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Lyon County's geographic scale, rural densities, topographic variation and distance between communities make travel challenging and leads to a transportation system that depends heavily on automobile use. These physical characteristics not only influence transportation planning but they also impact the County's ability to construct and maintain an efficient, affordable transportation system. Limited funding resources dictate a continuing emphasis on maintaining existing systems rather than pursuing new roadway construction and other improvements.

Three important transportation planning directions seem apparent:

- The connectivity and capacity of arterials and collectors will be a key element for the growth of the County and should be carefully conserved. Strategies to achieve this connectivity should include strict access control and development of residential and nonresidential design standards that emphasize internalization of circulation systems.
- Within communities, pre-planned expansion of highway and roadway systems is required to ensure that the function and viability of the development centers do not negatively impact the rural quality of life.
- Increasingly, the private sector will have to be part of the solution of transportation issues, including financing and other transportation systems modifications.

This Chapter provides guidelines for managing and improving the county's transportation system. The Goals and Policies strive to balance the need for providing safe and efficient transportation opportunities throughout Lyon County with current and future resources.

Transportation System Guidance

Land use and circulation are inextricably linked. Population growth increases traffic volumes and vehicle trip lengths; in rural Lyon County, considerable distances often separate residential areas from commercial areas and employment centers. In addition, land uses that generate relatively high traffic volumes, such as convenience stores and restaurants, affect the flow of traffic on adjacent roadways. In areas with low-density residential development, virtually every trip requires the use of an automobile.

Beyond a strict capacity-based approach to highway systems evaluation, consideration of the impact of roads and traffic on communities also needs to be considered. This is particularly true in the most rural areas, where development historically has been heavily highway oriented. Development in corridor form along the rural roads of the County (residential and nonresidential) will undoubtedly result in a loss of the rural character that the County wants to retain. The evolution of the local road system will heavily influence the form of future development. Access control policies will in turn influence the future local road systems.

The information provided below provides general guidance and direction for developing more specific policies and implementation tools.



Design Criteria for Roadway Types

To ensure compatibility with land use planning, roadways in Lyon County are classified by the levels of traffic they support, their location and purpose, and their dimensions. Public and private construction of roadways should follow AASHTO (American Association of State Highway Transportation Officials) guidelines when applicable and Lyon County standards as presented in Table 1 below.

Table 1 Roadway Section						
Roadway Type	ROW Width	ROW Components				Public Utility Easements (outside ROW)
		Half Street Width	Sidewalks	Utility Easements in ROW	* Median, Landscaping Strip, Bike Lanes	
Major Arterial	100'	43'	5'	2'	7' Median	7.5'
Minor Arterial	80'	34'	5'	2'	T.B.D.	7.5'
Major Collector	60'	21'	5'	4'	T.B.D.	7.5'
Minor Collector	50'	18'	4'	3'	T.B.D.	7.5'
Residential Road	50'	18'	4'	3'	T.B.D.	7.5'
** Local Road	40'	13'	4'	3'	T.B.D.	7.5'
Primitive Road	N/A	One or two lanes, width T.B.D.	N/A	N/A	N/A	N/A

Notes:
 1) * The County reserves the right to determine whether or not medians, 5' bike lanes, or landscape strips are required
 2) ** Not currently included in Title 15 or Public Works standards (Drawing L1: Roadway Sections - Urban and Suburban Areas)
 3) On street parking is permitted on all street sections except Major Arterials and Minor Arterials



Each roadway type is defined as follows:

- **Freeway** (not included in Table 1) – A freeway is a nationwide, statewide, or regional facility which has a primary function of mobility. Access to freeways is provided through grade separated interchanges only.
- **Arterial** – An arterial is a major regional facility that serves interregional, intraregional, and intercity travel. An arterial should primarily serve through traffic and access should be managed (i.e. limited driveways).
- **Collector** – A collector provides access between arterials and local streets. Collectors may provide direct access to abutting properties. Collectors have a lower level of access management than arterials.
- **Residential Road** – The primary function of these street sections is to provide access to abutting properties including single family residences. Residential roads are typically lower volume and lower speed facilities and connect to collector roadways. These streets have minimal access management.
- **Local Road** - Local Road sections are not currently a part of Title 15, or Drawing L1 of the Public Works design standards, *Roadway Sections*. These roadways are encouraged for inclusion in both documents so they may be used for infill development and other compact developments in the County. Like Residential roads, these roads have minimal access management and low traffic volumes and speeds. They cost less to construct and to maintain whether public or privately owned.
- **Primitive Roadway** - A primitive road is a one- or two-lane road providing direct access to undeveloped areas, ranches, recreational and scenic areas, or backcountry properties. This type of road shall not be used to provide access to subdivided property.

The “primitive” roadways in Lyon County may extend across private property and through publicly-owned lands to access patented mining claims that were bought and developed for single family dwellings. The standard allows for this type of development with the understanding that the County will provide no emergency services nor any repair or maintenance services for such roads. These roadways are typically unpaved. Property owners have to make reasonable efforts to demonstrate they have tried to secure either documentation of an access easement or attempted to secure an access easement for the existing primitive road from the public agency (USFS, BLM) and/or private property owners.



Access Management Guidelines

Access management involves managing the location, spacing, design, and operation of driveways, median openings, interchanges, and street connections to a roadway to provide vehicular access to land development in a manner that preserves the safety and efficiency of the transportation system. Each roadway type should determine the level of access management on that roadway. Table 2 displays Lyon County’s Access Management Guidelines.

Roadway Classification	Signal Spacing	Driveway Spacing	Left-Turns from Roadways and Driveways	Median Treatment (when required)	Other
Major Arterial	1/2 Mile desired 1/3 Mile minimum	300 ft. minimum (right in/out only with deceleration lane)	Only at Signal	Raised Median	<ul style="list-style-type: none"> - No full movement driveways - No more than 1 driveway per property on the arterial, joint driveways are recommended - Left turn <u>in</u> at major driveways/unsignalized roadways o.k.
Minor Arterial	1/2 Mile desired 1/3 Mile minimum	300 ft. (right in/out only with deceleration lane)	Only at Signal or Major Unsignalized Intersection	Raised Median, TWLTL	<ul style="list-style-type: none"> - No full movement driveways - No more than 1 driveway per property on the arterial, joint driveways are recommended - Left turn in at major driveways/unsignalized roadways is acceptable
Major Collector	1/4 Mile desired 1/5 Mile minimum	250 ft. minimum	Yes	Raised Median, TWLTL	<ul style="list-style-type: none"> - Do not offset driveways - One full movement driveway per property
Minor Collector	1/4 Mile desired 1/5 Mile minimum	250 ft. minimum	Yes	TWLTL	<ul style="list-style-type: none"> - Do not offset driveways - One full movement driveway per property

Notes: TWLTL – Two way left turn lane



Level of Service

The typical measure of intersection or roadway performance is Level of Service (LOS), which is a mechanism to determine how efficiently a transportation system moves motor vehicles. LOS is measured on a scale from A to F, with “A” representing the best performance and “F” the worst. Lyon County will strive to maintain a minimum of level of service “D” conditions on county roads and at intersections. Table 3 below relates the LOS letter designation to a general description of traffic operations.

Table 3 Intersection Level of Service Definitions	
Level of Service	Description
A	Represents free flow. Individual users are virtually unaffected by others in the traffic stream.
B	Stable flow, but the presence of other users in the traffic stream begins to be noticeable.
C	Stable flow, but the operation of individual users becomes significantly affected by interactions with others in the traffic stream.
D	Represents high traffic density, but stable flow.
E	Represents operating conditions at or near the capacity level.
F	Represents forced or breakdown flow (stop and go conditions).
Source: Highway Capacity Manual, 2000	



Table 4 below outlines the Average Daily Traffic (ADT) for roadway classifications and their corresponding LOS. The LOS thresholds shown in Table 4 should be used to determine the level of service on a daily basis for a roadway segment in Lyon County.

Table 4 Average Daily Traffic Level of Service Thresholds by Facility Type					
Facility Type	Maximum Service Flow Rate (daily) for Given Service Level				
Number of Lanes	LOS A	LOS B	LOS C	LOS D	LOS E
<i>Freeway/Highway</i>					
4	≤ 28,600	42,700	63,500	80,000	90,200
6	≤ 38,300	61,200	91,100	114,000	135,300
8	51,500	81,500	121,400	153,200	180,400
10	63,800	101,900	151,800	191,500	225,500
<i>Major Arterial</i>					
4	≤ 20,000	29,000	36,500	39,000	41,400
6	≤ 30,000	44,800	56,000	58,900	62,200
8	≤ 40,000	59,800	74,600	78,600	82,900
<i>Minor Arterial</i>					
4	n/a	n/a	28,700	33,500	36,100
6	n/a	n/a	44,400	51,400	54,600
8	n/a	n/a	59,200	68,600	72,700
<i>Major Collector</i>					
2	n/a	n/a	8,800	13,200	14,800
4	n/a	n/a	18,600	27,300	31,100
<i>Minor Collector/Local Street</i>					
2	n/a	n/a	7,300	8,500	9,100

Signalized Intersections

Level of Service at signalized intersections should be calculated using the Highway Capacity Manual, 2016 methodology. Delay at signalized intersections will be calculated on a peak hour basis and reported for the intersection overall. The overall intersections should operate at LOS D or better for the peak hour condition.

Unsignalized Intersections

Level of Service at unsignalized intersections should be calculated using the Highway Capacity Manual, 2016 methodology. Delay at unsignalized intersections will be calculated on a peak hour basis and reported for both the approach with the highest delay and the intersection overall. The intersection approaches should operate at LOS D or better for the peak hour condition.



System Considerations

Lyon County's transportation system for the future requires special consideration in view of several issues:

- County economic development benefits will be derived from improved transportation linkage to employment areas within the County and its communities.
- Increased development along the U.S. Highway 50 corridor needs to be properly managed in order to maintain safe and efficient operation.
- Future congestion of U.S. Highway 50 and the County's arterials will not only be the product of too much volume, but also of too many conflicting turning movements at intersections and driveways. This side friction inhibits the safe and efficient flow of traffic, and land use patterns that promote direct access to these roadways should be discouraged.
- Development patterns over the years have created a series of subdivisions which lack interconnection in the County. Greater street system connectivity between and among developments can reduce dependence on one route for access to and from residential developments (e.g., U.S. Highway 50) and effectively enhance the capacity of local, primary and secondary road systems in the County. However, efforts to connect existing road systems, particularly in existing developed neighborhoods will require sensitive treatment to avoid impacts to the community.
- Most county secondary roads have limited capacity to support substantial increases in traffic volumes as a result of local land uses. Greater control over access should be exercised to preserve or enhance their capacity to support increases in traffic volumes over time.
- Current development patterns will not support a major investment in transit service in the County. If transit is ever to become a viable alternative travel mode in Lyon County, the land use plan must establish areas along major transportation corridors at high enough residential and employment densities to support such service.
- Walking/hiking trails and bike trails are few in number in the County. These facilities have not been a key component of the County transportation program or development requirements in the past. Trail systems can serve to connect neighborhoods to one another and to key public facilities and provide an alternative means of transport; on foot or on bike. Such facilities are most important within the County's suburbanizing districts. They diversify transportation options and provide recreational amenities that enhance the quality of life for residents.
 - The County needs to elevate the status of pedestrian and bike facilities as a component of its overall transportation program. The County may consider developing a Pedestrian and Bicycle Facilities Master Plan.
- Periodic changes or reductions in the level of federal funding for roadways places more financial responsibility at the state, County and local levels, as well as with private



developers, to fund new improvements. Roadway construction funds must, therefore, be carefully expended, and road needs carefully identified and programmed.

Private Sector Contributions

When new developments are proposed, the developers will be responsible for designing, constructing, and maintaining throughout the construction stages, the roadways that will serve the project. The County maintains the right to assess the condition of roadways before accepting any ROW for dedication. Per the tables in this Chapter, developers will:

1. Provide development plans that include roadways of appropriate design per Table 1, supporting LOS D per Table 4, for the scale of project proposed;
2. Expect to bear financial responsibility for construction of roadways associated with the new development; and
3. Maintain new roadways throughout the construction process, with the County reserving the right to assess roadways for potential improvements before accepting dedication.

Integrated Transportation Network

Transportation Network Maps

The intent of the Transportation Network Map(s) is to show a generalized road network for the entire County. The Maps provide broad guidance for arterial and collector roads, and necessary road connections within communities and the County. Proposals for development must be conceptually consistent with the roadway network shown on the Transportation Network Maps. The Transportation Network Maps are located in Appendix B.



Goals, Policies and Actions

Goal TR 1: Cohesive Transportation System

Lyon County's transportation system will provide transportation options where residents and goods can move safely and efficiently, including during peak travel times.



Policy TR 1.1: Integrated Transportation Network

County and subdivision roadways shall be designed to provide efficient and practical connections to the regional and local road network.

Strategies:

- Connect new county and subdivision roadways to existing and planned future roadways, including those that have been or will be built by other jurisdictions.
- Recognize and plan for additional roadways as necessary to alleviate congestion and improve safety and convenience of the local road network.
- Implement a functional classification system for all existing and future roadways.
- Revise road design and improvement standards to provide for the safe and efficient movement of people and goods.
- Coordinate planning and standards for new roadways with other jurisdictions.
- Coordinate roadway construction funding requests and projects with other jurisdictions where joint projects will improve integration of the roadway system.





Policy TR 1.2: Alternative modes

Lyon County will encourage and enable the use of transportation alternatives to cars, such as bicycling, walking, or riding a bus.

Strategies:

- Require sidewalks and/or dedicated bike lanes or paths on all new and reconstructed collector and arterial roads in suburbanizing districts and in all new non-rural subdivisions.
- As funding allows, create dedicated lanes on existing roads and build pathways for non-motorized traffic in a pattern that connects communities in central Lyon County to employment centers and with each other.



Policy TR 1.3: Connectivity

The roadway system in Lyon County will be designed in a way that provides logical and efficient travel routes and minimizes unnecessary driving.

Strategies:

- Design new County and subdivision roadways to connect to existing and future roadways. Discourage single-access neighborhoods and dead-end streets.
- Update County roadway standards to require that new streets and roads connect with existing roadway systems.



Goal TR 2: County Roads

Local roads will be alternatives to primary highways.



Policy TR 2.1: Local Access Roads

To reduce and avoid highway congestion at peak times, Lyon County will work in conjunction with other public agencies and private developers to build and maintain alternative routes designed for shorter trips and local travel within communities.

Strategies:

- Identify areas of traffic congestion and develop plans for alternative local routes.
- Work with the Nevada Department of Transportation (NDOT) to design, build and maintain alternative routes.

Goal TR 3: Public Transportation

Lyon County will pursue cost-effective, public transportation for travel within and between population centers.



Policy TR 3.1: Identify Public Transportation Options

Lyon County will identify potential public transportation options that may be feasible in the context of our population demographics and distribution.

Strategies:

- Study public transportation available in similar communities, identify likely public transportation users and demand, and analyze costs and benefits to the community to identify possible alternatives for Lyon County.

Goal TR 4: Distribution Routes

Rail and highway routes will continue to be competitive as distribution routes for goods.



Policy TR 4.1: Distribution Routes

Recognizing the importance of competitive distribution routes to the industrial sector of our economy, Lyon County will protect rail lines and highways from uses that could reduce their effectiveness.

Strategies:

- Implement a hazardous material buffer corridor along highways and railroads.

Goal TR 5: Airports

Public and private airports will be sustained and promoted as an important transportation asset in the County.



Policy TR 5.1: Airports

When making land use designations and decisions, Lyon County will consider protection of airspace and the ability of airports to meet residents' current and future demand for air travel and transport.

Strategies:

- Minimize incompatible development, such as residential uses, immediately adjacent to airports to avoid potential noise and operation conflicts.
- In the Land Use section of the Master Plan, identify areas where the influences of airports and surrounding land uses are properly considered.