

To: Janelle Finck, President Fisk Land Surveying & Consulting Engineers, Inc.	
From: Mark Tuch, P.E. Tara Kramer, P.E.	Project: Sheridan Lake Rd/Fairway Hills Dr TIS
CC: Jody Page, P.E.	
Date: 10/1/10	Job No: 148243

## RE: Property Rentals, Inc Proposed Development

Property Rentals, Inc. is investigating development of a parcel in Rapid City, South Dakota proposed for office/retail use. These changes have the potential to affect traffic operations on streets and highways adjacent to the development. The main objective of the study was to determine the traffic impacts on streets adjacent to the planned development. A traffic analysis was performed for Sheridan Lake Road/Fairway Hills Drive and the proposed intersection at Fairway Hills Drive/Development Access to determine any mitigation measures necessary to maintain adequate traffic flow. To determine these impacts, the following tasks were performed:

- 2010 Existing AM and PM peak hour turning movement counts and a geometric inventory for the study area intersections were gathered by HDR.
- The site generated trips were estimated for the site as shown in **Tables 1 and 2**.
- The site generated trips were distributed to the study area intersections.
- Future traffic volumes (for year 2035) were projected.
- Build traffic volumes were developed that combined future no-build volumes and site generated trips representing 2035 traffic volumes.
- Capacity analyses were performed for four volume scenarios:
  - Existing traffic volumes
  - Existing build traffic volumes (year 2010 plus site generated Phase 1 development trips)
  - Future no-build traffic volumes (year 2035)
  - Future build traffic volumes (year 2035 no-build volumes plus Phase 1 and future phase site generated trips)

The proposed development is planned to occur in different phases. Phase 1 is expected to be completed by 2011 including 12,000 square feet office/retail mixed use. A future phase includes no more than an additional 24,000 square feet of office/retail mixed use. The exact timing of the future phase is unknown at this time.

## Findings

A summary of the findings is described below. The traffic volumes, levels of service and trips generated are shown in **Figures 1-6**.

- **Under the 2010 existing volume scenario** the Sheridan Lake Road/Fairway Hills Drive intersection is operating at acceptable levels of service.
- **Under the 2010 build (Phase 1 only) volume scenario** both the Sheridan Lake Road/Fairway Hills Drive intersection and the proposed Fairway Hills Drive/Development Access intersection would operate at acceptable levels of service.
- **Under the 2035 background (no-build) volume scenario** the Sheridan Lake Road/Fairway Hills Drive intersection would operate at LOS 'D' during the AM and PM peak hour.

- **Under the 2035 build volume scenario** the stop-controlled approach at the Sheridan Lake Road/Fairway Hills Drive intersection would operate at LOS 'E' and LOS 'F' during the AM and PM peak hour, respectively. The proposed Fairway Hills Drive/Development Access intersection would operate at acceptable levels of service.

Overall, study area intersections operate within allowable capacity tolerances under all the examined conditions. The stop-sign controlled approach at Sheridan Lake Road/Fairway Hills Drive would operate at low levels of service during peak traffic times in 2035, a condition that is fairly common on higher volume through-streets in an urban environment. Investigation of a traffic signal at this location might be considered; however, at this time the intersection does not meet the standards for traffic signal installation under current or future traffic conditions. If the land use changes or additional development in the area occurs, the signal warrant may be satisfied at a later date. It is recommended that the Sheridan Lake Road/Fairway Hills Drive intersection be monitored as the later phases of development occur.

### **Recommendations**

No changes to lane configurations or traffic control appear to be necessary within the study area for normal operation within the 25 year planning horizon. One change, however, is recommended as a safety enhancement. The apartment driveway on the south side of Fairway Hills Drive is located approximately 25 feet east of Sheridan Lake Road. This close spacing has the potential to create traffic operation problems, since vehicles will be turning in and out of the apartment drive and would conflict with turning vehicles on Sheridan Lake Road. The increase of traffic generated by the development will exacerbate these conflicts and create safety concerns. It would be desirable to relocate this driveway further away from the intersection; however, if this is not feasible than it is recommended that the median break be removed to eliminate the potential conflict between left-turning vehicles from the apartment driveway and vehicles turning from Sheridan Lake Road.

**Table 1. Phase 1 Trip Generation**

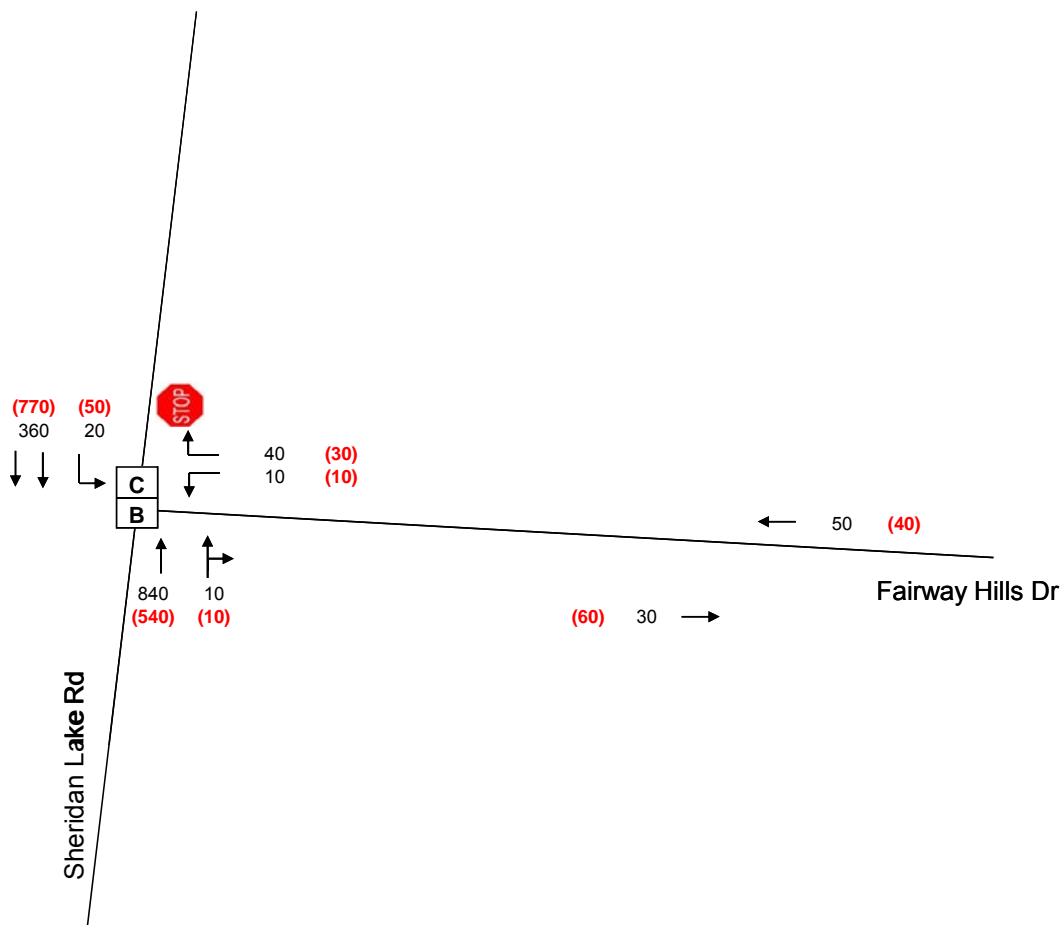
Land Use*	ITE Code	Intensity	Daily Trip Ends	PM Peak-Hour Trip Ends					AM Peak-Hour Trip Ends				
				Total	In		Out		Total	In		Out	
					%	Trips	%	Trips		%	Trips	%	Trips
General Office Building	710	6.0 KSF	153	86	17%	15	83%	71	20	88%	17	12%	3
Specialty Retail Center	814/820	6.0 KSF	294	36	44%	16	56%	20	29	48%	14	52%	15
Phase 1 Sub-Total			447	121		31		91	49		31		18

\*From 8th Edition of ITE Trip Generation

**Table 2. Future Phase Trip Generation**

Land Use*	ITE Code	Intensity	Daily Trip Ends	PM Peak-Hour Trip Ends					AM Peak-Hour Trip Ends				
				Total	In		Out		Total	In		Out	
					%	Trips	%	Trips		%	Trips	%	Trips
General Office Building	710	18.0 KSF	356	99	17%	17	83%	82	48	88%	42	12%	6
Specialty Retail Center	814/820	6.0 KSF	294	36	44%	16	56%	20	29	48%	14	52%	15
Future Phase Sub-Total			651	135		33		102	77		56		21
Total (Phase 1 + Future Phase)		36.0 KSF	1,098	256		63		193	126		87		39

\*From 8th Edition of ITE Trip Generation



**LEGEND**

xxx (xxx) AM Peak (PM Peak) Turning Movement Volumes

→ Existing Geometrics

X
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 AM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service

X
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 PM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service



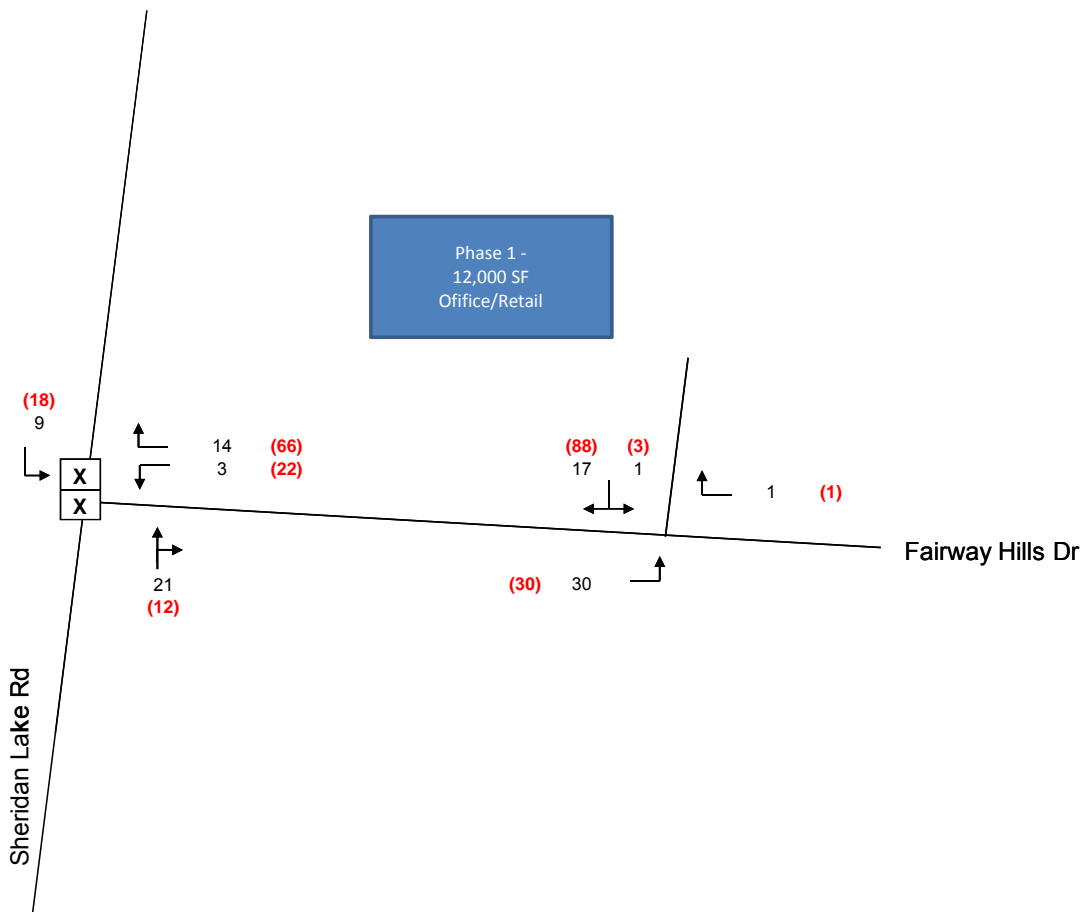
**Existing Conditions (2010)  
Volumes & Level of Service**

Sheridan Lake Road/Fairway Hills Drive TIS

Date  
October 2010

Figure

1



**LEGEND**

xxx (xxx) AM Peak (PM Peak) Turning Movement Volumes

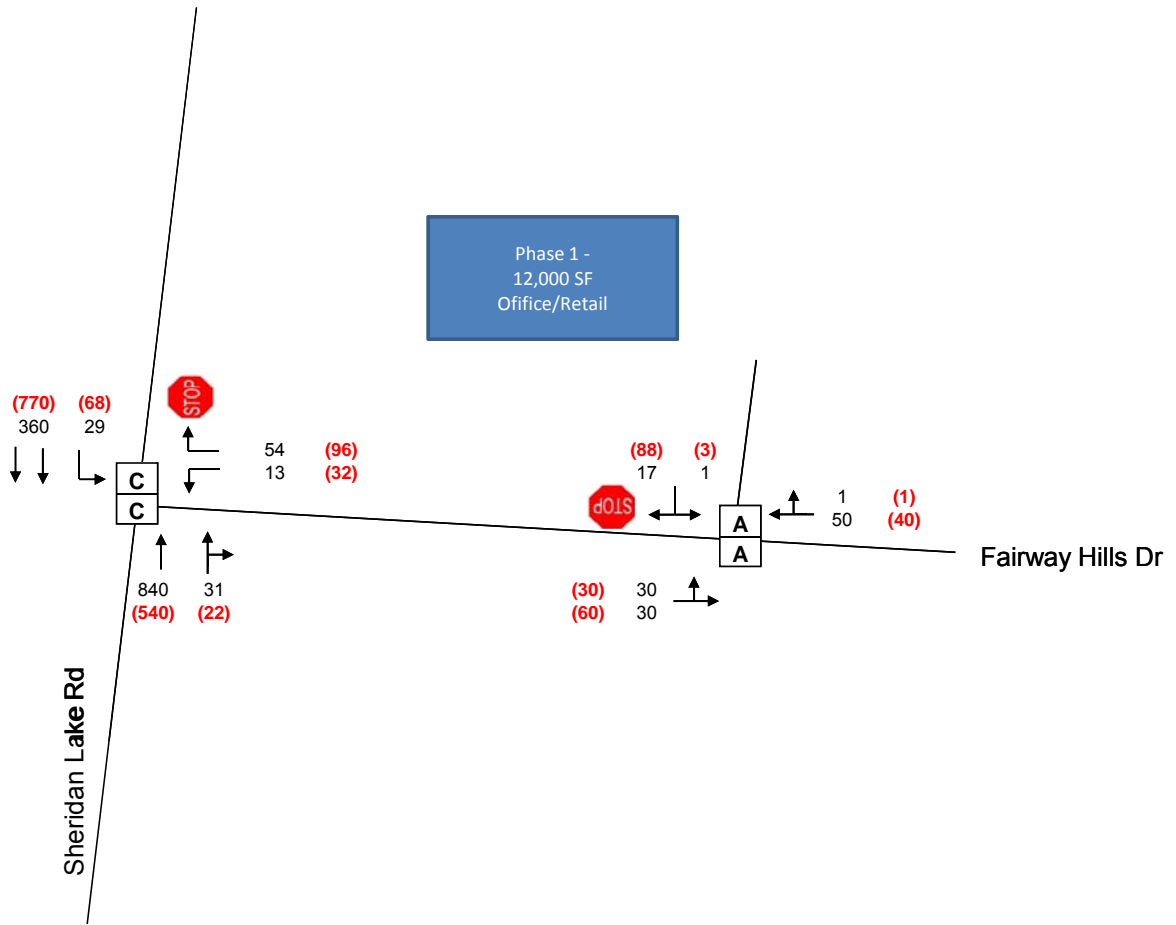


**Generated Trips (Phase 1 Only)**

Sheridan Lake Road/Fairway Hills Drive TIS

Date  
October 2010

Figure  
2



**LEGEND**

- xxx (xxx) AM Peak (PM Peak) Turning Movement Volumes
- Proposed Geometrics
- |   |
|---|
| X |
|---|

 AM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service
- |   |
|---|
| X |
|---|

 PM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service



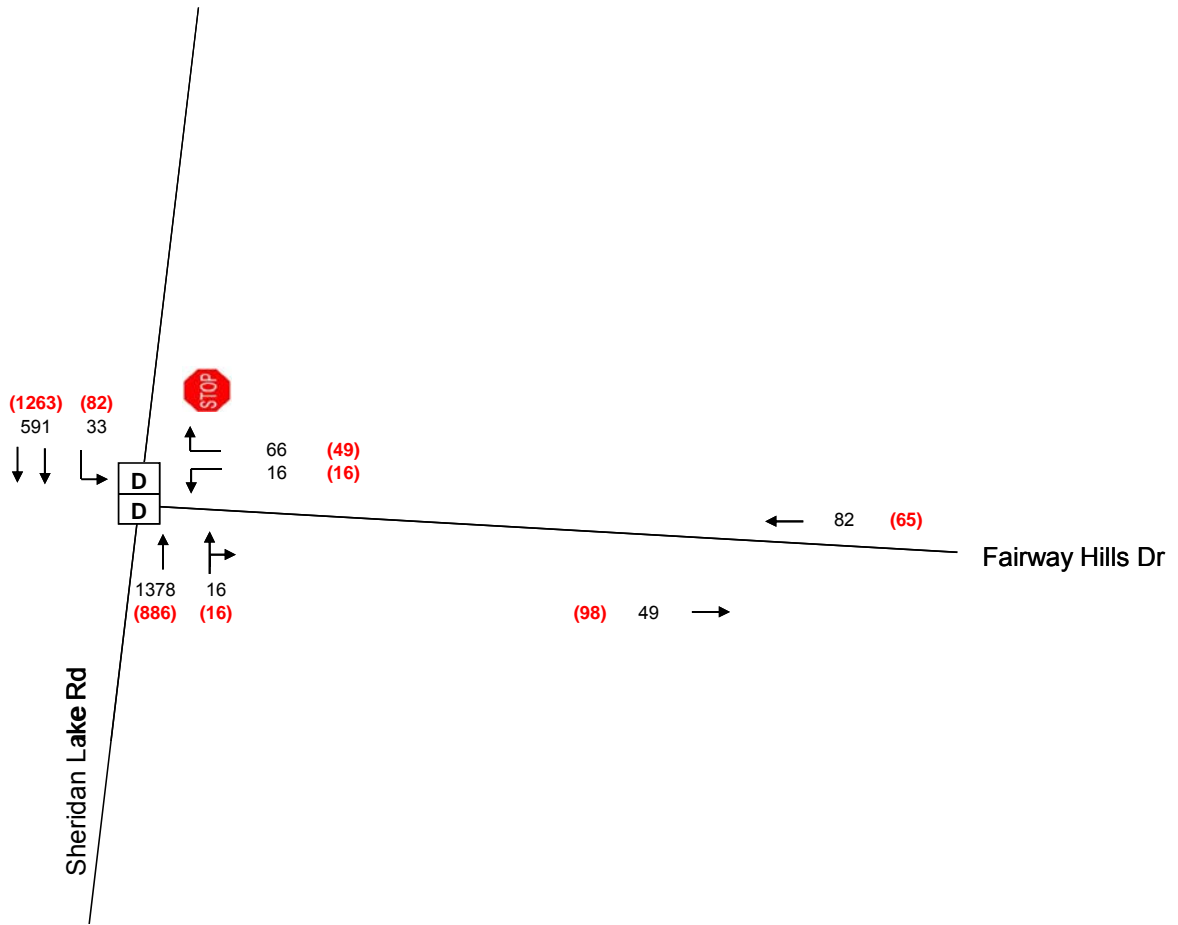
**Existing Conditions (2010) with Phase 1 Development Volumes & Level of Service**

Sheridan Lake Road/Fairway Hills Drive TIS

Date  
October 2010

Figure

3



**LEGEND**

xxx (xxx) AM Peak (PM Peak) Turning Movement Volumes

→ Existing Geometrics

X AM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service

X PM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service



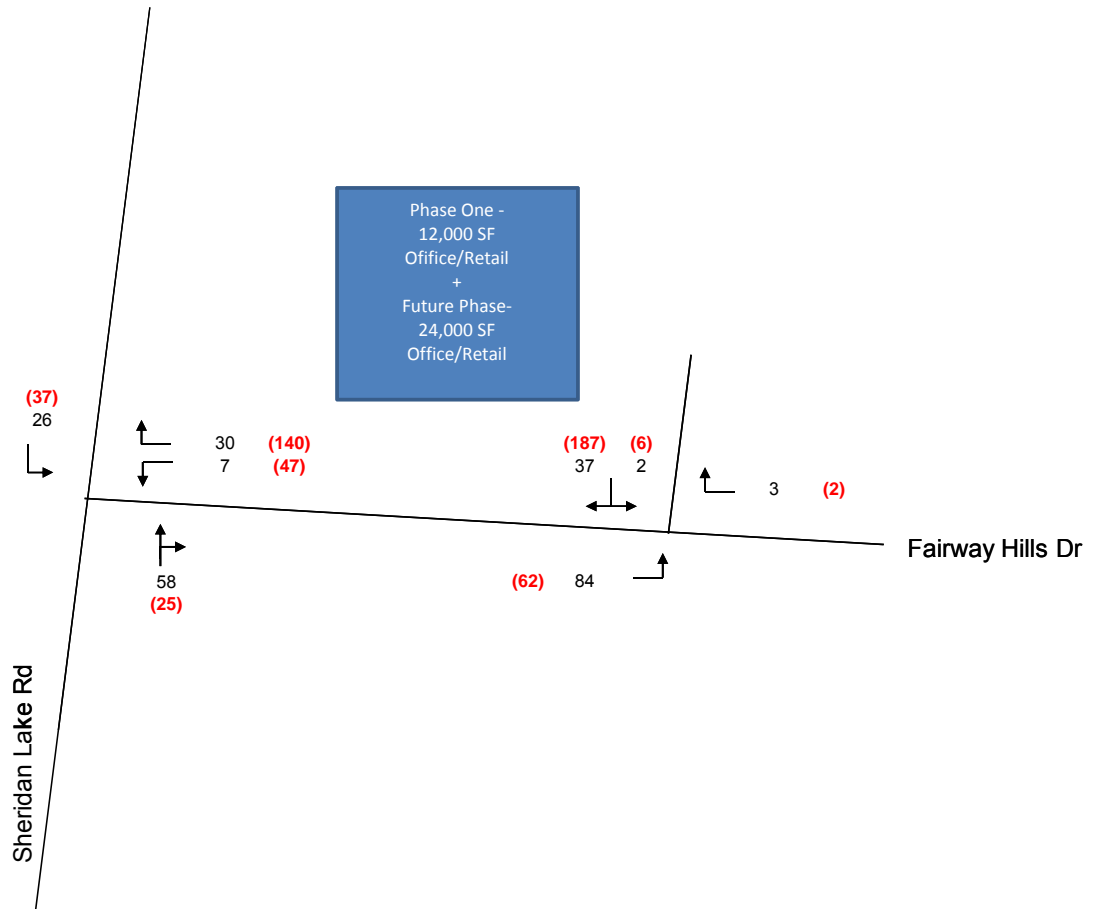
**2035 No Build  
Volumes & Level of Service**

Sheridan Lake Road/Fairway Hills Drive TIS

Date  
October 2010

Figure

4



**LEGEND**

xxx (xxx) AM Peak (PM Peak) Turning Movement Volumes



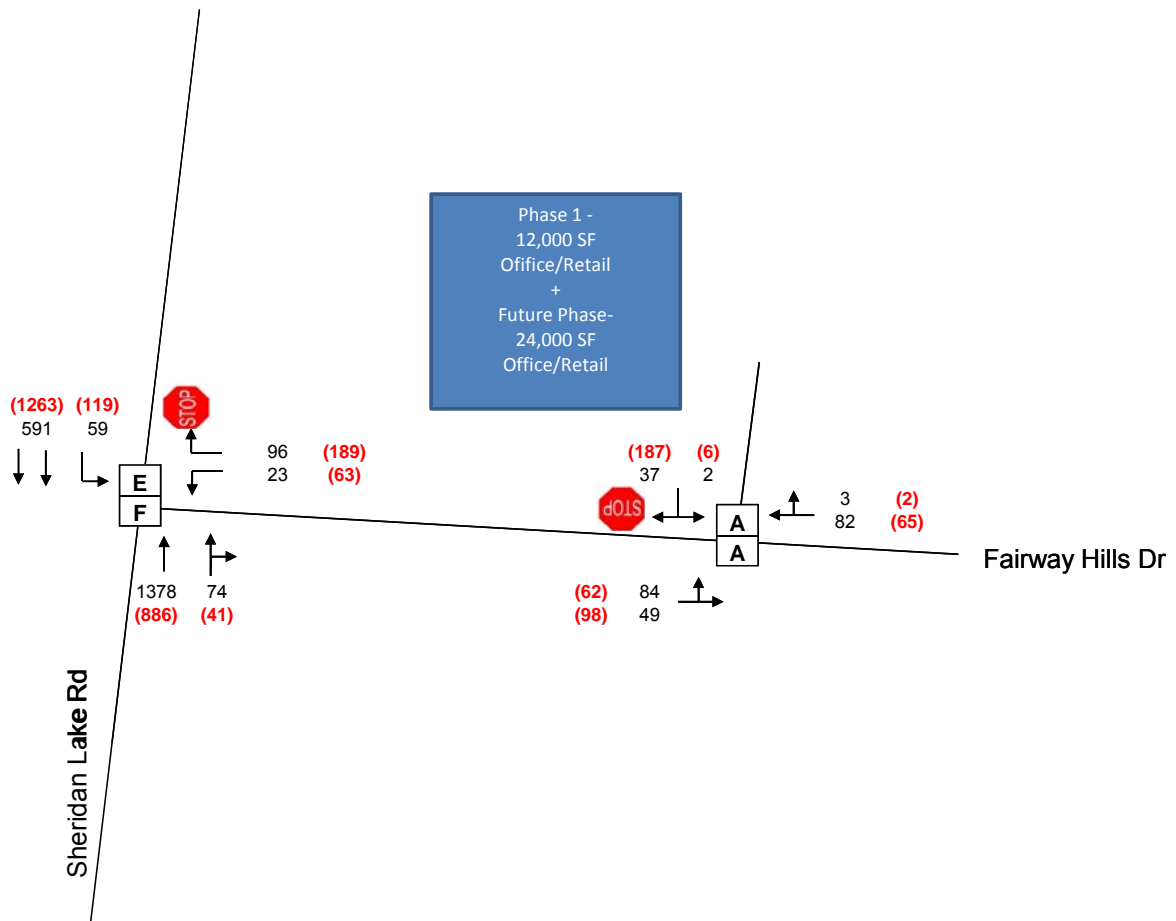
**Total Generated Trips (All Phases)**

Sheridan Lake Road/Fairway Hills Drive TIS

Date  
October 2010

Figure  
5





**LEGEND**

xxx (xxx) AM Peak (PM Peak) Turning Movement Volumes

→ Proposed Geometrics

X
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 AM Unsignalized Intersection Worst Case  
Stop Controlled Approach Level of Service

X
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 PM Unsignalized Intersection Worst Case  
Stop Controlled Approach Level of Service



**2035 Full Build-Out  
Volumes & Level of Service**

Sheridan Lake Road/Fairway Hills Drive TIS

Date  
October 2010

Figure

6