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Lyon County has a transportation system typical of suburbanizing rural counties. This system depends heavily on automobile use.

Lyon County's geographic scale, rural densities, topographic variation and distance between communities make travel challenging. These physical characteristics not only influence transportation planning but they also impact our ability to construct and maintain an efficient, affordable transportation system. Our 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:

1. The connectivity and capacity of arterials and collectors will be a key element for the growth of the County and should be carefully conserved. This implies strict access control and residential and nonresidential design standards that emphasize internalization of circulation systems.
2. 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 quality of life.
3. 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 our need for providing safe and efficient transportation opportunities throughout Lyon County with our current and future resources.

### **Transportation**

**Lyon County will strive to provide a cohesive circulation system for a range of transportation choices that are safe, reliable, and offer sufficient capacity. The system will meet the current and future needs of residents and businesses, and will be an asset for attracting and retaining employment opportunities in our communities.**

#### **County-wide 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 Roadway 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 arterial/regional



- highways to alleviate congestion and improve safety and convenience of the local road network.
- ◆ Implement a functional classification system for all existing and future roadways.
- ◆ Develop a Capital Improvement Plan, including budget, for transportation system improvement, expansion and maintenance that is consistent with the Land Use Map in this Plan.
- ◆ 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: Intersection Safety

Lyon County will strive to ensure that roadways and intersections meet adopted design standards and provide safe travel routes for vehicles, bicycles, and pedestrians.

#### Strategies:

- ◆ Evaluate roadway and intersection design and accident statistics to identify unsafe intersections, and make all feasible changes to improve safety and functionality of intersections and roadway segments.
- ◆ Coordinate design and installation of traffic control devices to ensure safe and efficient local/regional highway system interface.
- ◆ Identify priority areas for development or improvement of bicycle and pedestrian routes that improve safety and reduce conflicts between modes.



### Policy TR 1.3: 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 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.
- ◆ Revise Lyon County zoning regulations so that all new non-residential developments include safe pedestrian and bicycle access, and new large employment providers accommodate alternative modes (for example, by providing showers, bicycle racks, dedicated vanpool parking, and similar).
- ◆ Encourage the development of non-motorized multi-use paths along drainages, irrigation ditches and rivers, and through open space lands where the paths will not conflict with agricultural and other property uses.
- ◆ Encourage the conversion of former irrigation ditches and ditch easements to non-motorized multi-use paths.



### Policy TR 1.4: 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, and create a grid with, 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.
- ◆ Require that new development provide neighborhood access to retail development when within one-half (1/2) mile and safe pedestrian access to and from public services and gathering places such as schools, libraries, parks, and trails.

## Goal TR 2: County Roads

**Local roads will offer 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. Seek sources of funding for local access alternatives and build them as resources become available.
- ◆ 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.

#### Policy TR 3.2: Land Use and Transportation

Lyon County will promote an efficient transportation system through land use patterns that promote compact development and a mix of land uses in community centers.

#### Strategies:

- ◆ In the Land Use section of the comprehensive plan, designate higher-intensity land uses in appropriate locations and patterns to promote an efficient multimodal transportation system.
- ◆ Revise the zoning code to allow for and encourage mixed use areas and compact development patterns in and around community core areas.
- ◆ Revise the subdivision ordinance to encourage the development of walkable, mixed use neighborhoods that reduce the need for and length of vehicle trips by establishing standards for minimum lot coverage, building heights, maximum block lengths, and

roadway and parking design within the community cores.

### 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:

- ◆ Restrict incompatible development, such as residential uses, immediately adjacent to highways and rail lines to avoid potential noise and vibration conflicts, and develop mitigation standards, such as buffers and setbacks, to reduce conflicts.
- ◆ In the Land Use section of the comprehensive plan, reserve areas with excellent distribution access for transportation-dependent employment uses.

### 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 comprehensive plan, identify areas where the influences of airports and surrounding land uses are properly considered.
- ◆ Revise the zoning code to create an overlay district and performance standards for development within areas identified as being within the influence of airports.

### ***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 community character also needs to be considered. This is particularly true in the rural character districts 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. In the community centers, 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.

This section of this Transportation Chapter adds to the framework for addressing the development considerations discussed above. The information provided below provides general guidance and direction for developing more specific policies and implementation tools.

### **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. Also of concern is the future increase in traffic lights between Mound House and Chaves Road, and the affect they have on traffic flow.
- 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.
- Increased through-traffic, combined with increased local traffic on Highway 50 and State Route 95A, may require additional capacity and improvements for these highways to enhance traffic flow.
- 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.
- Concerns are likely to grow regarding the ability of the existing roads to serve current and projected increases in traffic volumes as a result of future development. These likely future concerns underscore the need now for greater control of access along primary and secondary routes in the County.

- 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 in future years. The County needs to develop 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 roadways and roadway improvements. Roadway construction funds must, therefore, be carefully expended, and road needs carefully identified and programmed.

### Level of Service

Lyon County will strive to maintain a minimum of level of service “D” conditions on county roads and at intersections.

The typical measure of intersection or roadway performance is level of service (LOS). LOS is measured on a scale from A to F, with “A” representing the best performance and “F” the worst. Table 1 below relates the LOS letter designation to a general description of traffic operations.

<i>Level of Service</i>	<i>Description</i>
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

### Roadway Segments

The LOS thresholds shown in Table 2 should be used to determine the level of service on a daily basis for a roadway segment in Lyon County.

Facility Type	Maximum Service Flow Rate (daily) for Given Service Level				
	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

Each facility type is defined as follows:

- Freeway – 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.
- Local Street – A local street's primary function is to provide access to abutting properties including single family residences. Local streets are typically lower volume and lower speed facilities and connect to collector roadways. Local streets have minimal access management.

### Signalized Intersections

Level of Service at signalized intersections should be calculated using the Highway Capacity Manual, 2000 methodology. Delay at signalized intersections should 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, 2000 methodology. Delay at unsignalized intersections should 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.

### 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 3 displays Lyon County's Access Management Guidelines. These guidelines are intended to guide the development of new roadway facilities.

<b>Roadway Classification</b>	<b>Signal Spacing</b>	<b>Driveway Spacing</b>	<b>Left-Turns from Roadways and Driveways</b>	<b>Median Treatment</b>	<b>Other</b>
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	- 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 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	- 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 o.k.
Major Collector	1/4 Mile desired 1/5 Mile minimum	250 ft. minimum	Yes	Raised Median, TWLTL	- 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	- Do not offset driveways - One full movement driveway per property

Notes: TWLTL – Two way left turn lane

### Master Plan Amendment Traffic Analysis Requirements

Major projects proposed with zoning that is not consistent with the master plan shall provide traffic impact analysis appropriate to the project's size and buildout timeframe.

#### Buildout 0 to 20 Years

If a project is proposed to buildout in a timeframe of twenty years or less a full transportation impact study shall be completed. The transportation impact study shall be scoped with Lyon County staff and at a minimum include the following:

- Assessment of existing conditions
- Project trip generation based on the most current version of Institute of Transportation Engineers (ITE) Trip Generation Manual (daily and peak hour), trip distribution, and trip assignment

- Existing plus project conditions
- Assessment of background conditions for the buildout year of the project
- Background plus project conditions
- Assessment of project impacts (level of service) and proposed improvements to lessen the impact

Lyon county staff will reserve the right to require additional analysis elements.

### **Buildout Beyond 20 Years**

If a project will buildout in a timeframe that is greater than 20 years, a daily volume traffic volume assessment shall be completed. The assessment should be scoped with Lyon County staff and include the following:

- Assessment of background daily traffic for the anticipated buildout year
- Daily trip generation for the project buildout, trip distribution, and trip assignment (the trip generation can be calculated using the Lyon County Travel Demand Model or ITE Trip Generation Manual)
- Buildout Year roadway segment level of service analysis with and without the proposed project traffic
- Assessment of major roadway needs due to the project generated traffic to maintain the level of service policy (new roads, roadway widening, grade separation)
- Phasing schedule that identifies when the major roadway improvements will be necessary in terms of level of development and a strategy for providing the major improvements

Lyon county staff will reserve the right to require additional analysis elements. In addition, a full transportation impact study will be required at subsequent submittals for each phase of the proposed project.

## ***Integrated Roadway Network***

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### **Roadway Network Maps**

The intent of the County-Wide Integrated Roadway Network Map(s) is to show a generalized road network for the entire County based on the County-wide land use designations. The County-wide Roadway Network Maps, which are conceptual in nature, are refined in the more specific Community Plans. County-wide Roadway Network map(s) provide broad guidance for arterial and collector roads, and necessary road connections within communities and the County. Until a Community Plan is adopted, the County-wide Roadway Network Maps will be the guide.

Proposals for development must be consistent with the roadway network shown on the County-wide Roadway Network Maps or applicable Community Roadway Network Maps.

### **The County-wide Roadway Network Map(s)**

The County-wide Integrated Roadway Network Maps are located in Appendix B – Integrated Roadway Network Maps.