APPENDIX F – TRAVEL DEMAND MODELLING MEMO

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MEMORANDUM

To: Bill Baranowski, P.E. West Jordan City
City Traffic Engineer

From: Kai Tohinaka, InterPlan
Transportation Planner

Date: December 10, 2014

Subject: **West Jordan City MTP Modeling**

Introduction

West Jordan City is currently undergoing a Transportation Master Plan update, and has hired InterPlan to conduct travel demand modeling supportive to the plan efforts being conducted by Horrocks Engineers. The following technical provides an overview InterPlan's modeling efforts, which produced the traffic forecasts found in the updated Transportation Master Plan.

Model Version

The Wasatch Front Regional Council (WFRC) – Mountainland Association of Governments (MAG) regional travel demand model version 7.0 was used for forecasting year 2040 travel demand. Model version 7.0 was used for all travel modeling but minor changes were made to the model network and the socio-economics to make it more consistent with the planned land use within the study area. These changes are documented below.

Socio-economic Inputs

Pulling largely from the modeling work completed by InterPlan for the 5600 West Planning Study, completed in mid-2013, updated socioeconomic model inputs were produced. The study used the West Jordan City General Plan to estimate future development within the study area. Build-out demographics were projected using the General Plan land use within each traffic zone and the assumed housing and employment densities shown in Tables 1 and 2 below.

Table 1 – Residential Net Density Assumptions

Land Use	Zoning	General Plan Density Range (Housing Units per Acre)	Assumed Density (Housing Units per Acre)	People per Unit
Very Low Density Residential	All A, RR, RE Zones, PC, PRD, VLSFR	0 - 2	1.5	3.6
Low Density Residential	RR, RE, R-1-12, R-1-14, PC, PRD	1.0 - 3.0	2.5	3.4
Low Density Residential	LSFR	1.0 - 3.5	2.9	3.4
Medium Density Residential	R-1-8, R-1-9, R-1-10, PC, PRD	3.1 - 5.0	4.5	3.2
Medium Density Residential	MFR	3.1 - 7.6	6.5	3.2
High Density Residential	RM, R-1-5, R-1-6, R-2, R-3-6, R-3-8,R-3-10, PC, PRD	5.1 - 10.0	8.8	2.8
High Density Residential	HFR	5.1 -14.1	11.9	2.8
Very High Density Residential	R-3-12, R-3-16, R-3-20, R-3-22, PC, PRD	10.1 and up	10.1	1.7
Very High Density Residential	HFR	10.1 and up	14.1	1.7
Mixed Use	MU	0 - 25.0	18.8	1.2

Table 2 – Employment Net Density Assumptions

Land Use	Total Employment per Acre
Mixed Use	20
Transit Oriented Development	20
Neighborhood Commercial	10
Community Commercial	18
Regional Commercial	19
Research Park	25
Professional Office	30
Light Industrial	10
Public Facilities	3
Agricultural Open Space	0.01
Parks and Open Land	0.01
Future Park	0.01

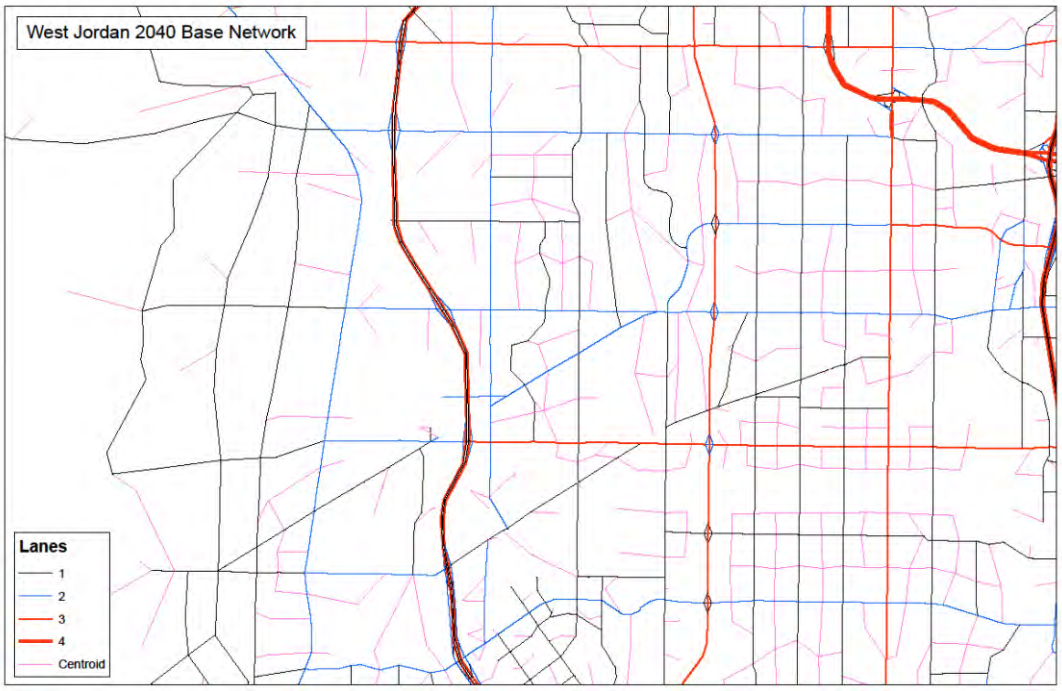
This dataset was then was reviewed and adjusted by the consultant with feedback provided by city staff, to account for any changes in the past two years. The resulting socioeconomic forecasts are shown in table 2 below.

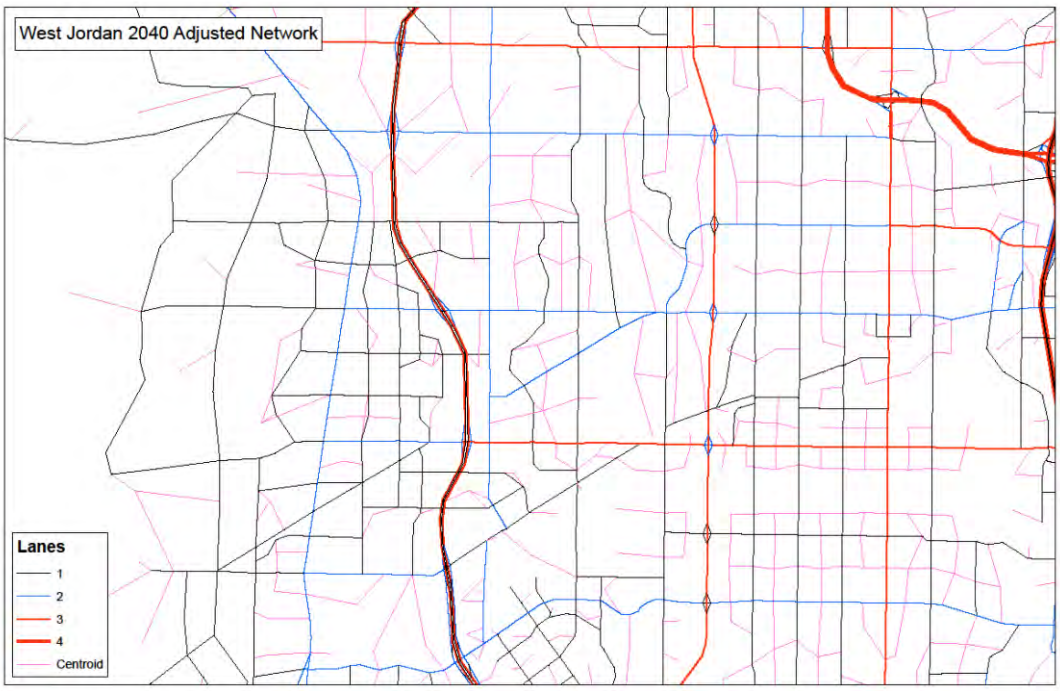
Table 1 – West Jordan 2040 Socioeconomic forecasts

TAZ ID	Households	Population	Employment		TAZ ID	Households	Population	Employment
1200	1,893	4,832	862		**1303**	474	1,454	106
1201	1,552	4,539	917		**1304**	14	44	2,935
1202	1,073	3,332	1,409		**1305**	1,219	3,645	149
1203	1,378	4,344	392		**1306**	635	1,915	96
1204	1,382	4,131	502		**1307**	1,438	4,167	1,413
1206	1,191	3,264	997		**1308**	705	2,121	909
1207	1,277	3,825	558		**1309**	659	2,107	212
1208	856	2,765	346		**1310**	452	1,020	1,276
1209	762	2,366	357		**1311**	832	2,086	1,509
1210	439	1,420	47		**1312**	1,609	4,756	749
1214	575	1,935	15		**1313**	455	1,296	1,267
1219	925	2,358	5,101		**1314**	1,274	3,519	1,739
1220	970	2,955	781		**1315**	683	1,659	893
1267	1,023	2,715	736		**1316**	510	1,529	525
1268	1,011	3,350	53		**1317**	657	1,638	332
1269	1,940	4,420	1,186		**1318**	1	3	3,455
1270	1,427	4,165	795		**1319**	15	26	4,558
1271	1,647	3,683	1,124		**1320**	281	586	1,886
1272	1,877	5,171	168		**1321**	489	1,592	-
1273	173	396	3,300		**1322**	245	783	483
1274	115	384	412		**1323**	121	456	1,713
1275	464	1,162	604		**1326**	630	2,016	320
1276	2,760	7,726	109		**1327**	487	1,559	333
1277	3,402	9,246	15		**1328**	1,564	3,943	687
1280	-	-	6,964		**1330**	1,023	2,670	641
1281	549	1,680	1,869		**1331**	481	1,575	373
1282	1,737	4,862	1,300		**1332**	452	1,064	370
1283	898	2,873	23		**1333**	114	351	299
1284	548	1,205	758		**1338**	251	826	548
1285	773	2,781	473		**1339**	882	2,618	295
1288	739	2,300	383		**1340**	352	1,090	631
1289	1,214	3,487	1,243		**1345**	1,016	2,239	1,168
1290	172	388	29		**1346**	-	-	2,283
1300	748	1,813	467		**1353**	929	2,888	93
1301	1,453	4,403	298		**1354**	857	2,803	402
1302	953	3,088	105		**Total**	**61,701**	**175,410**	**69,347**

Future Model Network

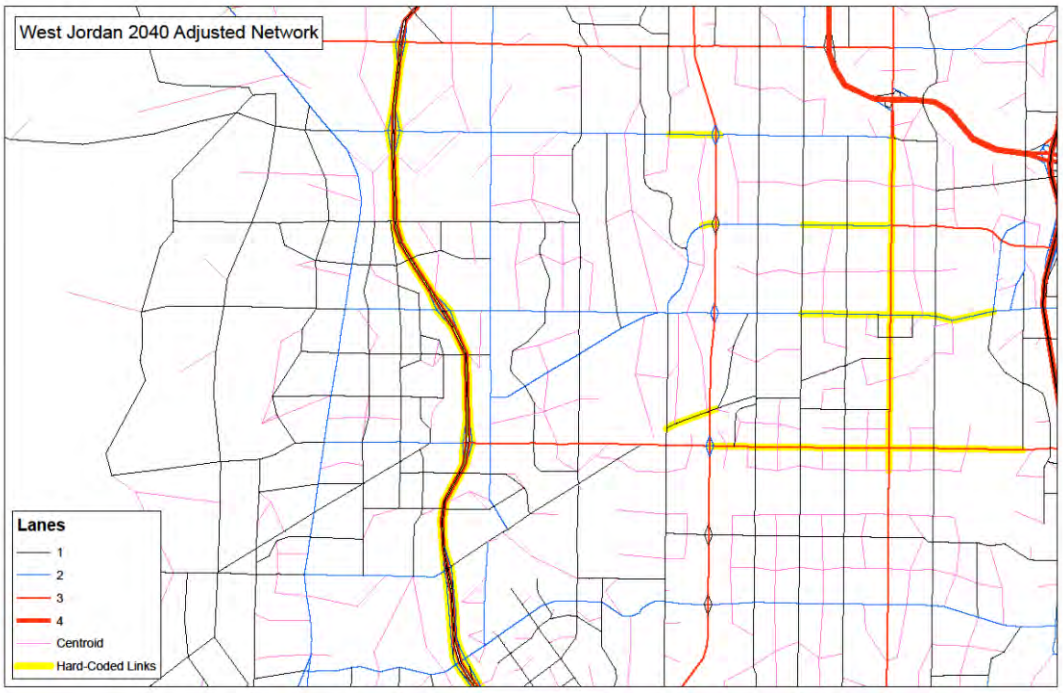
The updated West Jordan City Transportation Master Plan calls for a great deal of infrastructure development in the western portion of the city. Because of this, the network found in the WRFC base model was greatly out dated. Work was completed to update this network to accurately represent the future network proposed in the plan. The figures below show the original 2040 WFRC base network and the network updated for this plan.





Final Adjustments and Model Results

After the above describe work was completed, initial model outputs were reviewed by the city, Horrocks Engineers, and representatives from the WFRC, to identify any irregularities. Problematic road segments were identified and then 'hard-coded' in the model to predefined speeds and capacities in order to adjust for irregularities and produce model volume outputs which best reflect expected conditions. The map below identifies the road segments which received 'hard-coded' adjustments.



The resulting final model outputs were then provided to Horrocks Engineers for use in the plan. Figure 9 of the plan shows projected roadway volumes produced by this work. This data was also used in a Level of Service analysis conducted by Horrocks Engineers, the results of which are also found in Figure 9 of the plan.