Treasure Hill Traffic Study Summary

January 2017

Submitted To:
Treasure Hill

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Table of Contents

Report History

The following is a list of traffic studies, addendums or pertinent information that has been provided and is relevant to the proposed Treasure Hill Project with a focus on traffic and parking.

Original Traffic Impact Analysis – July 2004

As seen in the original report, the Treasure Hill Project accesses and intersections will function adequately to transfer the project-generated traffic to and from the site.

Occasional delays are currently experienced during winter PM Peak Periods and during special events such as Sundance, Arts Festival, 4th of July, etc. This Project will contribute little to existing delays. One intersection that will continue to experience delays higher than recommended is the Park Ave. and Empire Ave. / Deer Valley Drive intersection. Several proposals have been presented to Park City Staff for possible improvement to this intersection based on prior traffic studies performed in the study area. Another intersection that currently experiences delays on a limited number of days during the PM Peak Period is the Silver King Dr. and Empire Ave. intersection. Delays at this intersection result from the Park City Mountain day-skiers leaving the parking lots at approximately the same time. Any Treasure Hill Project traffic will also contribute to these delays. However, individuals who leave Treasure Hill in their cars to ski or visit elsewhere will be returning in the direction opposite to the main traffic flow during the PM Peak Periods. Therefore, they will not contribute to the traffic flow and delays created by day-skiers leaving the resort parking area. Finally, it is important to note that addressing the Silver King Dr. and Empire Ave. intersection delays will be of minimal practical value without addressing coinciding delays at Park Ave. and Empire Ave / Dear Valley Drive.

Adding turning lanes at Park Ave. and Empire Ave. / Dear Valley Drive, and a roundabout or traffic signal at Silver King Dr. and Empire Ave., although not recommended at the present time, are potential viable options if delays become more frequent and or longer in the future.

The following recommendations are forwarded with the purpose of assuring the most favorable LOS for the traffic study area: 1. Construct the gondola to Main Street and operate during PM Peak Periods. 2. Construct and maintain the proposed pedestrian connections. 3. Limit parking on Lowell / Empire Loop to local residents with permits and restrict parking to one side of Lowell / Empire Loop during winter months. 4. Prohibit parking on both sides of Lowell / Empire Loop adjacent to the Project. 5. Level the berm on the inside of the Lowell / Empire curve and revegetate with low lying plants. 6. Remove snow from Lowell and Empire Avenues on a priority basis. 7. Direct construction and service traffic to follow specified routes and avoid winter PM Peak Periods. 8. Accommodate construction parking and staging on site. 9. Encourage Treasure Project guests and residents to use alternate modes of transportation and follow the set pattern of up Lowell Avenue and down Empire Avenue. 10. Update analysis periodically using actual Peak Hour delay counts.

Addendum #1, Wayfinding Sign Study – Summer 2004

This study identified locations where wayfinding signs could be placed to direct motorists to Treasure and reduce unnecessary out of direction travel. Most locations identified are areas that existing signs currently direct motorists to other key landmark locations.

Addendum #2, Winter Traffic Counts – April 2005

The timing of the original study estimated winter traffic conditions at the study intersections. This addendum focused on the results of traffic volumes gathered on President's Day Weekend of 2005 to evaluate the difference between the estimated volumes in the original report and actual traffic volumes on one of the busiest skier weekends. As reflected in the addendum every intersection in the report was analyzed with more traffic then was found during President's Day Weekend.

Table 1 – Refined Traffic Count

Intersection	*Projected (From Original Report)*		*Actual (Counted February 19th)*	
	AM	*PM*	*AM*	*PM*
Park Ave. / Deer Valley	2392	2392	2302	3503
Deer Valley Dr. / Silver King Dr.	624	1003	314	438
Empire Ave. / Shadow Ridge	431	694	188	303
Empire Ave. / Manor Way	277	435	120	190
Empire Ave. / Crescent Tram	84	140	37	123
Lowell Ave. / Shadow Ridge	201	230	82	101
Lowell Ave. / Manor Way	170	637	74	139
Lowell Ave. / North Star	96	197	21	41
Note: The numbers depict the total volume at the intersection during one peak hour.				

Therefore the reduction in traffic volumes will improve the level of service previously reported and support the previous study conclusions.

Fehr and Peers Traffic Study Review – July 2005

Park City Municipal Corporation hired a third-party traffic engineering consultant to review the traffic study and associated addendums prepared for the Treasure Development. As stated from the review, "*In general, Fehr & Peers found that the Traffic Impact Analysis (TIA) performed by PEC, Inc. provides an adequate assessment of the traffic characteristics and potential impacts related to the proposed Treasure Hill project. Fehr & Peers also found that the proposed Treasure Hill project is consistent with general guidelines provided in the Transportation Element of the General Plan and Land Management Code.*"

Questions and Response from Planning Commission – February 2006

This was not a formal addendum to the traffic study but there were various questions raised by the Planning Commission. Many of these questions resulted in further addendums as described below but one question that was resolved with this letter was regarding truck turning movements at the various intersections. Exhibit A at the end of this Traffic Study Summary provides graphical results to answer this question. It identifies that there is sufficient room for the trucks to make the necessary turning movements.

Addendum #3, Lowell Ave Sidewalk Improvements – January 2008

This addendum addressed the questions regarding the need for a sidewalk along Lowell Ave. It was found that a five-foot sidewalk could be constructed on the uphill (west side) of Lowell Ave but the City would need to evaluate that versus the potential impact it may have on parking and existing driveways.

Addendum (no number), Walkability Study Update – June 2009

The purpose of this addendum letter was two-fold: present revisions to the walkability study and comment on the effect of the proposed changes to the roadway section on Empire Ave.

Walkability Study

A walkability study for the Treasure Hill development and surrounding Park City Resort area in January 2008 and this letter updated that addendum. In summary, the study concluded that improvements need to be made to provide safer pedestrian accommodations, with or without the proposed project. A list of recommended pedestrian improvements was included.

This letter updates the previous walkability study based on concerns brought forward by the Park City Planning Commission regarding safety on Empire Avenue. Changes to the walkability study recommended improvements include:

- Installation of sidewalk on the downhill side of Empire Avenue, and
- Elimination of the proposed sidewalk/stair improvements from Empire to Lowell on 10th Street (need eliminated by improvements on Empire).

The attached figure provides a graphical representation of the suggested improvements described with the addition of the changes listed above. The complete list of suggested improvements, as updated, is as follows:

- Install new sidewalk on the west side of Lowell Avenue and on the east side of Empire Avenue from the Park City Mountain Resort area to the Treasure Development. Current conditions warrant this improvement without the Treasure Development. It would also be the in the best interest of pedestrian safety to provide for the sidewalks to remain reasonably clear of snow during the winter season to allow for continued pedestrian use.

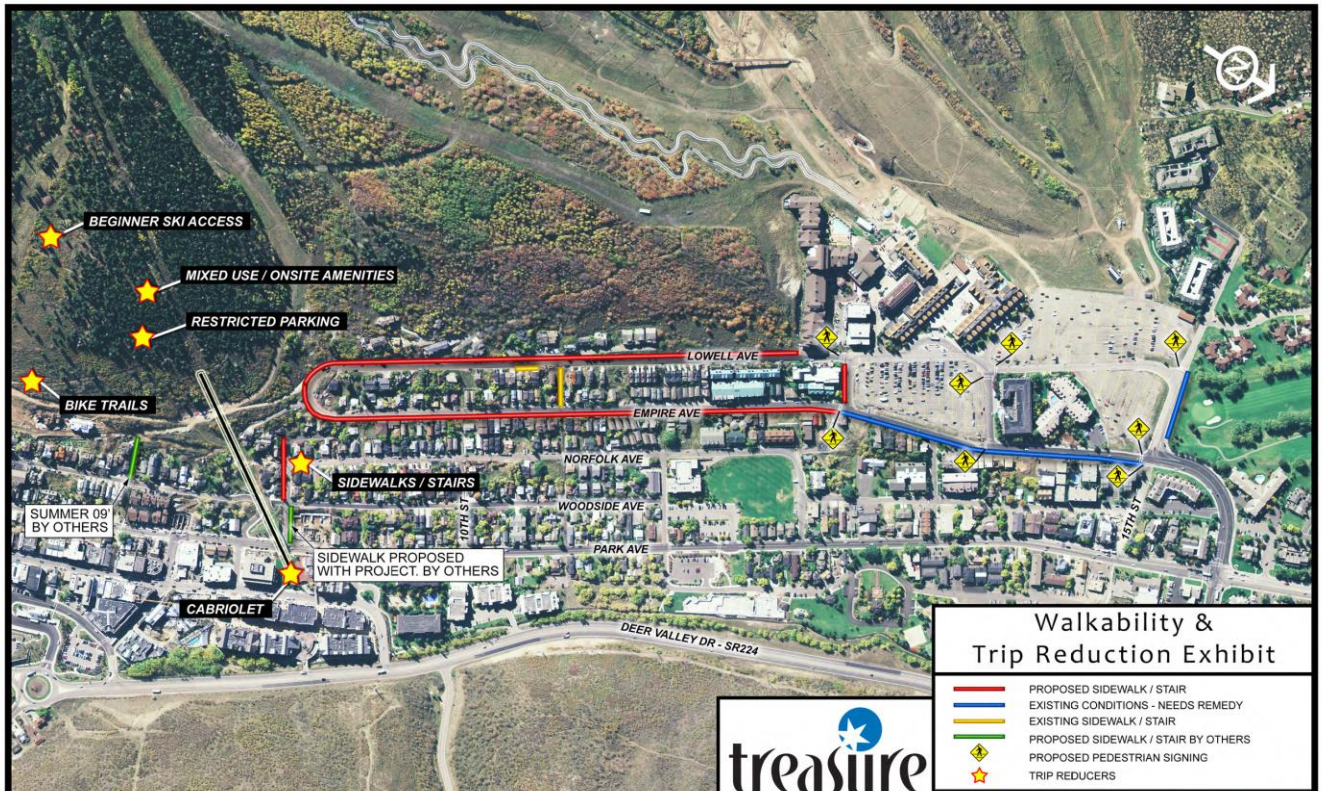
Due to the amount of snow and the number of rental units it is in the best interest of the City to assist in the snow clearing operations.

- Install new sidewalk/stair connections. This includes connections from Woodside to Crescent on 8th Street and Empire to Lowell on Manor.

- Install signs and paint crosswalks in eight (8) locations in the Park City Mountain Resort Area. These installations will help increase the safety of pedestrians using the area and their locations have the least amount of impact on vehicle traffic. Because of the current pedestrian habits of walking these roads freely, once the crosswalks are established it may be necessary for the City to enforce the crossing restrictions in order to realize safer traffic and pedestrian interaction.

- There are currently two (2) locations where sidewalk/stair improvements are warranted in order to provide adequate access for future growth. These improvements are understood to be scheduled for completion by others sometime in 2009. They are from Woodside to Treasure on 6th Street and Park to Woodside on 8th Street. It is our understanding that the 6th Street sidewalk/stair improvements are still anticipated.

Pursuit of these recommendations will contribute to safe pedestrian access around the Park City Resort area and the Treasure Development.



Empire Avenue

The walkability study as presented above reflects the current proposal to install sidewalk on Empire Ave. between the project and Manor Way. It is our understanding that some narrowing of the roadway will be required in order to create the space for that sidewalk. The question has been raised as to whether or not that action would reduce the traffic-carrying capacity of Empire Ave. significantly enough to affect the conclusions of the traffic impact analysis performed previously.

The original traffic study concluded that traffic on Empire south of Manor would operate at LOS A during the AM and PM peak hours. While the roadway narrowing may affect operating speeds on the roadway, it is our opinion that the operations will remain at LOS A. Those lower speeds are in line with the anticipated and desired character of that roadway. The traffic impact of the proposed change is negligible.

Addendum #4, Refined Land Use and Trip Generation – April 2009

A modification of the traffic trip generation rates based on refined land use information and these rates were modified to include more current information at the request of the Park City Municipal Planning Commission. The Land Use values are similar to those used in the original Traffic Impact Analysis, the Institute of Transportation Engineers (ITE) land use (L.U.) cited was: L.U. 230 for Condominium/Townhouse, L.U. 221 for Employee Housing, L.U. 310 for Hotel and L.U. 814 for Specialty Retail. The commercial L.U. applies to only 19,000 square feet because 34,000 square feet of the commercial space is already included in the hotel L.U. trip generation. The ITE Trip Generation Manual states, "Hotels have supporting facilities such as restaurants, cocktail lounges, meeting and banquet rooms or convention facilities, limited recreational facilities and /or other retail and service shops". Therefore the 34,000 square feet of commercial land use is included in the hotel trip generation numbers. It was assumed approximately 400 square feet per employee for housing accommodations.

Table 2 – Refined Trip Generation

Type of Facility	*AM Trip Generation*	*PM Trip Generation*	*AM Peak Hour*		*PM Peak Hour*	
			# Entering	*# Exiting*	*# Entering*	*# Exiting*
ORIGINAL STUDY TOTAL	133	162	73	60	79	83
MODIFIED PER ADDENDUM	108	147	45	63	79	68
NET CHANGE	-25	-15	-28	+3	0	-15

As reflected in the table above from Addendum #4, by providing employee housing on site and not providing additional parking for commercial use, there will be a net decrease of trips generated by the proposed development in comparison with the original study. Therefore

modified trip generation rates will improve the level of service previously reported and support the previous study conclusions.

Addendum #5, Parking Generation Study – June 2009

This study focused on evaluating the parking demand for the Treasure Project. Forecasts of vehicle parking demand for the proposed development were calculated using the 3rd edition of *Parking Generation*, published by the Institute of Transportation Engineers (ITE). Land use codes that matched the codes in the original traffic impact analysis were used to estimate the trips generated by the facility with the exception of the hotel support commercial. The original traffic impact analysis used land use code 814: Specialty Retail which is not currently available in *Parking Generation*. Land use code 820: Shopping Center was the closest available land use and was used in place of the original land use code. Regression equations were used to determine the parking generation. Details of the land use codes and generation rates used are attached.

Table 3 - Raw Parking Generation

Type of Facility	***# of Units***	***Weekday Parking Generation***	***Weekend Parking Generation***
Hotel	202	168	235
Condominium/Townhouse	103	176	143
Hotel/Resort Support Commercial	19	189	394
Employee Housing	58	57	61
TOTAL		590	833

Similar to the original traffic impact analysis, the raw estimated parking demand was calculated assuming no interaction or internal sharing of trips by the different land uses. This is unrealistic considering the mixed use nature of the development and the high probability of shared trips between the different land uses. In the original traffic impact analysis, a reduction was made to the calculated trips to account for the trips that are made internal to the development. In addition, trips were further reduced to account for the addition of on-site employee housing. Similarly, a portion of the parking demand is expected to be shared between the different land uses. This is especially true of the support commercial, where a large portion of visitors to these areas will be patrons of the hotel, residents of the condominium/townhomes, or employees.

However, the reduction in parking demand due to shared demand is not expected to be as great as the reduction in vehicle trips. In some instances, the reduction in vehicle trips does not correlate to a similar reduction in parking demand. Some examples of this could include patrons of the hotel that access Main Street via the gondola or walking and employees who live on site and walk to work, Main Street, etc. In both of these examples, there is justification for

reducing the number of vehicle trips. However, the demand for parking still exists since, in both cases, the patron and employee still have a car parked in the project.

Addendum four of the traffic impact analysis showed a reduction in trips (compared to the raw numbers) of 55% with on-site employee housing. The reduction in trips was applied across the board for the various land uses. Many of the mitigating factors that allow for that reduction also apply to the parking need, but for the reasons stated above, the reduction in parking generation is expected to be somewhat less. The assumed reductions for each of the land uses are as described below:

- Residential Uses (Hotel, Condominium/Townhouse, and Employee Housing) – While vehicle trips for these land uses are greatly reduced by the ability to walk or ride the cabriolet, the reduction in parking demand is expected to be modest. For purposes of this study, a 10% reduction was assumed.
- Hotel/Resort Support Commercial – These facilities are intended for the use of the resort guests only. Therefore no public parking is provided. However, a certain amount of parking will be needed for managers/employees living off-site, service issues, etc. 90% reduction was assumed.

The reduced parking generation is shown in Table 4.

Table 4 – Reduced Parking Generation

Type of Facility	***# of Units***	***Weekday Parking Generation***	***Weekend Parking Generation***
Hotel	202	151	212
Condominium/Townhouse	103	158	129
Hotel/Resort Support Commercial	19	19	39
Employee Housing	58	51	55
TOTAL		379	435

Based on the information presented in this addendum, it was recommended that approximately 435 parking spaces be provided to service the expected parking demand at the Treasure development.

Additional information Relevant to Parking - Lowell Avenue Community Meeting

While not an addendum as part of the Treasure Hill Project, a petition in December 2016 was submitted requesting the City to develop a residential permit parking zone on Lowell Avenue from Manor Way to 12th Street. A community meeting was held to discuss the issue of nonresidents looking for parking. This highlights the importance of the Treasure Project to have

an appropriate amount of parking on the site to alleviate any concerns of adding to the parking challenges along the streets specifically during the winter ski months.

Addendum #6, Intersection Operations Limiting Development Traffic on Empire Ave – June 2009

This addendum focused on the local street system and associated intersections if the traffic was focused towards Lowell Ave. instead of Empire Ave south of Manor Way. By moving that portion of the site traffic that was previously projected to use Empire Avenue over to Lowell Avenue, some of the traffic movements at the analysis intersections are projected to experience less delay, while other movements will experience increased delay. The net effect at both intersections is a minor increase in total intersection average delay. Both intersections are still projected to operate well within acceptable levels of delay in both the AM and PM peak periods on ski-days.

Additional information Relevant to Lowell Avenue; Lowell Avenue Project - 2015 to 2017

Park City has designed and plan to construct improvements along Lowell Avenue from Manor Way to the curve heading down to Empire Avenue. Along with utility improvements the finished typical section is anticipated to have 2.5 feet of rolled gutter on both sides, 17.5 feet of travel lane, 4.5 feet of flexible space for parking with a total hard surface of 27 feet (see diagram below). This typical section known as “Local Road – Old Town” adheres to the 2011 Park City Traffic and Transportation Master Plan (TMP).

During the planning phase of the project a traffic model was created and a memorandum of the results of that study were issued on April 2, 2015. The traffic model examined future traffic volumes on Lowell Avenue using the travel demand model developed for the Park City TMP update in 2011. The traffic model included existing conditions and build out conditions for Treasure Hill Project and the Bamberger property.

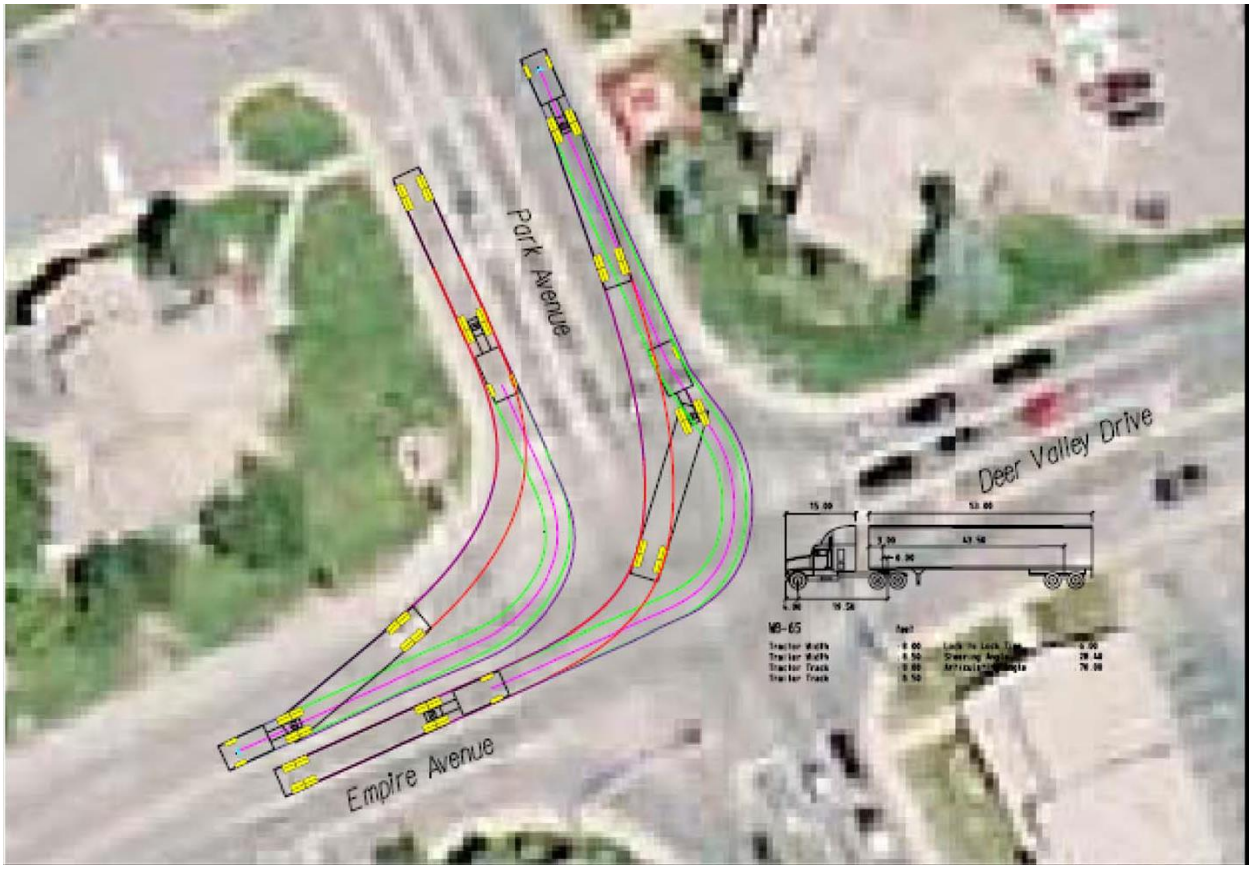
The conclusion of the study was that even with the addition of the Treasure Hill Project and potential Bamberger property development that Lowell Avenue can facilitate the existing and future traffic needs with the Local Road – Old Town typical section depicted below.

Conclusion and Summary

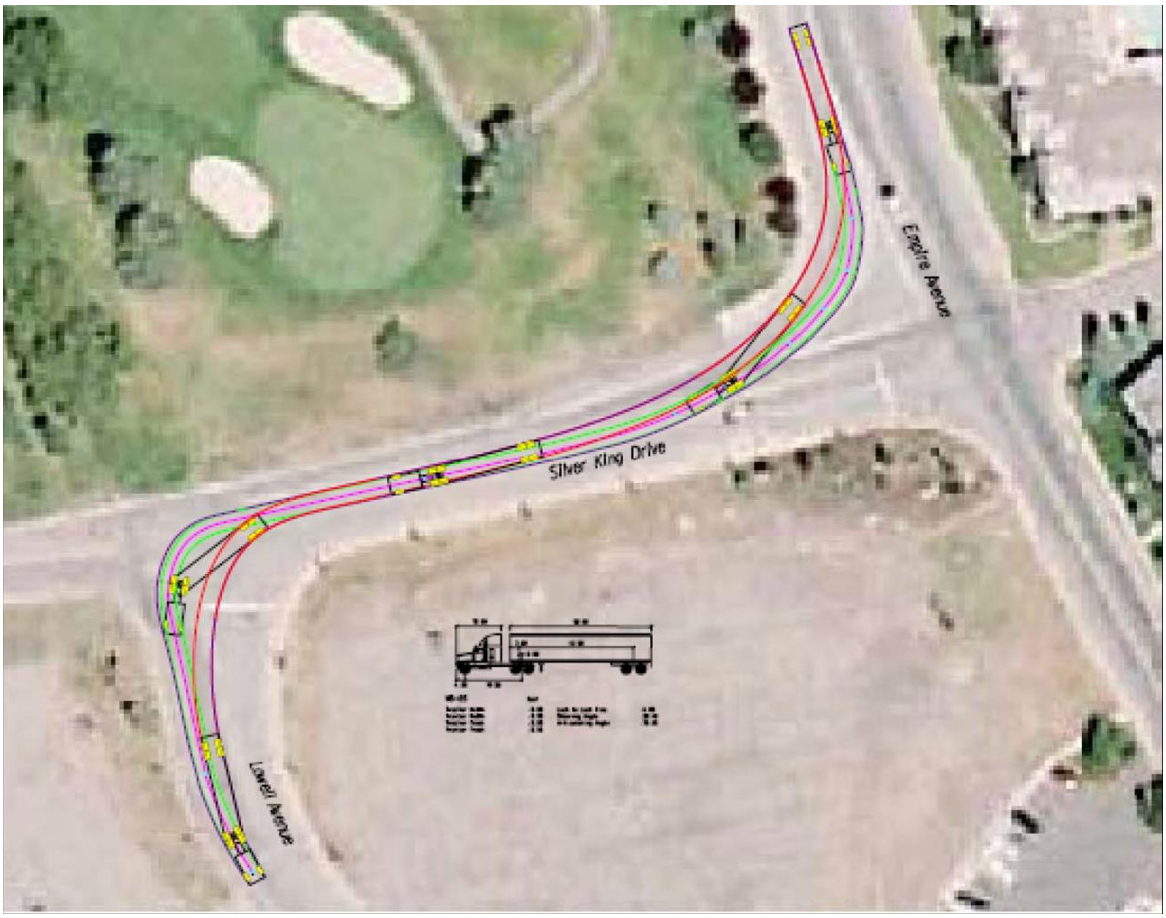
As reflected in the summary of the original study and subsequent addendums the roadway network can facilitate the traffic needs for existing traffic and the traffic anticipated from the Treasure Hill Project. These results are supported with the traffic modeling completed by Park City for the upcoming Lowell Avenue Project. With implementing the traffic study recommendations, it will continue to allow traffic to operate at an acceptable level of service in the future.

Exhibit A - Truck Turning Templates

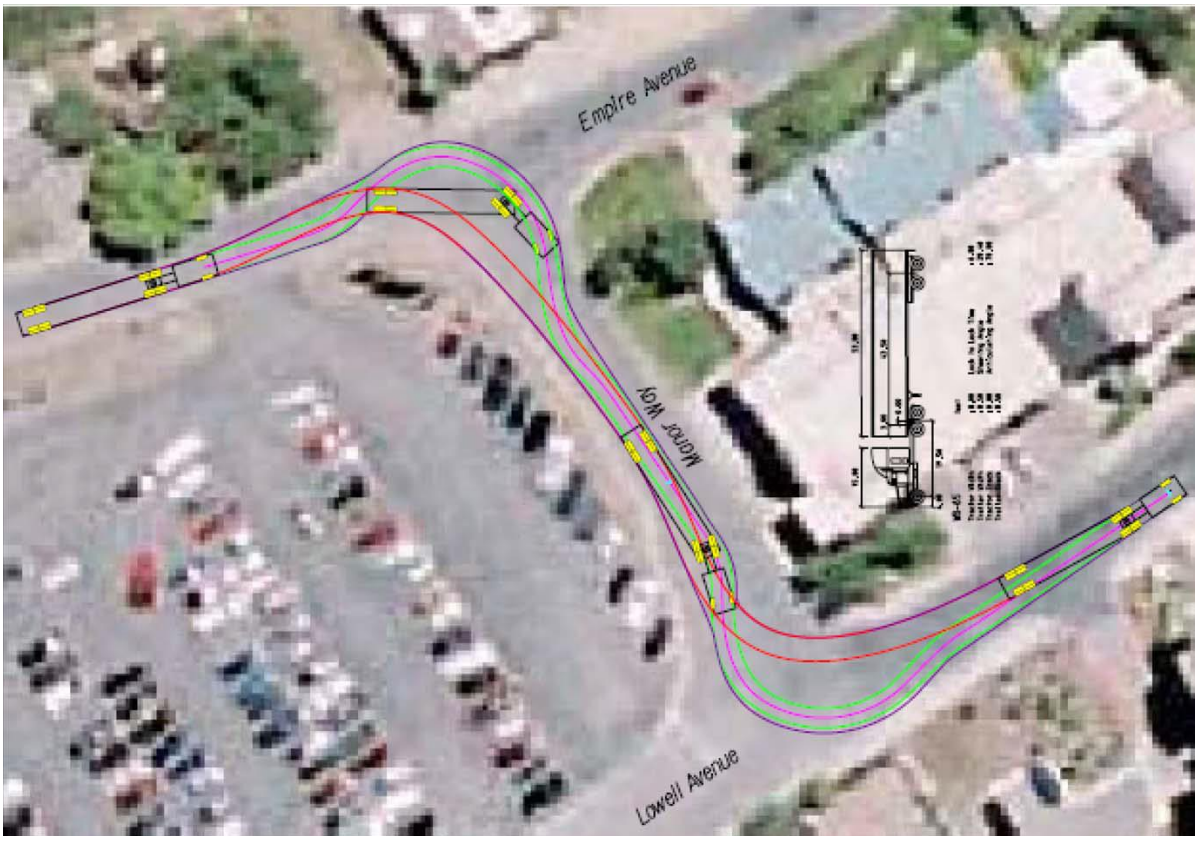
Overall view of the intersections evaluated for truck turning templates



Truck turning templates for Park Ave / Empire Ave and Deer Valley Drive



Truck turning templates for Silver King Dr / Empire Ave and Silver King Dr / Lowell Ave



Truck turning templates for Manor Way / Empire Ave and Manor Way / Lowell Ave