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MSFL McCARRAN CENTER

Planned Unit Development Handbook

This page added to provide additional information required by NRS 111.312 Sections 1-2.
(Additional recording fee applies)

This cover page must be typed or printed.

MSFL McCarran Center

Planned Unit Development Handbook

Prepared for:

City of Reno

When Recorded Return to:
Wood Rodgers, Inc.
5440 Reno Corporate Drive
Reno, NV 89511

NOTICE OF DESIGN GUIDELINES FOR
MSFL McCARRAN CENTER PLANNED UNIT DEVELOPMENT

Notice is hereby given that the Planned Unit Development Guidelines for the MSFL McCarran Center Planned Unit Development have been established, effective March 27, 2013. A copy of the guidelines are attached hereto and incorporated herein.

DATED this 2 day of April 2013

By _____
Ronald M. Zurek, Vice President of Administration and Finance

State of Nevada)
) ss
County of Washoe)

On this 2 day of April, 2013, personally appeared before me, a Notary Public, personally known to me (or proved) to be the person whose name is subscribed to the above instrument who acknowledged to me that he executed this instrument.

In witness whereof, I have hereunto set my hand and affixed my official stamp at my office in the Count of Washoe the day and year in this certificate first above written.

_____ (Seal)
Signature of Notary Public

JODI FRASER
Notary Public - State of Nevada
Appointment Recorded in Washoe County
No: 00-64696-2 - Expires August 10, 2016

EXHIBITS and TABLES

APPENDIX

1. Project Description

a. Introduction

The MSFL McCarran Center encompasses 104.00± acres. The project site is located on the east side of McCarran Boulevard. The site extends from Clean Water Way, approximately 4,700± feet to the south and has a depth of about 927± feet (*Refer to Exhibit 1, Vicinity Map*).

Current access to the site is available from McCarran Boulevard and Clean Water Way. Property to the north and east is owned by the Nevada System of Higher Education and is used for University of Nevada Reno (UNR) instruction, research and agricultural purposes. Business park uses and multi-family residences are located to the west across McCarran Boulevard. Property to the south is currently undeveloped.

The development plan for the MSFL McCarran Center builds upon the synergy of the adjacent uses to the west and will offer a mix of commercial, office, light industrial flex space, research and development, and business park uses. The Planned Unit Development Handbook (PUD) represents the design standards to guide development of the 104.00± acre site and protect it from flooding, as well as provide mitigation in accordance with FEMA and the City of Reno's Critical Flood Pool Regulations.

b. Objective

The objective of the MSFL McCarran Center PUD is to establish design standards and expectations to develop a mix of uses on the property that will address the following:

- Establishment of a high quality business and employment center that includes commercial, office, light industrial , as well as research and development opportunities consistent with business park and multi-family uses to the west;
- Sensitivity and compatibility with adjacent UNR agricultural operations to the east and undeveloped property to the south;
- Pedestrian connectivity from McCarran Boulevard and throughout the site.
- Utilization of sensitive grading, Low Impact Development (LID), and flood mitigation required for development of the site; and
- Future roadway realignments and extensions if appropriate.

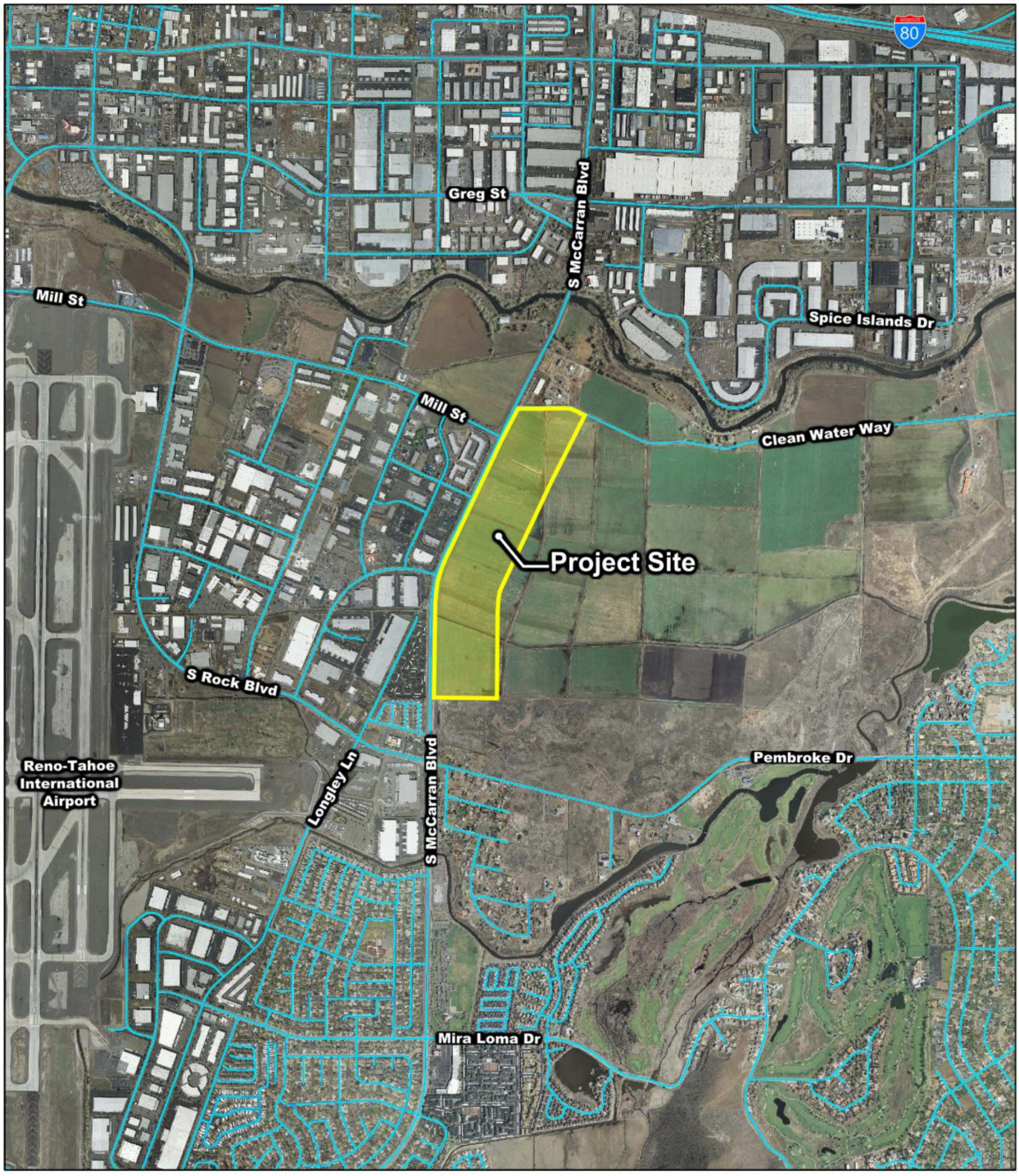

Exhibit 1
MSFL McCarran Center PUD
Vicinity Map

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c. Site Conditions

The site is currently undeveloped and used for UNR instructional, research and agricultural purposes. The property is relatively flat and slopes gently to the east and southeast. The Yori Drain crosses the site in an east/west direction near the southerly boundary. A large portion of the property is within the 1% Annual Chance (100-year flood event) Federal FEMA Regulatory Floodplain of the Truckee River and its tributaries. The site, however, is entirely outside of the floodway. The property is also within the City of Reno Critical Flood Pool area designated as Critical Flood Zone 1. This situation is discussed in detail in the Preliminary Master Hydrology Study in the Appendix.

d. Project Development Concept

The project concept is to develop a high quality business and employment center that promotes a mix of commercial, office, light industrial, as well as research and development uses. The project will be consistent with business park and multi-family uses to the west.

The development plan includes the following Land Use Categories, acreages and estimated development square footage and densities:

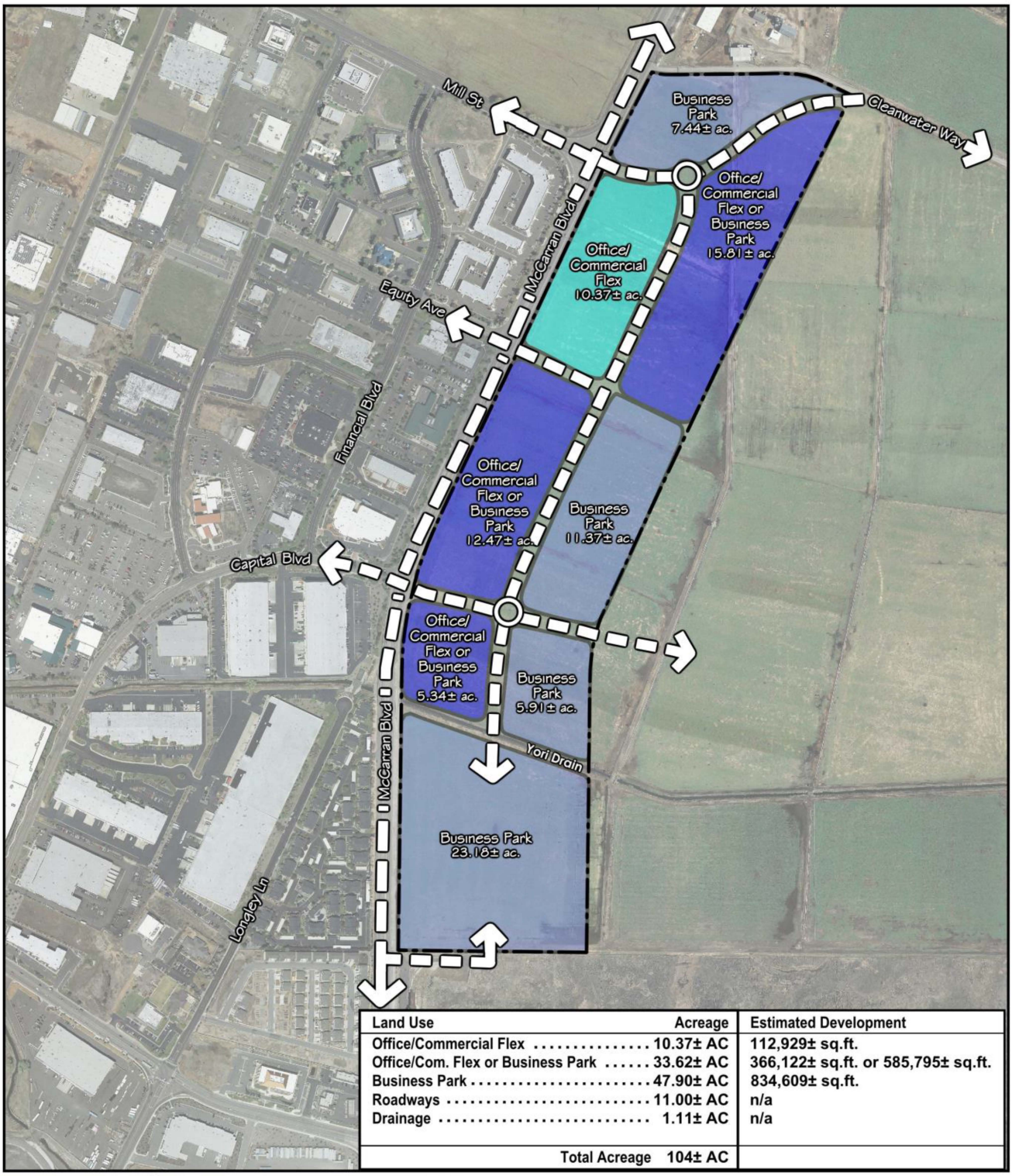
LAND USE	ACREAGE	TARGET FAR/DENSITY*	ESTIMATED DEVELOPMENT
Commercial /Office Flex	10.37± acres	.25	112,929± sq. ft.
Commercial /Office Flex OR Business Park	33.62 ± acres	.25 OR .40	366,122± **OR** 585,795± sq. ft.
Business Park	47.90± acres	.40	834,609± sq. ft.
Roadways and Drainage	12.11± acres	-	N/A
TOTAL	104.00± acres	.25 -.40	1,313,660± to 1,533,333± sq.ft.

Refer to Exhibit 2, Land Use Plan for land use category locations.

** Note: the target number is for planning purposes and is not a minimum requirement*

e. Development Schedule

Build out of the MSFL McCarran Center will be dependent on market conditions and is estimated to be 7-20 years. No specific phasing is proposed for the project. The project will be developed as market conditions dictate and in accordance with the standards provided herein.



Land Use	Acreage	Estimated Development
Office/Commercial Flex	10.37± AC	112,929± sq.ft.
Office/Com. Flex or Business Park	33.62± AC	366,122± sq.ft. or 585,795± sq.ft.
Business Park	47.90± AC	834,609± sq.ft.
Roadways	11.00± AC	n/a
Drainage	1.11± AC	n/a
Total Acreage	104± AC	

Exhibit 10
MSFL McCarran Center PUD
Land Use Plan

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f. Administration

The MSFL McCarran Center PUD shall be administered by the Zoning Administrator or his/her designee as defined in the City of Reno Annexation and Land Development Code.

There shall be a master developer in place from the first phase of development of the PUD. This master developer shall continue throughout the development of the PUD until and unless a master property owner's association or other entity is created to serve the role of master developer. The role of the master developer, for the purposes of this PUD, shall be:

- To prescribe and administer methods and procedures to ensure and control the quality of development that occurs within the MSFL McCarran Center PUD;
- Maintain all common area improvements, storm drain and/or channels, detention and/or other flood control facilities;
- Construct, or have constructed, all pedestrian pathways, and sidewalks and common area landscaping;
- Establish a Design Review Committee (DRC) to maintain consistent project architecture.

Only the Reno City Council and the master developer or his/her authorized designee may initiate an amendment to the PUD handbook.

g. Review Process

Prior to the submittal of a development application to the City, each project shall be reviewed by the master developer at their sole discretion. Each development application submitted to the City shall include written documentation of approval from the master developer. Written approval by the master developer does not constitute the City's approval of development applications. The construction of individual projects, including accessory structures shall follow the City of Reno building permit process. For some uses where a special use permit or site plan review is required, these processes shall precede the building permit process, as applicable.

h. Appeals

The applicant or developer may appeal any decision, comments, or recommendations of the Administrator in accordance with RMC Section 18.06.208, as amended.

i. Conflicts

In the event of a conflict between these design standards and City Code, these standards shall govern development of the MSFL McCarran Center. When a specific standard is not addressed by the PUD, then the applicable section of Reno Municipal Code Title 18, as amended, at the time of review shall prevail.

j. Flexibility

The Land Use Plan and Development Standards contained herein are intended to depict the general acreages of the various land uses allowed within the MSFL McCarran Center. Sufficient flexibility shall be allowed to permit detailed planning and design and at the time of actual development. The acreage of each land use category, as well as maximum building square footage may be increased by up to 10% to accommodate minor modifications to the project. This provision shall not exceed a cumulative total of 10% for each land use category or a total of up to 10% of the building square footage for the entire project. For changes in excess of 10%, the Administrator shall determine compliance with the Development Standards Handbook and the need for an amendment to the Development Standards Handbook.

k. Modifications

The Administrator shall have the ability to grant minor deviations as outlined in RMC 18.06.411(a)(1), as amended. Minor deviations shall be subject to written approval from the master developer. Deviations of 10% or more shall conform to the City of Reno Variance process as outlined in RMC 18.06.408, as amended.

2. Infrastructure

a. Access

Primary access to the property will be from South McCarran Boulevard at Mill Street (as extended), Clean Water Way as realigned, Capital Boulevard, Equity Avenue and the existing median opening at the southerly boundary of the property. The McCarran Boulevard/Mill Street intersection is currently signalized and will be modified to include an east approach. It is anticipated that the McCarran Boulevard/Capital Boulevard intersection will be signalized. Right in, right out access is also anticipated at a location immediately south of the Yori Drain. The extension of Mill Street and the future Southeast Connector are scheduled for completion by the Regional Transportation Commission prior to 2018. Capital Boulevard is planned to extend across the property and, if appropriate, can be extended to the east in the future.

b. Parking

Parking for all land use designations in the MSFL McCarran Center shall be provided and constructed in accordance with RMC Article XI Off-Street Parking and Loading, as amended, unless expressly modified within these development standards.

c. Traffic

Project traffic is discussed in detail in the Traffic Impact Study and letter update prepared by Solaegui Engineers (Refer to the Appendix of this PUD handbook). The original trip generation was based on the assumption of land uses acreages and gross building square footages that included a residential component. The updated trip generation, however, is based on land uses and acreages (that do not include residential) as shown in *Exhibit 2, Land Use Plan.* The average daily trips and peak hour trips analyzed in Traffic Impact Study are based on the land use assumption generating the highest traffic volumes. In summary, the total daily trips for the project shall not exceed 18,290 Average Daily Trips and 2,032 PM peak hour trips without an amendment to the PUD Handbook. A trip generation letter will be required with each project to verify the traffic volumes are within the trip generation envelopes.

d. Sanitary Sewer Service

The project is located within the Washoe County Sewer service district, and is served by the Truckee Meadows Water Reclamation Facility (TMWRF) located to the northeast at the end of Clean Water Way. In its current state, the only sanitary sewer facility located on-site is a 60 inch City of Reno interceptor that traverses the northern portion of the site at the Mill Street intersection. There are no existing sanitary sewer facilities located within Pembroke Drive to the south of the project site. Given the project's proximity to the TMWRF, it is anticipated that future development will include a direct connection to the existing 60 inch public main, and a gravity flow sewer network within the project site. This assumption will need to be verified to ensure the existing trunk main is at a sufficient depth to allow for gravity flow from the southern reaches of the property. As the MSFL McCarran Center PUD allows for flexibility

within land use categories, and final site layouts are not known at this time, a Technical Sanitary Sewer Study will be required with each development permit/application on the site to assure that adequate facilities are provided to service each project.

e. Domestic Water Service

Currently, the southern portion of the project site, from the southern boundary to approximately Capital Boulevard, is located with a Washoe County Department of Water Resources wholesale area, and the northern portion of the site from Capital Boulevard to Clean Water Way is shown to be outside of both the Washoe County service area and the Truckee Meadows Water Authority (TMWA) service area. Washoe County owns and operates a 14" distribution water main within Pembroke Drive to the south and McCarran Boulevard to the west, and TMWA owns and operates a 20" transmission main running parallel to McCarran Boulevard in the eastern shoulder of the roadway. As a portion of the project site is currently within Washoe County's service territory, it is assumed at this time that the remainder of the site would be annexed into Washoe County's territory and served via their network of distribution water mains. It should be noted that a merger of TMWA and the Washoe County Department of Water Resources is in process currently and may be completed by the time the project is ready for development, which would simplify the discussion as it relates to service territories.

f. Hydrology

The project site is located within two FEMA regulated flood zones. The western portion adjacent to McCarran Boulevard and the northern portion adjacent to Clean Water Way is largely within zone Shaded X, the remainder is located with zone AE. As such, a large portion of the property is within the 1.0% Annual Chance (100-year flood event) Federal FEMA Regulatory Floodplain of the Truckee River and its tributaries but is entirely outside the floodway. The entire property, however, is within the City of Reno Critical Flood Pool area designated as Critical Flood Zone 1. Mitigation options to elevate the site and protect future development from flooding, as well as excavating adjacent areas to provide flood storage will be required. With final design, the applicant shall ensure better than 1:1 flood mitigation.

While the project site is mostly devoid of drainage infrastructure in its current state, the Yori Drain, which is a large open air drainage ditch that receives storm water from numerous locations within the City of Reno to the west, traverses the property in the southern portion of the site. The City of Reno owns and operates a storm water drainage system that parallels McCarran Boulevard on both sides of the roadway serving properties to the west and the roadway itself, and ultimately disposes of those flows into the Yori Drain. In addition, there is an existing public storm drain that crosses McCarran at the property's southern boundary, which outfalls into an existing drainage channel that runs parallel to the southern property line. It is anticipated that development of the project site will include a storm drain network composed of underground pipes, detention basins and associated low impact development (LID) pretreatment systems such as bio-swales, infiltration swales, etc, that will drain to the Yori Drain and ultimately to Steamboat Creek located to the east.

A Preliminary Master Hydrology Study is provided in the Appendix of this PUD Handbook, which discusses in detail the existing conditions and future flood mitigation options. As the MSFL McCarran Center PUD allows for flexibility within land use categories, and final site layouts are not known at this time, a Technical Drainage Study will be required with each development permit/application on the site to assure that the site is adequately protected from flooding in accordance with City requirements.

g. Electric Service

The subject property currently has no direct electrical service to it, but is adjacent to existing NV Energy overhead transmission lines that run parallel to McCarran Boulevard within the eastern shoulder of the roadway and within Clean Water Way running along the northern portion of the roadway. It is assumed that the project will be served by direct connections to these overhead lines with appropriate voltage step-downs and associated underground infrastructure as necessary within the development site. Due to the size of the existing transmission lines, they will remain in their overhead locations after development.

h. Natural Gas

The subject property has no direct natural gas service to it, but is adjacent to two existing NV Energy gas mains running within McCarran Boulevard parallel to the project site in the eastern shoulder of the roadway. One of the mains is a high pressure transmission main that cannot be tapped, however the other main is a large diameter steel distribution main that should be available for tapping and service to the future development onsite. No existing gas facilities exist within Clean Water Way.

i. Communications

The subject property has no direct communications service to it, but is adjacent to an existing MCI/WorldCom overhead system within McCarran Boulevard that runs parallel to the project site in the eastern shoulder of the roadway. It is assumed that the project will be served by direct connections to this overhead line, and associated underground infrastructure to be located within the development site.

3. Design Standards

a. Introduction

This chapter addresses the development standards for the MSFL McCarran Center PUD land use categories. The property is designated Office/Commercial Flex and Business Park. The Office/Commercial Flex areas are located to take advantage of future access points at Mill Street and Capital Boulevard while ample property is envisioned for Business Park development. Flexibility to accommodate market conditions is included in the plan to allow for a mix of business opportunities and employment generating uses. A conceptual land use plan with acreages and estimated building square footage and densities is provided in *Exhibit 1, Land Use Plan*.

Development standards are provided for the two compatible land use categories: Office/Commercial Flex; and Business Park. The allowed uses, building height, setbacks, density/intensity, etc. that will guide future development of the MSFL McCarran Center are addressed within each land use area.

b. Land Use Categories

A summary of the two land use categories is provided as follows:

1. Office/Commercial Flex

A total of 10.37± acres of the property are designated for Office/Commercial Flex use. Access to this area will be from McCarran Boulevard via an extension of Mill Street and Equity Avenue. The extension of Mill Street may ultimately connect to the Southeast Connector at a later date. The target FAR is .25 and has been used for planning purposes, however, is not a minimum requirement. If market conditions, dictate, however, this area could be expanded to include 33.62± additional acres to the east and south.

2. Business Park

The Business Park area consists of 47.90± acres. Access to this area will be from McCarran Boulevard at Mill Street, Equity Avenue, Capital Boulevard and at the southerly end of the property. A north/south roadway is also anticipated to extend into the Business Park from the extension of Mill Street.

The target FAR is .40 and has been used for planning purposes, however, is not a minimum requirement. Based on market demands, however, the Business Park can be expanded to the north and west to include an additional 33.62 ± acres. The Business Park area is intended as an employment node with flex space, industrial and research and development opportunities.

c. Permitted and Prohibited Uses

The specific uses permitted, as well as prohibited in the various PUD land use categories are listed in Table 1, Table of Uses Permitted and Prohibited in Land Use Categories.

Table 1 - Table of Uses Permitted and Prohibited in Land Use Categories

Office/ Commercial Flex	Business Park
The land uses described under "AC" in RMC Table 18.08 - 5 shall apply with the following exceptions:	The land uses described under either "IB or IC" in RMC Table 18.08-5 shall apply with the following exceptions (if SUP or SPR required in one category, the most restrictive shall apply unless otherwise specified below):
Prohibited Uses: 1. Group Homes 2. Multi-Family 3. Single-Family Attached 4. Single Room Occupancy 5. Tattoo Parlor, Body Painting & Similar Uses 6. Pawn Shop 7. Blood Plasma Center 8. Cemetery/Mausoleum 9. Funeral Parlor 10. Collection Station 11. Crematorium	**Prohibited Uses:** 1. Adult Business 2. Pool or Billard Parlor 3. Theater (No Drive In) 4. Blood Plasma Center 5. Collection Station 6. Crematorium 7. Towing and Impound Yard
Allowed by right (No Special Use Permits required): 1. Automobile Rental 2. Bar 3. Car Wash 4. Country Club, private 5. Indoor Manufacturing, Processing, Assembly or Fabrication and Accessory Retail Sales 6. Mini-warehouse 7. Warehouse/Distribution Center 8. Wholesale of Construction Materials 9. Wholesale of products manufactured or assembled on site. 10. Uses operating between the hours of 11:00 p.m. and 6:00 a.m. 11. Accessory retail sales associated with a principal manufacturing, wholesaling, distribution or warehousing use. 12. Continued Interim Agricultural Uses	**Allowed by right (No Special Use Permits required):** 1. Library, Art Gallery or Museum 2. Convenience store with or without gas sales 3. Drive-through facilities 4. General Personal Service 5. General Retail Store or Commercial Use Other Than Listed. 6. Medical Facility, Day Use Only. 7. Hotel (Without Non-restricted Gaming Operation) 8. Motel 9. College, University or Seminary 10. Hospital, Acute and Overnight Care 11. Showroom 12. Uses operating between the hours of 11:00 p.m. and 6:00 a.m. 13. Continued Interim Agricultural Uses

Office/ Commercial Flex	Business Park
Allowed subject to Special Use Permit: 1. Gun Range (Indoor) 2. Dormitory 3. School, Primary (Public or Private) 4. School, Non-Traditional, Secondary (Public or Private)	**Allowed subject to Special Use Permit:** 1. Sports Arena, Stadium, or Track 2. Gun Range (Indoor) 3. Stable (Commercial) or Riding Academy 4. School, Primary (Public or Private) 5. School, Secondary (Public or Private) 6. School, Non-Traditional, Secondary (Public or Private) 7. Dormitory 8. Batch Plant, temporary only

d. Development Standards

The following section provides development standards for the land uses within the MSFL McCarran Center. General Standards for density/intensity; lot sizes; yards and setbacks; parking; landscaping; lighting and screening are addressed in Table 3: Development Standards for Land Use Categories. Standards relating to architecture; fencing; signage; backbone roadways and pedestrian access are subsequently presented in a narrative format.

1. General Standards

Table 3: Development Standards for Land Use Categories

Land Use Category	**Office/Commercial Flex** **Each project shall be evaluated under the AC standards listed in RMC Table 18.12-3 – Commercial and Mixed Use Zoning Districts – Bulk/Dimensional and Intensity Standards unless otherwise provided in this table.**	**Business Park – At the applicant's discretion, each project shall be evaluated under either the IC or IB standards listed in RMC Table 18.12-4 – Industrial Zoning Districts – Bulk/Dimensional and Intensity Standards unless otherwise provided in this table. These standards shall apply to the entire project.**
Density/Intensity		
Units per acre	N/A	N/A
Maximum Building Height	65 feet	65 feet
Lot Size Standards		
Minimum Lot Size	None	None
Minimum Lot Width	None	None
Yard and Setbacks [1,2]		
Exterior (perimeter) boundary of PUD and in locations	15 feet	15 feet

Land Use Category	**Office/Commercial Flex** **Each project shall be evaluated under the AC standards listed in RMC Table 18.12-3 – Commercial and Mixed Use Zoning Districts – Bulk/Dimensional and Intensity Standards unless otherwise provided in this table.**	**Business Park – At the applicant's discretion, each project shall be evaluated under either the IC or IB standards listed in RMC Table 18.12-4 – Industrial Zoning Districts – Bulk/Dimensional and Intensity Standards unless otherwise provided in this table. These standards shall apply to the entire project.**
adjacent to backbone roadways		
Front	10 feet	10 feet
Side	0 or 10 feet	0 or 10 feet
Rear	0 or 10 feet	0 or 10 feet
Separation between buildings	10 feet	10 feet
Parking		
	RMC Article X1: "Off-Street Parking and Loading", as amended.	RMC Article X1: "Off-Street Parking and Loading", as amended.
Landscaping		
	15%; other RMC Article XII: "Landscaping and Screening" requirements shall apply.	See Note 2 below
Screening		
	Not required between Office/Commercial Flex and Business Park land uses;	Not required between Business Park and Office/Commercial Flex land uses; solid screening required between Business Park and any future Residential land uses (if any) to the south to RMC 18.12.1207 standards;
Discretionary Review	Discretionary review shall not be required for proximity to residential uses and zoning districts per RMC 18.06.405 (a)12 and 18.06.406 (a)2, as amended,	

Notes for Table 1:

1. *A fully landscaped setback of 15 feet is required around the south, east and west perimeter boundary of the PUD and adjacent to on-site backbone roadways (extension of Mill Street; Equity Avenue; Capital Boulevard and north/south connector road). A fully landscaped setback of 30 feet is required at the northerly perimeter of the PUD. A minimum of one tree per 300 square feet and three shrubs per tree is required. The width of these setbacks may be used to satisfy front, side and rear setbacks and overall landscape requirements, as applicable.*
2. *Landscaping requirements for the Business Park Land Use Designation are as follows:*
   - *The entire required front yard setback shall be landscaped with a minimum of 1 tree per 300 square feet of required front yard and 3 shrubs per tree;*

- *A minimum 10 foot landscaped area is required adjacent to the front of each building and may include a combination of planting, sidewalk and decorative paving;*
- *Landscaping in parking areas shall include a minimum of 1 tree per 10 parking spaces. Trees may be placed in parking lot edge locations including adjacent to building entrances or in islands but shall be located within a maximum of 75 feet of each parking space. Islands and edges shall be a minimum of 10 feet in width and 126 square feet in area. Areas designated for truck and trailer parking and loading are exempt from island requirements; however, the 10 foot landscape edge shall be required.*
- *70% of the required trees shall have a minimum caliper of 2 ½ inches (deciduous) or have a minimum height of 10 feet (evergreen) while 30% may have a minimum caliper of 1 inch (deciduous) and minimum height of 6 feet (evergreen). Shrubs shall include a 75/25% mix of 1 and 5 gallon sizes.*
- *Decorative paving, rock or other inert materials, up to 25% of the required landscape area may be provided.*

2. Architecture

Architectural styles may vary from parcel to parcel within the MSFL McCarran Center PUD. However, architecture must be consistent within each individual parcel.

Non-Residential Standards

In addition to the standards listed in RMC 18.12.305 "Nonresidential and Mixed Use Site and Building Design Standards," (as amended), the following architectural standards shall apply to the Office/Commercial Flex and Business Park Land Use Categories:

- A combination of design elements such as changes in wall planes including projections or recesses in accordance with RMC 18.12.301 (as amended); changes in texture or material patterns and colors; the use of windows; awnings; trellises with vines and/or other architectural features shall be provided and approved by the DRC prior to submission for review to the City of Reno.
- Parking areas may face McCarran Boulevard, as well as backbone streets and shall be landscaped in accordance with the landscape requirements outlined in this handbook.
- Building articulation and exterior interest is required on the elevations of structures on parcels immediately adjacent to and facing McCarran Boulevard and buildings facing backbone roadways. All other interior elevations shall maintain consistent color and materials, and shall include wrapped architectural treatment from the exterior elevation to a logical terminus point on the interior elevation.
- Preferred exterior and accent materials include glass, stone, pre-cast concrete, concrete block, stucco, brick and composition panels. The use of exterior wood, vinyl or metal siding may be considered only if specifically approved by the DRC.

- The main surface color of the buildings shall be generally neutral, earth tones, consistent with the surrounding area. Accent colors, however, are encouraged. All flashing, sheet metal, vent stacks and pipes shall be painted to match the main surface color of the buildings.
- Roofs may be flat, sloping or pitched. Pitched roof materials shall be limited to standing seam or flat seam configuration metal. Colors shall be approved by the DRC prior to submittal to the City of Reno, which are consistent with the main building.
- Each project shall provide a visually appealing, well-articulated, identifiable path of entry for pedestrian and vehicular users from the street into the site, and from the site to the buildings. Landscaping, hardscaping, and architectural design elements for the project site and building entries must work together to create a sense of arrival and shall be approved by the DRC.
- Residential Adjacency Standards shall apply to all commercial projects abutting existing residential uses.

3. Fencing and Screening

a. Perimeter Fencing

If perimeter fencing on the north, south or east sides of the PUD is provided by the master developer, fence type, style, height and materials must be compatible. Fences facing public streets shall be designed with architectural treatments such as top caps, pilasters, and a decorative appearance on the side facing the street. Materials may include masonry, pre-cast stamped concrete panels, wood, solid vinyl or open view decorative type metal (but not chain link).

b. Other Fencing

- Other fencing for safety, security and screening purposes must be approved by the DRC.
- All walls and fences shall comply with AASHTO standards as applicable to maintain adequate sight distance requirements. All masonry/stucco walls shall be graffiti coated.

4. Signage

Signage within the MSFL McCarran Center PUD will include center identification, monument, building and directional signs. Signs shall be consistent for each project and must conform to the City of Reno RMC Sections 18.16.101 through 701, as amended, with the following modifications noted below. For purposes of translation, the following table shall establish the comparable City of Reno zoning designation to the land use categories defined within this PUD handbook.

Signage Equivalency Table

(*Reference RMC Table 18.16-1)*

Office/Commercial Flex	AC
Business Park	IB, IC

a. Signage Modifications:

- Double-sided free standing signs, not to exceed 25 feet in height and 150 square feet identifying the MSFL McCarran Center and major tenants are limited to the main entrances at Mill and McCarran; Equity and McCarran; and Capital Boulevard and McCarran.
- All other signs shall be as follows:
  - monument signs with a maximum height of 8 feet and a maximum of 100 square feet;
  - building/wall signs with one square foot per lineal foot of building façade for a maximum of 100 square feet per sign with individual letters not to exceed 60 inches;
  - small, on-site directional signs as approved by the DRC;

5. Backbone Roadways

For the purpose of this handbook, backbone roadways include the east/west extension of Mill Street; Equity Avenue; and Capital Boulevard; the southerly east/west roadway and the north/south connector road as shown in *Exhibit 2, Land Use Plan.* The construction of backbone roads may be phased to meet project demands. The following standards apply to backbone roadways:

- A 15 foot landscape buffer shall be provided adjacent to each side of each backbone roadway.
- A minimum of one tree per 300 square feet and three shrubs per tree is required within the buffer.
- Sidewalks, 6 feet in width, may be installed adjacent to the curb on both sides of the street in accordance with City standards OR an 8 foot wide meandering sidewalk may be provided on one side of the street.

6. Sidewalks and Pathways

Sidewalks, 6 feet in width, shall be required on at least one side of all non-backbone public streets within the MSFL McCarran Center PUD. Where feasible, sidewalks shall meander in landscape areas and connect to the overall sidewalk system and internal pathways on individual sites. There shall be a pedestrian connection either through a street connection or non-vehicular crossing over the Yori Drain to provide for circulation through the PUD. Internal pathways shall be a minimum of 4 feet in width and shall be Portland Cement Concrete.

7. Buffering and Disclosures

- Buffering
  A 30 foot landscape buffer shall be provided at the north property line of the PUD.
- Disclosures
  Disclosures shall be provided to all future buyers and tenants of the PUD informing them of the existence of Wolf Pack Meats a meat processing plant and slaughter house to the north and providing details regarding operations. The disclosure shall also inform buyers and tenants that there are agricultural activities to the east of the PUD.

MSFL McCarran Center

Preliminary Master Hydrology Study

Prepared for:
University of Nevada, Reno

August 2011
(Updated October 20, 2011)

Mark Gookin, P.E., CFM

WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
5440 Reno Corporate Drive Tel: 775.823.4068
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MSFL McCarran Center
Preliminary Master Hydrology Study

Prepared for University of Nevada, Reno
Prepared by Wood Rodgers, Inc
August 2011
(Updated October 20, 2011)

1.0 Introduction

The University of Nevada Reno (UNR) is beginning the process of pursuing development of an approximately 104 acre portion of its property on parcel APN 21-010-06 in the UNR Farms area on the east side of McCarran Boulevard just south of Clean Water Way. Please see Figure 1: Vicinity Map. The land is within Washoe County in the City of Reno Sphere of Influence. Currently the land is used for instructional research and agriculture and does not have any habitable structures on it. UNR contracted with Wood Rodgers Inc. in order to perform preliminary engineering analysis for the property, create a separate parcel for the property, prepare the property for annexation by the City of Reno, and prepare entitlement applications. This report is meant to outline the flooding and drainage issues for the parcel.

2.0 FEMA Issues

A large portion of the property is within the 1.0% Annual Chance (100-year flood event) Federal FEMA Regulatory Floodplain of the Truckee River and its tributaries but lies entirely outside the floodway. Please see Figure 2: FEMA Inundation Area Map. This means that the Finished Floor Elevations of all habitable structures constructed within the floodplain on the property must be at a minimum of 1.0 feet above the regulatory flood elevation. The regulatory flood elevation is 4395.0 NAVD '88 for the entire property, according to the latest FEMA Flood Insurance Rate Map (FIRM). Any parking, landscape features or similar non-habitable features or structures constructed on the property would not have to be built above the flood elevation.

2.1 Yori Drain

The Yori Drain, which is a City of Reno owned and maintained open air storm drainage channel, traverses the southern portion of the site and ultimately connects to Steamboat Creek at the eastern side of the project. The drain functions as an open air storm drain collection system and outfall for numerous public and private storm drain networks to the west of the project site. It is anticipated that the drain will remain in its current configuration upon development of the project site, and that it will serve as an outfall for the storm drain pipe networks anticipated to be constructed on-site. The existence of the Drain onsite is important to the development of the project as it provides for an effective connection strategy for the mitigation options discussed in the following sections of the report.

3.0 Critical Flood Pool Issues

Virtually the entire property proposed for development is within the City of Reno Critical Flood Pool area designated as Critical Flood Zone 1. The delineation of this area is included in the appendix. This means that any development of the site would be required to adhere to Section 18.12.605 – Critical Flood [Pools] Zone 1 of the Reno City Ordinance. A copy of the relevant section of the ordinance is attached in the appendix. Fundamentally, any placement of fill or construction of flood-proof buildings on the site on ground that is below the 1997 flood elevation (4397.36 NAVD '88) would require mitigation in order to create 1 unit of volume of flood storage for each 1 unit of volume of flood storage that the construction displaces. The mitigation must be done either within the same "flood storage area" and within the same elevation band as the filled area or be proven to be equivalent to the displaced volume in terms of hydraulic impacts as demonstrated through the use of the appropriate Truckee River flood Project Mitigation Hydraulic Model. The "flood storage areas" are areas delineated by the Truckee River Flood Project where water is thought to pool consistently and at the same

elevation during large flood events. An elevation band is defined as within 10 vertical feet of the project site's lowest natural elevation.

Please see Figure 3 for the project site relative to the surrounding Storage Areas, 1997 Maximum Water Surface Elevation (Max. W.S.), and ground elevations. The proposed development is within Storage Areas 8 and 9, with a Max. W.S of 4397.36. The lowest ground elevation within the property proposed to be developed is approximately 4393.5. The approximate volume of mitigation required if the entire property was brought above the Max. W.S would be 255 acre-feet, (the volume between the ground surface and 4397.36).

All area excavated for flood storage mitigation must be hydraulically connected to surrounding drainage facilities so that water does not pond there prior to a large flood event (i.e. the volume must be available for flood storage). The easiest drainage path for the site is the Yori Drain which bisects the site and drains to Steamboat Creek, shown on Figures 2 and 3.

3.1 Mitigation Options

There are at least four practical options to mitigate the proposed development in order to comply with the City's Critical Flood Pool regulation. They are as follows:

- **Mitigate within Site**
  It will be possible to mitigate the fill volume as the property is developed by raising the areas used for building pads above the flood elevation while excavating an equal volume below the Max. W.W. to be used for parking and landscaped areas. The only challenge to this option would be to ensure that all the excavated areas drain to the Yori Drain or to lower areas to the east and/or south and that the drainage paths are maintained as all the development on the site progresses. The excavation could not go below approximately 4390.5 and still have adequate drainage as the Yori Drain has a top of bank elevation of approximately 4390.0. Since this option would achieve mitigation in the same storage area as the fill, no further flood pool analysis would be required.
- **Mitigate within Storage Area # 8 and # 9 to the East**
  If the entire or a portion of the site was mass graded such that the final ground surface was above the Max. W. S., mitigation could be accomplished by excavating a volume of the land to the east within Storage Areas 8 and 9 equal to the volume of the fill placed for the project between the ground surface and Max. W.S. The Storage Area where the fill was placed (8 and 9) would be mitigated within the appropriate respective Storage Area. The excavated area would have to be permanently established and would have to slope downward to meet the elevation of the land to the east or drain through a drainage channel or gravity pipe to Yori Drain or the Boynton Slough. Again, this area could not be excavated below approximate elevation 4390.5 in order to preserve positive drainage flow. Since the land to be excavated is farm land, the top soil in the area should be considered and possibly preserved in the excavation process. Since this option would achieve mitigation in the same storage area as the fill, no further flood pool analysis would be required.
- **Mitigate within UNR/Flood Control's Property to the North**
  The Flood Control Project is expected to purchase from UNR at least a portion of the parcel that lies to the north of the project area within Storage Area 4 to widen the active flood channel of the Truckee River to include a 400-foot bench. There is debate whether they will purchase the entire parcel or just the land required for the channel widening. In either case, an agreement might be reached between the City of Reno, UNR and the Flood Project to allow the mitigation of the fill within the project site through excavation to the north in the area outside of the bench widening. Any excavation in this parcel would have to work around the UNR Farm Station and drain by gravity to the Truckee River or to the lower areas to the south. This option would most likely require analysis using the appropriate Truckee River flood Project Mitigation Hydraulic Model to demonstrate that the mitigation fulfills its purpose and, with the project's flood pool fill, does not cause an increase in the flood levels within the Truckee Meadows.
- **Mitigate within UNR Property to the East**
  As Figure 3 shows, UNR owns significant acreage to the east of the project area. Mitigation for either total or partial grading of the site above the Max. W.S. could be accomplished in Storage Area 7. The mitigation in this area would be more challenging as the ground elevation is lower than Storage Area 8 and 9. Consequently, a greater area would have to be disturbed to acquire similar mitigation volumes. Excavation depth would be limited to what could drain by gravity to the Boynton Slough or Steamboat Creek. This option would most likely require analysis using the appropriate Truckee River flood Project Mitigation Hydraulic Model to demonstrate that the mitigation fulfills its purpose and, with the project's flood pool fill, does not cause an increase in the flood levels within the Truckee Meadows.

An additional requirement for development within the City of Reno Critical Flood Pool/Critical Flood Zone 1, is that the post development peak runoff flows be less than or equal to pre-development peak runoff flows, as is typical with any development in the City of Reno. This would be accomplished by the installation of infiltration/retention areas within the project site to entrain storm water to lessen peak discharges. Analysis will be required as development plans progress to ensure that this requirement is met.

Attached: Figure1: Vicinity Map
Figure 2: FEMA Delineation
Figure 3: Mitigation Area
Figure 4: Cross Section

Appendix: Truckee River Flood Project Index Map
City of Reno Critical Flood Pool Ordinance

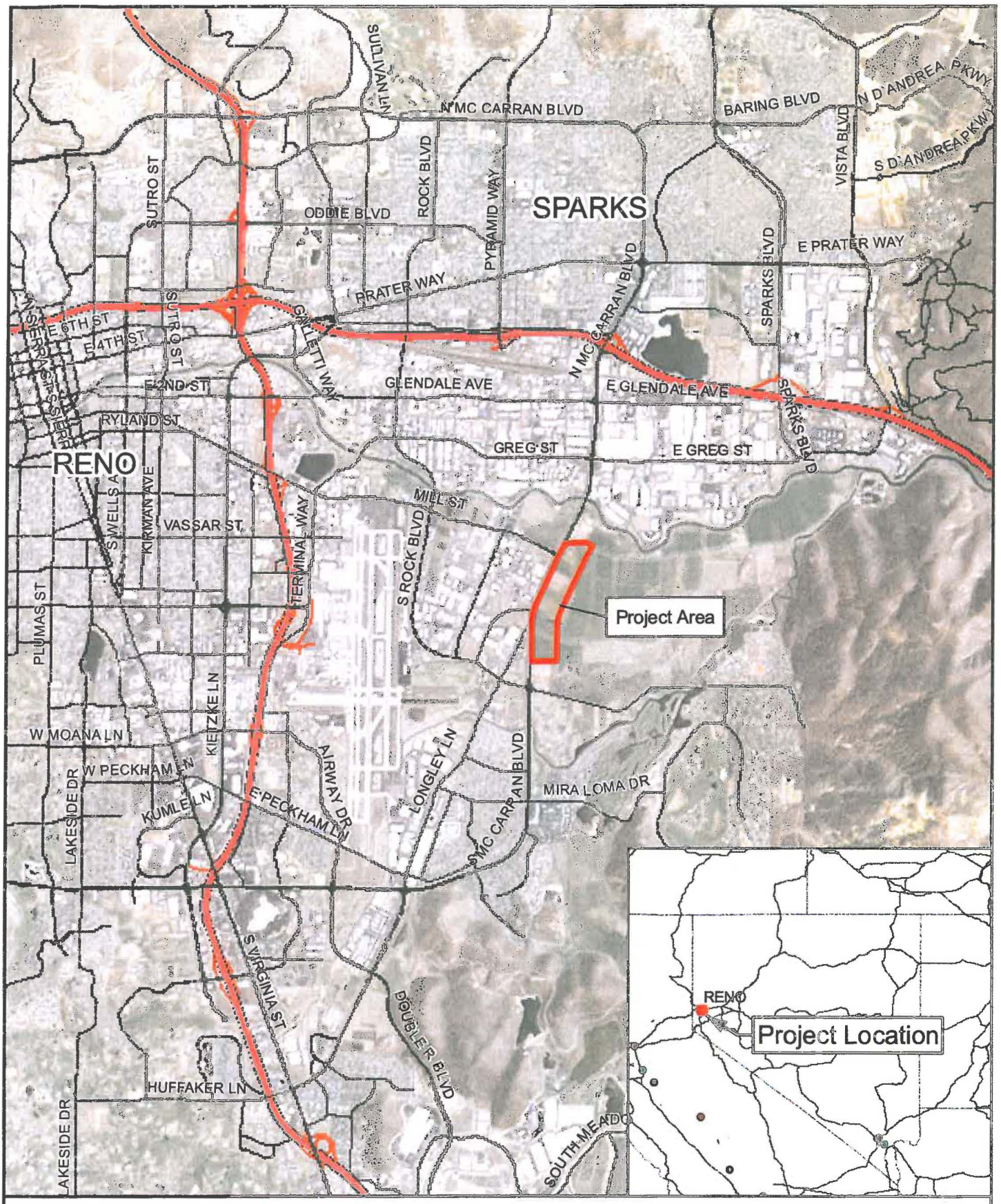

Figure 1 - Vicinity Map
UNR Master Hydrology Study
Reno, Nevada
May 2011

NOTES

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FEET

PRELIMINARY

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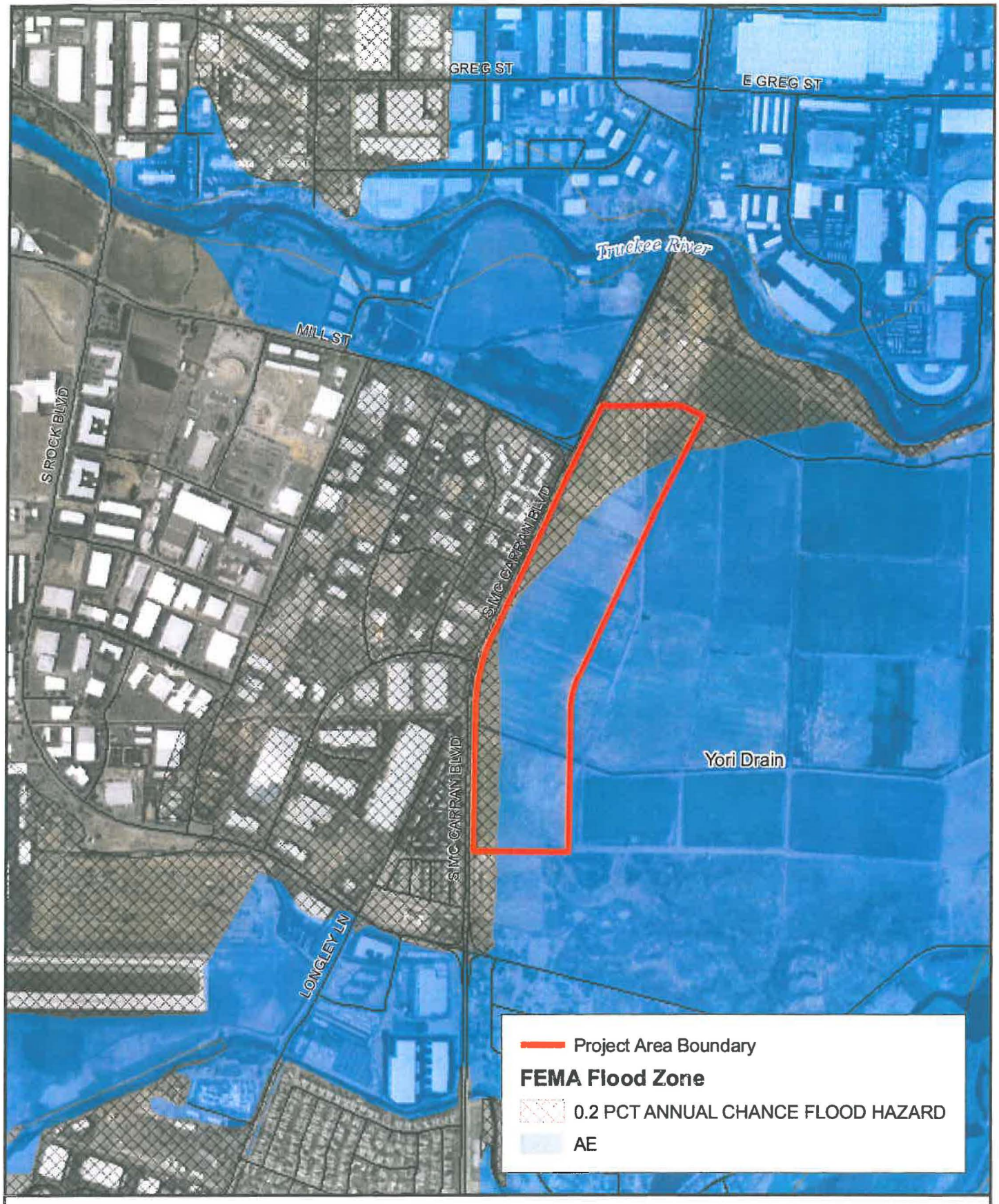

Figure 2 - FEMA Delineation
UNR Preliminary Master Hydrology Study
Reno, Nevada
May 2011

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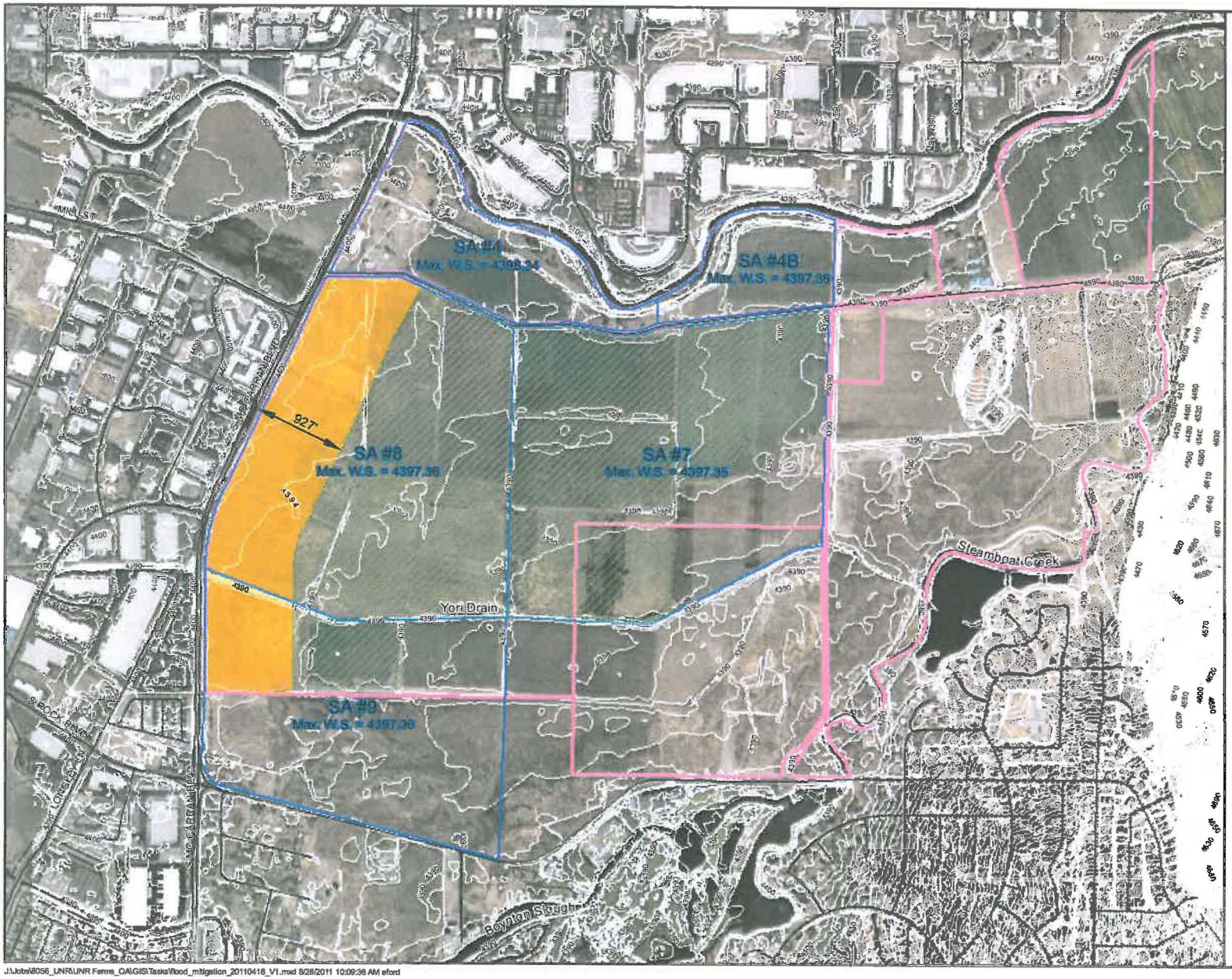

Figure 3 - Mitigation Area
UNR Preliminary Master Hydrology
Reno, NV
May 2011

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- Possible Area of Mitigation (with land surface elevation between 4390-4397.5)
- Project Area (104 ac.)
- Storage Area Boundary
- Parcels owned by UNR

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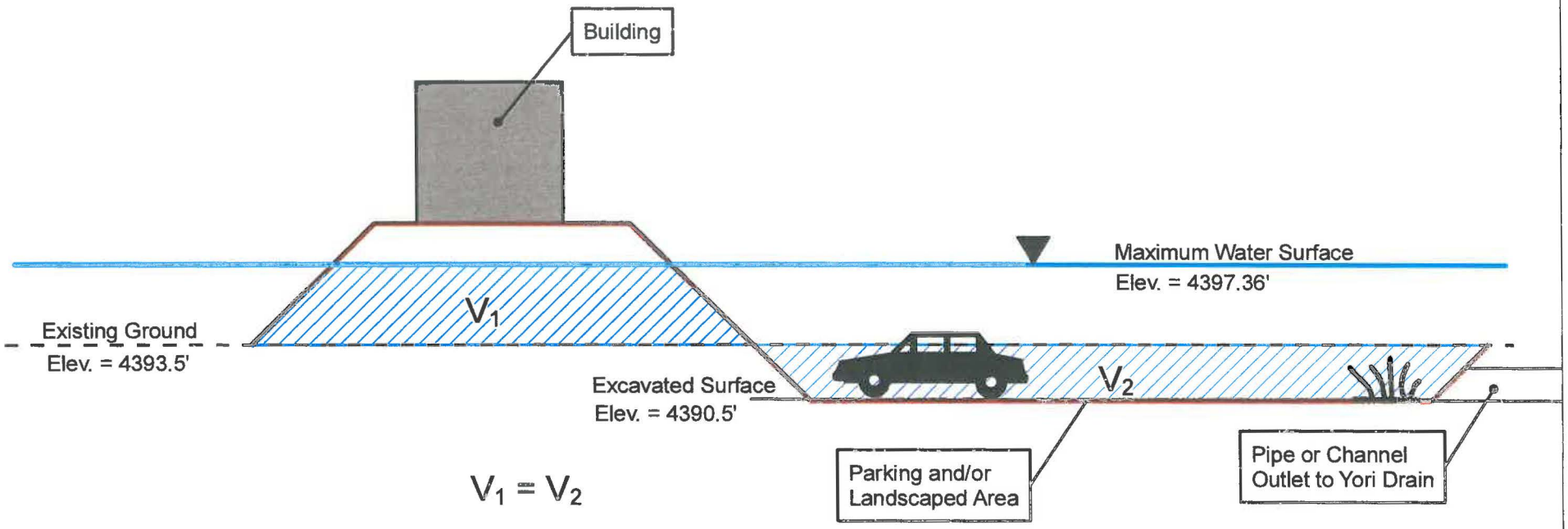

Figure 4 - Cross-Section
UNR Preliminary Master Hydrology Study
Reno, Nevada
May 2011

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PRELIMINARY

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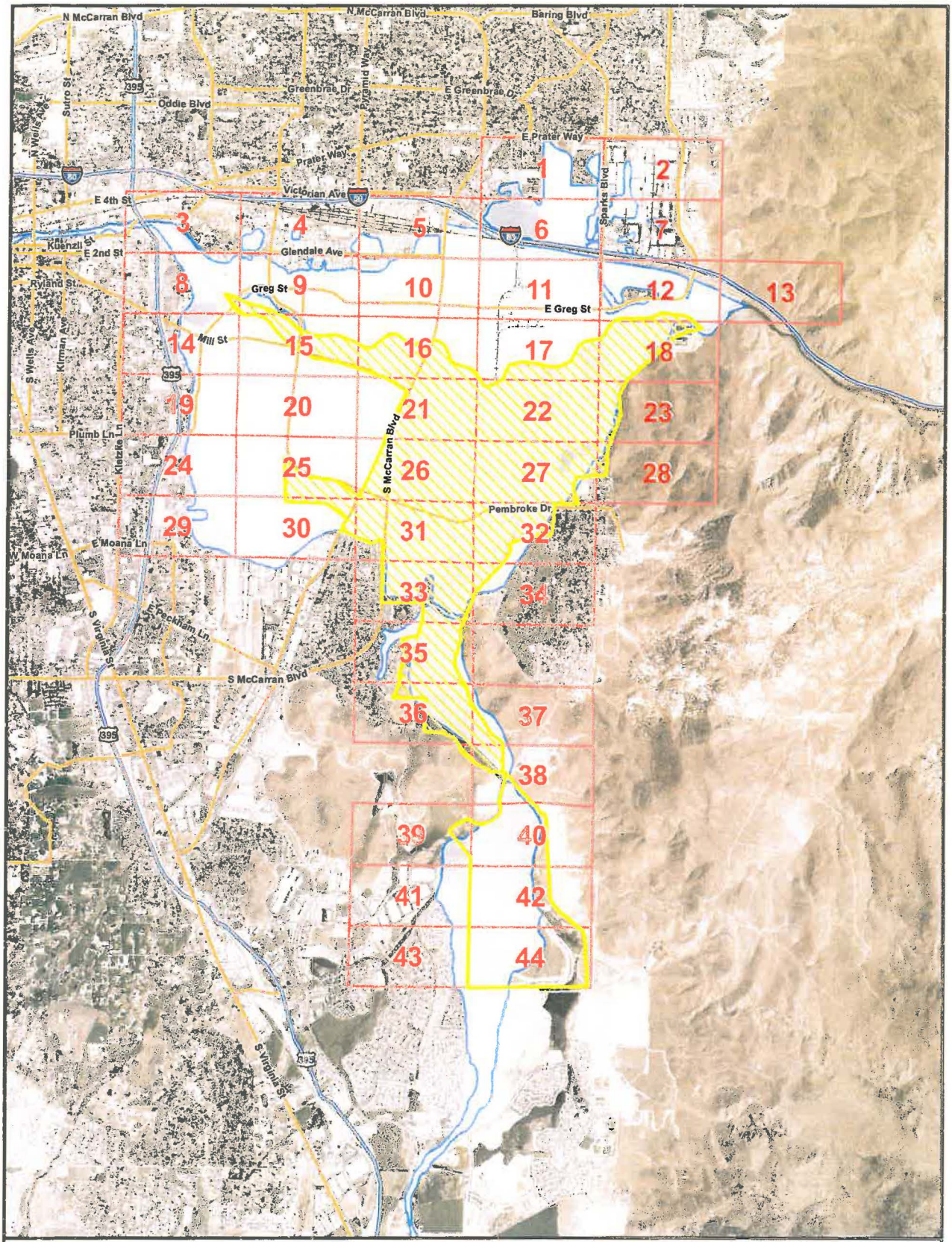
Appendix



Truckee River Flood Project
INDEX MAP:
Ground Elevation & Water Elevation

Critical Flood Pool Zone 1
Reno's Critical Flood Pool
Critical Flood Zone 1

Flood Inundation Boundary
Half-Section Index

Highways
Major Roads
Railroads

N

0 0.25 0.5 1 Miles

StatePlane_Nevada_West_FIPS_2703_Feet, NAD_1983
Grid Coordinate System Map created Sept26, 2008
TRFP_MapBook_Index_09262008.mxd jij

Produced by:
Michael Baker Corp.
9390 Gateway Dr, Suite 250
Reno, NV 89521
(775) 851-6577

EXPLANATION: Matter underlined is new; matter in brackets [ ] is material to be omitted.

BILL NO. 6724

ORDINANCE NO. 6164

AN ORDINANCE AMENDING RENO MUNICIPAL CODE, TITLE 18, "ANNEXATION AND LAND DEVELOPMENT," CHAPTER 18.12, "GENERAL DEVELOPMENT AND DESIGN STANDARDS," ARTICLE VI, "UTILITIES AND SERVICES," SECTION 18.12.605 "CRITICAL FLOOD POOLS," BY CLARIFYING REQUIREMENTS FOR FLOOD STORAGE VOLUME MITIGATION, TO ADDRESS NO ADVERSE IMPACT, AND CHAPTER 18.24 "RULES OF MEASUREMENT AND DEFINITIONS," SECTION 18.24.203 "DEFINITION OF WORDS, TERMS AND PHRASES, AND PROVIDING OTHER MATTERS PROPERLY RELATING THERETO.

SPONSORED BY: RENO CITY PLANNING COMMISSION

THE CITY COUNCIL OF THE CITY OF RENO DO ORDAIN:

SECTION 1. Chapter 18.12 of the Reno Municipal Code is hereby amended by adding certain wording to and deleting certain wording from Section 18.12.605, the same to read as follows:

Section 18.12.605. - Critical Flood [Pools] Zone 1.

(a) Any public or other improvement that changes existing grades, places fill, imports, and or displaces any volume of water [~~wherein a building or grading permit is required and that are located~~] within [~~a critical flood pool~~] Critical Flood Zone 1 for the Truckee River shall meet the following requirements:

(1) [~~Off-site~~] Storm water discharges from the project shall be limited to pre-development conditions relative to peak flows [~~and total run-off volumes~~]; and

(2) [~~No net decrease in the volume of flood storage in the critical flood pool shall be incurred as a result of development.~~] Flood storage volume mitigation meeting No Adverse Impact when displacement of available flood storage volume occurs below the 1997 water surface elevation of the Critical Flood Zone 1.

(b) Subject to the concurrence of the administrator, the requirements of (a)(1) and (a)(2) above may be met by:

(1) [~~Providing on-site or off-site improvements or alterations to satisfy the requirements;~~] Excavating one part volume for every one part volume of flood storage volume displaced. The excavation must occur within

a. the same "flood storage area" as the volume placed, and

b. at the same elevation band as the volume placed per the Elevation Map.

(2) [~~Providing on-site or off-site mitigation to satisfy the requirements;~~] When mitigation within the same Flood Storage Area and within same elevation band cannot be met because of utility conflicts, topography, high groundwater, or other conditions exist, mitigation outside of the same Flood Storage Area but within the Critical Flood Zone 1 must:

i. provide for at least one part excavation volume to one part volume displaced and

ii. demonstrate through application and output of the appropriate Truckee River Flood Project Mitigation Model the actual mitigation required

(3) [~~Any other feasible method or alternative to satisfy the requirements; or~~] The entire mitigated volume of mitigation areas must be available for flood storage during any flood event. Detention basins required by other ordinances are not eligible for mitigation of lost storage volumes.

(4) [~~Any combination of (b)(1), (2) or (3)~~] Mitigation cannot occur in conflict with and/or at same location of approved Truckee River Flood Project Features which are shown on the Truckee River Flood Project Features Maps on file with the City of Reno Community Development Department and Public Works Department, as amended, and incorporated by reference.

(5) Mitigation must occur concurrently with, or prior to, a reduction of flood storage volume.

SECTION 2. Chapter 18.24 of the Reno Municipal Code is hereby amended by adding certain wording to and deleting certain wording from Section 18.24.203, the same to read as follows:

Section 18.24.203. Definition of Words, Terms and Phrases.

Abandonment. As relates to rights-of-way and easement, "abandonment' means to abandon or vacate a public right-of-way or easement through the procedures stated in Chapter 18.06 of this title. When a right-of-way is abandoned, the ownership of the property reverts to the abutting properties as contemplated by NRS 278.479 et seq. When an easement is abandoned, the right to use the property established in the easement is terminated. Easements or rights-of-way that have been dedicated to the public may only be abandoned by ordinance of the city council.

PRELIMINARY SANITARY SEWER STUDY FOR MSFL McCARRAN CENTER PLANNED UNIT DEVELOPMENT

PREPARED FOR:

Nevada System of Higher Education,
for the benefit of the
University of Nevada, Reno
Board of Regents
Office of General Counsel, UNR
Mail Stop 550
Reno, Nevada 89557/0550

PREPARED BY:

Wood Rodgers, Inc.
5440 Reno Corporate Drive
Reno, NV 89511
(775) 823-4068

DATE:

August 30th, 2011
(Revised October 20th, 2011)

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FIGURES

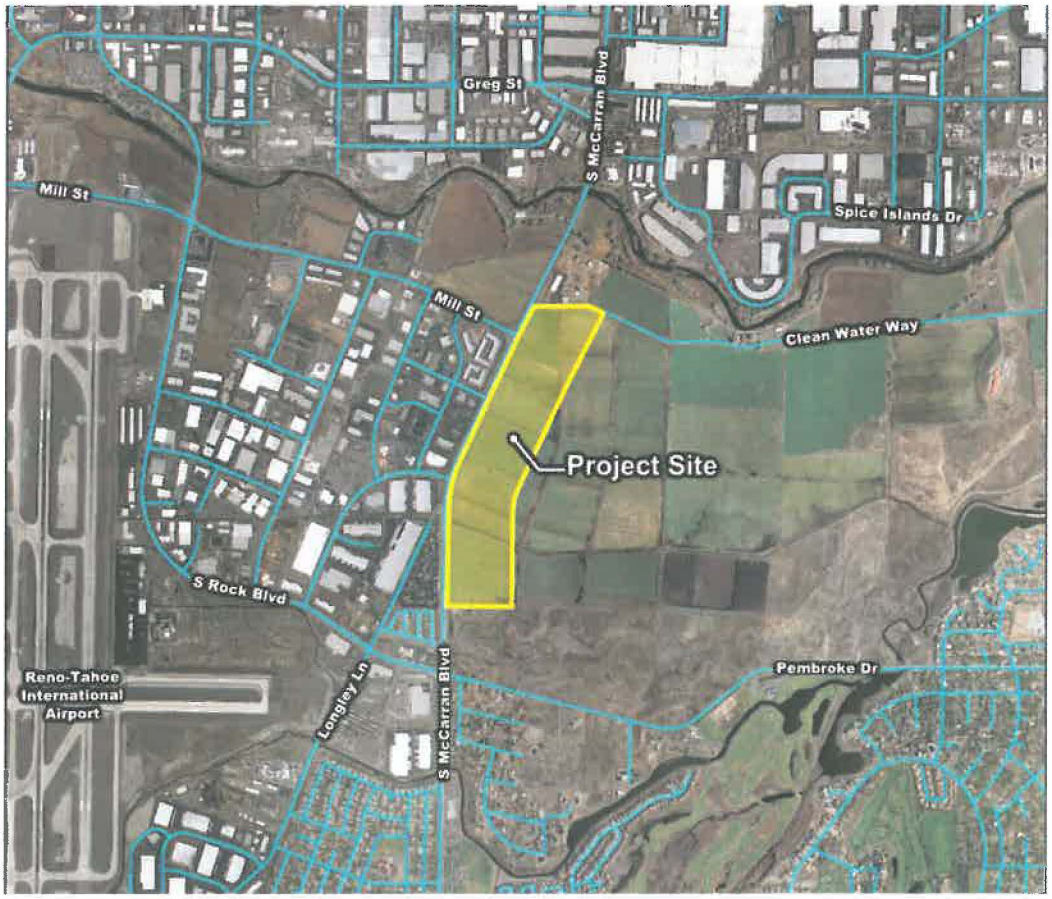
TABLES

I. INTRODUCTION

The purpose of this report is to investigate preliminary potential sanitary sewer issues generated by the MSFL McCarran Center Planned Unit Development located in Southeast Reno, east of McCarran Boulevard, south of Clean Water Way and north of Pembroke Drive. The analysis and conclusions contained herein are based on site reconnaissance, construction documents for existing infrastructure and analysis of the overall area, and land use proposed within the Planned Unit Development document, which could potentially be subject to change. It should be noted that the assumptions and calculations in this report are preliminary, and that a Technical Sanitary Sewer Study will be required prior to permit and final construction.

II. SITE LOCATION/GENERAL INFORMATION

The MSFL McCarran Center site is located within the W 1/2 of Sections 16 and 21, Township 19 North, Range 20 East, in Washoe County, Nevada. The site's location relative to the surrounding area is shown on **Figure 1 – Vicinity Map below**.



III. SEWER ANALYSIS/DISCUSSION

The project is located within the Washoe County Sewer service district, and is served by the Truckee Meadows Water Reclamation Facility (TMWRF) located to the northeast at the end of Clean Water Way. In its current state, the only sanitary sewer facility located on-site is a 60" City of Reno interceptor main that traverses the northern portion of the site at the Mill Street intersection. There are no existing sanitary sewer facilities located within Pembroke Drive to the south of the project site. Given the project's proximity to the TMWRF, it is anticipated that future development will include a direct connection to the existing 60" public main, and a gravity flow sewer network within the project site. This assumption will need to be verified to ensure the existing interceptor main is at a sufficient depth to allow for gravity flow from the southern reaches of the property.

As the MSFL McCarran Center PUD allows for flexibility within land use categories, and final site layouts are not known at this time, a Technical Sanitary Sewer Study will be required with each development permit/application on the site to assure that adequate facilities are provided to service the site. In order to study estimated sewer generation rates within the PUD at full buildout, an analysis was conducted using the City of Reno Deign Manual's peak flow rate methodology as well as an average flow rate methodology that is consistent with the thresholds in place for the Truckee Meadows Regional Planning Agency's Project of Regional Significance trigger. Reference **Table 1, Table 2 and Figure 2** below for sanitary sewer information as it relates to the project site:

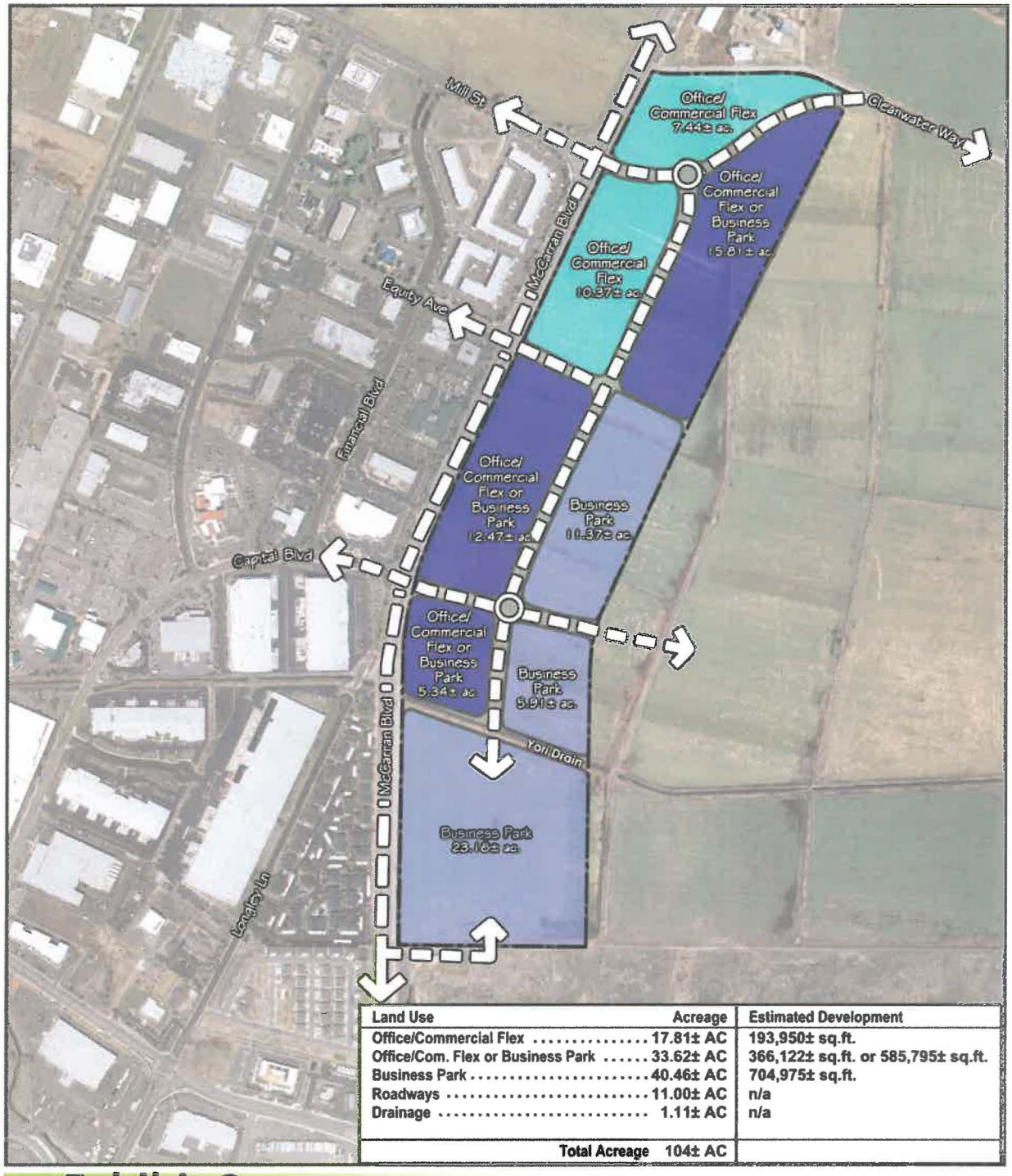
Table 1: MSFL McCarran Center Planned Unit Development – Sanitary Sewer Outflow-Peak Daily Flow Rate Analysis

Development Area	Area (acres-AC)	Unit*	GPD/Unit (Peak)	GPD	CFS
Commercial /Office Flex	17.81	AC	10,000	178,100	0.276
Commercial/Office Flex or Business Park	33.62	AC	10,000	336,200	0.520
Business Park	40.46	AC	3,200	129,472	0.200
TOTAL TO SANITARY SEWER FLOWS				**643,772**	**0.996**

Table 2: MSFL McCarran Center Planned Unit Development – Sanitary Sewer Outflow-Average Daily Flow Rate Analysis

Development Area	Gross Square Footage	Unit*	GPD/Unit (Average)	GPD	CFS
Commercial /Office Flex	193,950	1,000 gsf	100	19,395	0.030
Commercial/Office Flex or Business Park	585,795	1,000 gsf	200	117,159	0.181
Business Park	704,795	1,000 gsf	200	140,959	0.218
TOTAL TO SANITARY SEWER FLOWS				**277,513**	**0.429**

* Average Daily Flow rates taken from the City of Oakland Sanitary Sewer Design Guidelines (See Appendix for Data).



Land Use	Acreage	Estimated Development
Office/Commercial Flex	17.81± AC	193,950± sq.ft.
Office/Com. Flex or Business Park	33.62± AC	366,122± sq.ft. or 585,795± sq.ft.
Business Park	40.46± AC	704,975± sq.ft.
Roadways	11.00± AC	n/a
Drainage	1.11± AC	n/a
Total Acreage	**104± AC**	

Exhibit 2
MSFL McCarran Center PUD
Land Use Plan

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IV. CONCLUSION

The MSFL McCarran Center project site, as shown above, exceeds the Truckee Meadows Regional Planning Agency's threshold of 187,500 gpd for average daily sewer flow generation, and therefore qualifies as a Project of Regional Significance. It is important to note that due to the preliminary nature of this study, conservative estimates of possible flow generation have been provided. True flow generations from the project site will be impacted by numerous factors including ultimate tenant mix, differences in time to peak for differing uses, and development timeframes. It is also important to note that due to the project's proximity to an existing 60" interceptor sewer line and to the TMWRF, development of the project can be conducted with negligible impacts to the existing infrastructure in place. It is recommended that a Master Technical Sanitary Sewer Study should be completed during final design to study in detail the existing infrastructure in place, and to accurately model and size the proposed on-site sewer network to be constructed.

V REFERENCES

City of Reno (Revised January 2009). *Public Works Design Manual.*
City of Oakland, California. *Sanitary Sewer Design Guidelines.*

APPENDIX – ***MSFL McCarran Center Preliminary Sanitary Sewer Backup***

1. Mains (8 inches to 10 inches) - 350 gallons per capita per day (peak flow).

2. Trunk sewers (over 10 inches and under 18 inches) and interceptor sewers - (18 inches and over) - 250 gallons per capita per day (peak flow).

OCCUPANCY RATES

The following are minimum occupancy rates for dwelling units in computing sewage contributions:

1.	Single Family Residential	3.0	capita/dwelling unit
2.	Condominium	2.0	capita/dwelling unit
3.	Mobile Home	2.5	capita/dwelling unit
4.	Apartment	2.0	capita/dwelling unit

QUANTITY OF SANITARY SEWAGE PER ACRE

The following are minimum quantities of sanitary sewage per acre for computing sewage contributions from non-residential sources:

1.	Office	3,200	gal. per acre per day (peak flow)
2.	Public Facility	3,200	gal. per acre per day (peak flow)
3.	Commercial	10,000	gal. per acre per day (peak flow)
	Resort Hotels and Casinos	650	gal. per day per room (peak flow)
	Motels	500	gal. per day per room (peak flow)
4.	Industrial (unless water intensive usage is identified)	3,000	gal. per acre per day (peak flow)

The City Engineer may require different design quantities based on an individual case review.

SECTION 3. - Design and General Requirements:

1. Design Requirements for Public Sewers:

18. Tables

TOC

Table 1 – Average Flow Rate on Specific Developments

Development	Ave Daily Flow, gpd/unit	Unit
Auditorium	5	Seat
Automobile parking	25	1000 Gross square feet
Automobile repair garage	100	1000 Gross square feet
Bakery	300	1000 Gross square feet
Bar	20	Seat
Cafeteria	50	Seat
Carwash – coin operated	206	Stall
Carwash – in bay	412	5 gallons per minute (peak)
Church – fixed seat	5	Seat
Commercial	100	1000 Gross square feet
Community center	5	Occupant
Gymnasium	300	1000 Gross square feet
Hospital - Convalescent	85	Bed
Hospital – dog and cat	300	1000 Gross square feet
Hospital – non-profit	85	Bed
Hospital - surgical	500	Bed
Industrial	412	Gallons per minute (peak)
Jail	85	Inmate
Dog kennel / open	100	1000 Gross square feet
Laboratory - commercial	300	1000 Gross square feet
Laundromat - industrial	412	Gallons per minute (peak)
Laundromat	220	Washer
Manufacturing - industry	100	1000 Gross square feet
Medical building	300	1000 Gross square feet
Motel	150	Room
Office building	200	1000 Gross square feet
Dormitory – college or residential	85	Student
Residential – townhouses, set grade	330	Dwelling unit
Residential – bachelor/single	100	Dwelling unit
Residential – 1 bedroom apartment or condominium	150	Dwelling unit
Residential – 2 bedrooms apartment or condominium	200	Dwelling unit
Residential – 3 bedrooms apartment of condominium	250	Dwelling unit
Residential – boarding house	85	Bed
Residential - duplex	300	Dwelling unit
Residential – mobile home	200	Home space
Residential – single family dwelling	330	Dwelling unit
Residential – artist dwelling (2/3 area)	300	1000 Gross square feet
Residential – artist dwelling	100	Dwelling unit

Water Resources Electronic Map

- Care Facilities
- Schools
- Fire Stations
- Libraries
- Police
- Sheriff
- Government Facilities

City of Reno Utilities

- Sparks_mh
- City of Reno Sewer Lines
- City of Sparks Sewer Lines
- City of Reno Storm Pipes
- Water Courses
- Railroad
- Parcel Base

County Grids

- Sections

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Department of Water Resources

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http://wcwrgis.washoecounty.us/electronicMap/wr_system/web/mwf/outside_firewall_consult.mwf

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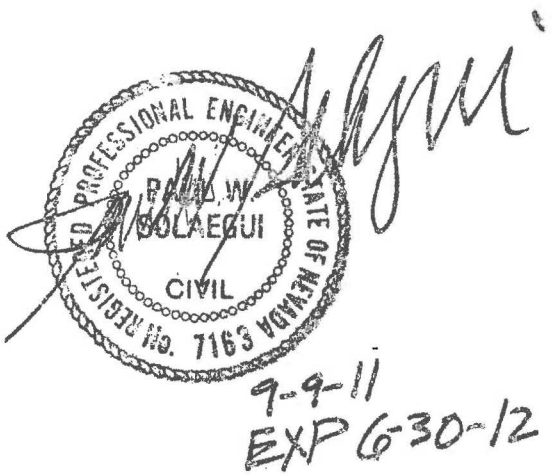
SOLAEGUI
ENGINEERS, LTD

MSFL McCARRAN CENTER

TRAFFIC ANALYSIS

SEPTEMBER, 2011



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MSFL McCARRAN CENTER

TRAFFIC ANALYSIS

EXECUTIVE SUMMARY

The proposed MSFL McCarran Center development is located in the City of Reno, Nevada. The project site is located east of McCarran Boulevard, south of Clearwater Way and north of Rock Boulevard. The site is currently agricultural land. The purpose of this study is to address the project's impact upon the adjacent street network. The McCarran Boulevard intersections with Mill Street, Equity Avenue, Capital Boulevard, and Rock Boulevard and two proposed project accesses on McCarran Boulevard have been identified for intersection capacity analysis for the existing and existing plus project scenarios. The sections of McCarran Boulevard, Mill Street and the Southeast Connector in the vicinity of the site have been identified for roadway capacity analysis for the 2018 and 2030 base and base plus project scenarios.

The Land Use Plan for the proposed MSFL McCarran Center development indicates that the project will include 35.1± acres of business park, 23.2± acres of business park or mixed residential, 17.8± acres of office/commercial flex, 15.8± acres of office/commercial flex or business park, and 12.1± acres of roadways/drainage for a total of 104± acres. The project is expected to generate a maximum of 18,290 average daily trips with a maximum of 1,976 trips occurring during the AM peak hour and 2,032 trips occurring during the PM peak hour.

Traffic generated by the proposed MSFL McCarran Center development will have some impact on the adjacent street network. The following recommendations are made to mitigate project traffic impacts.

It is recommended that any required signing, striping or traffic control improvements comply with City of Reno requirements.

It is recommended that the McCarran Boulevard/Mill Street intersection be improved to include one left turn lane and one right turn lane at both the north and south approaches and dual left turn lanes, one through lane, and one right turn lane at both the east and west approaches.

It is recommended that the McCarran Boulevard/Equity Avenue intersection be improved to include an exclusive left turn lane at the north approach, an exclusive right turn lane at the south approach, and one right turn lane with stop sign control at the east project access approach. The left turn and through movements at the east approach shall be prohibited.

It is recommended that a traffic signal be constructed at the McCarran Boulevard/Capital Boulevard intersection when warranted and the intersection be improved to include an exclusive left turn lane at the north approach, an exclusive right turn lane at the south approach, and a minimum of one left turn lane and one shared through-right turn lane at both the east and west approaches.

It is recommended that the McCarran Boulevard/South Residential Access intersection be improved to include an exclusive left turn lane at the north approach, an exclusive right turn lane at the south approach, and one right turn lane with stop sign control at the east project access approach. The left turn movement at the east approach shall be prohibited.

It is recommended that the McCarran Boulevard/North Residential Access intersection be constructed to serve right-in and right-out movements only with an exclusive right turn lane at the south approach. The access shall be located to meet access management standards for driveway spacing.

It is recommended that these intersection improvements be coordinated with the Southeast McCarran Boulevard Widening Project.

INTRODUCTION

STUDY AREA

The proposed MSFL McCarran Center development is located in the City of Reno, Nevada. The project site is located east of McCarran Boulevard, south of Clearwater Way and north of Rock Boulevard. The location of the site is shown on Figure 1. The purpose of this study is to address the project's impact upon the adjacent street network. The McCarran Boulevard intersections with Mill Street, Equity Avenue, Capital Boulevard, and Rock Boulevard and two proposed project accesses on McCarran Boulevard have been identified for intersection capacity analysis for the existing and existing plus project scenarios. The sections of McCarran Boulevard, Mill Street and the Southeast Connector in the vicinity of the site have been identified for roadway capacity analysis for the 2018 and 2030 base and base plus project scenarios.

EXISTING AND PROPOSED LAND USES

The project site is currently agricultural land. Adjacent development generally includes agricultural land to the north and east, undeveloped land to the south, and a business park development to the west across McCarran Boulevard. The Land Use Plan for the proposed MSFL McCarran Center development indicates that the project will include 35.1± acres of business park, 23.2± acres of business park or mixed residential, 17.8± acres of office/commercial flex, 15.8± acres of office/commercial flex or business park, and 12.1± acres of roadways/drainage for a total of 104± acres.

EXISTING AND PROPOSED ROADWAYS AND INTERSECTIONS

McCarran Boulevard is a four-lane roadway with two lanes in each direction in the vicinity of the site. The speed limit is posted for 50 miles per hour. Roadway improvements generally include curb and gutters in some areas and paved shoulders in other areas with a raised center median. The six-lane widening of McCarran Boulevard from Longley Lane to Greg Street is currently under design and anticipated to be completed by 2014.

Mill Street is a four-lane roadway with two lanes in each direction west of McCarran Boulevard. The speed limit is posted for 45 miles per hour. Roadway improvements generally include curb and gutters with a center two-way left turn lane. With development of the project Mill Street will be extended east of McCarran Boulevard to provide access.

Rock Boulevard is a four-lane roadway with two lanes in each direction west of McCarran Boulevard. The speed limit is posted for 35 miles per hour. Roadway improvements generally include curb, gutter, and sidewalks with a center two-way left turn lane.

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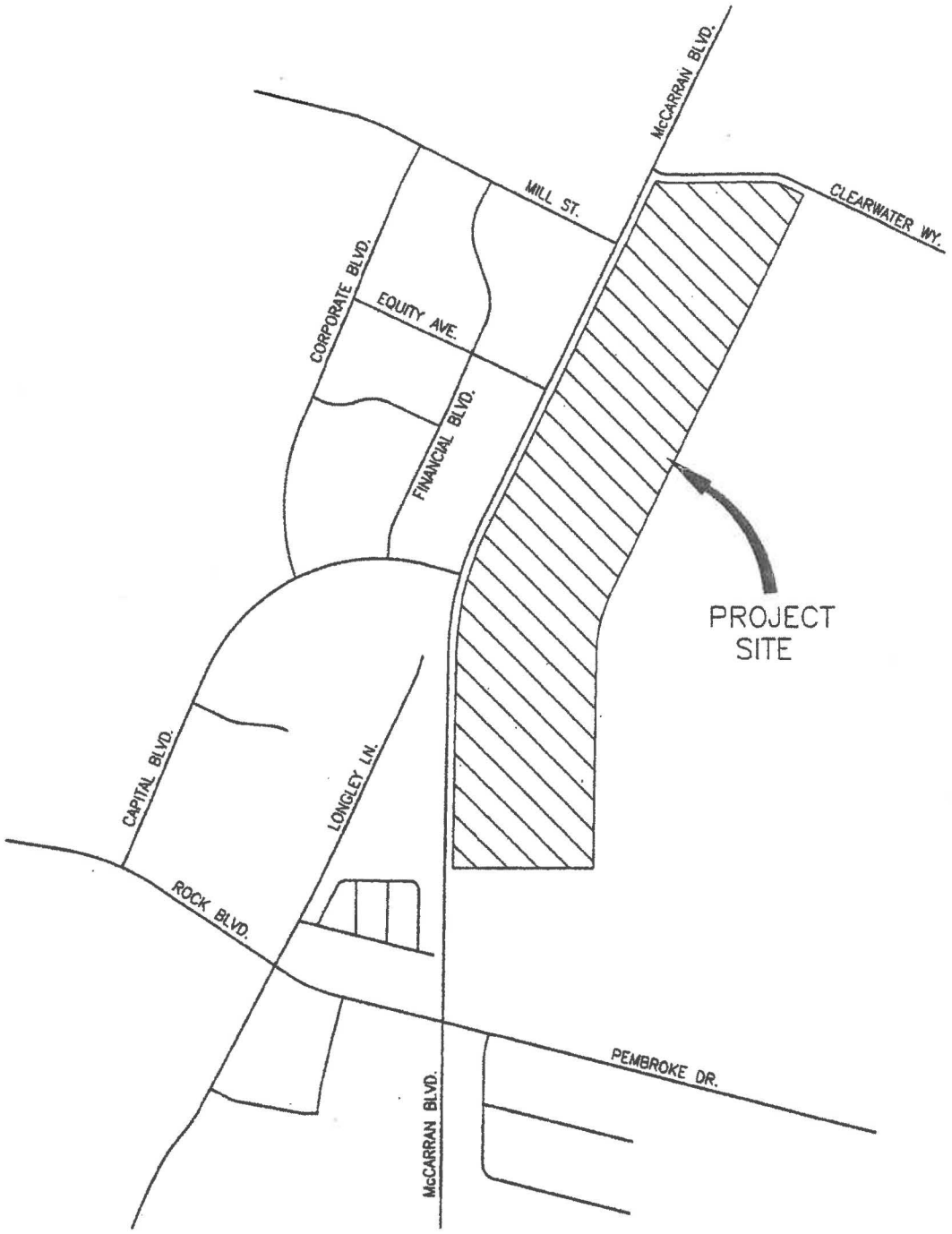

MSFL McCARRAN CENTER

VICINITY MAP

FIGURE 1

Pembroke Drive is a two-lane roadway with one-lane in each direction east of McCarran Boulevard. Pembroke Drive aligns with Rock Boulevard. The speed limit is posted for 40 miles per hour. Roadway improvements generally include paved travel lanes with graded shoulders.

Equity Avenue is a two-lane roadway with one lane in each direction west of McCarran Boulevard. The speed limit is not posted. Roadway improvements generally include curb and gutters with a center two-way left turn lane. With development of the site Equity Avenue will be extended east of McCarran Boulevard to provide project access.

Capital Boulevard is a two-lane roadway with one lane in each direction west of McCarran Boulevard. The speed limit is not posted. Roadway improvements generally include curb, gutter, and sidewalks with a center two-way left turn lane. A raised center median exists near McCarran Boulevard. With development of the site Capital Boulevard will be extended east of McCarran Boulevard to provide project access.

Two additional project accesses are proposed from McCarran Boulevard. Both accesses will serve the mixed residential/business park parcel. The south access will align with the existing median opening on McCarran Boulevard at the project's south boundary. The north access will be located south of Yori Drain and will serve right-in/right-out movements only.

The McCarran Boulevard/Mill Street intersection is a signalized "T" intersection with protected left turn phasing at the south approach. The north approach contains one through lane and one shared through-right turn lane separated by a large corner island. The south approach contains one left turn lane and two through lanes. The west approach contains one left turn lane and one shared left turn-right turn lane separated by a larger corner island. With development of the project the intersection will be improved as a four-leg intersection.

The McCarran Boulevard/Rock Boulevard/Pembroke Drive intersection is a signalized four-leg intersection with protected left turn phasing at the north and south approaches and protected/ permissive left turn phasing at the east and west approaches. The north and south approaches each contain one left turn lane, two through lanes, and one tapered right turn lane. The east approach contains on left turn lane, two through lanes and a tapered right turn lane. The west approach contains one left turn lane, one through lane, and one right turn lane.

The McCarran Boulevard/Equity Avenue intersection is an unsignalized "T" intersection with stop sign control at the west approach. The north approach contains one through lane and one shared through-right turn lane. The south approach contains one left turn lane and two through lanes. The west approach contains one right turn lane. With development of the project the intersection will be improved as a four-leg intersection.

The McCarran Boulevard/Capital Boulevard intersection is an unsignalized "T" intersection with stop sign control at the west approach. The north approach contains one through lane and one shared through-right turn lane. The south approach contains one left turn lane and two through lanes. The west approach contains one right turn lane. With development of the project the intersection will be improved as a four-leg intersection.

TRIP GENERATION

In order to assess the magnitude of traffic impacts of the proposed development on the key roadways and intersections, trip generation rates and peak hours had to be determined. Trip generation rates were obtained from the Eighth Edition of *ITE Trip Generation* (2008) for Land Uses 220: Apartments, 710: General Office Building, 770: Business Park, and 820: Shopping Center. The Land Use Plan for the proposed development indicates that the project will include 35.1± acres of business park, 23.2± acres of business park or mixed residential, 17.8± acres of office/commercial flex, and 15.8± acres of office/commercial flex or business park. Three alternate trip generation scenarios were therefore calculated in order to determine the highest number of trips. The first alternate includes 91.9 acres of business park and 475 apartments. The second alternate includes 50.9 acres of business park, 475 apartments, and 97,000 square feet of both office and shopping center. The third alternate includes 35.1 acres of business park, 475 apartments, and 183,000 square feet of both office and shopping center. The square footage for the office and shopping center land uses was estimated based on a 25% floor area ratio.

Trips generated by the project were calculated for the peak hours between 7:00 and 9:00 AM and 4:00 and 6:00 PM which correspond to the peak hours of adjacent street traffic. The trip generation worksheets are included in the Appendix. Table 1 shows a summary of the average daily traffic volumes and peak hour volumes generated by the three land use alternates and the recommended values that will be used in the analysis.

TABLE 1
TRIP GENERATION

		AM PEAK HOUR		PM PEAK HOUR	
LAND USE	ADT	IN	OUT	IN	OUT
Alternate 1					
Business Park, 91.9 AC	13,766	1,473	260	310	1,238
Apartment, 475 DU	3,159	48	195	190	105
Total	16,925	1,521	455	500	1,343
Alternate 2					
Business Park, 50.9 AC	7,624	816	144	172	686
Office, 97 KSF	1,068	132	18	24	120
Shopping Center, 97 KSF	4,165	59	38	178	184
Apartment, 475 DU	3,159	48	195	190	105
Total	16,016	1,055	395	564	1,095
Alternate 3					
Business Park, 35.1 AC	5,258	563	99	118	473
Office, 183 KSF	2,015	249	35	46	227
Shopping Center, 183 KSF	7,858	112	71	335	348
Apartment, 475 DU	3,159	48	195	190	105
Total	18,290	972	400	689	1,153
RECOMMENDED	**18,290**	**1,521**	**455**	**689**	**1,343**

TRIP DISTRIBUTION AND ASSIGNMENT

The distribution of the project traffic to the key intersections was based upon existing peak hour traffic patterns and the locations of attractions and productions in the area. The anticipated directions of approach are shown in Figure 2. The project trips were subsequently assigned to the key intersections based on the directions of approach shown in Figure 2. Figure 3 shows the AM and PM peak hour project trip assignment at the key intersections.

EXISTING AND PROJECTED TRAFFIC VOLUMES

The existing AM and PM peak hour traffic volumes at the key intersections were obtained from traffic counts taken during August and September of 2011. Existing counts were also conducted at the McCarran Boulevard/Clearwater Way intersection due to the fact that traffic currently using Clearwater will reroute to the Mill Street Extension. The existing AM and PM peak hour traffic volumes at the key intersections are shown in Figure 4. Figure 5 shows the existing plus project traffic volumes during the AM and PM peak hours. The existing plus project traffic volumes were obtained by adding the trip assignment volumes shown in Figure 3 to the existing traffic volumes shown in Figure 4. Figure 6 shows the 2018 average daily traffic volumes on the key roadways for the base and base plus project scenarios. Figure 7 shows the 2030 average daily traffic volumes on the key roadways for the base and base plus project scenarios. The 2018 and 2030 average daily traffic volumes were obtained directly from the Regional Transportation Commission's (RTC) traffic forecasting model.

INTERSECTION CAPACITY ANALYSIS

The key intersections were analyzed for capacity based on procedures presented in the *Highway Capacity Manual* (2000), prepared by the Transportation Research Board, for unsignalized and signalized intersections.

The result of capacity analysis is a level of service (LOS) rating for each signalized intersection and unsignalized intersection minor movement. Level of service is a qualitative measure of traffic operating conditions where a letter grade "A" through "F", corresponding to progressively worsening traffic operation, is assigned to the signalized intersection or unsignalized intersection minor movement.

The Highway Capacity Manual defines level of service for stop controlled intersections in terms of computed or measured control delay for each minor movement. Level of service is not defined for the intersection as a whole. The unsignalized intersection level of service criteria are shown in Table 2.

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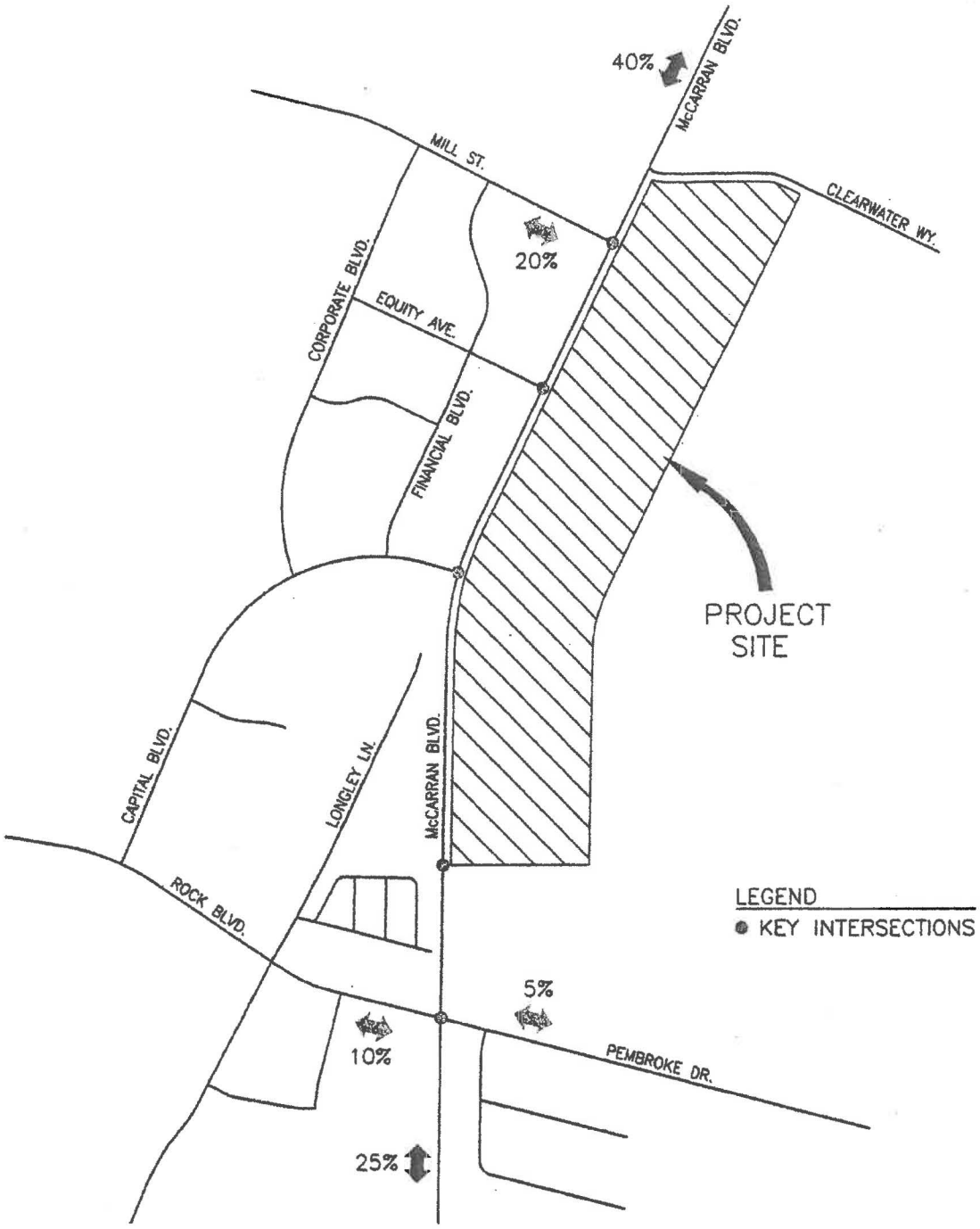

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DIRECTIONS OF APPROACH

FIGURE 2

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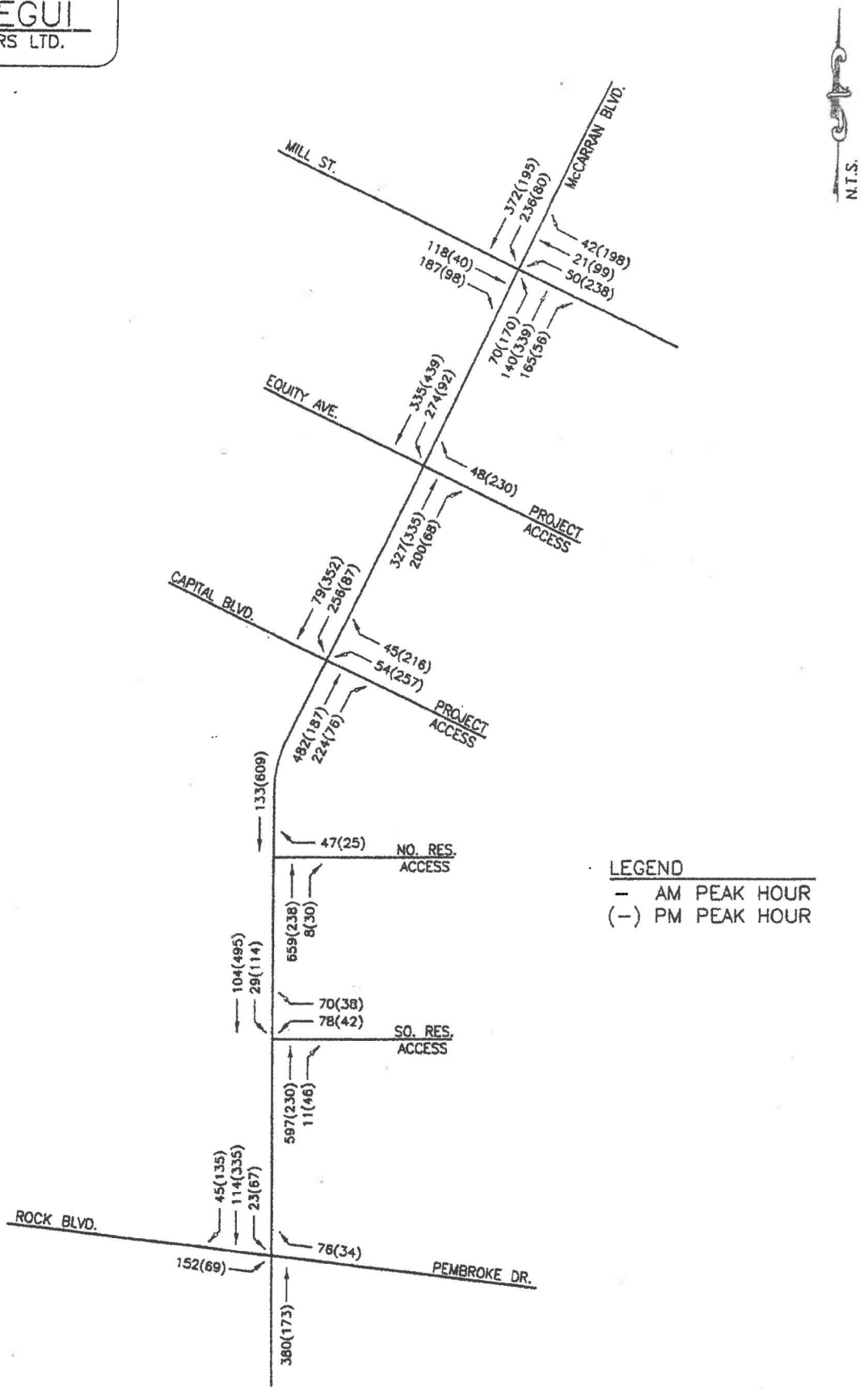

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PEAK HOUR TRIP ASSIGNMENT
FIGURE 3

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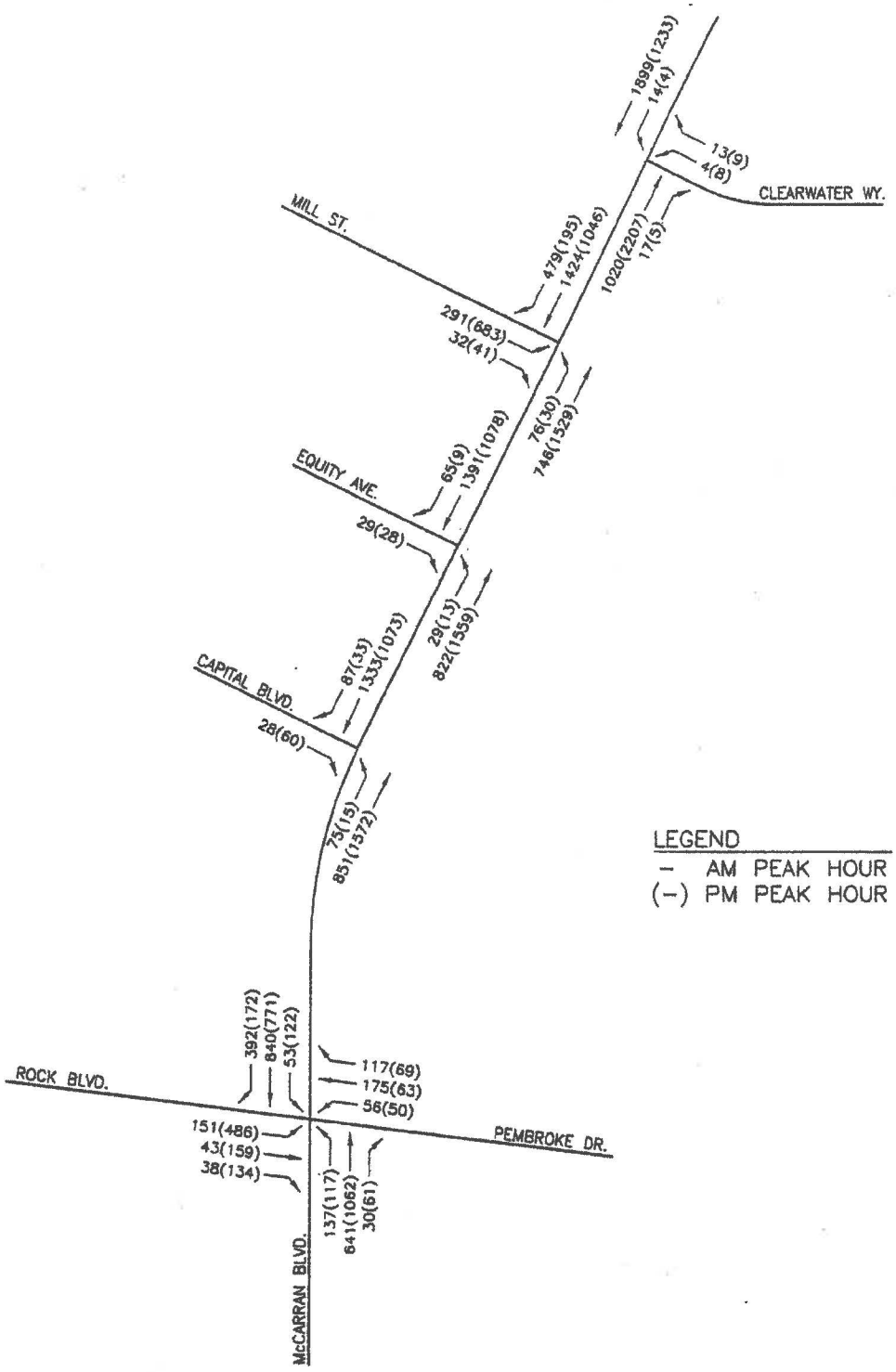

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EXISTING PEAK HOUR TRAFFIC VOLUMES

FIGURE 4

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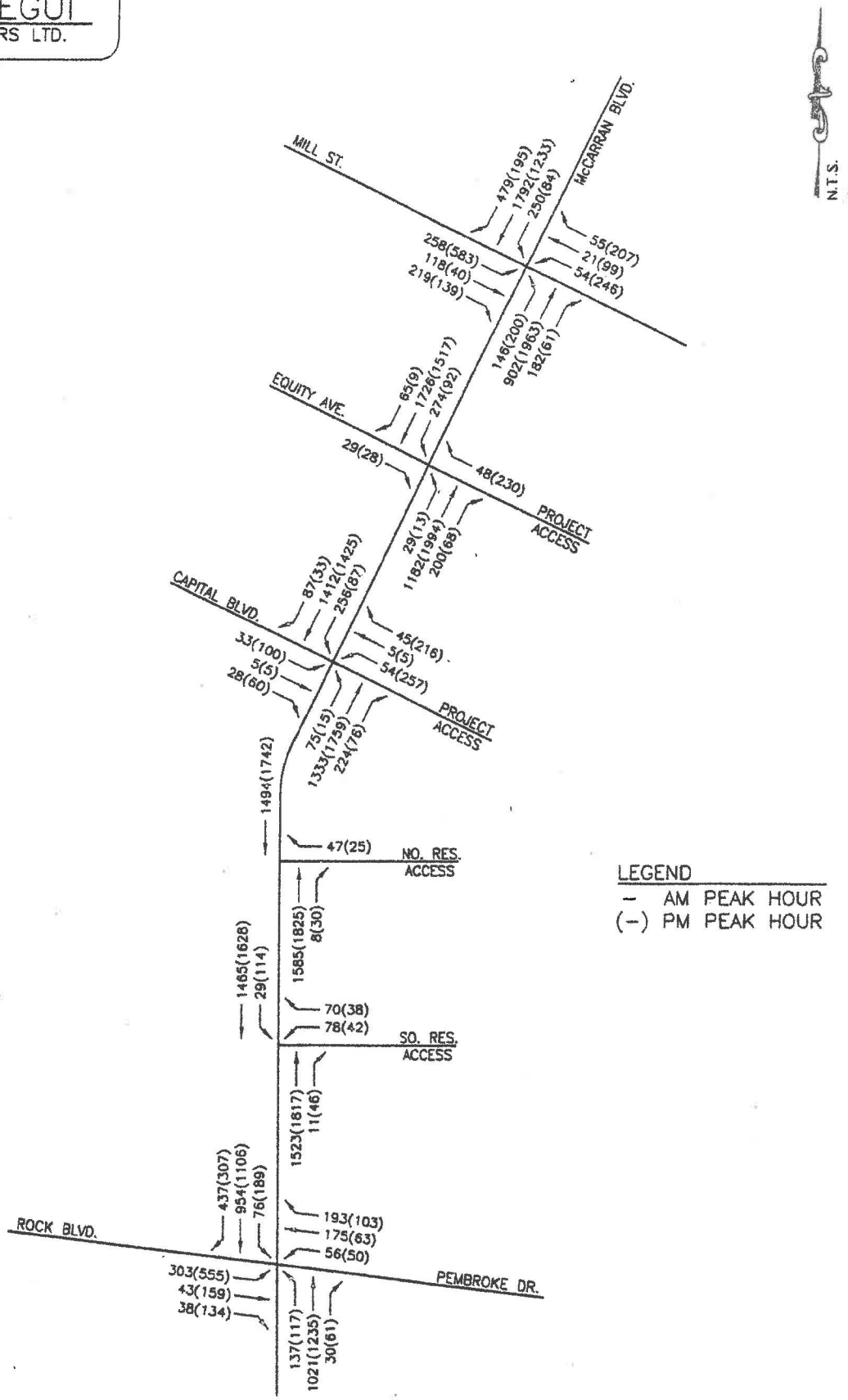

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EXISTING PLUS PROJECT PEAK HOUR TRAFFIC VOLUMES

FIGURE 5

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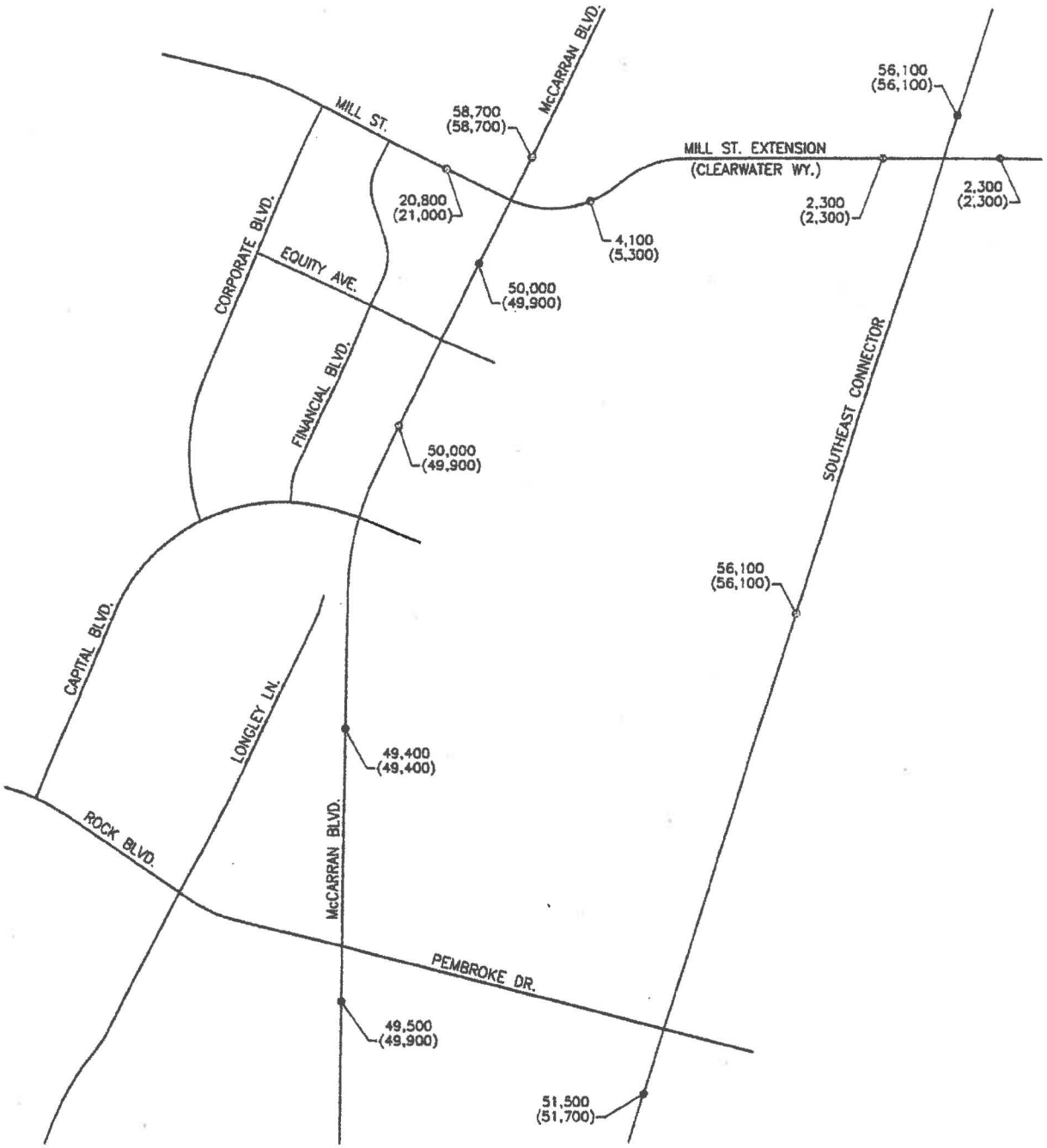
LEGEND
– BASE
(–) BASE PLUS PROJECT



MSFL McCARRAN CENTER
2018 AVERAGE DAILY TRAFFIC VOLUMES
FIGURE 6

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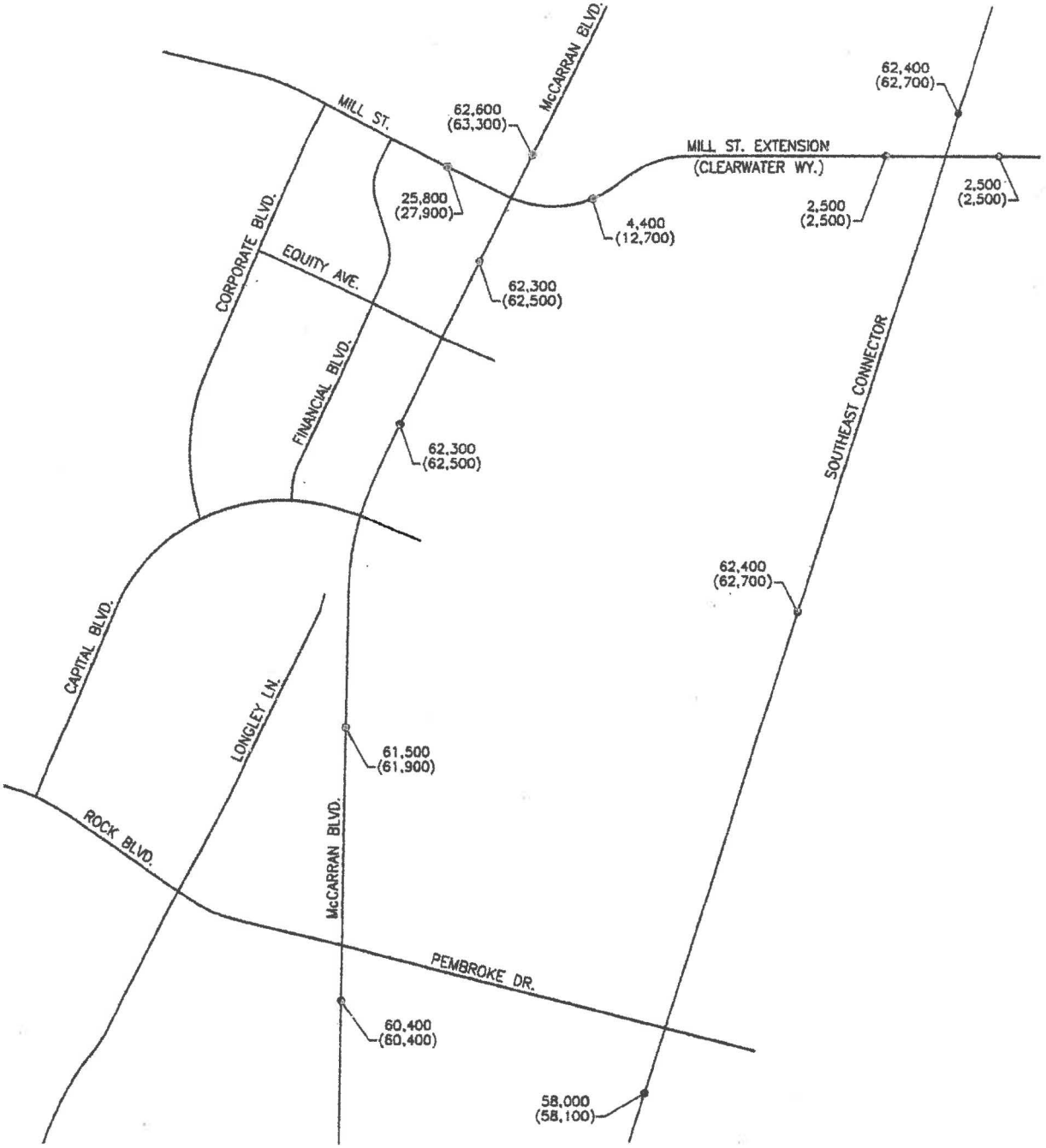
LEGEND
– BASE
(–) - BASE PLUS PROJECT



MSFL McCARRAN CENTER
2030 AVERAGE DAILY TRAFFIC VOLUMES
FIGURE 7

TABLE 2
LOS CRITERIA FOR UNSIGNALIZED INTERSECTIONS

LEVEL OF SERVICE	DELAY RANGE (SEC/VEH)
A	≤10
B	>10 and ≤15
C	>15 and ≤25
D	>25 and ≤35
E	>35 and ≤50
F	>50

The level of service for signalized intersections is stated in terms of the average control delay per vehicle for a peak 15 minute analysis period. The signalized intersection level of service criteria are shown in Table 3.

TABLE 3
LOS CRITERIA FOR SIGNALIZED INTERSECTIONS

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (SEC)
A	≤10
B	>10 and ≤20
C	>20 and ≤35
D	>35 and ≤55
E	>55 and ≤80
F	>80

Table 4 shows a summary of the level of service and delay results at the key intersections for the existing and existing plus project scenarios. The intersection capacity worksheets are included in the Appendix.

TABLE 4
INTERSECTION LEVEL OF SERVICE AND DELAY RESULTS

INTERSECTION	EXISTING AM	EXISTING PM	EX. + PROJECT AM	EX. + PROJECT PM
McCarran/Mill				
Signalized (2 NB/SB Thru Lanes)	C34.1	C20.6	D54.3	F82.4
Signalized (3 NB/SB Thru Lanes)	N/A	N/A	D38.2	D42.6
McCarran/Rock/Pembroke				
Signalized	C27.2	D39.8	C33.9	D49.6
McCarran/Equity				
Unsignalized				
NB Left	B12.3	A9.8	C18.4	B13.0
SB Left	N/A	N/A	C19.6	D34.8
WB Right	N/A	N/A	B10.4	B14.4
EB Right	B10.7	A.7	B10.3	B10.2
McCarran/Capital				
Unsignalized				
NB Left	C15.9	B11.6	N/A	N/A
EB Right	C15.1	B13.5	N/A	N/A
Signalized	N/A	N/A	C34.7	C34.9
McCarran/North Residential Access				
Unsignalized				
WB Right	N/A	N/A	C17.4	C18.7
McCarran/South Residential Access				
Unsignalized				
SB Left	N/A	N/A	B14.0	D28.0
WB Left/Right	N/A	N/A	F1876	F4659

McCarran Boulevard/Mill Street

The McCarran Boulevard/Mill Street intersection was analyzed for capacity as a signalized "T intersection for the existing traffic volumes and as a signalized four-leg intersection for the existing plus project traffic volumes. The intersection currently operates at LOS C with a delay of 34.1 seconds per vehicle during the AM peak hour and 20.6 seconds per vehicle during the PM peak hour. For the existing plus project traffic volumes the intersection is anticipated to operate at LOS D with a delay of 54.3 seconds per vehicle during the AM peak hour and LOS F with a delay of 82.4 seconds per vehicle during the PM peak hour. The McCarran Boulevard/Mill Street intersection was analyzed with the existing approach lanes for the existing traffic volumes.

For the existing plus project traffic volumes the intersection was analyzed with one left turn lane, two through lanes, and one right turn lane at the north and south approaches and dual left turn lanes, one through lane, and one right turn lane at the east and west approaches. The six-lane widening of McCarran Boulevard from Longley Lane to Greg Street is currently under design and anticipated to be completed by 2014. Even if delayed beyond 2014 the six-lane widening will easily be completed before full buildout of the project. With three northbound and southbound through lanes the intersection is anticipated to operate at LOS D with a delay of 38.2 seconds per vehicle during the AM peak hour and 42.6 seconds per vehicle during the PM peak hour. It is recommended that the McCarran Boulevard/Mill Street intersection be improved to include one left turn lane and one right turn lane at both the north and south approaches and dual left turn lanes, one through lane, and one right turn lane at both the east and west approaches.

McCarran Boulevard/Rock Boulevard/Pembroke Drive

The McCarran Boulevard/Rock Boulevard/Pembroke Drive intersection was analyzed as a signalized four-leg intersection for the existing and existing plus project traffic volumes. The intersection currently operates at LOS C with a delay of 27.2 seconds per vehicle during the AM peak hour and LOS D with a delay of 39.8 seconds per vehicle during the PM peak hour. With the addition of project traffic the intersection is anticipated to operate at LOS C with a delay of 33.9 seconds per vehicle during the AM peak hour and LOS D with a delay of 49.6 seconds per vehicle during the PM peak hour. The intersection was analyzed with the existing approach lanes for the existing and existing plus project traffic volumes. The six-lane widening of McCarran Boulevard from Longley Lane to Greg Street is currently under design and anticipated to be completed by 2014. These widening improvements will provide additional capacity at the intersection.

McCarran Boulevard/Equity Avenue

The McCarran Boulevard/Equity Avenue intersection was analyzed as an unsignalized "T" intersection with stop sign control at the west approach for the existing traffic volumes. The northbound left turn and eastbound right turn movements currently operate at LOS B or better during the AM and PM peak hours. The intersection was analyzed with the existing approach lanes for the existing traffic volumes. The intersection was subsequently analyzed as an unsignalized four-leg intersection with stop sign control at the east and west approaches for the existing plus project traffic volumes. For the existing plus project traffic volumes the left turn movements at the north and south approaches and the right turn movements at the east and west approaches are anticipated to operate at LOS D or better during the AM and PM peak hours. For the existing plus project traffic volumes the intersection was analyzed with one left turn lane, one through lane, and one shared through-right turn lane at the north approach; one left turn lane, two through lanes, and one right turn lane at the south approach; and one right turn lane at both the east and west approaches. The six-lane widening of McCarran Boulevard from Longley Lane to Greg Street is currently under design and anticipated to be completed by 2014. These widening improvements will provide additional capacity at the intersection.

It is recommended that the McCarran Boulevard/Equity Avenue intersection be improved to include an exclusive left turn lane at the north approach, and exclusive right turn lane at the south approach, and one right turn lane with stop sign control at the east project access approach. The left turn and through movements at the east approach shall be prohibited.

McCarran Boulevard/Capital Boulevard

The McCarran Boulevard/Capital Boulevard intersection was analyzed for capacity as an unsignalized "T" intersection with stop sign control at the west approach for the existing traffic volumes. The northbound left turn and eastbound right turn movements currently operate at LOS C or better during the AM and PM peak hours. The intersection was analyzed with the existing approach lanes for the existing traffic volumes. The intersection was subsequently analyzed for capacity as a signalized four-leg intersection for the existing plus project traffic volumes. Peak hour traffic signal warrant 3 per the Manual on Uniform Traffic Control Devices (MUTCD) is met for the existing plus project traffic volumes. For the existing plus project traffic volumes the signalized intersection is anticipated to operate at LOS C with a delay of 34.7 seconds per vehicle during the AM peak hour and 34.9 seconds per vehicle during the PM peak hour. For the existing plus project traffic volumes the intersection was analyzed with one left turn lane, one through lane, and one shared through-right turn lane at the north approach; one left turn lane, two through lanes, and one right turn lane at the south approach; and one left turn lane and one shared through-right turn lane at the east and west approaches. The six-lane widening of McCarran Boulevard from Longley Lane to Greg Street is currently under design and anticipated to be completed by 2014. These widening improvements will provide additional capacity at the intersection. It is recommended that a traffic signal be constructed at the McCarran Boulevard/Capital Boulevard intersection when warranted and the intersection be improved to include an exclusive left turn lane at the north approach, an exclusive right turn lane at the south approach, and a minimum of one left turn lane and one shared through-right turn lane at both the east and west approaches.

McCarran Boulevard/North Residential Access

The McCarran Boulevard/North Residential Access intersection was analyzed for capacity as an unsignalized, right-in/right-out intersection with stop sign control at the east approach for the existing plus project traffic volumes. The westbound right turn movement is anticipated to operate at LOS C during the AM and PM peak hours. The intersection was analyzed with two through lanes at the north approach; one through lane and one shared through-right turn lane at the south approach; and one right turn lane at the east approach. The six-lane widening of McCarran Boulevard from Longley Lane to Greg Street is currently under design and anticipated to be completed by 2014. These widening improvements will provide additional capacity at the intersection. It is recommended that the McCarran Boulevard/North Residential Access intersection be constructed to serve right-in and right-out movements only and contain an exclusive right turn lane at the south approach.

McCarran Boulevard/South Residential Access

The McCarran Boulevard/South Residential Access intersection was analyzed for capacity as an unsignalized, full movement intersection with stop sign control at the east approach for the existing plus project traffic volumes. The westbound left turn movement is anticipated to operate at LOS F during the AM and PM peak hours. The intersection was analyzed with one left turn lane and two through lanes at the north approach; one through lane and one shared through-right turn lane at the south approach; and one shared left turn-right turn lane at the east approach. The six-lane widening of McCarran Boulevard from Longley Lane to Greg Street is currently under design and anticipated to be completed by 2014. These widening improvements will provide additional capacity at this intersection. However, the six-lane widening will not improve the LOS F operation for the westbound left turn movement. It is recommended that the McCarran Boulevard/South Residential Access intersection be improved to include an exclusive left turn lane at the north approach, and exclusive right turn lane at the south approach, and one right turn lane with stop sign control at the east project access approach. The left turn movement at the east approach shall be prohibited.

ROADWAY CAPACITY ANALYSIS

Key sections of McCarran Boulevard, Mill Street, and the Southeast Connector in the vicinity of the site were reviewed for capacity for the 2018 and 2030 traffic volumes based on daily level of service thresholds established by the Regional Transportation Commission. The Regional Transportation Commission's 2008-2030 Regional Transportation Plan indicates that McCarran Boulevard and the Southeast Connector are classified as arterials with high access control (HAC) and Mill Street is classified as an arterial with moderate access control (MAC). Table 5 shows the daily level of service thresholds for high and moderate access control arterials.

TABLE 5
LEVEL OF SERVICE CRITERIA FOR ROADWAY SEGMENTS

	AVERAGE DAILY TRAFFIC VOLUME			
FACILITY/LANES	LOS C	LOS D	LOS E	LOS F
Arterial with HAC				
2 Lanes	≤17,300	17,301-19,200	19,201-20,300	>20,300
4 Lanes	≤36,100	36,101-38,400	38,401-40,600	>40,600
6 Lanes	≤54,700	54,701-57,600	57,601-60,900	>60,900
8 Lanes	≤73,200	73,201-76,800	76,801-81,300	>81,300
Arterial with MAC				
2 Lanes	≤14,800	14,801-17,500	17,501-18,600	>18,600
4 Lanes	≤32,200	32,201-35,200	35,201-36,900	>36,900
6 Lanes	≤49,600	49,601-52,900	52,901-55,400	>55,400
8 Lanes	≤66,800	66,801-70,600	70,601-73,900	>73,900

A summary of the level of service operation for the key roadway segments in this analysis is shown in Table 6.

TABLE 6
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS

ROADWAY	2018 BASE	2018 WITH	2030 BASE	2030 WITH
McCARRAN BOULEVARD				
North of Mill Street	58,700	58,700	62,600	63,300
6 Lane HAC	E	E	F	F
8 Lane HAC	C	C	C	C
Between Mill and Capital	50,000	49,900	62,300	62,500
6 Lane HAC	C	C	F	F
8 Lane HAC	C	C	C	C
Between Capital and Rock	49,400	49,400	61,500	61,900
6 Lane HAC	C	C	F	F
8 Lane HAC	C	C	C	C
South of Rock Boulevard	49,500	49,900	60,400	60,400
6 Lane HAC	C	C	E	E
SOUTHEAST CONNECTOR				
North of Mill Street	56,100	56,100	62,400	62,700
6 Lane HAC	D	D	F	F
8 Lane HAC	C	C	C	C
Between Mill and Pembroke	56,100	56,100	62,400	62,700
6 Lane HAC	D	D	F	F
8 Lane HAC	C	C	C	C
South of Pembroke Drive	51,500	51,700	58,000	58,100
6 Lane HAC	C	C	E	E
MILL STREET				
West of McCarran Boulevard	20,800	21,000	25,800	27,900
4 Lane MAC	C	C	C	C
East of McCarran Boulevard	4,100	5,300	4,400	12,700
2 Lane MAC	C	C	C	C
West of Southeast Connector	2,300	2,300	2,500	2,500
2 Lane MAC	C	C	C	C
East of Southeast Connector	2,300	2,300	2,500	2,500
2 Lane MAC	C	C	C	C

McCarran Boulevard

McCarran Boulevard was reviewed for capacity as a six-lane arterial with high access control from north of Mill Street to south of Rock Boulevard. The six-lane widened section of McCarran Boulevard north of Mill Street is anticipated to operate at LOS E for the 2018 base and base plus project traffic volumes and LOS F for the 2030 base and base plus project traffic volumes. The six-lane widened section between Mill Street and Rock Boulevard is anticipated to operate at LOS C for the 2018 base and base plus project traffic volumes and LOS F for the 2030 base and base plus project traffic volumes. The six-lane widened section south of Rock Boulevard is anticipated to operate at LOS C for the 2018 base and base plus project traffic volumes and LOS E for the 2030 base and base plus project traffic volumes. The six-lane widened section of McCarran Boulevard from north of Mill Street to south of Rock Boulevard will meet RTC's policy LOS E standards for the 2018 base and base plus project traffic volumes. The six-lane widened section of McCarran Boulevard south of Rock Boulevard will meet RTC's policy LOS E standards for the 2030 base and base plus project traffic volumes. The six-lane section of McCarran Boulevard from north of Mill Street to Rock Boulevard will need to be widened to eight lanes for the 2030 base and base plus project traffic volumes in order to meet RTC's policy LOS E standards. The Regional Transportation Plan indicates that McCarran Boulevard is planned to be widened to eight lanes between Greg Street and Longley Lane in the 2019 to 2030 timeframe.

Southeast Connector

The Southeast Connector was reviewed for capacity as an arterial with high access control. The 2018 base and base plus project traffic volumes indicate that the section of the Southeast Connector from north of Mill Street to south of Pembroke Drive will need to be six lanes in order to meet RTC's policy LOS E standards. The 2030 base and base plus project traffic volumes indicate that the section of the Southeast Connector from north of Mill Street to Pembroke Drive will need to be eight lanes and the section south of Pembroke Drive will need to be six lanes in order to meet RTC's policy LOS E standards. The Regional Transportation Plan indicates that the Southeast Connector is planned to be constructed as a six-lane roadway between Greg Street and South Meadows Parkway by 2018.

Mill Street

Mill Street was reviewed for capacity as an arterial with moderate access control. The four-lane section of Mill Street west of McCarran Boulevard is anticipated to operate at LOS C for the 2018 and 2030 base and base plus project traffic volumes which meets RTC's policy LOS D standards. The two-lane Mill Street extension from McCarran Boulevard to east of the Southeast Connector is anticipated to operate at LOS C or better for the 2018 and 2030 base and base plus project traffic volumes which meets RTC's policy LOS D standards. The Regional Transportation Plan indicates that the Mill Street Extension is planned to be constructed as a four-lane roadway between McCarran Boulevard and the Southeast Connector by 2018.

SITE PLAN REVIEW

A copy of the preliminary Land Use Plan for the proposed MSFL McCarran Center development is included in this submittal. The Land Use Plan indicates that project access will be provided from the extensions of Mill Street, Equity Avenue, and Capital Boulevard east of McCarran Boulevard and from an access roadway aligning with the existing McCarran Boulevard median opening at the project's south boundary. An additional right-in/right-out access from McCarran Boulevard is also anticipated to serve the mixed residential/business park parcel.

Spacing of the proposed signal on McCarran Boulevard at Capital Boulevard was reviewed based on the Regional Transportation Commission's access management standards. RTC's access management standards indicate that signal spacing on arterials with high access control shall be a minimum of 2,350 feet. The centerline spacing on McCarran Boulevard between Mill Street and Capital Boulevard is approximately 2,350 feet which meets the minimum signal spacing requirement.

Left turn movements from McCarran Boulevard onto Equity Avenue and the south residential access were reviewed based on the Regional Transportation Commission's access management standards. The access management standards indicate that left turns can be made from the major street to an access roadway if the access roadway is located a minimum of 750 feet from a signalized intersection. Equity Avenue is located approximately 1,030 feet south of Mill Street and approximately 1,320 feet north of Capital Boulevard which meets the minimum spacing requirement. The south residential access is located approximately 1,900 feet south of Capital Boulevard and approximately 1,000 feet north of Rock Boulevard which also meets the minimum spacing requirement.

The spacing of the north residential access on McCarran Boulevard was reviewed based on the Regional Transportation Commission's access management standards. The access management standards indicate that unsignalized accesses on arterials with high access control shall be located a minimum of 250 feet from signalized intersections and 500 feet from other driveways. It is recommended that the proposed north residential access be located to meet these spacing requirements.

RECOMMENDATIONS

Traffic generated by the proposed MSFL McCarran Center development will have some impact on the adjacent street network. The following recommendations are made to mitigate project traffic impacts.

It is recommended that any required signing, striping or traffic control improvements comply with City of Reno requirements.

It is recommended that the McCarran Boulevard/Mill Street intersection be improved to include one left turn lane and one right turn lane at both the north and south approaches and dual left turn lanes, one through lane, and one right turn lane at both the east and west approaches.

It is recommended that the McCarran Boulevard/Equity Avenue intersection be improved to include an exclusive left turn lane at the north approach, an exclusive right turn lane at the south approach, and one right turn lane with stop sign control at the east project access approach. The left turn and through movements at the east approach shall be prohibited.

It is recommended that a traffic signal be constructed at the McCarran Boulevard/Capital Boulevard intersection when warranted and the intersection be improved to include an exclusive left turn lane at the north approach, an exclusive right turn lane at the south approach, and a minimum of one left turn lane and one shared through-right turn lane at both the east and west approaches.

It is recommended that the McCarran Boulevard/South Residential Access intersection be improved to include an exclusive left turn lane at the north approach, an exclusive right turn lane at the south approach, and one right turn lane with stop sign control at the east project access approach. The left turn movement at the east approach shall be prohibited.

It is recommended that the McCarran Boulevard/North Residential Access intersection be constructed to serve right-in and right-out movements only with an exclusive right turn lane at the south approach. The access shall be located to meet access management standards for driveway spacing.

It is recommended that these intersection improvements be coordinated with the Southeast McCarran Boulevard Widening Project.

APPENDIX

Summary of Average Vehicle Trip Generation
For 91.9 Acres of Business Park
August 25, 2011

	24 Hour Two-Way Volume	7-9 AM Pk Hour		4-6 PM Pk Hour	
		Enter	Exit	Enter	Exit
Average Weekday	13766	1473	260	310	1238

	24 hour Two-Way Volume	Peak Hour	
		Enter	Exit
Saturday	2997	0	0
Sunday	1542	0	0

Note: A zero indicates no data available.
Source: Institute of Transportation Engineers
Trip Generation, 8th Edition, 2008.

TRIP GENERATION BY MICROTRANS

Summary of Average Vehicle Trip Generation
For 475 Dwelling Units of Apartments
September 07, 2011

	24 Hour Two-Way Volume	7-9 AM Pk Hour		4-6 PM Pk Hour	
		Enter	Exit	Enter	Exit
Average Weekday	3159	48	195	190	105

	24 hour Two-Way Volume	Peak Hour	
		Enter	Exit
Saturday	3035	0	0
Sunday	2784	0	0

Note: A zero indicates no data available.
Source: Institute of Transportation Engineers
Trip Generation, 8th Edition, 2008.

TRIP GENERATION BY MICROTRANS

Summary of Average Vehicle Trip Generation
For 50.9 Acres of Business Park
September 08, 2011

	24 Hour Two-Way Volume	7-9 AM Pk Hour Enter	7-9 AM Pk Hour Exit	4-6 PM Pk Hour Enter	4-6 PM Pk Hour Exit
Average Weekday	7624	816	144	172	686

	24 hour Two-Way Volume	Peak Hour Enter	Peak Hour Exit
Saturday	1660	0	0
Sunday	854	0	0

Note: A zero indicates no data available.
Source: Institute of Transportation Engineers
Trip Generation, 8th Edition, 2008.

TRIP GENERATION BY MICROTRANS

Summary of Average Vehicle Trip Generation
For 97 Th.Sq.Ft. GFA of General Office Building
September 08, 2011

	24 Hour Two-Way Volume	7-9 AM Pk Hour		4-6 PM Pk Hour	
		Enter	Exit	Enter	Exit
Average Weekday	1068	132	18	24	120

	24 hour Two-Way Volume	Peak Hour	
		Enter	Exit
Saturday	230	21	18
Sunday	95	8	6

Note: A zero indicates no data available.
Source: Institute of Transportation Engineers
Trip Generation, 8th Edition, 2008.

TRIP GENERATION BY MICROTRANS

Summary of Average Vehicle Trip Generation
For 97 Th.Sq.Ft. GLA of Shopping Center
September 08, 2011

	24 Hour Two-Way Volume	7-9 AM Pk Hour Enter	7-9 AM Pk Hour Exit	4-6 PM Pk Hour Enter	4-6 PM Pk Hour Exit
Average Weekday	4165	59	38	178	184

	24 hour Two-Way Volume	Peak Hour Enter	Peak Hour Exit
Saturday	4847	246	228
Sunday	2448	148	154

Note: A zero indicates no data available.
Source: Institute of Transportation Engineers
Trip Generation, 8th Edition, 2008.

TRIP GENERATION BY MICROTRANS

Summary of Average Vehicle Trip Generation
For 35.1 Acres of Business Park
August 25, 2011

	24 Hour Two-Way Volume	7-9 AM Pk Hour		4-6 PM Pk Hour	
		Enter	Exit	Enter	Exit
Average Weekday	5258	563	99	118	473

	24 hour Two-Way Volume	Peak Hour	
		Enter	Exit
Saturday	1145	0	0
Sunday	589	0	0

Note: A zero indicates no data available.
Source: Institute of Transportation Engineers
Trip Generation, 8th Edition, 2008.

TRIP GENERATION BY MICROTRANS

Summary of Average Vehicle Trip Generation
For 183 Th.Sq.Ft. GFA of General Office Building
September 08, 2011

	24 Hour Two-Way Volume	7-9 AM Pk Hour		4-6 PM Pk Hour	
		Enter	Exit	Enter	Exit
Average Weekday	2015	249	35	46	227

	24 hour Two-Way Volume	Peak Hour	
		Enter	Exit
Saturday	434	40	35
Sunday	179	15	11

Note: A zero indicates no data available.
Source: Institute of Transportation Engineers
Trip Generation, 8th Edition, 2008.

TRIP GENERATION BY MICROTRANS

Summary of Average Vehicle Trip Generation
For 183 Th.Sq.Ft. GLA of Shopping Center
September 08, 2011

	24 Hour Two-Way Volume	7-9 AM Pk Hour		4-6 PM Pk Hour	
		Enter	Exit	Enter	Exit
Average Weekday	7858	112	71	335	348

	24 hour Two-Way Volume	Peak Hour	
		Enter	Exit
Saturday	9145	465	430
Sunday	4619	280	291

Note: A zero indicates no data available.
Source: Institute of Transportation Engineers
Trip Generation, 8th Edition, 2008.

TRIP GENERATION BY MICROTRANS

HCS+: Signalized Intersections Release 5.3

Analyst: MSH
Agency: Solaegui Engineers
Date: 9/7/2011
Period: AM Peak Hour
Project ID:
E/W St: Mill Street

Inter.: McCarran & Mill
Area Type: All other areas
Jurisd: City of Reno
Year : Existing

N/S St: McCarran Boulevard

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	2	0	0	0	0	0	1	2	0	0	2	0
LGConfig	L	LR					L	T			TR	
Volume	291		32				76	746			1424	479
Lane Width	12.0	12.0					12.0	12.0			12.0	
RTOR Vol			5									125

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A				NB	Left	A			
	Thru						Thru	A	A		
	Right	A					Right				
	Peds	X					Peds				
WB	Left					SB	Left				
	Thru						Thru		A		
	Right						Right		A		
	Peds						Peds		X		
NB	Right					EB	Right				
SB	Right					WB	Right				
Green		20.0						8.0	57.0		
Yellow		4.0						4.0	4.0		
All Red		1.0						1.0	1.0		

Cycle Length: 100.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	687	3437	0.26	0.20	34.0	C		
LR	347	1735	0.50	0.20	36.8	D	35.4	D
Westbound								
Northbound								
L	142	1770	0.59	0.08	50.9	D		
T	2483	3547	0.33	0.70	6.0	A	10.1	B
Southbound								
TR	1951	3422	1.01	0.57	45.0	D	45.0	D

Intersection Delay = 34.1 (sec/veh) Intersection LOS = C

HCS+: Signalized Intersections Release 5.3

Analyst: MSH
Agency: Solaegui Engineers
Date: 9/7/2011
Period: PM Peak Hour
Project ID:
E/W St: Mill Street

Inter.: McCarran & Mill
Area Type: All other areas
Jurisd: City of Reno
Year : Existing

N/S St: McCarran Boulevard

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	2	0	0	0	0	0	1	2	0	0	2	0
LGConfig	L	LR					L	T			TR	
Volume	683		41				30	1529			1046	195
Lane Width	12.0	12.0					12.0	12.0			12.0	
RTOR Vol			10									40

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A				NB	Left	A			
	Thru						Thru	A	A		
	Right	A					Right				
	Peds	X					Peds				
WB	Left					SB	Left				
	Thru						Thru		A		
	Right						Right		A		
	Peds						Peds		X		
NB	Right					EB	Right				
SB	Right					WB	Right				
Green		25.0						10.0	50.0		
Yellow		4.0						4.0	4.0		
All Red		1.0						1.0	1.0		

Cycle Length: 100.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	859	3437	0.60	0.25	34.3	C		
LR	436	1745	0.59	0.25	35.1	D	34.6	C
Westbound								
Northbound								
L	177	1770	0.19	0.10	41.8	D		
T	2306	3547	0.72	0.65	12.7	B	13.2	B
Southbound								
TR	1733	3465	0.75	0.50	22.0	C	22.0	C

Intersection Delay = 20.6 (sec/veh) Intersection LOS = C

HCS+: Signalized Intersections Release 5.3

Analyst: MSH
Agency: Solaegui Engineers
Date: 9/7/2011
Period: AM Peak Hour
Project ID:
E/W St: Mill Street

Inter.: McCarran & Mill
Area Type: All other areas
Jurisd: City of Reno
Year : Existing + Project

N/S St: McCarran Boulevard

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	2	1	1	2	1	1	1	2	1	1	2	1
LGConfig	L	T	R	L	T	R	L	T	R	L	T	R
Volume	258	118	219	54	21	55	146	902	182	250	1792	479
Lane Width	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
RTOR Vol			50			10			40			100

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A	A			NB	Left	A			
	Thru		A	A			Thru			A	
	Right		A	A			Right			A	
	Peds			X			Peds			X	
WB	Left	A				SB	Left	A	A		
	Thru			A			Thru		A	A	
	Right			A			Right		A	A	
	Peds			X			Peds			X	
NB	Right					EB	Right				
SB	Right					WB	Right				
Green		6.0	3.0	20.0				16.0	4.0	70.0	
Yellow		4.0	0.0	4.0				4.0	0.0	4.0	
All Red		1.0	0.0	1.0				1.0	0.0	1.0	

Cycle Length: 139.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	346	3437	0.83	0.10	76.8	E		
T	308	1863	0.43	0.17	53.0	D	68.3	E
R	254	1538	0.74	0.17	66.1	E		
Westbound								
L	148	3437	0.41	0.04	66.6	E		
T	268	1863	0.09	0.14	51.7	D	59.0	E
R	221	1536	0.23	0.14	53.2	D		
Northbound								
L	204	1770	0.79	0.12	79.0	E		
T	1786	3547	0.56	0.50	24.3	C	30.4	C
R	775	1539	0.20	0.50	19.2	B		
Southbound								
L	318	1770	0.87	0.18	78.1	E		
T	1888	3547	1.05	0.53	69.3	E	62.7	E
R	819	1539	0.51	0.53	21.5	C		

Intersection Delay = 54.3 (sec/veh) Intersection LOS = D

HCS+: Signalized Intersections Release 5.3

Analyst: MSH
Agency: Solaegui Engineers
Date: 9/7/2011
Period: PM Peak Hour
Project ID:
E/W St: Mill Street

Inter.: McCarran & Mill
Area Type: All other areas
Jurisd: City of Reno
Year : Existing + Project
N/S St: McCarran Boulevard

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	2	1	1	2	1	1	1	2	1	1	2	1
LGConfig	L	T	R	L	T	R	L	T	R	L	T	R
Volume	583	40	139	246	99	207	200	1963	61	84	1233	195
Lane Width	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
RTOR Vol			30			50			15			45

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A	A			NB	Left	A	A		
	Thru		A	A			Thru		A	A	
	Right		A	A			Right		A	A	
	Peds			X			Peds			X	
WB	Left	A				SB	Left	A			
	Thru			A			Thru			A	
	Right			A			Right			A	
	Peds			X			Peds			X	
NB	Right					EB	Right				
SB	Right					WB	Right				
Green		13.0	8.0	20.0				10.0	5.0	64.0	
Yellow		4.0	0.0	4.0				4.0	0.0	4.0	
All Red		1.0	0.0	1.0				1.0	0.0	1.0	

Cycle Length: 140.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	638	3437	0.96	0.19	83.0	F		
T	373	1863	0.11	0.20	46.0	D	75.9	E
R	308	1539	0.37	0.20	49.2	D		
Westbound								
L	319	3437	0.81	0.09	77.0	E		
T	266	1863	0.39	0.14	55.4	E	71.0	E
R	219	1536	0.75	0.14	71.4	E		
Northbound								
L	253	1770	0.83	0.14	79.1	E		
T	1748	3547	1.18	0.49	123.6	F	117.4	F
R	758	1538	0.06	0.49	18.6	B		
Southbound								
L	126	1770	0.70	0.07	79.2	E		
T	1621	3547	0.80	0.46	35.5	D	36.7	D
R	703	1537	0.22	0.46	23.2	C		

Intersection Delay = 82.4 (sec/veh) Intersection LOS = F

HCS+: Signalized Intersections Release 5.3

Analyst: MSH
Agency: Solaegui Engineers
Date: 9/7/2011
Period: AM Peak Hour
Project ID:
E/W St: Mill Street

Inter.: McCarran & Mill
Area Type: All other areas
Jurisd: City of Reno
Year : Existing + Project

N/S St: McCarran Boulevard

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	2	1	1	2	1	1	1	3	1	1	3	1
LGConfig	L	T	R	L	T	R	L	T	R	L	T	R
Volume	258	118	219	54	21	55	146	902	182	250	1792	479
Lane Width	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
RTOR Vol			50			10			40			100

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A	A			NB	Left	A			
	Thru		A	A			Thru			A	
	Right		A	A			Right			A	
	Peds			X			Peds			X	
WB	Left	A				SB	Left	A	A		
	Thru			A			Thru		A	A	
	Right			A			Right		A	A	
	Peds			X			Peds			X	
NB	Right					EB	Right				
SB	Right					WB	Right				
Green		8.0	3.0	20.0				18.0	2.0	49.0	
Yellow		4.0	0.0	4.0				4.0	0.0	4.0	
All Red		1.0	0.0	1.0				1.0	0.0	1.0	

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	458	3437	0.63	0.13	51.9	D		
T	357	1863	0.37	0.19	42.8	D	49.1	D
R	295	1541	0.64	0.19	49.2	D		
Westbound								
L	229	3437	0.26	0.07	53.8	D		
T	311	1863	0.07	0.17	42.3	D	47.9	D
R	257	1540	0.19	0.17	43.4	D		
Northbound								
L	266	1770	0.61	0.15	51.7	D		
T	2072	5074	0.48	0.41	26.4	C	29.1	C
R	627	1535	0.25	0.41	23.6	C		
Southbound								
L	369	1770	0.75	0.21	53.1	D		
T	2156	5074	0.92	0.43	40.0	D	39.7	D
R	652	1535	0.65	0.43	29.6	C		

Intersection Delay = 38.2 (sec/veh) Intersection LOS = D

HCS+: Signalized Intersections Release 5.3

Analyst: MSH
Agency: Solaegui Engineers
Date: 9/7/2011
Period: PM Peak Hour
Project ID:
E/W St: Mill Street

Inter.: McCarran & Mill
Area Type: All other areas
Jurisd: City of Reno
Year : Existing + Project
N/S St: McCarran Boulevard

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	2	1	1	2	1	1	1	3	1	1	3	1
LGConfig	L	T	R	L	T	R	L	T	R	L	T	R
Volume	583	40	139	246	99	207	200	1963	61	84	1233	195
Lane Width	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
RTOR Vol			30			50			15			45

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A	A			NB	Left	A	A		
	Thru		A	A			Thru		A	A	
	Right		A	A			Right		A	A	
	Peds			X			Peds			X	
WB	Left	A				SB	Left	A			
	Thru			A			Thru			A	
	Right			A			Right			A	
	Peds			X			Peds			X	
NB	Right					EB	Right				
SB	Right					WB	Right				
Green		11.0	7.0	20.0				9.0	4.0	49.0	
Yellow		4.0	0.0	4.0				4.0	0.0	4.0	
All Red		1.0	0.0	1.0				1.0	0.0	1.0	

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	659	3437	0.93	0.19	67.8	E		
T	419	1863	0.10	0.22	37.0	D	61.9	E
R	347	1543	0.33	0.22	39.5	D		
Westbound								
L	315	3437	0.82	0.09	69.5	E		
T	311	1863	0.33	0.17	44.8	D	59.2	E
R	257	1540	0.64	0.17	52.0	D		
Northbound								
L	266	1770	0.79	0.15	64.3	E		
T	2241	5074	0.92	0.44	38.5	D	40.5	D
R	678	1536	0.07	0.44	19.4	B		
Southbound								
L	133	1770	0.66	0.08	65.6	E		
T	2072	5074	0.63	0.41	28.8	C	30.4	C
R	627	1535	0.25	0.41	23.6	C		

Intersection Delay = 42.6 (sec/veh) Intersection LOS = D

HCS+: Signalized Intersections Release 5.3

Analyst: MSH
Agency: Solaegui Engineers
Date: 9/7/2011
Period: AM Peak Hour
Project ID:
E/W St: Rock/Pembroke

Inter.: McCarran & Rock
Area Type: All other areas
Jurisd: City of Reno
Year : Existing

N/S St: McCarran Boulevard

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	1	1	2	0	1	2	1	1	2	1
LGConfig	L	T	R	L	TR		L	T	R	L	T	R
Volume	151	43	38	56	175	117	137	641	30	53	840	392
Lane Width	12.0	12.0	12.0	12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0
RTOR Vol			10			25			5			100

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A	A	A		NB	Left	A	A		
	Thru		A	A			Thru		A	A	
	Right		A	A			Right		A	A	
	Peds			X			Peds			X	
WB	Left	A		A		SB	Left	A			
	Thru			A			Thru			A	
	Right			A			Right			A	
	Peds			X			Peds				
NB	Right					EB	Right				
SB	Right					WB	Right				
Green		8.0	1.0	20.0				10.0	1.0	40.0	
Yellow		4.0	0.0	4.0				4.0	0.0	4.0	
All Red		1.0	0.0	1.0				1.0	0.0	1.0	

Cycle Length: 100.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	424	1763	0.42	0.39	21.8	C		
T	391	1863	0.13	0.21	32.2	C	25.1	C
R	324	1544	0.10	0.21	32.0	C		
Westbound								
L	356	1757	0.19	0.25	29.5	C		
TR	667	3335	0.47	0.20	35.9	D	34.7	C
Northbound								
L	283	1770	0.57	0.16	41.5	D		
T	1454	3547	0.52	0.41	22.4	C	25.5	C
R	629	1535	0.05	0.41	17.8	B		
Southbound								
L	177	1770	0.35	0.10	43.2	D		
T	1419	3547	0.70	0.40	26.5	C	26.6	C
R	633	1583	0.54	0.40	24.0	C		

Intersection Delay = 27.2 (sec/veh) Intersection LOS = C

HCS+: Signalized Intersections Release 5.3

Analyst: MSH
Agency: Solaegui Engineers
Date: 9/7/2011
Period: PM Peak Hour
Project ID:
E/W St: Rock/Pembroke

Inter.: McCarran & Rock
Area Type: All other areas
Jurisd: City of Reno
Year : Existing
N/S St: McCarran Boulevard

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	1	1	2	0	1	2	1	1	2	1
LGConfig	L	T	R	L	TR		L	T	R	L	T	R
Volume	486	159	134	50	63	69	117	1062	61	122	771	172
Lane Width	12.0	12.0	12.0	12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0
RTOR Vol			30			15			15			40

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A	A	A		NB	Left	A			
	Thru		A	A			Thru		A		
	Right		A	A			Right		A		
	Peds			X			Peds		X		
WB	Left	A		A		SB	Left	A			
	Thru			A			Thru		A		
	Right			A			Right		A		
	Peds			X			Peds				
NB	Right					EB	Right				
SB	Right					WB	Right				
Green		8.0	9.0	20.0				13.0	40.0		
Yellow		4.0	0.0	4.0				4.0	4.0		
All Red		1.0	0.0	1.0				1.0	1.0		

Cycle Length: 110.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	594	1759	0.91	0.43	49.6	D		
T	491	1863	0.36	0.26	33.4	C	43.8	D
R	407	1545	0.29	0.26	32.6	C		
Westbound								
L	297	1758	0.19	0.23	34.2	C		
TR	593	3261	0.22	0.18	38.5	D	37.2	D
Northbound								
L	209	1770	0.62	0.12	51.8	D		
T	1290	3547	0.91	0.36	43.6	D	43.6	D
R	557	1533	0.09	0.36	23.1	C		
Southbound								
L	209	1770	0.65	0.12	53.3	D		
T	1290	3547	0.66	0.36	30.7	C	32.6	C
R	576	1583	0.26	0.36	24.8	C		

Intersection Delay = 39.8 (sec/veh) Intersection LOS = D

HCS+: Signalized Intersections Release 5.3

Analyst: MSH
Agency: Solaegui Engineers
Date: 9/7/2011
Period: AM Peak Hour
Project ID:
E/W St: Rock/Pembroke

Inter.: McCarran & Rock
Area Type: All other areas
Jurisd: City of Reno
Year : Existing + Project
N/S St: McCarran Boulevard

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	1	1	2	0	1	2	1	1	2	1
LGConfig	L	T	R	L	TR		L	T	R	L	T	R
Volume	303	43	38	56	175	193	137	1021	30	76	954	437
Lane Width	12.0	12.0	12.0	12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0
RTOR Vol			10			45			5			100

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A	A	A		NB	Left	A	A		
	Thru		A	A			Thru		A	A	
	Right		A	A			Right		A	A	
	Peds			X			Peds			X	
WB	Left	A		A		SB	Left	A			
	Thru			A			Thru			A	
	Right			A			Right			A	
	Peds			X			Peds				
NB	Right					EB	Right				
SB	Right					WB	Right				
Green		6.0	5.0	20.0				10.0	1.0	38.0	
Yellow		4.0	0.0	4.0				4.0	0.0	4.0	
All Red		1.0	0.0	1.0				1.0	0.0	1.0	

Cycle Length: 100.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	430	1768	0.83	0.41	35.2	D		
T	466	1863	0.11	0.25	29.0	C	34.0	C
R	387	1546	0.09	0.25	28.8	C		
Westbound								
L	322	1767	0.20	0.23	31.1	C		
TR	653	3266	0.58	0.20	37.5	D	36.6	D
Northbound								
L	283	1770	0.57	0.16	41.5	D		
T	1383	3547	0.87	0.39	34.3	C	34.8	C
R	598	1534	0.05	0.39	19.0	B		
Southbound								
L	177	1770	0.50	0.10	44.9	D		
T	1348	3547	0.83	0.38	32.7	C	32.3	C
R	602	1583	0.66	0.38	28.3	C		

Intersection Delay = 33.9 (sec/veh) Intersection LOS = C

HCS+: Signalized Intersections Release 5.3

Analyst: MSH
Agency: Solaegui Engineers
Date: 9/7/2011
Period: PM Peak Hour
Project ID:
E/W St: Rock/Pembroke

Inter.: McCarran & Rock
Area Type: All other areas
Jurisd: City of Reno
Year : Existing + Project
N/S St: McCarran Boulevard

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	1	1	2	0	1	2	1	1	2	1
LGConfig	L	T	R	L	TR		L	T	R	L	T	R
Volume	555	159	134	50	63	103	117	1235	61	189	1106	307
Lane Width	12.0	12.0	12.0	12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0
RTOR Vol			30			25			15			75

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A	A	A		NB	Left	A			
	Thru		A	A			Thru			A	
	Right		A	A			Right			A	
	Peds			X			Peds			X	
WB	Left	A		A		SB	Left	A	A		
	Thru			A			Thru		A	A	
	Right			A			Right		A	A	
	Peds			X			Peds				
NB	Right					EB	Right				
SB	Right					WB	Right				
Green		5.0	20.0	15.0				11.0	1.0	48.0	
Yellow		4.0	0.0	4.0				4.0	0.0	4.0	
All Red		1.0	0.0	1.0				1.0	0.0	1.0	

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	611	1840	1.01	0.42	79.1	E		
T	543	1863	0.33	0.29	33.6	C	64.4	E
R	449	1540	0.26	0.29	32.9	C		
Westbound								
L	181	1840	0.31	0.14	47.2	D		
TR	399	3193	0.39	0.13	49.0	D	48.5	D
Northbound								
L	169	1844	0.77	0.09	72.4	E		
T	1419	3547	0.97	0.40	51.8	D	52.6	D
R	614	1535	0.08	0.40	22.4	C		
Southbound								
L	261	1844	0.80	0.14	66.5	E		
T	1448	3547	0.85	0.41	37.1	D	39.0	D
R	646	1583	0.40	0.41	25.5	C		

Intersection Delay = 49.6 (sec/veh) Intersection LOS = D

HCS+: Unsignalized Intersections Release 5.3

TWO-WAY STOP CONTROL SUMMARY

Analyst:	MSH
Agency/Co.:	Solaegui Engineers
Date Performed:	9/7/2011
Analysis Time Period:	AM Peak Hour
Intersection:	McCarran & Equity
Jurisdiction:	City of Reno
Units: U. S. Customary	
Analysis Year:	Existing
Project ID:	
East/West Street:	Equity Avenue
North/South Street:	McCarran Boulevard
Intersection Orientation: NS	Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	29	822			1391	65
Peak-Hour Factor, PHF	0.90	0.90			0.90	0.90
Hourly Flow Rate, HFR	32	913			1545	72
Percent Heavy Vehicles	2	--	--		--	--
Median Type/Storage	Raised curb			/ 0		
RT Channelized?						
Lanes	1	2			2	0
Configuration	L	T			T	TR
Upstream Signal?		No			Yes	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume						29
Peak Hour Factor, PHF						0.90
Hourly Flow Rate, HFR						32
Percent Heavy Vehicles						2
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes					1	
Configuration					R	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	L							R
v (vph)	32							32
C(m) (vph)	524							668
v/c	0.06							0.05
95% queue length	0.19							0.15
Control Delay	12.3							10.7
LOS	B							B
Approach Delay							10.7	
Approach LOS							B	

HCS+: Unsignalized Intersections Release 5.3

TWO-WAY STOP CONTROL SUMMARY

Analyst:	MSH
Agency/Co.:	Solaegui Engineers
Date Performed:	9/7/2011
Analysis Time Period:	PM Peak Hour
Intersection:	McCarran & Equity
Jurisdiction:	City of Reno
Units: U. S. Customary	
Analysis Year:	Existing
Project ID:	
East/West Street:	Equity Avenue
North/South Street:	McCarran Boulevard
Intersection Orientation: NS	Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	13	1559			1078	9
Peak-Hour Factor, PHF	0.92	0.92			0.92	0.92
Hourly Flow Rate, HFR	14	1694			1171	9
Percent Heavy Vehicles	2	--	--		--	--
Median Type/Storage	Raised curb			/ 0		
RT Channelized?						
Lanes	1	2			2	0
Configuration	L	T			T	TR
Upstream Signal?		No			Yes	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume						28
Peak Hour Factor, PHF						0.92
Hourly Flow Rate, HFR						30
Percent Heavy Vehicles						2
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes					1	
Configuration						R

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	L							R
v (vph)	14							30
C(m) (vph)	758							802
v/c	0.02							0.04
95% queue length	0.06							0.12
Control Delay	9.8							9.7
LOS	A							A
Approach Delay							9.7	
Approach LOS							A	

HCS+: Unsignalized Intersections Release 5.3

TWO-WAY STOP CONTROL SUMMARY

Analyst:	MSH
Agency/Co.:	Solaegui Engineers
Date Performed:	9/7/2011
Analysis Time Period:	AM Peak Hour
Intersection:	McCarran & Equity
Jurisdiction:	City of Reno
Units: U. S. Customary	
Analysis Year:	Existing + Project
Project ID:	
East/West Street:	Equity Avenue
North/South Street:	McCarran Boulevard
Intersection Orientation: NS	Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	29	1182	200	274	1726	65
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	32	1313	222	304	1917	72
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type/Storage	Raised curb			/ 0		
RT Channelized?			No			
Lanes	1	2	1	1	2	0
Configuration	L	T	R	L	T	TR
Upstream Signal?		Yes			Yes	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume			48			29
Peak Hour Factor, PHF			0.90			0.90
Hourly Flow Rate, HFR			53			32
Percent Heavy Vehicles			2			2
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes			1			1
Configuration			R			R

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	L	L			R			R
v (vph)	32	304			53			32
C(m) (vph)	301	545			722			713
v/c	0.11	0.56			0.07			0.04
95% queue length	0.35	3.40			0.24			0.14
Control Delay	18.4	19.6			10.4			10.3
LOS	C	C			B			B
Approach Delay				10.4			10.3	
Approach LOS				B			B	

HCS+: Unsignalized Intersections Release 5.3

TWO-WAY STOP CONTROL SUMMARY

Analyst:	MSH
Agency/Co.:	Solaegui Engineers
Date Performed:	9/7/2011
Analysis Time Period:	PM Peak Hour
Intersection:	McCarran & Equity
Jurisdiction:	City of Reno
Units: U. S. Customary	
Analysis Year:	Existing + Project
Project ID:	
East/West Street:	Equity Avenue
North/South Street:	McCarran Boulevard
Intersection Orientation: NS	Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	13	1994	68	92	1517	9
Peak-Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR	14	2167	73	99	1648	9
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type/Storage	Raised curb			/ 0		
RT Channelized?			No			
Lanes	1	2	1	1	2	0
Configuration	L	T	R	L	T	TR
Upstream Signal?		Yes			Yes	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume			230			28
Peak Hour Factor, PHF			0.92			0.92
Hourly Flow Rate, HFR			249			30
Percent Heavy Vehicles			2			2
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes			1			1
Configuration			R			R

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	L	L			R			R
v (vph)	14	99			249			30
C(m) (vph)	466	217			632			718
v/c	0.03	0.46			0.39			0.04
95% queue length	0.09	2.19			1.88			0.13
Control Delay	13.0	34.8			14.4			10.2
LOS	B	D			B			B
Approach Delay				14.4			10.2	
Approach LOS				B			B	

HCS+: Unsignalized Intersections Release 5.3

TWO-WAY STOP CONTROL SUMMARY

Analyst:	MSH
Agency/Co.:	Solaegui Engineers
Date Performed:	9/7/2011
Analysis Time Period:	AM Peak Hour
Intersection:	McCarran & Capital
Jurisdiction:	City of Reno
Units: U. S. Customary	
Analysis Year:	Existing
Project ID:	
East/West Street:	Capital Boulevard
North/South Street:	McCarran Boulevard
Intersection Orientation: NS	Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	75	851			1333	87
Peak-Hour Factor, PHF	0.90	0.90			0.90	0.90
Hourly Flow Rate, HFR	83	945			1481	96
Percent Heavy Vehicles	2	--	--		--	--
Median Type/Storage	Raised curb			/ 0		
RT Channelized?						
Lanes	1	2			2	0
Configuration	L	T			T	TR
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume						28
Peak Hour Factor, PHF						0.90
Hourly Flow Rate, HFR						31
Percent Heavy Vehicles						2
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes					1	
Configuration					R	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	L							R
v (vph)	83							31
C(m) (vph)	414							389
v/c	0.20							0.08
95% queue length	0.74							0.26
Control Delay	15.9							15.1
LOS	C							C
Approach Delay							15.1	
Approach LOS							C	

HCS+: Unsignalized Intersections Release 5.3

TWO-WAY STOP CONTROL SUMMARY

Analyst:	MSH
Agency/Co.:	Solaegui Engineers
Date Performed:	9/7/2011
Analysis Time Period:	PM Peak Hour
Intersection:	McCarran & Capital
Jurisdiction:	City of Reno
Units: U. S. Customary	
Analysis Year:	Existing
Project ID:	
East/West Street:	Capital Boulevard
North/South Street:	McCarran Boulevard
Intersection Orientation: NS	Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	15	1572			1073	33
Peak-Hour Factor, PHF	0.90	0.90			0.90	0.90
Hourly Flow Rate, HFR	16	1746			1192	36
Percent Heavy Vehicles	2	--	--		--	--
Median Type/Storage	Raised curb			/ 0		
RT Channelized?						
Lanes	1	2			2	0
Configuration	L	T			T	TR
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume						60
Peak Hour Factor, PHF						0.90
Hourly Flow Rate, HFR						66
Percent Heavy Vehicles						2
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes					1	
Configuration					R	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	L							R
v (vph)	16							66
C(m) (vph)	563							490
v/c	0.03							0.13
95% queue length	0.09							0.46
Control Delay	11.6							13.5
LOS	B							B
Approach Delay							13.5	
Approach LOS							B	

HCS+: Signalized Intersections Release 5.3

Analyst: MSH
Agency: Solaegui Engineers
Date: 9/7/2011
Period: AM Peak Hour
Project ID:
E/W St: Capital Boulevard

Inter.: McCarran & Capital
Area Type: All other areas
Jurisd: City of Reno
Year : Existing + Project
N/S St: McCarran Boulevard

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	1	1	0	1	2	1	1	2	0
LGConfig	L	TR		L	TR		L	T	R	L	TR	
Volume	33	5	28	54	5	45	75	1333	224	256	1412	87
Lane Width	12.0	12.0		12.0	12.0		12.0	12.0	12.0	12.0	12.0	
RTOR Vol			5			10			50			20

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A	A			NB	Left	A			
	Thru		A				Thru			A	
	Right		A				Right			A	
	Peds		X				Peds			X	
WB	Left	A	A			SB	Left	A	A		
	Thru		A				Thru		A	A	
	Right		A				Right		A	A	
	Peds		X				Peds			X	
NB	Right					EB	Right				
SB	Right					WB	Right				
Green		5.0	20.0					11.0	8.5	55.5	
Yellow		4.0	4.0					4.0	0.0	4.0	
All Red		1.0	1.0					1.0	0.0	1.0	

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	327	1830	0.11	0.25	34.6	C		
TR	267	1599	0.12	0.17	42.7	D	38.4	D
Westbound								
L	339	1829	0.18	0.25	35.2	D		
TR	264	1582	0.17	0.17	43.2	D	38.6	D
Northbound								
L	169	1844	0.49	0.09	54.1	D		
T	1640	3547	0.90	0.46	37.2	D	36.1	D
R	711	1537	0.27	0.46	20.0+	C		
Southbound								
L	376	1844	0.76	0.20	53.4	D		
TR	1876	3518	0.88	0.53	29.5	C	33.0	C

Intersection Delay = 34.7 (sec/veh) Intersection LOS = C

HCS+: Signalized Intersections Release 5.3

Analyst: MSH	Inter.: McCarran & Capital
Agency: Solaegui Engineers	Area Type: All other areas
Date: 9/7/2011	Jurisd: City of Reno
Period: PM Peak Hour	Year : Existing + Project
Project ID:	
E/W St: Capital Boulevard	N/S St: McCarran Boulevard

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	1	1	0	1	2	1	1	2	0
LGConfig	L	TR		L	TR		L	T	R	L	TR	
Volume	100	5	60	257	5	216	15	1759	76	87	1425	33
Lane Width	12.0	12.0		12.0	12.0		12.0	12.0	12.0	12.0	12.0	
RTOR Vol			15			55			15			5

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A		A		NB	Left	A			
	Thru			A			Thru			A	
	Right			A			Right			A	
	Peds			X			Peds			X	
WB	Left	A	A	A		SB	Left	A	A		
	Thru		A	A			Thru		A	A	
	Right		A	A			Right		A	A	
	Peds			X			Peds			X	
NB	Right					EB	Right				
SB	Right					WB	Right				
Green		5.0	1.0	20.0				6.5	1.0	66.5	
Yellow		4.0	0.0	4.0				4.0	0.0	4.0	
All Red		1.0	0.0	1.0				1.0	0.0	1.0	

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	178	1759	0.61	0.18	53.5	D		
TR	262	1569	0.21	0.17	43.5	D	50.2	D
Westbound								
L	405	1756	0.69	0.30	42.5	D		
TR	271	1549	0.66	0.17	52.2	D	46.3	D
Northbound								
L	96	1770	0.17	0.05	55.0-	D		
T	1966	3547	0.97	0.55	40.2	D	39.4	D
R	853	1539	0.08	0.55	12.5	B		
Southbound								
L	184	1770	0.52	0.10	53.4	D		
TR	1988	3535	0.79	0.56	23.1	C	24.8	C

Intersection Delay = 34.9 (sec/veh) Intersection LOS = C

HCS+: Unsignalized Intersections Release 5.3

TWO-WAY STOP CONTROL SUMMARY

Analyst:	MSH
Agency/Co.:	Solaegui Engineers
Date Performed:	9/7/2011
Analysis Time Period:	AM Peak Hour
Intersection:	McCarran & No. Res. Access
Jurisdiction:	City of Reno
Units: U. S. Customary	
Analysis Year:	Existing + Project
Project ID:	
East/West Street:	North Residential Access
North/South Street:	McCarran Boulevard
Intersection Orientation: NS	Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		1585	8		1494	
Peak-Hour Factor, PHF		0.90	0.90		0.90	
Hourly Flow Rate, HFR		1761	8		1660	
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Raised curb			/ 0		
RT Channelized?						
Lanes		2	0		2	
Configuration		T	TR		T	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume			47			
Peak Hour Factor, PHF			0.90			
Hourly Flow Rate, HFR			52			
Percent Heavy Vehicles			2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes			1			
Configuration			R			

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config					R			
v (vph)					52			
C(m) (vph)					343			
v/c					0.15			
95% queue length					0.53			
Control Delay					17.4			
LOS					C			
Approach Delay				17.4				
Approach LOS				C				

HCS+: Unsignalized Intersections Release 5.3

TWO-WAY STOP CONTROL SUMMARY

Analyst:	MSH
Agency/Co.:	Solaegui Engineers
Date Performed:	9/7/2011
Analysis Time Period:	PM Peak Hour
Intersection:	McCarran & No. Res. Access
Jurisdiction:	City of Reno
Units: U. S. Customary	
Analysis Year:	Existing + Project
Project ID:	
East/West Street:	North Residential Access
North/South Street:	McCarran Boulevard
Intersection Orientation: NS	Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		1825	30		1742	
Peak-Hour Factor, PHF		0.92	0.92		0.92	
Hourly Flow Rate, HFR		1983	32		1893	
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Raised curb			/ 0		
RT Channelized?						
Lanes		2	0		2	
Configuration		T	TR		T	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume			25			
Peak Hour Factor, PHF			0.92			
Hourly Flow Rate, HFR			27			
Percent Heavy Vehicles			2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage				/		/
Lanes			1			
Configuration			R			

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config					R			
v (vph)					27			
C(m) (vph)					290			
v/c					0.09			
95% queue length					0.31			
Control Delay					18.7			
LOS					C			
Approach Delay				18.7				
Approach LOS				C				

HCS+: Unsignalized Intersections Release 5.3

TWO-WAY STOP CONTROL SUMMARY

Analyst:	MSH
Agency/Co.:	Solaegui Engineers
Date Performed:	9/7/2011
Analysis Time Period:	AM Peak Hour
Intersection:	McCarran & South Access
Jurisdiction:	City of Reno
Units: U. S. Customary	
Analysis Year:	Existing + Project
Project ID:	
East/West Street:	South Access
North/South Street:	McCarran Boulevard
Intersection Orientation: NS	Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		1523	11	29	1465	
Peak-Hour Factor, PHF		0.90	0.90	0.90	0.90	
Hourly Flow Rate, HFR		1692	12	32	1627	
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	Raised curb			/ 0		
RT Channelized?						
Lanes		2	0	1	2	
Configuration		T	TR	L	T	
Upstream Signal?		Yes			Yes	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	78		70			
Peak Hour Factor, PHF	0.90		0.90			
Hourly Flow Rate, HFR	86		77			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		L		LR				
v (vph)		32		163				
C(m) (vph)		430		35				
v/c		0.07		4.66				
95% queue length		0.24		19.19				
Control Delay		14.0		1876				
LOS		B		F				
Approach Delay				1876				
Approach LOS				F				

HCS+: Unsignalized Intersections Release 5.3

TWO-WAY STOP CONTROL SUMMARY

Analyst:	MSH
Agency/Co.:	Solaegui Engineers
Date Performed:	9/7/2011
Analysis Time Period:	PM Peak Hour
Intersection:	McCarran & South Access
Jurisdiction:	City of Reno
Units: U. S. Customary	
Analysis Year:	Existing + Project
Project ID:	
East/West Street:	South Access
North/South Street:	McCarran Boulevard
Intersection Orientation: NS	Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		1817	46	114	1628	
Peak-Hour Factor, PHF		0.92	0.92	0.92	0.92	
Hourly Flow Rate, HFR		1974	49	123	1769	
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	Raised curb			/ 0		
RT Channelized?						
Lanes		2	0	1	2	
Configuration		T	TR	L	T	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	42		38			
Peak Hour Factor, PHF	0.92		0.92			
Hourly Flow Rate, HFR	45		41			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		L		LR				
v (vph)		123		86				
C(m) (vph)		277		9				
v/c		0.44		9.56				
95% queue length		2.15		12.26				
Control Delay		28.0		4659				
LOS		D		F				
Approach Delay				4659				
Approach LOS				F				

Lynnette R. Jones
City Clerk
(775) 334-2030
JonesL@reno.gov

Beverly Beaty-Benadom
Deputy City Clerk
(775) 334-2030
Beaty-BenadomB@reno.gov

Office of the City Clerk
Central Cashiering (775) 334-2032
Parking Tickets (775) 334-2293

FILED THIS DATE
3 / 29 / 13
BY: BBB
CITY CLERK

March 29, 2013

Troy Miller, Director of Real Estate
Business Center North
895 North Center Street
University of Nevada, Reno /239
Reno, NV 89557-0239

RE: Case No. LDC12-00015 (PUD - MSFL McCarran Center – UNR Farms) - Zoning Map Amendment

Dear Applicant:

At a regular meeting held March 27, 2013, the City Council upheld the recommendation of the Planning Commission and approved the request for a zoning map amendment on APN 021-010-07 within the City of Reno to PUD - Planned Unit Development to allow development of ±17.81 acres of office/commercial flex uses; ±15.81 acres of office/commercial flex or business park uses; ±35.09 acres of business park core uses; ±23.18 acres of business park or mixed residential uses; ±11 acres for roadways and ±1.11 acres for drainage, subject to 1) adoption of the appropriate ordinance, 2) Condition A (as follows) , 3) the following modifications of the Planning Unit Development (PUD) Handbook, and 4) removal of the prohibition on the restriction of tattoo parlors within the document.

This is a Project of Regional Significance, as the proposed uses will generate more than 187,500 gallons of sewage per day (±780,988 gallons per day) and more than 6,250 average daily trips (±18,290 average daily trips).

CONDITION A:
Approval of the MSFL McCarran Center Planned Unit Development is subject to the Conditions contained in Exhibit B and any modifications made by the Planning Commission and City Council at their respective public hearings. The revisions shall be incorporated into the PUD Handbook and submitted to staff in both paper and electronic versions for review within two (2) months of the date of an approval by the Regional Planning Commission as a project of Regional Significance. Failure by the applicant to adhere to this deadline shall render this approval null and void.

REQUIRED MODIFICATIONS TO THE PUD HANDBOOK:
Modify the PUD Handbook to include: a) disclosures to project property owners and tenants of the adjacent agricultural uses and slaughterhouse, b) a 30 foot setback from the northern perimeter, c) a change to industrial uses in the northernmost planning area, d) ensuring better than 1:1 flood mitigation and, e) a Handbook provision ensuring that agricultural uses will continue to be allowed within the project area.

Sincerely,

for Lynnette R. Jones
City Clerk

LRJ:bbb

xc: Community Development
Nathan Gilbert, Community Development
Jeff Mann, Parks, Recreation & Community Services
Melissa Lindell, Wood Rodgers, Inc.
Board of Regents, Office of General Counsel, UNR

EXHIBIT B

ENGINEERING, TRAFFIC AND HEALTH DEPARTMENT CONDITIONS

1. Prior to the approval of each permit, the applicant shall have an approved Sanitary Sewer Report in accordance with the Public Works Design Manual. Adequate easements and access shall be provided for all sanitary sewer improvements per the Public Works Design Manual. All required on-site and off-site sanitary sewer improvements necessary to serve the project shall be complete and functional prior to the issuance of any certificate of occupancy.

2. Prior to the approval of each permit, the applicant shall have an approved Hydrology Report addressing development in Critical Flood Zone 1, on-site and off-site storm water flows, detention, and facility capacities for the pre-development and post-development site conditions. Additionally, the applicant shall demonstrate that all grading and proposed storm water collection and discharge facilities, including infrastructure, access, and easements, are consistent with pre-development conditions as specified in the Reno Municipal Code and Public Works Design Manual.

3. The applicant shall provide sidewalks and demonstrate accessible and ADA compliant pedestrian routes from all adjacent public rights-of-way to the on-site buildings.

4. Project accesses, including ingress and egress limitation controls, shall be located and designed in conformance with the MSFL McCarran Center Traffic Analysis (prepared by Solaegui Engineers dated September 2011 with all addenda and updates thereto) on file for the project and in accordance with the geometric standards of the Public Works Design Manual.

5. All traffic study updates shall provide analyses and review of the site plan and proposed mitigations for project generated impacts, with regards to project and the trip generation distribution estimates included in the Traffic Analysis, on the adjacent roadway network, site accesses and pedestrian routes.

6. Prior to approval of each permit, the applicant shall provide a written response from RTC defining transit requirements for this project and shall dedicate rights-of-way or grant appropriate easements and construct transit improvement in accordance with RTC's requirements prior to the approval of any certificate of occupancy to the satisfaction of the Community Development Department staff.

7. The applicant shall provide a copy of executed encroachment permits from NDOT prior to the issuance of any City permit for applications proposing site access, grading, drainage, sanitary sewer, utility, or roadway improvements within the State right-of-way for McCarran Boulevard.

8. Any proposed detention, retention basins, and design of new channels shall have a low flow channel constructed with these facilities to allow summer nuisance water flows.

9. Low Impact Development (LID) practices are encouraged to allow storm and nuisance water infiltration on site. The placement of 4-6 inch cobble rock in the flow line of the bio and infiltration swales shall be required in order to reduce the accumulation of sediment build up in any applicable LID facilities.

10. The landscape design of turf for front yards, parking areas and islands shall require a Low Impact Development (LID) xericscape buffer of 18 inches from the back face of impervious surfaces to allow on site infiltration as well as minimizing storm and summer nuisance flows from entering the public infrastructure while reducing the downstream effect of these flows.

11. The Traffic Analysis, submitted as an Appendix of **EXHIBIT A** shall be amended to include the modifications listed in the attached letters from Solaegui Engineers dated October 14 and 19, 2011, to the satisfaction of the Engineering Division.

Lynnette R. Jones
City Clerk
(775) 334-2030
JonesL@reno.gov

Beverly Beaty-Benadom
Deputy City Clerk
(775) 334-2030
Beaty-BenadomB@reno.gov

Office of the City Clerk
Central Cashiering (775) 334-2032
Parking Tickets (775) 334-2293

May 10, 2013

FILED THIS DATE
5 / 10 / 13
BY: BBB
CITY CLERK

Troy Miller, Director of Real Estate
Business Center North
895 North Center Street
University of Nevada, Reno /239
Reno, NV 89557-0239

RE: Case No. LDC12-00015 (PUD - MSFL McCarran Center – UNR Farms) - Zoning Map Amendment – ***NOTICE OF FINAL ACTION, DECISION OR ORDER***

Dear Applicant:

At a regular meeting held May 8, 2013, the City Council passed and adopted Ordinance No. 6288, approving the zoning map amendment for the above referenced case.

Sincerely,

for Beverly Beaty-Benadom
Lynnette R. Jones
City Clerk

LRJ:bbb

xc: Community Development
Nathan Gilbert, Community Development
Jeff Mann, Parks, Recreation & Community Services
Melissa Lindell, Wood Rodgers, Inc.
Board of Regents, Office of General Counsel, UNR

Lynnette R. Jones
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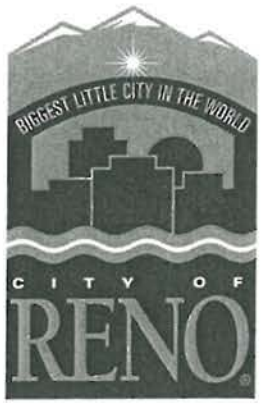
JonesL@reno.gov

Beverly Beaty-Benadom
Deputy City Clerk
(775) 334-2030
Beaty-BenadomB@reno.gov



Office of the City Clerk
Central Cashiering (775) 334-2032
Parking Tickets (775) 334-2279

FILED THIS DATE
8 / 30 / 13
BY: BBB
CITY CLERK

August 30, 2013

Received WRI-Reno
AUG 31 2013

Troy Miller, Director of Real Estate
Business Center North
895 North Center Street
University of Nevada, Reno/239
Reno, NV 89557-0239

RE: Case No. LDC12-00015 (MSFL McCarran Center PUD Handbook) – Certification of PUD Handbook

Dear Applicant:

At a regular meeting held August 28, 2013, the City Council upheld the staff recommendation and certified, in accordance with NRS 278.210, the MSFL McCarran Center Planned Unit Development (PUD) Handbook. The amendment was tentatively approved by the Council on May 8, 2013. On July 11, 2013, the PUD Handbook was reviewed and approved by the Regional Planning Commission as to its conformance with the Regional Plan (see enclosed letter).

In order to effectuate the PUD, the Handbook must be recorded at the Washoe County Recorder's Office in accordance with NRS 278A.

Sincerely,

for Beverly Beaty-Benadom

Lynnette R. Jones
City Clerk

LRJ:bbb

xc: Community Development
Vern Kloos, Community Development
Jeff Mann, Parks, Recreation & Community Services
Board of Regents, Office of General Counsel
Melissa Lindell, Wood Rodgers

Enclosure

REGIONAL PLANNING COMMISSION

July 11, 2013

Kimberly H. Robinson
Executive Director of Regional Planning, and
Clerk of the Regional Planning Commission
One East First Street, Suite 1100
Reno, Nevada 89501

Received by Clerk: 7.11.13

Mailed: 7/11/13

Dear Ms. Robinson:

On July 11, 2013, the Regional Planning Commission (RPC) held a public hearing and determined that the following matter conforms with the comprehensive Regional Plan:

> Regional Plan Conformance Review – Project of Regional Significance, MSFL McCarran Center (CR13-004) – a project of regional significance for traffic generation of more than 6,250 average daily trips (±18,290) and sewage generation in excess of 187,500 gallons per day (±780,988). The ±104 acre project site is located ±1,000 feet north of the intersection of Pembroke Drive and South McCarran Boulevard and Clean Water Way and is bounded to the north by the intersection of South McCarran Boulevard and Clean water Way, South McCarran Boulevard to the west, and to the east and south by remaining University of Nevada Systems property.

This letter has been filed with the Clerk of the Regional Planning Commission on this date and constitutes notice of final action under NRS 278.0235, "Actions against Agency: Commencement," unless a petition for review is timely filed by a person seeking review of the RPC action or determination pursuant to section I.3 of the Regional Planning Governing Board's *Regulations on Procedure*.

Please do not hesitate to contact me at 775/321-8392 if you have any questions on this matter.

Sincerely,

Sienna Reid

Sienna Reid
Senior Planner

cc: File CR13-004
Fred Turnier, City of Reno
Lynette Jones, City of Reno
Armando Ornelas, City of Sparks
Bill Whitney, Washoe County
Debra Goodwin, RTC
Nathan Gilbert, City of Reno

WASHOE COUNTY
RECORDER

OFFICE OF THE RECORDER
LAWRENCE R. BURTNESS, RECORDER

1001 E. NINTH STREET
POST OFFICE BOX 11130
RENO, NEVADA 89520-0027
PHONE (775) 328-3661
FAX (775) 325-8010

LEGIBILITY NOTICE

The Washoe County Recorder's Office has determined that the attached document may not be suitable for recording by the method used by the Recorder to preserve the Recorder's records. The customer was advised that copies reproduced from the recorded document would not be legible. However, the customer demanded that the document be recorded without delay as the parties rights may be adversely affected because of a delay in recording. Therefore, pursuant to NRS 247.120 (3), the County Recorder accepted the document conditionally, based on the undersigned's representation (1) that a suitable copy will be submitted at a later date (2) it is impossible or impracticable to submit a more suitable copy.

By my signing below, I acknowledge that I have been advised that once the document has been microfilmed it may not reproduce a legible copy.

Amber Harmon
Signature

9-10-13
Date

Amber Harmon
Printed Name