Context Sensitive Street Design Guidelines: A Complete Streets Approach

Farmington Metropolitan Planning Organization
Context Sensitive: “A collaborative, interdisciplinary approach that involves all stakeholders in providing a transportation facility that fits its setting. It is an approach that leads to preserving and enhancing scenic, aesthetic, historic, community, and environmental resources, while improving our maintaining safety, mobility, and infrastructure conditions.”

Federal Highways Administration (FHWA)
The urbanized area of San Juan County offers a cornucopia of beautiful vistas, rivers, outdoor recreation options, ancient ruins, Tribal culture and a pioneer spirit rarely found in any region across the country. The small town feel and sense of community is manifest as one visits Main Street diners, barbershops or one of the many civic-minded organizations. The management of this highly desirable region requires a thoughtful, holistic and community driven process that honors the natural splendor area residents have come to expect. This is not to suggest that challenges have been avoided when building streets made for all modes, ages and abilities. After extensive community outreach, voices expressed the desire to enhance place-making as it relates to streets and the public realm. In concert with other broad economic development tools, complete street policies will enable the urbanized areas of San Juan County to compete with other similar sized localities in the west.

Communities implementing place-making strategies understand that the greatest success will start with improvements to the street. Complete street policies have proven to catalyze public and private investments, improve public health, safety, congestion, balance transportation options and strengthen economic development initiatives. Context sensitivity means design standards must consider the convergence of rural to urban land uses and the small to large roadway types unique to our region. Elements of a complete street can vary but might include buffered sidewalks, designated well-marked bike lanes, on-street parking, buried utilities or bus shelter pull-outs.

Factors affecting decisions about business locations:

<table>
<thead>
<tr>
<th>Factor</th>
<th>Average Importance Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall quality of community</td>
<td>4.5</td>
</tr>
<tr>
<td>Reputation of community</td>
<td>4.2</td>
</tr>
<tr>
<td>Safe community</td>
<td>4.1</td>
</tr>
<tr>
<td>Brand image/location consistency</td>
<td>3.9</td>
</tr>
<tr>
<td>Visibility of business location</td>
<td>3.7</td>
</tr>
<tr>
<td>Abilities attract/retain talent</td>
<td>3.5</td>
</tr>
<tr>
<td>Future Growth Costs</td>
<td>3.4</td>
</tr>
<tr>
<td>Favorable zoning regulations</td>
<td>3.4</td>
</tr>
<tr>
<td>Area qualified employees</td>
<td>3.3</td>
</tr>
<tr>
<td>Employee commute time</td>
<td>3.1</td>
</tr>
<tr>
<td>* Favorable tax structure</td>
<td>3.1</td>
</tr>
<tr>
<td>Complementary businesses</td>
<td>3</td>
</tr>
<tr>
<td>* Business incentive packages</td>
<td>2.7</td>
</tr>
<tr>
<td>Quality of airport</td>
<td>2.6</td>
</tr>
</tbody>
</table>

Source: Sanoran Institute 2015 PLACE VALUE: How Communities Attract, Grow and Keep Jobs and Talent in the Rocky Mountain West
Equity in Complete Streets - Implementing Complete Streets principles also means addressing transportation needs in an equitable way. Complete Streets accommodate all modes and all users. It covers spectrums of economic class, age, physical ability, and mode choice. As the authors of the article “A Path to Complete Streets in Underserved Communities” point out, Complete Streets principles are rooted in equity.

Analysis of various Complete Streets policies points out that many communities do well at emphasizing all modes, but not necessarily all users. Policies are often written to include bicycles and pedestrians, but rarely go a step further to explicitly include diverse user groups, such as children, older adults, economically disadvantaged, people with disabilities and underserved neighborhoods. People of all ages need to make trips, and not all have access to or chose to use a personal motorized vehicle. Some are too young to drive; others have lost the ability or the license to drive.

Inequity in transportation often has a geographic component. Neighborhoods with concentrations of lower income households are precisely the ones most likely to lack reliable, affordable transportation. As an example, rural residents face a greater risk of obesity and other chronic diseases when compared to urban residents, this according to the National Rural Health Association’s Fall 2012 Journal of Rural Health. Multi-modal facilities such as widened shoulders, trail systems, and park and ride facilities can greatly enhance the transportation options for rural residents.

Safe, connected, multi-modal transportation networks and services are needed in all neighborhoods or areas of a community. Nationally, statistics indicate that these demographic groups who lack reliable transportation are growing in numbers, and are not currently being accommodated by the existing transportation system. To ensure a more equitable distribution of funds Federal or State agencies expect localities to strongly consider environmental justice in the decision making process. Recent Federal regulations now require entities to produce Title VI and ADA plans in order to be eligible for State or Federal funds.

Equity in complete streets is about making multi-modal connections between people and the destinations they choose to visit. It considers street form and function, access, as well as the natural and built environments. Weaving equity into place making will dignify all modes and abilities while strengthening communities and neighborhoods across the region. Of course true equity must include user proportionality in project selection.

Resource
1. The Future of Rural Health, Why Rural Health is Different, National Rural Health Association Policy Brief.
EXECUTIVE SUMMARY

Our streets lay the foundation for how we interface with travel needs, physical exercise, social exchanges, employment and access to goods & services. They are meaningful for all users of the transportation network; whether by car, bus, bike or walking.

Over the last several decades, the art of designing places for people has shifted in favor of accommodating the private vehicle. Although automobiles hold a valuable place within the overall transportation network, planners and engineers in many cases, have focused too heavily on its importance without considering other modes of travel. Examples include building too many travel lanes, incorporating polices leading to immense and underutilized parking lots, and applying a ‘one-size fits-all’ approach to the construction of multi-modal facilities such as sidewalks, bike lanes and transit stops. In many cases, these facilities have been left out all together in the planning phases. These practices have placed vulnerable, non-motorized transportation users next to high-speed, high-volume traffic. Not only does this discourage active living, but it can place a costly burden on cities and communities who endeavor to retrofit streets in rural areas, neighborhoods, commercial corridors and urban centers.

A need has been expressed to promote full spectrum outcomes from sensible, innovative and coordinated efforts in regional transportation planning. This approach might not always favor traditional benchmarks of efficiency such as level of service when assessing the effectiveness of streets built for all modes and abilities. Some solutions may reduce capacity as a trade-off to safety, aesthetics and economic vitality. Downtown streets and school zones may require performance measures that quantify the increase in walking/biking, transit ridership, public safety, economic activity or the reduction of vehicle miles traveled (VMTs). Not only does this discourage active living, but it can place a costly burden on cities and communities who endeavor to retrofit streets in rural areas, neighborhoods, commercial corridors and urban centers.

Complete Streets Planning Process

In May of 2012, Farmington MPO staff invited the Walkable and Livable Communities Institute (WALC) to the region. Led by a walkability expert, they educated local elected officials, area residents and transportation stakeholders on the details and best practices in Complete Streets. This led to an eagerness for more engagement in complete streets with the end goal to see more transportation projects incorporate elements of complete streets. A Complete Streets Advisory Group (CSAG) was organized in the fall of 2012 with the goal to develop regional goals and design guidelines. This group consisted of a diverse cross-section of transportation stakeholders from the region including Safe Routes to School, land use planners, private developers, civil engineers, public health/insurance professionals, senior housing advocates, economic/business and community activists for use by local governments, developers and the general public.

The grassroots nature of the complete streets planning process aided MPO staff in extracting community values as they pertain to area streets and roadways. The CSAG recommended policies, goals and design guidelines that reflect the regions consolidated voice which unify approaches and best practices. A process was instituted which allowed the advisory group to discuss local and regional issues as they pertained to the transportation system, and recommend policies and design guidelines to better meet the needs of their various constituents. Staff then presented the concepts to a technical review body for recommended approval before gaining final approval and adoption from the MPOs Policy Committee.

With the time, interest and momentum in complete streets and the scarcity of Federal funds and programs that specifically target complete street projects, wise investment strategies will need to be deployed to ensure complete street projects benefit the broader community. Performance measures such as increased economic activity, improved safety and the return on investment (ROI) generated from the private sector can help us spend our limited dollars wisely. Metrics such as improved public health, and improved marketability may be long-term measurements.

Through the planning process, six core values were highlighted and stressed as regionally significant as they relate to complete streets: Public Health, Safety, Economic Vitality, Aesthetics, Network Connectivity & Multi-Modal transportation. These core-values establish beautiful and well-planned streets that create an advantage for the region’s economy. They balance the accommodation of private vehicles with active transportation amenities that attract growing families, seniors who can age in place, and a talented labor force. The advisory group acknowledged that Complete Streets can facilitate economic resiliency while seeking to keep pace with ever-evolving demographic shifts and market demands.

Context sensitive street designs ensure that residents in the rural and urbanized areas of Farmington, Aztec, Bloomfield and San Juan County are provided balanced parameters in regards to the layout and function of the streets. The complete street guidelines aid developers and leaders and other users, to recognize and honor distinct regional visions, goals and policies.

Vision Statement

“The Farmington MPO region will plan, design, and construct connected, multi-modal, and context appropriate transportation networks. These networks will address the needs of all users and integrate the community values of health, safety, and economic vitality in an aesthetically pleasing way.” (CSAG August 7th, 2013)
The Complete Streets Advisory Group identified public health as one of the core values to be consider in the development of design guidelines. Failing health indicators such as obesity, diabetes and the diminishing propensity for physical activity all illustrate a need for consideration of health in all policy (HiAP) approaches in the planning phases of active living amenities. Transportation projects that encouraged physical activity for children, seniors and everyone in-between was one of many objectives identified by the group. The development of river corridors, school zones and senior housing facilities were stressed by group members along with the need for these projects to connect to central gathering places. Another objective is to develop partnerships with public health organizations to help educate and promote complete streets and healthy life styles such as walking, biking and public transit to all residents and especially in underserved areas.

Improvements to air quality by reducing vehicular congestion was another goal identified by the CSAG. Transit users typically will walk up to a quarter mile or more for services. Improvements to the Red Apple transit system and the design of bus stops should occur simultaneously with any new street improvements or when retrofitting existing street systems. The mild climate in the Four-Corners region allows for outdoor activity for much of the year.

**Why Public Health** - The protection of public health is of primary concern. Public health is built into federal, state and local codes, practices and laws. Protecting public health has traditionally been approached through zoning and engineering practices. Examples include water, sewer, and storm-water infrastructure while also separating incompatible land-uses. Aside from incompatible land-uses, the looming health crisis facing communities now lie in chronic disease. People experiencing chronic diseases such as congestive heart failure, asthma, cancer and diabetes account for the majority of health care users in the United States. Seventy percent of deaths in the US are attributed to chronic diseases, killing more that 1.7 million Americans annually (1). By 2025, chronic disease will impact over 164M Americans almost half of the estimated population (2). The U.S. Center for Disease Control and Prevention (CDC) estimates that eliminating three risk factors—poor diet, inactivity and smoking would prevent 80% of heart disease and stroke, 80% of type two diabetes, and 40% of cancer (3).

**The New Mexico Experience** - According to studies produced by Henry J. Kaiser Family Foundation, New Mexico’s average annual percent growth in health care expenditures ranked 7th nationally (7.7%) from 1991-2009 (4). The same study revealed that in 2013, uninsured New Mexican’s (adults 19-64) ranked 6th highest in the nation at 24% (5). The same study revealed that in 2013, uninsured New Mexican’s (adults 19-64) ranked 6th highest in the nation at 24% (5). 2012-2014 Health indicators specific to San Juan County reveal 33.3% of adults experience obesity, which is higher than State (27.3%) and National (29.6%) averages for the same time frame (6). Health care coverage costs for people with a chronic condition average $6,032 annually—five times higher than for those without those conditions (7). In spite of these unwelcomed regional, state and national statistics, health care premiums continue to rise, thus making insurance affordability more difficult for the average New Mexican household.

**The Number of People with Chronic Conditions is Rapidly Increasing**


Participation from regional public health professionals and advocates was key in contributing to the discussion of public health relation to complete streets. The Complete Streets Advisory Group was able to understand the linkages between regional health and transportation objectives, thus they ensured the design guidelines considered public health.
Historical Collaboration & Arising Concerns

In the late 19th and early 20th centuries, combating the spread of infectious diseases required collaboration from public health, urban planning and engineering professionals. Solutions from planning and engineering began with zoning laws and sanitation infrastructure. In the mean time, public health professionals effectively produced vaccinations that all but eliminated most infectious outbreaks. Collaborative success was short lived as planners shifted focus to suburban growth patterns, federal and state engineers to standard design solutions and public health on individualized health care models. Transportation professionals have traditionally addressed road design in terms of safety excluding public health. This document encourages a holistic approach benefiting the public in terms of health, safety and general welfare.

Innovative digital tools such as Walk-Score and the 15-item Maps-Mini are being used to measure the impacts a well designed neighborhood can have on public health. Planners and design professionals are using the data to quantify and calculate the activity levels of persons who live or work in all types of neighborhood settings. Research will lead to recommendations on how policy makers can better consider public health through urban design practices.

Health Impact Assessment (HIA)

Healthy lifestyles are enhanced when there is equitable access between transit, buffered bicycle/pedestrian space and housing. One meaningful way in which public health professionals are contributing to the discussion of transportation, is by conducting Health Impact Assessments (HIA). An HIA is a model that helps policy makers take advantage of scientific data, health expertise and public input to identify the potential—and often overlooked—health effects of proposed new laws, regulations, projects and programs. An HIA can be large or small depending on the time and scope of a project under review.

Health in All Policies (HiAP)

According to the National Association of County & City Health Officials, an HiAP facilitates system changes which influence how decisions are made and implemented by local, state, and federal governments. They help ensure that policy decisions have neutral or beneficial impacts on the determinants of health. HiAP emphasizes the need to collaborate across sectors to achieve common health goals seeking innovative approaches to the processes through which policies are created and implemented.

The need for HiAP stems from the growing inequality in access to health care coverage and services. The simultaneous increase in chronic illness plaguing the US adds to the importance of HiAP. Since transportation projects are often departmentalized, they do not always address income inequalities, which in turn impacts the Social Determinants of Health of a community. For example, low income neighborhoods lacking transit services will minimize opportunities for gainful employment. The root cause (lack of transit), often results in systematic disparities in multiple social determinants such as income, obesity, or depression.
Works Cited


5. The Henry J. Kaiser Family Foundation State Health Facts. Available at: http://kff.org/other/state-indicator/adults-19-64/

6. New Mexico’s Indicator-Based Information System (NM-IBIS) page. Available at: https://ibis.health.state.nm.us/community/highlight/profile/ObesityAdultCnty/GeoCnty/45.html


Resources

1. Creating a Health Profile of Your Community– A How-To Guide

2. Smart Growth America– Laura Jackson of Wellmark Blue Cross Blue Shield on Creating Healthier Communities
   https://www.youtube.com/watch?v=VGSUvJhfzaw

3. Bikeability Checklist– How bikeable is your community?

4. Walkability Checklist– How walkable is your community?
Safety is a key component to quality of life. Accidents of all types result from a range of reasons. New Mexico ranks as the nation’s second-deadliest state for bicyclists and the most dangerous for pedestrians. The reasons range from substance abuse to a lack of funding prioritization for bike lanes and pedestrian spaces (1). In the MPO from 2010-2014, there were 121 pedestrian/vehicle conflicts resulting in 7 fatalities. In the same period, 43 cyclists were struck resulting in 0 fatalities. There were 8,542 vehicle to vehicle crashes resulting in 35 fatalities. Bike and pedestrian conflicts account for less than 2 percent of all crashes in the region, however their combined crash rate of 72.3 fatalities per thousand crashes is much higher than the 4.1 fatalities per thousand for vehicle involved crashes (2).

Complete street concepts will add value in the region when designing or retrofitting roadways. Safety is one of the principal benefits of complete streets. As an example, the average motorist on a four-lane facility must reconcile adjacent lanes of traffic moving in the opposite or matching direction, possible parallel bike lane traffic, crossing pedestrians and the occasional transit pull-out bay. Targeted improvements might start in school zones where our youngest and most vulnerable users are present.

Safe Routes to School - In 1969 more than half of all adolescent school-age children walked to school at least once a week. Today those numbers have fallen to under 15 percent. It is no coincidence that there are three times as many overweight children as there were 25 years ago (3). When making decisions on whether to grant children the ability to walk to school, an often cited concern from parents revolves around dangerous streets and the geo-spatial distance from home to school. Contributing to this phenomenon is the popularity of suburban tract housing which allows the leap-frogging of neighborhoods and communities much farther from schools when compared to traditional neighborhoods designed prior to WWII. This may be the reason why 20 to 30% of morning rush hour traffic is from parents driving their children to school (4).

Re-channelization concept by the MPO at Animas Elementary features 3’ buffer with 5’ sidewalks. Driveway cuts were shortened from 30’ to 15’. The concept was constrained to use only existing Right of Way.

If people are hit by a car travelling with a speed of:

- **20 MPH**: 9/10 Survive
- **30 MPH**: 5/10 Survive
- **40 MPH**: 1/10 Survive

When making decisions on whether to grant children the ability to walk to school, an often cited concern from parents revolves around dangerous streets and the geo-spatial distance from home to school. Contributing to this phenomenon is the popularity of suburban tract housing which allows the leap-frogging of neighborhoods and communities much farther from schools when compared to traditional neighborhoods designed prior to WWII. This may be the reason why 20 to 30% of morning rush hour traffic is from parents driving their children to school (4).
Road Diet Case Study- Road-diets reduce speeds, integrate bike facilities, add center turn lanes, while reducing and narrowing the number of travel lanes for volumes less than 25,000 daily vehicle trips. They enhance safety for motorists, bicyclists and pedestrians. The City of Seattle began measuring road diet performance measures on multiple streets capturing before and after metrics on safety, speed, and mode split. The re-channelization project converted four-lanes of traffic down to one lane in each direction. With the additional space, bike lanes and a two-way left-hand turn lane were added as seen below. Project results improved motorist safety by 14% and reduced vehicle involved injuries by 33%. The frequency of motorists exceeding the speed limit by 10mph or more decreased by 75%. Despite removing two travel lanes along the corridor, vehicular capacity only decreased by 6% while bicycling activity increased by 35%. Another benefit noted in the study was that vehicle traffic volumes also decreased on adjacent parallel streets (5).

The additional 24’ multi-directional space gained in a road diet, can be reconfigured to add parking spaces, wider bike lanes, or a buffer zone for sidewalks and landscaping. These added features may calm traffic and ease the motorist through the corridor. Additional benefits include the upsurge in bike and pedestrian levels on re-channelized streets, which can also alleviate vehicular traffic.

Design Speed vs. Posted Speed– An extremely important measure to improve the safety of our streets, is to engineer the design speed to match as closely as possible the desired posted speed (6). For example, of the two stacked images with posted speeds of 25 mph to the left, only the top image features narrow travel lanes, juxtaposed parking facilities, building enclosure, shared travel/bike lanes and a raised landscaped median. In the upper picture, motorist might feel compelled to navigate the street at slower speeds to accommodate multi-modal travelers.

The four travel lanes pictured in the bottom image, lend itself to excessive travel speeds and lacks traffic calming visual cues such as landscaped medians, narrow lanes and bike and pedestrian facilities.

Works Cited
2. Farmington MPO Statistical Compilation: Raw Data Source: University of New Mexico Traffic Research Unit 2010-2014
4. Safe Routes to School Travel Data: “A Look at Baseline Results from Parent Surveys and Student Travel Times”. National Center for Safe Routes to School. 2007
6. Schlossberg, Marc; Rowell, John; Amos, Dave & Sanford, Kelly. Rethinking Streets- “An Evidence-Based Guide to 25 Complete Street Transformations.”

Source: City of Seattle Department of Transportation, Stone Way Before/After Illustration: Study compared data from 2005-07 to 2007-09.
Aesthetics originated from the Greek word ‘aesthesis’ which means perception. Oxford Dictionary defines aesthetics as something ‘concerned with beauty or appreciation of beauty’ or ‘designed to give pleasure through beauty’. Accordingly, aesthetics plays a significant role in our perception of place and it’s long-term appeal to keep us interested in the places we choose to live.

The natural beauty of the Four Corners area is one of the many assets which can be positively exploited to make this a vibrant region to live, work and play and stay. Currently, the region offers a high quality of aesthetic value with sandstone mesas, rivers and a picturesque desert landscape. The beautiful natural setting should have a complimentary duplication in the built environment. With this in mind, the CSAG identified aesthetic value as a top priority when designing our streets and roadways.

Beautiful streets alone cannot accomplish the place-making desired across the region. This “Aesthetics” core value stresses building facades, building forms, appropriately scaled streetscaping that is pleasing in appearance and welcoming to residents and visitors alike. Specific objectives should ensure all modes of travel interrelate to well designed public spaces. This guideline encourage all entities (State, County, & Local) to develop entryway signage or monuments that include landscaping and public art in downtowns and neighborhoods, ensure that street cross sections complement and enhance attention to building facades and the built environment in general.

Prioritizing Street Aesthetics: Decades of underinvestment in regular repair have left many states’ roads in poor condition, and the cost of repairing these roads is rising faster than many states can address them. Smart Growth America and Taxpayers for Common Sense, produced a 2014 report which examines road conditions and spending priorities in all 50 states and the District of Columbia. They found an unbalanced approach with respect to how federal funds are split between maintenance vs. new construction projects. The report stated that from 2009-2011, states spent 45% of all roadway construction funds on preserving and rehabilitating 99% of the total roadway inventory nationwide. New construction projects account for only 1% of the nation’s road inventory but consume 55% of the entire spending budget. “As a result of these spending decisions, road conditions in many states are getting worse and costs for tax payers are going up”. It is no surprise that their report recommended changes at both the state and federal levels to redirect spending allocation to rehabilitation and maintaining streets in good repair, thus benefiting taxpayers and creating a better transportation system (1).

When we consider the road infrastructure region-wide, we must also calculate what percent of our roads will require rehabilitation and retrofitting to become complete streets in the future. If changes in the federal allocation of transportation funds do indeed shift to maintenance over new road construction, localities regionally will not only need to prioritize which roads receive those funds, but which complete street elements can be infused into the project that address aesthetics. Aside from a smooth clean surface for motorists, other maintenance allocation funds should be directed to add more trees and landscaping, burying utilities, adding street lighting, improving sidewalks and bike lanes, and adding green storm water infrastructure (GSI).

Planning & Design: The fusion of urban planning, landscape architecture and engineering will be crucial to the success of complete streets regionally. When one or more of these professional services is left out of the equation, streets are left unbalanced and may not contribute to aesthetic value. Without this multi-disciplinary approach inefficiencies in the system are created. In addition, historic preservation processes should be followed where applicable, especially in downtown districts.

Though not specific to transportation planning, advisory group members stressed the value of well crafted land-use plans as they relate to the street. Plans that allow for zero lot lines in urban areas, landscaping that creates enclosure in parking lots, and street widths kept in scale with building height creating outdoor rooms were a few the recommended considerations. Good designers understand the importance of the human scale. When streets are built too wide in relationship to the built environment, they are rendered un-inviting and discourage multi-modal activity. The strategic placement of buildings and trees can improve the human scale and the multi-modal experience. Urbanists have observed that pedestrians first perceive enclosure when the width of a street is roughly four times longer than the height of the closest buildings on either side (2). Highly walkable streets do not require tall buildings, street trees may be used to provide a sense of definition and enclosure in medians and landscaped buffer zones.
Street Amenities: The CSAG emphasized the placement of street furniture and the accommodations of parklets that extend the public realm and create outdoor dining experiences. Street furniture such as benches, trash dispensers and bike racks should be aligned on the sidewalk so as to allow consistency and clear linear walking paths (The Walkable and Livable Communities Institute, 2012).

Street Amenities: The CSAG emphasized the placement of street furniture and the accommodations of parklets that extend the public realm and create outdoor dining experiences. Street furniture such as benches, trash dispensers and bike racks should be aligned on the sidewalk so as to allow consistency and clear linear walking paths (The Walkable and Livable Communities Institute, 2012).

Works Cited

Resources

Rural areas above left (Flickr), can provide beauty and accommodate multi-modal by proving detached trails, wider shoulders and natural run-off systems. In an urban setting, street furniture additions such as a Parklet above right (George Mahe), extend the public right of way while adding improved aesthetics to the street.

Landscape architects help conceptualize street configurations incorporating Green Storm Water Infrastructure (GSI) into plans found in the region.
Complete streets can be an effective tool for economic development as communities seek to revitalize their local and regional economies. Studies have shown immediate and long-term benefits from infrastructure and street investments. Each complete streets project should add to, or contribute in some measure, to regional economic vitality goals and values.

This core value, “Economic Vitality” identified the need for street designs (whether new build or retrofit projects), that spur investment along corridors and commercial centers. Many of the traffic calming measures identified in the Safety core values are elements also desired to promote economic vitality. These include slowing vehicular speeds in commercial centers and designating passageways that boost alternate mode of transportation such as walking, biking and transit trips. Urban street elements might be comprised of wider sidewalks, bump-outs, street furniture, bike racks, trees and landscaping. In addition there was a desire expressed to provide spaces (plazas, squares, paseos & parklets) with adequate signage that encourages locals and tourists to linger and shop. Public/private partnerships were discussed as a way to foster business and customers.

Economic development research has shown that what makes certain cities more attractive to others to entrepreneurs and businesses is a strong quality of life, an educated labor force and a strong customer base. Communities that dedicate resources to foster these identifiable characteristics have the highest potential of drawing innovative entrepreneurs, companies and jobs that can transform their local economies (1).

Quality of life in the Four Corners area of New Mexico may be the distinguishing asset to build upon regionally. Our temperate climate makes outdoor activities possible for almost 10 months of the year. At a regional scale, the proximity to fishing, river trails, off-road biking, and proximity to national parks is part of what makes the area attractive. On a local scale, active transportation provisions will contribute to the quality of life such as inviting walking facilities, connected cycling infrastructure and accommodating transit amenities. These amenities can weave into larger quality of life fabric both locally and as part of the regional community.

It is important to question whether complete street infrastructure improvements will yield a return on investment (ROI) that will benefit the community. After twenty years of decline, Lancaster Boulevard in Lancaster, CA needed rescuing. In a dramatic demonstration of the value of smart streetscape investment, the city officials devoted $11.5M to a Downtown Street project that attracted $130M in private investment and generated $273M in economic output. Revenues in the downtown area have nearly doubled only a year after revitalization efforts began.

The value of complete streets does not solely benefit downtowns and urban centers. In “Walking the Walk, How Walkability Raises Home Values in US Cities”, the highest scoring most walkable neighborhoods yielded higher market values when compared to non-pedestrian friendly neighborhoods (2). The placement of trails and active living amenities also play an important role in improving ROIs. Advisory Group members stressed the importance of master plans that highlight trails and active living amenities in commercial and residential areas. In Indianapolis, research discovered that homes a half mile closer to the Monon Trail sell for an average of 11% more. In Cincinnati, home values increase by $7 for every foot closer to the Little Miami Scenic Trail. Real-estate industries are catching onto the benefits of building active transportation back into our lives.

Works Cited


Lancaster Boulevard, Lancaster CA: Redesigned to calm traffic incorporating a flexible street concept for special events. Source: U.S. Environmental Protection Agency
Network Connectivity is a core value identified by the CSAG for making access from one destination to another easier. They link neighborhoods to commercial districts, civic centers and activity nodes such as parks, river trails, transit hubs/stops and other walk-bike and equestrian areas. Specific goals emphasized the implementation of grid patterns within new developments that disperse traffic, provide connectivity for vehicles, pedestrians, cyclists and that also calm traffic. Creative solutions should consider the use of easements, alleys, cul-de-sacs and dead-end streets as a means of connecting walking/biking/equestrian opportunities. The Farmington MPO has adopted an access management plan which is essential to effective complete streets. These tools might include raised medians, consolidated driveways, shared parking lots and driveway standards. A long-term goal is to encourage local governments to develop a mechanism for requiring construction of sidewalks for infill and vacant lots. Communities should integrate and enhance natural land forms and topographies into designs for new development.

Although streets are principally used for transportation and mobility, they also structure the skeletal framework of a city. They are the means by which owners access their land. Streets provide the aesthetic quality and patterns vital to community connectedness. In addition to moving people, streets can include utility lines, sewer and water, and communications infrastructure. The pattern in which we lay out our streets along with its many appendages determines the long-term efficiency and prosperity of the region.

The Decentralization of communities is attributed to the popularity of the personal automobile, changing roadway standards and patterns. The availability and value of land and infrastructure, outside the urban core, eased the leapprogging of community centers, schools and commercial developments. Developments were built on a simple grid. Street patterns changed from a connected grid network to a curvilinear loop disconnected system. The Complete Streets Advisory Group recognized the benefits of grid patterns throughout the region. Traditional and curvilinear grid configurations can be found in Farmington, Aztec, Bloomfield and urbanized areas of San Juan County. Recommendations from the CSAG are to improve connectivity in the regional skeletal network, using a combination of curvilinear and traditional grid features. These were proposed to improve safety, efficiency and economic resiliency.

### Safety

One of the primary goals of the CSAG is "safety". If streets in the metropolitan region of San Juan County are planned and designed to provide safety for all users, we benefit from many other elements of the street. Research has examined the roles street networks play in road safety outcomes. Data was collected on more than 130,000 crash sites occurring over nine years in 24 medium-sized California cities. Crash data was evaluated against street network density and connectivity at the Census Block Group level. Results suggest that street network characteristics do in fact play a role in road safety outcomes...more specifically that high risk-fatal or severe crashes occur with very low street network density and safety outcomes improve as the intersection density increases (2).

### Efficiency

Most street networks are developed in either one of two fashions, dendritic (branch systems) or interconnected (grid like) patterns. Eventually all trips converge to a single point and congestion is the inevitable result in a branching system. Traffic feeds to one point in a dendritic system receiving up to four times the amount than would an equivalent intersection in an interconnected system (3).

The benefits of inter-connectivity include: a decrease of traffic on arterial streets; more continuous and direct routes that encourage travel by walking and bicycling; greater access and quicker response times for emergency vehicles; more evacuation alternatives in the event of a disaster; and improvements in the quality of utility connections.

The Mid Region Council of Governments examined 2008 base-line volume to capacity (V/C) ratios with future 2035 modeled ratios contrasting the East and West side of Interstate 25 in the Albuquerque region. The East side of I-25 features a traditional grid pattern, whereas the West, is a feeder system for conventional cul-de-sac and looping land use patterns. Modeled results illustrated that most of the growing traffic congestion and delays in the transportation system would occur in the spaghetti street patterns found on the west side of the Albuquerque. Only minor increases in the V/C ratios occurred on the East side of I-25 as the traditional grid pattern is able to disperse traffic more efficiently. The study also revealed that most of the growing inefficiencies occurred on wide arterials acting as feeders (dendritic system) for non-connecting land uses.
Resiliency

Change is inevitable in all urban areas including San Juan County, whether intensified by environmental forces, population migration or economic dynamics. These influences should compel leaders, in both public and private sectors not only to adapt but to anticipate those changes.

One of the benefits of a well connected street network, whether in urban or rural areas, is its ability to acclimate to change. “The exact same 200’ x 800’ block of land was used repeatedly in Manhattan and has accommodated everything from wilderness to churches, houses, mercantile exchanges, and office skyscrapers. Land uses of Manhattan have changed consistently and continuously over time and will continue to do so. The street plan of Manhattan, on the other hand, is constant; it is the framework within which these changes are allowed to take place. When land uses turn over, new uses can simply plug-in to the existing infrastructure” (4).

A well linked network of streets that accommodate commercial, residential and agricultural uses will improve transportation efficiency, economic resiliency and safety of all users.

The transit system has already established bus stops and routes connecting many residents to high traffic and high need destinations such as San Juan College , the Animas Mall and government centers in Aztec, Bloomfield, and Farmington. Future considerations should consider park and ride destinations whether formalized or informal, bike routes and walking destinations. Red Apple Transit has been making efforts to connect transit riders to important nodes such as parks and other destinations. Early coordination and buy in from government agencies will be necessary to make sure long-range visions and plans are made readily known across departments from each entity.

Works Cited

Multi-Modal transportation encompasses all modes in the network, namely transit, passenger vehicles, as well as walking and biking. The vision statement from the Complete Streets Advisory Group was that “The Farmington MPO region will plan, design, and construct connected, multi-modal, and context appropriate transportation networks. These networks will address the needs of all users and integrate the community values of health, safety, and economic vitality in an aesthetically pleasing way.” (CSAG August 7th, 2013).

The Complete Streets Advisory Group (CSAG) identified goals and objectives for the construction of multi-modal facilities. One overarching goal identified is to plan, design and construct appropriate amenities for all modes providing balanced and aesthetically pleasing transportation systems in both rural and urban settings. Specific objectives include creating buffers such as striping, medians and temporary structures separating vehicular traffic and other modes where possible, constructing separated walking/biking paths and equestrian trails along high speed/volume arterials and rural residential areas. Also building transit stops that are ADA compliant and accessible by walking and biking facilities, garnering support and buy-in from city departments and transportation agencies that multi-modal features will be incorporated into planning and construction of roads, and encouraging local governments to develop a mechanism for constructing sidewalks for infill and vacant lots.

Public Transit- A study released by the American Public Transportation Association (APTA), showed that while car-sharing, bike-sharing, walking and car ownership will all play a part in the multi-modal network, public transportation is ranked highest as the best mode to connect to all other modes (1). Transit riders are composed of daily workers, students, choice riders, tourists, the disabled and low income persons. In order to plan for future demand, we must recognize changes in transportation based on demographic trends locally and nationally.

As an example, over the next twenty years, the number of Americans age 65 and older will increase to more than 71 million growing from 12 to 20 percent of the total population. Many of those seniors will chose to ‘live in place’ in lieu of moving to senior housing facilities. Access to public transportation will be a challenge from many seniors especially those who reside in rural and suburban locations (2). For this reason, policymakers and planners should focus on implementing projects and programs to meet the transportation needs of an aging public.

External factors are forcing Millennials (18-34 years) to drive less. Some of these factors may be temporary such as student loan debt, low-wage employment trends, and urban lifestyle preferences. For the time being, public transportation is and will be an important transportation option for many of those who make up this 75 Million strong age cohort (3).

As demand increases for public transportation, investments in technology can help improve the efficiency of public transit. One of the heralded transit success stories in NYC occurred only after the city installed signal priority technology on bus lines as well as off-board fare-collection stations. These hardware installations, helped increase ridership by 30%, bus speed by 20% with a 98% satisfaction rate with transit service (4).

Public Transit - A study released by the American Public Transportation Association (APTA), showed that while car-sharing, bike-sharing, walking and car ownership will all play a part in the multi-modal network, public transportation is ranked highest as the best mode to connect to all other modes (1). Transit riders are composed of daily workers, students, choice riders, tourists, the disabled and low income persons. In order to plan for future demand, we must recognize changes in transportation based on demographic trends locally and nationally.

As an example, over the next twenty years, the number of Americans age 65 and older will increase to more than 71 million growing from 12 to 20 percent of the total population. Many of those seniors will chose to ‘live in place’ in lieu of moving to senior housing facilities. Access to public transportation will be a challenge from many seniors especially those who reside in rural and suburban locations (2). For this reason, policymakers and planners should focus on implementing projects and programs to meet the transportation needs of an aging public.

External factors are forcing Millennials (18-34 years) to drive less. Some of these factors may be temporary such as student loan debt, low-wage employment trends, and urban lifestyle preferences. For the time being, public transportation is and will be an important transportation option for many of those who make up this 75 Million strong age cohort (3).

As demand increases for public transportation, investments in technology can help improve the efficiency of public transit. One of the heralded transit success stories in NYC occurred only after the city installed signal priority technology on bus lines as well as off-board fare-collection stations. These hardware installations, helped increase ridership by 30%, bus speed by 20% with a 98% satisfaction rate with transit service (4).

### 65+ Population Growth

<table>
<thead>
<tr>
<th>Year</th>
<th>SJC Pop</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>1,660</td>
</tr>
<tr>
<td>1970</td>
<td>2,563</td>
</tr>
<tr>
<td>1980</td>
<td>4,759</td>
</tr>
<tr>
<td>1990</td>
<td>7,021</td>
</tr>
<tr>
<td>2000</td>
<td>10,326</td>
</tr>
<tr>
<td>2010</td>
<td>14,083</td>
</tr>
<tr>
<td>2020</td>
<td>18,170</td>
</tr>
<tr>
<td>2030</td>
<td>22,966</td>
</tr>
<tr>
<td>2040</td>
<td>28,338</td>
</tr>
</tbody>
</table>
Vehicles - Recent transportation behaviors illustrate the end of the “Driving Boom”. National and New Mexico specific vehicle miles traveled (VMTs) data indicate a peak in driving behavior in 2007. Since that time, New Mexico’s VMT rate has been falling faster than national VMT levels (5). National figures as recent as 2013 reveal a 10 percent decline in vehicle miles traveled totaling some 330 billion miles. In addition, since the year 2000, new drivers (19 and younger), are waiting longer to obtain a driver’s license (6).

One of the emerging axioms in transportation planning has been coined as ‘integrated mobility systems’. It is clear that mobile phone apps are changing the way people access transportation. The rise of on-demand mobility services like Uber and Lyft has been spurred by GPS-enabled smartphones. Transit systems are now integrating smart pay systems which according to a study by UC Berkley rated ease of pay as the top reason for using on-demand mobility services (7).

Over the last several years, all age groups have adapted to technology and finding new ways to transport themselves as well as the goods and services they rely upon.

Real-time GPS delivery and information systems, are being used in the transportation sector daily. E-commerce has evolved into a cost effective way to move the goods and services to the personal household. Delivery vehicles can make up to 120 stops per day, and counter to early presumptions, are proving to decrease freight VMTs in urban areas (8).
Walking and Biking—The Desire for walkable communities was recognized by the Complete Streets Advisory Group as necessary in rural, urban and suburban environments. Attempts are being made to improve the walkability and bicycle friendly conditions regionally. Recently San Juan County received a million dollar Transportation Alternatives Program (TAP) grant to construct a detached multi-use trail connecting various elementary schools, a Junior High and High School in the Kirtland area. Along NM-516, the City of Farmington recently painted 6’ bike lanes along a parkway where none have existed in the past. One sidewalk project required the undergrounding of utilities to accommodate the widening of sidewalks and ADA ramps. Downtown corridors are being studied to see where walking and biking facilities might be installed to improve safety conditions. Community advocates have studied safe passage routes for a marginalized sector of the community suffering from addiction and substance abuse. Others are looking to improve the safety in and around public schools.

When it comes to building safe, comfortable and affordable transportation facilities, physical separation is often preferred by pedestrians and motorist alike. Protected bicycle lanes can be adaptively created with planters, parked cars, bollards or concrete infrastructure within the existing right of way. This provides designated spaces for all users, and often times is accomplished without significant groundwork to curb/gutter and sidewalks.

The current scarcity of local, state and federal funds will require governments to clearly prioritize multi-modal projects and ensure they are detailed in local and regional plans. At the national and state level, funding priorities will need to change if our walk/bike facilities are to be retrofitted into existing systems. Currently less than 2% of federal transportation funds go directly to bike/ped systems.

Transportation boards and commissions are realizing that in order to fill funding gaps for complete streets may at times require legislative action. They are working with State legislatures and government agencies to raise revenue through a gas tax. According to the Regional Transportation Commission of Southern Nevada, “Indexing fuel tax not only funds road projects but also creates critically needed jobs, helps to broaden development, and encourages economic growth. For these reasons, it received support from a myriad of partners, including the local business community, elected officials and key stakeholders,” said Clark County Commissioner Larry Brown, Chairman of the RTC.
Multi-Modal Intersections

The careful consideration and design of multi-modal intersections are fundamental to the safety and efficiency of transportation users across the region. According to the U.S. Department of Transportation, 21% of fatalities and 50% of serious injuries occur at the intersection.

As with the design guidelines for each road type and land use area, designing a multi-modal intersection needs flexibility to accommodate and encourage high levels of multi-modal activity. As such, the design must anticipate the need for shared spaces, and should be reviewed on a case by case basis.

Aside from just a transportation component, intersections have a place-making element as well. Some intersections act as gateways into neighborhoods, special districts and to cities themselves. These elements should be highlighted and encouraged across entity boundaries. Highly visible entryway intersection designs should not occur in a vacuum, but follow public processes and community values.

Throughout the Nation and the Farmington Metropolitan Planning area, intersections pose significant challenges to pedestrians, cyclists and motorists alike. Challenges are intensified where State or US Highways converge which often create dangerous conflict points. Within the region, some of the largest intersections lie in the heart of smaller scaled communities. Local examples can be experienced at both US 550/US 64 intersections in Bloomfield, and the US 550/NM 516 intersection in Aztec. These highway junctions already feature elements that discourage safe multi-modal movements, such as a six to seven travel lanes, generous turning radii which promote fast right-turns into crosswalks, heavy truck traffic, and design standards that lack a context sensitive approach.

When designing multi-modal intersections regionally, design treatments should improve the safety of the pedestrian, the cyclist and the personal vehicle. The following illustrations highlight a few of the many possibilities being applied across the country and being proposed, as appropriate, for our regional interpretation.

**Pedestrians**

The pedestrian is the most vulnerable transportation user at the intersection. The size and scale of the intersection coupled with vehicle speeds and their varying size can create significant pedestrian hazards that discourage on-foot travel. Design principles should attempt to reduce the crossing distance for the pedestrian, slow right-turn car movements, and increase protections for pedestrians.

Curb extensions at the intersection have multiple benefits to the pedestrian and the streetscape. Aside from reducing crossing distances, they can also act as gateway treatments. Elements in the curb extension might include street furniture, trees and landscaping that captures storm-water to prevent ponding at the intersection. Curb extensions work best where parallel or angled parking exist as part of the street configuration.

Corner radii directly impact vehicle turning speeds and pedestrian crossing distances. Large radii promote faster right turning movements and longer cross walks, whereas a smaller curb radius expand the pedestrian area, decrease crossing distance and better aligns pedestrian ramps (9).
Median refuge islands as seen right, are protected spaces placed in the center of the street at the intersection to facilitate pedestrian movements. They can simplify crossings for both cyclists and on-foot travelers as they wait for acceptable gaps in traffic. They act as a buffer while minimizing crossing length and exposure to vehicles.

**Cyclists** - A multi-modal intersection can and should accommodate the cyclists. Planning and engineering are pushing the design applications for safety in a multitude of ways depending on bike routes and corridors used by the community.

One feature that makes a safe and comfortable experience for cyclists includes intersection crossing markings. The top image depicts markings as they extend the path of the cyclist into the center of the intersection.

The bike box intersection (middle image) complements and continues the path of designated bike routes. It places cyclists in the lead position at a signalized intersection while providing cyclists with a safe and visible way of queuing during the red signal phase. Seventy-seven percent of cyclists felt bicycling through the intersection was safer with a bike box design (10).

In locations where designated cycling routes converge, the protected intersection may just be an appropriate solution (bottom). Features include a forward stop bar which decreases the bicycle crossing distance, a corner safety island or barrier, as well as a set-back pedestrian crossing, a similar feature common in the modern roundabout. Another feature includes signal operations for cyclists (11). The concept can range from small intersections as seen above, to larger intersections which might include a corner refuge island vs. just a bollard protective barrier.

**Vehicles** - A multi-modal intersection should be designed to create a safe and comfortable environment for motorists that allows sufficient visual cues to see and interpret their environment as they approach, cross and exit the intersection. As an example, the recognition of crosswalk markings will minimize pedestrian and vehicle conflicts.

Longitudinal striping at the crosswalk, improve early detection by the motorist, thereby creating safer environments for the pedestrian. The approach at key intersections can enhance pedestrian safety with the addition of traffic calming measures (see Toolkit on pages 29). Their applications broaden the motorists triangulated view points and highlight vehicular and pedestrian queuing at the intersection.

There are intersections in each community that are assigned to handle larger vehicles such as semis, buses and delivery vehicles all known as the “design vehicle”. The design vehicle helps determine the size and scale of the intersection. There are cases however when designing for the largest vehicle can negatively impact the safety and comfort of multi-modal travelers. A context sensitive approach should be applied when accommodating the design vehicle. An example might be to remove parking spaces near the intersection and recess the stop line on the receiving street. This helps maintain smaller intersection geometry and allows larger vehicles to use the whole intersection while turning.
Multi-Modal Intersections

Roundabouts- One proven way to advance the safety for motorists while simultaneously maintaining vehicle efficiency is with the modern roundabout. They are recognized as a safety counter measure by the Federal Highways Administration (FHWA). The National Cooperative Highway Research Program Report 572, found that US based roundabouts reduced injuries by 76% and vehicular crashes up to 35% (12). Aside from just safety, the modern roundabout can also maintain and in many cases improve efficiency at the intersection. Studies by Kansas State University and the Insurance Institute for Highway Safety measured traffic delay before and after the installation of roundabouts. Efficiency improvements ranged from 20% to 89% in all cases, with vehicle stoppages declining by an average of 56% (13).

Conclusion- There are many factors to consider when designing or improving a multi-modal intersection. Geometric improvements coupled with clear and vibrant markings accommodate high levels of activity and shared space among all users. It is crucial to design intersections individually, on case-by-case basis while balancing the intersection type needed based on community values. Acknowledging the travel needs of pedestrians, cyclists and vehicle modes of transportation at the intersection will help balance our streets and improve the safety and comfort level for all users.

Works Cited
5. New Mexico Vehicle Miles Traveled Statistics, Federal Highways Administration Annual Highway Statistics Table, VM-2
12. www.protectedintersection.com

Resources
2. Urban Bikeway Design Guide- National Association of City Transportation Officials- 2013
3. www.protectedintersection.com
Design Guidelines
The Federal Highway Association (FHW) states, "The coordination of land use and transportation requires that those concerned with the well-being of a community (or region, state or nation) assess and evaluate how land use decisions affect the transportation system and can increase viable options for people to access opportunities, goods, services, and other resources to improve the quality of their lives".

MPOs are designated as forums for coordination, analysis and recommendations impacting land-use and transportation. Current and previous federal transportation bills enabled MPOs to lead transportation discussions that impact water/sewer/storm-water, energy consumption, and land-use issues at a regional scale. It is understood that what one community does affects another. As such, bridging dialogue occurs across jurisdictions and considers the larger perspective of the region. The Complete Streets Advisory Group has brought up many local examples that highlight the trials and opportunities to better coordinate land-use and transportation decisions. Though not specific to the MPO, the following examples are meant to provide an overview of what Advisory Group members discussed when coordinating Land-Use and Transportation.

**Schools** - The Centers for Disease Control and Prevention (CDC) has reported that in 1969, 50% of all school children walked to school on a daily basis and 87% lived within a mile or less of the elementary school they attended. Today however, many children live over a mile distance from the school they attend and fewer than 15% walk to school and cite distance as the number one barrier to walking.

In the Mid 1990s, State officials in Maine recognized the relationship between land-use planning, school construction and the cost associated with sprawling development patterns. Analyst found trends in declining enrollment numbers and increased spending on school construction. To combat these negative trends, they passed legislation that allowed for easier renovations of existing schools and launched educational and technical funding assistance programs coordinated out of the State Planning Office.

**Seniors** - In 2010 AARP issued a livable communities award to a Santa Fe senior housing project ElderGrace. This co-housing condominium development for low and middle income residents ages fifty-five and older was designed through partnerships involving residents and a local non-profit Santa Fe Community Housing Trust. The 3.5 acre site provides outdoor active living amenities such as paths for walking and biking as well as community gardens and orchards. The site location is within a half-mile of grocery stores, and quarter mile to transit services.

**Toolkits** - The Montana Department of Transportation created a toolkit to guide decision makers with the coordination of land use and transportation issues. They stated, "The coordination of transportation and land use planning decisions is vital to Montana's long-term economic growth and fiscal well-being." One element of the tool kit involves Design Standards and Policy, which encourage developers to densify, which in turn promotes the extension of local street networks and the viability of multimodal transportation. Physical elements of urban form and roadway design are also considered, such as the size, scale, and orientation of buildings, streetscape requirements, or the provisions of sidewalks and bus shelters.

[http://www.mdt.mt.gov/research/toolkit/m1/pptools/dsr.shtml]

*Investment in Transit Oriented Development in Colombia, VA will cut growth in driving by 25% and ensuring a reduction in greenhouse gas emissions. Source: Center for Clean Air Policy*
Complete Streets are designed in an array of configurations based on community values that reflect transecting land-uses and the overlaid road typology. Using a one-size-fits-all practice to street planning makes non-motorist activities such as walking and biking a hazardous undertaking in rural and urban areas. In addition, the Federal and State Transportation agencies have created their own street hierarchy (functional classification), used in the application of design standards on the National Highway System (NHS) can render streets unbalanced to multi-modal movements. The CSAG understood that in order to move toward a full balanced approach, would require the identification of land-uses and road typology at a regional scale that would gain approval by elected officials, land-use planners and traffic engineers. In its place, a context sensitive approach considers retail activity, population density, future developments and the type and scale of the street. Street designs standards would be conceptualized based on the convergence of both land-use and road typologies. The application of design guidelines would serve to guide new developments and retrofit street projects.

Initially undertakings identified eight land-use context areas and nine road typologies. The definitions and labels used to define land use context areas are intended to provide a broad identification of land-uses that either share commonality or easy adaptability based on local codes and comprehensive plans.

After a lengthy process, LUCAs were defined despite the fact that three of the four surrounding entities have unique land-use and zoning descriptions and one currently lacks adopted zoning and land-use descriptions.

<table>
<thead>
<tr>
<th>Land Use Context Areas (LUCAs)</th>
<th>Road Typology</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Rural</td>
<td>1. Lane</td>
</tr>
<tr>
<td>2. Industrial</td>
<td>2. Street</td>
</tr>
<tr>
<td>3. Neighborhood</td>
<td>3. Avenue</td>
</tr>
<tr>
<td>5. Downtown/Urban Area</td>
<td>5. Parkway</td>
</tr>
</tbody>
</table>

Ultimately the CSAG established five land-use context areas that best define our regional allocation of business types and general private and public land activities. These taken together with five defined Road Typologies help define our context sensitive applications of complete street concepts.

Road typology helps classify the lay citizen’s perception and understanding of our streets and roadways. The initial nine road typology labels were found to follow conventional functional class systems which currently do not produce complete streets.

In this vein, the CSAG selected street nomenclature common in historic US cities. The familiarity of street nomenclature such as Avenues, Boulevards, Parkways, Streets and Lanes evoke images of accommodating multi-modal streets. In combination with Land-Use Context Areas, Road Typologies will help define appropriate design guidelines.

After much discussion on implementation, it was decided that the design guidelines should be easily understood, interpretive rather than prescriptive. This would ultimately be found to be more favorable for the region when pursuing regional adoption. It was decided that the entities would have the ability to adopt the guidelines individually as deemed appropriate. The document should provide a range of context sensitive options to the end user.
The Complete Streets Advisory Group developed five unique land-use context areas and five distinct road typologies. Together they will help ensure that a menu of choices is offered to the design professional.

Land use areas and roadway types comprise the organizing framework for the selection of appropriate roadway design guidelines. Land Use Context Areas (LUCAs) were developed with input from land-use professionals from across the region. They are comprised of a unique combination of different land use types (rural to urban core), which may also have unique architectural types, urban forms, building densities, topography variations and other natural features.

**Land Use Context Areas (LUCAs)**

- Rural
- Industrial
- Neighborhood
- Commercial
- Downtown/Urban Area

**Road Typologies**

- Lane
- Street
- Avenue
- Boulevard
- Parkway

Road typology is composed of a defined hierarchy of street types that connect the community and region. Although loosely based on USDOT’s functional classification system, regional values supersede the definitions used by Federal and State governments.

In practice, road typologies do not always fit neatly into the defined context areas, or the boundaries between context areas may be fluid. The planner or designer should use their best judgment in selecting the road typology that most closely matches the existing and proposed land uses. Feedback from the CSAG let us know that design guidelines that were simple to understand, and that allowed reasonable interpretive flexibility would be the most favorable for regional adoption and application.
As the design professional studies the existing and future land uses in combination with the street typology that will be built, they should acknowledge some basic principles in regards to multi-modal forms of transportation. As an example, a sidewalk in a low traffic, low speed area will require different applications when compared to a high speed high volume street. In the latter setting, a premium would be placed on protecting the pedestrian from fast moving vehicles. Transit boarding in a residential neighborhood differs significantly from a high speed high volume setting, designers should create pull outs in such places that do not hinder traffic and allow adequate time for the boarding of disabled or elderly populations. Motorists in a low speed low traffic area may encounter more pedestrian movements which in turn will require vibrant markings and crosswalks, whereas technology at signalized intersections may help the driving experience at large and busy intersections.
<table>
<thead>
<tr>
<th>Road Typology</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lane</td>
<td>One or two lane roads with the lowest travel speeds that serve low density residential and commercial areas. Lower volumes and speeds allow for integrated bike use in the roadway and do not necessarily require separate facilities. Sidewalks are encouraged depending on the surrounding density. They may have flexible transit services and stops. Rural lanes are not always paved.</td>
<td>N Church Street in Aztec, McCoy Ave in SJ County, (North Aztec) (Cir, PL, DR &amp; Alley) ADT: Up to 1,000</td>
</tr>
<tr>
<td>Street</td>
<td>Two lane roads with the lowest travel speeds that serve residential and commercial areas within the cities. On street parking is common but may be restricted in some places. Driveway-Lane access is allowable at moderate levels. Medians may be present but not recommended. Lower volumes and speeds allow for integrated bike use in the roadway and do not necessarily require separate facilities. Sidewalks should be buffered from the street.</td>
<td>West Blanco &amp; South 1st St in Bloomfield, Fairview between Main St and 20th St</td>
</tr>
<tr>
<td>Avenues</td>
<td>These will be the most common utilitarian streets in the network. They are characterized by lower volume speeds with 2-4 lanes primarily connecting commercial, retail, and downtown districts. Bike lanes, wide sidewalks, and transit stops are prevalent, multi-modal side-paths in high traffic areas are encouraged. These roads distribute traffic between the higher classifications and local streets. Medians and two-way left turn lanes are common. Shared driveway access is encouraged. Downtown areas include additional street-scape features that promote multi-modal travel.</td>
<td>Downtown Main St in FMTN &amp; Aztec, Chaco in Aztec, West Blanco &amp; South 1st St in Bloomfield, Fairview between Main St and 20th St, Butler between Apache and 20th St</td>
</tr>
<tr>
<td>Boulevards</td>
<td>These meaningful roads are meant to be enjoyed. They steer motorist through/to local amenities such as rivers, urban centers and neighborhoods. They are 2-4 lanes with moderate volume and speeds and connect travel through a city serving commercial areas. Travel lanes are smaller in width to accommodate the presence of medians, sidewalks &amp; bike lanes and or multi-modal side-paths, on-street parking, and transit stops. These streets support the higher road classifications and connect with Lanes and Streets and feed to Parkways. Access management controls should minimize conflicts with bicyclists and pedestrians.</td>
<td>Butler north of 30th, 20th Street between Dustin and Main St, West Blanco in BLMFLD, Rio Grande Ave in Aztec, W Chaco St in Aztec, Piñon Hills Blvd, CR 3000</td>
</tr>
<tr>
<td>Parkways</td>
<td>Vehicle-oriented, high speeds &amp; volumes, typically 4-6 lanes; land uses include office parks, multi-use centers with parking lots; access management controls; recommends multi-modal side-paths; locate transit stops within adjacent developments</td>
<td>Murray Drive, US 64, US 550, NM 516, CR 350</td>
</tr>
</tbody>
</table>
## LAND-USE CONTEXT AREAS (LUCA) DEFINITIONS

<table>
<thead>
<tr>
<th>Land Use Context Area</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td>Predominately low density residential on large lots. Farmland and pastures are common. Large land areas for regional recreation/open space. Small commercial and retail are also found.</td>
<td>Kirtland, Crouch Mesa, Glade Area</td>
</tr>
<tr>
<td>Industrial</td>
<td>Primarily industrial parks and other places served by trucks such as coal mines, refineries, and mineral extractions sites. Truck size would be large and volume would be frequent.</td>
<td>CR 350/3100 in SJC, CR 4900 are in BLMFLD, Troy King area in FMTN</td>
</tr>
<tr>
<td>Neighborhood</td>
<td>Include subdivisions that have medium density with a mix of uses including churches, schools, and parks with varied grid patterns. Smaller commercial and retail uses within proximity or abutting neighborhoods that provides good accessibility for all modes.</td>
<td>East side of Aztec, west side of Bloomfield, central Farmington</td>
</tr>
<tr>
<td>Commercial</td>
<td>Commercial and retail that serves the region. Larger sites include mall locations, big box retail, chain restaurants, auto dealers and strip malls. Smaller scale non-intrusive industrial uses are common, including warehouses, storage yards, mechanic shops etc.</td>
<td>20th Street, San Juan Blvd, E Main St, US 64/CR 6500 in Kirtland</td>
</tr>
<tr>
<td>Downtown /Urban Area</td>
<td>Higher density and mixed use of residential, commercial and retail. Highly accessible by all modes. Uniform building aesthetics and setbacks. On street parking and wide sidewalks.</td>
<td>Downtown Farmington, Downtown Aztec</td>
</tr>
</tbody>
</table>
# Rural Design Guidelines

## Rural (Minimum Standards)

<table>
<thead>
<tr>
<th></th>
<th>Total ROW</th>
<th>Sidewalk Zone(s)</th>
<th>Buffer Zone(s)</th>
<th>Curb(s)</th>
<th>Gutter(s)</th>
<th>Parallel Parking Zone(s)</th>
<th>Angled Parking Zone(s) 30° or 60°</th>
<th>Transition Zone(s)</th>
<th>Bike Zone(s)</th>
<th>Travel Zone(s)</th>
<th>Center Lane/Median</th>
<th>Detached Multi Use Trail (DMUT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lane (Alley)</td>
<td>24 Feet</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>12'</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Street</td>
<td>60 Feet</td>
<td>5' *</td>
<td>5'</td>
<td>N/A</td>
<td>N/A</td>
<td>8.5'</td>
<td>N/A</td>
<td>2'</td>
<td>6'</td>
<td>11'</td>
<td>6'</td>
<td>14'</td>
</tr>
<tr>
<td>Avenue</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boulevard</td>
<td>100 Feet</td>
<td>5' *</td>
<td>5'</td>
<td>6”</td>
<td>1.5'</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>12'</td>
<td>14’</td>
<td>10’</td>
</tr>
<tr>
<td>Parkway</td>
<td>120 Feet</td>
<td>N/A</td>
<td>5’</td>
<td>6”</td>
<td>1.5’</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>12’</td>
<td>14’</td>
<td>10’</td>
</tr>
</tbody>
</table>

* Denotes the option to develop a sidewalk or a detached multi-use trail.
## Industrial (Minimum Standards)

<table>
<thead>
<tr>
<th>Lane (Alley)</th>
<th>Total ROW</th>
<th>Sidewalk Zone(s)</th>
<th>Buffer Zone(s)</th>
<th>Curb(s)</th>
<th>Gutter(s)</th>
<th>Parallel Parking Zone(s)</th>
<th>Angled Parking Zone(s) 30° or 60°</th>
<th>Transition Zone(s)</th>
<th>Bike Zone(s)</th>
<th>Travel Zone(s)</th>
<th>Center Lane/Median</th>
<th>Detached Multi Use Trail (DMUT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street</td>
<td>Boulevard</td>
<td>Parkway</td>
<td>Avenue</td>
<td>Boulevard</td>
<td>Parkway</td>
<td>Avenue</td>
<td>Boulevard</td>
<td>Parkway</td>
<td>Boulevard</td>
<td>Parkway</td>
<td>Boulevard</td>
<td>Parkway</td>
</tr>
<tr>
<td>70 Feet</td>
<td>10' *</td>
<td>5’ 6” 1.5’</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>12’ 14’</td>
<td>10’ *</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100 Feet</td>
<td>10’ *</td>
<td>5’ 6” 1.5’</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>12’ 14’</td>
<td>10’ *</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>120 Feet</td>
<td>10’ *</td>
<td>5’ 6” 1.5’</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>12’ 14’</td>
<td>10’ *</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Denotes the option to develop a sidewalk or a detached multi-use trail.
<table>
<thead>
<tr>
<th>Lane (Alley)</th>
<th>Total ROW</th>
<th>Sidewalk Zone(s)</th>
<th>Buffer Zone(s)</th>
<th>Curb(s)</th>
<th>Gutter(s)</th>
<th>Parallel Parking Zone(s)</th>
<th>Angled Parking Zone(s) 30° or 60°</th>
<th>Transition Zone(s)</th>
<th>Bike Zone(s)</th>
<th>Travel Zone(s)</th>
<th>Center Lane/Median</th>
<th>Detached Multi Use Trail (DMUT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 Feet</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>24'</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Street</td>
<td>60 Feet</td>
<td>5' *</td>
<td>5’</td>
<td>6”</td>
<td>1.5’</td>
<td>8.5’</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>6’</td>
<td>11’</td>
<td>N/A</td>
</tr>
<tr>
<td>Avenue</td>
<td>70 Feet</td>
<td>5' *</td>
<td>5’</td>
<td>6”</td>
<td>1.5’</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>6’</td>
<td>12’</td>
<td>14’</td>
</tr>
<tr>
<td>Boulevard</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parkway</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Denotes the option to develop a sidewalk or a detached multi-use trail.
## COMMERCIAL DESIGN GUIDELINES

### Commercial (Minimum Standards)

<table>
<thead>
<tr>
<th></th>
<th>Total ROW</th>
<th>Sidewalk Zone(s)</th>
<th>Buffer Zone(s)</th>
<th>Curb(s)</th>
<th>Gutter(s)</th>
<th>Parallel Parking Zone(s)</th>
<th>Angled Parking Zone(s) 30° or 60°</th>
<th>Transition Zone(s)</th>
<th>Bike Zone(s)</th>
<th>Travel Zone(s)</th>
<th>Center Lane/Median</th>
<th>Detached Multi Use Trail (DMUT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lane (Alley)</td>
<td>24 Feet</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>24’</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Street</td>
<td>60 Feet</td>
<td>5’</td>
<td>5’</td>
<td>6”</td>
<td>1.5’</td>
<td>8.5’</td>
<td>N/A</td>
<td>N/A</td>
<td>6’</td>
<td>11’</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Avenue</td>
<td>70 Feet</td>
<td>5’ *</td>
<td>5’</td>
<td>6”</td>
<td>1.5’</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>12’</td>
<td>14’</td>
<td>10’ *</td>
</tr>
<tr>
<td>Boulevard 2 Lanes</td>
<td>100 Feet</td>
<td>5’ *</td>
<td>5’</td>
<td>6”</td>
<td>1.5’</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>6’</td>
<td>24’</td>
<td>16’</td>
</tr>
<tr>
<td>Boulevard 4-5 Lanes</td>
<td>100 Feet</td>
<td>N/A</td>
<td>10’</td>
<td>6”</td>
<td>1.5’</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>11’</td>
<td>16’</td>
<td>10’</td>
</tr>
<tr>
<td>Parkway 2 Lanes</td>
<td>120 Feet</td>
<td>N/A</td>
<td>10’</td>
<td>6”</td>
<td>1.5’</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>12’</td>
<td>16’</td>
<td>10’</td>
</tr>
<tr>
<td>Parkway 4-6 Lanes</td>
<td>120 Feet</td>
<td>N/A</td>
<td>10’</td>
<td>6”</td>
<td>1.5’</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>12’</td>
<td>16’</td>
<td>10’</td>
</tr>
</tbody>
</table>

* Denotes the option to develop a sidewalk or a detached multi-use trail.
<table>
<thead>
<tr>
<th>Total ROW</th>
<th>Sidewalk Zone(s)</th>
<th>Buffer Zone(s)</th>
<th>Curb(s)</th>
<th>Gutter(s)</th>
<th>Parallel Parking Zone(s)</th>
<th>Angled Parking Zone(s) 30° or 60°</th>
<th>Transition Zone(s)</th>
<th>Bike Zone(s)</th>
<th>Travel Zone(s)</th>
<th>Center Lane/Median</th>
<th>Detached Multi Use Trail (DMUT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lane (Alley) 24 Feet</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>12'</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Street 60 Feet</td>
<td>5'</td>
<td>5'</td>
<td>6''</td>
<td>1.5'</td>
<td>8.5'</td>
<td>N/A</td>
<td>N/A</td>
<td>6'</td>
<td>11'</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Avenue 70 Feet</td>
<td>5'</td>
<td>5'</td>
<td>6''</td>
<td>1.5'</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>6'</td>
<td>11'</td>
<td>14'</td>
<td>N/A</td>
</tr>
<tr>
<td>Downtown Commercial 80 Feet</td>
<td>10'</td>
<td>N/A</td>
<td>6''</td>
<td>1.5'</td>
<td>8'</td>
<td>16'</td>
<td>2'</td>
<td>6'</td>
<td>10'</td>
<td>TBD *</td>
<td>N/A</td>
</tr>
<tr>
<td>Boulevard 100 Feet</td>
<td>10' *</td>
<td>5'</td>
<td>6''</td>
<td>1.5'</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>6'</td>
<td>12'</td>
<td>14'</td>
<td>10' *</td>
</tr>
<tr>
<td>Parkway 120 Feet</td>
<td>10' *</td>
<td>5'</td>
<td>6''</td>
<td>1.5'</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>6'</td>
<td>12'</td>
<td>14'</td>
<td>10'*</td>
</tr>
</tbody>
</table>

* Denotes the option to develop a sidewalk or a detached multi-use trail.
We would like to acknowledge the time and effort put into this document by the following individuals. Without their ideas, collaboration, and sense of community this document would not have been possible.

**ACKNOWLEDGEMENTS**

Greg Allen  
San Juan Safe Communities Initiative (SJSCI)

Keith Ashmore  
Bicycle advocate

Linda Barbeau  
City of Farmington MRA Commission

Teresa Brevik  
City of Bloomfield & MPO Technical Committee

Joyce Cardon  
San Juan County Homebuilders & City of Farmington P&Z Commission

Judy Castileberry  
SJC Enterprise Center

Judy Cumberworth  
Equestrian advocate

Joe Delmagori  
City of Farmington - MPO

Dave Eppich  
San Juan College

Cheri Floyd  
BC/BS of NM

Fran Fillerup  
San Juan County

Adrian Garcia  
City of Bloomfield

Mary Gardocki  
City of Farmington

Larry Hathaway  
San Juan County & MPO Technical Committee Alternate

Bil Homka  
City of Aztec & MPO Technical Committee Alternate

Dave Keck  
San Juan County & MPO Technical Committee

Terri Kennedy  
Citizen (Place Matters member)

Virginia King  
City of Farmington

Joe Kozimor  
Consolidated Constructors

Steve Krest  
City of Farmington

Cindy Lopez  
City of Farmington & MPO Technical Committee

Nick Martin  
Optum Health

Gayla McCulloch  
City of Farmington City Councilor

Elizabeth McNally  
Animas Environmental

John McNeill  
City of Farmington MRA Commission

Andrew Montoya  
Red Apple Transit Manager

Rebecca Morgan  
Namaste House

Christina Morris  
State of New Mexico

Steve Mueller  
City of Aztec

Roshana Moojen  
City of Aztec

Jessica Polatty  
City of Bloomfield-Senior Center

Christa Romme  
4 CED

John Shepard  
City of Farmington

Cory Styron  
City of Farmington

David Sypher  
City of Farmington & MPO Technical Committee

Charley Trask  
City of Farmington

Pam Valencia  
San Juan County Partnership-Place Matters

Anggela Wakan  
Safe Routes to School (SRTS) & San Juan Safe Communities Initiative (SJSCI)

Bill Watson  
City of Aztec & MPO Technical Committee

Nica Westerling  
City of Farmington & MPO Technical Committee Alternate

**MPO Staff**

Mary Holton, MPO Officer

Duane Wakan, MPO Planner

Derrick, Garcia, MPO Associate Planner

June Markle, MPO Administrative Aide