

Appendix II A

Planning Variables Documentation

This appendix provides the methodology and procedures used in the development of RTC Planning Variables (PV) for the RTC Travel Demand Forecasting (TDF) Model during 2004 – 2005. One of the most important TDF model inputs is socioeconomic/land use data. There are two parts to the development of the land use forecast: 1) determining the current and future land use development patterns and 2) converting the land use patterns to the planning variables (PV) that are inputs to the travel demand forecast model. The model is eventually used for the determination of conformity for the 2006-2008 Transportation Improvement Program and the 2006-2030 Regional Transportation Plan.

PLANNING VARIABLE DEVELOPMENT AND METHODOLOGY

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Clark County (Comprehensive Planning Department)
City of Las Vegas (Planning and Development Department)
City of North Las Vegas (Planning and Development Department)
City of Henderson (Community Development Department)

These organizations have been instrumental in assisting defining the planned land use categories for the RTC's Travel Demand model socioeconomic data need. LUWG also set the initial residential densities for future control population estimates prior to land development planning. Each LUWG member then developed its planned land use data in 5-year increment from 2003 through 2035. After the PV was developed, the members were involved in the quality control process.

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1 INTRODUCTION

This document provides the methodology and procedures used in the development of RTC Planning Variables (PV) for the RTC Travel Demand Forecasting (TDF) Model during 2004 – 2005. One of the most important TDF model inputs is socioeconomic/land use data. There are two parts to the development of the land use forecast: 1) determining the current and future land use development patterns and 2) converting the land use patterns to the planning variables (PV) that are inputs to the travel demand forecast model. It is widely acknowledged that land use forecasting is a complex process. “[A]ll of the land use models currently in use in the United States, from the most sophisticated to the simplified, still appears to leave substantial uncertainty in their forecasts, requiring careful attention, the introduction of expert knowledge, and the expenditure of the significant amounts of time.” (Making the Land Use Transportation Air Quality Connection, Appendix B, pg B-2)

Recognizing the complexity of land use forecasting, the Southern Nevada Regional Planning Coalition (SNRPC)¹ formed a Land Use Working Group (LUWG) at the request of Regional Transportation Commissions of Southern Nevada (RTC). LUWG is responsible for providing forecasted land use activity for the RTC. The LUWG consists of planning staff from Clark County and the cities of Las Vegas, North Las Vegas, and Henderson

The SNRPC has provided consensus regarding the methodology for population and housing unit projections developed by LUWG. Please refer to **Appendix I** for details. The group’s charge is to define planned land development in 5-year increments using LUWG defined land use classifications which were specifically designed to address the data needs of PV development. The LUWG product is the land use forecast for the years of 2005, 2010, 2015, 2020, 2025, 2030 and 2035 as growth based on the vacant land for the Clark County Assessor’s 2003 closed roll parcels (July 2003). The PV is developed based on the same source – Assessor’s 2003 parcel and LUWG August 2004 developed planned land uses.

¹ In its 1997 session, the Nevada State Legislature enabled the formation of the Southern Nevada Regional Planning Authority (SNRPA). There are ten members in the Coalition membership and Board. Two elected officials are appointed by the governing body of each public entity (except Boulder City and the Clark County School District with one appoint member each). The SNRPC conducts some of its business through subcommittees.

2. METHODOLOGY AND PROCEDURES

2.1 DATA SOURCE HIGHLIGHTS FOR PV CREATION

The PV tables are developed using the sources listed below.

- 1) Base Year Land Use: Clark County Assessor's 2003 closed roll parcels land use (July 1, 2003 as cut-off date);
- 2) Future Year Land Use: SNRPC LUWG August 2004 developed land use growth plans in 5-year increment starting 2005 and through 2035, which is briefly described in the future land use forecast section;
- 3) Land Use Classification: Current Clark County Department of Comprehensive Planning's 2003 Geographically Integrated Land Use Information System (GILIS) table for converting each parcel's land use definitions to the corresponding RTC definition (table 4);
- 4) Land Use Classification: Future LUWG defined planned land use category (table 5);
- 5) Employment Data: Nevada State Department of Employment, Training and Rehabilitation (DETR) 2003 2nd and 3rd Quarter employer data.
- 6) Population and Employment: Control Totals from UNLV Center for Business and Economic Research (CBER)²
- 7) Data from various agencies/institutions' staff and web sites, including Nellis Air Force Base (NAFB), McCarran International Airport (MIA), University of Nevada at Las Vegas (UNLV), Nevada State College (NSC), Community College of Southern Nevada (CCSN), Clark County School District (CCSD), and local phone book (private grade schools, etc.);
- 8) Aerial photographs from Clark County Geographic Information System Management Office (GISMO).

2.2 DATA STRUCTURE OF PVs

PVs are the land use input for Travel Demand Forecast (TDF) model. The RTC's TDF model requirements dictate inputs identified in the PV structure. The PVs are aggregated to the Traffic Analysis Zones (TAZs). Table 1 lists the current required structure.

² Population Forecasts: Long-Term Projections for Clark County, Nevada, 2005 – 2035, Prepared by Bengte Evenson, Ph.D. and R. Keith Schwer Ph.D. July 27, 2005, The Center for Business and Economic Research, University of Nevada, Las Vegas

Table 1 Planning Variable Data Structure

#	FIELD	DESCRIPTION
1	TAZ	Unique Traffic Analysis Zone (TAZ) number
2	DISTRICT	District number the TAZ falls in. Currently ranging from 1 through 17.
3	POP	Population
4	DU	Dwelling units
5	OCCDU	Occupied dwelling units
6	HH_SIZE	Household size
7	INC	Household medium income quartile
8	TOTEMP	Total employment excluding Special Generators (Nellis AFB, McCarran Int'l Airport, Ivanpah Int'l Airport, UNLV (Main & NLV campus), Nevada State College)
9	HOTEL	Hotel employment
10	OFFICE	Office employment
11	INDUST	Industrial employment
12	R_SHOP	Regional retail employment
13	C_SHOP	Community retail employment
14	OTHER_RET	Other (neighborhood) retail employment
15	OTHER_NON	Employment not in any other employment categories
16	RETAIL	Sum of R_Shop, C_Shop and Other_Ret)
17	NAFB	Nellis Air Force Base employment (special generator and hard coded)
18	MIA_EMP	McCarran Int'l Airport employment (special generator and hard coded)
19	MIA_PASS	McCarran Int'l Airport average daily passengers (special generator and hard coded)
20	IVPH_EMP	Ivanpah Int'l Airport employment (special generator and hard coded)
21	IVPH_PASS	Ivanpah Int'l Airport average daily passengers (special generator and hard coded)
22	UNLV_MAIN_EMP	UNLV main campus employment (special generator and hard coded)
23	UNLV_MAIN_ENR	UNLV main campus student enrollment
24	UNLV_NLV_EMP	UNLV NLV campus employment (special generator and hard coded)
25	UNLV_NLV_ENR	UNLV NLV campus student enrollment
26	NEV_ST_COLL_EMP	Nevada State College employment (special generator and hard coded)
27	NEV_ST_COLL_ENR	Nevada State College student enrollment
28	F18	Student enrollment in 1st through 8th grades
29	F912	Student enrollment in 9th through 12th grades
30	F13	Student enrollment in higher education (practically Community College of Southern Nevada only)
31	DU2	Duplicates of field DU
32	CONV_SPACE	Square feet of convention space
33	LOCATION	Location Code: 1 = CBD, 2 = Resort Corridor, 3 = Urban, 4 = Suburban
34	CBD	CBD Code: 1 = CBD, 0 = None CBD
35	STRIP	Strip Code: 1 = Strip, 0 = None Strip
36	MED_INC	Household medium income
37	JURIS_ID	Jurisdiction IDs: 1=Lower Kyle Canyon, 2=Lone Mountain, 3=Las Vegas, 4=North Las Vegas, 5=Sunrise Manor, 6=NAFB, 7=Summerlin South, 8=Spring Valley,9=Winchester, 10=Paradise, 11=Whitney, 12=Enterprise, 13=Henderson, 14=Unincorporated

2.3 DEVELOPMENT OF DWELLING UNIT AND EMPLOYMENT

The RTC's PV development converts base year parcel land use data and SNRPC planned future land use to PVs (see table 1 for details) for base and future years respectively with the exception of base year employment. The base year employment is processed from DETR employer data.

The RTC's PV creation process includes following activities: 1) obtain and prepare base year parcel data from Assessors/GISMO; 2) obtain and prepare future land use forecasts through working with SNRPC LUWG; 3) establish dwelling units/acreage and jobs/acreage conversion method and factors; 4) develop PV; and 5) validate PVs. Post processes such as control total benchmark and LUWG review/quality control were performed as necessary.

The part of PV information, which is not land use-based, is acquired through other means and integrated into the final PV product. Nellis Air Force Base (NAFB), McCarran International Airport (MIA), Ivanpah International Airport (IIA), University of Nevada at Las Vegas (UNLV) - the main campus and North Las Vegas campus, and Nevada State College (NSC), are treated as special generators in TDF model. Their employments are not included in the employment categories in PV creation process. Methodology and procedures of developing PV dwelling units, and employment are presented below. The method to derive special generators' relevant employment and passengers is described in the next section. School enrollment is discussed in the section entitled SCHOOL ENROLLMENT.

2.3.1 Base Year Land Use

Every year in June the Assessor's office defines an official version (closed roll) of parcel geography along with AoExt (the parcel attributes database), etc. for the year. The version is submitted to and certified by the State of Nevada. The current base year land use is the Assessor's 2003 closed roll parcel. It contains two parts: the parcel geography and a parcel attribute database. AoExt is the parcel attribute database, which includes land use. A copy of AoExt, called GILIS database, is maintained by Clark County Comprehensive Planning Department. The GILIS database contains verified and corrected Assessor's parcel information and additional information for planning purpose. The GILIS database is developed corresponding to the same version of the parcel data.

The RTC's base year PVs are developed using the Assessor's parcel geography along with AoExt data, and GILIS data. The parcel geography is linked with AoExt/GILIS data through parcel number. The RTC's PV creation process keeps the parcel geography and adds additional attributes for travel demand forecasting purpose. Two crucial attributes are; 1) the RTC's land use definition and 2) parcel capacity, which is number of dwelling units in the case of residential uses, and number of rooms in the case of hotel related uses at the parcel level. An equivalent table (see table 4 below) was created to translate GILIS land use definition to the RTC land use categories. The RTC's base year land use database corresponds to the same source data.

The RTC process deals with one-to-many and many-to-one relationships among parcel geography and AoExt/GILIS database. An example of the one-to-many relationship would be condominiums. There is one record (geography/polygon) in parcel geography corresponding to multiple records in AoExt/GILIS (equal to the number of units in the condominiums). The process assigns total units to the corresponding single parcel's capacity in parcel geography. In case of many-to-one, for example, crossing section parcels, there are multiple parcels in parcel geography sharing the same parcel number (the Assessor splits parcels along section line without altering the parcel number), and corresponding to one record in AoExt/GILIS. The process assigns the average capacity in the AoExt against the parcel numbers in parcel geography.

Table 2 provides the data structure of the RTC prepared parcel land use (showing only RTC added fields).

Table 2 RTC Prepared Parcel Data Structure

#	FIELD	DESCRIPTION	SOURCE
1	TM_PclID	Unique parcel index number (RTC added to both Assessors Parcel and RTC Parcel for linking purpose)	RTC
2	TM_APN8	First 8 digits of Assessors parcel number	ASR
3	TM_Acre	GIS calculated parcel acreage	RTC
4	TM_APN_Frq	Occurrence of parcels with same parcel number	RTC
5	TM_Juris	Jurisdiction a parcel is in	RTC
6	TM_LU_ASR	Land use - Assessors	ASR
7	TM_LU_GLI	Land use - GILIS	GILIS
8	TM_LU_TM	Land use - RTC	RTC
9	TM_Cap_ASR	Capacity (number of housing units or room number)	ASR
10	TM_Cap_GLI	Capacity (number of housing units or room number)	GILIS\RTC
11	TM_Cst_Yr_ASR	Construction year	ASR
12	TM_Val_ASR	Value	ASR
13	TM_SaleDat	Date of sale	ASR
14	TM_StrNum	Street number	ASR
15	TM_StrDir	Street direction	ASR
16	TM_StrNam	Street name	ASR
17	TM_StrTyp	Street type	ASR
18	TM_ZIP	ZIP code	ASR
19	TM_Subd	Subdivision name	ASR
20	TM_Owner	Owner name	ASR
21	TM_ResDen	Residential parcel's density (units/acre)	RTC
22	TM_AreaTyp	Area type (1=CBD, 2=Resort Corridor, 3=Urban, 4=Suburban)	RTC
23	TM_TAZ1218	1218 Traffic Analysis Zone (TAZ) number	RTC

- Note:
1. Source ASR indicates the data is carried over from Assessors parcel data.
 2. Source GILIS indicates the data is carried over from GILIS parcel land use table.
 3. Source RTC indicates data is created or processed by RTC.

Table 3 presents the RTC parcel land use definition

Table 3 RTC Parcel Land Use Definition

#	Land Use	Description
1	RRes	Residential – Rural
2	LDRes	Residential - Low Density
3	MDRes	Residential - Mid Density
4	MHDRes	Residential - Mid-High Density
5	HDRes	Residential - High Density
6	Hotel_R	Hotel&Resort
7	Hotel_H	Hotel
8	Casino	Casino
9	RRet	Retail - Regional
10	CRet	Retail - Community
11	NRet	Retail - Neighborhood
12	CarSale	Retail - Auto Dealership
13	ORet	Retail - Race Track, etc
14	Office	Office
15	Hospital	Hospital and Medical Center
16	School	School
17	Religiou	Religious
18	P_F	Police and Fire Station
19	Trans_1	Transportation - Terminal, Depot, etc
20	Warehouse	Warehouse
21	REC_O	Recreational - outdoor (golf course, race track)
22	REC_I	Recreational - indoor
23	REC_RP	Recreational - RV Park
24	Parking	Parking lot, garage
25	OS	Open Space
26	LInd	Light Industrial
27	HInd	Heavy Industrial
28	AgMining	Agriculture, Ranching, Mining
29	ROW	Right-Of-Way
30	PHeld	Public Land Management Area\Public Held
31	NAFB	Nellis AFB
32	MIA	McCarran Int'l Airport
33	UNLV	UNLV
34	Vac	Vacant

In the RTC-prepared parcel database, the parcel's RTC land use definition is obtained through converting parcel's GILIS land use definition. Table 4 is the GILIS-RTC land use equivalency table.

Table 4 GILIS to RTC Land Use Equivalency Table

GILIS LAND USE CODE		RTC LAND USE	LAND USE DESCRIPTION	
FROM	TO		GILIS	RTC
110	190	Res	Residential	Residential
195	195	OS	Common Area	Open Space
198	198	Res	Residential	Residential
199	199	Res	Residential - Other	Residential
210	211	LInd	Manufacturing (food, etc.), R&D (electronic, etc)	Industrial - Light
215	215	HInd	Industrial	Industrial - Heavy
220	220	AgMining	Mining	Agriculture and Mining
230	230	HInd	Heavy Equipment	Heavy Industrial
240	259	Warehouse	Storage - Warehouses & Outdoor, etc., Ind. Condos.	Warehouse
260	260	Office	Industrial Condos	Office
310	311	Hotel_R	Hotel w/ Resort	Hotel with Resort
312	321	Hotel_H	Hotel&Motel	Hotel and Motel
325	325	Casino	Casino	Casino and Gaming
330	330	NRet	Laundromat, copying center, etc.	Retail - Neighborhood
331	331	Hospital	Hospital	Hospital
335	335	Office	Prof. & Business Services (medical, accountants, etc.)	Office
336	336	School	Day Care	School
338	339	Office	Financial (bank, etc.), Data Processing Center	Office
340	341	REC_I	Entertainment Facilities (theater, race track, etc.)	Recreational - Indoor
345	345	REC_I	Indoor Recreation (pool parlors, athletic area, etc.)	Recreational - Indoor
346	349	REC_O	Outdoor Recreation (Driving Range, Golf Course, etc.)	Recreational - Outdoor
350	350	RRet	Regional Shopping Center	Retail - Regional
355	355	CRet	Neighborhood Shopping Center	Retail - Community
358	358	CRet	Department Stores, etc.	Retail - Community
359	359	NRet	Convenient Stores	Retail - Neighborhood
360	360	CRet	Restaurants	Retail - Community
365	365	LInd	Food & Beverage Business (Distributor)	Industrial - Light
370	370	CarSale	Auto Dealership	Industrial - Heavy
371	371	CRet	Auto Repair	Retail - Community
372	372	OS	Auto Wrecking Yard	Open Space
375	375	NRet	Auto Service	Retail - Neighborhood
378	378	CRet	Sale of building&construction supplies and services	Retail - Community
380	380	REC_RP	RV Park	Recreational - RV park
385	385	Office	Commercial Condos	Office
399	399	ORet	Other Commercial Activities, i.e. Race Track	Retail - Other
410	410	School	School	School
411	411	LInd	Trade School	Industrial - Light
420	420	Religious	Church	Religious
430	430	CRet	Libraries, Post Offices, etc.	Retail - Community
431	431	OS	Cemeteries	Open Space
440	440	OS	Parks	Open Space
450	450	REC_I	YMCA, Red Cross, United Way	Recreational - Indoor
451	451	Office	Social, community organizations	Office
460	460	Office	Gov Facilities - Animal Control	Office
461	461	Office	Gov. offices	Office
462	462	Office	Gov. Support services	Office
463	463	P_F	Police, fire stations	Police\Fire Station

GILIS LAND USE CODE		RTC LAND USE	LAND USE DESCRIPTION	
FROM	TO		GILIS	RTC
466	466	Military	Military Facilities	Military
470	470	REC_I	Community centers	Recreational - Indoor
499	499	Office	Gov. Offices	Office
510	530	AgMining	Agriculture, Ranching	Agriculture and Mining
610	610	Office	Communication & Utility Office	Office
611	611	OS	Transmission Facilities	Open Space
613	613	LInd	Print Communication	Industrial - Light
620	620	Trans_1	Shipping Terminals, Depots, Stops, Freight Docks, etc.	Transportation
621	621	Parking	Parking lot, garage	Parking lot, garage, etc.
630	631	OS	Major Utility Facilities	Open Space
710	730	OS	Minor Improvements	Open Space
900	900	ROW		Right-of-Way
0	0	Vac		Undeveloped

Note: The residential parcels are recognized as general residential in this step. More specific classification (Rural, Low Density, Medium Density, Medium High Density, and High Density) is done through a post process by calculating the residential density as units divided by acreage, and replace the designation from general RES to one of the five more specific definition (RRes, LDRes, MDRes, MHDRes, HDRes).

2.3.2 Future Year Land Use Forecast

2.3.2.1 Future Land Use by Jurisdiction

The future year land use forecast was created through the work of the Southern Nevada Regional Planning Coalition (SNRPC) Land Use Workgroup (LUWG) with the members representing the cities of Las Vegas, North Las Vegas, Henderson, urbanized Clark County and the RTC. The workgroup was formed to develop a consensus based process to define future land use development plans for the RTC's transportation planning process. Based on the available vacant land of the Assessor's 2003 closed roll parcel, the group created GIS data of planned land development using the RTC/SNRPC planned land use development definition. This future land use is in 5-year increments by jurisdiction covering the years from 2005 through 2035. Table 5 provides the LUWG defined planned land use categories. One exception is the mixed land use, which are not included in the standard LUWG category listed in Table 5. The LUWG's land use forecast for the City of Las Vegas have several mixed land use categories.

Table 5 LUWG Planned Land Use Categories

#	SNRPC Planned Land	
	Category	Description
1	SF	Residential - Single Family
2	MF	Residential - Multi Family
3	MFH	Residential - High Rise Residential
4	Hotel	Hotel
5	RRet	Retail – Regional
6	CRet	Retail – Community
7	NRet	Retail – Neighborhood
8	Office	Office
9	School	School
10	Hospital	Hospital
11	OS	Open Space
12	Ind	Industrial
13	Other_Non	Everything Else

Those mixed uses are distributed to the standard category using the percentage table the City of Las Vegas provided (Table 6). The mixed use categories include Mixed Uses (MIX), Planned Community Development (PCD), Suburban Mixed Uses (MIX_SB), Main Street Mixed Uses (MIX_MT), Urban Center Mixed Uses (MIX_UB), Summerlin (SUM), Conversations (Cons).

**Table 6 Percentage Distribution
Mixed Land Use to LUWG Standard Land Use**

LU	PERCENTAGE						
	MIX	PCD	MIX_SB	MIX_MT	MIX_UB	SUM	Cons
SF	15%	55%	5%	0%	0%	49%	55%
MF	20%	16%	20%	20%	20%	6%	16%
MFH	0%	0%	0%	0%	0%	0%	0%
Hotel	5%	0%	3%	3%	3%	5%	0%
RRet	0%	0%	0%	0%	0%	0%	0%
CRet	25%	6%	45%	50%	45%	12%	6%
NRet	0%	0%	0%	0%	0%	0%	0%
Office	20%	0%	10%	10%	12%	5%	0%
School	3%	5%	0%	2%	0%	5%	5%
Hospital	0%	0%	0%	0%	0%	0%	0%
OS	2%	6%	2%	0%	0%	8%	6%
Ind	2%	0%	0%	0%	0%	2%	0%
Other_Non	8%	12%	15%	15%	20%	8%	12%
ROW	0%	0%	0%	0%	0%	0%	0%
SUM	100%	100%	100%	100%	100%	100%	100%

2.3.2.2 Future PVs

The planned land use data is then processed for future PV creation through a two-step process: 1) a GIS process to apply TAZ feature to the development and 2) summarization of the development acreages by land use categories, by TAZ, and by horizon years. The result is development growth acreages by TAZ by land use definition for each horizon year. Table 7 is the summary of the result of the allocation process. **Appendices II and III** provides the LUWG planned land use acreage by jurisdiction.

Table 7 Forecast Developed Acres 2005 – 2030

TIME PERIOD	FORECAST GROWTH ACRES		
	Residential	Non-Residential	TOT
2005 - 2010	21,218	16,447	37,665
2010 - 2015	13,275	11,070	24,345
2015 - 2020	7,423	6,761	14,184
2020 - 2025	5,677	3,855	9,532
2025 - 2030	4,444	3,005	7,449
TOTAL 05-30	52,037	41,138	93,175

The RTC TDF Model structure contains 1219 traffic analysis zones (TAZs) covering 350,000 acres that make up the urbanized Las Vegas area. According to 2003 parcel data, approximately 186,400 of these acres had residential or non-residential development or were used for public right-of-way (ROW). It was estimated that an additional 16,600 acres would be developed by 2005, bringing the developed total to 203,000 acres.

As can be seen from Table 7, between 2005 and 2030, 93,000 acres are forecasted to be developed, leaving 54,000 acres undeveloped in the urbanized Las Vegas area. Most of these remaining 54,000 acres are forecasted to be located in areas where physical constraints limit development. Of the developable land, a portion of them will be utilized for transportation, drainage and utility ROW. The LFWG assumed that 20 percent of the forecasted developed vacant land would be needed for ROW. Therefore, all acreage totals provided to the RTC were initially reduced by 20 percent. During the validation process, it was observed that many of the forecasted parcels were already served by public facilities and did not require a 20 percent ROW reduction. For example, the vacant land west of downtown Las Vegas and north of the Clark County Government Center is already served by a mature transportation system. For this area, the ROW factor was adjusted from 20 percent to 5 percent. In comparison, completely vacant land northeast of the Aliante Master Planned Development in North Las Vegas does not have any public facilities serving it. Therefore, the ROW factor for this area was kept at 20 percent. This forecast activity does not address growth outside of the Las Vegas urbanized area.

2.4 DEVELOPMENT OF CONVERSION FACTORS

The RTC’s TDF Model uses planning variables that describe population, dwelling units, employees, and students. Therefore, the land use data in base year parcel and LUWG planned land use development had to be converted into these variables.

2.4.1 Occupancy Rate and Household Size

The occupancy rate and household size are provided by Clark County Department of Comprehensive Planning (**Appendix IV** – Clark County Occupancy and Household Size Surveys), and applied to dwelling unit to obtain occupied dwelling units (ODU) and population for all years. The occupancy rate is estimated by postal ZIP code geography and by dwelling type (single family, multi family and mobile home). The household size is estimated by census tract geography and by dwelling type (single family, multi family and mobile home).

2.4.2 Base Year Dwelling Unit Factor

The base year dwelling unit is contained in the parcel data and therefore acreage factor is not needed.

2.4.3 Future Year Dwelling Unit Factor

The LUWG uses the average residential density as 8 and 18 dwelling units per acre for single and multi family respectively. The densities are used to control the forecasted land development by the entity’s control population. Table 8 lists the control population by jurisdiction.

Table 8 LUWG Control Population

Jurisdiction	Population							
	2003	2005	2010	2015	2020	2025	2030	2035
City of Las Vegas	535,395	568,000	643,000	686,000	729,000	770,000	805,000	900,000
City of North Las Vegas	147,877	181,172	260,751	333,371	408,555	468,157	519,748	519,748
City of Henderson	220,236	250,855	329,039	388,405	430,342	437,990	442,570	442,570
Unincorporated Clark County in Las Vegas Urban Area	669,477	728,250	890,848	984,502	1,065,895	1,130,023	1,183,417	1,230,052
Las Vegas Valley Urban Total	1,572,985	1,728,277	2,123,638	2,392,278	2,633,792	2,806,170	2,950,735	3,092,370

During the RTC’s process of translating land use acreage to population through density based dwelling units, it was found that the universal density for all jurisdiction and all years does not work well in the sense of it does not generate the population comparable

to the jurisdiction’s control population. The need to test and adjust the initial densities arose in order to achieve the control population by year and by entity. Table 9 presents the adjusted densities by entity and by year.

Table 9 Residential Density

LU	JURIS-DICTION	DENSITY (Units\Acre)							DESCRIPTION
		2005	2010	2015	2020	2025	2030	2035	
SF	CC	8	8	8	10	8	8.5	10	Clark County Single Family
MF	CC	18.5	29.5	27	35.5	27	34.5	41	Clark County Multi Family
MFH	CC	50	50	60	70	61	61	61	Clark County Multi Family High Rise
SF	LV	7	6.5	6.5	7	7	7	7	City of Las Vegas Single Family
MF	LV	19	19	17	20	20	20	20	City of Las Vegas Multi Family
MFH	LV	50	50	60	70	61	61	61	City of Las Vegas Multi Family High Rise
SF	NLV	7	6.5	8.5	9	10	7	7	City of N Las Vegas Single Family
MF	NLV	13.5	20.5	28.5	28.5	27	20.5	20.5	City of N Las Vegas Multi Family
MFH	NLV	50	50	60	70	61	61	61	City of N Las Vegas Multi Family High Rise
SF	HD	6	8	8.5	11	3.2	10	3	City of Henderson Single Family
MF	HD	15	27	31	26.5	18	22	18	City of Henderson Multi Family
MFH	HD	50	50	60	70	61	61	61	City of Henderson Multi Family High Rise

2.4.4 Base Year Employment Factor

The base year employment is not acreage factored but developed from Nevada State Department of Employment, Training and Rehabilitation (DETR) employer data. The detailed information is discussed in later part of this documentation.

2.4.5 Future Year Employment Factor

Compared to population forecasts, the development of an employment planning variable forecast is very challenging. While population data can be tracked in a relatively straightforward manner using dwelling unit count data from the Clark County Comprehensive Planning and Assessor offices, the forecast of employment planning variables has to consider several factors, including:

1. Number and type of employees per acre or square feet of building space,

2. Conversion factors relating property acreage and square feet of building space,
3. Location of employees compared with office address, for example, a residential construction company may have its main office at Valley View and Russell but have hundreds of employees working at construction sites in Mountain's Edge and Aliante,
4. Variability of employment types such as hotel, retail, office, and industrial.

Non-residential acreage was converted into employment using factors derived from the analysis of data from the Clark County Assessor, Clark County Comprehensive Planning, and the Nevada Department of Employment, Training and Rehabilitation (DETR). The parcel data contains the information about parcel acreage, land use type and address. The DETR data provide the information of employer's industry code, number of employees and address. The industry code is interpreted into a relevant land use type. The addresses from the two data sets were matched and analyzed. Table 9 summarizes these factors. **Appendix V** provides samples of the data that were taken from DETR and parcel to develop the factors in Table 10. As stated in various sections of this document, the factors listed in Table 10 serve as a starting point and may be adjusted during the validation step.

Table 10 Acreage to Employment Factors

IDX	LAND USE		EMPLOYMENT		
	LU	DESCRIPTION	CATEGORY	Per Acre	Gross to Net
1	Hotel	Hotel (Resort Corridor)	Hotel	100	0.80
2	Hotel_N	Hotel (Not on Resort Corridor)	Hotel	40	0.80
3	RRet	Retail - Regional	R_Shop	22	0.80
4	CRet	Retail - Community	C_Shop	22	0.80
5	NRet	Retail - Neighborhood	Other_Ret	22	0.80
6	Other_Non	Land use not in any other categories	Other_Non	20	0.80
7	Office	Office	Office	50	0.80
8	School	School	Other_Non	15	0.80
9	Hospital	Hospital	Other_Non	70	0.80
10	Ind	Industrial	Indust	12	0.80
11	OS	Open Space	Other_Non	0.5	0.80

Note: The Land Use is for the purpose of corresponding to the LUWG planned land use category. The Employment category is corresponding to TDF model's employment category. The gross to net ratio is for the purpose of reducing the land needed for public facility such as ROW.

2.5 DEVELOP INITIAL PLANNING VARIABLES

In this section, the procedure of initial planning variables development is discussed. The PV summary data by jurisdiction is provided in **Appendix VI**.

2.5.1 Base Year Dwelling Unit

Base year dwelling unit data is available at parcel level. Base year occupied dwelling unit and population are calculated by applying occupancy rate (by type) and household size (by type) to dwelling unit. Two occupancy rates are employed: one for single family and one for multi-family. The area that has a density of less or equal to six units per acre is considered single family and those that are greater than six units per acre are considered as multi-family. Through the following formula, information was obtained on parcel level dwelling units, occupied dwelling units, and population.

$$\begin{array}{lcl}
 \text{Occupied Dwelling Units} & = & \text{Dwelling Units} \quad * \text{ Occupancy Rate} \\
 \text{Population} & = & \text{Occupied Dwelling Units} \quad * \text{ Household Size}
 \end{array}$$

The parcel level data are then processed with GIS to get the data for each of the 1218 TAZs. The population is divided by the occupied household in each TAZ to obtain the average household size for each perspective TAZ.

2.5.2 Future Year Dwelling Unit

The same process as the base year dwelling unit calculation is applied to the residential growth acreages in 3 residential classes – single family, multi-family and multi-family high density by horizon year discussed in the previous section “Future Year Land Use Forecast”. The growth of dwelling units is calculated at the TAZ level by applying acreage to proper density factors in Table 8, which is factored by unit type, by jurisdiction and by horizon year. The growth of occupied dwelling unit and population are calculated by applying occupancy rate (by type) and household size (by type) to dwelling unit growth. The process yields the growth of dwelling units, occupied dwelling units and population by TAZ, by unit type of single family, multi-family and high density multi family for each horizon year.

2.5.3 Base Year Employment

The base year employment numbers are generated with the DETR 2003 2nd quarter employer data, which is not included in this document but available as a data file. The DETR employer data is processed by: 1) address matching with GISMO street center line; 2) translating DETR employer code to TDF modeling categories; 3) aggregating the employment to TAZ by category; and 4) post processing. The details are described in the following sections.

2.5.3.1 DETR Address Information & Address matching

There are total of 34,482 establishments in the DETR 2003 2nd quarter employer database. Of those, 32,133 (93.19%) of them are reported with address information, and 2,349 establishments are without address information. Some establishments reported the employment to a single address. Of the 32,133 addressed establishments, 30,412 (94.64%) are within our Travel Demand Forecast (TDF) modeling domain and successfully address matched. The addresses in the database are examined and standardized to the addresses with matching issues. For example, these streets have address match problem caused by their names in the DETR database and need to be standardized before address match process: Las Vegas Blvd., Casino Center Blvd., and Casino Dr. The addresses matched outside the TDF modeling domain area are re-matched with ZIP codes for the reason that street names are not unique across the jurisdictions. The Warm Springs, Sunset, and Russell addresses are re-matched with ZIP codes for the reason that these street names are used by both the Clark County and the City of Henderson. Table 11 lists the address match summary by employment range of DETR employer data.

**Table 11 DETR 2003 3rd Quarter Employer Data
Address Match Summary by Employment Range**

EMPLOYMENT CLASS		Clark County				LV Valley (Address Matched)			
EMP RANGE	AVG EMP	Estab-lish-ment	Percent	EMP	Per-cent	Estab-lish-ment	Per-cent	EMP	Per-cent
Zero; no em- ployment	0	5,293	15.35%	0	0.00%	4,427	14.56%	0	0.00%
1 to 4 em- ployees	3	13,103	38.00	39,309	4.83	11,175	36.75	33,525	4.48
5 to 9 em- ployees	7	6,064	17.59	42,448	5.21	5,470	17.99	38,290	5.11
10 to 19 em- ployees	15	4,547	13.19	68,205	8.38	4,229	13.91	63,435	8.47
20 to 49 em- ployees	35	3,353	9.72	117,355	14.42	3,132	10.30	109,620	14.64
50 to 99 em- ployees	75	1,140	3.31	85,500	10.50	1,072	3.52	80,400	10.74
100 to 249 employees	175	637	1.85	111,475	13.69	593	1.95	103,775	13.86
250 to 499 employees	375	176	0.51	66,000	8.11	164	0.54	61,500	8.21
500 to 999 employees	750	93	0.27	69,750	8.57	84	0.28	63,000	8.41
1000 to 1499 employees	1,250	24	0.07	30,000	3.69	18	0.06	22,500	3.00
1,500 to 1,999 employee	1,750	14	0.04	24,500	3.01	13	0.04	22,750	3.04
2,000 to 2,499 employee	2,250	6	0.02	13,500	1.66	5	0.02	11,250	1.50
2,500 to 2,999 employee	2,750	10	0.03	27,500	3.38	9	0.03	24,750	3.31
3,000 to 3,999 employee	3,500	11	0.03	38,500	4.73	11	0.04	38,500	5.14
4,000 to 4,999 employee	4,500	5	0.01	22,500	2.76	4	0.01	18,000	2.40
5,000 to 5,999 employee	5,500	1	0.00	5,500	0.68	1	0.00	5,500	0.73
6,000 to 6,999 employee	6,500	1	0.00	6,500	0.80	1	0.00	6,500	0.87
7,000 to 7,999 employee	7,500	1	0.00	7,500	0.92	1	0.00	7,500	1.00
8,000 to 8,999 employee	8,500	1	0.00	8,500	1.04	1	0.00	8,500	1.14
9,000 to 9,999 employee	9,500	1	0.00	9,500	1.17	1	0.00	9,500	1.27
20,000 plus employees	20,000	1	0.00	20,000	2.46	1	0.00	20,000	2.67
Total		34,482	100.00	814,042	100.00	30,412	100.00	748,795	100.00

2.5.3.2 Category Translation – DETR Industry Code to TDF Model Employment Category

An equivalency table to convert DETR employer industry code to TDF model employment category is created by assigning each of the 800 plus employment categories in the DETR employer database to the appropriate TDF modeling employment category. The RTC staff developed the equivalency table, which was later modified by Parsons Transportation Group (PTG). This equivalency look up table was used in the employment data conversion process. In the case where a category was missing in the PTG-modified table, the proper category in the original RTC equivalency table is used. The equivalency table is included as **Appendix VII**. Table 12 summarizes processed data by the TDF model employment category.

Table 12 Summary of Address Matched DETR 2003 3rd Quarter Employer Data By TDF Model Employment Category

Category	Establishment	PCT	EMP	PCT
HOTEL	3,088	10.15%	221,571	29.59%
RRET	4,704	15.47%	93,723	12.52%
CRET	1,223	4.02%	22,684	3.03%
NRET	1,632	5.37%	20,417	2.73%
OFFICE	11,147	36.65%	159,307	21.28%
IND	3,663	12.04%	103,123	13.77%
OTHER_NON	4,955	16.29%	127,970	17.09%
TOTEMP	30,412	100.00%	748,795	100.00%

2.5.3.3 Post Processes (Headquarter Issue)

Clark County School District Employment (CCSD) -- CCSD reported all employment at the district office address. The process assigned 3% of it at this address (Table 14). The school specific employment is described in the section entitled SCHOOL ENROLLMENT.

CCSN Employment -- CCSN reported total of 1,750 employments at Cheyenne campus. The number is redistributed into all three main campuses (Cheyenne, Charleston and Henderson) with the following formula:

$$\begin{aligned}
 &\text{Employment at a Campus} \\
 &= \text{Total Teachers} + \text{Total Staff} \\
 &= (\text{Total Employment} * A * B) + (\text{Total Employment} * C)
 \end{aligned}$$

Where:

- A is the ratio of teachers to total employment, which is assumed to be 85%.*
- B is the ratio of student number at a campus to total students*
- C is the ratio of staff at a campus to total employment. C is assumed as 10% for Cheyenne campus, 3% for Charleston campus and 2% for Henderson campus.*
- A + C = 100%*

Table 13 summarizes the results.

Table 13 2003 CCSN Employment Redistribution

ID X	CAMPUS	ADDRESS	CITY	ENR_03 Student	EMP03_CALC	TAZ
1	Charleston	6375 W Charleston Blvd	Las Vegas	11,429	623	544
2	Cheyenne	3200 E Cheyenne Ave	North Las Vegas	13,586	854	240
3	Henderson	700 College Dr	Henderson	4,762	273	1101
	Total			29,776	1,750	

Local Governments -- The local governments, including the cities of Las Vegas, North Las Vegas, Henderson and Clark County, reported all employment at a single address respectively. The employment number at each agency's main location can be corrected by either getting specific information from the agency or assuming a flat ratio, for example 65%, of total employment working at that location. Table 14 lists the assumed percentages with the number assigned to the main address for each agency. The remaining percentages are left out in this process due to lack of the specific location and employment distribution information except CCSD and CCSN which are handled as previously described. This action did not substantively change the accuracy of the employment information.

**Table 14 DETR 2003 3rd Quarter Employer Data
Employment Assigned to Headquarter Address**

Company	Address	City	ZIP	EMP	Percent Assigned to MAIN Address	EMP Assigned to MAIN Address	TAZ
Clark County School District	2832 E Flamingo Rd	Las Vegas	89121	20,000	3%	600	701
Clark County	500 S Grand Central Pkwy	Las Vegas	89106	9,500	15%	1,425	528
University Of NV-LV	4505 S Maryland Pkwy	Las Vegas	89154	4,500	100%	4,500	748
Las Vegas Metropolitan Police	400 Stewart Ave	Las Vegas	89101	4,500	5%	225	468
University Medical Ctr Of S NV	1800 W Charleston Blvd	Las Vegas	89102	3,500	70%	2,450	526
City Of Las Vegas	416 N 7th St	Las Vegas	89101	3,500	20%	700	479
U S Postal Service	1001 Circus Circus Dr	Las Vegas	89109	2,750	10%	275	608
City Of Henderson	240 Water St	Henderson	89015	2,750	20%	550	942
Community College of So NV	3200 E Cheyenne Ave	Las Vegas	89115	1,750		0	240
City of N LV-Human Resources	2200 Civic Ctr Dr	N Las Vegas	89030	1,750	20%	350	329
Transportation Security Admin	5757 Wayne Newton Blvd	Las Vegas	89111	1,250	100%	1,250	845
Dept Veterans Affairs-Medical Ctr	1703 W Charleston Blvd	Las Vegas	89102	750	100%	750	556
Consolidated Non-appropriated	5942 Swaab Blvd	Nellis AFB	89191	750	100%	750	220
L V Valley Water District	1001 Valley View	Las Vegas	89153	750	100%	750	525
LV Convention & Visitors Auth	3150 Paradise Road	Las Vegas	89109	750	100%	750	616
U S Department Of Energy	232 Energy Way	North Las Vegas	89030	375	100%	375	298
Total				59,125		15,700	

2.5.4 Future Year Employment

The previous section “Future Year Land Use Forecast” described the process that created the TAZ level tables containing the growth acreages by non residential land use categories (Table 5). The growth of employment is calculated at the TAZ level by applying acreage to conversion factors listed in Table 9. The employment growth is calculated by applying the proper factors to acreages for each horizon year respectively. The general formula is as follows:

$$\text{Emp Growth} = \sum [\text{AcG} * \text{GtN} * \text{Emp per Ac}]$$

Where:

- AcG Employment’s corresponding land use acreage growth
- GtN Land use’s corresponding gross to net ratio
- Emp per Ac Land use’s corresponding employee per acre
- ∑ Employment of an employment category is the total of all the land use categories (Table 5) falls into the employment category (Table 2)

2.6 VALIDATION OF INITIAL DEVELOPED PLANNING VARIABLES (DWELLING UNITS & EMPLOYMENT)

The PV was validated on a TAZ by TAZ basis using aerial photographs from the Clark County GISMO. The intent here was to look for reasonableness in terms of how many acres were being developed between 2005 and 2030 and the estimated dwelling unit and employment totals. In particular, developing employment totals for industrial, transportation, utility facilities and areas with a lot of open space are challenging and need to be carefully reviewed. Adjustments were made which are reflected in the Table 15 totals.

Table 15 Population and Employment in PV Table

Year	Population		Employment	
	Growth	Total	Growth	Total
2003		1,539,832		741,493
2005	202,020	1,741,852	112,801	854,294
2010	425,421	2,167,273	210,940	1,065,235
2015	385,428	2,552,702	197,360	1,262,595
2020	297,253	2,849,955	144,473	1,407,068
2025	216,778	3,066,733	110,476	1,517,544
2030	173,082	3,239,815	90,368	1,607,912

A large part of the process involved the use of aerial photo review. Aerial photographs are available from the Clark County GISMO and were used to visually check the planning variable results by TAZ with actual land use and vacant land that is available for development. This check minimizes the risk of, for example, a misassignment of 2000 workers to a 40 acre gravel pit.

The employment data was further validated by Parsons Transportation Group (PTG). Proper adjustment was made whenever needed. **Appendix VIII** contains the documentation provided by PTG.

A late change was inserted for the North 5th Street Super Arterial/BRT Study related land use plan update. The City of North Las Vegas provided dwelling unit and associated numbers were directly entered in to the PV and replaced the numbers in the impacted TAZs. Table 16 lists these changes.

Table 16 Land Use/DU Update for N 5th Super Arterial/BRT Study

TAZ	Popula- tion	DU	ODU	% Developed By		Population by		DU by	
				2010	2015	2010	2015	2010	2015
91	12,412	4,570	4,570	20%	100%	2,482	12,412	914	4,570
92	14,648	5,185	5,185	20%	100%	2,930	14,648	1,037	5,185
93	20,541	7,275	7,275	20%	100%	4,108	20,541	1,455	7,275
121	6,819	2,485	2,485	80%	100%	5,455	6,819	1,988	2,485
122	7,008	2,600	2,600	80%	100%	5,606	7,008	2,080	2,600
141	8,504	3,085	3,085	100%	100%	8,504	8,504	3,085	3,085
142	8,630	3,200	3,200	100%	100%	8,630	8,630	3,200	3,200
162	2,668	970	970	100%	100%	2,668	2,668	970	970
163	4,442	1,641	1,641	100%	100%	4,442	4,442	1,641	1,641
188	2,687	982	982	100%	100%	2,687	2,687	982	982
189	2,335	820	820	100%	100%	2,335	2,335	820	820
215	1,183	455	455	100%	100%	1,183	1,183	455	455
1151	6,471	2,335	2,335	20%	100%	1,294	6,471	467	2,335
1155	10,500	3,030	3,030	20%	100%	2,100	10,500	606	3,030
1156	3,264	1,178	1,178	100%	100%	3,264	3,264	1,178	1,178
1161	1,343	472	472	100%	100%	1,343	1,343	472	472
SUM	113,455	40,281	40,281			59,032	113,455	21,348	40,281

2.7 BENCHMARK

Benchmark is a process to factor the numbers across board to a control number. The decision was made by the RTC to benchmark 2005 through 2030 population to UNLV CBER published Clark County 2005 Population Estimates. Please note that benchmark process can cause small population change at TAZ level while the occupied dwelling units remain unchanged. Table 17 presents the CBER population control numbers for relevant years.

**Table 17 Control Population
UNLV CBER Clark County 2005 Population Estimates**

Year	Clark County Population	Population in TDF Domain (95% of Total CC Population)
2005	1,833,500	1,741,825
2010	2,281,340	2,167,273
2015	2,687,055	2,552,702
2020	2,999,953	2,849,955
2025	3,228,140	3,066,733
2030	3,410,332	3,239,815
2035	3,580,908	3,401,863

2.8 QUALITY CONTROL BY LUWG

The final PV was made available to members of LUWG for quality and reality review. The questions, comments, and suggestions from the review have been addressed and incorporated into the final document.

3. SPECIAL GENERATORS

Nellis Air Force Base (NAFB), McCarran International Airport (MIA), Ivanpah International Airport (IIA), University of Nevada at Las Vegas (UNLV, including the main campus and North Las Vegas campus), and Nevada State College (NSC) are treated as special generators in TDF model. Thus, their employments are not included in the other employment categories in the PV process. The current and future special generator relevant data is obtained/derived from relevant agencies, departments, and institutions. Sources include their planning staff and web sites. Table 18 lists the employment and passenger data from NAFB, MIA, and IIA. The MIA employment is calculated from annual passenger using 2004 passenger/employment ratio. The Ivanpah Airport data is from Clark County Aviation Department's Ivanpah Valley International Airport Phase I Transportation Access Master Plan (by Parsons for Clark County Aviation Department, March 2005).

Table 18 Employment/Passengers of NAFB, MIA, and IIA

YEAR	Nellis AFB (TAZ 220)	McCarran Int'l Airport (TAZ 798)			Ivanpah Airport (TAZ 1219)		
	Employees	Employees	Passengers		Employees	Passengers	
			Annual	Daily		Annual	Daily
2003	9,200	14,727	36,265,932	99,359			
2004	11,750	16,000	41,441,531	113,538			
2005	12,000	16,569	40,800,000	111,781			
2010	13,000	19,371	47,700,000	130,685	500		
2015	13,500	22,457	55,300,000	151,507	5,000		
2020	14,000	21,117	52,000,000	142,466	3,200	10,878,900	29,805
2025	14,500	21,117	52,000,000	142,466	5,000	19,855,950	54,400
2030	15,000	21,117	52,000,000	142,466	6,526	28,075,376	76,919
2035	15,500	21,117	52,000,000	142,466			

Table 19 lists employment/enrollment for UNLV and NSC.

Table 19 UNLV and NSC Employment and Enrollment

YEAR	UNLV Main (TAZ 748)		UNLV NLV (TAZ 77)		Nevada State College			
	Faculty	Enrollment	Faculty	Enrollment	(TAZ 1110)		(TAZ 1180)	
					Faculty	Enrollment	Faculty	Enrollment
2003	2,399	26,393			35	350		
2004	2,483	27,317			35	350		
2005	2,570	28,273			50	500		
2010	2,965	32,613			750	7,500		
2015	3,521	38,734					1,200	12,000
2020	3,521	38,734	1,000	10,000			1,450	14,500
2025	3,521	38,734	2,897	28,973			1,625	16,250
2030	3,521	38,734	3,000	30,000			1,800	18,000
2035	3,521	38,734						

4. SCHOOL ENROLLMENT

The school enrollment number was developed with various methods. The F18, F912 and F13 in PV table represent the student enrollment numbers for the following type of schools: Clark County School District (CCSD), large private grade schools found in local phone book, and Community College of Southern Nevada (CCSN). F18, F912 and F13 correlate accordingly to grades 1 through 8, grades 9 through 12, and grade 13 (CCSN only in this instance) and above respectively.

CCSD provided CCSD 2003 enrollment data was address matched and aggregated to TAZs for 2003 enrollment data. It's also supplemented by private school enrollment through telephone survey. The employment was derived by student/teacher ratio and added to PV's under other_non employment category. The ratios 14, 16 and 20 were used for elementary, middle, and high schools respectively.

CCSD web site listed future schools until 2005 – 2006 at the time of PV development. The future school data was address matched and aggregated to TAZs for enrollment growth from 2003 – 2005. The assumed capacity enrollment was assigned to future schools. The capacity assumption is 750, 1700, and 2700 for elementary, middle and high schools respectively. The above student/teacher ratio for 2003 was applied to produce employment and the number was added to PV under other_non category.

The grade school enrollment beyond 2005 was defined through the LUWG land use acreage factored by students per acre. 80 students per acre were assumed for elementary and middle school, and 70 students per acre were used for high school.

The CCSN 2003 enrollment at three campuses (Cheyenne, Charleston, and Henderson) was obtained from CCSN, and the CCSN staff suggested that a 6% annual growth be used for the future growth. Table 20 lists the processed result for CCSN enrollment.

Table 20 CCSN Enrollment

Campus	Charleston	Cheyenne	Henderson	Total
TAZ	544	240	1101	
2003	11,429	13,586	4,762	29,776
2005	12,842	15,265	5,350	33,457
2010	17,185	20,428	7,160	44,773
2015	22,997	27,338	9,581	59,916
2020	30,775	36,584	12,822	80,181
2025	41,185	48,958	17,158	107,301
2030	41,185	48,958	17,158	107,301
2035	41,185	48,958	17,158	107,301

5. CONCLUSION

This is the very first attempt by the RTC using this approach to develop Planning Variables. Although great care was used during the process, the land use forecasting is both a complex and continuous process. There are various areas within the process that could and shall be improved upon. Because employment totals are very difficult to estimate for a large area such as the Las Vegas Valley, the factors employed in this land use forecast and the resulting values used in each TAZ and horizon year should be reviewed and monitored for each set of milestone level travel demand forecast activity. Given the continuous nature of the land use planning, more fine-tuning will occur in each of the subsequent land use updates.