;

(iii) Provide guidance on ownership and maintenance of trail system;

(iv) Maintain or improve multi-purpose trails;

(v) Provide wayfinding to attract visitors to the trail system and improve the ability of residents and visitors to find area attractions.

(6) Maintain or improve circulation of vehicles on road system.

(Ord. 4808, 7-18-18)

§ 31.08.070. Background.

(a) The 2010 Circulation Plan was adopted as an element of the Grand Junction Comprehensive Plan. It is limited to a brief description of the planning area and the principle that development should support an integrated transportation system. It also includes a functional classification street network map, of future, general vehicular

circulation patterns for collector and arterial streets and highways to accommodate the ultimate buildout of the urban area.

(b) The 2001 Urban Trails Plan was developed as a strategic tool to guide the future course of trail development in the Grand Valley. The Plan identifies the locations for new nonmotorized facilities and serves as a guide for the development, protection, management, operations and use of a trail system that meets the demands of the growing community. The Plan identifies the opportunity to utilize the natural waterways, drainages and canals to create an interconnected system of safe and efficient means of nonmotorized travel.

(c) This Circulation Plan acknowledges the planning that was previously completed and incorporates the previous findings into a broader framework for transportation to include more than a functional classification of streets. The Circulation Plan works to combine urban trails planning with street planning and establish goals and policies with a multi-modal approach to transportation within the Urban Development Boundary established in the Comprehensive Plan. In addition to these two plans, the City and County also have adopted transportation plans for specific neighborhoods and geographic areas (see GJMC § 31.08.150, Appendix A – Maps).

(d) The following adopted plans have shaped the transportation planning in the community and have been adopted by one or both, the City of Grand Junction and Mesa County, and can be found at www.mesacounty.us/planning and/or at http://www.gjcity.org. These plans serve as the foundation for the updated Circulation Plan.

(1) 2010 Grand Junction Comprehensive Plan (GJMC Title 31);

(2) Grand Valley 2040 Regional Transportation Plan;

(3) 2001 Urban Trails Master Plan;

(4) 2002 Redlands Area Transportation Plan (repealed by Ord. No, 5227, August 2024);

(5) 2004 Pear Park Neighborhood Plan (repealed by Ord. No, 5227, August 2024);

(6) 2014 Orchard Mesa Neighborhood Plan (repealed by Ord. No, 5227, August 2024);

(7) 2011 Clifton/Fruitvale Community Plan;

(8) 2007/2011 North Avenue Corridor Plans and Zoning Overlay (GJMC Title 32);

(9) 24 Road Subarea Plan and Overlay (GJMC Title 33).

(e) Access Management Policies and Access Control Plans. The City, County and CDOT have various access management plans and policies. This Circulation Plan update has been developed to work in conjunction with these policies, which can be found in the following documents:

(1) Mesa County Standard Specifications for Road and Bridge Construction (RB Spec) – www.mesacounty.us/publicworks/roads/specifications.aspx;

(2) Mesa County Road Access Policy – www.mesacounty.us/RoadAccessPolicy.aspx;

(3) City of Grand Junction Transportation Engineering Design Standards (TEDS) (GJMC Title 29);

(4) Access Control Plans with the Colorado Department of Transportation (CDOT). Some corridors fall under the ownership and jurisdiction of CDOT. CDOT has specific "Access Control Plans" that are implemented through intergovernmental agreements with Mesa County and/or Grand Junction for the State Highway system which affects driveways, street intersections and signalization spacing on these roads. The roads include Interstate-70, I-70 Business Loop, State Highway 141, State Highway 340, U.S. Highway 6 (North Avenue), and U.S. Highway 50, all of which run through the Grand Junction community.

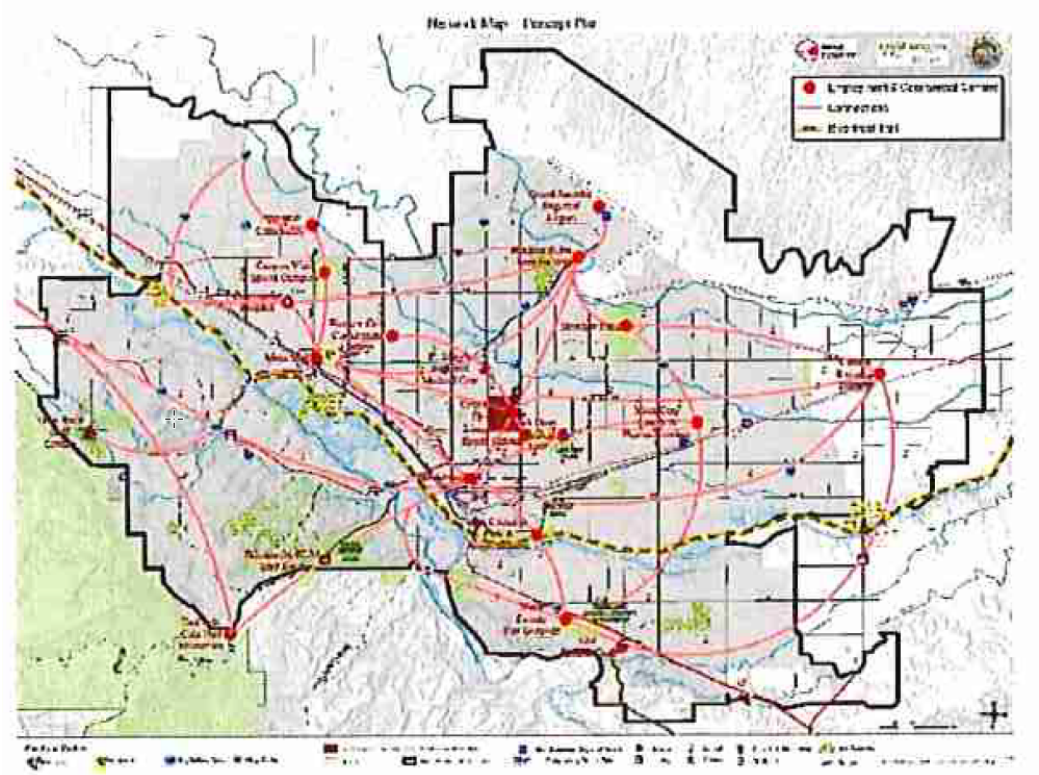
(Ord. No. 5227, 8/9/2024; Ord. 4808, 7-18-18)

Article II

Plan Elements

§ 31.08.080. Section A: Maps.

(a) The Network Map. The Network Map is a conceptual view of the community from an overall "30,000 foot" vantage point that identifies important corridors and linkages connecting centers, neighborhoods and community attractions. It is used to support more detailed planning, such as the Active Transportation Corridors Map. It is implemented through capital construction of streets, sidewalks and trail infrastructure. A full-page map is included in GJMC § 31.08.150, Appendix A – Maps, as Figure 1.

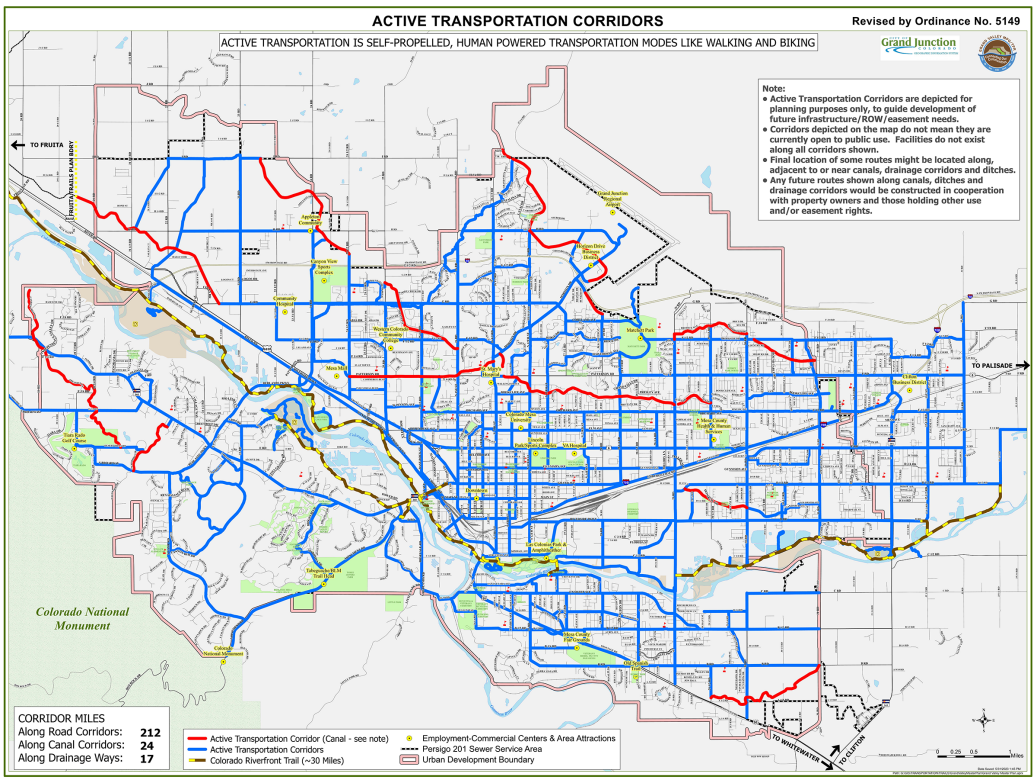


(b) The Active Transportation Corridors Map (Nonmotorized Transportation Map). This Circulation Plan establishes the Active Transportation Corridors Map, to create a network of critical, continuous, safe, and convenient connections for nonmotorized transportation (bicycles, pedestrians, motorized wheelchairs, e-bikes where permitted by law, etc.). While it may be used for recreation or connect to the Colorado River and other trails, the active transportation corridors are intended to provide a complete alternative network of nonmotorized traffic routes. This includes using existing streets and future trails along waterways (canals, ditches and drainages) to connect neighborhood, schools, parks and other open space areas, as well as commercial and business districts with each other. It further identifies specific corridors that follow and support the Network Map and links important centers identified in the Comprehensive Plan's Future Land Use Map with neighborhoods and other attractions and local amenities.

Active transportation corridors will include some canal, ditch and drainageway alignments where they provide the safest and best connections between neighborhoods and area attractions. This focused approach limits the use of canals, ditches and drainageways to only those routes that are most viable and critical for the active transportation network. During the planning, design and construction of these corridors the best route can be established which may include a combination of canals, ditches, drainageways, roads or other properties to locate the actual active transportation nonmotorized corridor on. Final location of these routes may be located on, along, adjacent to or near the canals, ditches and drainageways, but will be constructed to respect canal and drainage companies' operations.

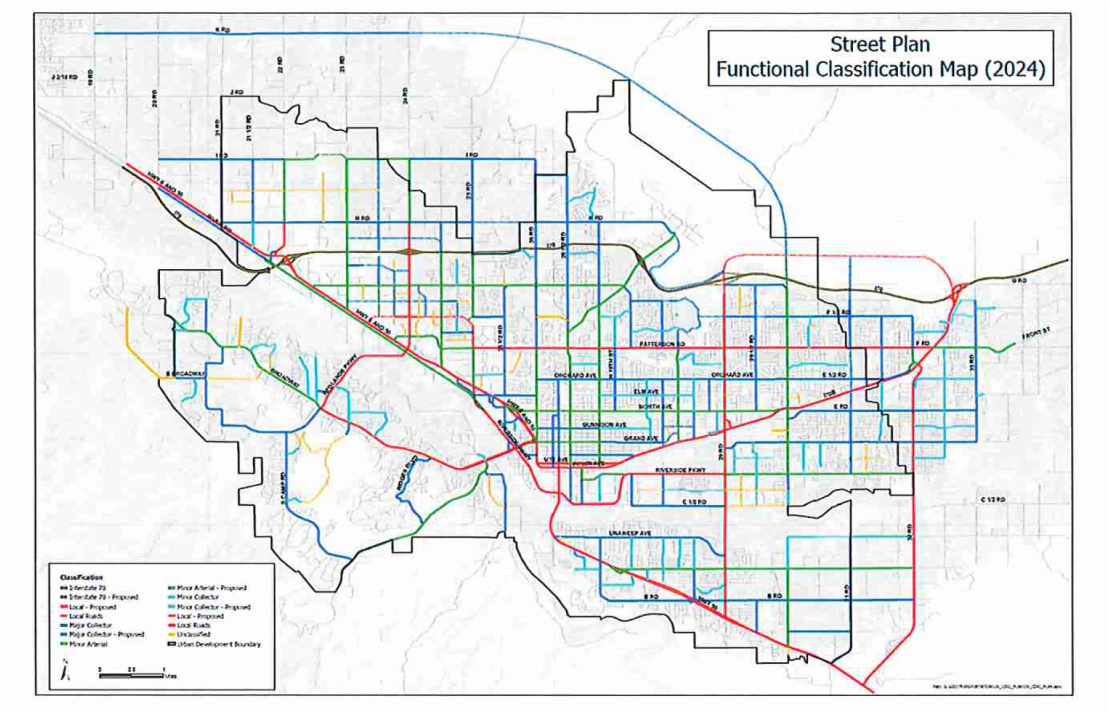
The Active Transportation Corridors Map will be used to support more detailed planning and implementation, including capital construction of sidewalks, bike lanes and trail infrastructure. Active transportation corridors can be improved during new development projects or through capital improvement projects and through the development of drainageways as identified in the Grand Junction Comprehensive Plan.

As property develops there may be situations where trails may be a desired amenity but a route is not shown on the map. An example of this may be providing a connection from an internal subdivision street to an outside collector or arterial street. Constructing these types of site and development specific improvements will provide connectivity that helps the overall transportation system work. See also GJMC § 31.08.130, Section B: Strategies/Policies – Improve the Urban Trails System both on and connecting to active transportation corridors (Strategy). A full-page map of the active transportation corridors is included in GJMC § 31.08.150, Appendix A – Maps, as Figure 2.



(c) The Street Plan Functional Classification Map. The Street Plan Map identifies major corridors for general circulation of motorized traffic within the Urban Development Boundary. Roadway classifications include collectors and arterial streets that move more traffic than local subdivision streets. Subdivision and other local streets connect to collector streets that connect to arterial streets. Collector and arterial streets connect community attractions including neighborhood centers, village centers, and downtown together. The map also shows unclassified roads which are important for neighborhood circulation. They establish general locations for these important future local streets in undeveloped areas. The classification of these will be determined via a traffic impact analysis that demonstrates vehicular traffic demand within the area of interest.

There are over 50 changes to the Street Plan Map in this Circulation Plan since the map was adopted by City Council and Mesa County in 2010. These revisions are incorporated into the map and are the result of new development or improved traffic data. A full-page map is included in GJMC § 31.08.150, Appendix A – Maps, as Figure 3.



(d) Horizon Drive Business Improvement District Trail Network Plan. The Horizon Drive BID Trail Network Plan identifies a series of proposed multimodal trail connections within the Horizon Drive corridor area to provide safe, convenient and functional nonmotorized linkages to amenities within the District and to the surrounding area. A full-page map of the Horizon Drive Business Improvement District Trail Network Pan is included in GJMC § 31.08.150, Appendix A – Maps, as Figure 6.

(Ord. No. 5239, 11/20/2024; Ord. 4851, 5-1-19; Ord. 4808, 7-18-18)

§ 31.08.090. Section B: Strategies/Policies – Complete streets policies (Policy).

(a) Grand Junction – Adopt a Complete Streets Policy. The complete streets policy will support the City of Grand Junction Comprehensive Plan goal to "develop a well-balanced transportation system that supports automobile, local transit, pedestrian, bicycle, air, and freight movement while protecting air, water and natural resources." A complete streets approach integrates the needs of people and places in the planning, design, construction, operation and maintenance of transportation networks, making streets safer for people of all ages and abilities and thereby supporting overall public and economic health. At the heart of a complete streets policy is the intent for communities to build streets that safely accommodate all modes of transportation.

While the City has historically incorporated complete streets concepts in the design of transportation corridors, this policy memorializes that commitment for all transportation related projects. The Grand Junction complete streets policy recognizes the importance of all modes of transportation and is established for the areas under the jurisdiction of the City of Grand Junction.

The City established the Urban Trails Committee to advise City Council on matters pertaining to the safe, convenient and efficient movement of pedestrians and bicyclists of all ages and abilities. It has been a long-standing goal and desire of the Urban Trails Committee, whose planning jurisdiction is limited to the Persigo 201 service area, to develop and adopt a complete streets policy. That goal was incorporated into the 2017 City Council Strategic Plan as a Key Initiative.

(b) Mesa County – Develop and Adopt a "Complete Streets" Policy. For Mesa County, an urban area complete streets policy limited to the urban development boundary will be developed that is appropriate to its jurisdiction and supports the Grand Junction Comprehensive Plan by fostering community values of transportation connections, attractive corridors and safe routes for all modes of travel. This policy will be part of the Mesa County Road and Bridge Standards and separate from the complete streets policy adopted by the City of Grand Junction.

(Ord. 4808, 7-18-18)

§ 31.08.100. Section B: Strategies/Policies – Apply the principles of an integrated transportation system (Strategy).

(a) An integrated transportation system is defined as a system that provides transportation options and needs for all mobility types. New development shall be designed to continue or create an integrated system of streets and trails that provides for efficient movement of pedestrians, bicycles, and automobiles to and from adjacent development, while also encouraging the use of transit. Design shall allow for through movement of general traffic utilizing connectivity, thus avoiding isolation of residential areas and over-reliance on arterial streets.

(b) Another aspect of an integrated transportation system is the concept of complete networks. There are limited number of corridor segments that cannot serve all mobility types due to a variety of restrictions such as constrained rights-of-way or an exclusive facility type. Some corridors, like off-street trails, are intended exclusively for bicycles and pedestrians and a small number of corridors can serve vehicles only. However, in all instances the transportation system as a whole should provide effective connections for all modes of travel. The individual corridors, when combined, work together to form an integrated transportation system or "complete network." This Circulation Plan update was prepared with this concept in mind. The Street Functional Classification Map and the Active Transportation Corridors Map have been developed to work together with the complete network concept in mind.

(c) Implementation Actions.

(1) Amend development codes to include requirements for building street networks and identify construction/reconstruction responsibility.

(2) Amend development codes to establish construction responsibility, design guidelines, and ownership guidance for bicycle and pedestrian facilities.

(3) Develop methods to incentivize construction of bicycle and pedestrian facilities.

(4) Revise the City of Grand Junction Transportation Engineering and Development Standards (TEDS) Manual (GJMC Title 29), specifically relating to street and trail design guidelines and cross sections and transit requirements, to support the concepts presented in this plan.

(5) Revise the City's Zoning and Development Code to create best practices for street and intersection design alternatives based on anticipated travel patterns and multi-modal demand.

(6) Update the Mesa County Road and Bridge Standards to include additional options for implementation of the strategies/policies presented in this plan.

(7) Revise the Mesa County Development Standards to provide the necessary criteria to promote an integrated transportation system.

(Ord. 4808, 7-18-18)

§ 31.08.110. Section B: Strategies/Policies – Incorporate sub-area maps (Strategy).

(a) Various plans have been developed for some areas (sub-areas) within the urban development boundary while many other areas still need specific plans. The following list recognizes planning efforts to date that are incorporated into this Circulation Plan.

(1) Safe Routes to Schools. Studies to improve safety for children between existing neighborhoods and schools continue with projects planned, funded and constructed for Nisley Elementary, Clifton Elementary and West Middle School. Other planning has occurred and will continue to occur for all schools in School District 51.

(2) Clifton Pedestrian Plan – refer to Clifton/Fruitvale Community Plan.

(3) Orchard Mesa Pedestrian Plan at the Fairgrounds/Meridian Park Neighborhood Center – refer to Orchard Mesa Neighborhood Plan (Repealed by Ord. No, 5227, August 2024).

(4) Redlands area – refer to the Redlands Area Plan (Repealed by Ord. No, 5227, August 2024).

(5) North Avenue Corridor Plans (GJMC Title 32).

(6) Pear Park – refer to the Pear Park Neighborhood Plan (Repealed by Ord. No, 5227, August 2024).

(7) Horizon Business District – refer to (future) Horizon Business District Overlay.

(8) Mesa Mall Environs – (future).

(9) Safe Routes to Parks and Open Space – (future).

(b) Implementation Actions.

(1) Revisit each sub-area plan regularly and update when needed.

(2) Add to the list as new sub-areas are planned and mapped.

(Ord. No. 5227, 8/9/2024; Ord. 4808, 7-18-18)

§ 31.08.120. Section B: Strategies/Policies – Improve interconnectivity with Grand Valley Transit (GVT) (Strategy).

(a) The vision for GVT is to provide a viable transportation choice for all populations that connects communities, neighborhoods, and destinations while improving quality of life and supporting economic vitality in the region. GVT strives to provide an affordable, connected, efficient, and easy to use transit system that attracts all rider types, integrates all modes of transportation and that provides a transportation system that supports jobs, recreation and overall community well-being. Additional statistical information for GVT can be found in GJMC § 31.08.160, Appendix B – Background on previous adopted transportation plans.

(b) To achieve GVT's vision, the transit system must provide improved interconnectivity and accessibility including first and last mile connections. Many of the improvements will rely on coordination with both Mesa County and City of Grand Junction for implementation.

(c) Implementation Actions.

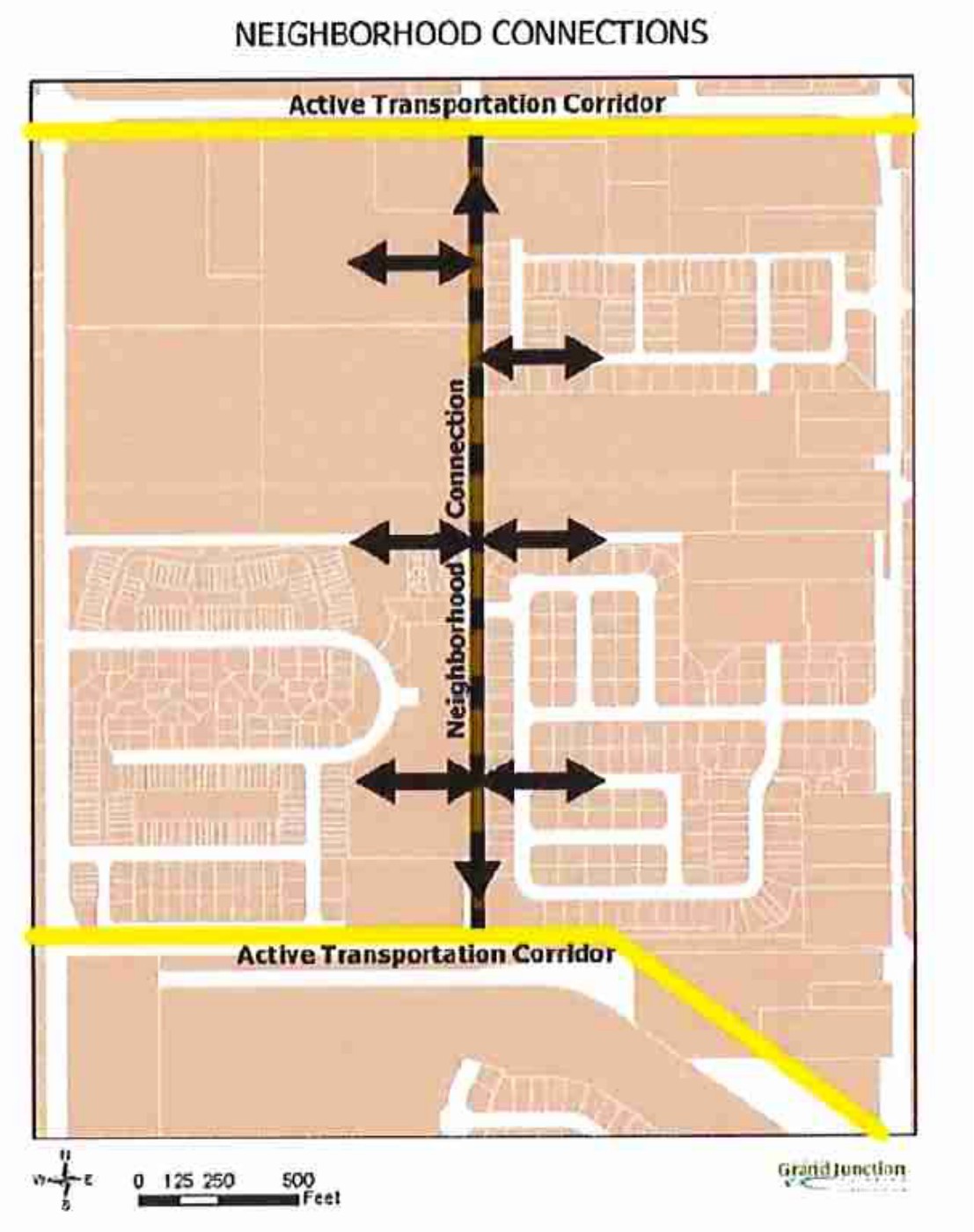
(1) Access. In coordination with its partners, GVT will improve sidewalks, curb ramps, and bike lanes and provide bike racks at bus stops in an ongoing effort to improve access for riders.

(2) Collaboration. GVT will collaborate and be a strong community partner that works with public, private, and non-governmental organizations to provide transit service options within the transportation system and look to emerging trends and technologies to bring this to fruition.

(Ord. 4808, 7-18-18)

§ 31.08.130. Section B: Strategies/Policies – Improve the Urban Trails System both on and connecting to active transportation corridors (Strategy).

Creating neighborhood and community connections that are safe, convenient and efficient are very important to providing transportation options. These can include active transportation routes to parks, schools, commercial and employment areas that are off the major, highly traveled ways. Efforts should look at planning at a one-quarter mile radius from a proposed development as well as the entire transportation corridor between major attractions.



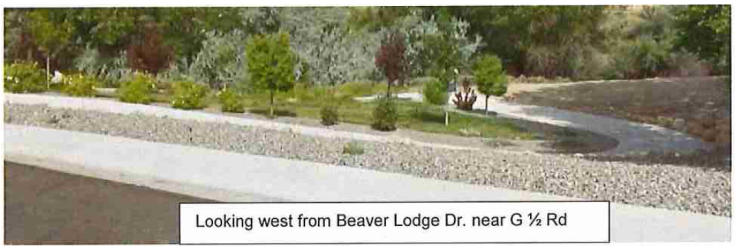
Access between neighborhoods and subdivisions and connecting them and other attractions to the active transportation corridors can be accomplished in a variety of ways. Using drainageways and open space areas is deemed the highest priority to make these connections work. See the four examples below.

The City has a history of working with development to create safe and convenient connectors between not only similar land uses, like residential neighborhoods, but also between unlike land uses.

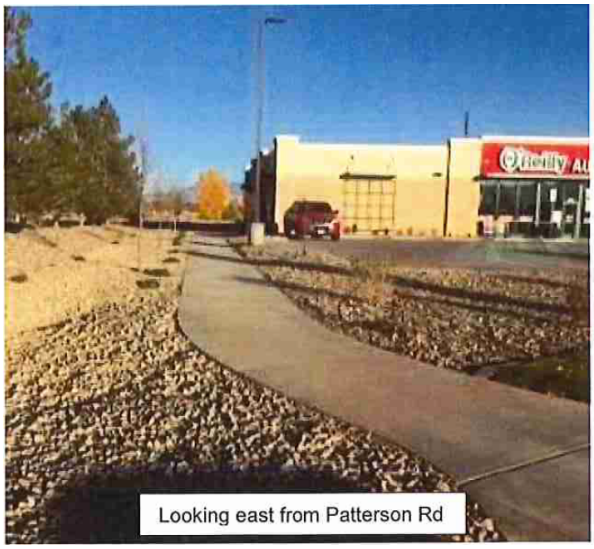
Example 1: Lincoln Park Connection from North Avenue. Creating a safe community connection from collector and arterial streets allows good public access to major attractions and is important in encouraging nonmotorized transportation including transit. A bus stop exists on North Avenue at the entrance of this trail connection.

Example 2: Leach Creek Trail. The Estates and Blue Heron residential subdivisions and development of the Leach Creek bike/pedestrian concrete trail.

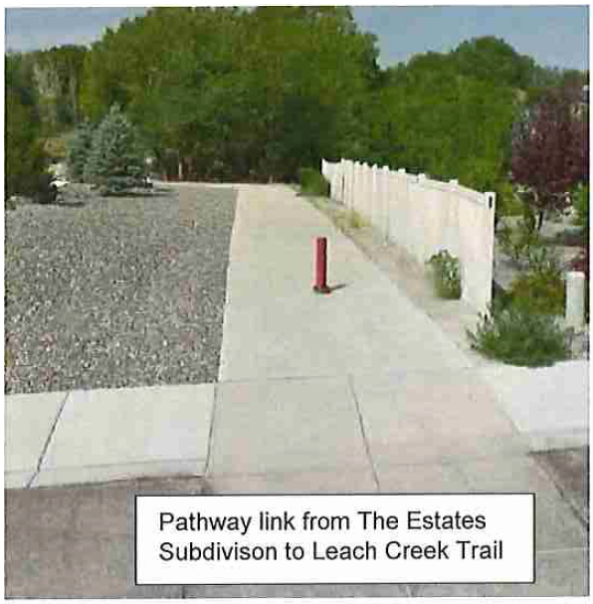
Leach Creek Drainage Trail – Connecting G Road and G ½ Rd



Example 3: Connection with Patterson Road. Trail across O'Reilly Auto Parts store property connects GVT Transfer Station with Patterson Road via a crosswalk at 24 ½ Road.



Example 4: Neighborhood connections to active transportation corridors. These "neighborhood connections" provide individual subdivisions with access to the larger transportation system and link them with neighborhood subdivisions and other areas of the community. A "pathway" from a subdivision which leads to an active transportation corridor will provide residents with an optional mode of transportation, while providing them access to major attractions in the urban area.



(a) Incentives for Trail Construction.

(1) Trails and public streets are part of the transportation network. They provide transportation corridors for commuting purposes; serve as an amenity to the community, new developments, and neighborhoods. Trails have been shown to improve public health, strengthen community social connections and lead to increased property values.[1]

(2) Implementation Actions.

(i) The City or County will seek funding for off-site trail construction to connect development-required trail(s) to the existing trail network (active transportation corridors).

(A) Revise the City's Zoning and Development Code (Z&D) and County's Land Development Code (LDC) to establish responsibility of new development and incentives for constructing trails shown on the Active Transportation Corridors Map and associated connections within their project limits.

(b) Standards for Trail Design and Construction. All trails should be hard surface, preferably concrete and constructed to meet the American with Disabilities Act (ADA) requirements, follow specific regulations found in the Grand Junction Development Code and Transportation Engineering Design Standards (TEDS) Manual (GJMC Title 29), and be designed according to the latest industry standard.

The type of facility to be constructed for on-street trails shown on the Active Transportation Corridors Map will generally be specified by the standard street cross-sections in the TEDS Manual (GJMC Title 29). However, the flexibility to choose a

1. **Note: CMU Study: "The Impact of Natural Amenities on Home Values in the Greater Grand Junction Area" by Nathan Perry, Tammy Parece, Cory Casteneda and Tim Casey – updated June 2017.**

facility type that exceeds the minimum standards should be allowed and encouraged. Additionally, consideration should be given to implementing innovative pedestrian and bicycle facilities, in accordance with the latest industry standards, when the context of the corridor makes it feasible. Careful selection of the appropriate facility type is particularly important along the CDOT State Highway segments identified as active transportation corridors. For example, because of a corridor's context, a detached multi-use path or a separated two-way path could be preferred instead of on-street bike lanes. The designs for all projects on State Highway corridors are subject to the review and approval of CDOT staff.

(1) Standards for trail design and construction must also account for crossings. Trail crossings occur when on-street or off-street trails intersect with another street. Crossings should be designed according to the latest industry standards and guidelines and prioritize the safety of vulnerable road users, pedestrians, and bicyclists.

(i) The majority of trail crossings will occur at existing street intersections. Design standards pertaining to the application of pedestrian crosswalks will apply.

(ii) Current design standards and guidelines should be utilized to determine which of the various trail and pedestrian crossing treatments to select. For new crossing locations, an engineering study including a warrant analysis should be performed. The various trail and pedestrian crossing treatments that could be warranted by engineering study include crosswalk signage and markings, flashing warning beacons, pedestrian hybrid beacons, conventional traffic signals with pedestrian signal heads, or a grade separated crossing.

(iii) When off-street trails cross streets, such as trails along drainageways or trails along canals, the preferred crossing treatment should be a grade separated facility. Ideally this would utilize a structure that accommodates both the trail and the necessary drainage conveyance. If a grade separated crossing cannot be reasonably accommodated, then an engineering study should be performed to select the appropriate at-grade crossing treatment. Ideally all at-grade crossings should occur at signalized intersections.

(iv) When on-street trails cross CDOT State Highways or City/County arterials, the preferred crossing treatment should be a signalized intersection. A grade separated facility should be provided when it can be accomplished in combination with primarily vehicular bridge structures; such as the 29 Road overpass crossing the I-70 Business Loop. Grade separated trail crossings may also be possible by reallocating space on existing bridge structures; such as the B ½ Road Overpass crossing Highway 50. The designs for all projects crossing State Highway corridors are subject to the review and approval of CDOT staff.

(2) Implementation Actions.

(i) Revise the City's Zoning and Development Code (Z&D) and County's Land Development Code (LDC) to reflect the intent of the following:

(A) Off-street trails shown on the Active Transportation Corridors Map shall be 10 feet wide, designed and constructed per the Transportation Engineering Design Standards (TEDS) (GJMC Title 29).

(B) Minimum standards for on-street trails shown on the Active Transportation Corridors Map shall consist of on-street bike lanes in accordance with standard street cross sections and a detached sidewalk.

(C) In some cases, because of topography or other concerns, it may be impossible to meet ADA requirements. Soft trails may be acceptable in those instances.

(D) Per the Stormwater Management Manual (SWMM) (GJMC Title 28), most drainage channels require at least one 12-foot-wide service road. All drainage channel service roads shall also be designed to function as soft trails. If a trail is shown on the Active Transportation Corridors Map along a drainage channel, the service road must be constructed of a hard surface. To achieve the required 12-foot service road width, it can be 10 feet of concrete with compacted road base shoulders.

(c) Ownership and Maintenance of Trail System.

(1) This policy is as follows and is different within the jurisdiction of Grand Junction than it is in the unincorporated areas of Mesa County.

(2) City of Grand Junction Implementation Actions. Revise the Zoning and Development Code to reflect the intent of the following:

(i) If the trail is shown on the Active Transportation Corridors Map it must be in a tract or easement dedicated to the City of Grand Junction. If the trail is not shown on the Active Transportation Corridors Map the developer shall dedicate an appropriately sized tract or easement to accommodate the trail to the appropriate entity in the following order of descending priority: the City of Grand Junction, the Canal Company/Drainage District, or the Homeowners Association (HOA) per the following:

(A) When the trail is located adjacent to a drainage channel maintained by the City of Grand Junction, it shall be dedicated to the City. If the Grand Valley Drainage District (GVDD) maintains the channel, dedication shall be to the City and/or the GVDD.

(B) If the trail is located adjacent to a canal, dedication shall be to the City and/or the canal company.

(C) Trails connecting internal subdivision streets or trails to external streets or trails shall be dedicated to the City or the HOA.

(D) Trail connections between neighborhoods shall be dedicated to the City or the HOA.

(3) Unincorporated Areas of Mesa County Implementation Actions. Establish the following language in the Mesa County Land Development Code and/or Transportation and Engineering Design Standards (TEDS) for developing property:

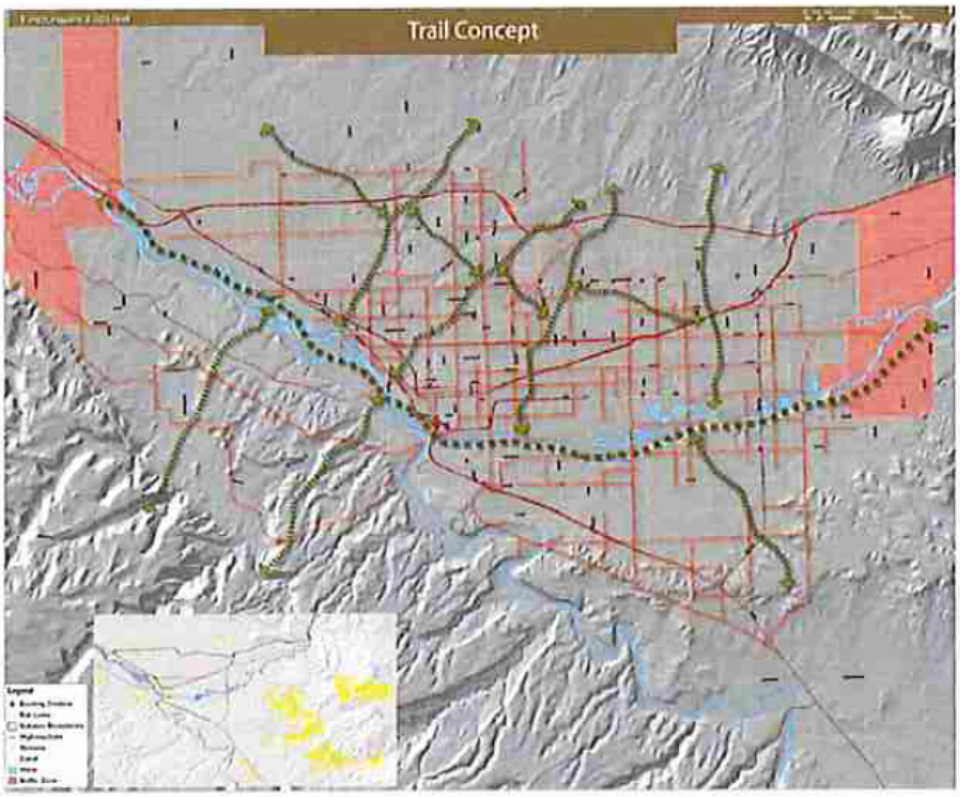
(i) Trails connecting internal subdivision streets or trails to external streets or trails shall be dedicated to the HOA, but available for public use with appropriate easements.

(ii) Trail connections between neighborhoods shall be dedicated to the HOA of which they are a part, but available for public use with appropriate easements.

(iii) Sidewalks along streets shall be in the Mesa County right-of-way.

(d) Active Transportation Corridors along Drainageways, Canals and Ditches. As shown in the 2010 Comprehensive Plan, the Colorado River Regional Trail envisioned by Grand Junction, Mesa County and many other partners establishes a regional trail running the length of the Colorado River from the Town of Palisade to the City of Fruita and beyond. Today parts of this trail are already built and more segments will be constructed through the combined efforts of various partners including Colorado Parks and Wildlife, the Colorado Riverfront Commission (One Riverfront), partner municipalities and the Urban Trails Committee.

(1) Trails along Drainage Ways. North of the Colorado River, drainageways generally orient in a northeast/southwest direction as they drain toward the river. These drainageways create a grid system separate from the grid of the street system and can provide necessary connections for a trail network from many existing and future residential neighborhoods and the Colorado River. In the Redlands, drainageways generally orient from southeast to northwest. Trails can be located within some of the broader drainageways, but may have to be aligned along the edge of narrower drainage corridors.



(2) Trails along Canals and Ditches. Canals are part of the secondary water system of the valley and generally run along contour lines in a northwest/southeast alignment, following the terrain of the valley. These canals are owned and operated by the U.S. Bureau of Reclamation (BOR) and private irrigation companies, and are located on lands owned by the BOR, in rights-of-way or easements across private land. Using a combination of limited drainageway trails (discussed above) and limited canal trails can create a part of the active transportation corridor grid system.

(3) The concept of accessing the Colorado River Trail system through these nonmotorized active transportation corridors takes advantage of existing road corridors, greenways, drainages, and a few canal and ditch segments as identified on the Active Transportation Corridors Map to tie most of Grand Junction to the Colorado River Regional Trail.

(4) City of Grand Junction Implementation Actions. Revise the Zoning and Development Code to reflect the intent of the following:

(i) Trails along canals and drainages are shown on the Active Transportation Corridors Map for certain segments needed to make essential trail system connections. Utilizing these segments for trail connections will require:

(A) Cooperation and allowance of public access from the irrigation and drainage providers to ensure public safety along the canal.

(B) Providing canal and drainage operators the ability to maintain their infrastructure.

(C) Permission from the underlying landowners and provisions to minimize public impacts on private land (such as fencing).

(D) Establishment of memorandums of understanding (MOUs) to address liability.

(5) Unincorporated Areas of Mesa County Implementation Actions. It is Mesa County's policy to not require trails along drainageways or canals.

(e) Develop Wayfinding and Marketing for Trails System.

(1) A wayfinding system for bicyclists and pedestrians consists of comprehensive signing and/or pavement markings to guide bicyclists and pedestrians to their destinations along "active transportation corridors" and other preferred routes. Signs are normally placed at decision points along routes – typically at the intersection of two or more routes, trails, or bikeways, and at other key locations leading to and along bike and pedestrian routes.[2]

(2) Implementation Actions for All Transportation Providers/Partners.

(i) Make trail maps available on key websites including at a minimum: Mesa County, City of Grand Junction, Grand Junction Economic Partners, Chamber of Commerce, Colorado Mesa University, and "Visit Grand Junction."

(ii) Distribute hard copy maps/brochures at visitors' centers/mobile visitor centers/hotels/libraries/schools and other locations that serve as visitor and user destinations.

(iii) Distribute and/or post full-sized maps at various locations including downtown, the CMU campus, GVT transit centers and at important transit stops showing the multi-modal transportation network (GVT routes, trails, and roads, etc.).

(iv) Develop a phone app showing different forms of circulation using different modes including photos. A mobile app could also be used to show history or points of interest as well as include the ability to report problems or suggestions.

(Ord. 4808, 7-18-18)

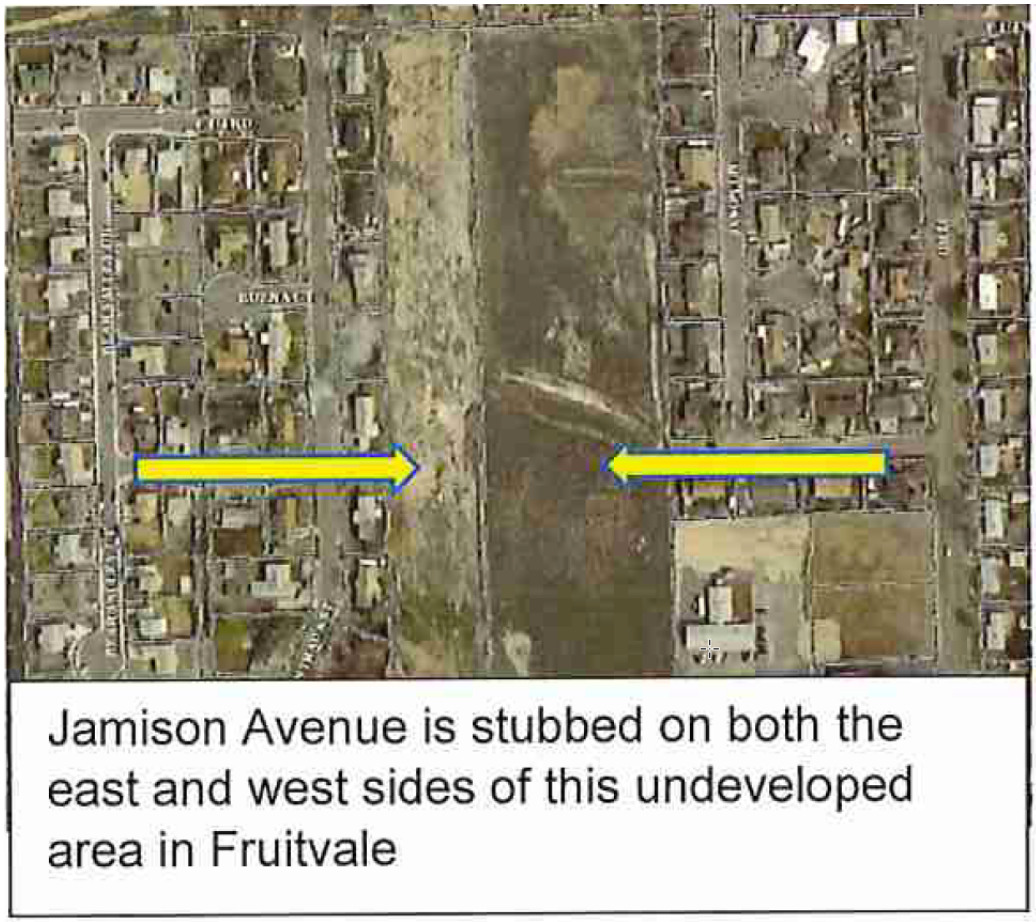
§ 31.08.140. Section B: Strategies/Policies – Maintain/improve vehicular and nonvehicular circulation (Policy).

In less developed sections of the urban area there is a need for local (subdivision) streets to be constructed in specific locations for better connectivity and access to the collector and arterial street network. These streets have been identified as "Unclassified" on the Street

2. **Note: Adopted from *Urban Bikeway Design Guide*, Second Edition, National Association of City Transportation Officials, March 2014.**

Functional Classification Map and may be reclassified in the future when actual traffic demand is determined with development proposals.

(a) Stub Streets. Local circulation systems and land development patterns must not detract from the efficiency of adjacent higher order streets nor limit access to undeveloped property within a neighborhood. Requiring stub streets is necessary to provide access and connectivity within a neighborhood. Management of access to higher volume streets, including public and private streets and driveways, is necessary to ensure that efficiency and safety are not unduly compromised.



(b) Implementation Actions. Revise the Z&D and LDC to reflect the following:

(1) Unclassified "future" streets are required to be built during development. However, the classification will be determined via a traffic impact analysis that demonstrates vehicle traffic demand within the area of interest (not limited to the development under consideration).

(2) Developments are required to stub streets to adjacent properties in logical locations, based on the circulation plan and each jurisdiction's access management policies. This will allow for an interconnected local street system while minimizing the number of points required for access to the general street

system. Stub streets may be required for any functional classification street including local streets.

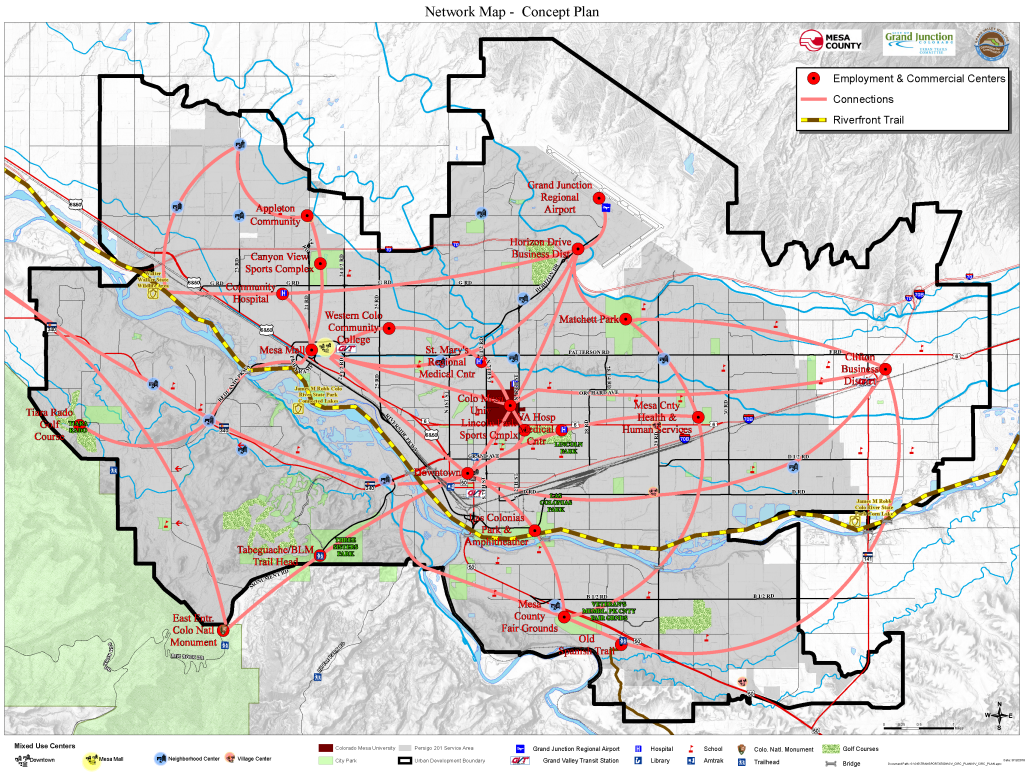
(Ord. 4808, 7-18-18)

Article III

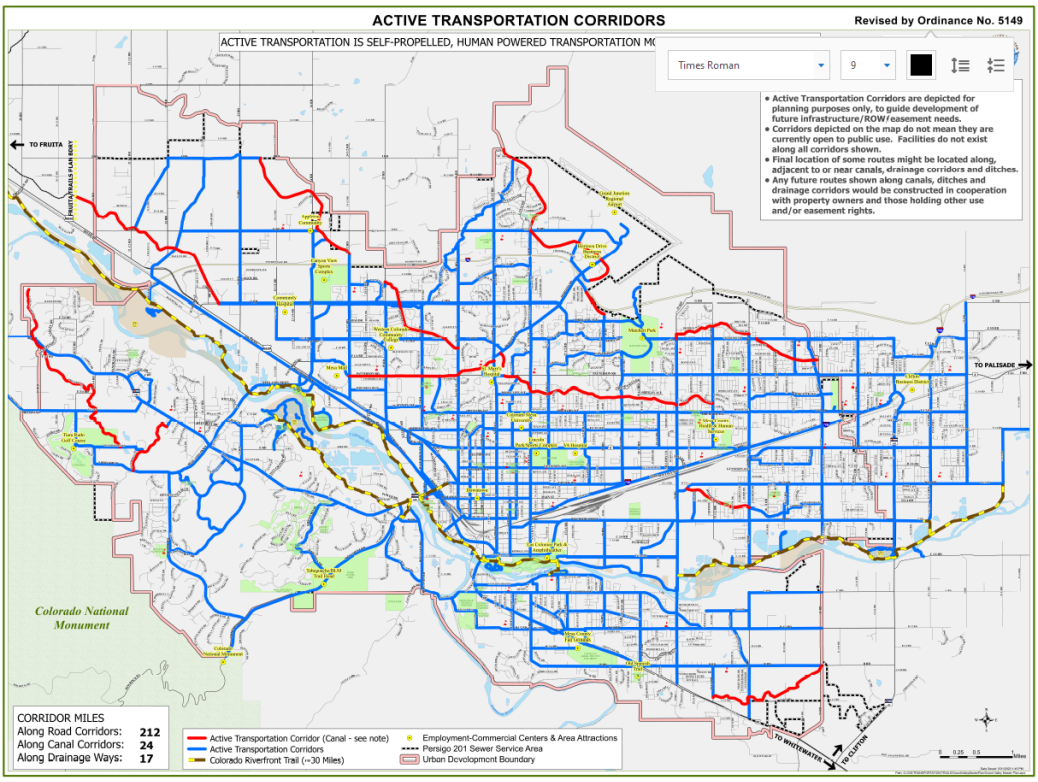
Appendices

§ 31.08.150. Appendix A – Maps.

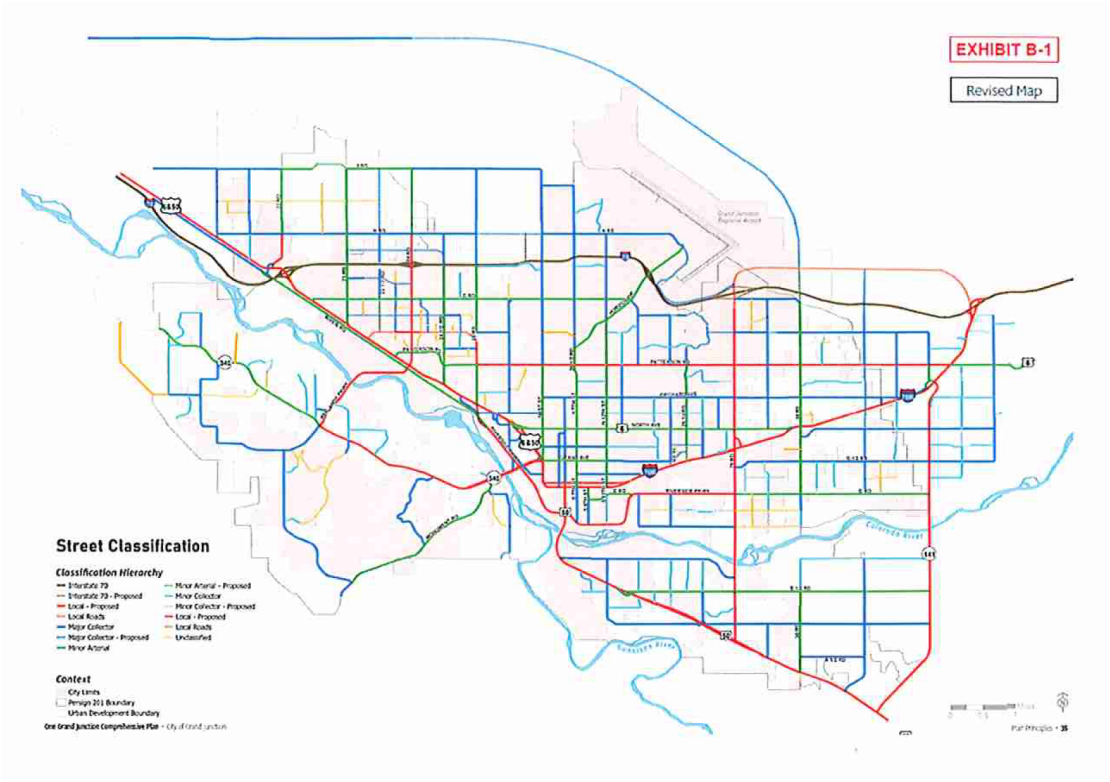
(a) Figure 1 – Network Map.



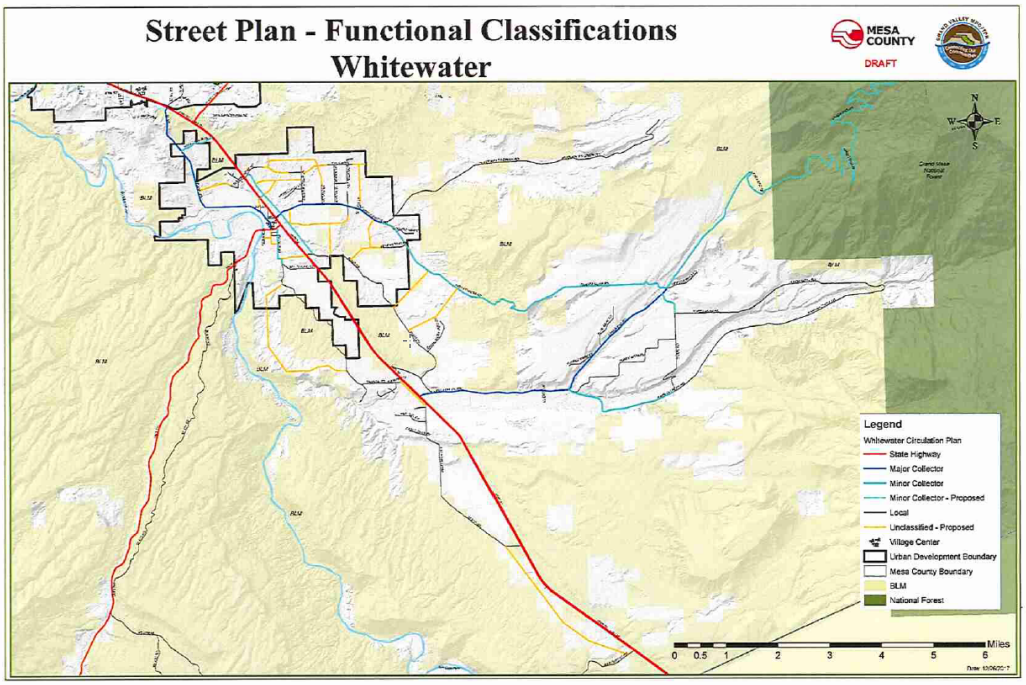
(b) Figure 2 – Active Transportation Corridors Map.



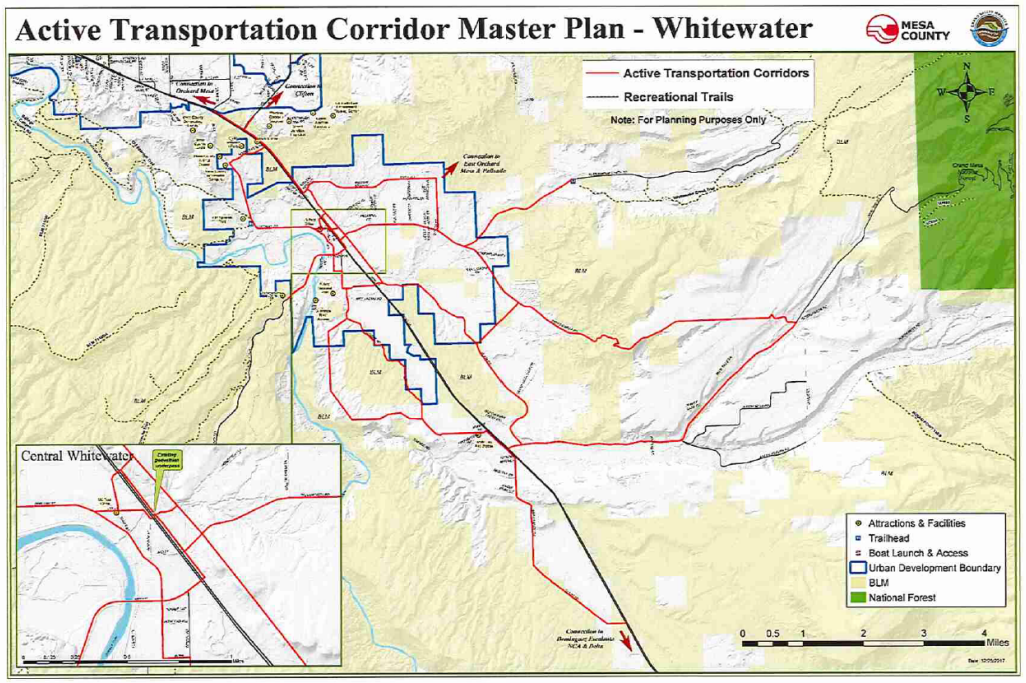
(c) Figure 3 – Street Plan – Functional Classification Map.



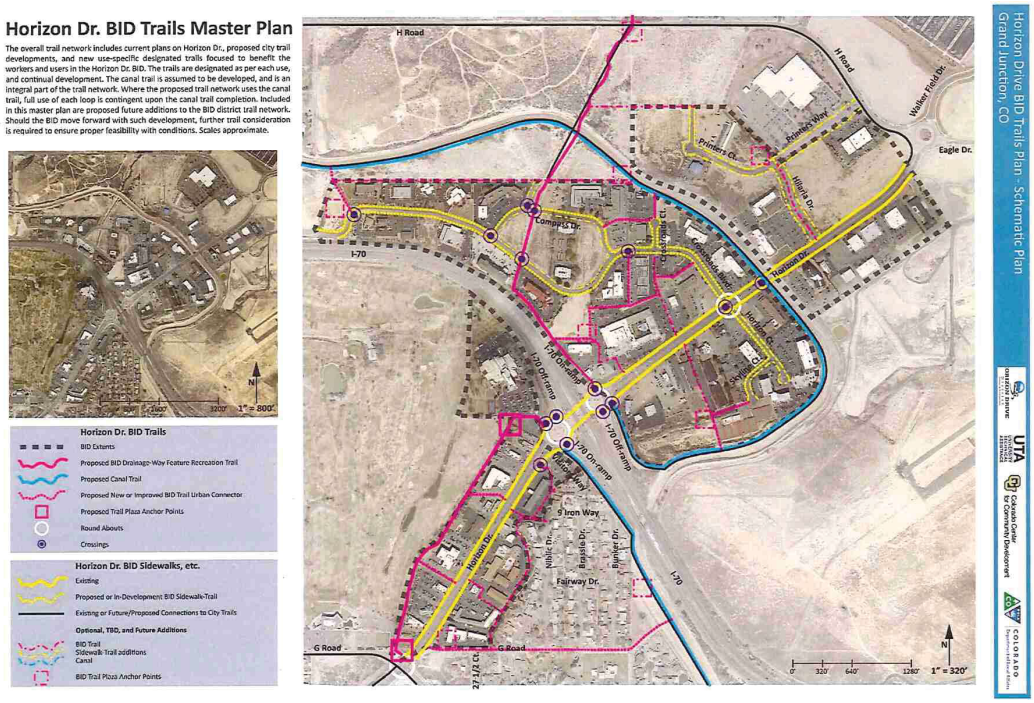
(d) Figure 4 – Whitewater – Street Plan – Functional Classification Map.



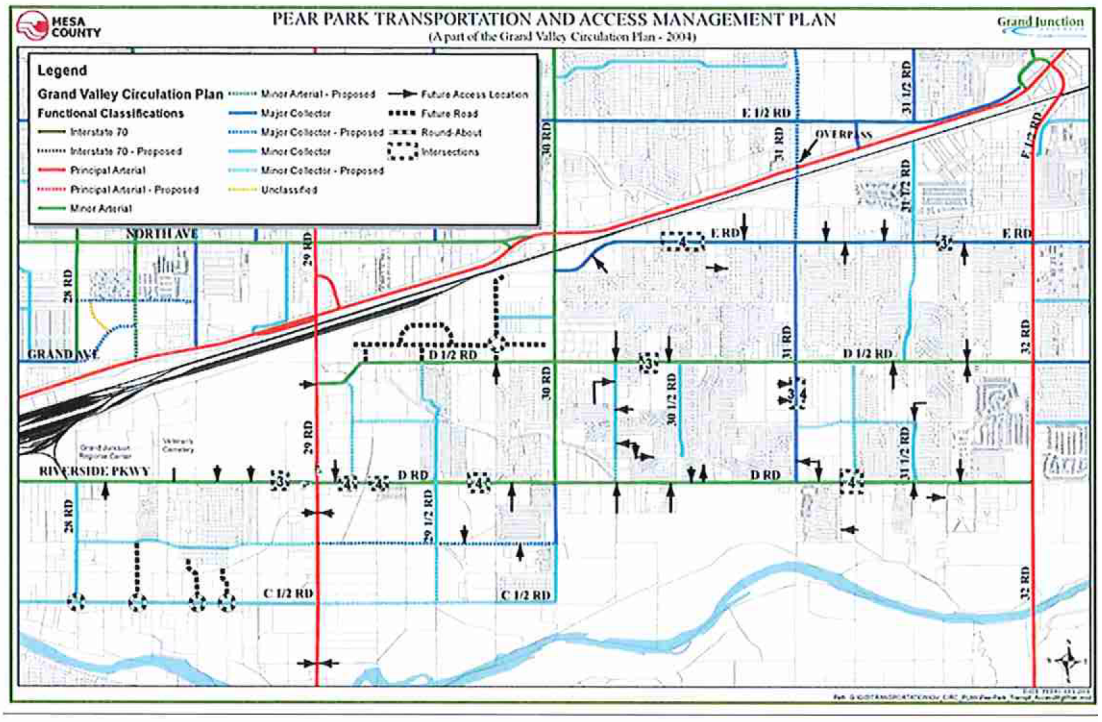
(e) Figure 5 – Whitewater – Active Transportation Corridor Map.



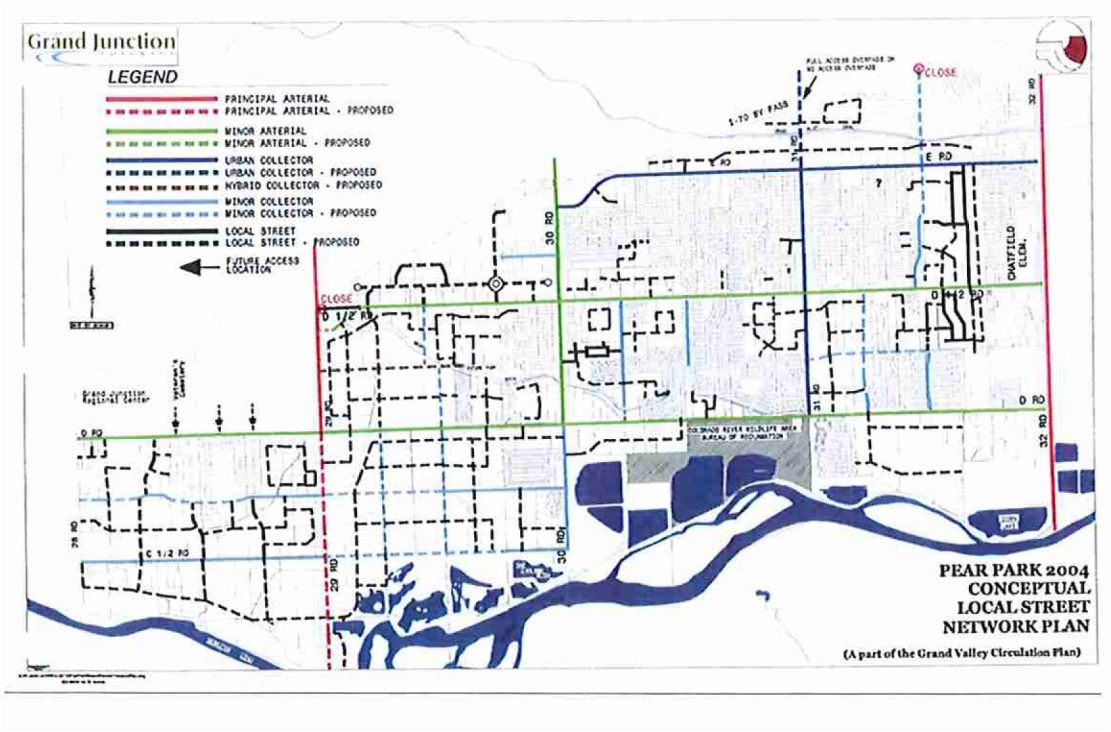
(f) Figure 6 – Horizon Drive Business Improvement District Trail Network Plan.



(g) Figure 7 – Pear Park Transportation Access Management Plan.



(h) Figure 8 – Pear Park 2004 Conceptual Local Street Network Plan.



(Ord. No. 5239, 11/20/2024; Ord. No. 5227, 8/9/2024; Ord. 5149, 5-17-23; Ord. 4851, 5-1-19; Ord. 4808, 7-18-18)

§ 31.08.160. Appendix B – Background on previous adopted transportation plans.

The following adopted plans have shaped the transportation planning in the community and have been adopted by one or both the City of Grand Junction and Mesa County, and can be found at www.mesacounty.us/planning and/or at http://www.gjcity.org. These plans serve as the foundation for the updated Circulation Plan.

(a) 2010 Grand Junction Comprehensive Plan. The Grand Junction Comprehensive Plan was adopted in 2010 by both the City Council of Grand Junction and the Mesa County Planning Commission. The Comprehensive Plan provides the vision and the goal of "Becoming the Most Livable Community West of the Rockies." Creating a community with an excellent transportation system is essential to achieving this vision. The goals and policies of the Comprehensive Plan are further discussed in this Circulation Plan.

(b) Grand Valley 2040 Regional Transportation Plan (see gv2040rpt.org). The 2040 Plan was adopted by the Grand Valley Regional Transportation Commission in 2015. To maintain the region's transportation system, ensure the efficient movement of people and goods, and support future growth and development, transportation services and infrastructure are planned and coordinated through a regional transportation planning process carried out by the Grand Valley Metropolitan Planning Organization (GVMPO). The GVMPO is the federally designated transportation planning organization for the Grand Junction urbanized area and all of Mesa County. The long-term guidance developed in the regional Long Range Regional Transportation Plan (RTP) informs a short-term capital improvement plan, or the Transportation

Improvement Program (TIP), and prioritize projects to make the best use of limited funding. The regional plan covers all of Mesa County, including incorporated Grand Junction. The Grand Valley 2040 Regional Transportation Plan (RTP) is the most recent update to the region's overall vision for future transportation infrastructure and investment and identifies the types of investments and strategies needed to address transportation mobility needs in the region. The plan guides future investments in the region's transportation system to reduce congestion; ease commutes; improve roadway safety; enhance sidewalks, bike, and multi-use trails; and maintain an efficient and effective transportation system that supports the regional economy. It is scheduled to be updated in 2019 by a 2045 Plan.

(c) 2001 Urban Trails Master Plan. The City of Grand Junction last adopted an Urban Trails Master Plan in 2001 and the Mesa County Board of County Commissioners retired it in April 2014, leaving a plan that is limited, outdated and only implemented within the city limits of Grand Junction. The Urban Trails Master Plan defines the type and locations of nonmotorized transportation corridors in the Grand Junction urban area, as well as on-street bicycle and pedestrian facilities. Rather than update the Urban Trails Master Plan, it is being incorporated into this Plan, which will provide more direction, priorities, policies and implementation strategies.

(d) 2002 Redlands Area Transportation Plan (repealed by Ord. No. 5227, August 2024). Includes a transportation section that was adopted as part of the Circulation Plan in 2002. There were four key elements of the planning effort: (1) State Highway 340 Access Control Plan; (2) capacity improvements on existing routes; (3) new roadways and neighborhood connections; and (4) multi-modal accommodations.

(e) 2004 Pear Park Neighborhood Plan (repealed by Ord. No. 5227, August 2024). Includes a Transportation and Access Management Plan for the Pear Park neighborhood and was adopted as part of the Circulation Plan in 2004. It remains a part of the Circulation Plan today and its detail at a neighborhood level guides development access and street cross sections for major corridors in Pear Park.

(f) 2014 Orchard Mesa Neighborhood Plan (repealed by Ord. No. 5227, August 2024). Includes a transportation planning section supporting complete street improvements, multi-modal enhancements for all major corridors on Orchard Mesa including US Highway 50, establishing nonmotorized crossings of U.S. Highway 50 (including the eastbound conversion of the B ½ Road overpass to a pedestrian/bicycle path), and creating safe nonmotorized routes to area attractions, schools, the riverfront, and centers.

(g) 2011 Clifton/Fruitvale Community Plan. Includes the Clifton Transportation Study and Clifton Pedestrian Circulation Study. Adopted in 2006 and amended in 2011, it specifically looks at pedestrian and bicycle improvements to U.S. Highway 6 that runs through Clifton on the way to Palisade.

(h) 2007/2011 North Avenue Corridor Plans and Zoning Overlay. Includes transportation requirements that reinforce a "complete street" infrastructure that support this Circulation Plan.

(i) 24 Road Subarea Plan and Overlay. Adopted in 2000 and updated in 2017, it includes transportation requirements that reinforce a "complete street" infrastructure and support this Circulation Plan.

(Ord. No. 5227, 8/9/2024; Ord. 4808, 7-18-18)

§ 31.08.170. Appendix C – GVT Transit.

(a) GVT Transit Summary, Service Areas and Major Corridors. Based on onboard passenger surveys conducted between 2008 to 2016, the two major destinations for Grand Valley Transit (GVT) passengers while riding the bus are home followed by work. Therefore, GVT focuses the system around densities of residential development and centers of employment. Determining factors for route alignments and stop placement focus on transit-dependent populations that include older adult, persons with ambulatory disabilities, low-income, and zero-vehicle populations. Much of this information comes from Census tract data, while the Grand Junction Housing Coalition is another resource.

(b) GVT Focuses on Specific Corridors. Since the inception of fixed routes in 2000, GVT has focused on particular corridors including the following within the City of Grand Junction: North Avenue, Patterson Road, Orchard Avenue, Horizon Drive, Unaweep Avenue, D ½ Road, D Road, 4th and 5th Street couplets, 7th Street, 12th Street, 29 Road, and 32 Road.

(c) GVT Daily Boardings and Alightings.

(1) The busiest stops in 2016 for passenger boardings include the following (in order):

(i) Downtown Transfer Facility;

(ii) Clifton Transfer Facility;

(iii) West Transfer Facility;

(iv) North Avenue and East of 28 ¾ Road – Walmart;

(v) 1st Street and North of Rood Avenue – City Market;

(vi) North Avenue and West of 28 ¾ Rd – Texas Road House – North Avenue and East of 28 ½ Rd – Homeward Bound.

(2) The busiest stops in 2016 for passengers' alightings include the following:

(i) Downtown Transfer Facility;

(ii) Clifton Transfer Facility;

(iii) West Transfer Facility;

(iv) North Avenue and Orchard Avenue – West of 29 ¼ Road;

(v) North Avenue and East of 28 ½ Road – Homeward Bound;

(vi) North Avenue and West of 29 ½ Road – Career Center;

(vii) East of 28 ¾ Road – Walmart.

(d) GVT Seeks Economic and Community Vitality. Provide a transit system that supports jobs, recreation, and overall community well-being.

(e) GVT Seeks System Preservation. Maintain a financially sustainable transit system operating in a state of good repair.

(f) GVT Seeks Education and Outreach. Strive to inform and educate the public about transit services and the mobility options they provide for all trip types and populations.

Municipalities and educational institutions can partner with GVT to leverage grant funding for capital improvements.

(g) Examples of recent successes include:

(1) Pedestrian and bicycle facilities (crossing beacons, sidewalks, ADA ramps, etc.);

(2) Buildings (County Fleet addition in Whitewater, park-and-ride facilities);

(3) Compressed Natural Gas (CNG) fueling facilities;

(4) Litter vacuum for Mesa County Facilities Department;

(5) CMU coach bus, District 51 and GVT bus pullout on 7th and Elm at new engineering building;

(6) Connecting the GVT West Transfer Station on 24 ½ Road, to Patterson Road, a "Neighborhood Connection" a trail that was built by O'Reilly Auto Parts providing pedestrian access from 24 ½ Road to Patterson Road.

CMU (7th St) – GVT Bus Pullout

GVT Bus Transfer Station across street

Looking west from 24 ½ Rd

(Ord. 4808, 7-18-18)

§ 31.08.180. Appendix D – Resources.

(a) City of Grand Junction.

(1) www.gjcity.org.

(2) Grand Junction Comprehensive Plan (GJMC Title 31).

(3) Transportation Engineering Design Standards Manual (TEDS) (GJMC Title 29).

(4) Urban Trails Committee.

Additional plans can be found at http://www.gjcity.org/residents/community-development/long-range-planning/.

(b) Mesa County.

(1) www.mesacounty.us/planning.

(2) Mesa County Road Access Policy.

(3) Mesa County Road and Bridge Specifications.

Additional plans can be found at http://www.mesacounty.us/planning/master-plan.aspx.

(c) Grand Valley Metropolitan Planning Organization.

(1) www.rtpo.mesacounty.us.

(2) 2040 Regional Transportation Plan.

(3) Safe Routes to School.

Additional plans, reports and studies can be found at http://rtpo.mesacounty.us/plans-reports-studies.aspx.

(d) Colorado Mesa University Natural Resource Center.

(1) http://www.coloradomesa.edu/natural-resource-center/NRC%20Reports/socioeconomic-studies.html.

(2) Studies include:

(i) Grand Valley Public Trail Systems Socio-Economic Study, 2018.

(ii) Rural Colorado Migration Study, 2018.

(iii) Mesa County Hedonic House Price Study, 2017.

(Ord. 4808, 7-18-18)

Article IV

City of Grand Junction Complete Streets Policy [3]

§ 31.08.190. Vision.

Repealed by Ord. 5149.

(Res. 48-18, 7-18-18)

§ 31.08.200. Purpose.

Repealed by Ord. 5149.

(Res. 48-18, 7-18-18)

§ 31.08.210. Complete streets principles/context sensitive design standards.

Repealed by Ord. 5149.

(Res. 48-18, 7-18-18)

§ 31.08.220. Exceptions.

Repealed by Ord. 5149.

(Res. 48-18, 7-18-18)

§ 31.08.230. Applicability.

Repealed by Ord. 5149.

(Res. 48-18, 7-18-18)

3. **Editor's note: Ord. 5149 repealed Res. 48-18 and replaced it with the Pedestrian and Bicycle Plan. Said plan is included as an attachment to this article.**

§ 31.08.240. Performance measures.

Repealed by Ord. 5149.

(Res. 48-18, 7-18-18)

§ 31.08.250. Implementation strategies.

Repealed by Ord. 5149.

(Res. 48-18, 7-18-18)

Chapter 31.12

Wireless Master Plan

Article I

§ 31.12.010. Acknowledgements.

The following individuals played an important role in the development of this plan. Gratitude also is extended to the citizens, wireless industry and other stakeholders who participated in the public hearings and other special meetings.

Grand Junction Regional Communications Center

John Camper, Chair and Chief of Police, Grand Junction
Matt Lewis, Sheriff, Mesa County
Ken Watkins, Fire Chief, Grand Junction
Judy Macy, Chief of Police, Fruita
Deb Funston, Chief of Police, Palisade
Mick Lockwood, Fire Chief, Plateau Valley Fire District

City of Grand Junction

City Council

Phyllis Norris, Mayor
Marty Chazen, Mayor Pro Tem
Barbara Traylor Smith
Bennett Boeschenstein
Duncan McArthur
Chris Kennedy
Rick Taggart

Planning Commission

Christian Reece, Chair
Jon Buschhorn
Kathy Deppe
Ebe Eslami
Keith Ehlers
George Gatseos
Aaron Miller
Steve Tolle
William Wade

City Manager

Tim Moore

Mesa County

Board of County Commissioners

Rose Pugliese, Chair
John Justman
Scott McInnis

Planning Commission

John "Rusty" Price, Chairperson
Robert Erbisch
Christi Flynn
David Hartmann
Phillip Jones
Joseph Moreng
Chip Page
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Bill Somerville
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Susan Rabold, Project Manger

Elizabeth Smith, Government Relations Manager

Jon Edwards, P.E. Principal Engineer
Anna Tapp, GIS Mapping

(Ord. 4703, 6-1-16)

§ 31.12.020. Preface.

(a) Purpose. The following is an excerpt from the Request For Proposal (RFP-3890-14-NJ):

In May of 2014, the Grand Junction City Council adopted a three to five years Economic Development Plan (EDP) for the purpose of creating a clear plan of action for improving business conditions and attracting and retaining employers. Section 1.4 of the EDP focuses on providing technology infrastructure that enables and supports private investment. Expanding broadband capabilities and improving wireless and/or cell coverage to underserved areas are key objectives of the EDP. The City has determined that the development of a Wireless Telecommunications Master Plan (WTMP) for eventual inclusion in the City's Comprehensive Plan would be a positive step toward accomplishing those objectives.

A request for proposal (RFP) was issued by the City of Grand Junction and Mesa County which specifies several geographic study areas of interest for the WTMP.

The goal of the WTMP is to facilitate the creation of an optimized wireless telecommunications environment that is efficient, capable, and meets the long-term forecasted user requirements of the businesses, residents and visitors in the City of Grand Junction and Mesa County.

CityScape Consultants, Inc. (CityScape) was awarded the contract to develop a WTMP (hereafter referred to as a Wireless Master Plan or WMP) for the City of Grand Junction (City), Mesa County (County) and the Grand Junction Regional Communication Center (GJRCC). The WMP will serve as a general planning tool for the City, County and GJRCC. CityScape works exclusively for public agencies to address these identified concerns. CityScape specializes in developing land use strategies to control the proliferation of wireless infrastructure, affording the maximum control for local governments, while maintaining compliance with State statutes, the Telecommunications Act of 1996, Middle Class Tax Relief and Job Creation Act of 2012 and subsequent federal regulations.

The WMP is intended to balance the goals of providing good wireless network services throughout the defined study areas while minimizing the visual impacts of the telecommunications infrastructure. It is an illustrative planning tool and guide for developing planning policies for future wireless communications infrastructure. The WMP includes a framework for maximizing network coverage while minimizing the future number of new telecommunication facilities; and suggestions for design standards that will guide decisions about the siting of future communication facilities.

The WMP provides a short history on wireless telecommunications technology, an overview on network deployment practices, an inventory of existing wireless infrastructure throughout the City and County, theoretical propagation mapping, 10-year projection maps of potential future network deployment patterns and recommendations for meeting future network deployment objectives over the next 10 to 15 years.

(b) WMP Study Areas and Tasks. There are nine geographic regions identified as study areas:

- The City of Grand Junction (the 201 Service Boundary was used to approximate the boundaries of the City because of the irregular boundary created by noncontiguous annexations of property into the City limits)
- Study Area A: City of Fruita (Lower Valley), Town of Palisade, Town of DeBeque
- Study Area B: Glade Park, Gateway, Whitewater, Town of Collbran
- Study Area C: Corridors (Interstate 70 and Highway 50)

The scope of services includes the following six tasks:

- Task A: Preliminary research and data assessments.
- Task B: Infrastructure assessments; kick-off meeting; and theoretical root mean square (RMS) mapping.
- Task C: Theoretical propagation mapping based on participant responses at kick-off meeting.
- Task D: Design and development of draft master plan; draft ordinance review and amendment recommendations; and technical meeting.
- Task E: Public meetings and presentations of draft documents.
- Task F: Final documents.

(Ord. 4703, 6-1-16)

Article IA

The Telecommunications Industry

§ 31.12.030. Introduction.

Telecommunications is the transmission and/or reception of radio signals, whether it is in the form of voice communications, data, digital images, sound bites or other information, via wires or space on radio frequencies, using satellites, microwaves, or other electromagnetic systems. Telecommunications includes the transmission of voice, video, data, broadband, wireless and satellite technologies and others.

Traditional landline telephone service utilized an extensive network of copper lines to transmit and receive a phone call between parties. As the communications industry evolved, modified copper wire circuit or T-carrier (T-1) lines were developed to add capacity, bandwidth and speed to the standard copper wire line. However, copper-based technology, in any form, is insufficient to support the ever increasing service demands. With today's technology, the only methods available to achieve the necessary bandwidth and speed for data transfer is to utilize fiber optic or microwave technology for backhaul. Backhaul is the network interconnection that links individual network nodes together through the core network backbone. The lack of fiber or microwave currently is a limiting factor for true high-speed telecommunications.

Wireless telephony, also known as wireless communications, includes mobile phones, pagers, and two-way enhanced radio systems. It relies on the combination of landlines, cable and an extensive network of elevated antennas – most typically found on communication towers to

transmit voice and data information. The evolution of this technology has progressed through advances referred to as first, second, third and fourth generations (1G through 4G) of wireless deployment. Fifth generation (5G) wireless is expected to exponentially expand wireless network capacity by incorporating new transmission technologies and a wide range of frequency spectrum between 600 megahertz (MHz) and 24 gigahertz (GHz). Advanced technologies with 5G will result in much quicker download speeds for smartphones and other smart devices, and machine-to-machine (M2M) data transmission between automotive vehicles and between pieces of equipment in industries such as transportation and logistics, home health care, manufacturing and public safety.

(Ord. 4703, 6-1-16)

§ 31.12.040. Wireless handset evolution.

1G, 1984 Mobria Cell Phone
(Image: J Bundy)

During the early 1980s, the first generation, consisting of 850 megahertz (MHz) band cellular systems, was launched nationwide. The 1G portable cell phones were boxy in shape and operated much like a small AM or FM radio station. The 850 MHz frequency (i.e., low band) allows the radio signal from the antenna on the tower to travel beyond five miles, depending on topography and line-of-sight conditions between the towers. Customers using a cell phone knew when they traveled outside of the service area because they would hear a static sound on the phone similar to the sound of a weak AM or FM radio station. The signal either faded or remained crackling until the subscriber was within range of another facility.

Originally, the 850 MHz band only supported an analog radio signal. By 2010, 1G had been phased out of network design in most urban markets, but still serves as a platform of initial coverage in remote and undeveloped areas – including large areas identified in Study Area B of Mesa County.

The 1990s marked the deployment of second generation technologies, consisting of the 1,900 MHz band (i.e., high band) Personal Communication Systems (PCS) and Enhanced Specialized Mobile Radio (ESMR) commonly referred to as Nextel, that operated in the 800 MHz band. Nextel and 2G cellular wireless technology was developed primarily to allow for simultaneous phone calls over a digital signal, on both 850 and 1,900 MHz, that were audibly clearer than those made with an analog signal. The handsets were much smaller than the 1G cellular phones and the first handsets provided low speed data services such as paging and

limited text messaging through the handheld unit. However, 2G had some network functionality trade-offs. The technology offered a static free signal but with a higher rate of disconnects or dropped calls. The network solution to reduce the number and frequency of dropped calls required significantly more base stations and towers for several reasons: First, the propagation signal in the high band does not travel as far as the low band signal. Thus, the number of required facilities almost tripled just to provide basic 2G coverage in the same geographic area as a 1G service area. Second, the industry was reluctant to share tower space with a competitor and many service providers resisted co-locating on the same tower. And third, subscriber base and usage grew rapidly so the industry needed more sites to improve network coverage demands by their customers.

2G Phone (left)
4G Phone (right)
(Image: Answers.com)

Third generation (3G) wireless was launched in the early 2000s and offered improved mobile download speeds and increased penetration of signal strength for indoor environments. This technology also permits multimedia messaging (MMS) which increased the character limit on text messaging, allowed photo transfer and provided elementary video conferencing.

Fourth generation (4G) wireless handsets were introduced in 2010 and offered a wide variety of new tools and services that provided access to email, news, music and videos. Newer technologies incorporated better cameras for still photos and video, global positioning services (GPS), Internet commerce, and millions of downloadable applications for just about any use.

Advancing technologies in 2015 resulted in new smartphones and tablets that support video streaming and remote access to Internet-based cloud data storage both of which require large amounts of bandwidth. Service providers continue to upgrade existing networks by: 1) adding additional base stations and towers to improve and increase network capacity; 2) purchasing additional licenses in the 700, 1,700 – 1,800, and 2,100 – 2,400 MHz frequencies; 3) upgrading equipment at the towers and base stations and adding more antennas and feed lines; and 4) adding remote radio heads (RRH) on towers to increase signal strength and capacity.

One of 4Gs greatest advancements is the transition to Long Term Evolution (LTE) services as the global cellular network operating standard. Network operating platforms nationally and internationally were fractured during the implementation of 3G networks because of the

adoption of Time Division Multiple Access (TDMA) and Code Division Multiple Access (CDMA) as competing operating platforms. The universal LTE and LTE-Advanced platforms will promote efficient use of spectrum, faster download speeds and continued use of smart devices across the United States and throughout the world. The need for additional 4G infrastructure is significant nationwide and the continued deployment of new towers and base stations will be necessary as the industry transitions to fifth generation (5G) networks sometime around 2019-2020.

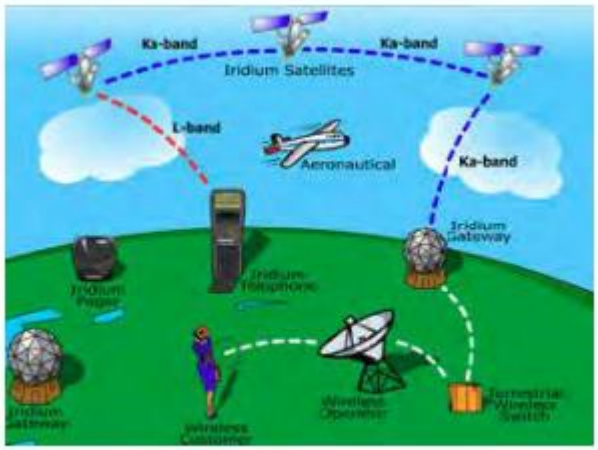
In summary, 1G and 2G provided the initial launch of personal wireless service. Third generation improved data transfer with the addition of MMS, 4G increased speeds and capacity and 5G deployments will focus on implementation of full broadband service. Fourth generation network technology (the platform for smartphones) emphasized improving network capacity and maximizing the use of bandwidth for faster and more efficient transfers of data. Fifth generation standards are in the design phase and will be implemented when gigahertz spectrum is available and backhaul systems utilizing fiber optic networks are available. The improved network speeds and bandwidth of 5G are anticipated to be sufficient to compete directly with computer networks with average Internet download speeds at or above the 100 Megabits per second (Mbps) range. Fifth and sixth generation (5G and 6G) advancements over the next 30 years will allow all forms of communications and entertainment to be streamed resulting in the eventual elimination of digital subscriber lines (DSL) and cable/satellite TV; and will provide the underlying communication technology that will allow vehicles to drive themselves. Like all previous generations, 5G and 6G will require more wireless infrastructure.

(Ord. 4703, 6-1-16)

§ 31.12.050. Satellite technologies.

The growth of satellite usage has surpassed the highest expectations of only a few years ago. The reason is simply lower cost. Previously, relaying information, data, and other related materials was cumbersome and required many relay stations in very specific locations and in relatively close proximity. Initially satellite use was expensive because of the limited amount of airtime that was available. Satellite airtime has become more affordable with the deployment of additional satellites, increased competition and advanced technologies that allow more usage of the same amount of bandwidth. In addition, satellite service providers are in the early stages of increasing the number of localized networks which will contribute to the already rapid growth.

Several licensees of satellite services such as Sirius XM Radio and a number of satellite telephone service providers successfully petitioned the Federal Communications Commission (FCC) to allow deployment of additional land-based supplemental transmission relay stations so that they can compete more aggressively with existing ground-based services and overcome the obstacles typical to satellite technology. Subscribers found the delay, fade and signal dropout between interactive devices to be unacceptable. Sirius XM Radio has been successful in obtaining ground-based supplemental transmitter rights and has become one of the alternative subscribers of ground-based transmitter networks.



Iridium Satellite Routing System
(Image: wcclp.com)

(Ord. 4703, 6-1-16)

§ 31.12.060. Transmission equipment.

(a) On May 18, 2015, the Federal Communication Commission (FCC) announced and published notice of "The Wireless Infrastructure Report and Order", which defines transmission equipment to be:

any equipment used in connection with any Commission-authorized wireless transmission, licensed or unlicensed, terrestrial or satellite including commercial mobile, private mobile, broadcast, and public safety services, as well as fixed wireless services such as microwave backhaul or fixed broadband.

(b) Wireless transmission equipment is comprised of four main apparatus:

(1) An electronic equipment cabinet;

(2) Feed lines;

(3) Antenna or antenna array; and

(4) An antenna support facility such as a tower or base station.

(Ord. 4703, 6-1-16)

§ 31.12.070. Equipment cabinet and feed lines.

Electronic equipment used to transmit and receive the radio signals from the antenna is installed within an equipment facility including, but not limited to, cabinets, shelters, pedestals or other similar enclosures. Copper coaxial cable (coax) or fiber optic (fiber) feed lines are used to connect the antenna with the ground-based equipment. The equipment cabinets and feed lines shown in Figure 1 are typical for service providers operating in the

high band frequencies and ground space requirement for this equipment is around 10 square feet.

Figure 1: Example of High Band Wireless Infrastructure Ground Equipment

The electronics equipment used with low band systems generates substantial heat, so the shelters which house the ground equipment are much larger and generally need a minimum of 400 square feet. The only noise that would typically be generated in the vicinity of any tower or base station would be from an air conditioner or a backup generator that automatically starts in the event of a power failure. Figure 2 shows a typical configuration for low band ground equipment.

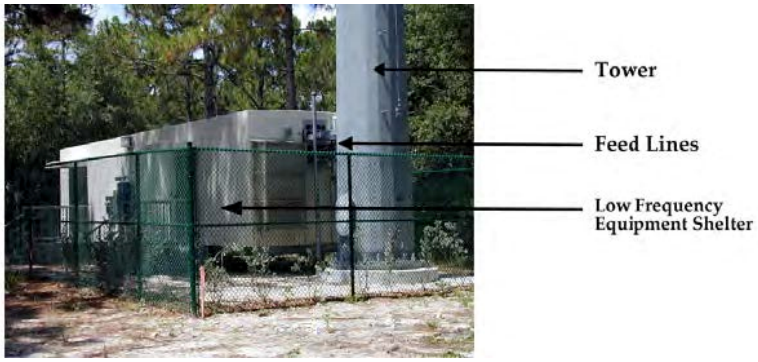


Figure 2: Example of Low Band Wireless Infrastructure Ground Equipment

(Ord. 4703, 6-1-16)

§ 31.12.080. Antennas and antenna arrays.

Antennas are used for both transmitting and receiving signals. Examples as shown in Figure 3 include: a single omni-directional (whip) antenna that can be used to transmit and/or receive two-way radio, ESMR, cellular, Personal Communications Service (PCS), or Specialized Mobile Radio (SMR) signals. A sectionalized panel antenna array can be used for transmitting and receiving cellular, digital or ESMR wireless telecommunication signals. Each antenna or antenna array is connected to the ground equipment cabinet via a feed line.

Microwave dish antennas and fiber optics cable are used for backhaul. Backhaul is used by service providers to send the signal received by the antenna to the supporting network and vice versa. Point-to-point microwave antennas are used to provide backhaul capabilities over

greater distances than are possible between the primary antennas on towers and base stations. Microwave is frequently used as backhaul throughout Mesa County to connect the towers in the urban areas like Grand Junction to towers in remote locations such as Gateway and Palisade Point.

Most service providers are now mounting a power amplifier unit on the tower close to the antenna. The top mounted amplifiers (TMA) and remote radio units (RRU) provide greater efficiencies and better service in both transmitting and receiving modes. However, these improvements come at the cost of higher visual impacts caused by the increased amount of tower-mounted equipment mounted high on the towers.

Figure 3: Examples of Panel, Directional and Microwave Antennas

(Ord. 4703, 6-1-16)

§ 31.12.090. Transmission equipment, towers and base stations.

Antennas can be mounted on a variety of structures referred to as wireless towers or base stations. As defined in the FCC Report and Order, a wireless tower is “a structure built for the sole or primary purpose of supporting any Commission-licensed or authorized antennas and their associated facilities”. Examples of nonconcealed towers are monopoles, lattice and guy towers and shown in Figure 4.

Self-Support Monopole Tower

Self-Support Lattice Tower

Guy Tower

Figure 4: Examples of Nonconcealed Antenna Support Facilities

As defined in the FCC Report and Order, a base station is "equipment and non-tower supporting structure at a fixed location that enable Commission-licensed or authorized wireless communications between user equipment and a communications network". Examples of base stations are buildings, water tanks, tall signage and light poles; provided, that (1) the structure is structurally capable of supporting the antenna and the feed lines; and (2) there is sufficient ground space to accommodate the base station and accessory equipment used in operating the network. Examples of nonconcealed base stations are shown in Figure 5.

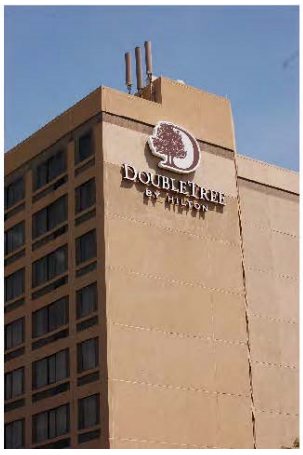


Figure 5: Examples of Nonconcealed Base Stations

(Ord. 4703, 6-1-16)

§ 31.12.100. Concealment options.

Base stations and towers can be concealed. Antenna concealment techniques include faux dormers and chimneys, elevator shafts encasing the antenna feed lines and equipment cabinet, and painted antenna and feed lines to match the color of a building or structure. Example of base station concealment techniques are shown in Figure 6.

Figure 6: Examples of Antenna Concealment Techniques

A concealed tower is not readily identifiable as a wireless facility. In slick sticks, banners and flagpoles and three-legged poles the antennas are covered by fiberglass shields; and on faux trees the monopole and antennas are painted and surrounded by faux branches. Partially concealed towers include modified braces and brackets on the lattice towers and painted monopoles. Dual purpose towers include light stanchions and poles added within an existing utility tower. Figure 7 provides examples of this type of concealed infrastructure.

CityScape conducted a WMP kick-off meeting on June 30, 2015, and participants were asked for feedback on their preference for different types of infrastructure. Participants voted on the type of infrastructure they preferred to see in both rural and urban areas. The kick-off meeting presentation was made available on the City and County's web sites and citizenry who could not attend the meeting could vote on infrastructure preferences online.

The results of the voting are shown in Table 1. In both the urban and rural areas the monopole was chosen as the most preferred nonconcealed tower type; concealed base stations are preferred over nonconcealed equipment and the use of utility poles is preferred over building a new free standing tower. Concealed dual purpose types of towers are preferred in the urban areas and slick sticks, faux trees and tower wrapping is preferred for the rural and undeveloped study areas.


Slick Stick


Flag Pole


Three Legged Pole


Faux Tree


Banner & Light Pole


Modified Lattice Tower


Light Stanchion


Dual Function Utility


Painted Monopole

Figure 7: Examples of Concealed, Partially Concealed and Dual Purpose Towers

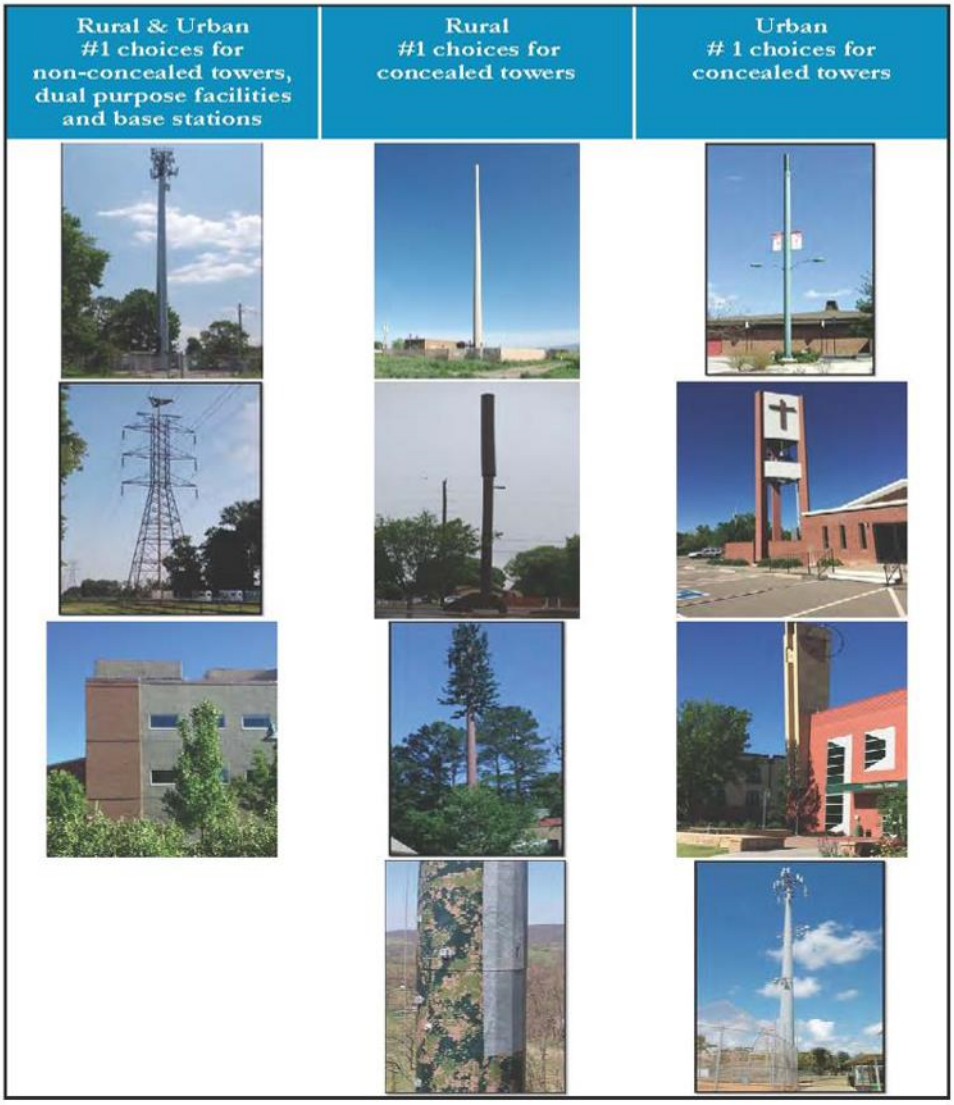


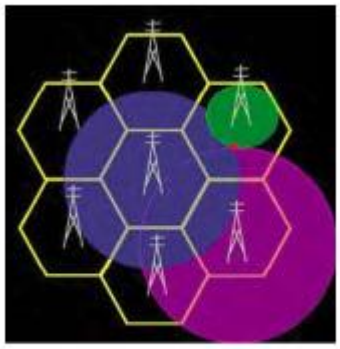
Table 1: Preferences of Types of Infrastructure

(Ord. 4703, 6-1-16)

§ 31.12.110. Wireless infrastructure.

To design the wireless networks, radio frequency (RF) engineers overlay hexagonal cells representing circles on a map to create a grid system. These hexagons represent an area equal to the proposed tower or base station coverage area. The center of the hexagon pinpoints the theoretical "perfect location" for a tower or base station (antenna support facility). Next, coverage predictions are added from the tower or base station within the hexagon. The propagation pattern is generally circular and the size of the coverage area is affected by many variables such as antenna mounting elevation, topography, land cover, and size of the immediate subscriber base. The illustration shows a smaller coverage area in green and the largest coverage area in purple. The difference in coverage areas could be caused by the antenna mounting elevations at each site (i.e., a lower antenna mounting elevation on the

tower in the green circle and a higher mounting elevation on the tower in the purple shaded circle; or differences in cell type (macro, micro, pico, distributed antenna system (DAS etc.) network capacity or topography. The grid system models are unique to each service provider and maintained by each individual wireless provider's engineering department.



Hexagonal Grid with Circular Coverage from a Tower or Base Station
(Image: 5freshminutes.IT)

(Ord. 4703, 6-1-16)

§ 31.12.120. Antenna network capacity.

The number of towers and/or base station sites located in a network grid not only determines the extent of geographic area covered, but also determines the number of subscribers (customers) the system can support at any given time. Each provider is different, but a given provider can only process or turn over a certain number of calls per minute and only a certain number of calls can occur simultaneously. These limits on service availability are referred to as network capacity. As local wireless customers, tourists and other users of applications increase, so does the need for network capacity. When the network capacity reaches its limit, a customer will usually experience a degradation of service such as a dropped call, a delayed text message or prolonged timeframe to access the results of an application request.

As the wireless network reaches design network capacity, it causes the service coverage area to shrink, further impacting wireless service objectives. Network capacity can be increased several ways. The service provider can shift channels from an adjacent site, or the provider can add additional towers and base stations with additional infrastructure.

A tower added to provide additional capacity in an area that already has network coverage is referred to as a "capacity tower." A capacity tower or base station provides additional calling resources that enhance the network's ability to serve more wireless phone customers within a specific geographic area. An assumption behind the capacity tower or base station concept is that an area already has plenty of radio signal propagation from existing coverage towers or base stations and the signals are clear. Too many calls sent or received through the existing towers or base stations result in "no service" indicators for subscribers who attempt to place a call.

According to a CTIA-The Wireless Association® indices report dated June 2014, the number of wireless devices deployed now exceeds the population of the United States. This does not mean that every person has a cell phone; rather, many people will have more than one wireless device. For example, many people have both a smartphone and a tablet. Subscriber density for 3G and 4G coverage areas determines how far apart towers and base stations can be without impacting service. Current network design standards, based on local wireless penetration rates and usage, say that each site should handle between 1,750 and 2,500 devices. As the number of wireless devices increases in a given service area and as the amount of high bandwidth applications (i.e., streaming video) usage increases, coverage areas shrink and the number of subscribers must also be reduced by service providers to avoid overloading their systems.

Wireless broadband is the transmission of high-speed wireless data over the same medium that was previously only intended for voice communications. It is not limited to smartphones and tablets. It can also be for computers, laptops and other wireless devices. The FCC recently revised the definition of "broadband" to mean Internet access with download speeds of at least 25 Mbps and upload speeds of at least three Mbps. Because of this revised standard there are few wireless service providers that can effectively meet these speeds today. Many wireless broadband providers today do not meet this revised standard. For purposes of this discussion, the term "broadband" will also encompass current technologies that do not quite meet the new standard today. The 3G and 4G wireless deployments added the capability of wireless data networks, now including the 700 and 2,400 MHz frequencies, but many service providers are using their designated voice channels for broadband.

Wireless services are in a rapidly changing industry. Newer wireless handsets (smartphones) can communicate via voice (phone) and via the Internet using Voice over Long Term Evolution (VoLTE). Some service providers such as Clearwire and other smaller regional companies provide wireless data/Internet, but not traditional voice service to its subscriber base as an alternative.

The infrastructure for wireless broadband is similar to that used for wireless phone service: a separate elevated antenna for each service provider. The area covered by one antenna shrinks in order to maintain an acceptable download speed for customers in the area resulting in the need for more wireless infrastructure to cover the same geographic area. For example, the number of tower sites needed to cover an area of approximately five square miles in Mesa County depending on the network technology used and during maximum usage periods is:

- 1G – Analog (1 site)
- 2G – Digital TDMA (3 sites)
- 3G – CDMA/Email/MMS (5 sites)
- 4G – Smartphones/LTE/AWS (8 sites)

(Ord. 4703, 6-1-16)

§ 31.12.130. Conclusions.

Wireless handsets used for personal wireless services have changed significantly from the initial launch of cellular phones in the 1980s. The traditional infrastructure that serves as the network backbone for these handsets has not changed nearly as much from a visual

perspective. The wireless networks still need elevated antennas that are above tree lines, rooftops and any manmade or natural obstructions to transmit and receive communication signals between wired and wireless devices. Moisture contained within foliage absorbs and refracts the signal and creates an unpredictable propagation variable. This will always be a factor when designing wireless systems as the propagation characteristics do not change within the current transmission standard. Wireless antennas can function below the tree line but not at the same performance level when compared to antennas placed above the tree line at the same location. For this reason, the industry will continue to prefer placement of their antenna arrays above the tree line or in a favorable location with few manmade obstructions to achieve optimal propagation from the infrastructure and maximize their investment in the communities they are servicing. The antenna sizes used have changed minimally over the years. Recent inclusion of remote radio heads and tower-mounted amplifiers on the antenna mounting structure will generally result in larger and more complex antenna arrays as compared to the earlier 2G and 3G installations.

The structures on which the antennas are mounted have changed very little, other than generally becoming shorter. The monopole and lattice towers remain the most widely used tower infrastructure nationwide. Concealment techniques continue to be used to mitigate the visual impact of towers in areas identified by local governments as a concern.

Mergers and acquisitions (such as Cingular and AT&T, Sprint and Nextel, T-Mobile and MetroPCS) bring about a temporary downsizing and consolidation of infrastructure by combining electronic resources at existing sites and by enabling the reuse of the same frequencies more efficiently. Overall the industry will continue to need more infrastructure for the transition to 5G and beyond.

(Ord. 4703, 6-1-16)

Article II
Master Plan Development

§ 31.12.140. WMP design process.

The WMP evaluates wireless coverage throughout the nine study areas by:

- Identifying, assessing, cataloguing and mapping exiting transmission equipment; and
- Designing an engineered search radii template and applying it over the jurisdictional boundary of the City and County to evaluate theoretical build-out conditions; and
- Forecasting future infrastructure needs based on the status of the existing deployments' population trends and gaps in network coverage.

(Ord. 4703, 6-1-16)

§ 31.12.150. Existing transmission equipment, stakeholders and inventory.

Prior to the granting of the cellular licenses in 1980 for the first phase of deployment, the United States was divided into 51 regions by Rand McNally and Company. These regions are described as Metropolitan Trading Areas (MTA). The spectrum auction conducted by the Federal Government for the 1,900 MHz bands for 2G (PCS) further divided the United States into 493 geographic areas called Basic Trading Areas (BTA). Mesa County (including all

incorporated and unincorporated areas) is located in the "Denver" MTA (a.k.a. MTA 22) and the "Grand Junction, CO" BTA (a.k.a. BTA 168). Service providers acquire the rights to deploy their networks by service area and range of spectrum frequency.

Per Section 704 of the Telecommunications Act of 1996, all service providers will require uninterrupted and continuous handoff service throughout the City and County. There are 11 known service providers that will each want to compete for the subscriber base in and around the City of Grand Junction and Mesa County. Each of these wireless voice and data providers will need towers and/or elevated antenna mounting locations to improve network coverage and capacity that will result in an ongoing need to deploy more infrastructure, especially in areas of greater residential density.

The following service providers have purchased licenses to serve all incorporated and unincorporated areas of Mesa County in the lower frequency ranges of 700 – 900 MHz: AT& T; Access 700, LLC, Dish, T-Mobile, Union Telephone (Union Cellular) and Verizon Wireless. Personal Communications Services (PCS) licensees and service providers for wireless phone and broadband operating in the higher frequencies of 1,700 – 2,700 MHz bands include: AT&T Wireless, Atlantic Wireless, Cleartalk, Clearwire Spectrum Holdings III, LLC, Commnet Wireless, LLC, Leaco Rural Telephone Cooperative, Inc., Sprint, T-Mobile and Verizon Wireless.

Most network service providers do not own the antenna mounting structure on which they attach their equipment. Tower companies typically construct and own the monopole, lattice or guyed towers and lease space on the towers to service providers. A service provider may also contract with a tower builder to construct a tower in a particular location and once the facility is constructed lease space on the newly constructed tower from the tower owner. Throughout Mesa County there are a number of tower companies who own and lease their vertical real estate to the service providers including American Tower Corporation (ATC), Crown Castle International (CCI), The Leasing Company, SBA and others.

(Ord. 4703, 6-1-16)

§ 31.12.160. Existing antenna locations.

(a) Tasks A and B of the scope of services include research to gather antenna and tower location data in order to develop initial transmission equipment location base maps. The City and County GIS Departments provided some existing facility locations to CityScape. Additional infrastructure locations were obtained by CityScape from tower owners and various databases including the FCC's database. Once the sites were mapped, each site was individually assessed and validated for:

(1) Physical location of existing telecommunications facilities currently within the defined study areas;

(2) Type of infrastructure;

(3) Ownership of the infrastructure; and

(4) Potential for future provider equipment co-location on the existing structures.

(b) The assessment included an in-person visit to each of the transmission equipment locations. While there are many types of antennas used for a variety of communication purposes throughout the defined study areas (dispatch, wifi hot spots, broadcast etc.), CityScape generally only included infrastructure sites in the inventory that met the following criteria:

(1) Towers and base stations that currently support wireless and/or cell coverage and broadband infrastructure as referenced in the EDP;

(i) Personal wireless service facilities (PWSF) meaning any staffed or unstaffed location for the transmission and/or reception of radio frequency signals or other wireless communications, including commercial mobile services, unlicensed wireless services, wireless broadband services, and common carrier wireless exchange access services as defined in the Telecommunications Act of 1996, and usually consisting of an antenna or group of antennas, transmission cables, feed lines, equipment cabinets or shelters, and may include a tower. The following developments shall be deemed a PWSF: new, replacement, or existing towers, public towers, replacement towers, co-location on existing towers, base station attached concealed and nonconcealed antenna, concealed towers, and nonconcealed towers (monopoles, lattice and guyed);

(2) Towers and base stations with microwave dish antenna because of their potential to promote co-location;

(3) Broadcast towers because of their potential to promote co-location; and

(4) Towers in remote locations because of their potential to either promote co-location or to be reconstructed to accommodate future co-locations.

(c) The wireless infrastructure assessment identified 142 existing transmission equipment sites that meet the prescribed criteria within the nine study areas. Also included in the assessment are 10 sites within a 1.5 mile perimeter of the County boundary. These locations were included because their signals may affect service within the defined study area. *Fifteen sites contain multiple towers so the number of towers exceeds the total number of sites.*

(d) Table 2 provides a summary of the total number of types of antenna mounting structures found throughout the study areas and Table 3 identifies the ownership of the infrastructure as of January 2016.

Table 2: Type of Infrastructure Summary

TYPE OF INFRASTRUCTURE	TOTAL
Lattice Tower	69
Guyed Tower (includes 2 guyed monopoles)	47
Base Station (rooftop or water tank)	16
Monopole Tower	14
Concealed	6

Table 2: Type of Infrastructure Summary	
TYPE OF INFRASTRUCTURE	**TOTAL**
Self Support	5
Wood Pole	4
Approved But Not Constructed	4
TOTAL	**165**

Table 3: Owner of Infrastructure	
INFRASTRUCTURE OWNER	**TOTAL**
Others (independent tower owners and/or local businesses)	46
Other Government Agencies (City, County, State, BLM, DOI)	17
Broadcast Companies	20
SBA	19
Unknown	19
American Tower Corporation	7
Crown Castle International	5
Verizon Wireless	5
The Leasing Company	3
AT&T	2
TOTAL	**142**

(Ord. 4703, 6-1-16)

§ 31.12.170. Search area within proposed coverage areas.

Wireless location search rings are usually calculated to be circles approximately one-quarter of the radius of the proposed cell. In practice it is fairly simple to determine whether the calculated search ring radius is reasonable. The distance from the closest existing site is determined then halved and a handoff overlap of about 20 percent is added. One fourth of this distance is the search ring radius. Generally, in areas where signal coverage is the objective, taller towers allow the antenna to service a larger geographic coverage area and provide more potential for equipment co-locations by other service providers. Shorter tower heights limit the geographic coverage area and reduce the number of possible co-locations resulting in a greater number of towers required within each search ring.

The search area or search ring for new wireless infrastructure is part of a package provided to a site search consultant who looks for property that can be leased to accommodate the required wireless antenna and related infrastructure, whether that be a new tower, a rooftop or other existing structure. From an engineering perspective, any location within the search ring is considered to be acceptable to the provider after considerations are made for terrain and sometimes population distribution. The relative location of the selected property to the ideal location within the search ring will dictate the required antenna height.

(Ord. 4703, 6-1-16)

§ 31.12.180. Search area radii.

Search ring calculations for the low and high band frequencies are shown in Tables 4 and 5. The tables utilize the "Okumura-Hata" propagation path loss formula for low band, and the "COST-231" formula for high band. Maximum coverage radii for typical in-vehicle coverage is calculated for various tower heights, reduced by 20 percent to account for a reasonable handoff zone, then divided by four to obtain a search ring radius for each tower height. For example, according to the information in the following tables, a low band antenna mounted at the 100-foot elevation would have a search ring radius of 0.72 miles, and a radius of 0.36 miles for high band antennas.

Table 4: Okumura-Hata Coverage Predictions for 700 – 900 MHz

ANTENNA MOUNTING HEIGHT	50'	100'	115'	150'
Radius, miles	2.53	3.6	3.88	3.91
Allow for handoff	2.03	2.88	3.1	3.6
Search ring, miles	0.51	0.72	0.78	0.9

Table 5: COST 231 Coverage Predictions for 1,700 – 2,100 MHz

ANTENNA MOUNTING HEIGHT	50'	100'	115'	150'
Radius, miles	1.33	1.82	1.95	2.32
Allow for handoff	1.07	1.46	1.56	1.79
Search ring, miles	0.27	0.36	0.39	0.45

Tables 4 and 5 represent theoretical predictions and each facility will vary somewhat from these estimates.

(Ord. 4703, 6-1-16)

§ 31.12.190. Tower height and antenna mounting elevation considerations.

Taller structures (towers, rooftops, and water tanks) may offer more opportunity for co-location which could theoretically decrease the number of additional towers and antennas required in an area, but capacity issues may overcome the advantage of the taller structure. Each potential structure must be subjected to a radio frequency (RF) engineering review to determine the extent to which height will increase co-location opportunities. In geographic areas where there is a large wireless phone subscriber base or terrain concerns, build-out plans may require lower antenna mounting elevations. Antennas located at higher points on the support facility are more common in rural areas. In some cases, wireless providers limit the antenna placement height in more populous geographic areas because they need multiple antennas installed at differing heights on a single tower to target specific locations or to reduce the potential for interference with other equipment on the structure.

CityScape is often asked to estimate how many towers and base stations it will take to cover a particular geographic area. Because of the number of factors that might affect the coverage for a given service provider, CityScape uses theoretical root mean square (RMS) maps to help the client visualize the number of antenna locations that may be necessary to provide wireless communications coverage for a given geographic study area. This hypothetical network identifies the minimum number of tower or base station locations required for one service provider to provide complete coverage without any considerations for terrain, vegetative cover or subscriber base.

One of the key variables affecting the theoretical coverage analysis is the assumed height of the antenna on the tower or structure. CityScape reviewed the existing tower inventory and applicable height regulations for the City and County and determined the average tower height of the towers used for wireless telecommunications purposes to be around 118 feet. Therefore, the antenna mounting elevation of 118 feet was chosen for the development of the theoretical RMS coverage maps.

According to the Okumura-Hata propagation path loss formula coverage for low frequency (i.e, 800 MHz), a reasonable coverage area for an antenna mounted for cellular deployment at 118 feet on flat terrain is about 3.88 miles from the antenna. Referring to the “COST-231” formula for 1,900 MHz a reasonable coverage area for an antenna mounted at 118 feet for a high band site on flat terrain is approximately 1.95 miles. The coverage reduction from 3.88 miles to 1.95 miles reflects the variable change from low to high band frequency.

Figures containing the theoretical maps for both low and high band frequencies, for each study area, can be found in Article III of this chapter, Study Areas.

(Ord. 4703, 6-1-16)

§ 31.12.200. Inventory mapping.

Mapping the existing antenna sites creates a base map from which observations and analysis can be derived relative to current and future deployment patterns. Generally, most of the wireless infrastructure in Mesa County is located within and around the more urban study areas, particularly the City of Grand Junction, Lower Valley, Palisade, DeBeque and the I-70 corridor. Whitewater is the only rural study area with a larger concentration of infrastructure because of the Highway 50 corridor and the larger subscriber base in that area. Minimal or no

wireless network coverage was found for the undeveloped areas within the County's zoning jurisdiction.

Maps of the existing and proposed tower infrastructure and a site data table are provided in Article III of this chapter, Study Areas, for each individual study area. A complete listing including photographs of the verified infrastructure is provided in the January 16, 2016, inventory document.

(Ord. 4703, 6-1-16)

§ 31.12.210. Theoretical composite coverage from existing antenna locations.

The next step in the network evaluation process is to examine the coverage from all known antenna locations to identify gaps in network coverage. For the purposes of this WMP, CityScape has chosen to use theoretical composite propagation modeling.

Propagation modeling is a process that uses mapping techniques to illustrate the expected level of cellular coverage theoretically provided from one or more antenna sites, based on reliable service factor most of the time. Relative signal strength is displayed in color bands to illustrate the anticipated coverage provided by each antenna. Signal strength, in this application, is a term used to approximate the level of operability and quality of service of a wireless device. The stronger the signal at the mobile device the better functionality it will have. A reduced signal lessens the quality of the call or data usage and can result in dropped calls, lack of or slow connectivity or frozen video. Distance between the mobile device and facility, intervening obstructions such as trees or buildings, and whether or not the subscriber is indoors or outside are all significant factors that affect signal strength and quality of service.

The level of propagation signal strength is shown for low band services in yellow and high band services in blue. These colors represent a generally acceptable and reliable signal level for indoor use for both low and high bands of service. Indoor usage is used as the lowest acceptable service threshold due to the signal loss that occurs from building penetration when compared to in-vehicle or outdoor pedestrian usage. Generally, the closer the mobile device is to the antenna, the more reliable and acceptable the service. The further the mobile device is from the antenna, and the closer it is to the edge of coverage, the more prone it is to service degradation when cellular usage on the tower becomes saturated or environmental conditions vary.

Theoretical composite propagation maps include terrain, vegetative cover, and current population density variables in the coverage calculations. The antenna mounting elevation is assumed to be at the highest mounting elevation of towers and base stations where the heights are known and at the average height of 118 feet for structures of unknown height. The resulting composite maps are included in the analysis provided in Article III of this chapter, Study Areas.

(Ord. 4703, 6-1-16)

§ 31.12.220. Network capacity, wireless network planning and future tower site projections.

Service providers use base population estimates and subscriber data to design their network, to decide how many antennas are needed and to determine how far apart antennas should be located. Depending on the number of wireless subscribers connected to a given antenna (i.e., the local wireless penetration rate) and each device's usage, a given site has the capacity to provide service to between 1,750 and 2,500 devices. As the number of wireless devices increases and/or usage increases (particularly for more data intensive applications like social media, music and video streaming), the geographic area covered by the antenna decreases and the number of subscribers served by the facility must be reduced into order to avoid overloading the system and impacting data transfer speeds. Based on the expected increases to both subscriber rates and usage over the next 10 years, the current facility design model of 1,750 to 2,500 devices per site will shrink to between 500 to 1,200 devices per site, depending on the provider, services offered, and the number of overall subscribers. Because of this shrinkage, the number of towers and base stations needed to provide coverage to the same geographic area will increase dramatically over the 10-year period covered by this study.

The shrinkage in propagation signal pattern resulting from projected technology changes, increases in subscribers, and the usage demand caused by new applications is shown in a second set of composite maps included in Article III of this chapter, Study Areas. These maps illustrate how the network coverage patterns for a single high frequency service provider are expected to shrink over the next 10 to 15 years.

The resulting areas with no service, gaps in service, and average/acceptable service are also areas of particular planning interest in the coming years. Comparing the current coverage maps with the 10-year projection in undeveloped areas shows minimal change in future demand. However, comparing maps in more urban areas shows that coverage gaps will become larger if the network infrastructure is not expanded. The resulting geographic areas with marginal to no service are of particular planning concern over the next 10 to 15 years.

(Ord. 4703, 6-1-16)

§ 31.12.230. Estimation of future antenna sites.

CityScape has estimated, by study area, the number of sites that may be needed for planning purposes over the next 10 to 15 years. The estimates are based on calculations taking into account expected changes in population density, subscriber base and usage, daily transient movement through the given study area and how many calls a tower or base station may simultaneously serve at any given time. The projections include coverage, capacity, and broadband network objectives and take into account the variables of terrain, population and proposed maximum infrastructure height variables. The projection model includes all known existing antenna support structure locations (towers, rooftops, tanks and broadcast towers) for maximum co-location efficiency that reduces the number of new towers required within a given geographic area. These projection maps are also provided in Article III of this chapter, Study Areas.

While the launch date of 5G is unknown, it will happen within the next 10 years and will provide true high-speed data transfer rates in excess of today's broadband download standard

of 25 Mbps. With wireless broadband speeds available on 5G networks, most all types of communications (from voice to computer data) and entertainment (from cable/satellite TV and radio to first run motion pictures) will be available over wireless systems. Few new sites will be built to provide new coverage but to resolve over-capacity issues in an area currently served. Since 5G networks will utilize frequencies much higher than today's 4G networks, coverage areas will be more compressed around the antenna source. Most new towers will be built to place antennas close enough to the end user to deliver the high frequency and high bandwidth speeds needed to meet broadband demands.

Construction of the new sites needed to keep up with advancing technologies and customer demand is not expected to happen evenly throughout the study area. However, over the next 10 to 15 years the cities and County should anticipate that up to 40 new tower or base station sites will be needed. The more populated areas will likely see the development of "small cell" sites. Small cells are individual "nodes" that typically consist of concealed antennas located relatively close together on shorter tower or support structures. For example, small cells can be added to existing light posts and placed every few hundred feet, or may be concealed on shorter buildings. There are many options for small cell design that allow this infrastructure to be connected to form a "mini network" that can handle the high capacity required in the more urban areas.

The cities and County can easily anticipate five to eight co-locations, upgrades or antenna modifications (in any combination) per year over the next 10 years based on expected changes in population density, subscriber base and usage, transient movement through the City and County and how many calls a tower or base station can simultaneously serve at any given time.

(Ord. 4703, 6-1-16)

Article III

Study Areas

§ 31.12.240. Study areas.

(a) The City of Grand Junction and Mesa County, on behalf of the Grand Junction Regional Communication Center (GJRCC), entered into an agreement with CityScape Consultants in May, 2015 to develop a Countywide WMP. CityScape used a three-step process to evaluate wireless coverage and develop a plan.

(1) Identify, assess, catalogue and map existing transmission equipment; and

(2) Design an engineered search radii template and apply it over the jurisdictional boundary of the cities and County to evaluate theoretical build-out conditions; and

(3) Forecast future infrastructure needs based on the status of the existing deployments, population trends, and network coverage gaps.

(b) Nine study areas were identified across the County and detailed analysis was completed for each area creating, in effect, nine mini WMPs which are presented in this article. The nine study areas are shown in Figure 8 and defined and grouped as follows:

(1) Study Area A includes the population centers and surrounding areas of the County:

(i) City of Grand Junction/Persigo 201 Boundary (City of Grand Junction, Appleton, Horizon, Northwest, Orchard Mesa, Pear Park and Redlands);

(ii) Lower Valley (City of Fruita, Fruita Buffer, Loma, Mack, and Lower Valley);

(iii) Palisade (Town of Palisade, Clifton, Palisade Buffer/East OM);

(iv) DeBeque.

(2) Study Area B includes four large, mostly unincorporated areas that receive significant tourists and local traffic:

(i) Glade Park;

(ii) Gateway;

(iii) Whitewater;

(iv) Collbran (Collbran, Plateau Valley, Mesa, Powderhorn).

(3) Study Area C includes the major highway corridors:

(i) I-70 Highways;

(ii) Highway 50;

(iii) Highway 330;

(iv) Highway 65;

(v) Highway 141;

(vi) Unaweep/Uncompahgre.

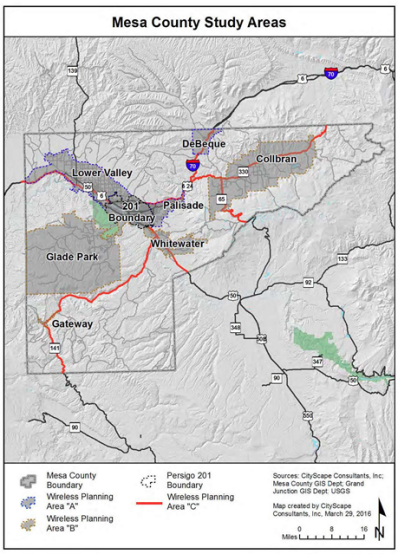


Figure 8: Study Areas

(Ord. 4703, 6-1-16)

§ 31.12.250. PWSF inventory, analysis and mapping by study area.

Countywide, CityScape identified 142 existing transmission equipment sites and 165 towers or base stations that either currently support PWSF installations (i.e., cellular services) or have the potential for supporting PWSF in the future. Some sites have more than one facility. The Wireless Infrastructure Inventory is included as an appendix to the Master Plan. CityScape recommends that the inventory be updated as facilities are added or modified.

Most of the current wireless infrastructure is located within and around the more urban areas of the County; Grand Junction, Palisade, Fruita and the Interstate corridor have the largest concentrations of infrastructure because of the larger subscriber bases in those areas. The more rural and undeveloped areas have minimal or no infrastructure. Table 6 identifies the number of sites that are located within each study area, plus sites within 1.5 miles outside (out) of the study area that may also provide coverage. The "Projected Fill-In" column indicates the number of additional sites that would be needed in each study area to provide best-case coverage, while the "Estimated Build-Out" column shows the number of sites that are more realistically predicted to be built.

Table 6: Inventory Analysis by Study Area

Study Area	Existing Sites		Projected Fill-In (10-15 Years)	Estimated Build-Out (Including Public Safety)
	In	Out		
City of Grand Junction/201 Boundary	50	5	11 – 18	11 – 18
Lower Valley	10	11	7	4

Table 6: Inventory Analysis by Study Area				
Study Area	Existing Sites		Projected Fill-In (10-15 Years)	Estimated Build-Out (Including Public Safety)
	In	Out		
Palisade	4	8	6	6
DeBeque	2	0	3	1 – 3
Glade Park	0	29	9	1 – 4
Gateway	0	3	3	1
Whitewater	5	1	4	2 – 4
Collbran	4	39	15	2 – 4

The current infrastructure inventory and theoretical coverage mapping is provided for each study area in this article. Theoretical composite propagation modeling was used to determine the potential coverage of all existing antenna locations. Then, Geographic Information Systems (GIS) mapping techniques were used to factor in terrain, vegetative cover, and population density to create a more realistic coverage model. Next, CityScape used current and projected population data through 2030 (from the 2010 U.S. Census; Colorado State Demography Office; Regional Transportation Planning Office; and Mesa County) to illustrate the impact that future growth would have on network coverage. Finally, by adding in projected changes related to technology improvements and population growth, CityScape was able to estimate future infrastructure needs for each study area over the next 10 to 15 years. The following pages include the "mini master plans" for each study area.

(Ord. 4703, 6-1-16)

§ 31.12.260. City of Grand Junction characteristics.

(a) Urban.

(b) 63.79 square miles.

(c) 2010 population estimate 102,277.

(d) 2030 population estimate 137,145.

(Ord. 4703, 6-1-16)

§ 31.12.270. City of Grand Junction theoretical root mean square maps.

Given the checkerboard effect on the city limits created when noncontiguous properties are annexed from the County into the City of Grand Junction, the Persigo 201 Boundary area was selected as the study area that best reflects the geographic area for the City. Throughout this document, the Persigo 201 Boundary is used interchangeably with the City of Grand Junction to identify the area generally corresponding to the City of Grand Junction.

Figures 9 and 10 represent a theoretical build-out of equally distributed antennas, mounted at a tower height of 118 feet, in a perfect radio frequency environment for a single service provider that excludes topographic, vegetative cover and population density considerations. The black dot within each larger circle indicates the ideal antenna location. The smaller circle within the larger circle represents the acceptable search ring for locating the tower and antennas.

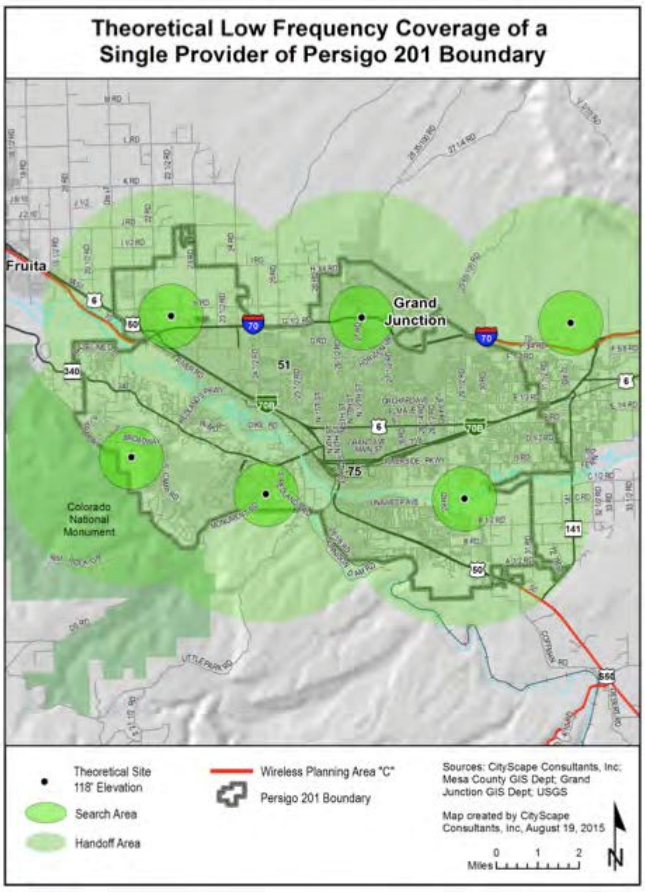


Figure 9: Theoretical Low Frequency Coverage

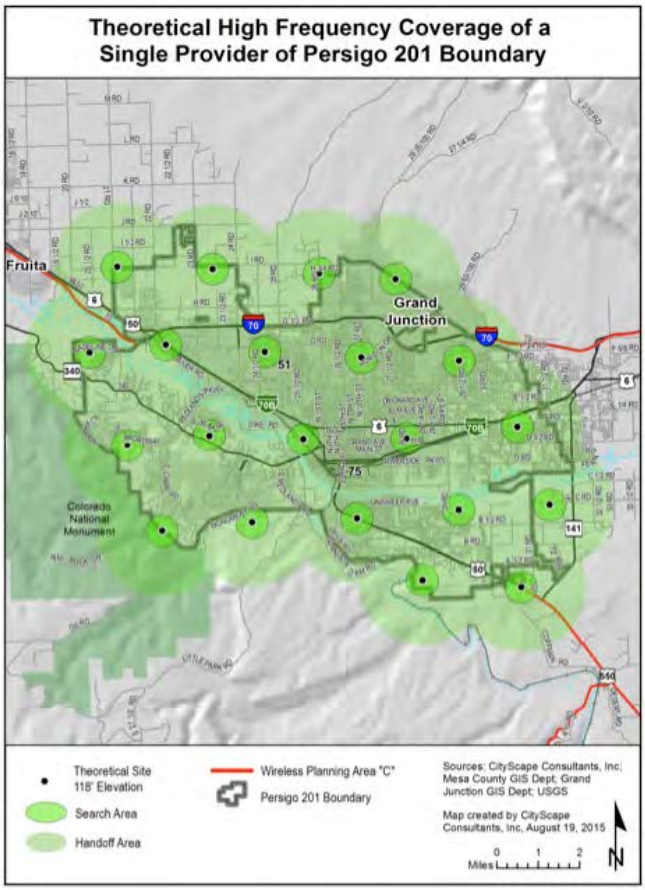


Figure 10: Theoretical High Frequency Coverage

Figure 9 illustrates that six towers or base stations equally distributed throughout the 201 Boundary would provide complete low frequency coverage to the defined study area. Figure 10 illustrates that 21 locations would be needed to provide complete high frequency coverage to the same geographic area.

(Ord. 4703, 6-1-16)

§ 31.12.280. Persigo 201 Boundary existing antenna locations.

Most of the 50 wireless transmission equipment sites considered as part of the 201 Boundary study area are located south of I-70 and north of I-70B and Highway 6. This corresponds with where most of the commercial and industrial land use zones are located. Individual and small clusters of towers and base stations are located outside the triangular boundary created by the interstate and highway network in areas of larger residential land use zones and generally at higher ground elevations. Five of the sites are located just outside the 201 Boundary and are included in the study area because their signal affects coverage within the 201 Boundary. Two sites contain both a tower and a base station which explains why the number of towers is two greater than the number of sites.

Table 7: Summary of Existing and Proposed Transmission Equipment					
Existing Total Number of Towers	**In**	**Out**	**Existing Total Number of Base Stations**	**In**	**Out**
Eligible Tower with PWSF	17	3	Eligible Base Station with PWSF	2	0
Noneligible Tower with PWSF	2	1	Noneligible Base Station with PWSF	3	0
Eligible Tower with no PWSF	3	0	Eligible Base Station with no PWSF	1	0
Noneligible Tower with no PWSF	11	0	Noneligible Base Station with no PWSF	9	0
Proposed Eligible Tower	2	1	Proposed Eligible Base Station	0	0
Total	**35**	**5**	**Total**	**15**	**0**
Site numbers in the 201 Boundary: 40 – 48, 50 – 59, 61 – 76, 78 – 85, 126, 127, 129					
Site numbers within 1.5 mile perimeter of the 201 Boundary: 60, 77, 86, 87, 128					

Figure 11 identifies the location of the sites listed in Table 7 above and are represented as follows:

- Black dot – Eligible towers or base stations with PWSF which have been approved through a prescribed process by the underlying zoning district.
- Red dot – Noneligible towers or base stations (meaning infrastructure built without prior approval for construction by the underlying zoning agency).
- Orange dot – Tower or base station that has either been approved and not yet built; or is undergoing review at the time of this publication.

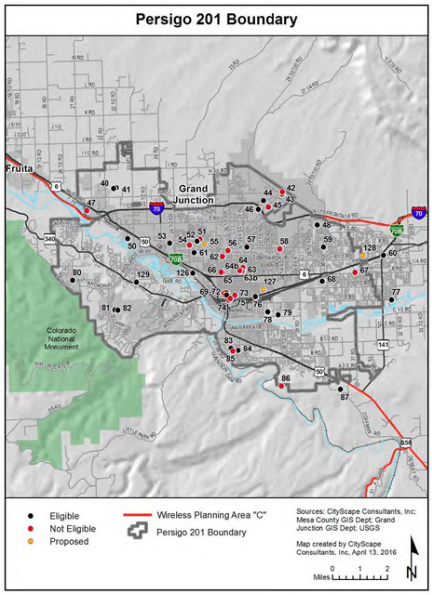


Figure 11: Existing Antenna Locations

(Ord. 4703, 6-1-16)

§ 31.12.290. Persigo 201 Boundary composite maps.

The service area coverage based on propagation signal strength modeling is shown for both low band frequency in yellow and high band frequency in blue on the following composite maps. The highlighted areas represent where a generally reliable signal level should be available for indoor use for both low and high bands of service.

Indoor usage is the service threshold utilized for composite modeling because it represents the lowest signal strength acceptable after considering the signal loss that occurs from building penetration. Outdoor signal strength in the same area will usually be higher than indoor signal strength. Generally the closer the subscriber is to the facility, the more reliable the service. A subscriber further from the facility will have less reliable service. As the subscriber gets closer to the edge of the yellow or blue area, the signal strength becomes more prone to degradation, particularly as usage in the area increases or environmental conditions worsen. Areas of gray on the map indicate where the subscriber will experience weak, unpredictable levels of signal strength, or no service at all. Filling in these coverage gaps would require the installation of additional antennas and corresponding construction of more towers or the identification of buildings that would serve as base stations.

Figure 12 illustrates current theoretical coverage for one service provider operating in the low or high band frequency assuming they had equipment on each site in the facility inventory. Figure 13 shows how population growth and technology changes will affect the current coverage model shown in Figure 12.

Both composite maps include the expected effects of terrain, vegetative cover, and current population density variables. The antenna mounting elevation in both figures is assumed to be at the top of the towers and base stations where the height is known or at 118 feet where unknown.

Figures 12 and 13 identify the location of the inventoried sites categorized as follows:

- Black dot – Eligible towers or base stations with PWSF
- ★ Black star – Noneligible towers or base stations without PWSF

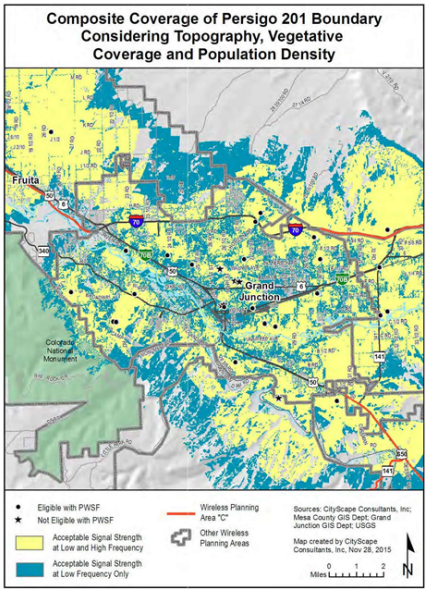


Figure 12: Current Potential Coverage

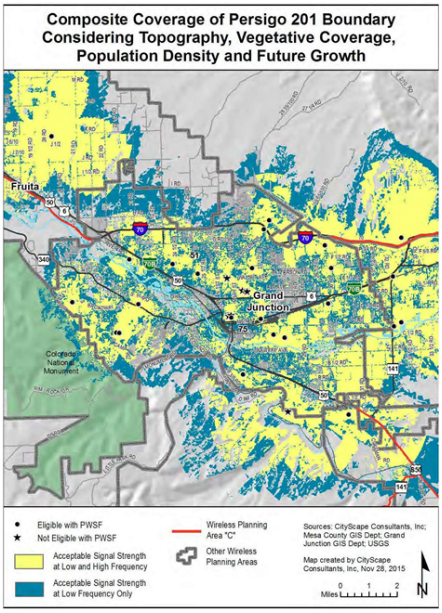


Figure 13: Current Potential Coverage Including Future Growth

(Ord. 4703, 6-1-16)

§ 31.12.300. Persigo 201 Boundary propagation mapping.

In propagation mapping the gradation of colors from yellow to blue indicates the level of propagation signal strength. The geographic areas in yellow identify superior signal strength; green equates to areas with average signal strength; shades of blue symbolize acceptable signal strength; and gray shades show marginal or no signal strength.

Generally, the closer the proximity to the antenna the brighter the shades of yellow within the geographic service area which means the better quality of wireless communications between the elevated antenna and the wireless handset. As distance increases between the handset and the antenna, the green, blue, and gray shades appear, indicating geographic service areas with average, acceptable, and no signal strength respectively. Table 8 provides further explanation of the color coding relative to propagation signals.

Table 8: Signal Strength

SIGNAL STRENGTH		
COLOR	**TITLE**	**DESCRIPTION**
Yellow	Superior	Signal strength strong enough to receive signal in many buildings
Green	Average	Signal strength strong enough to receive signal in a car, but not inside most buildings
Blue	Acceptable	Signal strength strong enough to receive signal outside for many handsets, but no expectation of receiving a signal in a car or building
Gray	No Service	Signal strength is marginal or no service

Figure 14 illustrates various levels of propagation signal coverage including terrain, network capacity and environmental variables. While the industry standards identify green and blue shades as “average” and “acceptable” coverage, customers tend to find otherwise. Most 21st century wireless subscribers demand superior signal strength (yellow) in their residences, schools, offices, and places frequented for shopping and entertainment. As consumers continue the trend of terminating traditional landline phone services and using the wireless handset as the primary mode of communication, having superior signal strength inside buildings becomes paramount to meeting their expectations. Therefore the industry’s “average” and “acceptable” coverage variables do not meet customer demands and expectations.

Figure 14 shows that significant gaps in coverage can be expected over the next 10 to 15 years with the existing infrastructure in the Persigo 201 Boundary. More than 50 percent of the projected signal coverage quality from existing infrastructure will be marginalized or eliminated based on technology changes anticipated with 5G networks. A significant amount of additional infrastructure will be needed to improve the quality of network coverage shown in areas with hues of green to blue and in all gray areas.

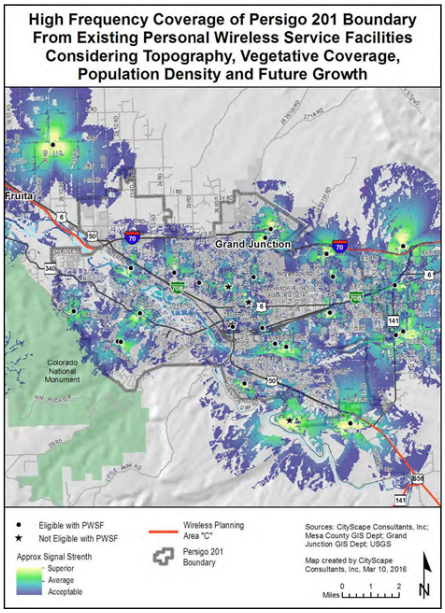


Figure 14: Propagation Map

(Ord. 4703, 6-1-16)

§ 31.12.310. Persigo 201 Boundary estimation of future antenna sites.

Due to the urban characteristics of the City of Grand Junction, CityScape estimates that the largest number of new sites constructed over the next 10 to 15 years will be built in and around the Persigo 201 Study Area. Approximately 11 to 19 new towers or base stations will be needed to fill in the anticipated coverage gaps. These estimates are based on the expected changes in population density, subscriber base and usage, daily transient movement through the study area and the number of calls a facility can service at any given time. The projections consider coverage, capacity, and broadband network objectives and take into consideration terrain, population and proposed maximum infrastructure height variables. The projection model that CityScape designed assumes that all existing tower and base station locations will be used for maximum co-location opportunities in an effort to reduce the number of new towers and base stations required within a given geographic area. Should the industry not maximize the use of existing facilities, a greater number of towers will need to be constructed over this same time period. It should also be noted that even with this increase in new facilities, some areas within the study area will still be underserved due to the terrain and rural characteristics around the periphery of the study area.

(Ord. 4703, 6-1-16)

§ 31.12.320. Public properties as fill-in sites for network gaps.

(a) When publicly owned property is used for new tower or base station construction, the community, represented by their local government agency, is assured that their preferences for tower types and concealment technology are followed. As public properties are developed, the infrastructure installed becomes the precedent for how future sites should be developed on both public and private land. For example, many

slick sticks and flagpole towers are available to the industry as are other creative concealment techniques. Some are more aesthetically pleasing and more practical than other types. As the local government adopts preferred products on publicly owned property, their application becomes the standard for future tower sites developed on public and private land within their zoning jurisdiction. Leasing public properties to tower builders and tenant carriers for new wireless infrastructure can also create new sources of public revenue. Additionally, having a tower on public property results in an asset for the local government that is available for emergency services radio and wireless broadband equipment use.

(b) The City of Grand Junction has affirmed their interest in the use of City owned properties within the Persigo 201 Boundary and has established the following minimal criteria for each property:

(1) The property shall be located within the Grand Junction Persigo 201 Boundary or can be included in the Grand Junction Persigo 201 Boundary.

(2) The property shall be one acre minimum in lot size.

(3) The property shall have vehicular access to an improved public right-of-way.

(4) The property shall have access to utilities.

(5) The property shall be outside the 100-year floodplain.

(6) The cellular facility shall meet all City development standards and be subject to all regulations of the zoning code including but not limited to, "in residential zoning districts and in mixed use zoning districts that include residential uses, new concealed towers shall not be permitted on lots where the primary use or principal structure is single-family or two-family residential, group living, day care, or a multifamily structure of fewer than three stories. Examples of land uses/structure types in residential areas where the site may include a concealed tower are: school, religious assembly, fire station, stadium tower or stand, or other similar institutional/civic uses/structures."

(7) Concealment is required and the owner of the property must identify the type of concealment proposed with the understanding that if accepted by the City, then any type of concealment aside from what is proposed and accepted at the time of the Master Plan vetting process would require a conditional use permit (CUP).

(c) The City has reviewed and qualified a total of 15 of the 19 fill-in locations. The City has identified site-specific concealment infrastructure required on each property. These properties are referenced as public priority site locations and if developed according to the recommendations in Table 9 and the City's zoning codes, are entitled to a streamlined administrative approval process.

(d) Additionally, the City invited private property owners to submit their land as potential priority site locations; provided, that the properties met the same criteria as the City-owned priority sites. Private property owners seeking inclusion of their property as a priority site in the Master Plan submitted an application to the City of Grand Junction for review. The selected nonpublic priority sites, which includes property that is not for profit, are also listed in Table 9. During the vetting process, the Orchard Mesa

Irrigation District, a public property land owner, requested that three of their properties be reviewed and added to the public priority site list. All three properties are included in Table 9 as sites Q, R and S. Additionally, The Museum of Western Colorado vetted two properties and they are listed as sites T and U in Table 9 under Non Public Priority heading.

(e) Public properties not owned by the City of Grand Junction but which could potentially be used as fill-in sites are listed in Table 9. These properties have not been vetted since they are not owned by the City of Grand Junction. However, as potential fill-in sites they are listed in Table 9 with a not determined recommendation. Use of these public fill-in sites is encouraged and promoted in the City's ordinance, but will require conditional use approval.

Table 9: Grand Junction Potential Fill-In Public and Nonpublic Properties

Public Priority Site ID	Owner	Location	Address	Parcel Number	Acreage	Site-Specific Recommendation
I1	City of Grand Junction	Grand Junction City Limits	727 24 1/2 Road	2701-333-00-941 Zoned CRS	35.595	Canyon View Park Entry or Art Feature; Slick Stick
I2	City of Grand Junction	Grand Junction City Limits	728 24 Road	2701-333-00-942 Zoned CSR	39.741	Canyon View Park Entry or Art Feature; Slick Stick
I4	City of Grand Junction	Grand Junction City Limits	730 24 Road	2701-333-00-948 Zoned CSR	36.793	Canyon View Park Entry or Art Feature; Slick Stick
J1	City of Grand Junction	Grand Junction City Limits	773 Old Orchard Street	2701-352-51-945 Zoned CSR	31.653	Saccomanno Park Slick Stick; Concealed 3-Legged Pole
J2	City of Grand Junction	Grand Junction City Limits	822 Lanai Drive	2701-264-14-941 Zoned CSR	2.817	Paradise Hills Park Banner Pole
J3	City of Grand Junction	Grand Junction City Limits	731 27 Road	2701-354-00-949 Zoned CSR	12.643	Horizon Park Banner Pole
K1	City of Grand Junction	Grand Junction City Limits	2155 Broadway	2947-231-17-944 Zoned CSR	3.269	Fire Station 5 Slick Stick; Flagpole; Concealed 3-Legged Pole
L	City of Grand Junction	Grand Junction City Limits	2400 Blue Heron Road	2945-093-00-945 Zoned CSR	46.519	Colorado Riverfront Trail Slick Stick; Banner Pole
N1	City of Grand Junction	Grand Junction City Limits	405 Ridges Boulevard	2945-174-24-944 Zoned PD	1.926	Open Space Banner Pole

Table 9: Grand Junction Potential Fill-In Public and Nonpublic Properties

Public Priority Site ID	Owner	Location	Address	Parcel Number	Acreage	Site-Specific Recommendation
N2	City of Grand Junction	Grand Junction City Limits	407 Saddle Court	2945-174-29-941 Zoned PD	28.041	Open Space Banner Pole
N3	City of Grand Junction	Grand Junction City Limits	406 Ridges Boulevard # F1	2945-212-13-944 Zoned PD	3.207	Open Space Banner Pole
N4	City of Grand Junction	Grand Junction City Limits	585 Hidden Valley Court	2945-212-14-944 Zoned PD	7.028	Open Space Banner Pole
Q	Orchard Mesa Irrigation District (OMID)	Mesa County	158 29 1/2 Road	2943-321-00-946 Zoned RSF-R	1.672	Slick Stick; Flagpole; Concealed 3-Legged Pole
R	USA c/o OMID	Grand Junction City Limits	2962 A 1/2 Road	2943-321-00-913; 2943-321-00-175[4] Zoned RSF-4	4.725	Slick Stick; Flagpole; Concealed 3-Legged Pole
S	USA c/o OMID	Mesa County	121 31 Road	2943-334-00-948 Zoned AFT	19.89	Slick Stick; Flagpole; Concealed 3-Legged Pole

Other Public Priority Site ID	Owner	Location	Address	Parcel Number	Acreage	Site-Specific Recommendation
H1	Mesa County	GJ 201 Boundary	651 Railhead Circle	2945-062-16-938	9.194	Not Determined
H2	State of Colorado	GJ 201 Boundary	Walter Walker Wildlife Area	2947-142-00-922	470.112	Not Determined
I3	Caprock Bldg Association	Grand Junction City Limits	Caprock Elementary	2701-334-00-940 Zoned R-5	7.683	Not Determined
K2	District 51 Master Lease Association	GJ 201 Boundary	Redlands Middle School	2947-231-00-949	20.239	Not Determined
M	Colorado Game Fish and Parks Department	Grand Junction City Limits	711 Independent Avenue	2945-104-00-922	9.88	Not Determined
O	State Highway Department	Grand Junction City Limits	606 S 9th Street	2945-231-03-928	5.085	Not Determined

4. **Editor's Note: The reference to parcel number 2943-321-00-914 has been updated to be to 2943-321-00-175.**

Other Public Priority Site ID	Owner	Location	Address	Parcel Number	Acreage	Site-Specific Recommendation
P	Mesa County	GJ 201 Boundary	275 1/2 Coulson Drive #B	2943-302-47-935	7.495	Not Determined

Nonpublic Priority Site ID*	Owner	Location	Address	Parcel Number	Acreage	Site-Specific Recommendation
T	Museum of Western Colorado	Grand Junction City Limits	462 Ute Avenue	2945-143-28-992 Zoned B-2	1.15	Concealed Base Station on Observation Station
U	Museum of Western Colorado	Mesa County	3065 Patterson Road	2943-091-00-993 Zoned RSF-4	22.34	Farm Entry; Art Feature; Slick Stick; Flagpole; Concealed 3-Legged Pole

*Nonpublic also includes property that is not for profit

Figure 15 illustrates the potential solutions that will need to be considered to fill in the gaps identified in Figure 14. The area colored with yellow to green gradients shows the theoretical coverage from existing towers and base stations with PWSF. The areas colored with light to dark shades of red gradients show the projected theoretical coverage from existing towers and base stations without current PWSF that could be utilized or upgraded for co-locations. The areas colored with light to dark orange gradient would be filled with new infrastructure that has already been submitted for review. The areas colored with pink gradient represent areas where new fill-in sites would need to be located to provide the required coverage.

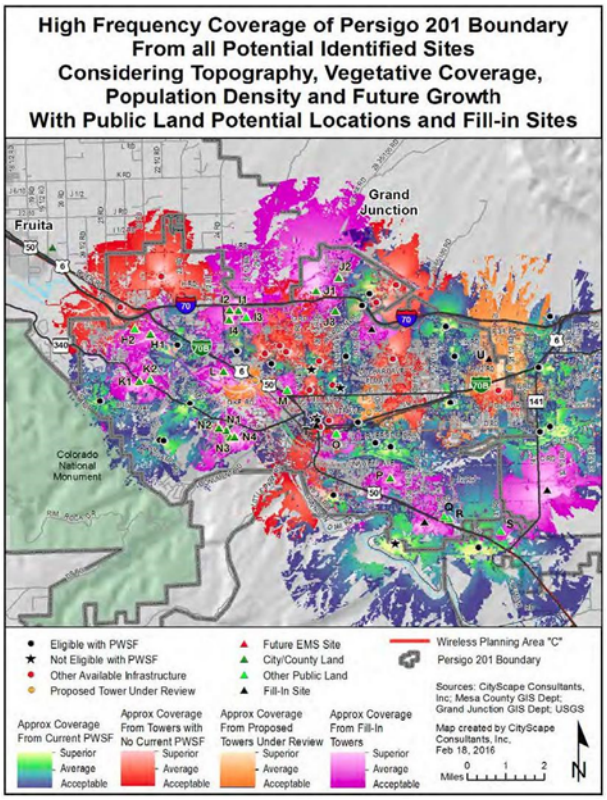


Figure 15: High Frequency Coverage with Future Fill-in

(Ord. 4703, 6-1-16)

§ 31.12.330. Lower Valley characteristics.

(a) Rural;

(b) 139.85 square miles;

(c) 2010 population estimate 18,437;

(d) 2030 population estimate 26,900.

(Ord. 4703, 6-1-16)

§ 31.12.340. Lower Valley theoretical root mean square maps.

The following maps represent a theoretical build-out of equally distributed antennas, mounted at a tower height of 118 feet, in a perfect radio frequency environment for a single service provider that excludes topographic, vegetative cover and population density considerations. The black dot within each larger circle indicates the ideal antenna location. The smaller circle within the larger circle represents the acceptable search ring for locating the tower and antennas.

Figure 16 illustrates that 14 towers or base stations equally distributed throughout the Lower Valley would provide complete low frequency coverage to the defined study area. Figure 17 illustrates that 40 locations would be needed to provide complete high frequency coverage to the same geographic area.

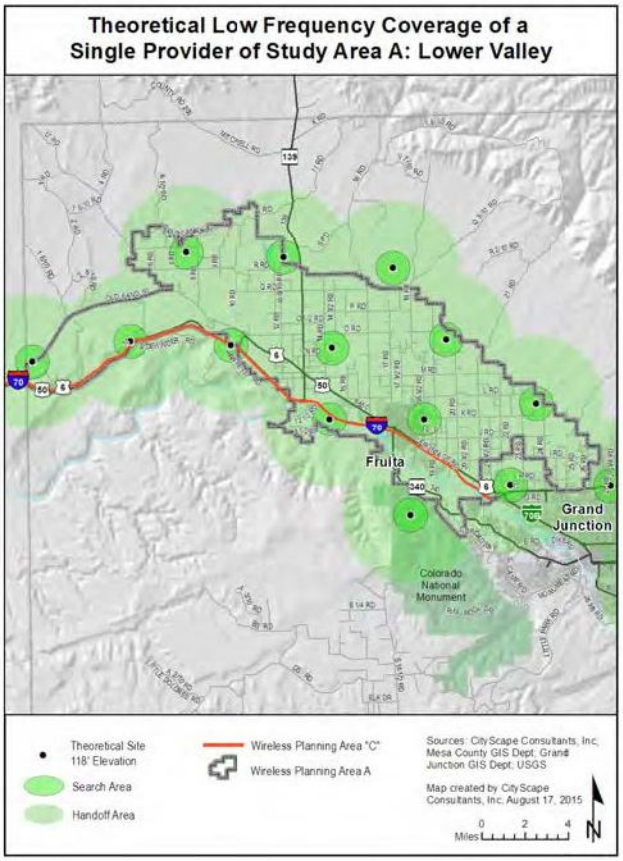


Figure 16: Theoretical Low Frequency

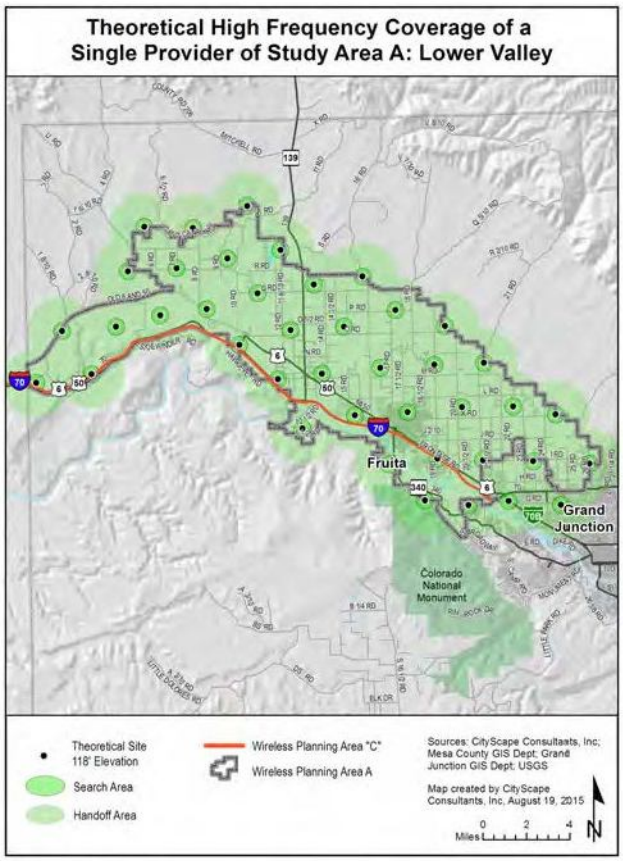


Figure 17: Theoretical High Frequency

(Ord. 4703, 6-1-16)

§ 31.12.350. Lower Valley existing antenna locations.

Almost half of the 21 total sites in and around the Lower Valley are located within a 1.5 mile perimeter of the actual study area and nine of those 10 sites are within the Persigo 201 Boundary. Of the 10 sites within the Lower Valley study area only four currently have PWSF on them. Three of the sites (35, 36 and 37) are located parallel to I-70 and two of the sites (39 and 131) are located in the eastern half of the Lower Valley. Sites 136 through 139 all support wireless Internet facilities. This pattern of deployment is very common for the industry. The greatest concentration of towers and base stations is closer to the urban area along the major transportation networks.

Table 10: Summary of Existing and Proposed Transmission Equipment

Existing Total Number of Towers	In	Out	Existing Total Number of Base Stations	In	Out
Eligible Tower with PWSF	4	3	Eligible Base Station with PWSF	0	1

Table 10: Summary of Existing and Proposed Transmission Equipment					
Existing Total Number of Towers	**In**	**Out**	**Existing Total Number of Base Stations**	**In**	**Out**
Noneligible Tower with PWSF	0	0	Noneligible Base Station with PWSF	0	0
Eligible Tower with no PWSF	0	2	Eligible Base Station with no PWSF	0	0
Noneligible Tower with no PWSF	6	2	Noneligible Base Station with no PWSF	0	2
Proposed Eligible Tower	0	1	Proposed Eligible Base Station	0	0
Total	**10**	**8**	**Total**	**0**	**3**
Site numbers in the Lower Valley: 34 – 39, 136 – 139					
Site numbers within 1.5 mile perimeter of the Lower Valley: 40, 41, 47, 50 – 55, 80, 131					

Figure 18 identifies the location of the sites listed in Table 10 above and are represented as follows:

- Black dot – Eligible towers or base stations with PWSF which have been approved through a prescribed process by the appropriate local government agency.
- Red dot – Noneligible towers or base stations (meaning infrastructure built without prior approval for construction by the appropriate local government agency).
- Orange dot – Tower or base station that has either been approved but not yet built; or is undergoing review at the time of this publication.

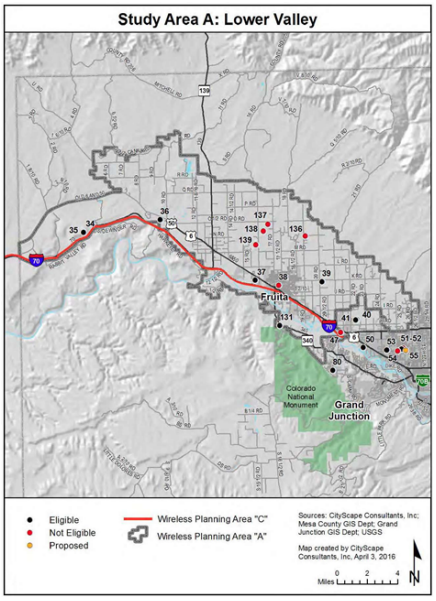


Figure 18: Existing Antenna Locations

(Ord. 4703, 6-1-16)

§ 31.12.360. Lower Valley composite maps.

The service area coverage based on propagation signal strength modeling is shown for both low band frequency in yellow and high band frequency in blue on the following composite maps. The highlighted areas represent where a generally reliable signal level should be available for indoor use for both low and high bands of service.

Indoor usage is the service threshold utilized for composite modeling because it represents the lowest signal strength acceptable after considering the signal loss that occurs from building penetration. Outdoor signal strength in the same area will usually be higher than indoor signal strength. Generally the closer the subscriber is to the facility the more reliable the service. A subscriber further from the facility will have less reliable service. As the subscriber gets closer to the edge of the yellow or blue area, the signal strength becomes more prone to degradation, particularly as usage in the area increases or environmental conditions worsen. Areas of gray on the map indicate where the subscriber will experience weak, unpredictable levels of signal strength, or no service at all. Filling in these coverage gaps would require the installation of additional antennas and corresponding construction of more towers or the identification of buildings that would serve as base stations.

Figure 19 illustrates current theoretical coverage for one service provider operating in the low or high band frequency assuming they had equipment on each site in the facility inventory. Figure 20 shows how population growth and technology changes will affect the current coverage model shown in Figure 19.

Both composite maps include the expected effects of terrain, vegetative cover, and current population density variables. The antenna mounting elevation in both figures is assumed to be

at the top of the towers and base stations where the height is known or at 118 feet where unknown.

Figures 19 and 20 identify the location of the inventory sites categorized as follows:

- • Black dot – Eligible towers or base stations with PWSF
- ★ Black star – Noneligible towers or base stations without PWSF

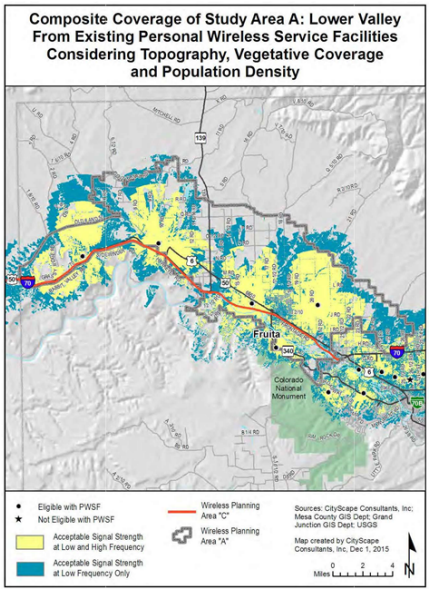


Figure 19: Current Potential Coverage

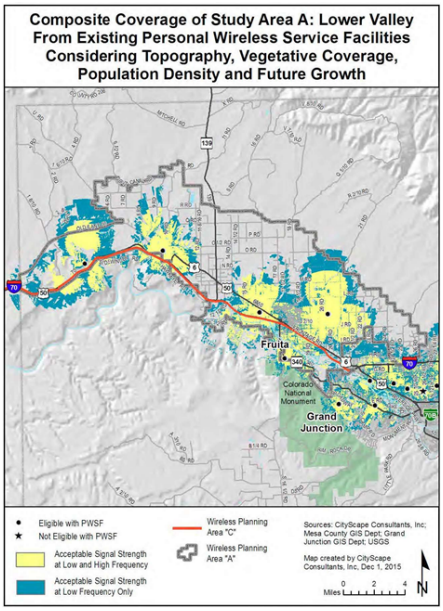


Figure 20: Current Potential Coverage Including Future Growth

(Ord. 4703, 6-1-16)

§ 31.12.370. Lower Valley estimation of future antenna sites.

Due to the rural characteristics of the Lower Valley, CityScape estimates that the largest number of new sites constructed over the next 10 to 15 years will be built along the I-70 corridor. Approximately seven new towers or base stations will be needed to fill in anticipated coverage gaps. However, only four of the seven sites have been turned on in the gap analysis map in Figure 20 because CityScape believes it is unlikely that the industry will add all seven facilities over the next 10 to 12 years.

These estimates are based on the expected changes in population density, subscriber base and usage, daily transient movement throughout the study area and the number of calls a facility can service at any given time. The projections consider coverage, capacity, and broadband network objectives and take into consideration terrain, population and proposed maximum infrastructure height variables. The projection model that CityScape designed assumes that all existing tower and base station locations will be used for maximum co-location opportunities in an effort to reduce the number of new towers and base stations required within a given geographic area. Should the industry not maximize the use of existing facilities, a greater number of towers will need to be constructed over this same time period. It should also be noted that even with this increase in new facilities, some areas within the study area will still be underserved due to the terrain and to the rural characteristics of portions of the study area.

CityScape has reviewed the gaps in network coverage in comparison to the location of publicly owned properties and considered the impact that placing a tower on those properties would have on network and public safety coverage. When publicly owned property is used for new tower or base station construction, the community, represented by their local government agency, is assured that their preferences for tower types and concealment technology are followed. As public properties are developed, the infrastructure installed becomes the precedent for how future sites should be developed on both public and private land. For example, many slick sticks and flagpole towers are available to the industry as are other creative concealment techniques. Some are more aesthetically pleasing and more practical than other types. As the local government adopts preferred products on publicly owned property, their application becomes the standard for future tower sites developed on public and private land within their zoning jurisdiction. Leasing public properties to tower builders and tenant carriers for new wireless infrastructure can also create new sources of public revenue. Additionally, having a tower on public property results in an asset for the local government that is available for emergency services radio and wireless broadband equipment use.

Figure 21 indicates how certain geographic areas would benefit with improved network coverage from the addition of the publicly owned properties. Table 11 identifies potential public property fill-in sites. Tower type preferences are not provided in the recommendation column because the property has not been vetted by the local planning agency.

Table 11: Lower Valley Potential Fill-In Public Property

Public Site ID	Owner	Location	Address	Parcel Number	Acreage	Site-Specific Recommendation
D	State of Colorado		Highline State Park	2691-053-00-922	325.442	Not Determined

Table 11: Lower Valley Potential Fill-In Public Property						
Public Site ID	**Owner**	**Location**	**Address**	**Parcel Number**	**Acreage**	**Site-Specific Recommendation**
E1	Lower Valley Protection District	Loma	1341 13 Road	2691-334-04-498	0.79	Not Determined
E2	State Department of Highways	Loma	1346 13 3/ 10 Road	2691-342-00-924	9.762	Not Determined
F1	City of Fruita	Fruita	324 N Coulson Street	2697-172-00-940	1.398	Not Determined
F2	City of Fruita	Fruita	300 W Ottley Avenue	2697-172-00-946	6.04	Not Determined
F3	Lower Valley Protection District	Fruita	168 N Mesa Street	2697-172-53-944	0.675	Not Determined
F4	District 51	Fruita	Fruita Middle School	2697-172-28-942	12.725	Not Determined
F5	City of Fruita	Fruita	210 Frontage Road	2697-173-09-945	3.51	Not Determined
G	Mesa County	Fruita	916 19 1/2 Road	2697-224-00-939	5.281	Not Determined

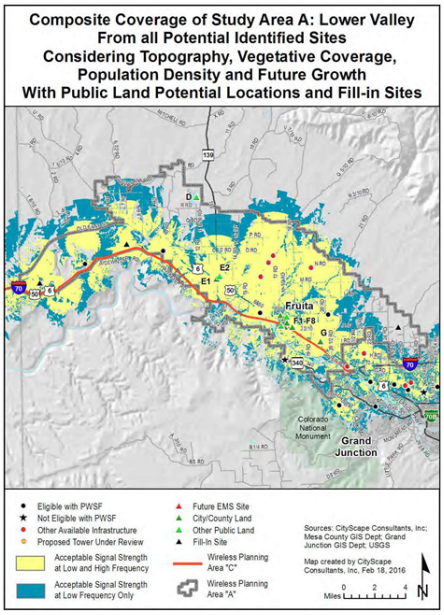


Figure 21: Coverage with Future Fill-In

(Ord. 4703, 6-1-16)

§ 31.12.380. Palisade characteristics.

(a) Rural;

(b) 35.21 square miles;

(c) 2010 population estimate 18,642;

(d) 2030 population estimate 24,247.

(Ord. 4703, 6-1-16)

§ 31.12.390. Palisade theoretical root mean square maps.

The following maps represent a theoretical build-out of equally distributed antennas, mounted at a tower height of 118 feet, in a perfect radio frequency environment for a single service provider that excludes topographic, vegetative cover and population density considerations. The black dot within each larger circle indicates the ideal antenna location. The smaller circle within the larger circle represents the acceptable search ring for locating the tower and antennas. Figure 22 illustrates that six towers or base stations equally distributed throughout the Palisade area would provide complete low frequency coverage to the defined study area. Figure 23 illustrates that 15 locations would be needed to provide complete high frequency coverage to the same geographic area.

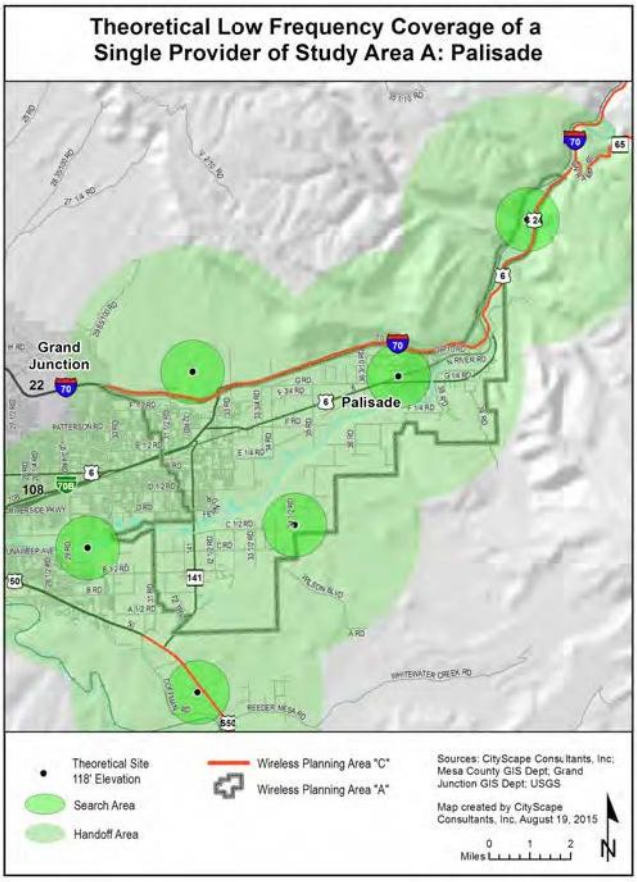


Figure 22: Theoretical Low Frequency Coverage

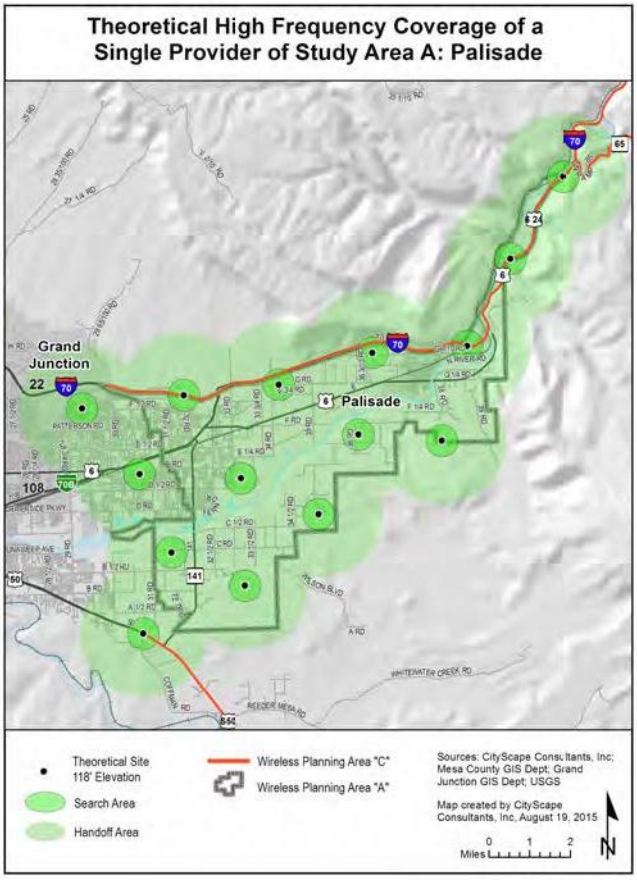


Figure 23: Theoretical High Frequency Coverage

(Ord. 4703, 6-1-16)

§ 31.12.400. Palisade existing antenna locations.

There are 12 transmission equipment facilities in and around the Palisade Study Area. Two-thirds of these are located within a 1.5 mile perimeter of the actual study area. These outlying sites are either in the 201 Persigo Boundary or along I-70, Highway 6 or Highway 50. Three of the four sites within the Palisade Study Area are near the western boundary in close proximity to the 201 Boundary. Only one site (site 6) is not in either of these vicinities. This pattern of deployment is very common for the industry. The greatest concentration of towers and base stations are closer to the urban area along the major transportation networks.

Table 12: Summary of Existing and Proposed Transmission Equipment

Existing Total Number of Towers	In	Out	Existing Total Number of Base Stations	In	Out
Eligible Tower with PWSF	3	5	Eligible Base Station with PWSF	0	1
Noneligible Tower with PWSF	0	0	Noneligible Base Station with PWSF	0	0

Table 12: Summary of Existing and Proposed Transmission Equipment					
Existing Total Number of Towers	**In**	**Out**	**Existing Total Number of Base Stations**	**In**	**Out**
Eligible Tower with no PWSF	0	0	Eligible Base Station with no PWSF	0	0
Noneligible Tower with no PWSF	0	1	Noneligible Base Station with no PWSF	0	1
Proposed Eligible Tower	1	0	Proposed Eligible Base Station	0	0
Total	**4**	**6**	**Total**	**0**	**2**
Site Numbers in the Palisade Study Area: 6, 60, 77, 128					
Site Numbers within the 1.5 mile perimeter of the Palisade Study Area: 5, 48, 49, 59, 67, 68, 87, 132					

Figure 24 identifies the location of the sites listed in Table 12 above and are represented by:

- Black dot – Eligible towers or base stations with PWSF which have been approved through a prescribed process by the appropriate local government agency.
- Red dot – Noneligible towers or base stations (meaning infrastructure built without prior approval for construction by the appropriate local government agency).
- Orange dot – Tower or base station that has either been approved but not yet built; or is undergoing review at the time of this publication.

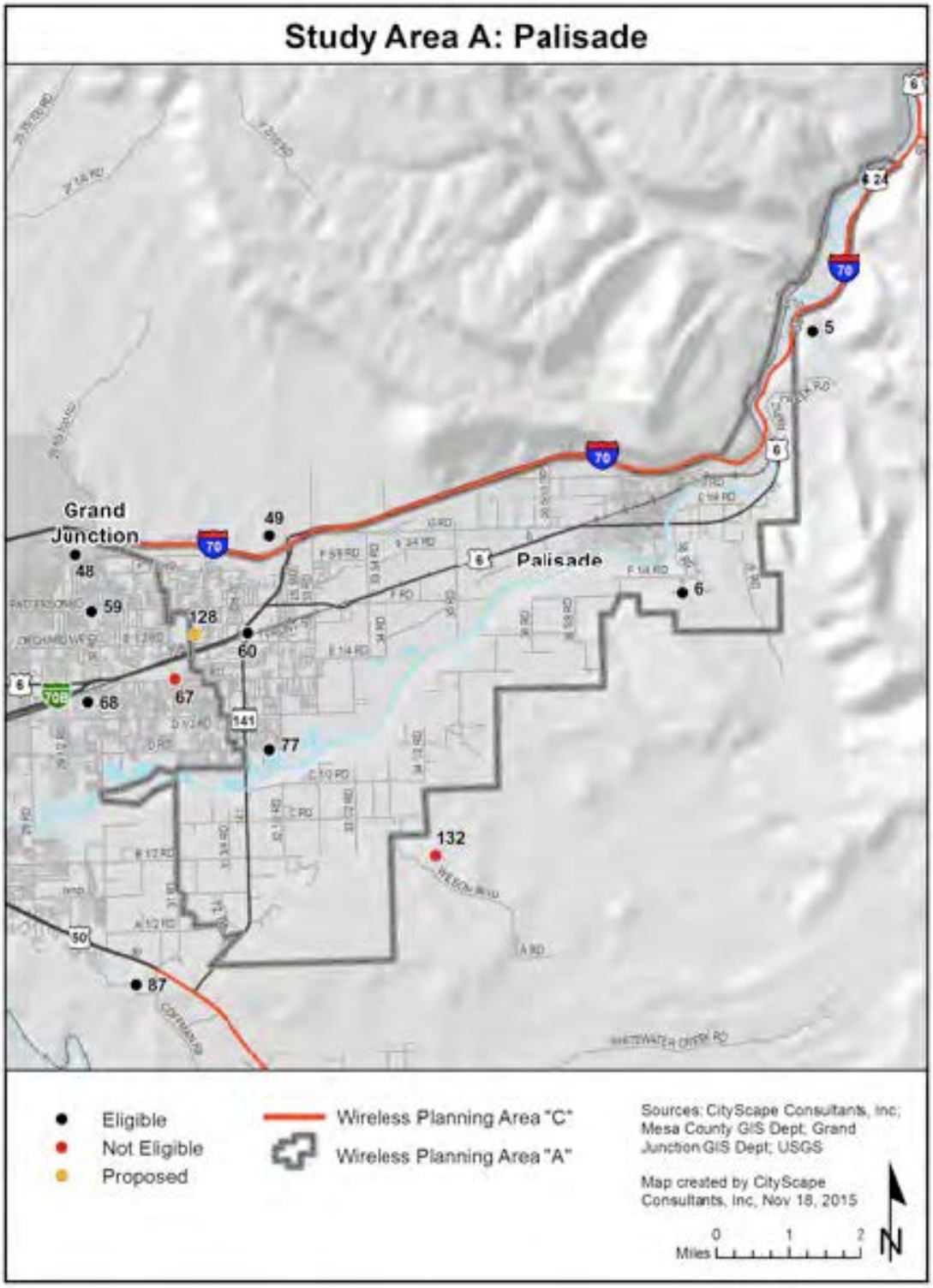


Figure 24: Existing Antenna Locations

(Ord. 4703, 6-1-16)

§ 31.12.410. Palisade composite maps.

The service area coverage based on propagation signal strength modeling is shown for both low band frequency in yellow and high band frequency in blue on the following composite maps. The highlighted areas represent where a generally reliable signal level should be available for indoor use for both low and high bands of service.

Indoor usage is the service threshold utilized for composite modeling because it represents the lowest signal strength acceptable after considering the signal loss that occurs from building penetration. Outdoor signal strength in the same area will usually be higher than indoor signal strength. Generally the closer the subscriber is to the facility the more reliable the service. A subscriber further from the facility will have less reliable service. As the subscriber gets closer to the edge of the yellow or blue area, the signal strength becomes more prone to degradation, particularly as usage in the area increases or environmental conditions worsen. Areas of gray on the map indicate where the subscriber will experience weak, unpredictable levels of signal strength, or no service at all. Filling in these coverage gaps would require the installation of additional antennas and corresponding construction of more towers or the identification of buildings that would serve as base stations.

Figure 25 illustrates current theoretical coverage for one service provider operating in the low or high frequency assuming they had equipment on each inventoried facility. Figure 26 shows how population growth and technology changes will affect the current coverage model shown in Figure 25.

Both composite maps have included the expected effects of terrain, vegetative cover, and current population density variables. The antenna mounting elevation in both figures is assumed to be at the top of the towers and base stations where the height is known or at 118 feet where unknown.

Figures 25 and 26 identify the location of the inventory sites categorized as follows:

- • Black dot – Eligible towers or base stations with PWSF
- ★ Black star – Noneligible towers or base stations without PWSF

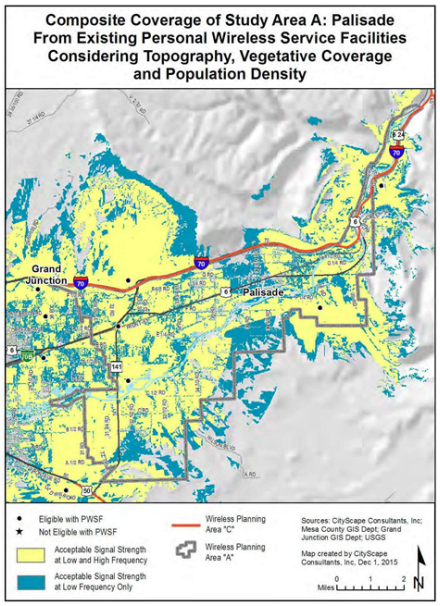


Figure 25: Current Potential Coverage

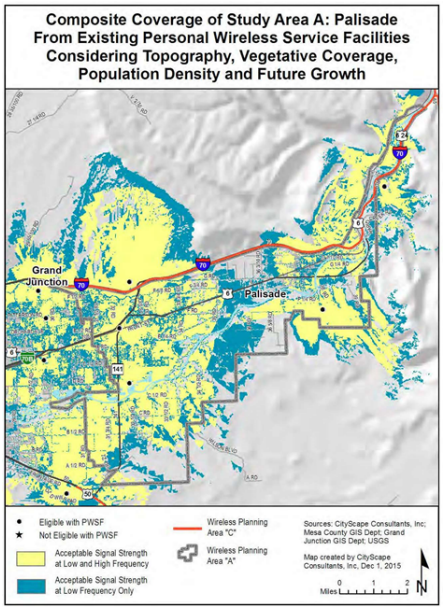


Figure 26: Current Potential Coverage Including Future Growth

(Ord. 4703, 6-1-16)

§ 31.12.420. Palisade estimation of future antenna sites.

Due to the rural characteristics of the Palisade Study Area, CityScape estimates that about six new towers or base stations will be needed over the next 10 to 15 years located along the corridors of I-70, Highway 141 and Highway 50. The fill-in map, shown in Figure 27,

includes the six new sites which will provide almost complete coverage for the Palisade Study Area.

These estimates are based on the expected changes in population density, subscriber base and usage, daily transient movement throughout the study area and the number of calls a facility can service at any given time. The projections consider coverage, capacity, and broadband network objectives and take into consideration terrain, population and proposed maximum infrastructure height variables. The projection model that CityScape designed assumes that all existing tower and base station locations will be used for maximum co-location opportunities in an effort to reduce the number of new towers and base stations required within a given geographic area. Should the industry not maximize the use of existing facilities, a greater number of towers will need to be constructed over this same time period. It should also be noted that even with this increase in new facilities, some areas within the study area will still be underserved due to the terrain and to the rural characteristics of portions of the study area.

CityScape has reviewed the gaps in network coverage in comparison to the location of publicly owned properties and considered the impact that placing a tower on those properties would have on network and public safety coverage. When publicly owned property is used for new tower or base station construction, the community, represented by their local government agency, is assured that their preferences for tower types and concealment technology are followed. As public properties are developed, the infrastructure installed becomes the precedent for how future sites should be developed on both public and private land. For example, many slick sticks and flagpole towers are available to the industry as are other creative concealment techniques. Some are more aesthetically pleasing and more practical than other types. As the local government adopts preferred products on publicly owned property, their application become the standard for future tower sites developed on public and private land within their zoning jurisdiction. Leasing public properties to tower builders and tenant carriers for new wireless infrastructure can also create new sources of public revenue. Additionally, having a tower on public property results in an asset for the local government that is available for emergency services radio and wireless broadband equipment use.

Figure 27 indicates how certain geographic areas would benefit with improved network coverage from the addition of the publicly owned properties. Table 13 identifies potential public property fill-in sites. Tower type preferences are not provided in the recommendation column because the property has not been vetted by the local planning agency.

Table 13: Palisade Potential Fill-In Public Properties

Public Site ID	Owner	Location	Address	Parcel Number	Acreage	Site-Specific Recommendation
Q	Colorado Department of Highways	Palisade	816 35 8/10 Road	2937-063-00-924	10.241	Not Determined
R1	Town of Palisade	Palisade	175 E Third Street	2937-091-04-941	0.95	Not Determined
R2	Town of Palisade	Palisade	120 W Eighth Street	2937-093-36-941	2.476	Not Determined
R3	Town of Palisade	Palisade	571 W Fifth Street	2937-093-00-940	2.875	Not Determined

Table 13: Palisade Potential Fill-In Public Properties						
Public Site ID	**Owner**	**Location**	**Address**	**Parcel Number**	**Acreage**	**Site-Specific Recommendation**
R4	Town of Palisade	Palisade	711 Iowa Avenue	2937-093-37-943	3.189	Not Determined
S	East Orchard Fire Protection District	Palisade	544 35 1/2 Road	2941-084-00-944	1.108	Not Determined

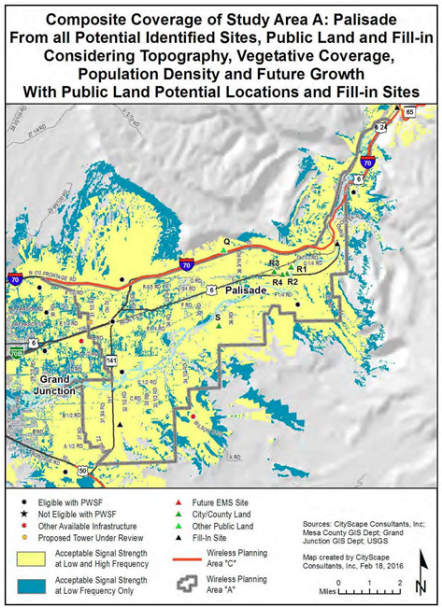


Figure 27: Coverage with Future Fill-In

(Ord. 4703, 6-1-16)

§ 31.12.430. DeBeque characteristics.

(a) Rural.

(b) 30.34 square miles.

(c) 2010 population estimate 808.

(d) 2030 population estimate 1,096.

(Ord. 4703, 6-1-16)

§ 31.12.440. DeBeque theoretical root mean square maps.

The following maps represent a theoretical build-out of equally distributed antennas, mounted at a tower height of 118 feet, in a perfect radio frequency environment for a single service provider that excludes topographic, vegetative cover and population density considerations. The black dot within each larger circle indicates the ideal antenna location. The smaller circle

within the larger circle represents the acceptable search ring for locating the tower and antennas. Figure 28 illustrates that three towers or base stations equally distributed throughout the DeBeque Study Area would provide complete low frequency coverage to the defined study area. Figure 29 illustrates nine locations would be needed to provide complete high frequency coverage to the same geographic area.

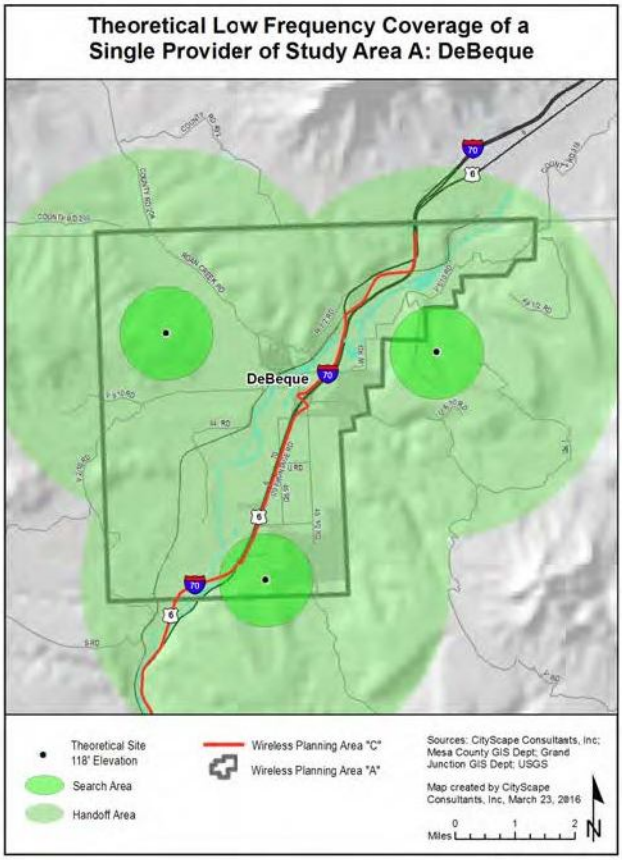


Figure 28: Theoretical Low Frequency Coverage

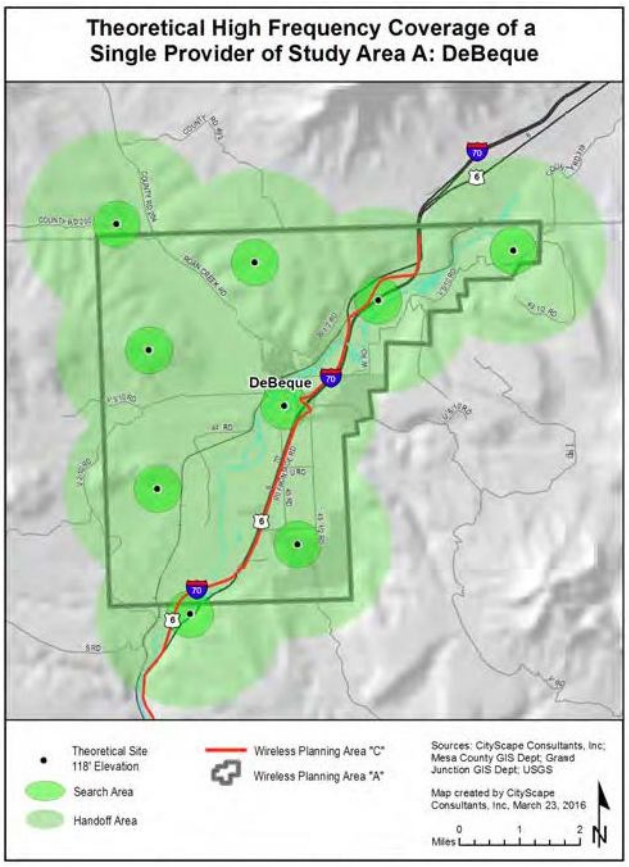


Figure 29: Theoretical High Frequency Coverage

(Ord. 4703, 6-1-16)

§ 31.12.450. DeBeque existing antenna locations.

Of the three geographic regions included in Study Area A, the DeBeque Study Area is the least populated. There are two equipment communication facilities within the DeBeque Study Area and both of the towers are equipped with PWSF. Both towers are located parallel to I-70 with the intent of serving that corridor.

Table 14: Summary of Existing and Proposed Transmission Equipment

Existing Total Number of Towers	In	Out	Existing Total Number of Base Stations	In	Out
Eligible Tower with PWSF	2	0	Eligible Base Station with PWSF	0	0
Noneligible Tower with PWSF	0	0	Noneligible Base Station with PWSF	0	0
Eligible Tower with no PWSF	0	0	Eligible Base Station with no PWSF	0	0

Table 14: Summary of Existing and Proposed Transmission Equipment					
Existing Total Number of Towers	**In**	**Out**	**Existing Total Number of Base Stations**	**In**	**Out**
Noneligible Tower with no PWSF	0	0	Noneligible Base Station with no PWSF	0	0
Proposed Eligible Tower	0	0	Proposed Eligible Base Station	0	0
Total	**2**	**0**	**Total**	**0**	**0**
Site Numbers in the DeBeque Study Area: 1, 2					
Site numbers within the 1.5 mile perimeter of the DeBeque Study Area: None					

Figure 30 identifies the location of the sites listed in Table 14 above and are represented by:

- Black dot – Eligible towers or base stations with PWSF which have been approved through a prescribed process by the appropriate local government agency.
- Red dot – Noneligible towers or base stations (meaning infrastructure built without prior approval for construction by the appropriate local government agency).
- Orange dot – Tower or base station that has either been approved but not yet built; or is undergoing review at the time of this publication.

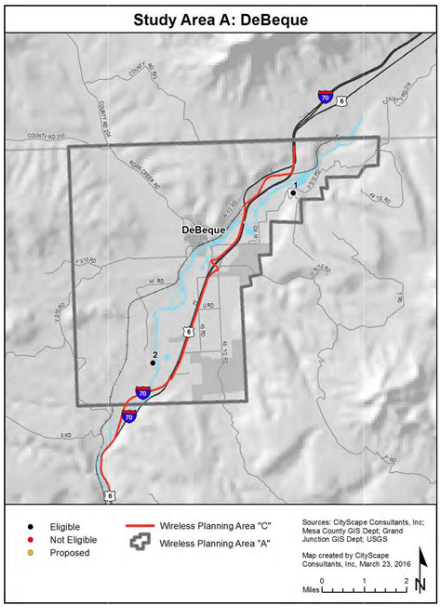


Figure 30: Existing Antenna Locations

(Ord. 4703, 6-1-16)

§ 31.12.460. DeBeque composite maps.

The service area coverage based on propagation signal strength modeling is shown for both low band frequency in yellow and high band frequency in blue on the following composite maps. The highlighted areas represent where a generally reliable signal level should be available for indoor use for both low and high bands of service.

Indoor usage is the service threshold utilized for composite modeling because it represents the lowest signal strength acceptable after considering the signal loss that occurs from building penetration. Outdoor signal strength in the same area will usually be higher than indoor signal strength. Generally the closer the subscriber is to the facility the more reliable the service. A subscriber further from the facility will have less reliable service. As the subscriber gets closer to the edge of the yellow or blue area, the signal strength becomes more prone to degradation, particularly as usage in the area increases or environmental conditions worsen. Areas of gray on the map indicate where the subscriber will experience weak, unpredictable levels of signal strength, or no service at all. Filling in these coverage gaps would require the installation of additional antennas and corresponding construction of more towers or the identification of buildings that would serve as base stations.

Figure 31 illustrates current theoretical coverage for one service provider operating in the low or high band frequency assuming they had equipment on each facility. Figure 32 shows how population growth and technology changes will affect the current coverage model shown in Figure 31.

Both composite maps have included the expected effects of terrain, vegetative cover, and current population density variables. The antenna mounting elevation in both figures is assumed to be at the top of the towers and base stations where the height is known or at 118 feet where unknown.

Figures 31 and 32 identify the location of the inventory sites categorized as follows:

- • Black dot – Eligible towers or base stations with PWSF
- ★ Black star – Noneligible towers or base stations without PWSF

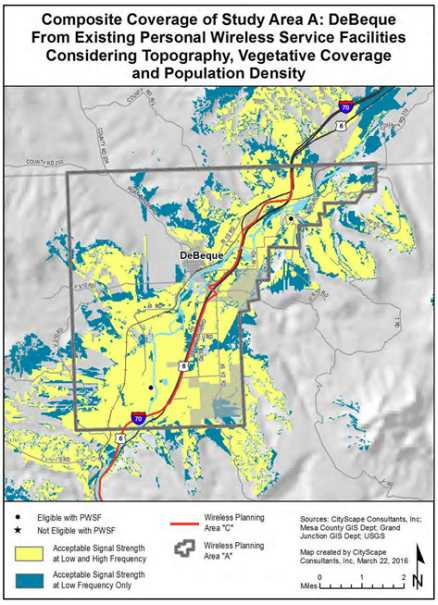


Figure 31: Current Potential Coverage

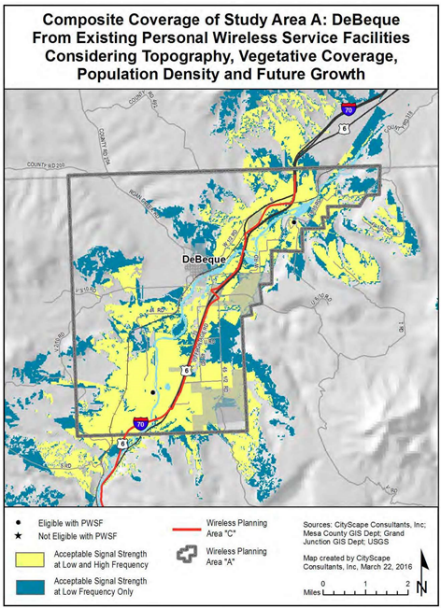


Figure 32: Current Potential Coverage Including Future Growth

(Ord. 4703, 6-1-16)

§ 31.12.470. DeBeque estimation of future antenna sites.

Due to the rural characteristics of the DeBeque Study Area, CityScape estimates that approximately three new sites will be needed in the next 10 to 15 years: one along the I-70 corridor, one in the town of DeBeque and one in the northwest quadrant of the study area. It is likely that the I-70 site will be constructed first, with the other two sites possibly being

added in the distant future. The fill-in map in Figure 33 illustrates great improvement to the I-70 corridor coverage with one new site and almost complete coverage for the study area with the construction of all three sites.

These estimates are based on the expected changes in population density, subscriber base and usage, daily transient movement throughout the study area and the number of calls a facility can service at any given time. The projections consider coverage, capacity, and broadband network objectives and take into consideration terrain, population and proposed maximum infrastructure height variables. The projection model that CityScape designed assumes that all existing tower and base station locations will be used for maximum co-location opportunities in an effort to reduce the number of new towers and base stations required within a given geographic area. Should the industry not maximize the use of existing facilities, a greater number of towers will need to be constructed over this same time period. It should also be noted that even with this increase in new facilities, some areas within the study area will still be underserved due to the terrain and to the rural characteristics of the study area.

CityScape has reviewed the gaps in network coverage in comparison to the location of publicly owned properties and considered the impact that placing a tower on those properties would have on network and public safety coverage. When publicly owned property is used for new tower or base station construction, the community, represented by their local government agency, is assured that their preferences for tower types and concealment technology are followed. As public properties are developed, the infrastructure installed becomes the precedent for how future sites should be developed on both public and private land. For example, many slick sticks and flagpole towers are available to the industry as are other creative concealment techniques. Some are more aesthetically pleasing and more practical than other types. As the local government adopts preferred products on publicly owned property, their application becomes the standard for future tower sites developed on public and private land within their zoning jurisdiction. Leasing public properties to tower builders and tenant carriers for new wireless infrastructure can also create new sources of public revenue. Additionally, having a tower on public property results in an asset for the local government that is available for emergency services radio and wireless broadband equipment use.

Figure 33 indicates how certain geographic areas would benefit with improved network coverage from the addition of the publicly owned properties. Table 15 identifies potential public property fill-in sites. Tower type preferences are not provided in the recommendation column because the property has not been vetted by the local planning agency.

Table 15: DeBeque Potential Fill-In Public Properties

Public Site ID	Owner	Location	Address	Parcel Number	Acreage	Site-Specific Recommendation
A	Joint School District 49	DeBeque		2445-213-00-942	20.575	Not Determined
B1	DeBeque Fire Protection District	DeBeque	4580 I70 Frontage Road	2445-274-00-944	5.86	Not Determined

Table 15: DeBeque Potential Fill-In Public Properties						
Public Site ID	**Owner**	**Location**	**Address**	**Parcel Number**	**Acreage**	**Site-Specific Recommendation**
B2	Town of DeBeque	DeBeque	414 Rouse Avenue	2445-272-00-943	61.767	Not Determined

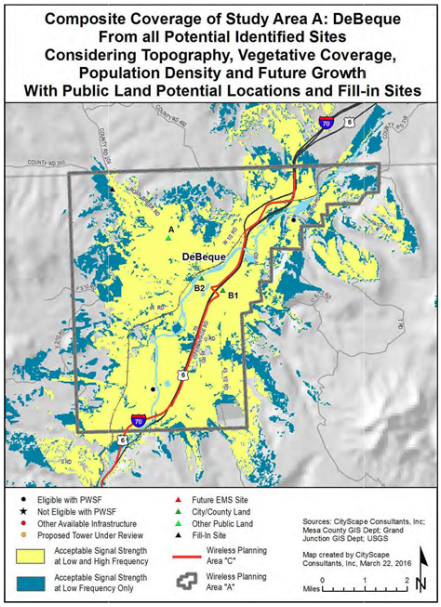


Figure 33: Coverage with Future Fill-In

(Ord. 4703, 6-1-16)

§ 31.12.480. Glade Park characteristics.

(a) Undeveloped.

(b) 387.86 square miles.

(c) 2010 population estimate 1,664.

(d) 2030 population estimate 1,956.

(Ord. 4703, 6-1-16)

§ 31.12.490. Glade Park theoretical root mean square maps.

The following maps represent a theoretical build-out of equally distributed antennas, mounted at a tower height of 118 feet, in a perfect radio frequency environment for a single service provider that excludes topographic, vegetative cover and population density considerations. The black dot within each larger circle indicates the ideal antenna location. The smaller circle within the larger circle represents the acceptable search ring for locating the tower and antennas.

Figure 34 illustrates that 26 towers or base stations equally distributed throughout the Glade Park Study Area would provide complete low frequency coverage to the defined study area. Figure 35 illustrates that 89 locations would be needed to provide complete high frequency coverage to the same geographic area.

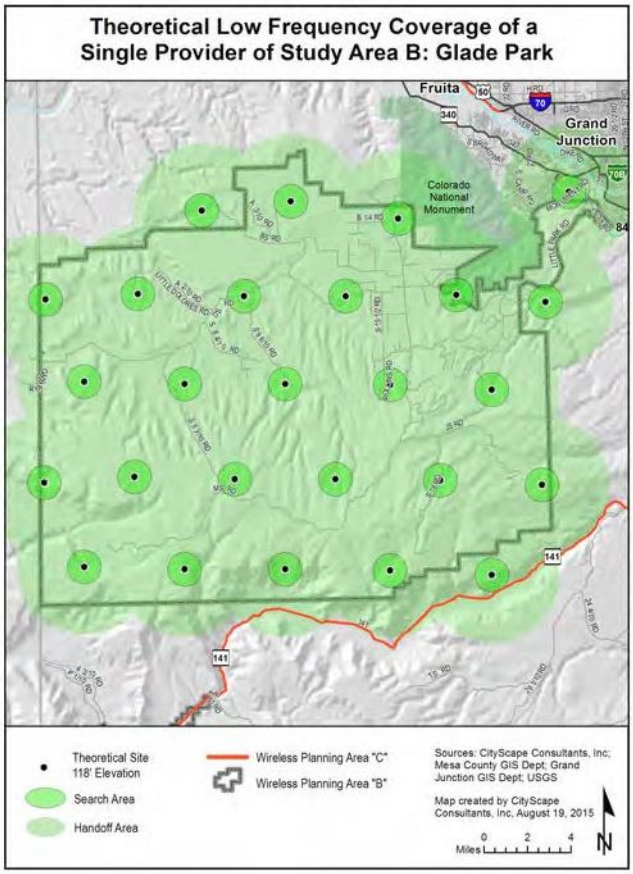


Figure 34: Theoretical Low Frequency Coverage

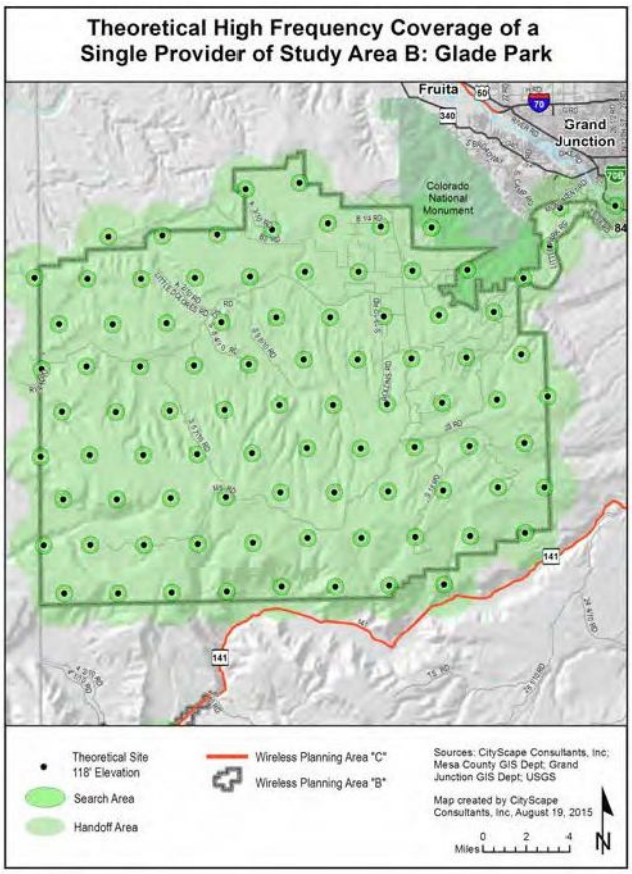


Figure 35: Theoretical High Frequency Coverage

(Ord. 4703, 6-1-16)

§ 31.12.500. Glade Park existing antenna locations.

There are no towers or base stations within the Glade Park Study Area. All 26 sites listed below are outside the study area and within either the Persigo 201 Boundary or in a tower cluster located on Blackridge above the Colorado National Monument. The low population density and seasonal tourist and recreational visitors do not meet industry criteria for additional infrastructure within the study area at this time.

Table 16: Summary of Existing and Proposed Transmission Equipment

Existing Total Number of Towers	In	Out	Existing Total Number of Base Stations	In	Out
Eligible Tower with PWSF	0	4	Eligible Base Station with PWSF	0	1
Noneligible Tower with PWSF	0	0	Noneligible Base Station with PWSF	0	0

Table 16: Summary of Existing and Proposed Transmission Equipment					
Existing Total Number of Towers	**In**	**Out**	**Existing Total Number of Base Stations**	**In**	**Out**
Eligible Tower with no PWSF	0	1	Eligible Base Station with no PWSF	0	0
Noneligible Tower with no PWSF	0	21	Noneligible Base Station with no PWSF	0	2
Proposed Eligible Tower	0	0	Proposed Eligible Base Station	0	0
Total	**0**	**26**	**Total**	**0**	**3**
Site numbers in the Glade Park Study Area: None					
Site numbers within the 1.5 mile perimeter of the Glade Park Study Area: 71 – 75, 81 – 85, 88 – 102, 141					

Figure 36 identifies the location of the sites listed in Table 16 above and are represented by:

- Black dot – Eligible towers or base stations with PWSF which have been approved through a prescribed process by the appropriate local government agency.
- Red dot – Noneligible towers or base stations (meaning infrastructure built without prior approval for construction by the appropriate local government agency).
- Orange dot – Tower or base station that has either been approved but not yet built; or is undergoing review at the time of this publication.

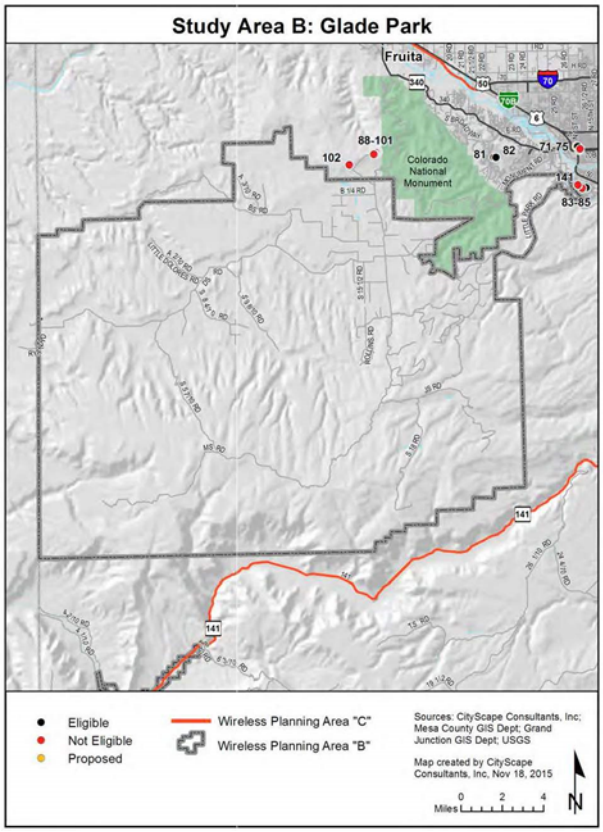


Figure 36: Existing Antenna Locations

(Ord. 4703, 6-1-16)

§ 31.12.510. Glade Park composite maps.

The service area coverage based on propagation signal strength modeling is shown for both low band frequency in yellow and high band frequency in blue on the following composite maps. The highlighted areas represent where a generally reliable signal level should be available for indoor use for both low and high bands of service.

Indoor usage is the service threshold utilized for composite modeling because it represents the lowest signal strength acceptable after considering the signal loss that occurs from building penetration. Outdoor signal strength in the same area will usually be higher than indoor signal strength. Generally the closer the subscriber is to the facility the more reliable the service. A subscriber further from the facility will have less reliable service. As the subscriber gets closer to the edge of the yellow or blue area, the signal strength becomes more prone to degradation, particularly as usage in the area increases or environmental conditions worsen. Areas of gray on the map indicate where the subscriber will experience weak, unpredictable levels of signal strength, or no service at all. Filling in these coverage gaps would require the installation of additional antennas and corresponding construction of more towers or the identification of buildings that would serve as base stations.

Figure 37 illustrates current theoretical coverage for one service provider operating in the low or high frequency assuming they had equipment on each facility. Figure 38 shows how population growth and technology changes will affect the current coverage model shown in Figure 37. There appears to be very little difference between Figures 37 and 38 due to the scale of the map and the height of the existing tower.

Both composite maps have included the expected effects of terrain, vegetative cover, and current population density variables. The antenna mounting elevation in both figures is assumed to be at the top of the towers and base stations where the height is known or at 118 feet where unknown.

Figures 37 and 38 identify the location of the inventory sites categorized as follows:

- Black dot – Eligible towers or base stations with PWSF
- ★ Black star – Noneligible towers or base stations without PWSF

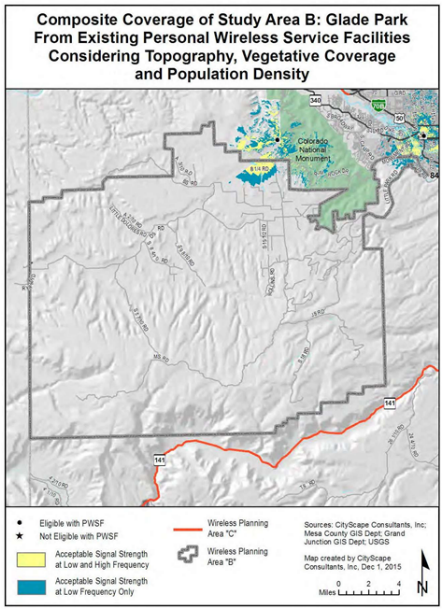


Figure 37: Current Potential Coverage

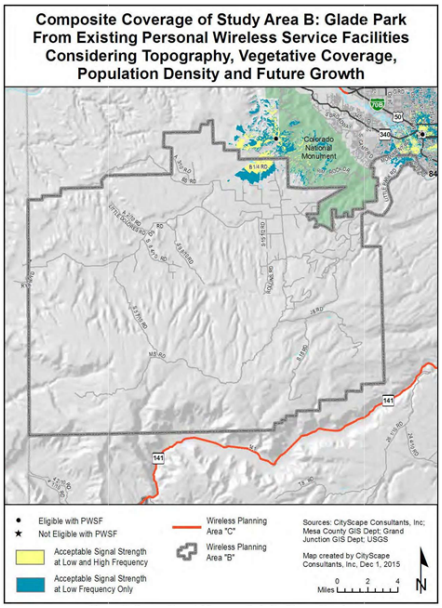


Figure 38: Current Potential Coverage Including Future Growth

(Ord. 4703, 6-1-16)

§ 31.12.520. Glade Park estimation of future antenna sites.

CityScape understands the residents' and visitors' desire to have service coverage in the Glade Park Study Area. A study was recently completed to identify possible locations for additional emergency services infrastructure. Three of these sites are located in this study area and have been added to the fill-in map in Figure 39 and are identified by a red triangle. CityScape has identified an additional six locations that would maximize the effectiveness of new infrastructure but anticipates that only one of those facilities (site T) may be constructed over the next 10 to 15 years. These fill-in sites are shown with green and black triangles. The majority of the population lives in the Northwest corner of the study area and services for these residents could be improved by a facility in that area. However, the sparsity of the subscribers and the division between multiple providers makes this area too small of a footprint for most major service providers to justify a new facility. Due to the unique circumstances found in this study area, CityScape recommends that residents and local government agencies work with the service providers to create a coordinated effort to develop new sites.

These estimates are based on the expected changes in population density, subscriber base and usage, daily transient movement throughout the study area and the number of calls a facility can service at any given time. The projections consider coverage, capacity, and broadband network objectives and take into consideration terrain, population and proposed maximum infrastructure height variables. The projection model that CityScape designed assumes that all existing tower and base station locations will be used for maximum co-location opportunities in an effort to reduce the number of new towers and base stations required within a given geographic area. Should the industry not maximize the use of existing facilities, a greater number of towers will need to be constructed over this same time period. It should also be

noted that even with this increase in new facilities, some areas within the study area will still be underserved due to the terrain and to the rural characteristics of the study area.

CityScape has reviewed the gaps in network coverage in comparison to the location of publicly owned properties and considered the impact that placing a tower on those properties would have on network and public safety coverage. When publicly owned property is used for new tower or base station construction, the community, represented by their local government agency, is assured that their preferences for tower types and concealment technology are followed. As public properties are developed, the infrastructure installed becomes the precedent for how future sites should be developed on both public and private land. For example, many slick sticks and flagpole towers are available to the industry as are other creative concealment techniques. Some are more aesthetically pleasing and more practical than other types. As the local government adopts preferred products on publicly owned property, their application becomes the standard for future tower sites developed on public and private land within their zoning jurisdiction. Leasing public properties to tower builders and tenant carriers for new wireless infrastructure can also create new sources of public revenue. Additionally, having a tower on public property results in an asset for the local government that is available for emergency services radio and wireless broadband equipment use.

Figure 39 indicates how certain geographic areas would benefit with improved network coverage from the addition of the publicly owned properties. Table 17 identifies potential public property fill-in sites. Tower type preferences are not provided in the recommendation column because the property has not been vetted by the local planning agency.

Table 17: Glade Park Potential Fill-In Public Property

Public Site ID	Owner	Location	Address	Parcel Number	Acreage	Site-Specific Recommendation
T	County of Mesa	Glade Park	16430 DS Road	2959-243-02-932	2.089	Not Determined

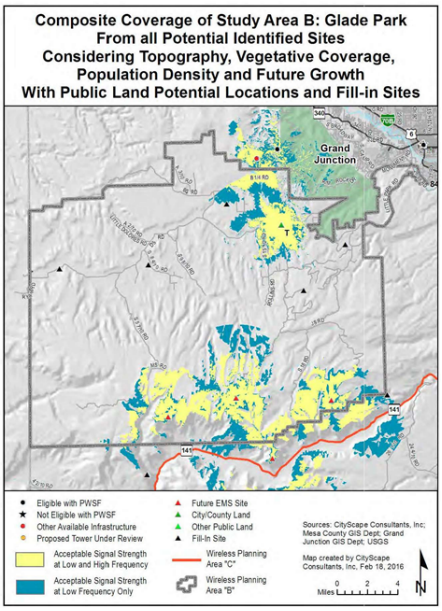


Figure 39: Coverage with Future Fill-In

(Ord. 4703, 6-1-16)

§ 31.12.530. Gateway characteristics.

(a) Undeveloped.

(b) 3.69 square miles.

(c) 2010 population estimate 142.

(d) 2030 population estimate 342.

(Ord. 4703, 6-1-16)

§ 31.12.540. Gateway theoretical root mean square maps.

The following maps represent a theoretical build-out of equally distributed antennas, mounted at a tower height of 118 feet, in a perfect radio frequency environment for a single service provider that excludes topographic, vegetative cover and population density considerations. The black dot within each larger circle indicates the ideal antenna location. The smaller circle within the larger circle represents the acceptable search ring for locating the tower and antennas.

Figure 40 illustrates that two towers or base stations centrally located in the Gateway Study Area would provide complete low frequency coverage to the defined study area. Figure 41 illustrates that it would take four locations to provide complete high frequency coverage to the same geographic area.

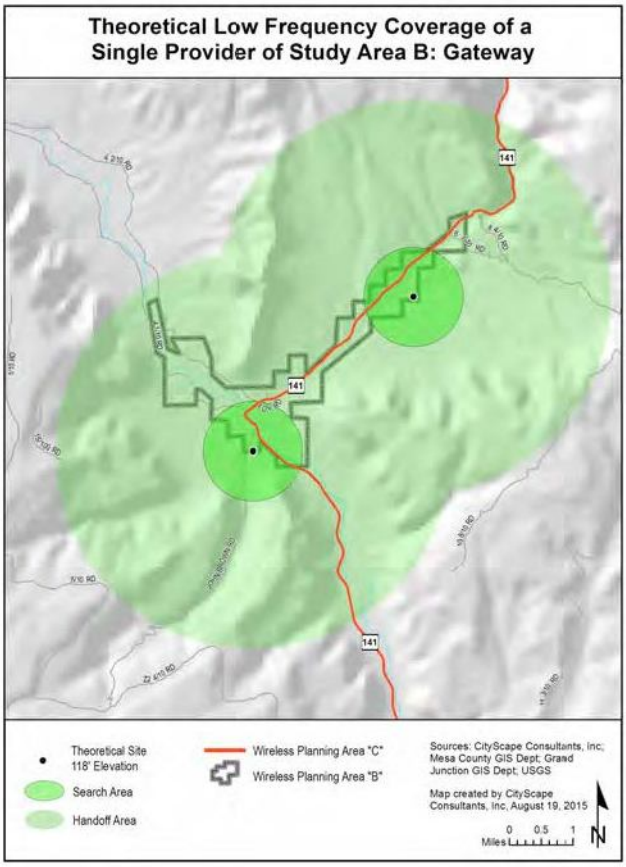


Figure 40: Theoretical Low Frequency Coverage

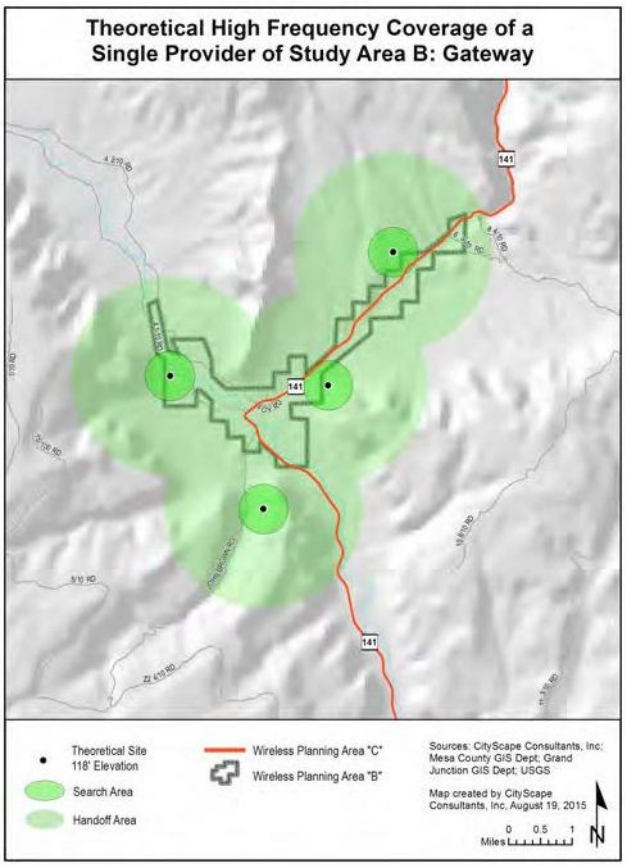


Figure 41: Theoretical High Frequency Coverage

(Ord. 4703, 6-1-16)

§ 31.12.550. Gateway existing antenna locations.

The Gateway Study Area has no communication equipment within the study boundary. There are three sites located to the west on Lee's Point which provide some service to Gateway and the Highway 141 corridor. Gateway, a remote, rural community, has a minimal subscriber base which explains the lack of wireless infrastructure in this region of the County. There is a resort located in Gateway which is likely the reason a PWSF was constructed on Lee's Point.

Table 18: Summary of Existing and Proposed Transmission Equipment

Existing Total Number of Towers	In	Out	Existing Total Number of Base Stations	In	Out
Eligible Tower with PWSF	0	0	Eligible Base Station with PWSF	0	0
Noneligible Tower with PWSF	0	1	Noneligible Base Station with PWSF	0	0
Eligible Tower with no PWSF	0	0	Eligible Base Station with no PWSF	0	0

Table 18: Summary of Existing and Proposed Transmission Equipment					
Existing Total Number of Towers	**In**	**Out**	**Existing Total Number of Base Stations**	**In**	**Out**
Noneligible Tower with no PWSF	0	2	Noneligible Base Station with no PWSF	0	0
Proposed Eligible Tower	0	0	Proposed Eligible Base Station	0	0
Total	**0**	**3**	**Total**	**0**	**0**
Site numbers in the Gateway Park Study Area: None					
Site numbers within the 1.5 mile perimeter of the Gateway Park Study Area: 133 – 135					

Figure 42 identifies the location of the sites listed in Table 18 above and are represented by:

- Black dot – Eligible towers or base stations with PWSF which have been approved through a prescribed process by the appropriate local government agency.
- Red dot – Noneligible towers or base stations (meaning infrastructure built without prior approval for construction by the appropriate local government agency).
- Orange dot – Tower or base station that has either been approved but not yet built; or is undergoing review at the time of this publication.

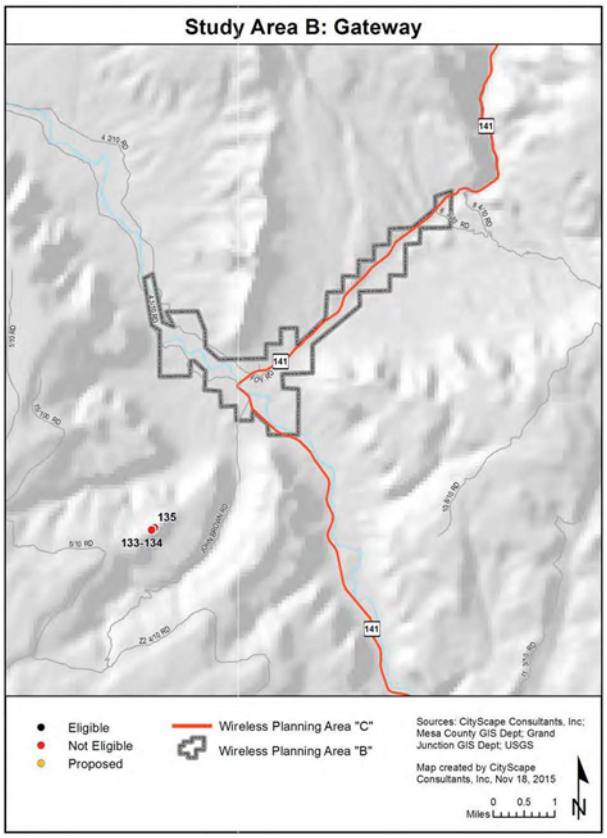


Figure 42: Existing Antenna Locations

(Ord. 4703, 6-1-16)

§ 31.12.560. Gateway composite maps.

The service area coverage based on propagation signal strength modeling is shown for both low band frequency in yellow and high band frequency in blue on the following composite maps. The highlighted areas represent where a generally reliable signal level should be available for indoor use for both low and high bands of service.

Indoor usage is the service threshold utilized for composite modeling because it represents the lowest signal strength acceptable after considering the signal loss that occurs from building penetration. Outdoor signal strength in the same area will usually be higher than indoor signal strength. Generally the closer the subscriber is to the facility the more reliable the service. A subscriber further from the facility will have less reliable service. As the subscriber gets closer to the edge of the yellow or blue area, the signal strength becomes more prone to degradation, particularly as usage in the area increases or environmental conditions worsen. Areas of gray on the map indicate where the subscriber will experience weak, unpredictable levels of signal strength, or no service at all. Filling in these coverage gaps would require the installation of additional antennas and corresponding construction of more towers or the identification of buildings that would serve as base stations.

Figure 43 illustrates current and future theoretical coverage for one service provider operating in the low or high band frequency assuming they have equipment on each facility. This composite map includes the expected effects of terrain, vegetative cover, and current population density variables. The antenna mounting elevation is assumed to be at the top of the towers and base stations where the height is known or at 118 feet where unknown.

(Ord. 4703, 6-1-16)

§ 31.12.570. Gateway estimation of future antenna sites.

Due to the undeveloped characteristics of the Gateway rural community, CityScape estimates that only one to three new sites may be built over the next 10 to 15 years. Any sites built will parallel Highway 141. The most likely location for a new facility would be in or near the town, which would improve wireless access for the citizens, resort visitors and travelers on Highway 141.

These estimates are based on the expected changes in population density, subscriber base and usage, daily transient movement throughout the study area and the number of calls a facility can service at any given time. The projections consider coverage, capacity, and broadband network objectives and take into consideration terrain, population and proposed maximum infrastructure height variables Should all three projected structures be constructed, then all of the Gateway Study Area would have wireless access.

CityScape has reviewed the gaps in network coverage in comparison to the location of publicly owned properties and considered the impact that placing a tower on those properties would have on network and public safety coverage. When publicly owned property is used for new tower or base station construction, the community, represented by their local government agency, is assured that their preferences for tower types and concealment technology are followed. As public properties are developed, the infrastructure installed becomes the precedent for how future sites should be developed on both public and private land. For example, many slick sticks and flagpole towers are available to the industry as are other creative concealment techniques. Some are more aesthetically pleasing and more practical than other types. As the local government adopts preferred products on publicly owned property, their application becomes the standard for future tower sites developed on public and private land within their zoning jurisdiction. Leasing public properties to tower builders and tenant carriers for new wireless infrastructure can also create new sources of public revenue. Additionally, having a tower on public property results in an asset for the local government that is available for emergency services radio and wireless broadband equipment use.

Figure 43 indicates how certain geographic areas would benefit with improved network coverage from the addition of the publicly owned properties. Table 19 identifies potential public property fill-in sites. Tower type preferences are not provided in the recommendation column because the property has not been vetted by the local planning agency.

Table 19: Gateway Potential Fill-In Public Property

Public Site ID	Owner	Location	Address	Parcel Number	Acreage	Site-Specific Recommendation
X	Mesa County	Gateway	42700 Highway 141	3477-153-01-936	7.663	Not Determined

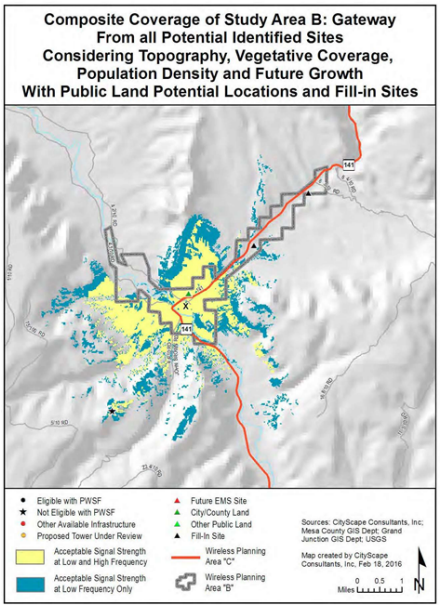


Figure 43: Coverage with Future Fill-In

(Ord. 4703, 6-1-16)

§ 31.12.580. Whitewater characteristics.

(a) Rural/Undeveloped.

(b) 49.49 square miles.

(c) 2010 population estimate 1,864.

(d) 2030 population estimate 2,391.

(Ord. 4703, 6-1-16)

§ 31.12.590. Whitewater theoretical root mean square maps.

The following maps represent a theoretical build-out of equally distributed antennas, mounted at a tower height of 118 feet, in a perfect radio frequency environment for a single service provider that excludes topographic, vegetative cover and population density considerations. The black dot within each larger circle indicates the ideal antenna location. The smaller circle within the larger circle represents the acceptable search ring for locating the tower and antennas.

Figure 44 illustrates that five towers or base stations equally distributed throughout the Whitewater Study Area would provide complete low frequency coverage to the defined study area. Figure 45 illustrates that 14 locations would be needed to provide complete high frequency coverage to the same geographic area.

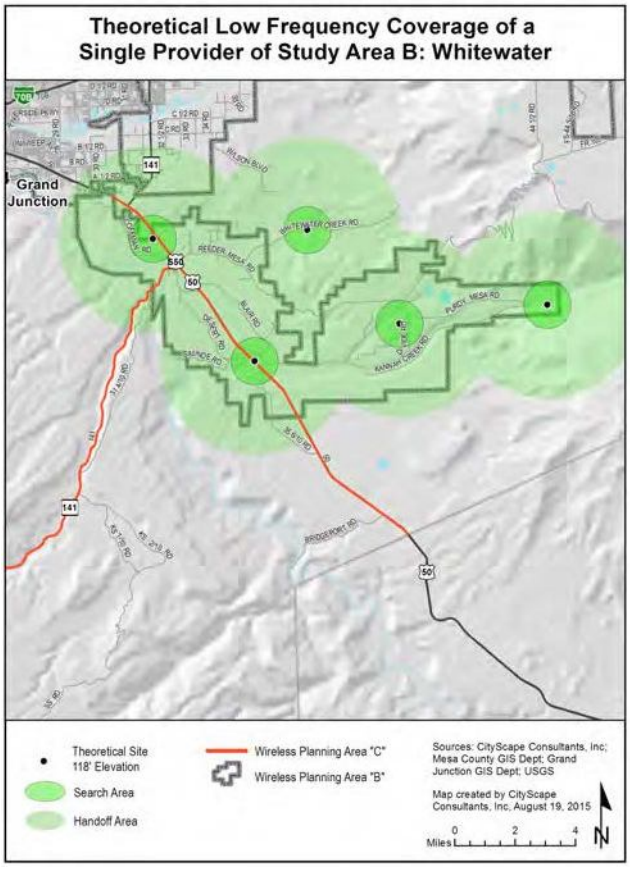


Figure 44: Theoretical Low Frequency Coverage

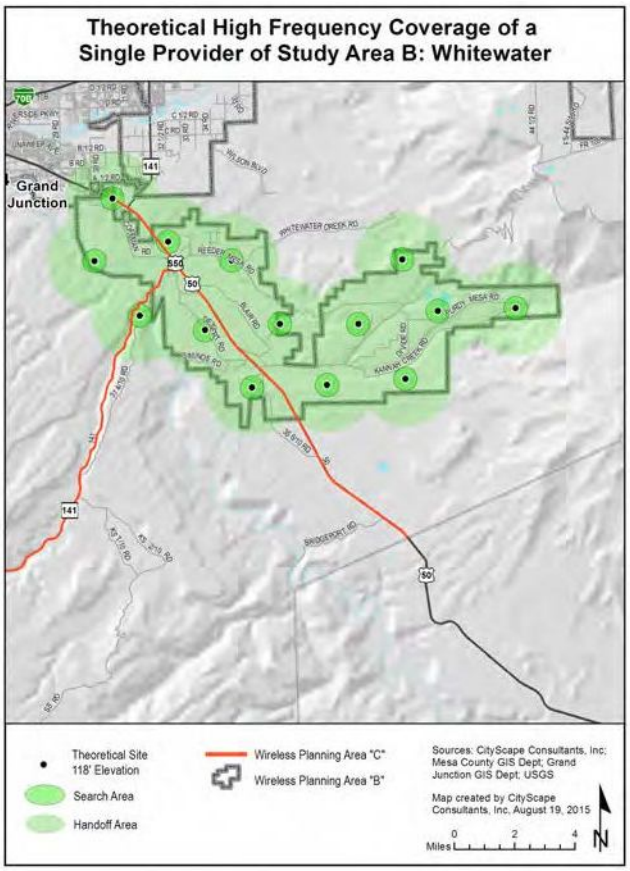


Figure 45: Theoretical Low Frequency Coverage

(Ord. 4703, 6-1-16)

§ 31.12.600. Whitewater existing antenna locations.

There are five communication facilities within the Whitewater Study Area located parallel to Highway 50. Only one of the three facilities is equipped with a PWSF. One additional facility is located west of the boundary area.

Table 20: Summary of Existing and Proposed Transmission Equipment

Existing Total Number of Towers	In	Out	Existing Total Number of Base Stations	In	Out
Eligible Tower with PWSF	1	0	Eligible Base Station with PWSF	0	0
Noneligible Tower with PWSF	1	1	Noneligible Base Station with PWSF	0	0
Eligible Tower with no PWSF	0	0	Eligible Base Station with no PWSF	0	0

Table 20: Summary of Existing and Proposed Transmission Equipment					
Existing Total Number of Towers	**In**	**Out**	**Existing Total Number of Base Stations**	**In**	**Out**
Noneligible Tower with no PWSF	3	0	Noneligible Base Station with no PWSF	0	0
Proposed Eligible Tower	0	0	Proposed Eligible Base Station	0	0
Total	**5**	**1**	**Total**	**0**	**0**
Site numbers in the Whitewater Study Area: 87, 103, 104					
Site numbers within the 1.5 mile perimeter of the Whitewater Study Area: 86					

Figure 46 identifies the location of the sites listed in Table 20 above and are represented by:

- Black dot – Eligible towers or base stations with PWSF which have been approved through a prescribed process by the appropriate local government agency.
- Red dot – Noneligible towers or base stations (meaning infrastructure built without prior approval for construction by the appropriate local government agency).
- Orange dot – Tower or base station that has either been approved but not yet built; or is undergoing review at the time of this publication.

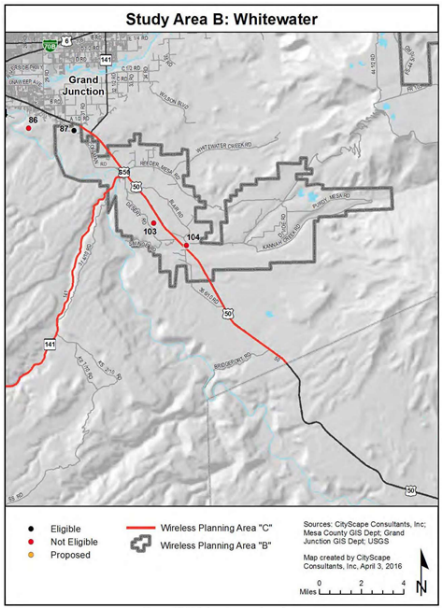


Figure 46: Existing Antenna Locations

(Ord. 4703, 6-1-16)

§ 31.12.610. Whitewater composite maps.

The service area coverage based on propagation signal strength modeling is shown for both low band frequency in yellow and high band frequency in blue on the following composite maps. The highlighted areas represent where a generally reliable signal level should be available for indoor use for both low and high bands of service.

Indoor usage is the service threshold utilized for composite modeling because it represents the lowest signal strength acceptable after considering the signal loss that occurs from building penetration. Outdoor signal strength in the same area will usually be higher than indoor signal strength. Generally the closer the subscriber is to the facility the more reliable the service. A subscriber further from the facility will have less reliable service. As the subscriber gets closer to the edge of the yellow or blue area, the signal strength becomes more prone to degradation, particularly as usage in the area increases or environmental conditions worsen. Areas of gray on the map indicate where the subscriber will experience weak, unpredictable levels of signal strength, or no service at all. Filling in these coverage gaps would require the installation of additional antennas and corresponding construction of more towers or the identification of buildings that would serve as base stations.

Figure 47 illustrates current theoretical coverage for one service provider operating in the low or high frequency assuming they had equipment on each facility. Figure 48 shows how population growth and technology changes will affect the current coverage model shown in Figure 47.

Both composite maps include the expected effects of terrain, vegetative cover, and current population density variables. The antenna mounting elevation in both figures is assumed to be at the top of the towers and base stations where the height is known or at 118 feet where unknown.

Figures 47 and 48 identify the location of the inventory sites categorized as follows:

- • Black dot – Eligible towers or base stations with PWSF
- ★ Black star – Noneligible towers or base stations without PWSF

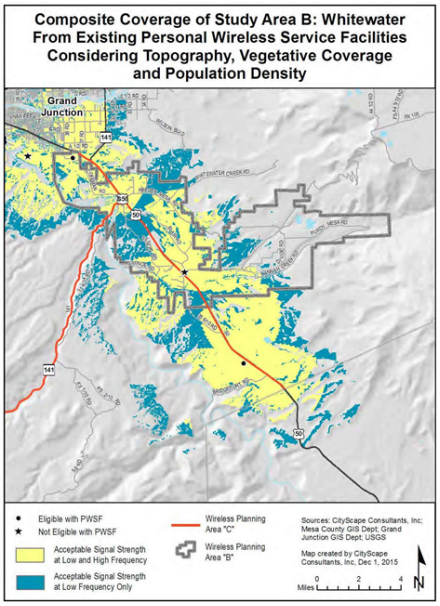


Figure 47: Current Potential Coverage

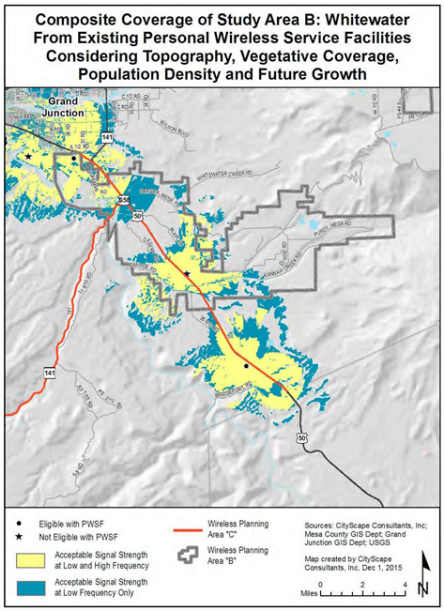


Figure 48: Current Potential Coverage Including Future Growth

(Ord. 4703, 6-1-16)

§ 31.12.620. Whitewater estimation of future antenna sites.

The three existing towers in the Whitewater Study Area, if occupied by the same wireless service provider would offer very good service coverage along the Highway 50 corridor. CityScape has identified the need for four additional towers or base stations in this study area

by 2030. Figure 49 illustrates three of the four sites turned on. In all likelihood, the first two sites added will be parallel to the highway.

These estimates are based on the expected changes in population density, subscriber base and usage, daily transient movement throughout the study area and the number of calls a facility can service at any given time. The projections consider coverage, capacity, and broadband network objectives and take into consideration terrain, population and proposed maximum infrastructure height variables. The projection model that CityScape designed assumes that all existing tower and base station locations will be used for maximum co-location opportunities in an effort to reduce the number of new towers and base stations required within a given geographic area. Should the industry not maximize the use of existing facilities, a greater number of towers will need to be constructed over this same time period.

CityScape has reviewed the gaps in network coverage in comparison to the location of publicly owned properties and considered the impact that placing a tower on those properties would have on network and public safety coverage. When publicly owned property is used for new tower or base station construction, the community, represented by their local government agency, is assured that their preferences for tower types and concealment technology are followed. As public properties are developed, the infrastructure installed becomes the precedent for how future sites should be developed on both public and private land. For example, many slick sticks and flagpole towers are available to the industry as are other creative concealment techniques. Some are more aesthetically pleasing and more practical than other types. As the local government adopts preferred products on publicly owned property, their application becomes the standard for future tower sites developed on public and private land within their zoning jurisdiction. Leasing public properties to tower builders and tenant carriers for new wireless infrastructure can also create new sources of public revenue. Additionally, having a tower on public property results in an asset for the local government that is available for emergency services radio and wireless broadband equipment use.

Figure 49 indicates how certain geographic areas would benefit with improved network coverage from the addition of the publicly owned properties. Table 21 identifies potential public property fill-in sites. Tower type preferences are not provided in the recommendation column because the property has not been vetted by the local planning agency.

Table 21: Whitewater Potential Fill-In Public Property

Public Site ID	Owner	Location	Address	Parcel Number	Acreage	Site-Specific Recommendation
U1	Mesa County	Whitewater	527 Desert Road	2967-231-00-939	116.554	Not Determined
U2	City of Grand Junction	Whitewater	33129 Mill Tailing Road	2967-243-00-944	138.554	Not Determined
V1	City of Grand Junction	Whitewater	2080 Purdy Mesa Road	2969-251-00-944	216.145	Not Determined
V2	City of Grand Junction	Whitewater	7630 Reeder Mesa Road	2969-242-00-948	1333.34	Not Determined
V3	City of Grand Junction	Whitewater	3330 Purdy Mesa Road	2971-363-00-941	47.659	Not Determined

Table 21: Whitewater Potential Fill-In Public Property						
Public Site ID	**Owner**	**Location**	**Address**	**Parcel Number**	**Acreage**	**Site-Specific Recommendation**
W1	City of Grand Junction	Whitewater	3280 Purdy Mesa Road	2971-361-00-940	1057.746	Not Determined
W2	City of Grand Junction	Whitewater	8570 Kannah Creek Road	3199-051-00-944	20.48	Not Determined
W3	City of Grand Junction	Whitewater	9470 Kannah Creek Road	2937-334-00-941	26.649	Not Determined

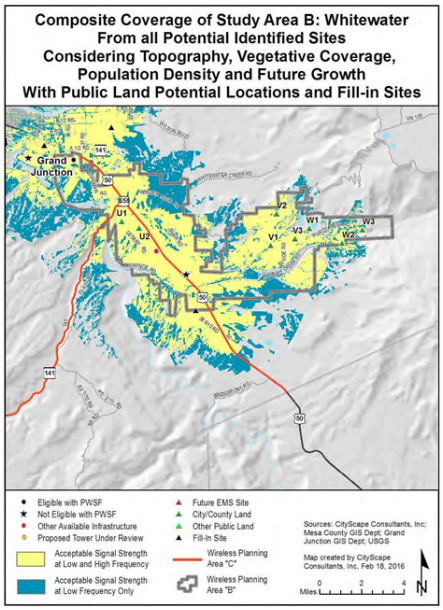


Figure 49: Coverage with Future Fill-In

(Ord. 4703, 6-1-16)

§ 31.12.630. Town of Collbran characteristics.

(a) Rural/Undeveloped.

(b) 251.49 square miles.

(c) 2010 population estimate 2,359.

(d) 2030 population estimate 3,008.

(Ord. 4703, 6-1-16)

§ 31.12.640. Town of Collbran theoretical root mean square maps.

The following maps represent a theoretical build-out of equally distributed antennas, mounted at a tower height of 118 feet, in a perfect radio frequency environment for a single service provider that excludes topographic, vegetative cover and population density considerations.

The black dot within each larger circle indicates the ideal antenna location. The smaller circle within the larger circle represents the acceptable search ring for locating the tower and antennas.

Figure 50 illustrates that 19 towers or base stations equally distributed throughout the Town of Collbran Study Area would provide complete low frequency coverage to the defined study area. Figure 51 illustrates that 60 locations would be needed to provide complete high frequency coverage to the same geographic area.

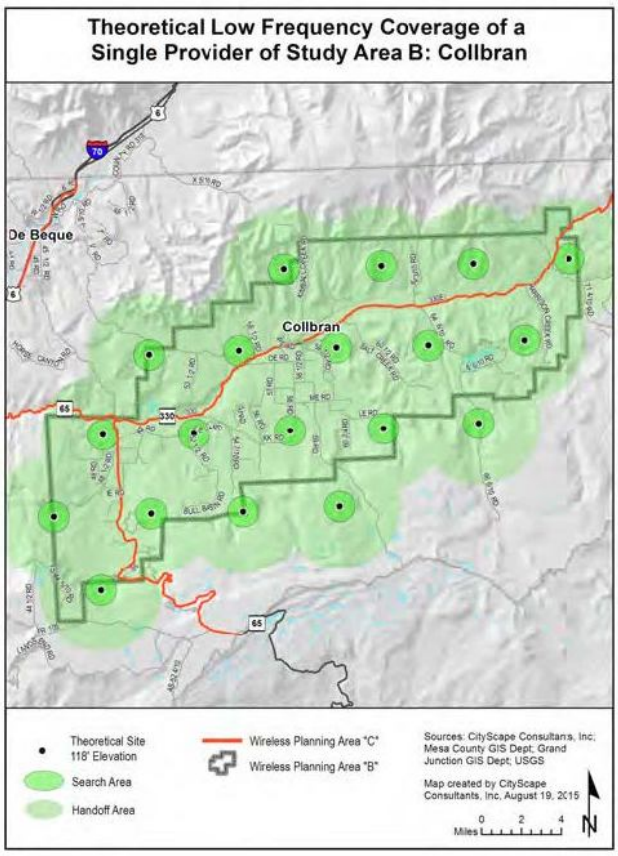


Figure 50: Theoretical Low Frequency Coverage

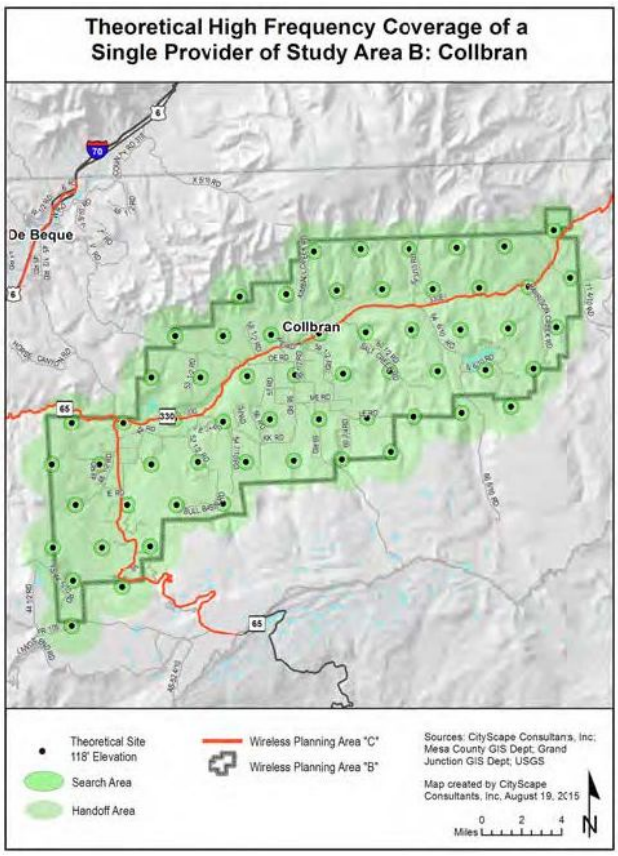


Figure 51: Theoretical High Frequency Coverage

(Ord. 4703, 6-1-16)

§ 31.12.650. Town of Collbran existing antenna locations.

A total of four transmission towers are located within the Town of Collbran Study Area. Only one has PWSF installed. There are tower clusters just west of the study area boundary at Land's End and Palisade Point. The clusters consist of 37 towers but only two contain PWSF equipment. The majority of the cluster towers contain either broadcast equipment for radio and television or microwave use. Aside from Glade Park, the Town of Collbran Study Area contains the most acreage with the lowest population density. For this reason, the wireless industry has not deployed much infrastructure except at the Powderhorn Ski Resort. This is very similar to the situation in Gateway where the resort and the tourist traffic have provided enough business incentive for the carriers to provide limited service.

Table 22: Summary of Existing and Proposed Transmission Equipment

Existing Total Number of Towers	In	Out	Existing Total Number of Base Stations	In	Out
Eligible Tower with PWSF	0	1	Eligible Base Station with PWSF	0	0

Table 22: Summary of Existing and Proposed Transmission Equipment					
Existing Total Number of Towers	**In**	**Out**	**Existing Total Number of Base Stations**	**In**	**Out**
Noneligible Tower with PWSF	1	1	Noneligible Base Station with PWSF	0	0
Eligible Tower with no PWSF	0	0	Eligible Base Station with no PWSF	0	0
Noneligible Tower with no PWSF	3	37	Noneligible Base Station with no PWSF	0	0
Proposed Eligible Tower	0	0	Proposed Eligible Base Station	0	0
Total	**4**	**39**	**Total**	**0**	**0**
Site numbers in the Town of Collbran Study Area: 4, 33, 130, 142					
Site numbers within the 1.5 mile perimeter of the Town of Collbran Study Area: 7 – 30					

Figure 52 identifies the location of the sites listed in Table 22 above and are represented by:

- Black dot – Eligible towers or base stations with PWSF which have been approved through a prescribed process by the appropriate local government agency.
- Red dot – Noneligible towers or base stations (meaning infrastructure built without prior approval for construction by the appropriate local government agency).
- Orange dot – Tower or base station that has either been approved but not yet built; or is undergoing review at the time of this publication.

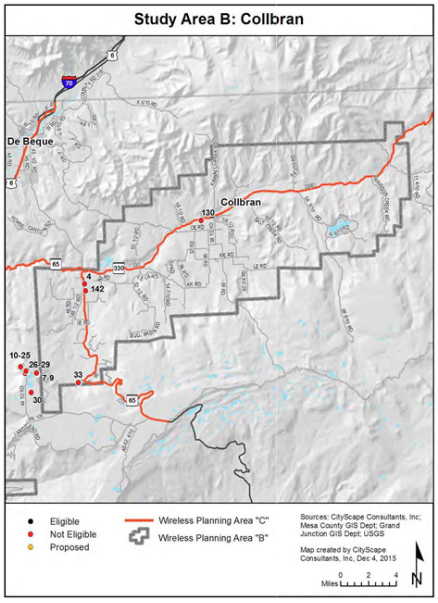


Figure 52: Existing Antenna Locations

(Ord. 4703, 6-1-16)

§ 31.12.660. Town of Collbran composite maps.

The service area coverage based on propagation signal strength modeling is shown for both low band frequency in yellow and high band frequency in blue on the following composite maps. The highlighted areas represent where a generally reliable signal level should be available for indoor use for both low and high bands of service.

Indoor usage is the service threshold utilized for composite modeling because it represents the lowest signal strength acceptable after considering the signal loss that occurs from building penetration. Outdoor signal strength in the same area will usually be higher than indoor signal strength. Generally the closer the subscriber is to the facility the more reliable the service. A subscriber further from the facility will have less reliable service. As the subscriber gets closer to the edge of the yellow or blue area, the signal strength becomes more prone to degradation, particularly as usage in the area increases or environmental conditions worsen. Areas of gray on the map indicate where the subscriber will experience weak, unpredictable levels of signal strength, or no service at all. Filling in these coverage gaps would require the installation of additional antennas and corresponding construction of more towers or the identification of buildings that would serve as base stations.

Figure 53 illustrates current and future theoretical coverage for one service provider operating in the low or high band frequency assuming they had equipment on each facility.

This map includes the expected effects of terrain, vegetative cover, and current population density variables. The antenna mounting elevation in both figures is assumed to be at the top of the towers and base stations where the height is known or at 118 feet where unknown.

Figure 53 identifies the location of the inventory sites categorized as follows:

- • Black dot – Eligible towers or base stations with PWSF
- ★ Black star – Noneligible towers or base stations without PWSF

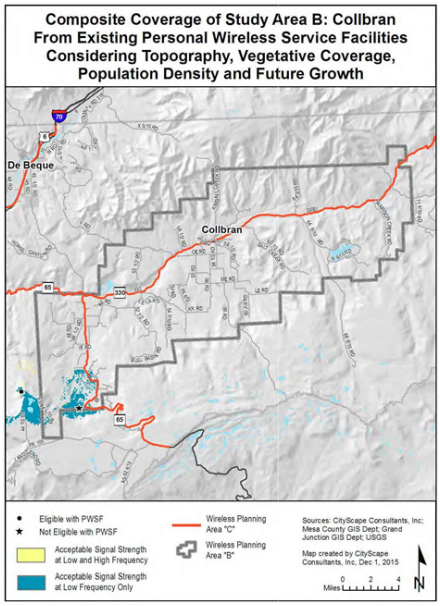


Figure 53: Current Potential Coverage Including Future Growth

(Ord. 4703, 6-1-16)

§ 31.12.670. Town of Collbran estimation of future antenna sites.

There are three concentrations in populations in the Town of Collbran Study Area: Town of Collbran, Mesa Community and Powderhorn Resort. The Town and County desire to have services to connect the residents and vehicular activity between the three places. Recently, a study was completed to identify possible locations for additional emergency services infrastructure. Two of these sites are located in this study area and one is located just east of the Town's limits. All three sites have been added to the map in Figure 54, identified by red triangles. Temporary towers, often referred to as Cell On Wheels (COW), have been used by the oil and gasoline industries in this region. Unfortunately once a project is finished the COW is removed resulting in a sudden loss of service. In order to provide long-term solutions to network gaps CityScape has identified an additional 12 locations that would provide a blanket of coverage along the Highway 330 corridor and the Town of Collbran. But, CityScape anticipates that only two of those facilities may be constructed over the next 10 to 15 years. Due to the unique circumstances found in this study area, CityScape recommends that residents and local government agencies work with the service providers to create a coordinated effort to develop new sites.

CityScape has reviewed the gaps in network coverage in comparison to the location of publicly owned properties and considered the impact that placing a tower on those properties would have on network and public safety coverage. When publicly owned property is used for new tower or base station construction, the community, represented by their local government agency, is assured that their preferences for tower types and concealment technology are followed. As public properties are developed, the infrastructure installed

becomes the precedent for how future sites should be developed on both public and private land. For example, many slick sticks and flagpole towers are available to the industry as are other creative concealment techniques. Some are more aesthetically pleasing and more practical than other types. As the local government adopts preferred products on publicly owned property, their application becomes the standard for future tower sites developed on public and private land within their zoning jurisdiction. Leasing public properties to tower builders and tenant carriers for new wireless infrastructure can also create new sources of public revenue. Additionally, having a tower on public property results in an asset for the local government that is available for emergency services radio and wireless broadband equipment use.

Figure 54 indicates how certain geographic areas would benefit with improved network coverage from the addition of the publicly owned properties. Table 23 identifies potential public property fill-in sites. Tower type preferences are not provided in the recommendation column because the property has not been vetted by the local planning agency.

Table 23: Town of Collbran Potential Fill-In Public Property

Public Site ID	Owner	Location	Address	Parcel Number	Acreage	Site-Specific Recommendation
C	Town of Collbran	Town of Collbran	61416 E Hwy 330	2665-203-00-941	1.196	Not Determined

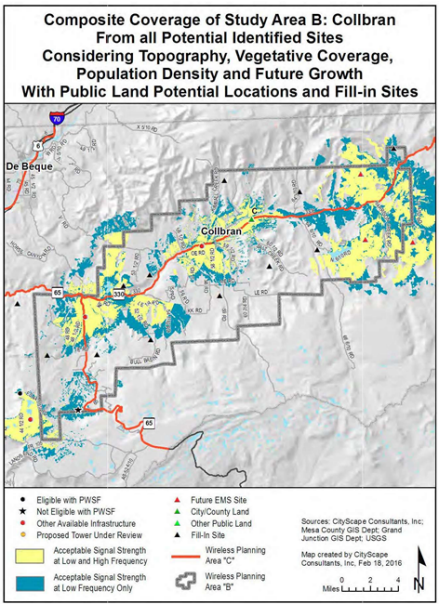


Figure 54: Coverage with Future Fill-In

(Ord. 4703, 6-1-16)

§ 31.12.680. Mesa County Study Area C – Overview.

The third study area specified in the RFP for analysis is identified as Corridors: I-70, Highway 50, Highway 330, Highway 60 and Highway 141. Due to the large geographic area

covered by these corridors, Study Area C has been divided into four sections. Since much of the corridor analysis is included in the other study areas, the estimated future antenna sites focus only on the projected fill-in analysis shown in Figure 55, as insets 1, 2, 3 and 4.

The service area coverage based on propagation signal strength modeling is shown for both low band frequency in yellow and high band frequency in blue on the following composite maps. The highlighted areas represent where a generally reliable signal level should be available for indoor use for both low and high bands of service.

Indoor usage is the service threshold utilized for composite modeling because it represents the lowest signal strength acceptable after considering the signal loss that occurs from building penetration. Outdoor signal strength in the same area will usually be higher than indoor signal strength. Generally the closer the subscriber is to the facility the more reliable the service. A subscriber further from the facility will have less reliable service. As the subscriber gets closer to the edge of the yellow or blue area, the signal strength becomes more prone to degradation, particularly as usage in the area increases or environmental conditions worsen. Areas of gray on the map indicate where the subscriber will experience weak, unpredictable levels of signal strength, or no service at all. Filling in these coverage gaps would require the installation of additional antennas and corresponding construction of more towers or the identification of buildings that would serve as base stations.

Figure 56 illustrates current and future theoretical coverage for one service provider operating in the low or high band frequency assuming they had equipment on each inventoried facility. This map includes the expected effects of terrain, vegetative cover, and current population density variables. The antenna mounting elevation is assumed to be at the top of the towers and base stations where the height is known or at 118 feet where unknown.

CityScape has reviewed the gaps in network coverage, as shown in Figures 57 through 60, in comparison to the location of publicly owned properties and considered the impact that placing a tower on those properties would have on network and public safety coverage. When publicly owned property is used for new tower or base station construction, the community, represented by their local government agency, is assured that their preferences for tower types and concealment technology are followed. As public properties are developed, the infrastructure installed becomes the precedent for how future sites should be developed on both public and private land. For example, many slick sticks and flagpole towers are available to the industry as are other creative concealment techniques. Some are more aesthetically pleasing and more practical than other types.

As the local government adopts preferred products on publicly owned property, their application becomes the standard for future tower sites developed on public and private land within their zoning jurisdiction. Leasing public properties to tower builders and tenant carriers for new wireless infrastructure can also create new sources of public revenue. Additionally, having a tower on public property results in an asset for the local government that is available for emergency services radio and wireless broadband equipment use.

Figures 57 through 60 indicate how certain geographic areas would benefit with improved network coverage from the addition of the publicly owned properties. Table 24 identifies potential public property fill-in sites that satisfy both corridor and study area coverage gaps. Tower type preferences are not provided in the recommendation column because the property has not been vetted by the local planning agency.

Table 24: Mesa County Potential Fill-In Public Properties

Public Site ID	Owner	Location	Address	Parcel Number	Acreage	Site-Specific Recommendation
B1	DeBeque Fire Protection District	DeBeque	4580 I70 Frontage Road	2445-274-00-944	5.86	Not Determined
B2	Town of DeBeque	DeBeque	414 Rouse Avenue	2445-272-00-943	61.767	Not Determined
C	Town of Collbran	Town of Collbran	61416 E Hwy 330	2665-203-00-941	1.196	Not Determined
E1	Lower Valley Protection District	Lower Valley/ Loma	1341 13 Road	2691-334-04-948	0.79	Not Determined
E2	State Department of Highways	Lower Valley/ Loma	1346 13 3/10 Road	2691-342-00-924	9.762	Not Determined
G	Mesa County	Lower Valley	916 19 1/2 Road	2697-224-00-939	5.281	Not Determined
Q	Colorado Department of Highways	Palisade	816 35 8/10 Road	2937-063-00-924	10.241	Not Determined
U1	Mesa County	Whitewater	527 Desert Road	2967-231-00-939	116.554	Not Determined
U2	City of Grand Junction	Whitewater	33129 Mill Tailing Road	2967-243-00-944	138.554	Not Determined
X	Mesa County	Gateway	42700 Highway 141	3477-153-01-936	7.663	Not Determined

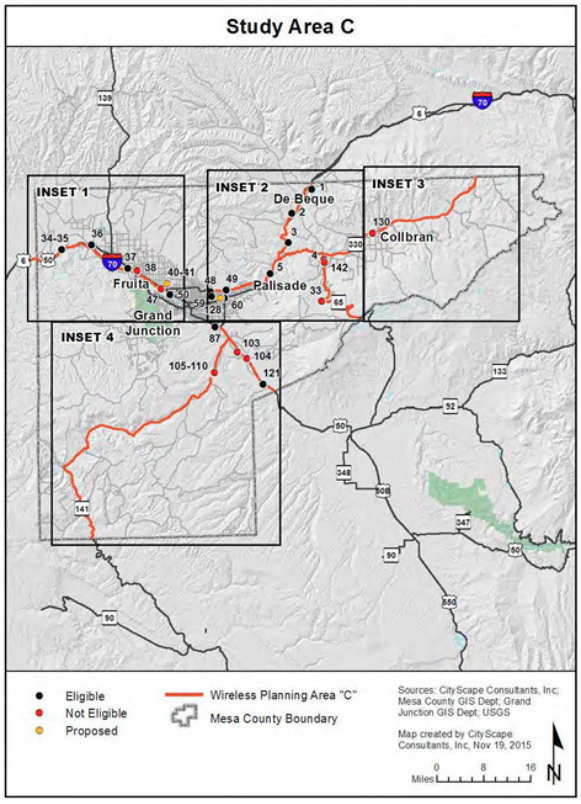


Figure 55: Existing Antenna Locations

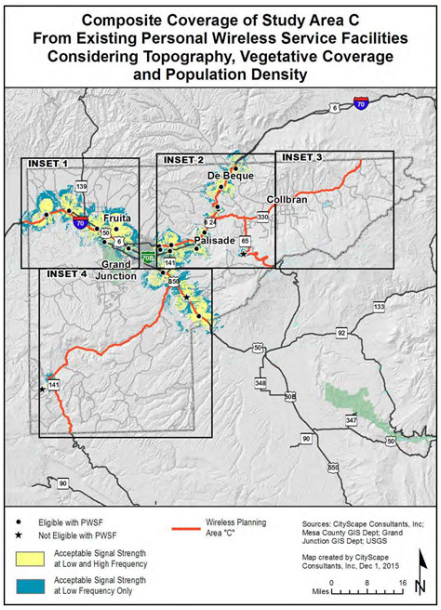


Figure 56: Current Potential Coverage Including Future Growth

(Ord. 4703, 6-1-16)

§ 31.12.690. Estimation of future antenna sites: Inset 1.

CityScape estimates that six new towers or base stations will be needed over the next 10 to 15 years along the I-70 corridor as shown in Figure 57.

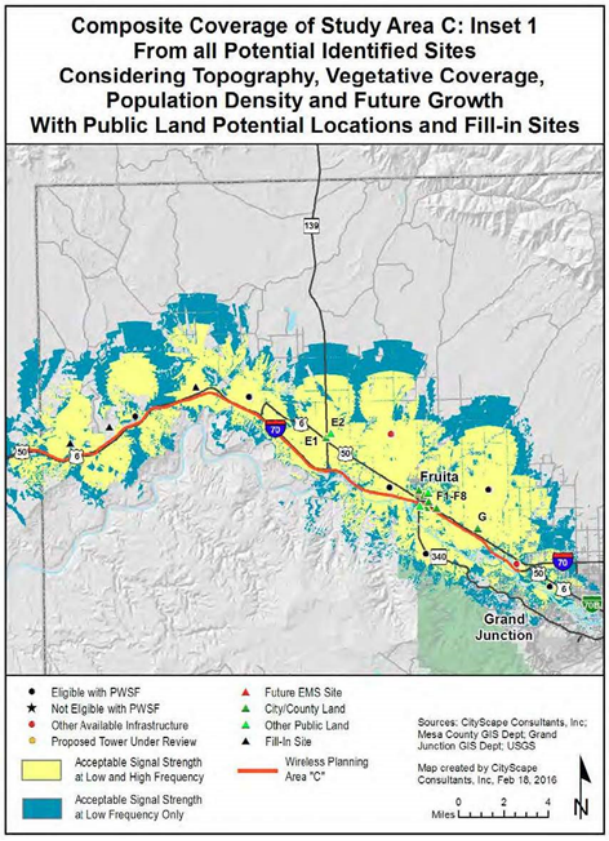


Figure 57: Coverage with Future Fill-In Inset 1

(Ord. 4703, 6-1-16)

§ 31.12.700. Estimation of future antenna sites: Inset 2.

CityScape estimates that, in addition to adding three proposed emergency service facilities, eight new towers or base stations will be needed over the next 10 to 15 years along the corridors shown in Figure 58.

Approximately 15 new sites would be needed to provide complete coverage. However, the sites along Highway 65 and Highway 330 will likely not be a high priority for the industry and therefore, four of the 15 sites have not been turned on.

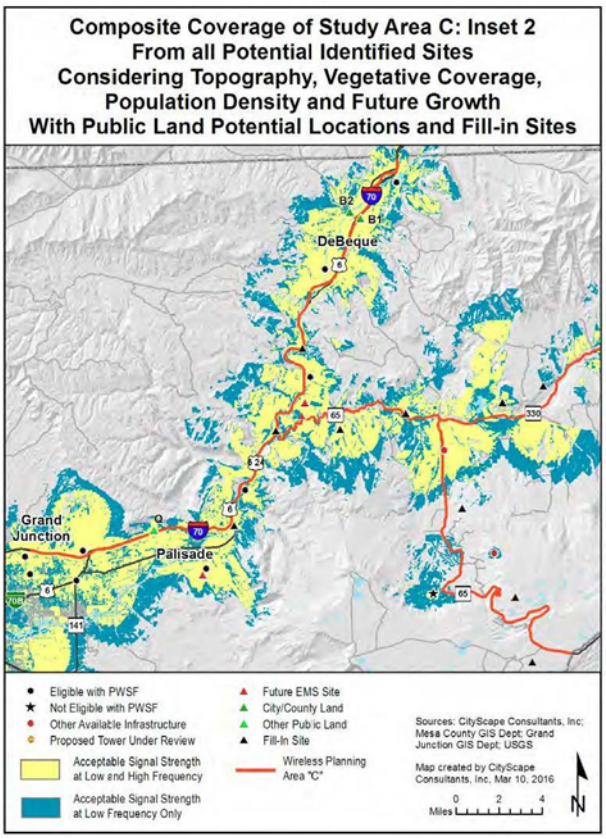


Figure 58: Coverage with Future Fill-In Inset 2

(Ord. 4703, 6-1-16)

§ 31.12.710. Estimation of future antenna sites: Inset 3.

Highway 330 from the Town of Collbran eastward to the County line is a secondary highway and will not likely be a high priority for the service providers over the next 10 to 15 years due to the low subscriber base. CityScape has identified seven facilities to fill in the coverage gaps along the highway but is only turning on Site C (also in the Town of Collbran Study Area) and the three tower locations identified as potential emergency management service facilities shown in Figure 59.

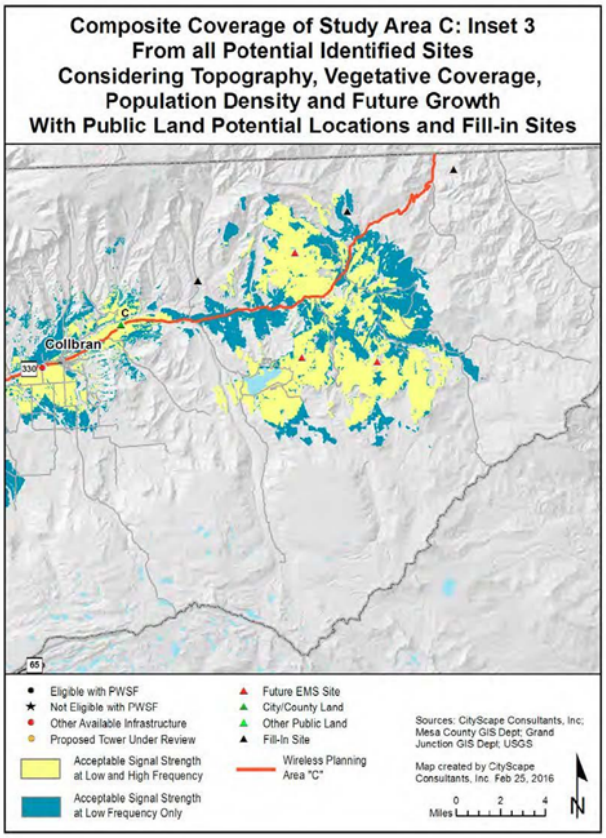


Figure 59: Coverage with Future Fill-In Inset 3

(Ord. 4703, 6-1-16)

§ 31.12.720. Estimation of future antenna sites: Inset 4.

Providing coverage along Highway 141 will be challenging due to the topography of the area. It is not likely the industry will provide near term coverage to this corridor because of the rural and undeveloped nature of the area. CityScape included the use of seven proposed emergency service facilities in the coverage map and forecasts that seven additional towers or base stations would be needed to provide full coverage along the corridors as shown in Figure 60. CityScape anticipates that two of the seven proposed facilities may be built south of the Highway 50 and Highway 141 intersection.

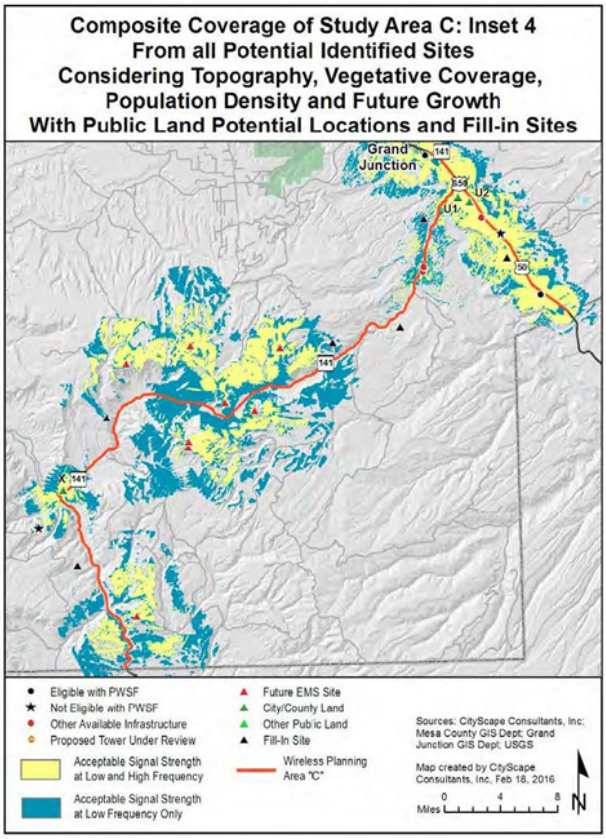


Figure 60: Coverage with Future Fill-In Inset 4

(Ord. 4703, 6-1-16)

§ 31.12.730. Summary.

Wireless connectivity has become an increasingly important part of our everyday lives. Wireless telecommunication technology has evolved rapidly over the past 20 years providing capabilities that have resulted in dramatically increased cellular phone and Internet use. Cellular phones used to be just a way of making a phone call when you were away from home or work. Now we use smartphones and tablets to shop, find restaurants, compare prices, buy movie tickets, bank, navigate, and to stay in touch through social media sites. First responders throughout Mesa County rely more and more on cellular data communication in the field, as do 911 callers in an emergency situation. The demand for wireless Internet and data service coverage and capacity has strained existing telecommunication network facilities and is causing cellular service providers to plan for the construction of new infrastructure.

Due to the semi-remote location of Mesa County, wireless technologies are critical for personal, business and emergency communication, and are heavily relied upon by residents and visitors. The blend of urban and undeveloped areas, year-round recreational activity, communication needs, and canyons, valleys, plateaus and ridge lines all create difficult coverage challenges for service providers. Wireless telecommunications master planning is an approach taken by communities to determine wireless service industry deployment patterns

and to identify gaps in network coverage. With this information communities can develop strategies to fill in those gaps.

The benefits of a WMP are multi-faceted, addressing community, economic development, and planning needs, as well as emergency service provider requirements. A comprehensive approach to wireless development will align the needs of personal wireless and broadband service providers with optimal infrastructure solutions that will support government and community objectives, allowing for infrastructure planning and development that will accommodate multiple providers, improve public safety and help to attract and retain residents and businesses.

(Ord. 4703, 6-1-16)

§ 31.12.740. Grand Junction/Persigo 201 study area.

Due to the concentration of population and urban characteristics of the City of Grand Junction, CityScape estimates that the largest number of new sites constructed over the next 10 to 15 years will be built in and around the Persigo 201 Study Area. Approximately 11 to 18 new towers or base stations will be needed to fill in the anticipated coverage gaps. The projection model that CityScape designed assumes that all existing tower and base station locations will be used for maximum co-location and/or replacement opportunities in an effort to reduce the number of new towers and base stations required within a given geographic area. Should the industry not maximize the use of existing facilities, a greater number of towers will need to be constructed over this same time period. It should also be noted that even with this increase in new facilities, some areas within the study area will still be underserved due to the terrain and rural characteristics around the periphery of the study area.

(Ord. 4703, 6-1-16)

§ 31.12.750. Countywide.

CityScape estimates that five to eight co-locations, upgrades or antenna modifications (in any combination) per year can be anticipated over the next 10 years. Over the next 15 years, up to 40 new tower or base station sites will be needed Countywide to fill coverage gaps and/or increase capacity. The more populated areas of the County will likely see the development of “small cell” sites that consist of multiple concealed antennas located relatively close together on shorter towers or existing support structures like light and utility poles. Rural areas are more likely to be served by towers that can provide coverage over larger geographic areas.

(Ord. 4703, 6-1-16)

§ 31.12.760. Ongoing goals and objectives to maximize the benefits of the master plan.

The City of Grand Junction and Mesa County will need to manage the development of wireless telecommunication infrastructure in order to maximize the use of existing towers and base stations and to minimize the total number of new facilities needed to fill in coverage

gaps. The Wireless Master Plan recommends the following action items be implemented to meet these goals:

(a) Maintain the wireless facilities inventory, updating it as facilities are added or modified, and make it available to the public online through the City and County websites.

(b) Prepare amendments to the City and County development codes that update zoning requirements and review procedures for wireless telecommunications facilities to make the codes compliant with current FCC regulations.

(1) Update the development codes as needed when regulations change.

(c) Maintain a priority site list of fill-in sites, identifying properties that are both publicly and privately owned, that meet the criteria established for preferred cellular facilities. Properties that are on the priority site list may be eligible for expedited administrative review of wireless facilities, provided the proposed facility meets the concealment requirements identified at the time of inclusion on the priority list, and all other applicable standards of the development code. The criteria for priority sites are:

(1) The property shall be located within the Grand Junction Persigo 201 Boundary or can be included in the Grand Junction Persigo 201 Boundary.

(2) The property shall be one acre minimum in lot size.

(3) The property shall have vehicular access to an improved public right-of-way.

(4) The property shall have access to utilities.

(5) The property shall be outside the 100-year floodplain.

(6) The cellular facility shall meet all City development standards and be subject to all regulations of the zoning code.

(7) Concealment is required and the owner of the property must identify the type of concealment proposed, prior to inclusion on the priority site list, with the understanding that if accepted by the City, then any type of concealment aside from what is proposed and accepted at the time of the Master Plan vetting process would require a conditional use permit (CUP).

(d) Seek out public/private partnerships to encourage the development of wireless facilities in rural areas that are underserved and have significant coverage gaps.

(e) Where feasible, plan for the ability to co-locate private wireless facilities on public safety communication infrastructure, in order to fill coverage gaps and provide better service to residents.

(f) Encourage the development of broadband infrastructure that will help support the development of wireless infrastructure.

(g) Work with economic development partners to seek out opportunities to expand wireless telecommunication facilities to support business development.

(h) Maintain awareness of evolving concealment options so the design and planning processes of new towers will blend visually within the community they serve.

(Ord. 4703, 6-1-16)

§ 31.12.770. Appendix - Wireless Infrastructure Inventory.

Wireless Infrastructure Inventory is attached to this Chapter.

(Ord. 4703, 6-1-16)

Title 32

(RESERVED)

Editor's Note: Former Title 32, NORTH AVENUE CORRIDOR, consisting of Ord. 4486, 11-2-11; Res. 174-07 (Exh. A), 12-3-07; and Senate Bill 11-265, 6-6-11, was retired from the Comprehensive Plan and repealed by Ord. No. 5238, 11/6/2024.

Title 33

24 ROAD CORRIDOR SUBAREA PLAN

Chapter 33.04
Introduction

§ 33.04.010. Executive summary.

The 24 Road Corridor Subarea Plan (the "Subarea Plan") has been developed to articulate a vision, plan and strategy for the future use and development of the project area, which comprises approximately 1,000 acres in the vicinity of 24 Road between Interstate 70 and the Mesa Regional Mall on Patterson Road. The Subarea Plan is intended to assist the City of Grand Junction, utility and service providers, and property owners in the project area as they plan for the future use and development of the area, including important infrastructure investments that will be necessary to serve future development. Figure ES-1 shows the location of the 24 Road Corridor Subarea.

(Res. 109-00, 11-1-00)

§ 33.04.020. Planning process.

In September, 1999, the City of Grand Junction initiated a planning process for the 24 Road Corridor. The purpose of this study was to evaluate current and projected market conditions in the 24 Road Corridor, formulate and evaluate different land use and development alternatives for this area and identify a preferred pattern of development and to formulate an implementation strategy. BRW, Inc., of Denver, a multi-disciplinary planning and engineering firm, and Leland Consulting Group, an economics firm, were hired to prepare the study.

The consultant team worked with City staff and a 15-person Council-appointed Steering Committee, as well as property owners and their representatives, to examine the issues and options related to development along 24 Road. There were a total of seven workshops conducted by the consultants with the 24 Road Corridor Steering Committee. The findings, conclusions and recommendations of the planning process are presented in this report.

(Res. 109-00, 11-1-00)

§ 33.04.030. Issues.

The 24 Road Corridor subarea planning process was in part an outgrowth of public reaction to the zoning proposed in the 1996 Grand Junction Growth Plan. The primary criticism was

voiced by property owners, who suggested that the zoning proposal was in conflict with market forces shaping land uses and development patterns along 24 Road. This important issue was then incorporated into the project scope to evaluate various land uses and development patterns, including the City-proposed zoning plan, and their concurrence with regional market forces and community desires.

An additional concern of the property owners is the proposed expansion of 24 Road from two lanes to three lanes. Once again, the property owners believe that the expansion is not reflective of demand. They suggest that 24 Road be expanded to a five-lane boulevard or parkway, as a catalyst for the intensity of development they believe will occur in the area.

(Res. 109-00, 11-1-00)

§ 33.04.040. Market analysis.

A market study was conducted to quantify demand for various land uses, including those proposed by the City and those proposed by the property owners. Growth trends, supported by traffic analysis, show continued growth, particularly in residential uses, in the northeast and southwest quadrants of the City. Traffic volumes east and west, along U.S. Highway 6/ 50, support commercial land use concentration along the Corridor.

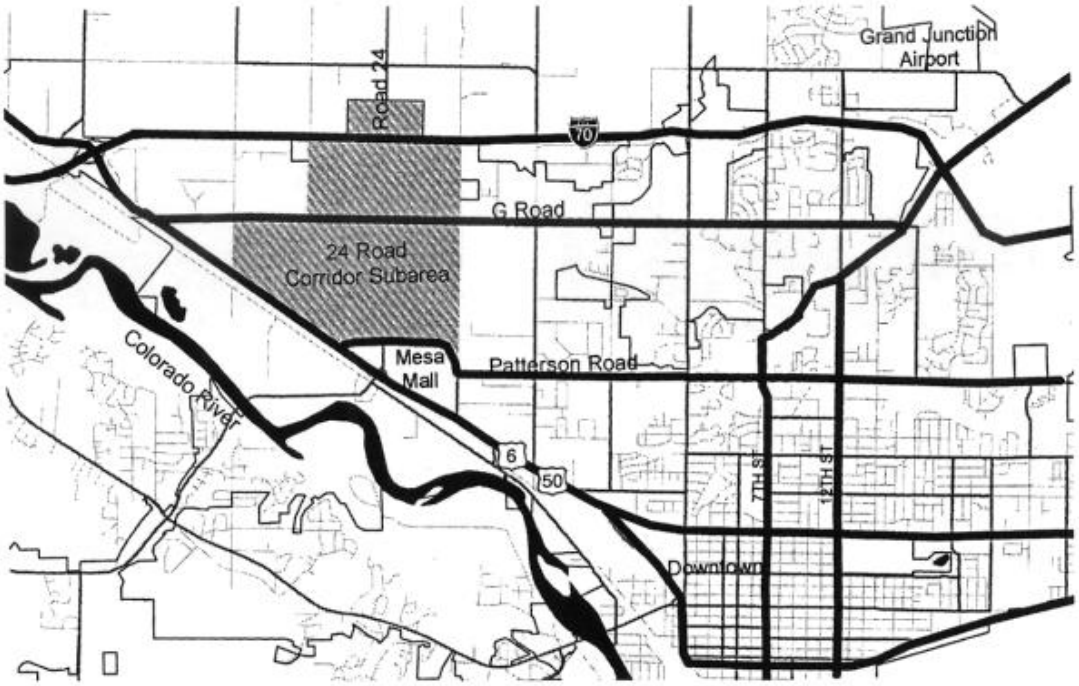


Figure ES-1: General Location Map

View to the Colorado Monument from 24 Road

The City's concern that large-scale commercial development might undermine existing activity centers is valid. There appears to be a sufficient supply of existing commercially zoned land and built space to meet projected demands over the next 10 years. The market study concluded that the corridor might receive as much as a 25 percent share of future nonresidential development, which could begin to compete with other locations in Grand Junction. To address this, an important element of the 24 Road Subarea Plan and implementation will be to limit the types of retail commercial uses in the area. This would avoid undermining existing regional retail centers while allowing for neighborhood retail uses and some regional employment/commercial uses for which there are suitable alternative sites (i.e., large acreage) in the Grand Junction area. There does not appear to be a conflict regarding office, industrial and other employment uses.

Canyon View Park

24 Road near the I-70 interchange

The market analysis supports the concept of commercial clustering near Mesa Mall with perhaps some expansion along U.S. Highway 6/50, due to traffic volumes along the highway. Although it is difficult to be extremely "location specific" in a market as small as Grand Junction, very little evidence was found to support the demand for a significant amount of

commercial land uses along 24 Road north of Patterson. It should be noted, however, that the analysis likewise does not indicate a significant demand for the amount of land area dedicated to multifamily uses as proposed in the Growth Plan.

(Res. 109-00, 11-1-00)

§ 33.04.050. Elements of the 24 Road Corridor "Preferred Plan.".

The Steering Committee reached a general consensus on the following features of the "Preferred Plan":

(a) Vision Statement.

(1) Achieve high quality development in the corridor in terms of land use, site planning and architectural design.

(2) Provide for market uses that complement existing and desired uses and benefit the Grand Junction community.

(3) Take advantage of and expand upon existing public facilities in the corridor to create a "civic" presence.

(4) Achieve a distinctive "parkway" character along the roadway that can serve as a gateway to the Grand Junction community.

(5) Encourage development that is consistent with the Growth Plan.

(6) Adjust and/or amend the Grand Junction Land Use Code and Growth Plan to achieve the 24 Road Corridor vision, concept and plan and to create a predictable environment for future development of the area.

(b) Subarea Plan Concept. The Subarea Plan is to provide a land use and transportation framework for future development in the 24 Road Corridor project area that:

(1) Allows for flexibility in land use (type, intensity and density), while recognizing inherent differences between development on small parcels compared with larger parcels.

(2) Establishes a transportation network that interconnects to create a logical urban pattern.

(3) Establishes a high quality image through zoning, design standards and public improvements.

(c) Subarea Plan Elements.

(1) Image. The Subarea Plan is intended to foster the development of a high quality environment within the corridor that reflects its importance as a gateway to Grand Junction. Public improvements should establish this quality within the public realm (road right-of-way and public open space) and create a "parkway" character. This overall theme and sense of quality should be carried over to private sites by applying design standards and guidelines. The Subarea Plan recognizes that a development "catalyst," such as a golf course or recreational

facility, would encourage high quality development as well as contribute positively to the area's image.

(2) Open Space/Public Facilities. Canyon View Park already establishes a "civic" character for the area, as well as providing valuable open space and recreational facilities. This character should be continued through the development of 24 Road as a landscaped parkway, including regional trails connecting the park and the Colorado River. Future open space/public facilities may include a golf course or other recreational amenity, which could be developed as a public/private venture as part of a larger land holding, assemblage or cooperative venture among smaller landowners.

(3) Circulation. U.S. Highway 6/50, 24 Road, Patterson Road and G Road currently comprise the major road network for the area. Successful development in the future will depend upon the creation of a secondary road system that provides continuity of travel, access to sites and alternative routes north/south and east/west in the area. Future rights-of-way for public streets should be reserved.

Expansion of 24 Road as a five-lane landscaped parkway with a landscaped median is a key implementation element that should occur as soon as possible. It will "set the tone" for development in the area and should be coordinated with Colorado Department of Transportation (CDOT) plans for the interchange.

(4) Land Use. Identify the most appropriate uses for different areas in the 24 Road Corridor, according to the following categories:

(i) Rural Residential. Rural residential land north of I-70 is consistent with the Growth Plan, including the current church site northwest of the I-70 interchange.

(ii) Residential. Low- and medium-density residential on individual parcels or as part of a planned development.

(iii) Commercial. Allow for a commercial node in the northeast corner of the I-70 interchange, as well as expansion of commercial uses adjacent to the Mesa Mall area.

(iv) Industrial. Continue industrial uses in the western sector between G Road and U.S. Highway 6/50.

(v) Park/Open Space. Existing open space includes the existing Canyon View Park. Future public open space will be along the Leach Creek corridor connecting to the Colorado River trail and open space corridor.

(vi) Planned Development. Planned development in the remaining areas should include a mixture of uses: employment, residential and open space. Retail commercial may be appropriate in the form of nodal development (such as 24 Road and G Road).

Although specific site development plans have not yet been approved for properties in this area, they will need to be approved as part of the City review process, which will rely in part on a comprehensive set of design standards and guidelines.

Owners of small parcels will be required to follow existing zoning or combine their property with others to take advantage of this designation. The expectation is that the development quality of the area will be high and will be an appropriate western gateway to Grand Junction.

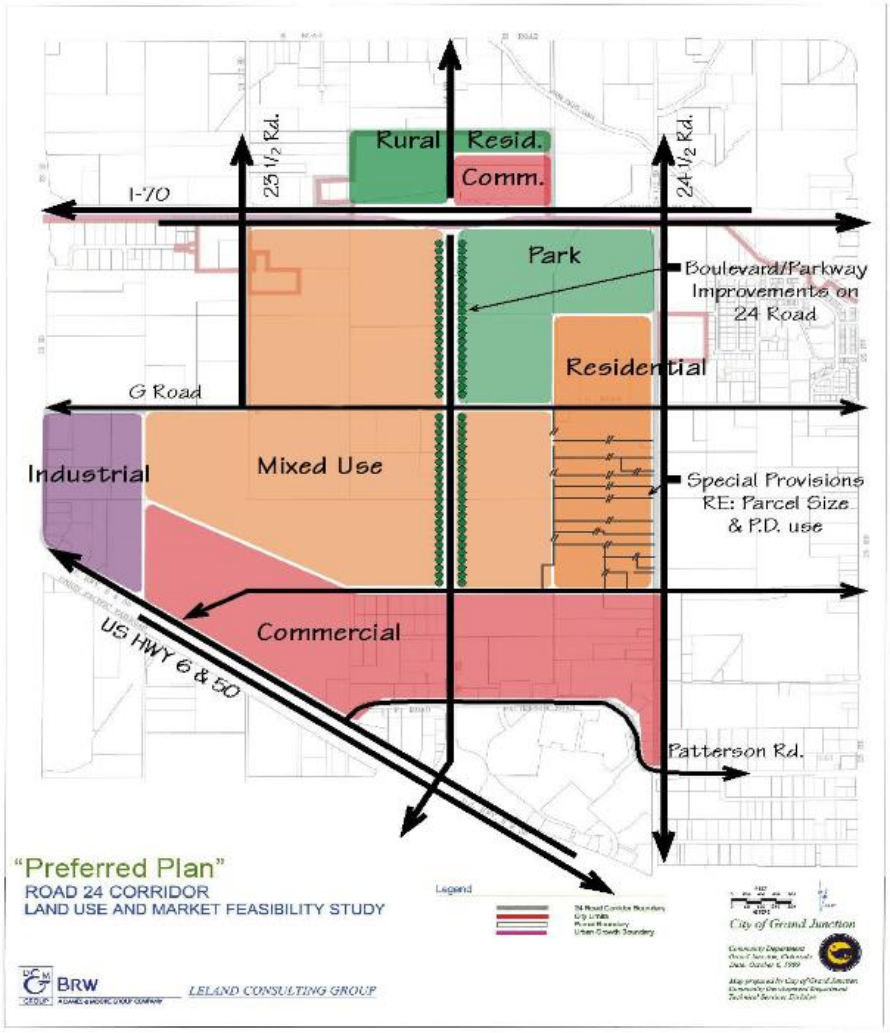


Figure ES-2: "Preferred Plan"

Existing agricultural lands west of 24 Road

(Res. 109-00, 11-1-00)

§ 33.04.060. Implementation of the Subarea Plan.

(a) The Steering Committee discussed how the Subarea Plan could be implemented, through both public and private means. These options fall into the general areas of policies, programs and capital investments.

(1) Implement 24 Road Improvements. Expand to five-lane parkway, with landscaped median, as soon as possible in order to meet transportation requirements as well as "set the tone" in the area for high-quality development.

(2) Adopt a Subarea Plan. Incorporate the recommendations of the Steering Committee into the Grand Junction Growth Plan by adopting a Subarea Plan for the 24 Road Corridor Subarea.

(3) Create a Mixed Use Zone for the Area. Current Grand Junction regulations provide for several planned development zones; however, they may not contain sufficient criteria to achieve the vision for 24 Road Corridor. A new mixed use zone could address issues and opportunities specific to the 24 Road Corridor.

(4) Adopt Design Standards and Guidelines. Develop design standards and guidelines to address the design and planning issues related to commercial development as well as larger land use, open space and transportation framework issues in the corridor.

(5) Develop a Secondary Road Network Master Plan. Establish the location, type and character of secondary roads within the project area, including key access points and interconnections.

(b) In addition, the Steering Committee discussed two other potential options:

(1) The establishment of a public/private entity to provide for cost-sharing of "public" improvements, i.e., two additional lanes on 24 Road, boulevard landscaping, Leach Creek recreational improvements, a possible golf course, and gateway/entry designs.

(2) The potential to create an organization to represent property owners and plan, implement and maintain desired area improvements. This would "institutionalize" private sector involvement and create the means for agreement/cooperation among private sector interests and with the public sector.

Although landowners support the five elements described in subsection (a) of this section, including the concept of more rigorous design standards than the City has in place today, it remains to be seen whether they are willing to step forward to participate financially in exchange for more flexibility in land use and site design through the planned development (PD) process. The potential for cost-sharing between the City and landowners for improvements to a five-lane 24 Road was discussed, with no resolution at this time.

(Res. 109-00, 11-1-00)

§ 33.04.070. Introduction.

The 24 Road Corridor Subarea Plan (the "Subarea Plan") has been developed to articulate a vision, plan and strategy for the future use and development of the project area, which comprises approximately 1,000 acres in the vicinity of 24 Road between Interstate 70 and the Mesa Regional Mall on Patterson Road. The Subarea Plan is intended to assist the City of Grand Junction, utility and service providers, and property owners in the project area as they plan for the future use and development of the area, including important infrastructure investments that will be necessary to serve future development.

Impetus for the Corridor Subarea Plan was initiated by the City to refine the concepts in the 1996 City of Grand Junction Growth Plan and the different perspectives for development represented by the Growth Plan, property owners, and the community.

This report presents the resulting conclusions and implementation of the four-month planning effort, which included:

(a) An extensive public participation program involving property owners in the corridor, as well as others in the community.

(b) A market study of existing and future supply and demand for commercial and residential development for the entire urbanized area.

(c) An analysis of available commercial lands within the urbanized area.

(d) An analysis of environmental conditions within the corridor.

(e) An analysis of infrastructure availability and capacity within the corridor.

(f) Development of alternative land use plans for the corridor.

(g) Evaluation of the alternatives.

(h) Selection of a preferred plan.

(i) Recommended implementation actions.

Existing agricultural land in the 24 Road Corridor Subarea

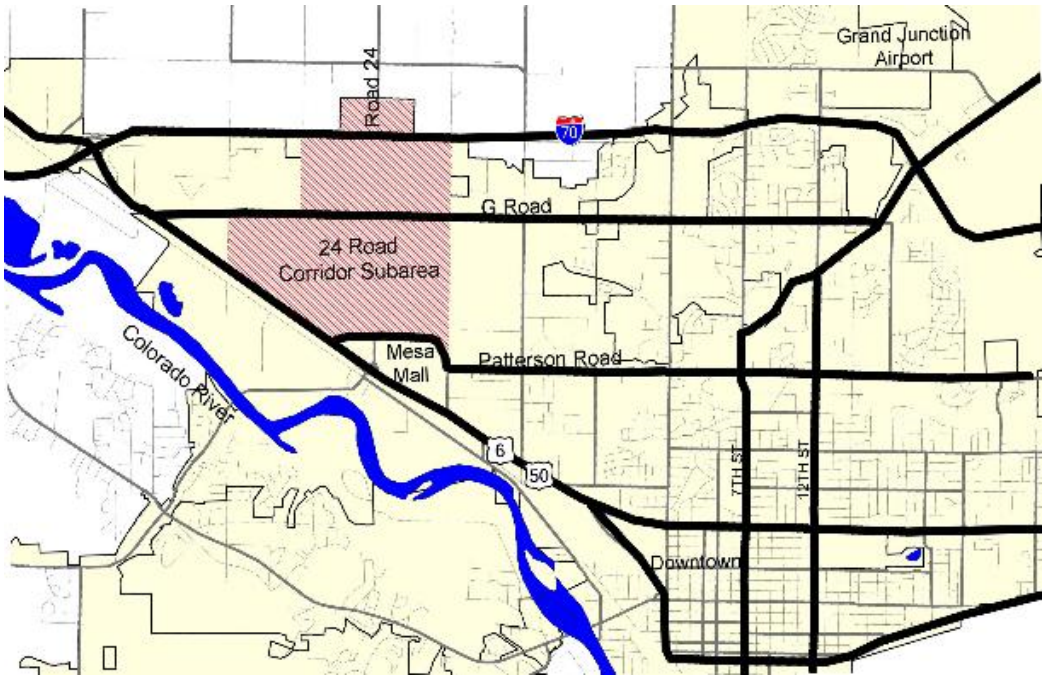


Figure 1: General Location Map

(Res. 109-00 § 1, 11-1-00)

Chapter 33.08

Planning Process

§ 33.08.010. Planning process.

The Subarea Plan was developed with involvement primarily by the 24 Road Steering Committee, property owners in the corridor, representatives of Grand Junction and Mesa

County departments, and members of the Grand Junction Planning Commission. The process for developing the Plan began in September, 1999, when the City of Grand Junction retained a team of consultants comprised of BRW, Inc., in association with Leland Consulting Group to organize and direct the public process to develop and evaluate various alternative development patterns or options.

The project focused on investigating economic, financial, and market conditions in Grand Junction and the project area, as well as the physical conditions of the site related to utilities, land use, transportation and environmental features.

During the planning process, which lasted approximately four months, the consultant team led a series of seven workshops with the 24 Road Corridor Steering Committee, to review assembled data, prepare and review alternative land use schemes, determine a preferred land use plan, and review actions required to implement the preferred plan for the corridor.

The findings, conclusions and recommendations for the Plan are presented in this report, which will be presented to the Grand Junction Planning Commission and City Council during the early part of the year 2000.

(Res. 109-00 § 2, 11-1-00)

Chapter 33.12
Market Conditions

§ 33.12.010. Market conditions.

This chapter presents information regarding current and future market conditions in the Grand Junction/Mesa County area that would affect future development in the 24 Road Corridor. These include economic and demographic indicators, market indicators, and a summary of market opportunities relative to future development.

Leland Consulting Group conducted a thorough market analysis to identify opportunities for new development along the 24 Road Corridor. Since the corridor represents a sub-market within the City of Grand Junction (the City), and as such will likely compete with projects from a broader trade area, overall economic and demographic indicators, supply factors, and demand estimates were analyzed for both areas. The trade area consists of the Grand Junction Metropolitan Statistical Area (Mesa County), Delta County, Montrose County, and a portion of Garfield County. This trade area was determined considering the following factors:

(a) Current and future development patterns in the Grand Junction area and surrounding communities.

(b) Employment, residential and commercial development concentrations.

(c) Influence of competitive projects/communities.

(Res. 109-00 § 3, 11-1-00)

§ 33.12.020. Economic and demographic indicators.

Economic and demographic characteristics in the market are indicators of overall trends and economic health which may affect private and public sector development. The following

summarizes economic and demographic trends which will affect development demand within the 24 Road Corridor over the next decade.

(Res. 109-00 § 3, 11-1-00)

§ 33.12.030. Population and household growth.

The Grand Junction trade area population increased at a compound average annual rate of 2.7 percent between 1990 and 1999. In comparison, the City population grew at a slightly higher 3.0 percent rate. This trend is expected to reverse over the next decade, as the trade area population is expected to grow at a compound average annual rate of 2.0 percent, compared to a 1.4 percent growth rate for the City.

Household growth in the trade area and the City closely mirrors population trends, both in terms of historical and projected growth. Average household sizes in the trade area are significantly higher than those for the City, indicating a higher concentration of one- and two-person households and a lower concentration of families within the City.

These population and household growth patterns, projected to continue over the next 10 years, are indicative of regional trends that indicate an increasing number of single professionals and retired couples moving into Colorado.

Table 1: Population and Household Growth

City of Grand Junction

	City	Trade Area*
1990 Population	32,893	153,535
1999 Population	43,100	195,600
2005 Population	47,100	221,600
2010 Population	50,300	243,800
1990 Households	14,300	59,660
1999 Households	18,700	77,900
2005 Households	20,700	89,300
2010 Households	22,200	98,700
1990 Average Household Size	2.15	2.51
1999 Average Household Size	2.08	2.45
2005 Average Household Size	2.04	2.42
2010 Average Household Size	2.02	2.41

* Trade area includes all of Mesa County, Delta County, Montrose County and one-half of Garfield County.

Source: U.S. Census Bureau; Colorado Department of Local Affairs; Claritas, Inc.; and Leland Consulting Group.

(Res. 109-00 § 3, 11-1-00)

§ 33.12.040. Median household income growth.

The current median household income for the trade area is $31,300 – significantly higher than that for the City ($24,600). Over the past nine years, the trade area median household income increased at a compound average annual growth rate of 3.3 percent, while the City's grew at a slower annual rate of 2.8 percent. This trend is expected to continue over the next 10 years, as trade area household incomes are expected to grow at a rate faster than that for the City.

Table 2: Median Household Income Growth		
City of Grand Junction		
	City	Trade Area
1990 Median Household Income	$19,161	$23,352
1999 Median Household Income	$24,600	$31,300
2005 Median Household Income	$26,800	$38,100
2010 Median Household Income	$29,000	$44,900

Source: U.S. Census Bureau; Claritas, Inc.; and Leland Consulting Group.

(Res. 109-00 § 3, 11-1-00)

§ 33.12.050. Employment growth.

Trade area employment is currently estimated at approximately 95,200. The Grand Junction MSA (Mesa County) comprises over 60 percent of trade area total employment. Recent high job growth rates (five percent to six percent) in the trade area are expected to decline to steadier rates in the 2.5 percent to three percent range over the next decade.

Growth in trade area employment will likely continue to be dominated by the trade and services sectors, which comprise approximately 55 percent of the total economy. Another fast-growing industry is manufacturing, projected to grow at an average annual rate of 2.98 percent over the next five years. This is indicative of the national growth trend in small, independent service companies.

Table 3: Employment Growth		
City of Grand Junction		
	City	Trade Area
1995 Employment	NA	83,500

Table 3: Employment Growth		
City of Grand Junction		
	City	Trade Area
1999 Employment	NA	95,200
2005 Employment	NA	113,700
2010 Employment	NA	128,600

Source: Colorado Department of Labor and Employment and Leland Consulting Group.

(Res. 109-00 § 3, 11-1-00)

§ 33.12.060. Market indicators by land use.

Critical to interpreting the 24 Road Corridor's competitive position within the Grand Junction trade area market is an understanding of the supply characteristics of competitive developments and surrounding sub-markets. In order to identify potential market opportunities, given the corridor's potential competitive position and prevailing market conditions, demand estimates were also prepared. The following discussion presents an overview of existing supply conditions and estimates of future demand by land use type.

(a) Retail. The Grand Junction MSA recently reached a population concentration level sufficient to attract the attention of national retailers, particularly "big-box" users. These large-scale discount retailers have accounted for the majority of new retail development in the Grand Junction area over the past two years. As with other mid-sized metropolitan areas, this "big-box" development activity has occurred in close proximity to a regional mall – in this case, the Mesa Mall. At the intersection of 24 Road and U.S. Highway 6/50, the Mesa Mall provides a regional shopping destination for Grand Junction, Mesa County and the entire Western Slope. The area developing around Mesa Mall currently consists of a mix of national and regional chains.

(1) Local retailers are generally concentrated within other commercial areas/corridors in the Grand Junction market area, such as the following:

(i) Downtown Grand Junction – primarily specialty retail.

(ii) North Avenue – older strip commercial.

(iii) Orchard Avenue – older strip commercial.

(iv) Horizon Drive – new strip commercial.

(v) U.S. Highway 6/50 – mix of strip commercial and highway-related retail.

(2) Supply characteristics for the Grand Junction retail market are summarized as follows:

(i) There is an estimated 3,500,000 to 4,000,000 square feet of retail space in the Grand Junction market area, comprised primarily of regional retail and neighborhood commercial space.

(ii) Current retail vacancy rates in Grand Junction appear to range between 10 percent and 20 percent, with older commercial areas (e.g., North and Orchard Avenues) experiencing the highest vacancy rates.

(iii) Retail lease rates in the Grand Junction market generally range between $6.00 and $12.00 per square foot. Older commercial areas (e.g., Downtown, North and Orchard Avenues) are at the lower end of the rent range, while areas such as Horizon Drive and Mesa Mall are at the high end of the rent range.

(iv) Overall, the Grand Junction retail market is experiencing market stability, with declining vacancy rates, steady absorption, and rent inflation.

Demand for retail space is determined by the potential level of retail expenditures in a given trade area. Existing and projected total household retail expenditures in the Grand Junction trade area were determined by multiplying growth in households with that portion of household income typically spent on general retail purchases. The results of this analysis (shown in Table 4) indicate demand for 100,000 to 150,000 square feet of additional retail space annually in the Grand Junction trade area over the next 10 years.

Table 4: Trade Area Retail Demand

1999 to 2010

Household Expenditure Method	**Trade Area**
Total 1999 Households	77,900
Total 2010 Households	98,700
New Household Growth	20,800
Annual Per Household Expenditures for Select Retail Categories*	$14,700
Aggregate Retail Sales Potential from Household Growth	$305,760,000
Trade Area Supportable Retail Square Feet (@ $200/SF)	1,528,800
Average Annual Demand for Retail Space (SF)	100,000 to 150,000

* Categories include those featured in a community and/or neighborhood center.

Source: U.S. Census Bureau; Colorado Department of Local Affairs; Claritas, Inc.; and Leland Consulting Group.

(b) Office. The Grand Junction office market is concentrated in two primary areas: Downtown and Horizon Drive. Serving local professionals, Grand Junction's office inventory primarily consists of lower-cost Class B and C space. New office activity has been concentrated along Horizon Drive, which is developing as the primary commercial route connecting Walker Field (the regional airport) and Downtown Grand Junction.

Supply characteristics for the Grand Junction office market are summarized as follows:

(1) There are an estimated 9,500,000 square feet of office space in the Grand Junction trade area, comprised primarily of local service space.

(2) Current office vacancy rates in Grand Junction appear to range between 10 percent and 15 percent, with older office concentrations (e.g., Downtown, North Avenue) experiencing the highest vacancy rates. Newer office space along Horizon Drive appears to exhibit lower vacancy rates.

(3) Office lease rates in the Grand Junction market generally range between $6.00 and $15.00 per square foot. Older commercial areas (e.g., Downtown, North and Orchard Avenues) are at the lower end of the rent range, while newer areas such as Horizon Drive are at the high end of the rent range.

(4) Overall, the Grand Junction office market is experiencing market stability, with declining vacancy rates, steady absorption, and rent inflation.

Demand for new office space is derived from two primary sources: expansion of existing industry and the relocation of new companies into the market. Employment projections by industry classification for the Grand Junction trade area were used to estimate an average annual demand of approximately 300,000 square feet of office space between 1999 and 2005 and an average annual demand of approximately 370,000 square feet of office space between 2006 and 2010 (shown in Table 5).

Table 5: Trade Area Office Demand, 1999 to 2010

	Average Annual Increase	Penetration Rate	Office Space Employees	Office Square Feet Per Employee	Total Demand
1999 – 2005					
Manufacturing	271	15.00%	41	200	8,140
Mining/Construction	237	15.00%	36	200	7,123
TCPU	173	45.00%	78	200	15,540
Trade	848	35.00%	297	200	59,354
FIRE	130	85.00%	110	200	22,015
Service	866	60.00%	520	200	103,970
Government	496	90.00%	447	200	89,355
Self-Employed	62	15.00%	9	200	1,850
Projected Annual Demand	**3,083**		**1,537**		**307,347**
2006 – 2010					
Manufacturing	326	15.00%	49	200	9,768
Mining/Construction	285	15.00%	43	200	8,547
TCPU	207	45.00%	93	200	18,648
Trade	1,018	35.00%	356	200	71,225
FIRE	155	85.00%	132	200	26,418
Service	1,040	60.00%	624	200	124,764
Government	596	90.00%	536	200	107,226

Table 5: Trade Area Office Demand, 1999 to 2010					
	Average Annual Increase	**Penetration Rate**	**Office Space Employees**	**Office Square Feet Per Employee**	**Total Demand**
Self-Employed	74	15.00%	11	200	2,220
Projected Annual Demand	**3,700**		**1,844**		**368,816**

Source: Colorado Department of Labor and Employment and Leland Consulting Group.

(c) Industrial. The Grand Junction industrial market is concentrated in two primary areas: near Walker Field and along U.S. Highway 6/50. Similar to office space, Grand Junction's industrial inventory primarily consists of lower-cost space serving small local users. New industrial activity has occurred in the two areas outlined above, locating in those areas primarily for their easy transportation access (air/highway).

Supply characteristics for the Grand Junction industrial market are summarized as follows:

(1) There are an estimated 8,000,000 square feet of industrial space in the Grand Junction trade area, comprised primarily of local service space.

(2) Current industrial vacancy rates in Grand Junction appear to range between five percent and 10 percent, with most industrial concentrations experiencing relatively low vacancy rates.

(3) Industrial lease rates in the Grand Junction market generally range between $2.00 and $6.00 per square foot. Older industrial areas (e.g., U.S. Highway 6/50) are at the lower end of the rent range, while newer areas near Walker Field are at the high end of the rent range.

(4) Overall, the Grand Junction industrial market is experiencing market stability, with declining vacancy rates, steady absorption, and rent inflation.

Demand for new industrial space is derived from two primary sources: expansion of existing industry and the relocation of new companies into the market. Employment projections by industry classification for the Grand Junction trade area were used to estimate an average annual demand of approximately 270,000 square feet of industrial space between 1999 and 2005 and an average annual demand of approximately 320,000 square feet of industrial space between 2006 and 2010 (shown in Table 6).

Table 6: Trade Area Industrial Demand					
	Average Annual Increase	**Penetration Rate**	**Industrial Space Employees**	**Industrial Square Feet Per Employee**	**Total Demand**
1999 – 2005					
Manufacturing	271	65.00%	176	550	97,002
Mining/ Construction	237	55.00%	131	350	45,703

Table 6: Trade Area Industrial Demand					
	Average Annual Increase	**Penetration Rate**	**Industrial Space Employees**	**Industrial Square Feet Per Employee**	**Total Demand**
TCPU	173	55.00%	95	350	33,238
Trade	848	20.00%	170	350	59,354
FIRE	130	5.00%	6	350	2,266
Service	866	5.00%	43	350	15,162
Government	496	5.00%	25	350	8,687
Self-Employed	62	25.00%	15	350	5,396
Projected Annual Demand	**3,083**		**662**		**266,809**
2006 – 2010					
Manufacturing	326	65.00%	212	550	116,402
Mining/ Construction	285	55.00%	157	350	54,843
TCPU	207	55.00%	114	350	39,886
Trade	1,018	20.00%	204	350	71,225
FIRE	155	5.00%	8	350	2,720
Service	1,040	5.00%	52	350	18,195
Government	596	5.00%	30	350	10,425
Self-Employed	74	12.00%	19	350	6,475
Projected Annual Demand	**3,700**		**1,844**		**320,170**

Source: Colorado Department of Labor and Employment and Leland Consulting Group.

(d) Multifamily Housing. Supply characteristics for the Grand Junction housing market are summarized as follows:

(1) The average single-family home price in the Grand Junction market area was approximately $128,000 in 1998 and the average condominium/townhouse price was $88,000.

(2) Residential construction has recently averaged approximately 1,600 units annually. Multifamily construction represents a minimal share of new home construction.

(3) One-bedroom apartment rents in the Grand Junction market area currently range between $350.00 and $800.00, with the majority of units under $400.00. Two-bedroom apartment rents currently range between $425.00 and $1,000, with the majority of units under $500.00. Apartment vacancy rates in the Grand Junction market area generally range between five percent and 10 percent, with older projects experiencing vacancy rates between 10 percent and 20 percent.

Demand for new residential units is primarily a factor of the growth in households within a trade area. Projected Grand Junction trade area household growth was analyzed along with historical patterns of single-family and multifamily development trends to arrive at an estimated average annual demand for 650 to 700 multifamily units in the Grand Junction trade area over the next decade.

Table 7: Trade Area Multifamily Housing Demand

Demand Estimate	Trade Area
Total 1999 Households	77,900
Total 2010 Households	98,700
New Household Growth	20,800
Estimated Percent New Multifamily Units (Rental and For-Sale)	35%
Total Demand for New Multifamily Units (Rental and For-Sale)	7,280
Average Annual Demand for Multifamily Units (Rental and For-Sale)	650 to 700

Source: U.S. Census Bureau; Colorado Department of Local Affairs; Claritas, Inc.; and Leland Consulting Group.

(Res. 109-00 § 3, 11-1-00)

§ 33.12.070. Summary of market demand.

Taking into consideration these market analysis conclusions, specific development opportunities were identified for the 24 Road Corridor. Table 8 presents a summary of these opportunities and their potential timing.

Table 8: 24 Road Corridor Market Opportunities

Land Uses	Short-Term 1 to 3 Years	Mid-Term 3 to 5 Years	Long-Term 5 to 10 Years
Retail			
Specialty Retail		X	
Entertainment Retail		X	
Neighborhood-Serving	X		
Big-Box Retail	X		
Office			
Class A High-Rise			X
Corporate Campus		X	
Class B Suburban	X		

Table 8: 24 Road Corridor Market Opportunities			
Land Uses	**Short-Term 1 to 3 Years**	**Mid-Term 3 to 5 Years**	**Long-Term 5 to 10 Years**
Incubator Space	X		
Industrial			
"Flex" Office/Warehouse	X		
Light Industrial		X	
Office/R&D	X		
Housing			
Rental Apartments	X		
Affordable Housing		X	
High-Density Ownership		X	

Source: Leland Consulting Group.

(Res. 109-00 § 3, 11-1-00)

§ 33.12.080. Development program implications.

Based on the specific development opportunities identified for the 24 Road Corridor, potential market capture rates were applied to arrive at supportable land utilization in the corridor over the next 10 years. The market capture rates were based on the following factors:

(a) Market Factors.

(1) Ability to create theme/identity for corridor.

(2) Build on current development concentrations/activity in corridor (Mesa Mall).

(b) Physical Factors.

(1) Proximity to major transportation corridors (I-70, U.S. Highway 6/50).

(2) Capacity of base infrastructure (roads, utilities).

(3) Proximity to corridor amenities (Canyon View Park).

(c) Regulatory Factors.

(1) Subarea planning for land use, infrastructure, development regulations, and financing.

(2) Consistency with community vision.

(d) Economic Factors.

(1) Cost of base infrastructure (24 Road improvements, utilities).

(2) Cost of land assemblage.

(3) Development risk versus return.

(4) Levels of public/private participation.

Table 9 presents a summary of the market capture and land utilization analysis.

Table 9: 24 Road Corridor Development Summary

Land Use	Trade Area Average Annual Demand	Corridor Capture Rate	Annual Corridor Development	Total Corridor Development	Projected Bldg./Land Ratio	Total Acres Absorbed
Retail	125,000	20%	25,000	250,000	25%	23
Office	335,000	15%	50,250	502,500	30%	38
Industrial	300,000	15%	45,000	450,000	20%	52
Multifamily	675	20%	135	1,350	20%	68
				Total Development		**181**

Source: Leland Consulting Group.

(Res. 109-00 § 3, 11-1-00)

Chapter 33.16
Existing Physical Conditions

§ 33.16.010. Existing physical conditions.

This section summarizes existing physical conditions in the 24 Road Corridor study area, including land use, circulation, open space, utilities and environmental conditions. Existing zoning and patterns of property ownership are also discussed. This section includes a general summary of development constraints and opportunities.

The 24 Road Corridor study area is located in western Grand Junction, between I-70 on the north and U.S. 6/50 on the south. As defined for this study, the corridor includes approximately 1,000 acres on the east and west sides of 24 Road between 23 Road and 24 1/2 Road.

Commercial development along Road 24 1/2

(Res. 109-00 § 4, 11-1-00)

§ 33.16.020. Existing land use.

The predominant character and use of land within the study area is agricultural. Much of this area remains in 40-acre parcels, typical of development patterns in rural communities. Commercial land uses are clustered near Mesa Mall and industrial uses are primarily located adjacent to or near U.S. Highway 6/50.

The study area and adjacent environs were annexed into the City in 1995 – one of the largest area annexations. The annexation of this area provided the City with control of the development of the western-most edge of the City as well as the area north of Mesa Mall. The study area and environs are shown on Figure 1. Existing land use is summarized in Table 10 and is illustrated in Figure 2.

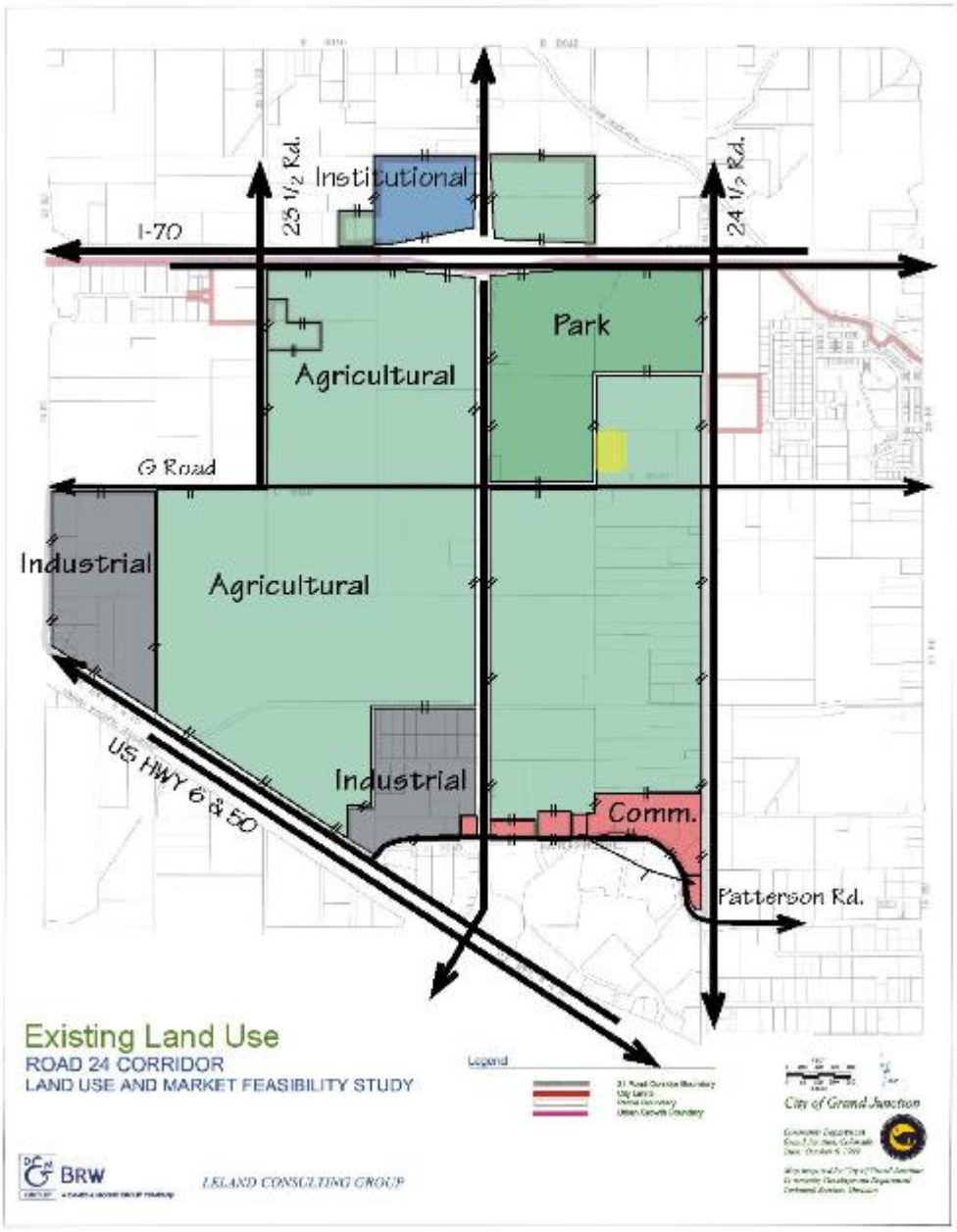


Figure 2: Existing Land Use

Table 10: 24 Road Corridor Existing Land Use	
Category	**Area (acres)**
Residential	52.8
Commercial	9.57
Industrial	71.4

Table 10: 24 Road Corridor Existing Land Use	
Category	**Area (acres)**
Agricultural	43.86
Institutional	26.7
Undeveloped	47.6
Undeveloped/Agricultural	651.27
Public	114.7
Total	**1,018**

Source: BRW, Inc., and the City of Grand Junction Community Development Department.

Existing commercial development near Patterson Road and 24 Road

Canyon View Park

Leach Creek and undeveloped land east of 24 Road

(Res. 109-00 § 4, 11-1-00)

§ 33.16.030. Circulation.

(a) The 24 Road Corridor is bordered on the north and south by major traffic routes in the Grand Junction area. Average daily trip volume along Interstate 70, where motorists are passing through Grand Junction, is approximately 7,000 ADT. Of the approximately 28,000 vehicles per day using U.S. Highway 6/50, most of these trips are predominately local in origin and generate the demand that has resulted in the commercial uses that line the roadway. There are approximately 4,000 vehicles per day using 24 Road between I-70 and Patterson Road. Patterson Road connects Mesa Mall with downtown and the eastern quadrant of Grand Junction and carries approximately 7,000 vehicles per day.

(b) The Colorado River and the Burlington Northern Railroad tracks run parallel to and south of U.S. Highway 6/50. One of the two bridges connecting Grand Junction with the residential development south of the river aligns with 24 Road.

(c) The area displays a hierarchy of existing streets to serve transportation regionally and within the area. The descending hierarchy of roads within the study area, based upon traffic volumes, is:

(1) U.S. Highway 6/50 is the major east/west corridor carrying inner-city and regional traffic.

(2) Patterson Road carries the majority of traffic from the Mall into the City.

(3) I-70 serves mostly pass-through traffic.

(4) G Road provides east/west access within the City.

(5) 24 Road provides north/south access between Redlands, the Mall and North Valley.

This data indicates that the highest traffic volumes are along the east-west streets and highlights a dilemma faced by the City's transportation engineers. Travel patterns created by and reinforcing the land use pattern place the greatest demand on the east-west street network. However, there are few east-west streets that are continuous across the City. F Road, which becomes Patterson Road east of 24 Road, and G Road are both east-west streets and carry large volumes of traffic through several residential neighborhoods. The impact upon the neighborhoods limits the effective capacity of these roadways.

(d) An important public policy consideration is whether incentives should be created for motorists to use I-70 (which is significantly under-capacity) to travel east-west and then use the arterial and collector street network to travel north-south (e.g., 24 Road and other north-south arterial streets). Such an incentive could justify the expansion of 24 Road. The problem is that neither regional nor local land use patterns support that concept.

(e) The City is in the process of expanding 24 Road from two lanes to three lanes, adding a center turn lane and median. The Steering Committee and property owners would like to see 24 Road expanded to a five-lane landscaped parkway. There are three constraints which restrict the five-lane expansion:

(1) The City is receiving 80 percent of the funding for the three-lane expansion from federal and State sources and funding is only available to construct three lanes.

(2) The proximity of Leach Creek would require that all of the additional rights-of-way for a five-lane roadway would be acquired from properties on the west side of 24 Road. Several west side property owners have already voiced their concern about such an approach. The relocation of Leach Creek is a possibility, but estimates indicate that it may be prohibitively expensive.

(3) Current and projected traffic volumes, based upon the proposed new zoning designations implementing the Growth Plan, do not warrant five lanes.

(Res. 109-00 § 4, 11-1-00)

§ 33.16.040. Open space.

The City of Grand Junction has constructed regional park improvements in the 24 Road Corridor at the southeast corner of the I-70 interchange. Canyon View Park, a 120-acre regional park that provides ball fields and other recreational improvements, attracts users from throughout Mesa County. Two branches of Leach Creek flow from the north toward the Colorado River through the corridor. These include an open channel tributary on the east side of 24 Road south of I-70 as well as the main branch of Leach Creek which flows through the park to the west. As a result, there are two outfalls on the north side of G Road. The City is discussing the potential for using the Leach Creek drainage alignment as a route for a trail to connect the regional park with the extensive Colorado River trail system.

(Res. 109-00 § 4, 11-1-00)

§ 33.16.050. Utilities.

The 24 Road Corridor is served by all major utilities, including water, sanitary sewer, electric, natural gas, cable television, and telephone. The City is currently involved in the process to upgrade and replace water and sanitary sewer lines in the area.

(Res. 109-00 § 4, 11-1-00)

§ 33.16.060. Environmental.

There are limited environmental constraints to use or development land within the 24 Road Corridor. The land is gently sloped to the southwest, toward the Colorado River. Flows in Leach Creek are minimal, yet are increasing over time as runoff from development is added to the drainage basin. The Corps of Engineers has identified vegetation indicative of wetlands along Leach Creek, which may pose a constraint to filling and/or relocating this drainage.

(Res. 109-00 § 4, 11-1-00)

§ 33.16.070. Proposed policies – Growth plan and future land use.

The land uses proposed in the Growth Plan within the 24 Road Corridor subarea are divided between approximately equal portions of commercial and residential uses. Residential

densities would not exceed eight units per acre. Commercial and industrial uses would likely consist of a mix of strip retail, big-box discount retailers, and warehousing and distribution.

The vision and policies contained within the Growth Plan applicable to the area are:

(a) To "encourage the conversion of heavy commercial and industrial uses along 24 Road, Patterson Road and U.S. Highway 6/50 near Mesa Mall to a mixture of retail/service commercial and multifamily uses." (Policy 8.6)

(b) To "support integrated commercial development using shared access points along 24 Road, Patterson Road and U.S. Highway 6/50 in areas designated for commercial use." (Policy 8.7)

(c) To "ensure that capital improvement and land use decisions are consistent with the development of 24 Road as an arterial parkway and community gateway." (Policy 8.8)

Future land use in the Grand Junction Growth Plan is illustrated in Figure 3.

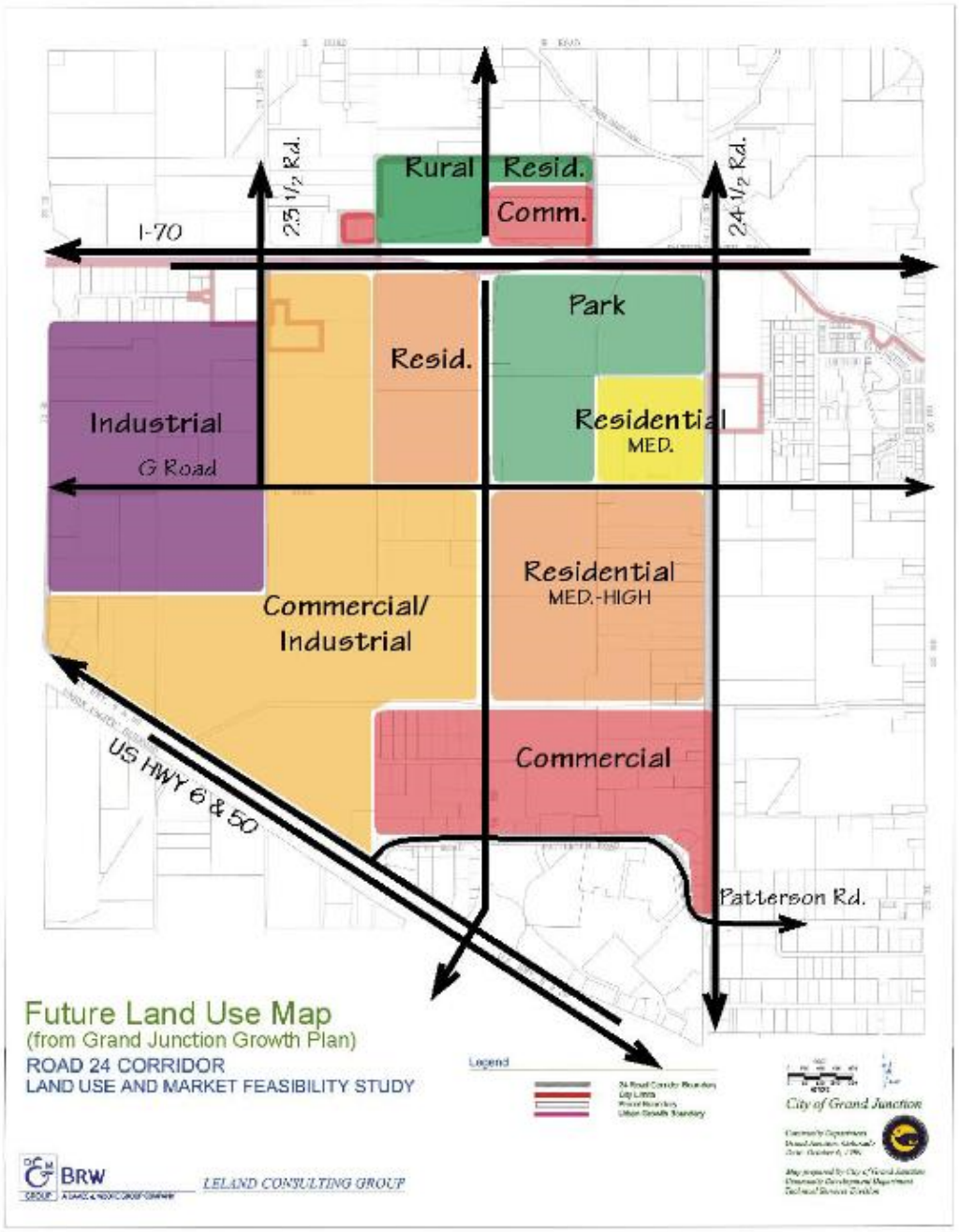


Figure 3: Future Land Use Map (from Grand Junction Growth Plan)

(Res. 109-00 § 4, 11-1-00)

§ 33.16.080. Zoning.

Existing zoning in the area is comprised of several zoning districts including:

(a) Commercial (C-2).

(b) Highway Oriented (HO), which is primarily commercial uses.

(c) Industrial (I-1), light industrial uses.

(d) Residential Single-Family (RSR-F), not to exceed one dwelling unit per five acres.

(e) Residential Single-Family (RSF-2), not to exceed two dwelling units per acre.

(f) Planned Recreational Vehicle Resort (PRVR).

(g) Planned Residential (PR).

(h) Public Zone (PZ) (Canyon View Park).

The breakdown of the existing allocation of land area for each zoning designation in the subarea is shown below in Table 11. Existing zoning (September 1999) is shown in Figure 4.

Table 11: Existing Zoning

Category	Approximate Area (acres)
Commercial (C-2)	164
Highway Oriented (HO)	417
Industrial (I-1)	48
Residential Single-Family (RSR-F)	161
Residential Single-Family (RSF-2)	9
Planned Recreational Vehicle Resort (PRVR)	76
Planned Residential (PR)	29
Public Zone (PZ)	115
Total	+/-1,018

Source: BRW, Inc., and the City of Grand Junction Community Development Department.

As this table indicates, the predominate zoning classification is commercial zoning districts, C-2 and HO, which comprise more than 50 percent of the zoned land area. The City is facing some difficulty due to the fact that some of the property owners, under the proposed new zone designations derived from the Growth Plan process, would not be allowed the commercial uses they have today.

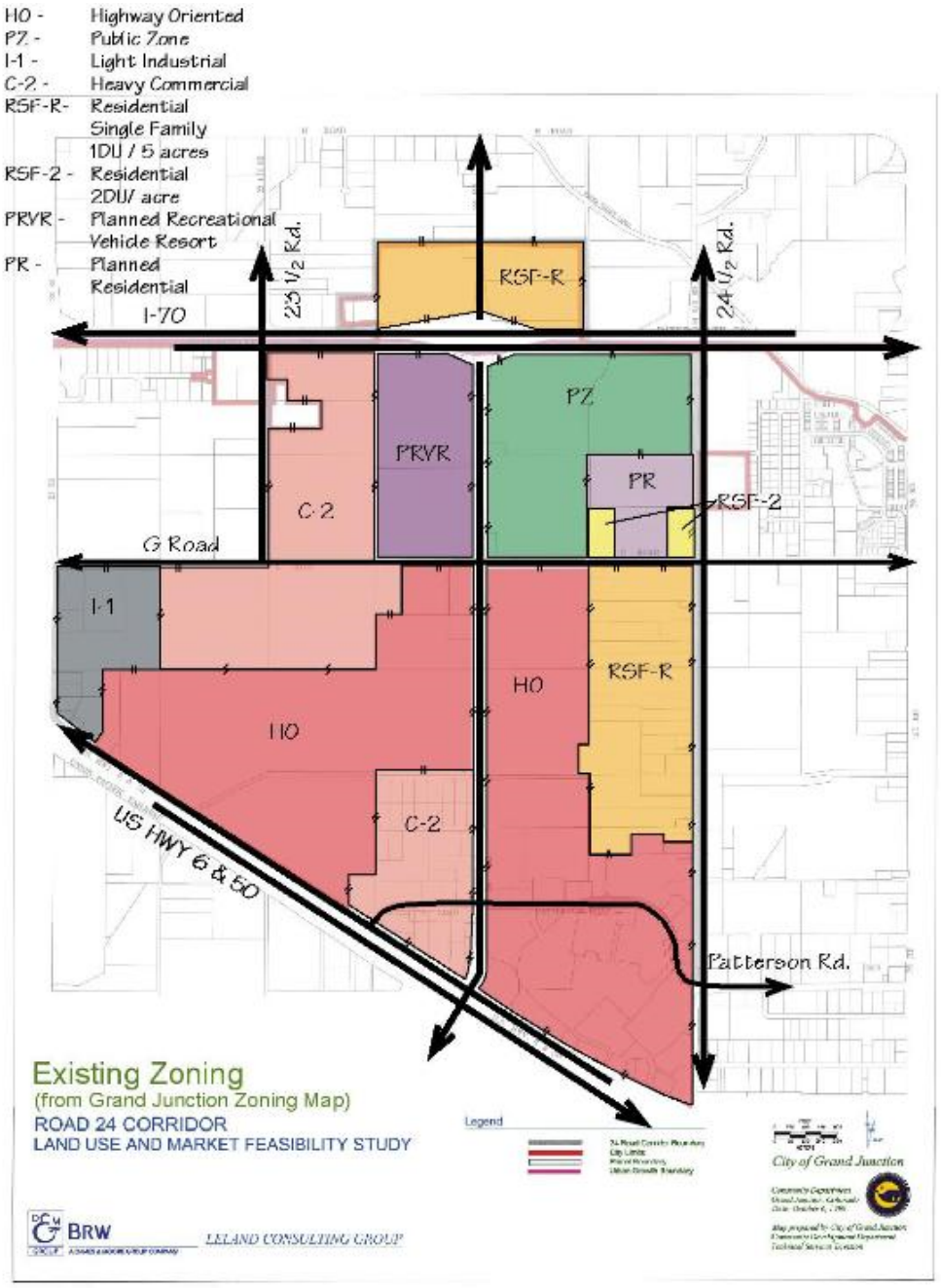


Figure 4: Existing Zoning

(Res. 109-00 § 4, 11-1-00)

§ 33.16.090. Property ownership.

Property ownership patterns in the area reflect the existing agricultural land use pattern of large farms. Where (relatively) new development has occurred, the subdivision of property has resulted in a significantly smaller lot pattern. Although the largest parcel is almost 200

acres, the average parcel size is eight acres. Three private property owners control 41 percent or 420 acres of land within the study area. Publicly owned property, primarily Canyon View Park, comprises approximately 115 acres, making the City the third-largest land owner in the area.

(Res. 109-00 § 4, 11-1-00)

§ 33.16.100. Summary of constraints and opportunities.

The following summarizes the general constraints and opportunities for the project area, relative to physical conditions and considering the import of market and demographic factors as discussed in Section 2. (See Figure 5.)

(a) Retail Synergism. Mesa Mall, the regional retail center for Mesa County, will continue to offer a synergistic relationship for additional retail users who will want to locate near the Mall, as well as adjacent to U.S. Highway 6/50.

(b) Land Use Supply and Demand. Based upon the market analysis, there is a greater supply of land in all categories than demand exists for the foreseeable future. Development will occur in a cyclical manner, e.g., a significant amount of development may occur over the next two years, but then no additional development may occur for the next eight years until the supply of space is absorbed.

(c) Development Cycles. It is likely that a fairly typical cycle of development will occur in Grand Junction: leading with employment, followed by single-family residential, commercial, and multifamily residential.

(d) Population Trends. According to the Growth Plan, since 1980, the population aged over 65 increased by over 30 percent, while at the same time the population aged 15 to 29 decreased by 30 percent. What this means is Grand Junction is a “graying” community. The increase in seniors can be attributed to climate, quality of life, health care facilities, and affordable housing. Therefore, recent population growth in Grand Junction has more to do with these factors than as a result of employment growth.

(e) Employment Trends. According to the Growth Plan, the top 10 employers in Grand Valley are either public employers or in the health care sector. City Market is the only employer on the list of major employers that does not fit into one of these two categories. This trend is likely to continue in the future.

(f) Transportation Circulation Patterns. The planned expansion of 24 Road from two lanes to three lanes (adding a center turn lane and median) will improve safety and increase capacity along the road corridor. The City’s plans for a secondary street system connecting to 24 Road is essential to properly serve the anticipated development.

Existing conditions along 24 Road, including Leach Creek on the right

(g) Infrastructure Availability. Adequate infrastructure is available to serve development in the corridor. Utilities are in place and are being upgraded.

Leach Creek drainage structure near Canyon View Park

(h) Environmental Conditions. There are few environmental constraints in the project area, other than Leach Creek and associated wetlands, which may impact development.

Leach Creek wetlands

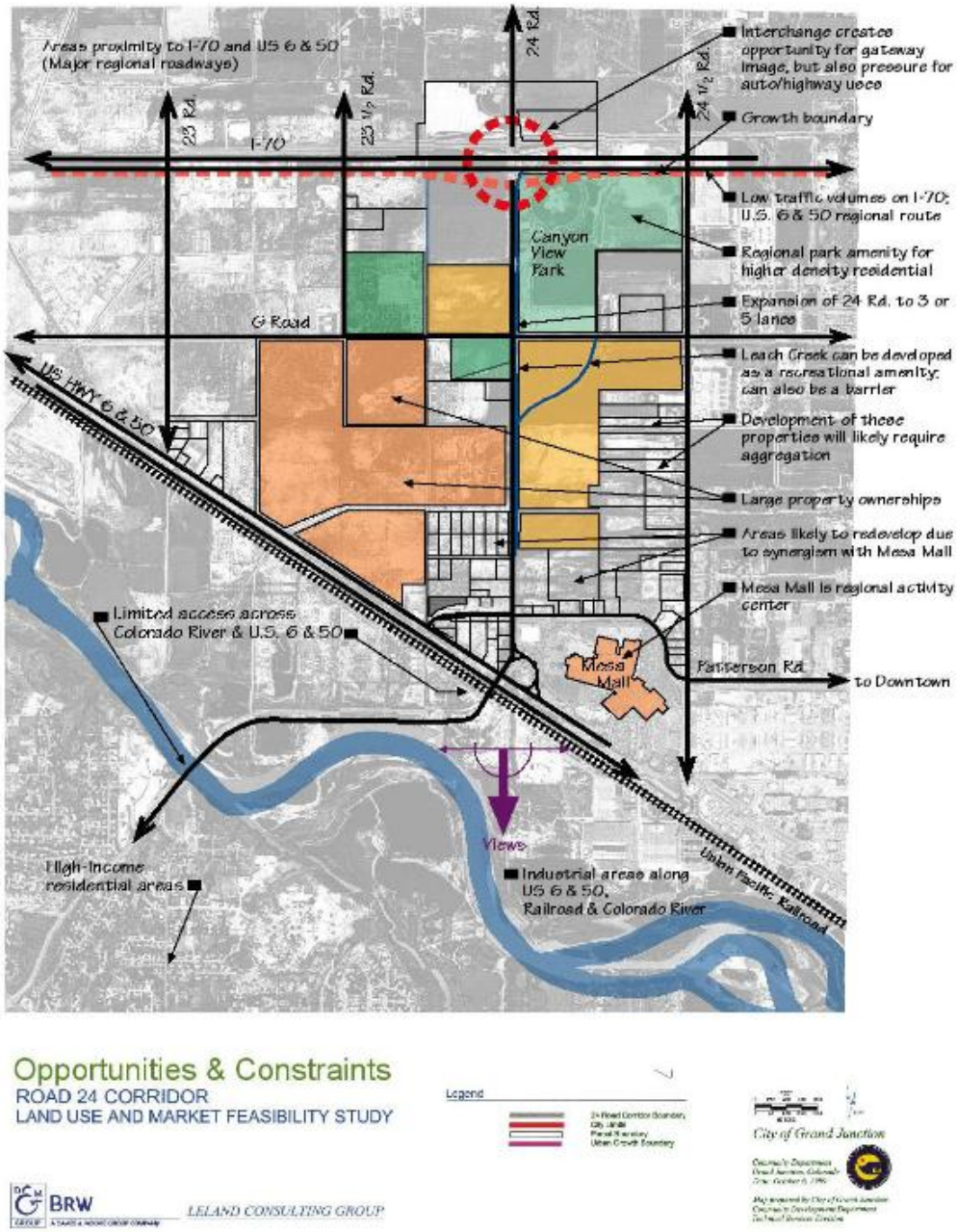


Figure 5: Opportunities and Constraints Map

(Res. 109-00 § 4, 11-1-00)

Chapter 33.20

Planning Alternatives

§ 33.20.010. Planning alternatives.

This chapter presents alternative concepts for the future development of the 24 Road Corridor which was discussed by the Steering Committee. These concepts incorporate various approaches to allocating land uses within the corridor and are depicted graphically as well as

in narrative. They include a Workshop Compilation Plan and Concept Plans 1, 2, and 3, which were developed by the consultant team. These concepts were then used as a starting point for the "Preferred Plan" presented in Chapter 33.24 GJMC.

The purpose of creating several different land use and circulation options is to evaluate how the spatial relationships of land use and circulation patterns relate to the community's goals and objectives. Each of the development options or scenarios will rely upon the application of the opportunities and constraints (to land development) as identified in the discussion of existing conditions in Section 4. The variable between each of the proposed alternatives is the spatial location of land uses, size (acreage), intensity of use, open space, and circulation patterns.

The land use categories in Table 12 were used in the formulation of the different concepts. They generally correspond to the land use categories in the 1995 Grand Junction Growth Plan, but are more generalized.

Table 12: Land Use Categories

Category: Growth Plan Land Use Concepts	Description	Concept Alternative Land Use Categories
Commercial	Wide range of commercial development – no outdoor storage. May allow mixed commercial and residential developments in some cases.	Retail/Commercial
Commercial Industrial	Heavy commercial, offices and light industrial uses – no outdoor operations. Some yard operations, provided they are screened. No residential uses.	Employment
Industrial	Heavy commercial and industrial operations – includes batch plants and manufacturing operations. No residential uses.	Industrial
Park	Active park and recreational sites with significant public access – public or private ownership.	Park
Residential: Estate	Single-family homes – two- to five-acre lots.	Estate
Residential: Low-Density	Single-family – lots from one-half to two acres. Generally have water and sewer.	Residential
Residential: Medium- to Low-Density	Two to four units/acre – urban services.	Residential
Residential: Medium-Density	Mix of residential units less than eight units/ acre – urban services.	Residential
Residential: Medium- to High-Density	Mix of residential units less than 12 units/ acre – urban services.	Residential

Table 12: Land Use Categories		
Category: Growth Plan Land Use Concepts	**Description**	**Concept Alternative Land Use Categories**
Residential: High-Density	Mix of residential units – between 12 and 24 units/acre – with urban services. Higher density may be allowed if compatible.	Residential

(Res. 109-00 § 5, 11-1-00)

§ 33.20.020. Workshop compilation plan.

During the fourth Steering Committee workshop, participants including property owners and their representatives took part in an exercise to develop land use plans and visions for the study area. Divided into five small groups, each group developed a land use plan for the area; these five plans were compiled into one plan representing the concepts of the group.

The land use concept that resulted, referred to as the Workshop Compilation Plan (Figure 6), featured an expansion of commercial uses along Highway 6/50 and a commercial node at the 24 Road/Interstate 70 interchange to take advantage of the access and visibility from these roadways. The most significant element of this proposal is the designation of land adjacent to 24 Road as "employment." This land use designation, which would include office uses, research and development, might take the form of either office and/or a combination of manufacturing and office uses in a campus setting. Hotels and service uses, restaurants, and convenience retail uses might also be included.

A major concept inherent in the Workshop Compilation Plan is to maintain flexibility to respond to the trends of the market place.

(a) Advantages.

(1) Provides for commercial uses where market forces have traditionally demanded such uses.

(2) "Employment" land use designation allows flexibility and is reflective of the mix of office, research, and assembly operations occurring in many parts of the country.

(b) Disadvantages.

(1) Provides more commercially zoned land than market will support, possibly leading to lower quality development because of over-supply.

(2) Flexibility requires more discretion in the public review process and therefore creates uncertainty for both public and private sectors.

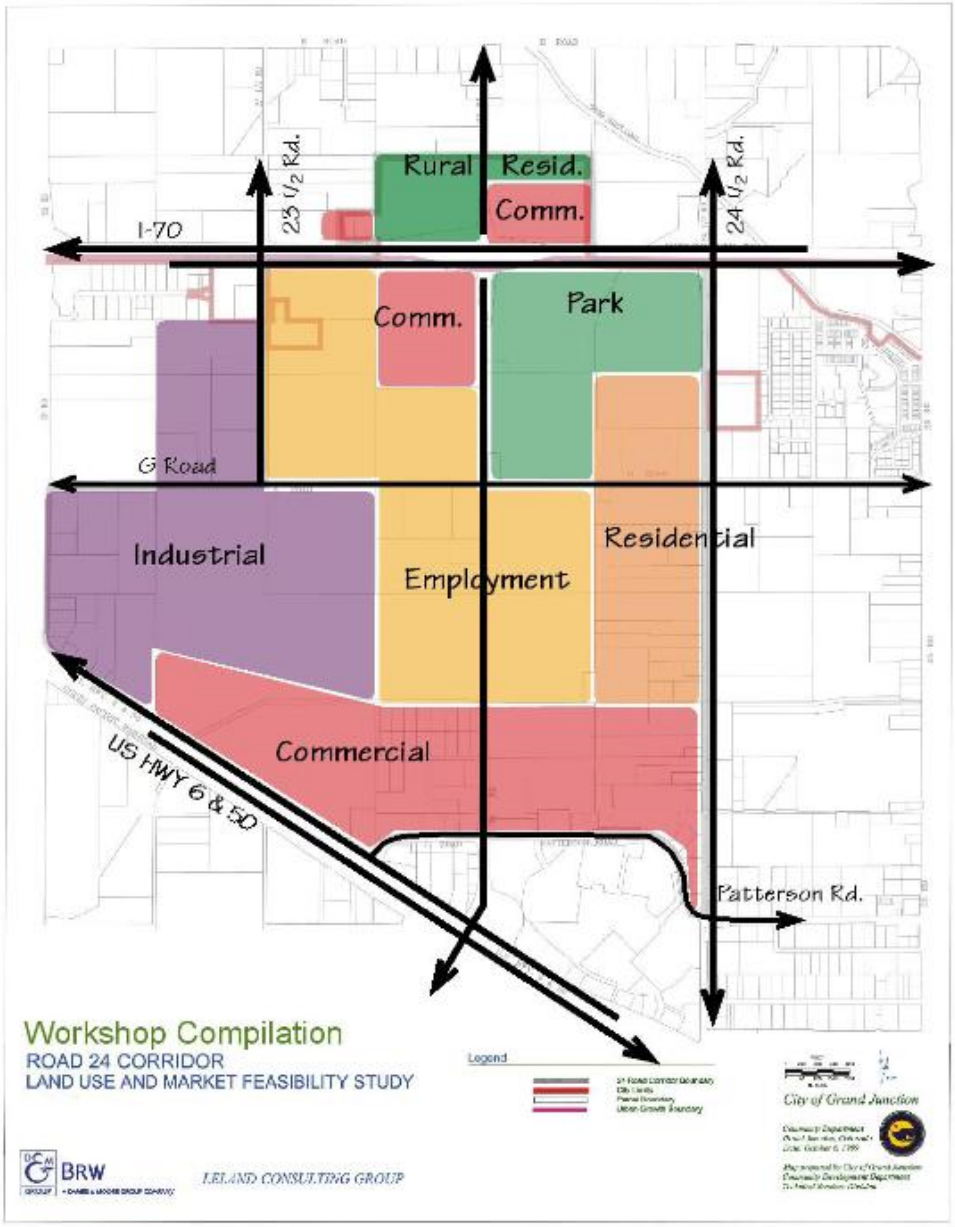


Figure 6: Workshop Compilation Plan

(Res. 109-00 § 5, 11-1-00)

§ 33.20.030. Consultant-developed concept plans.

A common theme for the three concepts developed by the consultant team and discussed by the Steering Committee was to encourage residential, employment, commercial, and industrial uses in the corridor. Several issues underlie the development of Concept Plans 1, 2 and 3:

(a) There is an over-supply of or lack of demand for land, either of which results in low land value.

(b) The community desires to have high quality (design) development occur along the corridor, which is unlikely given the implications of subsection (a) of this section.

(c) The socio-economic characteristics of the community (i.e., current growth being driven primarily by forces related to Grand Junction's role as a retirement community).

Although the consultants did not examine the market demand for a golf course, each of the three concepts includes the proposed development of approximately 120 acres as a golf course or significant open space amenity. Another sort of recreational activity could also be considered, as long as it serves the graying demographics of Grand Junction. Either way, the recreational amenity was intended to serve as a catalyst for high quality development by increasing the value of land on adjacent properties. In fact, one of several reasons for choosing a golf course is that it would provide positive impact on a wide variety of land use types, such as residential and office uses. The location of the golf course varies from concept to concept, so as not to imply that there is only one preferred location or desire to impact any one particular property owner.

(Res. 109-00 § 5, 11-1-00)

§ 33.20.040. Concept Plan 1.

(a) Concept. The overall concept provides for residential, employment, commercial, and industrial uses in the corridor, including development of 120 acres as a golf course/ amenity. Concept Plan 1 illustrates the golf course east of 24 Road. Employment uses are shown west of 24 Road and residential uses to the east and north of the golf course. Commercial is shown along Highway 6/50, with industrial to the west. Concept Plan 1 is illustrated in Figure 7.

(b) Commercial. Commercial nodal development is shown at the 24 Road/I-70 interchange and at the G and 24 Road intersection. Expansion of the existing commercial uses along and adjacent to U.S. Highway 6/50 is also shown. This area is intended to provide sites for large discount retailers (big-box/category killers) that are prevalent today. The G and 24 Road intersection commercial node is intended to provide neighborhood-oriented retail uses. Commercial development at the I-70 and 24 Road interchange is intended for the interstate traveler and regional market.

(c) Rural Residential. Rural residential land north of I-70 is consistent with the Growth Plan.

(d) Residential. Development density is not specified. Residential areas which wrap around land proposed for the golf course may vary from single-family to moderate-density multifamily development.

(e) Park/Recreation. Concept Plan 1 provides for the use of Leach Creek as a trail corridor linking Canyon View Park and the Colorado River Trail, and accents natural features within the golf course.

(f) Employment. Employment zones in this plan are intended to provide the opportunity for office, industrial flex-space and light industrial development with limited retail and residential uses.

(g) Industrial. Industrial areas are illustrated as an extension of the existing industrial area south and east of the U.S. Highway 6/50 and I-70 interchange.

(h) Advantages.

(1) Allows logical expansion of large-scale commercial users adjacent to the highway, providing access and visibility with minimal impacts.

(2) Creates a regional and site amenity (golf course) which increases land value and creates a "signature" image for the area.

(i) Disadvantages.

(1) Market demand for all uses is weak and the market for a golf facility may not exist.

(2) The commercial node at the interchange may draw demand from other less well-served areas of the City. If commercial development occurs at this location first, land values may not satisfy the community's desire for high-quality development along other areas of the corridor.

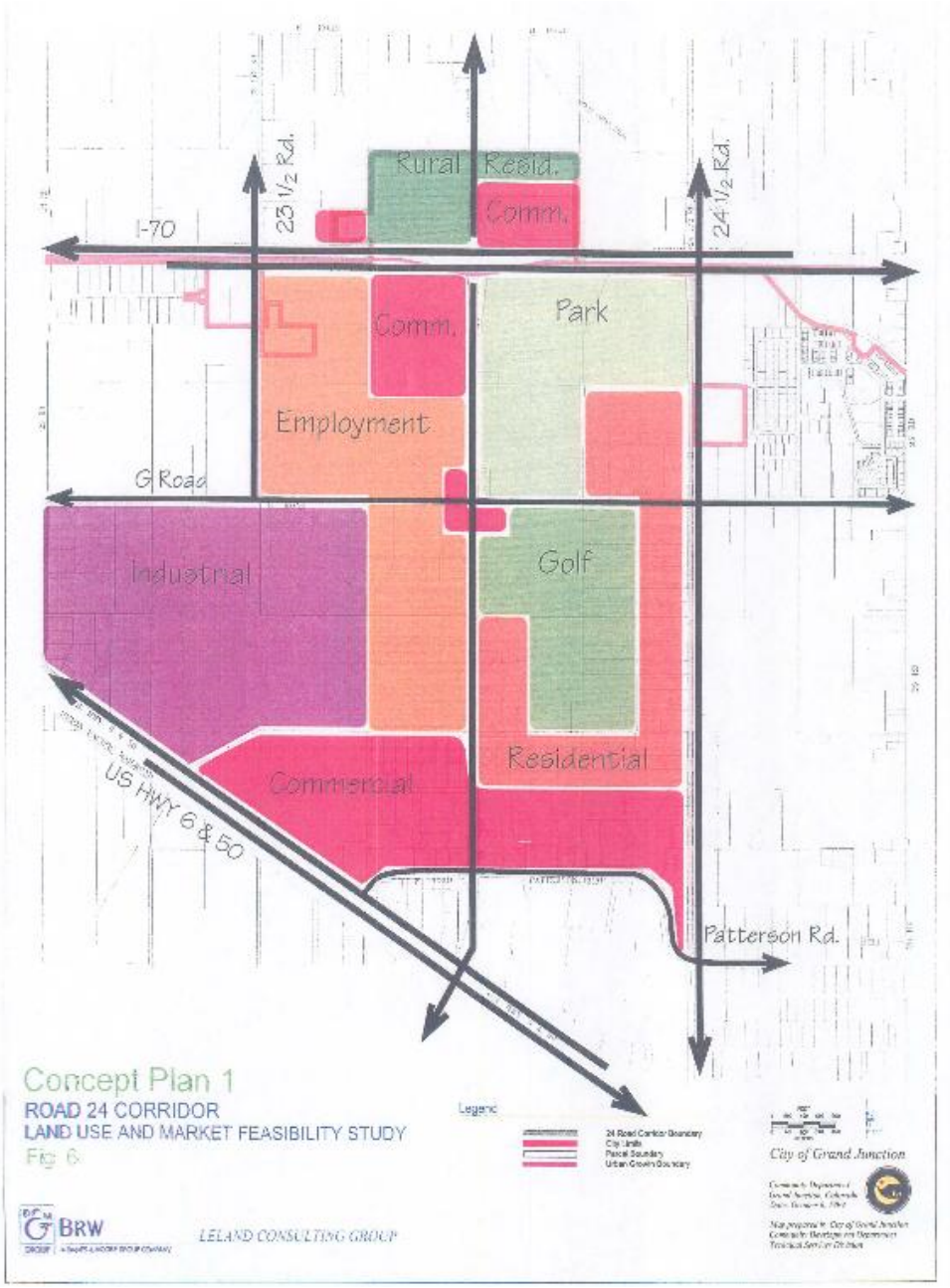


Figure 7: Concept Plan 1

(Res. 109-00 § 5, 11-1-00)

§ 33.20.050. Concept Plan 2.

(a) Concept. The overall concept provides for residential, employment, commercial, and industrial uses in the corridor, including development of 120 acres as a golf course/ amenity. Concept Plan 2 illustrates the golf course west of 24 Road. Employment uses are shown east of 24 Road and residential uses to the west and north of the golf course. Concept Plan 2 is illustrated in Figure 8.

(b) Key Elements.

(1) Commercial. Land along U.S. Highway 6/50 is suggested for commercial (big-box) development. Additional commercial uses are proposed for the south side of G Road and east and west of the 24 Road intersection as well as at the 24 Road and I-70 interchange.

(2) Employment. Employment uses include office, office warehouse, and light industrial uses. Three areas are proposed for employment use: in the southeast quarter of the G Road and 24 Road intersection; one-half mile west of the 24 Road and I-70 interchange; and between G Road and U.S. Highway 6/50, approximately one-half mile west of 24 Road.

(3) Residential. Residential use is illustrated along 24 1/2 Road, between the Mesa Mall area and the regional park, adjacent to existing residential use. Additional residential development is proposed west of 24 Road, north and south of G Road. The latter area is shown to wrap the proposed golf course. Development density is not specified.

(4) Rural Residential. Rural residential land is shown north of I-70, consistent with the Growth Plan.

(5) Industrial. Industrial zoning is illustrated as an extension of the existing industrial area south and east of the U.S. Highway 6/50 and I-70 interchange.

(c) Advantages.

(1) Allows logical expansion of large-scale commercial users adjacent to the highway, providing access and visibility with minimal impacts.

(2) Creates a regional and site amenity (golf course) which increases land value and creates a "signature" image for the area.

(d) Disadvantages.

(1) Market demand for all uses is weak and the market for a golf facility may not exist.

(2) The commercial node at the interchange may draw demand from other less well-served areas of the City. If commercial development occurs at this location first, land values may not satisfy the community's desire for high-quality development.

(3) The location of residential uses adjacent to the golf course does not benefit from synergism of adjacency to other residential development along 24 1/2 Road.

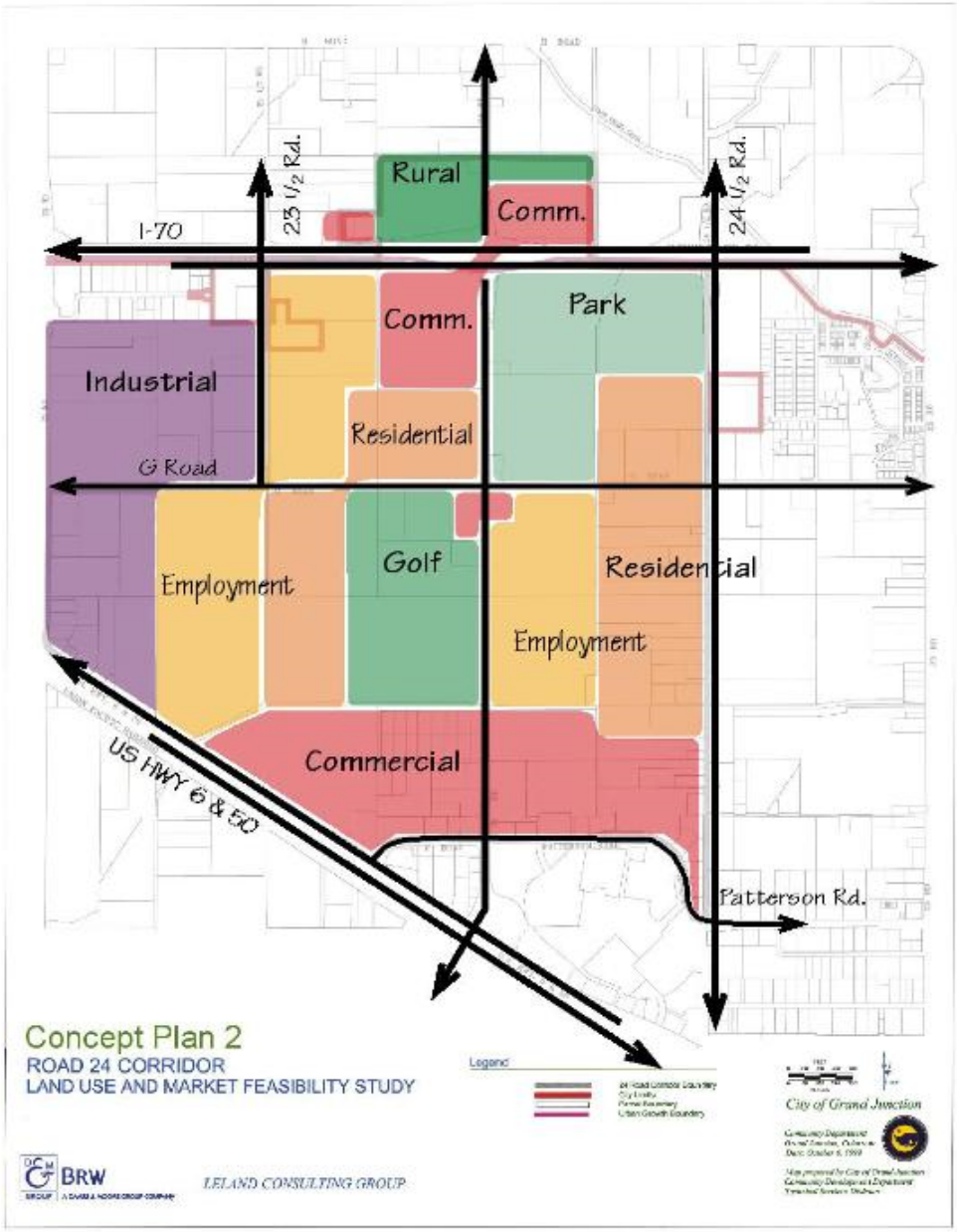


Figure 8: Concept Plan 2

(Res. 109-00 § 5, 11-1-00)

§ 33.20.060. Concept Plan 3.

(a) Concept. The overall concept of Plan 3 is to encourage residential, employment, commercial, and industrial uses in the corridor, including development of 120 acres as a golf course/amenity. This will serve as a catalyst for high-quality residential and employment development. Concept Plan 3 shows the golf course west of 24 Road and north and south of G Road and is illustrated in Figure 9.

(b) Key Elements.

(1) Commercial. Commercial use is illustrated in three locations: at the northeast corner of the I-70 interchange, at the southeast corner of the G/24 Road intersection, and as expansion along U.S. Highway 6/50.

(2) Industrial. The industrial area south of I-70 will be allowed to expand into the western portion of the study area.

(3) Residential. There are two areas designated for residential use in this concept. One of the areas is located along 24 1/2 Road from the regional park on the north to the commercial area north of Mesa Mall on the south. The second area is located adjacent to the western and southern edges of the golf course.

(4) Employment. Employment uses include office, office warehouse, and light industrial uses. Three areas proposed for employment use: in the southeast quarter of the G Road and 24 Road intersection encircled by the golf course, one-half mile west of the 24 Road and I-70 interchange, and between G Road and U.S. Highway 6/50, approximately one-half mile west of 24 Road.

(5) Rural Residential. Rural residential land north of I-70 is consistent with the Growth Plan.

(c) Advantages.

(1) Allows logical expansion of large-scale commercial users adjacent to the highway, providing access and visibility with minimal impacts.

(2) Creates a regional and site amenity (golf course) which increases land value and creates a "signature" image for the area.

(d) Disadvantages.

(1) Market demand for all uses is weak and the market for a golf facility may not exist.

(2) The commercial node at the interchange may draw demand from other less well-served areas of the City. If commercial development occurs at this location first, land values may not satisfy the community's desire for high-quality development.

(3) The location of residential uses adjacent to the golf course does not benefit from synergism of adjacency to other residential development along 24 1/2 Road.

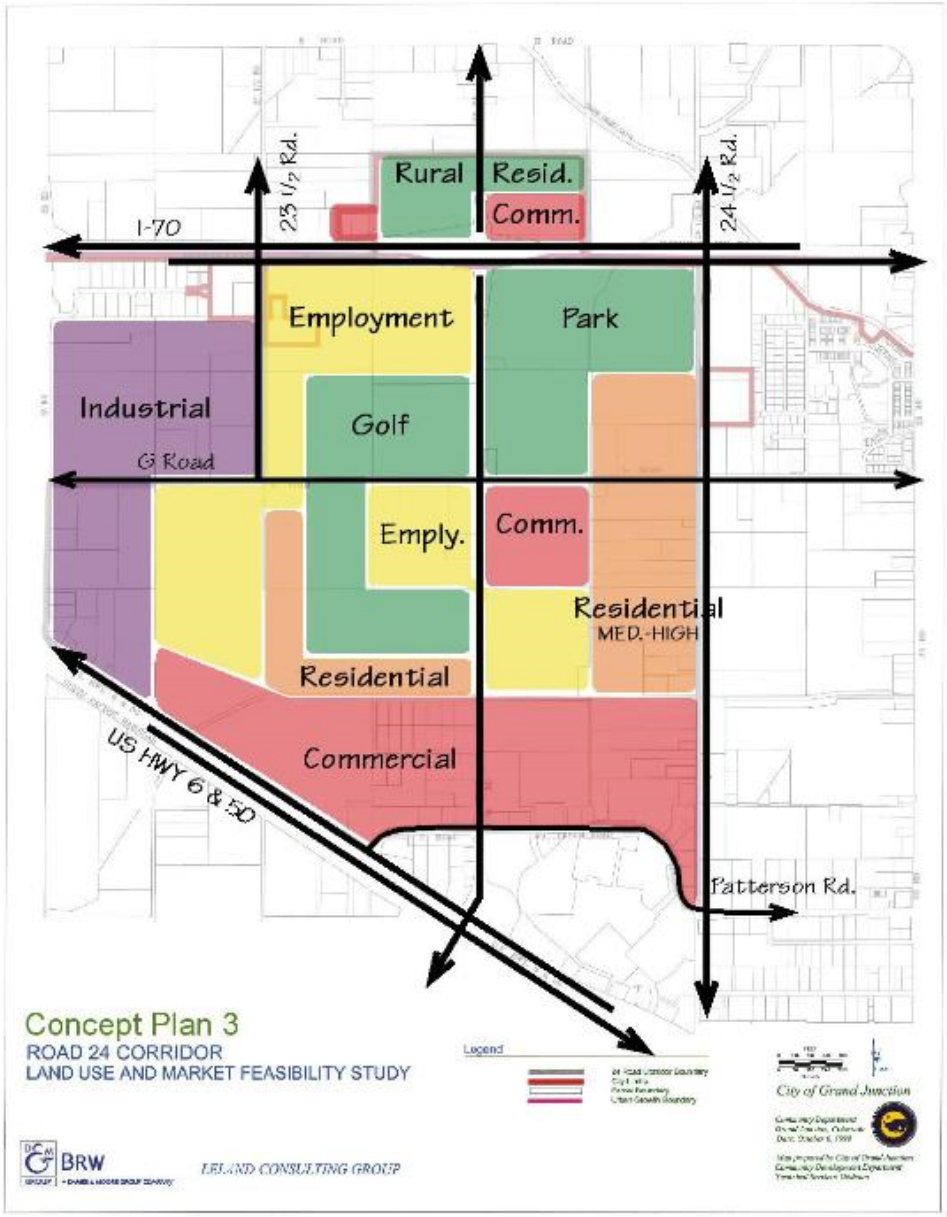


Figure 9: Concept Plan 3

(Res. 109-00 § 5, 11-1-00)

Chapter 33.24

"Preferred Plan" for the 24 Road Corridor

§ 33.24.010. "Preferred Plan" for the 24 Road Corridor.

This section presents the "Preferred Plan" for the 24 Road Corridor. It was formulated after the Steering Committee reviewed the concept alternatives and current City plan for the area as presented in the Grand Junction Growth Plan. The "Preferred Plan" is presented as a map

and a written description. Implementation of the "Preferred Plan" is discussed in Chapter 33.28 GJMC.

(Res. 109-00 § 6, 11-1-00)

§ 33.24.020. Vision statement.

(a) Achieve high-quality development in the corridor in terms of land use, site planning and architectural design.

(b) Provide market uses that complement existing and desired uses and benefit the Grand Junction community.

(c) Take advantage of and expand upon existing public facilities in the corridor to create a "civic" presence.

(d) Achieve a distinctive "parkway" character along the roadway that can serve as a gateway to the Grand Junction community.

(e) Encourage development that is consistent with the Grand Junction Growth Plan.

(f) Adjust and/or amend the Grand Junction Land Use Code and Growth Plan to achieve the Road 24 vision, concept, and plan and to create a predictable environment for future development of the area.

(Res. 109-00 § 6, 11-1-00)

§ 33.24.030. Subarea plan concept.

Provide a land use and transportation framework for future development in the 24 Road Corridor that:

(a) Allows for flexibility in land uses (type, intensity, and density) while recognizing inherent differences between development on small parcels compared with larger parcels.

(b) Establishes a transportation network that interconnects to create a logical urban pattern.

(c) Establishes a high-quality image through zoning, design standards, and public improvements.

Key components of the "preferred plan" are discussed in this chapter.

(Res. 109-00 § 6, 11-1-00)

§ 33.24.040. Image.

The City of Grand Junction should develop a high-quality environment within the corridor that reflects its importance as a gateway to Grand Junction. In addition, the City must utilize public improvements to establish this quality within the public realm (road right-of-way and public open space), building upon a "parkway" character. Design standards and guidelines on private sites should reinforce the overall theme and sense of quality. A development

"catalyst," such as a golf course or recreational facility, would encourage high-quality development as well as contribute positively to the area's image.

(Res. 109-00 § 6, 11-1-00)

§ 33.24.050. Open space/public facilities.

Canyon View Park already establishes a "civic" character for the area, as well as providing valuable open-space and recreational facilities. This character should be continued through the development of the 24 Road "parkway" and linear parks systems, including regional trails connecting the park and the Colorado River. Future open space/public facilities may include a golf course or other recreational amenity, which could be developed as a public/private venture as part of a larger land holding, assemblage, or cooperative venture among smaller landowners.

(Res. 109-00 § 6, 11-1-00)

§ 33.24.060. Circulation.

U.S. Highway 6/50, 24 Road, Patterson Road and G Road currently comprise the major road network for the area. Successful development in the future will depend upon the creation of a secondary road system that provides continuity of travel, access to sites, and alternative routes north/south and east/west in the area.

Expansion of 24 Road as a five-lane landscape parkway with a median is a key feature that should occur as soon as possible to "set the tone" for development in the area. It should be coordinated with CDOT plans for the interchange.

A Secondary Road Network Master Plan should be developed for the subarea. Future rights-of-way for public streets should be reserved prior to development.

(Res. 109-00 § 6, 11-1-00)

§ 33.24.070. Land use.

The following categories are deemed to be most appropriate for the 24 Road Corridor:

(a) Rural Residential. Rural residential land north of I-70 consistent with the Growth Plan, including the current church site north west of the I-70 interchange.

(b) Residential. Medium-density residential along 24 1/2 Road, or as part of a planned development.

(c) Commercial. Commercial node in the north east corner of the I-70 interchange, as well as expansion of commercial uses along U.S. Highway 6/50.

(d) Industrial. Continue industrial uses in the western sector between G Road and U.S. Highway 6/50.

(e) Park/Open Space. Existing open space includes Canyon View Park. An open space corridor should be developed in the future along Leach Creek linking Canyon View Park and the Colorado River corridor.

(f) Mixed Use Development. Mixed use development is encouraged in the remaining areas to include employment, residential and open space. Retail commercial may be appropriate as a secondary use, integral to other uses and structures or as a small (eight to 10 acres) nodal development at 24 Road and G Road intersection.

Although specific site development plans have not yet been approved for properties in this area, they will need to be approved as part of the City review process, which will rely in part on a comprehensive set of design standards and/or guidelines. Development in the area will be of a high quality and otherwise appropriate to Grand Junction's "western gateway."

Elements of the "Preferred Plan" are summarized below and presented in Figure 10. A summary of proposed land uses is proposed in Table 13.

Table 13: Proposed Land Uses

Preferred Plan	**Area (acres)**
Rural Residential	44
Commercial	260
Mixed Use	423
Community Recreation	114
Residential Multifamily Medium-High	116
Industrial	61
Total	**1,018**

Source: BRW, Inc.

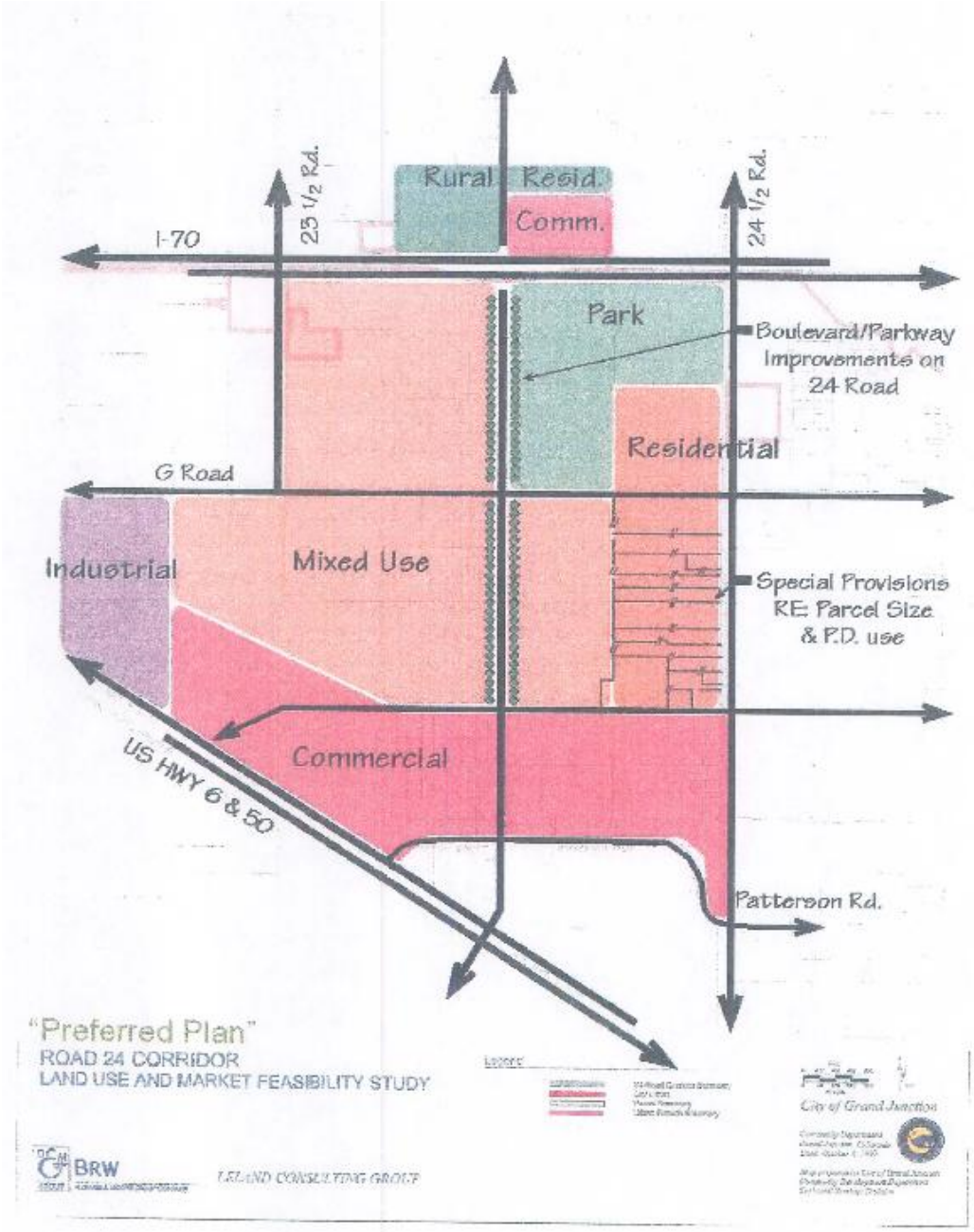


Figure 10: "Preferred Plan"

(Res. 109-00 § 6, 11-1-00)

Chapter 33.28
Implementation

§ 33.28.010. Implementation.

This chapter presents the recommendations of the Steering Committee regarding implementation of the 24 Road Corridor Subarea Plan. The Committee evaluated a variety of

implementation plans which are summarized in this chapter. The chapter then concludes with implementation recommendations for the "Preferred Plan."

(Res. 109-00 § 7, 11-1-00)

§ 33.28.020. Background and assumptions.

Answering the basic questions of what (type of future do residents want), where (is the appropriate location within the community for these activities to take place), and who (is the primary responsible party) is obviously important. How these decisions are made and executed is equally important. If the decisions cannot be implemented for lack of funding or political support, then the grandest of visions will fail.

The recommended implementations actions are based on the following assumptions:

(a) The public sector should provide the policy framework, regulations and programs which guide development in the public interest and to provide the infrastructure and basic services.

(b) Development will be dependent primarily upon private investment in response to market forces and trends.

(c) All land use and transportation decisions by their nature will create different opportunities and constraints for different properties.

The importance of these three assumptions is that they recognize the public sector has a limited ability to change or direct market trends, although they can direct or manage how and where these forces physically manifest themselves, and that inequities exist and will be created which benefit some properties and not others.

Table 14 summarizes the range of actions presented to and discussed by the 24 Road Steering Committee.

Table 14: Summary of Possible Implementation Actions

Action	Discussion	Responsibility
Revise Grand Junction Growth Plan or adopt 24 Road Corridor Subarea Plan.	Goal • Revise recommended land uses in the 24 Road Corridor. Implication • Requires City Council approval and then modifies Growth Plan.	Public

Table 14: Summary of Possible Implementation Actions

Action	Discussion	Responsibility
Revise existing Planned Development (PD) zone or establish a new mixed use zone for large-scale planned commercial, residential, and industrial developments. This zone would be applicable to the 24 Road Corridor and other areas where appropriate, subject to the following: • Significant benefit to the City as a whole, based upon cost benefit analysis. • Minimizes or mitigates any potential adverse environmental and social impacts. Other criteria.	Goals • Complement or refine existing PD zone districts. • Allow flexibility in intensity and mix of land uses. • Concentrate commercial development in compact centers or districts (rather than letting it spread out in strips). • Encourage high-quality visual environment. • Phase development to allow rational expansion of infrastructure. Implications • Existing PD zone may presently provide land-use flexibility – no need to create new zone. • Design standards should be added to existing language.	Public
Create design standards for new development.	Goal • Encourage high-quality visual environment (materials, site planning, signage, landscaping, architectural design). Implications • Adherence to “design standards” likely to increase cost of development. • Lack of guidelines or standards is likely to perpetuate existing type and quality of development.	Public
Prepare a Secondary Road Master Plan that establishes the location, standards for design, and construction of all area roads.	Goal • Establish interconnecting, logical road network. Implications • Parties responsible for constructing minor roads likely to be individual developments unless other mechanism, e.g., an “improvement district,” is in place. • Requires coordination between land owners and City.	Public

Table 14: Summary of Possible Implementation Actions

Action	Discussion	Responsibility
Establish a "general improvement district" to provide cost-sharing of "public improvements."	Goals • Create amenities and enhancements that add land value and improve community image. • Plan, construct and maintain key image-giving visual elements, e.g., boulevard landscaping along 24 Road, Leach Creek recreational improvements, "gateway/entry design features," golf course, etc. Implications • Without method for cost-sharing, improvements to public areas will require capital improvement funding from General Fund and be limited by availability of funds. • Individual property owners are unlikely to voluntarily finance perceived "area-wide" public or private improvements/amenities, e.g., golf course, trail system, etc.	Public/Private
Create organization to represent property owners, plan, and implement desired area improvements.	Goal • Create institutionalized method to address goals and issues by encouraging cooperation, collaboration and high-quality visual environment. Implications • Requires cooperation for the benefit of the many, at perhaps the expense of the few. • Some improvements and actions may be impossible to implement without cooperation.	Private

Following is a summary of background information relative to several of the development tools described above.

(Res. 109-00 § 7, 11-1-00)

§ 33.28.030. Background on key implementation tools.

(a) Overlay Zone. The use of overlay zoning is one way to create a more flexible and discretionary alternative to traditional Euclidean zoning. An overlay zone is defined as "a mapped overlay district superimposed on one or more established zoning districts which may be used to impose supplemental restrictions on uses in these districts, permit uses otherwise disallowed, or implement some form of density bonus or incentive bonus program."

Overlay zones are distinct from "floating" zones because of several features, the most significant of which is that overlay zones are mapped and floating zones are not mapped.

An overlay zone supplements the underlying zone district with additional requirements or incentives. Underlying zoning regulations remain in place. Examples might include special requirements such as design standards or guidelines, additional setbacks or

height limits. A parcel within the overlay zone will thus be simultaneously subject to two sets of zoning regulations: the underlying and the overlay zoning requirements.

Overlay zone boundaries are also not restricted by the underlying zoning districts' boundaries. An overlay zone may or may not encompass the entire underlying zoning district. Likewise, an overlay zone can cover more than one zoning district, or even portions of several underlying zoning districts.

(b) Improvement Districts. Improvement districts are a legal vehicle established by the City Council, or appropriate legislative body, whereby improvements to public property are financed by special tax assessments on affected private property.

Traditionally, improvement districts have accomplished street-oriented improvements, such as street paving, curb and gutter, sidewalks and drainage projects. Other types of improvements in public areas can be funded in this manner as long as they contribute to the public good.

The purpose of an improvement district is to provide financing and distribute costs over a specific area. It allows a city or county to construct and pay the entire cost of an extensive project within a very short time. The improvement also makes the improvements affordable to the benefited property since payment for improvements is usually carried over 10 years.

(c) Design Guidelines and Design Standards. Design elements including architectural style, use of materials, landscaping, signage and site plan features and elements can be addressed in the guidelines and standards. Without strong political support for their application, guidelines and standards will be ineffective. Traditionally, these tools are used in areas where there is a unique development pattern or character, such as an historic district or where there is a particular type of development to be controlled, such as retail or commercial. There should also be a method for the review of projects subject to the guidelines, such as a design review board comprised of citizens and professionals in the design field.

Because guidelines are advisory and often voluntary, challenges to them can be successfully argued. Standards are regulations adopted by the City Council or other appropriate legislative body and become part of the land use "code." In either case, specificity in intent and language is desirable.

(d) Other Property Owners or Business Owners and Entities. These are all examples of institutionalized or legally organized methods for collaboration and cost- and profit-sharing. Many downtown or other business districts have been modeled after shopping centers, where agreements governing the "Common Area Improvements" responsibilities, etc., are used. In situations where there may be many unequal interests, and therefore unequal benefits, contractual agreements establishing organizational structures may be of benefit.

(e) Implementation Recommendations. The Steering Committee discussed how the 24 Road Corridor Subarea Plan could be implemented through both public and private means. These options fall into the general areas of policies, programs and capital investments.

(1) Implement 24 Road Improvements. Expand 24 Road to a five-lane parkway, with landscaped median, as soon as possible in order to meet transportation requirements as well as "set the tone" in the area for high-quality development.

(2) Adopt a Subarea Plan. Incorporate the recommendations of the Steering Committee into the Grand Junction Growth Plan by adopting the 24 Road Corridor Subarea Plan.

(3) Create a Mixed Use Zone for the Area. Current Grand Junction regulations provide for several planned development zones; however, they do not contain sufficient criteria to achieve the vision for 24 Road Corridor. A new mixed use zone could address issues and opportunities specific to the 24 Road Corridor.

(4) Adopt Design Standards and Guidelines. Develop design standards and guidelines to address the design and planning issues related to commercial development as well as larger land use, open space, and transportation framework issues in the corridor.

(5) Develop a Secondary Road Network Master Plan. Establish the location, type and character of secondary roads within the project area, including key access points and interconnections.

(f) In addition, the Steering Committee discussed two other potential options:

(1) The establishment of a public/private entity to provide for cost-sharing of "public" improvements, i.e., two additional lanes on 24 Road, boulevard landscaping, Leach Creek recreational improvements, a possible golf course, and gateway/entry designs.

(2) The potential to create an organization to represent property owners and plan, implement and maintain desired area improvements. This would "institutionalize" private sector involvement and create the means for agreement/cooperation among private sector interests and with the public sector.

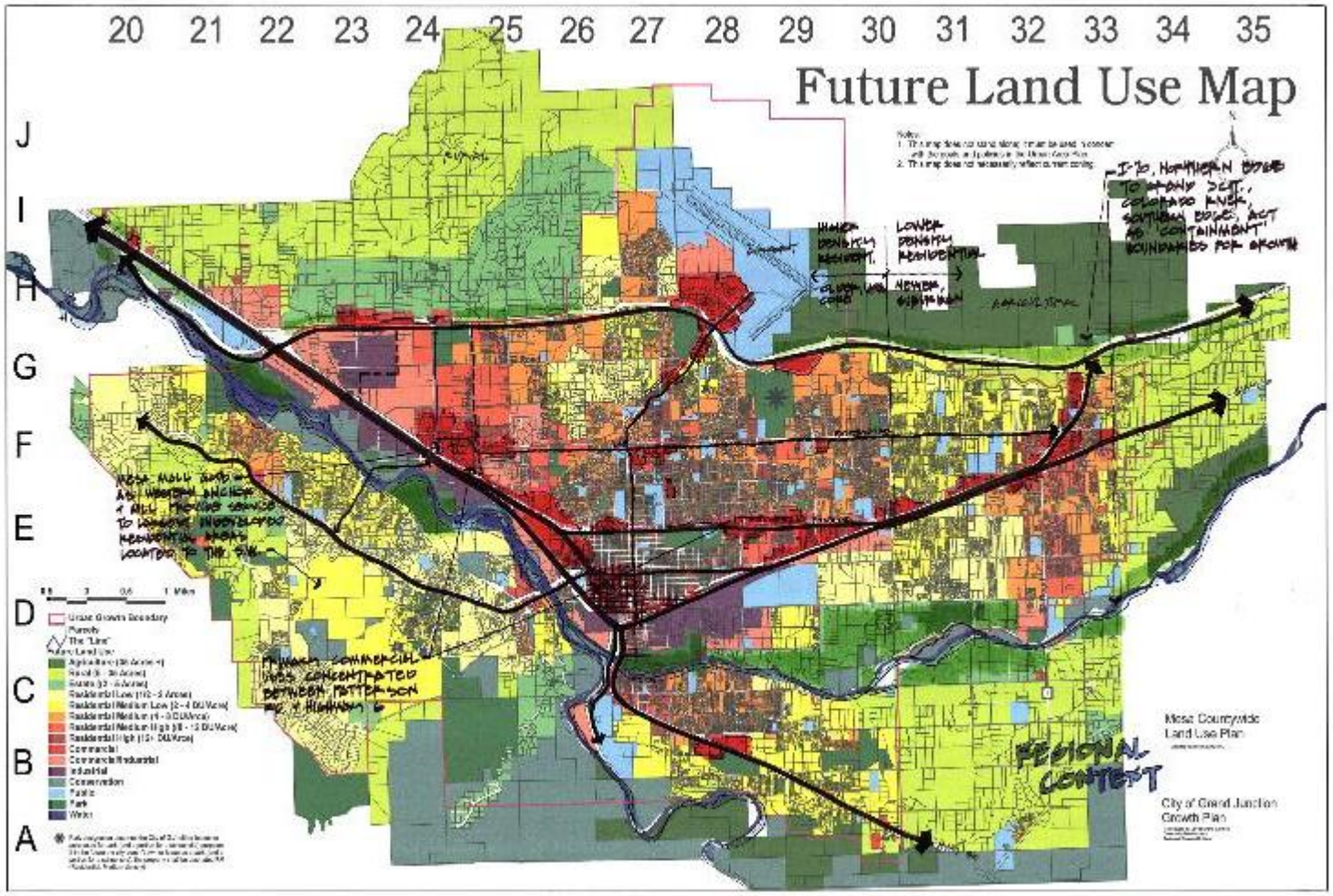
Although landowners support the five elements described above, including the concept of more rigorous design standards than the City has in place today, it remains to be seen whether they are willing to step forward to participate financially in exchange for more flexibility in land use and site design through the planned development (PD) process. The potential for cost-sharing between the City and landowners for improvements to a five-lane 24 Road was discussed, with no resolution at this time.

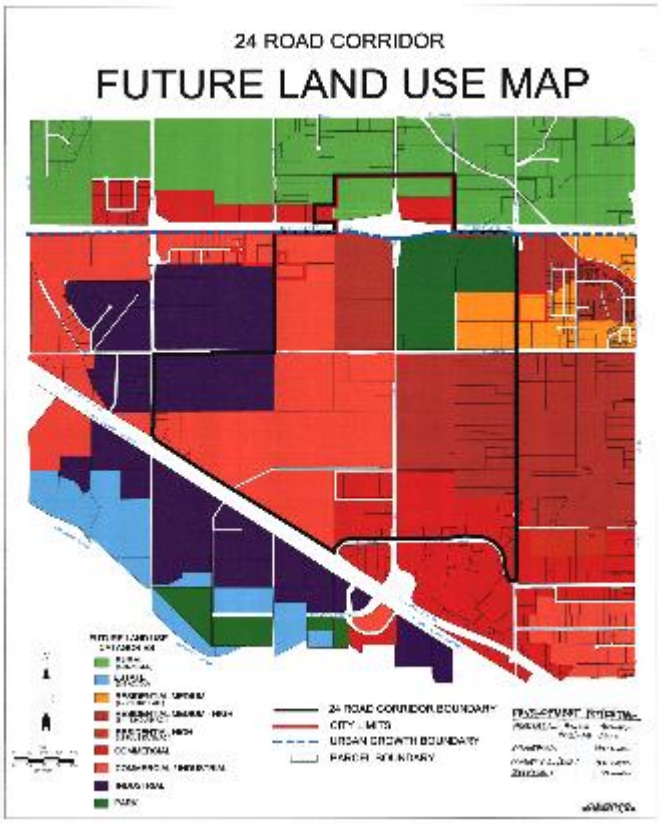
(Res. 109-00 § 7, 11-1-00)

Chapter 33.32

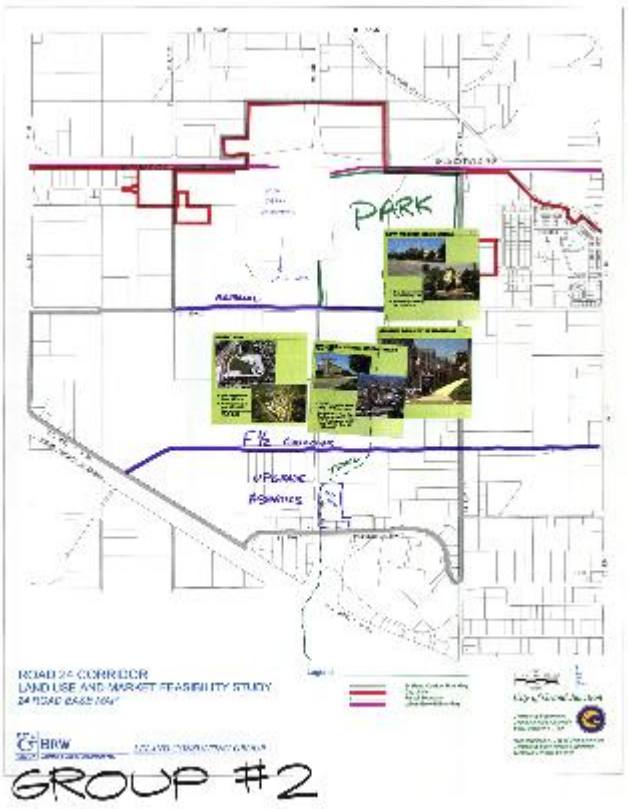
Appendix A – Supplementary Illustrations

§ 33.32.010. Supplementary illustrations.


Future Land Use Map
20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35
J I H G F E D C B A
Mesa Countywide Land Use Plan
City of Grand Junction Growth Plan
REGIONAL CONTEXT


24 ROAD CORRIDOR
FUTURE LAND USE MAP
24 ROAD CORRIDOR BOUNDARY
CITY LIMITS
URBAN GROWTH BOUNDARY
PARCEL BOUNDARY


PARK
BIG BOX RETAIL
ROAD 24 CORRIDOR
LAND USE AND MARKET FEASIBILITY STUDY
GROUP #1


PARK
F½
ROAD 24 CORRIDOR
LAND USE AND MARKET FEASIBILITY STUDY
GROUP #2


BUFFER W/TREES ON 24
CHURCH
ENTERT'T RETAIL
HOTEL
PARK
OFFICE CAMPUS
MAIN
CITY MARKET
ROAD 24 CORRIDOR
BRW
GROUP #3

(Res. 109-00 § 7, 11-1-00)

Title 34

(RESERVED)

Title 35

(RESERVED)

Title 36

(RESERVED)

Editor's Note: Former Title 36, Greater Downtown Plan, consisting of Ord. 4571, 3-20-13, was retired from the Comprehensive Plan and repealed by Ord. No. 5238, 11/6/2024.

Title 37

(RESERVED)

Title 38

(RESERVED)

Title 39

(RESERVED)