IN THE SUPREME COURT OF THE STATE OF NEVADA

CITY OF LAS VEGAS, A POLITICAL SUBDIVISION OF THE STATE OF NEVADA,

Appellant,

vs.

180 LAND CO., LLC, A NEVADA LIMITED-LIABILITY COMPANY; AND FORE STARS, LTD., A NEVADA LIMITED-LIABILITY COMPANY,

Respondents.

No. 84345

180 LAND CO., LLC, A NEVADA LIMITED-LIABILITY COMPANY; AND FORE STARS, LTD., A NEVADA LIMITED-LIABILITY COMPANY,

Appellants/Cross-Respondents,

vs.

CITY OF LAS VEGAS, A POLITICAL SUBDIVISION OF THE STATE OF NEVADA,

Respondent/Cross-Appellant.

No. 84640

AMENDED JOINT APPENDIX VOLUME 76, PART 6

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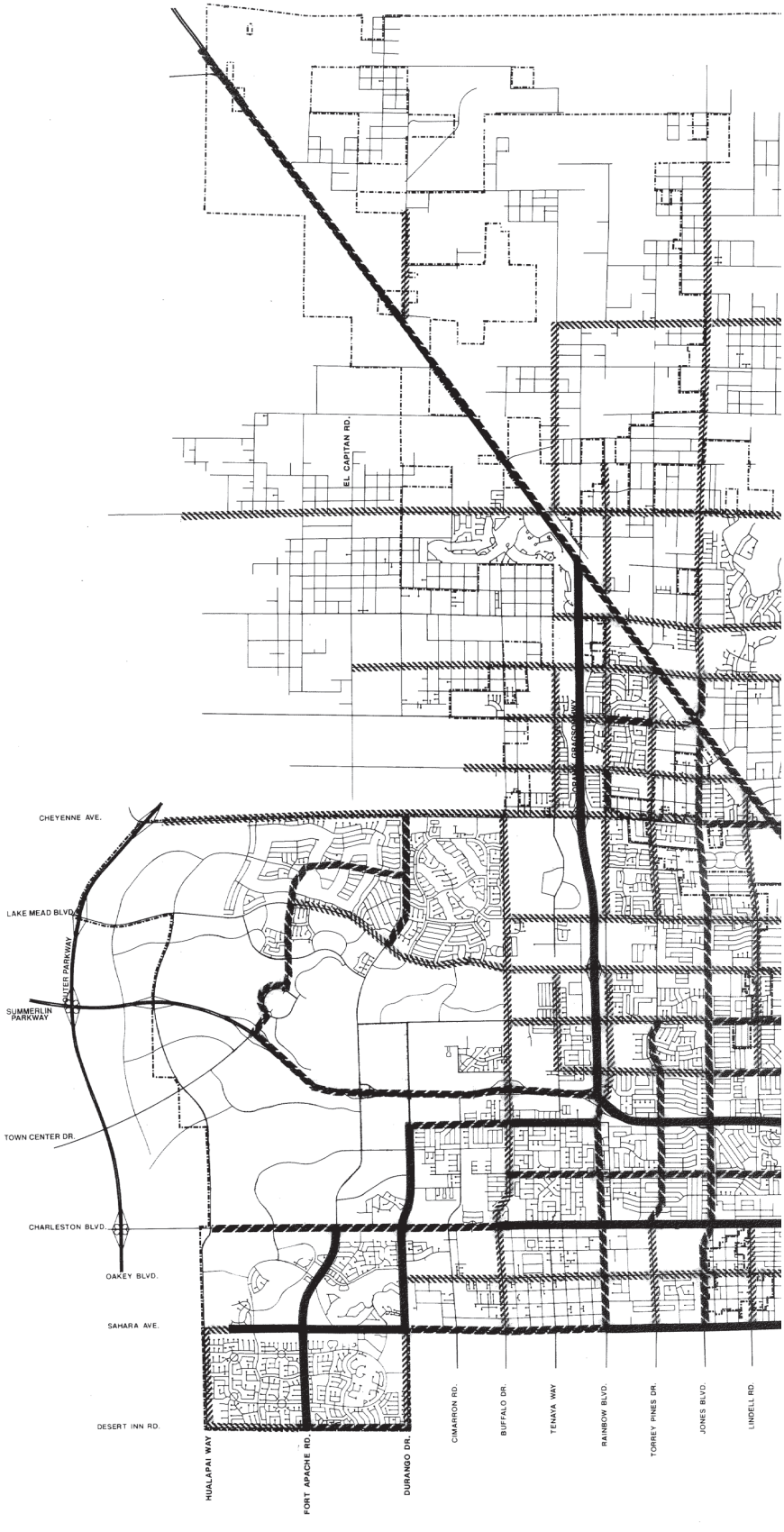

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ing service to trips of moderate length. Also known as a secondary thoroughfare.

- **Minor Collector**: A street with a minimum right-of-way width of sixty feet which connects arterials and major collectors in a more or less direct line. They are streets which penetrate neighborhoods, collecting traffic from local streets, and channeling it to the thoroughfare system. The minor collector system primarily provides land access.

- **Local**: A street with a minimum right-of-way width of fifty-one feet which is designed to carry residential traffic between collector and other streets or highways and abutting properties. Through traffic is usually discouraged.[1]

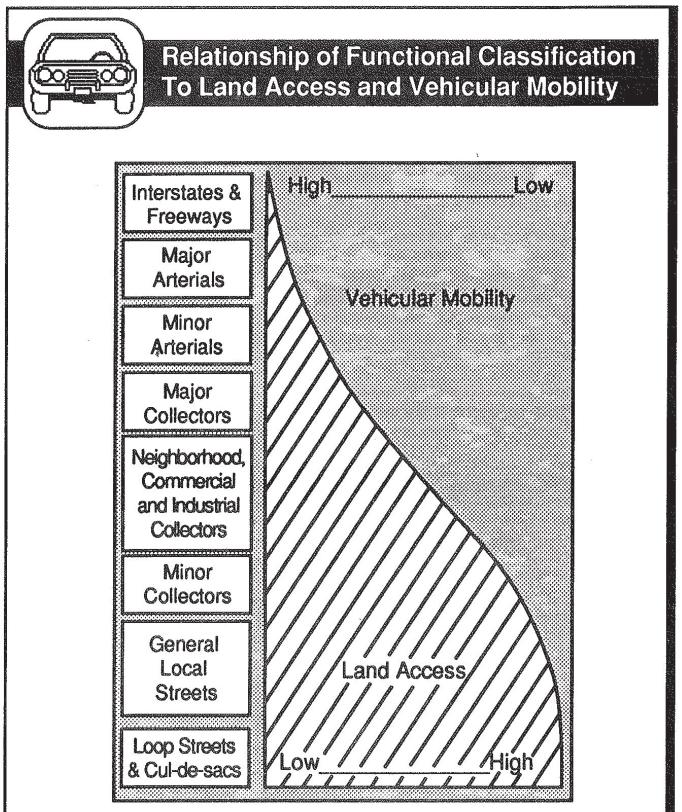
The highway network has two basic functions: to provide access to adjacent land uses, and to furnish mobility from origin to destination. There is an inherent conflict with these two functions: mobility is served with higher speeds and uniform traffic flows, while land access is best served with slower speeds and inconsistent flows. The goal is an appropriate mix of roadway types in an integrated network which optimizes mobility and access appropriate for the local land use. Figure 1, Relationship of Functional Classification to Land Access and Vehicular Mobility, illustrates a balanced relationship between the functional classification categories regarding mobility and access to adjacent land.

To appropriately handle the travel demand associated with the various roadway functional classification categories, there are standard designs for each roadway functional classification. The City of Las Vegas roadway cross-sections for arterial roadways, collector, and local streets are illustrated in Figure 2, Standard Roadway Cross-Sections.

Rights-of-Way

The right-of-way is the total width of the lineal segment of land required for the road paving and for placement of future utilities and infrastructure (gas, water, sewer, telephone, and electric facilities). The right-of-way also includes landscaping, sidewalks, and curb and gutter. In the Las Vegas Valley, arterial roads (primary thoroughfares) are generally located at one mile intervals along section lines and major collector roads (secondary thoroughfares) are traditionally located at half mile intervals along quarter-section lines. The subdivision and site-plan approval process provides for the dedication of rights-of-way for all street system improvements by property owners. The property owner is responsible for "half-street" improvements of master planned, arterial streets that are located immediately adjacent to new subdivisions. This includes the construction of travel lanes, parking lanes, sidewalks, curbs, gutters and streetlights. Also, developers are required to construct, at minimum, 30 foot, two-way, paved roadways to link

Figure 1



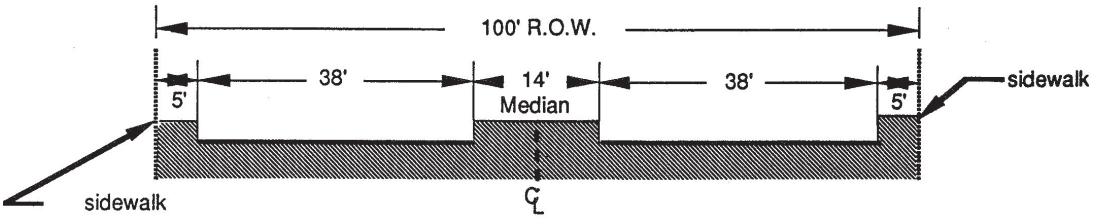
Source: Adapted from AASHTO - Geometric Design of Highways and Streets, 1984 and the U.S Department of Transportation Highway Functional Classification, Concepts, Criteria and Procedures, 1974.

GP.CR Fig 1 Relation Funct;KS;pm.ai/9-9-91

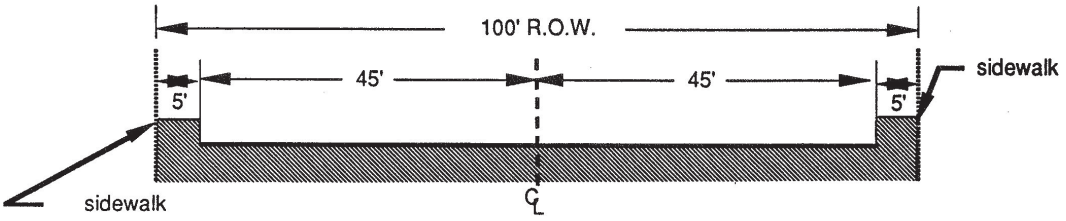
Figure 2

Standard Roadway Cross-Sections

Source: City of Las Vegas, Dept. of Public Works

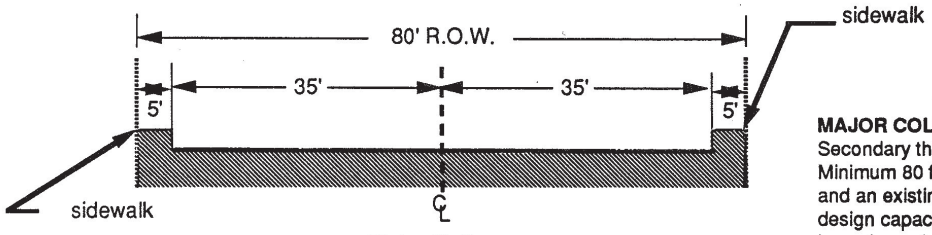


Arterial with Median Island



Arterial without Median Island

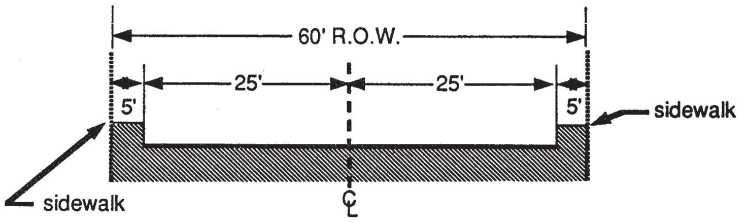
ARTERIAL: Primary thoroughfare. Minimum 100 foot right-of-way and an exisitng or potential design capacity of two or more travel lanes in each direction. Primarily provides through traffic.



Major Collector

MAJOR COLLECTOR:
Secondary thoroughfare. Minimum 80 foot right-of-way and an existing or potential design capacity of two travel lanes in each direction.

MINOR COLLECTOR:
A street with a minimum 60 foot right-of-way which connects primary and secondary thoroughfares.
Primarily provides land access.



Commercial/Industrial or Minor Residential Collector

SCALE: 1" - 20'

their new subdivisions to existing roadways if linkage is not already available.

5.1.3 Traffic Operations and Analysis

This section presents data regarding existing traffic operations and travel demand in the Las Vegas area, and will introduce some methods of analyzing traffic operations and traffic demand. The data are from studies prepared by NDOT, the BRW, Inc. Project Team which is preparing the *Las Vegas Regional Transportation Update* for the RTC, as well as the *Las Vegas Downtown Traffic Circulation Study*, and by Peat Marwick for the *Resort Corridor Study*.

Annual Average Daily Traffic (AADT)

One type of data used by transportation engineers and planners is the volume of traffic on area roadways known as annual average daily traffic (AADT). Map 2 shows the Las Vegas Valley AADTs collected by NDOT in 1990. Observation of these counts reveals key points:

- Average volumes on east-west roads are higher to the east of I-15 than west of I-15.
- Volumes on I-15 increase significantly moving from the northern and southern edges of the Las Vegas area, toward the Central Valley, with the highest volumes at the I-15/US 95 interchange.
- On east-west roads within the City, traffic volumes are particularly heavy on Charleston Blvd. between Rancho Drive and Martin Luther King Boulevard and Sahara Ave. between Maryland Pkwy. and Decatur Blvd.
- On north-south roads, traffic is heaviest on Decatur Boulevard between Washington Ave. and Charleston Blvd., Rainbow Blvd. between Sahara Ave. and US 95, and on Las Vegas Blvd. between Russell Road and Downtown.
- Traffic volumes on Rancho Drive are highest between Lake Mead Blvd. and Washington Avenue.
- Volumes on the Oran K. Gragson Highway and US 93/95 are highest between Rancho Drive and Eastern Avenue.

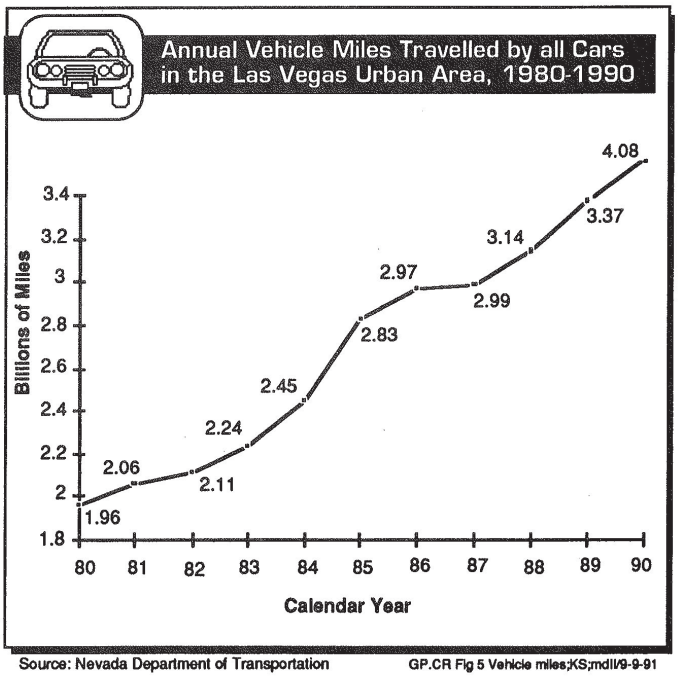
A comparison of the volumes at the 91 recorder stations within the City between 1985 and 1990 indicates a 36.75% increase in traffic volumes for this period. This does not include the counts taken at the 14 stations on the freeways and expressways within the City which show a 118% increase in volumes from 1985 to 1990. A listing of all the stations in the City and the totals for 1985 and 1990 can be found in Appendix 2: in Annual Average Daily Traffic, 1985 - 1990.

Vehicle Miles Traveled (VMT)

Another type of data used in traffic analysis is vehicle miles traveled (VMT). This is a principal indicator of travel demand and is essential in the analysis of roadway improvements. VMT is a measure of the amount of usage of a section of highway and is obtained by multiplying the average daily traffic by the length in miles. Figure 3, Annual VMT Traveled By All Cars in the Las Vegas Valley, 1980 - 1990, depicts the annual VMT for the Las Vegas region for the period 1980 - 1990.

Between 1980 and 1983, there was an average 4.3% annual increase in miles traveled. Beginning in 1983, there has been a marked increase in VMT from the previous three years averaging 9.7% each year[2]

Figure 3



Source: Nevada Department of Transportation GP.CR Fig 5 Vehicle miles;KS;mdll/9-9-91

Capacity Analysis and Level of Service (LOS)

Capacity is the maximum rate of flow at which either persons or vehicles can be reasonably expected to pass a specified point or a segment of roadway during a specified period of time. It is expressed as vehicles per hour or persons per hour. Capacity analysis is a set of procedures used to approximate the amount of traffic a roadway can accommodate over a range of defined operational conditions or level of service.[3]

Level of Service (LOS) describes operational conditions within a traffic stream and a person's perception of these conditions. The conditions are generally described in Table 1, Level of Service. The descriptions of the LOS characteristics are both general and conceptual, and pertain to roadways with uninterrupted flow, which means there are no constraints to flow such as traffic signals or stop signs. Therefore, these LOS categories generally apply to limited access freeways and uninterrupted flow highways.[4]

For arterial* roadways, which primarily serve persons traveling through the area and secondarily provide access to adjacent properties, the LOS evaluation does **not** consider capacity or traffic volume. The capacity of its signalized intersections generally governs the capacity of this type of roadway. The average travel speed of either a section or the entire arterial under consideration determines arterial LOS. The number of signals per mile, the timing and phasing of those signals, and the coordination between signals greatly influences average travel speed. Therefore, time spent at stop lights is factored into the average travel speed.

Table 2, Arterial Levels of Service, generally defines the LOS for arterials while also indicating average travel speed (mph) for three arterial classifications: suburban, intermediate, and urban.[5]

Table 1

Levels of Service

Level of Service	Description of Traffic Flow
A	Free Flow, Maneuverability and desired speed unimpeded
B	Stable Flow, Maneuverability and desired speed slightly restricted
C	Stable Flow, Maneuverability and desired speed restricted by presence of others
D	Approaching unstable Flow Speed selection and maneuverability serverly restricted
E	Unstable Flow speed selection and maneuverability extremely different
F	Forced Flow (Jammed) Stop-n-Go waves which are very unstable

Source: Highway Capacity Manual, Transportation Research board, Special Report 209, 1985

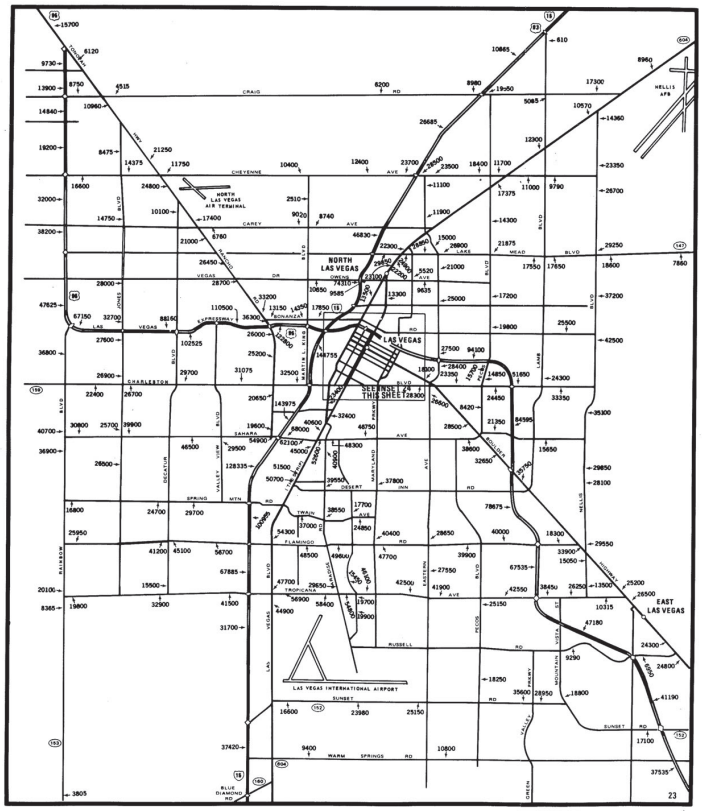
GP.CR Table 1 Levels;KS;pm/9-9-91

As a part of the Inventory and Analysis portion of the BRW update of the Regional Transportation Plan for the RTC, BRW has assigned a level of service for roadway segments based on volume to capacity (V/C) ratios. Levels of service using the V/C ratios were assigned based on the ranges shown in Table 3, LOS and Roadway V/C Ratio Relationship. Using this relationship, major roads in the Las Vegas Valley were assigned a LOS. Map 3 shows those found to be LOS D, E, and F .[6]

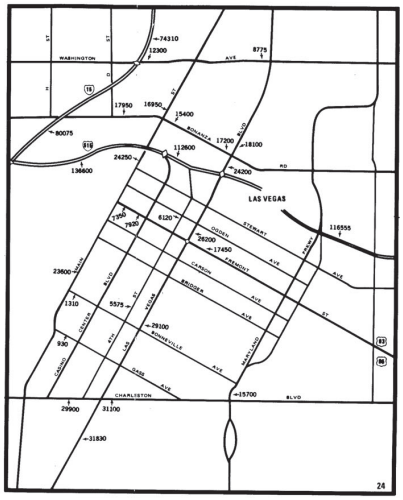
Some observations of key points from Map 3 are:

- Two of the most congested roadways are in the City: Sahara Avenue and Las Vegas Blvd., both of which experience LOS D, E, and F at many locations.
- Rancho Road operates at LOS C or better except in the area surrounding its interchange with Oran K. Gragson Highway.

* *For the purpose of this subsection only, arterial refers to both primary and secondary thoroughfares.*



LAS VEGAS AREA



CENTRAL LAS VEGAS

Map 2

Annual Average Daily Traffic Count 1991

V-6a

Source: Nevada Dept. of Transportation & U.S. Dept. of Transportation Federal Highway Administration

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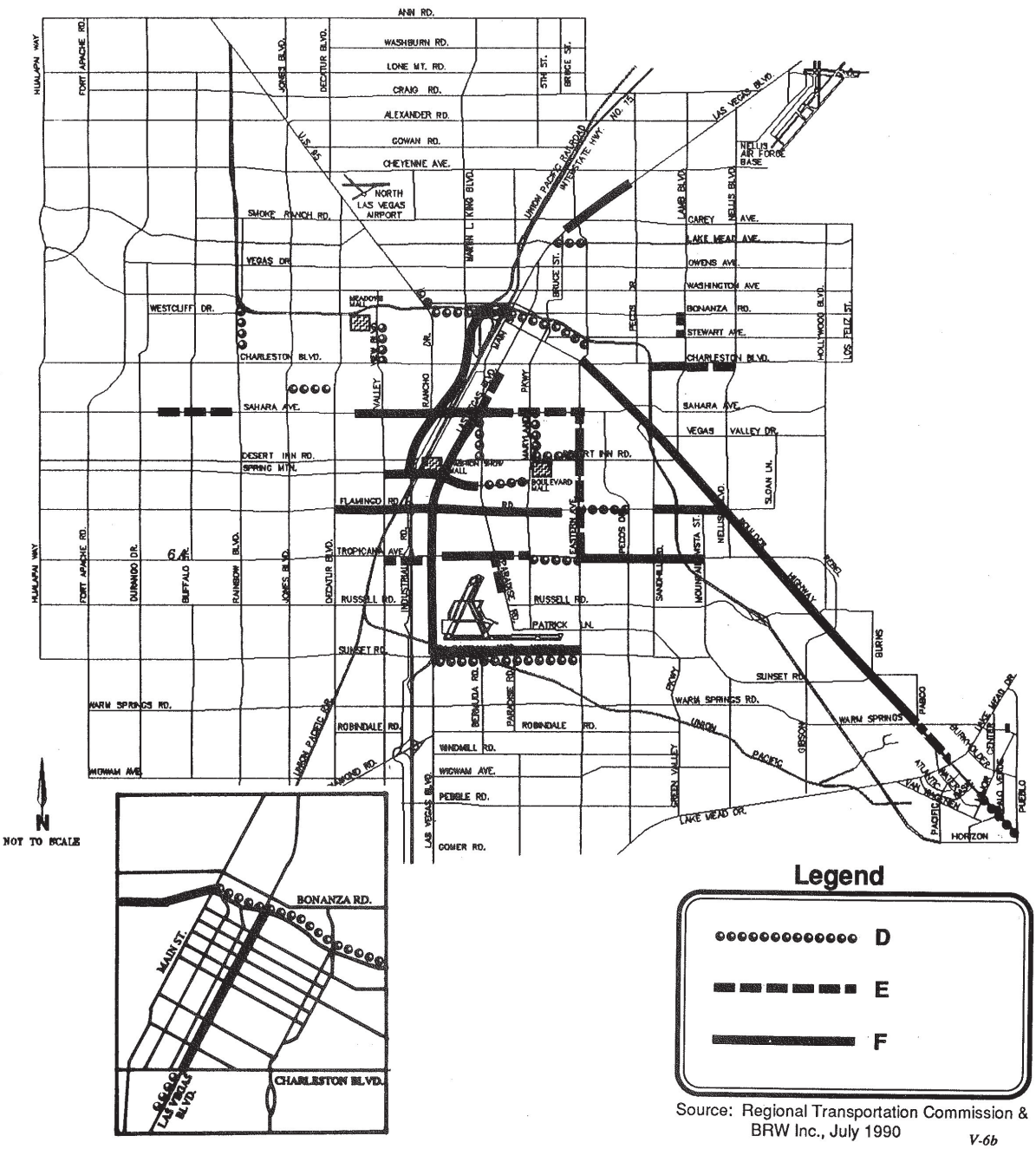
Map 3

1990 Roadway Level of Service



Legend

D

E

F

Source: Regional Transportation Commission & BRW Inc., July 1990

V-6b

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Table 2

Arterial Levels of Service

Arterial Class	Suburban	Intermediate	Urban
Range of Free Flow Speeds (mph)	45 to 35	35 to 30	35 to 25
Typical Free Flow Speed (mph)	40 mph	33 mph	27 mph

Level of Service	Average Travel Speed (mph)*		
A	> 35	> 30	> 25
B	> 28	> 24	> 19
C	> 22	> 18	> 13
D	> 17	> 14	> 9
E	> 13	> 10	> 7
F	> 13	> 10	> 7

** Includes time at stop lights*

Source: Highway Capacity Manual, Transportation Research Board, Special Report 209, 1985

GP.CR Table 2 Arterial levels;KS;pm/9-9-91

Table 3

Levels of Service & Roadway Volume/Capacity Ratio Relationship

Level of Service	Volume/Capacity Ratio
C or Better	0.0 — .80
D	.81 — .90
E	.91 — 1.0
F	1.0 +

Source: BRW, Inventory and Analysis Document for the Update of the Regional Transportation Plan, June, 1990.

GP.CR Table 3 Roadway vol;KS;pm/8-28-91

- I-15 functions at LOS F from Desert Inn Road through the "Spaghetti Bowl" Interchange.
- U.S. 95 is relatively uncongested except for the Downtown "Spaghetti Bowl" area where LOS D and F predominate.[7]

Intersection Levels of Service

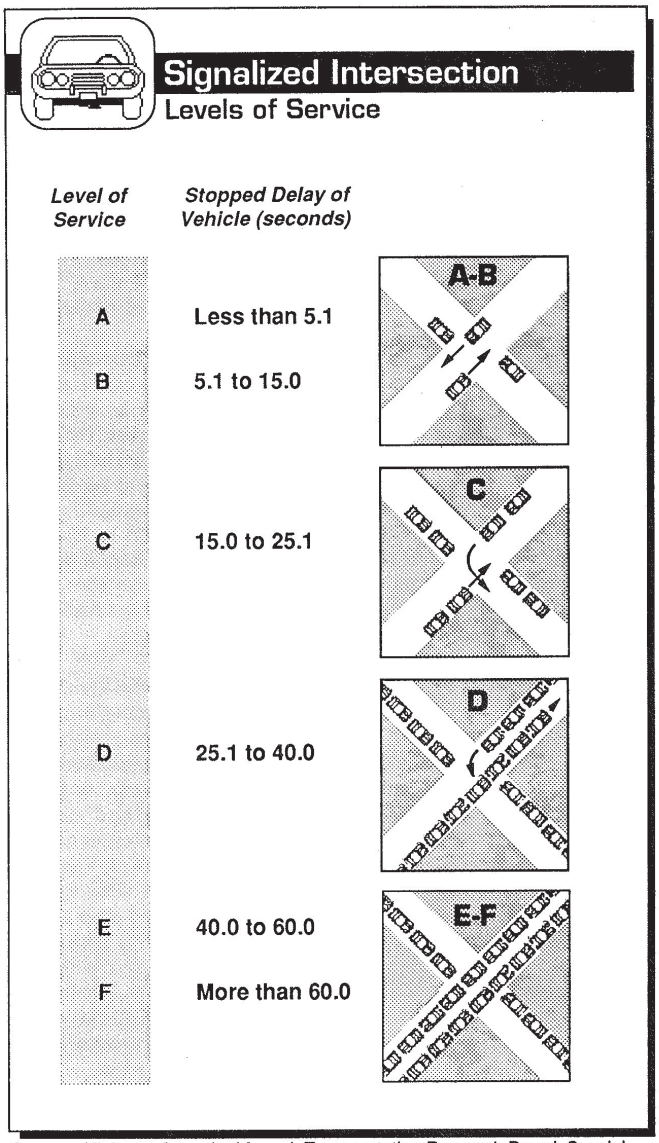
Intersection levels of service are comparable to roadway levels of service. At signalized intersections, the average delay experienced by vehicles decides LOS as outlined in Figure 4, Signalized Intersection Levels of Service.

BRW has calculated intersection levels of service for 224 intersections in the Las Vegas Valley using data collected from recent studies. The results of these calculations are in Appendix 3: Intersection Levels of Service. The intersections are identified as under (LOS A - C), over (LOS D - E) or near capacity (LOS F). Map 4 visually represents those intersections within the City which the studies found to be near or over capacity.

Travel Demand Forecasting

Travel demand forecasting is a process used in transportation planning that evaluates roadway project alternatives based on future land use. In the Las Vegas area, computerized modeling for travel demand forecasting has been done primarily by NDOT. Currently, the RTC and NDOT along with the City of Las Vegas and other area jurisdictions are working with BRW, Inc. in the update and conversion of the existing NDOT regional transportation model to TRANPLAN, a computer based regional transportation model, for the Las Vegas Valley. TRANPLAN, which has been adopted as the standard model by the Clark County transportation planning agencies, will give each agency the capability of looking at future travel demand regionally and locally to assist in the planning of future roadways.

Figure 4



Source: Highway Capacity Manual, Transportation Research Board, Special Report 209, 1985 & Resort Corridor Study, Early Action Program, Jan 1991

GP.DR Fig 4 Signalized;KS;pm/9-9-91

5.1.4 Funding

Private developers complete full street improvements within their development and full "half-street" improvements of master planned, arterial streets immediately adjacent to their subdivision.

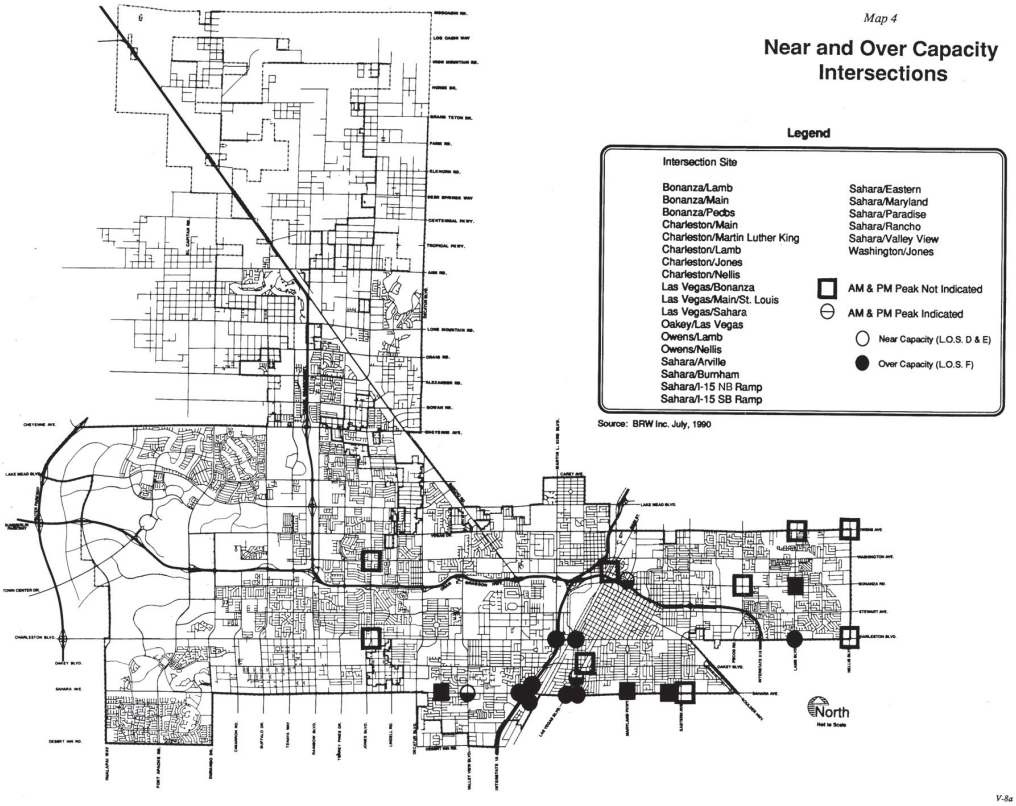
Another form of private funding for street improvements is the Special Improvement District (SID) that assesses the property owners who will derive a benefit from the capital improvements. Owners are assessed a portion of the cost of the improvement which is payable over a ten year period. SIDs are formed by two methods:

- Petitioned for by the affected property owners if the owners of at least 66 2/3 percent of the affected frontage have made the request.
- Required by the governing body, provided that:
  - 24 percent of the funding is derived from a source other than the levy of assessments, i.e., RTC project (RTC is only responsible for the travel lanes, therefore the curb, gutter, sidewalks, and streetlights would be paid for through a SID).
  - The portion to be improved, between existing improvements, is less than 1320 feet.

The primary, historical source of funding for RTC arterial and major collector projects is the Clark County gasoline tax (currently four cents but incrementally increasing to nine cents by 1995). Generally, this funding source has been inadequate in meeting the needs for regional transportation improvement projects; therefore, the Clark County Board of Commissioners supplements the funding with the issue of general obligation bonds. The most recent bonds issued in 1987, provides over $225 million for road improvements in Clark County.[8] Additionally, the Clark County Commission approved a three cent county-wide property tax levy that has been leveraged with a new bond issue and is providing an additional

Map 4

Near and Over Capacity Intersections



Source: BRW Inc. July, 1990