

***TIENKEN ROAD AND KINGS COVE***

***TRAFFIC STUDY***

***CITY OF ROCHESTER HILLS***



**DECEMBER 2002**

**Prepared by:**



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**Consulting Engineers**

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## ***Section 9 - Recommendations and Conclusions***

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Traffic on Tienken Road between Livernois and Rochester Roads is projected to reach 30,200 vehicles per day by the year 2025. HRC has shown that the additional trips assigned to the roadway system from new developments in the area and future traffic growth will have an adverse impact on the existing roadway network and the study intersection of Tienken Road and Kings Cove. As a result, we have several recommendations.

### **Roadway Geometry Improvement**

Currently, the level of service on Tienken Road is LOS D. The intersection of Tienken Road and Kings Cove/Oakbrook is not currently signalized; however, a signal is warranted to provide safe access to and from the side streets. Signalization takes critical time away from the through movement on Tienken Road and results in delays for the westbound through movement. A comparison of the level of service for the Tienken Road approaches with and without a signal is shown in Table 20.

**Table 20: Comparison of Level of Service on Tienken Road Approaches**

<b>Peak Hour</b>	<b>Unsignalized</b>		<b>Signalized</b>	
	<b>Eastbound LOS</b>	<b>Westbound LOS</b>	<b>Eastbound LOS</b>	<b>Westbound LOS</b>
<b>AM</b>	B	A	A	D
<b>PM</b>	B	B	A	B

In the future, the capacity analysis indicates that both a two-lane and a three-lane road on Tienken Road will result in a LOS F for the overall intersection during the AM peak hour although the PM peak hour is not a problem. A five lane road is the only geometry that results in an acceptable level of service for the overall intersection during both peak hours. See Table 21 for a comparison of level of service for the overall Tienken and Kings Cove/Oakbrook intersection for various scenarios.

**Table 21: Comparison of Level of Service for Overall Intersection of Tienken at Kings Cove/Oakbrook**

<b>Traffic Condition Road Geometry</b>	<b>Level of Service AM Peak Hour</b>	<b>Level of Service AM Peak Hour</b>
<b>Existing Volumes 2 lanes</b>	D	B
<b>Existing plus Proposed Development 2 lanes</b>	D	B
<b>Future Volumes 2 lanes</b>	F	D
<b>Future Volumes 3 lanes</b>	F	C
<b>Future Volumes 5 lanes</b>	B	B

To accommodate future traffic volumes and to provide an acceptable level of service, HRC recommends widening Tienken Road from two to five lanes through this section. Further, HRC has concluded that to install a signal today without making the necessary geometric improvements to Tienken Road will worsen congestion and delay on Tienken Road. In order to widen the road, it will be first necessary to widen the bridge over the Paint Creek from two to five lanes. The Paint Creek Bridge is located so close to the intersection (approximately 124 feet) and the road widening project will begin several hundred feet east of the bridge.

**Traffic Signal Installation**

HRC recommends the installation of a traffic signal at the intersection of Tienken Road and Kings Cove/Oakbrook after Tienken Road is widened to five lanes. Warrants were met to install a traffic signal at this intersection based on Warrant 2, Warrant 9 and Warrant 11.

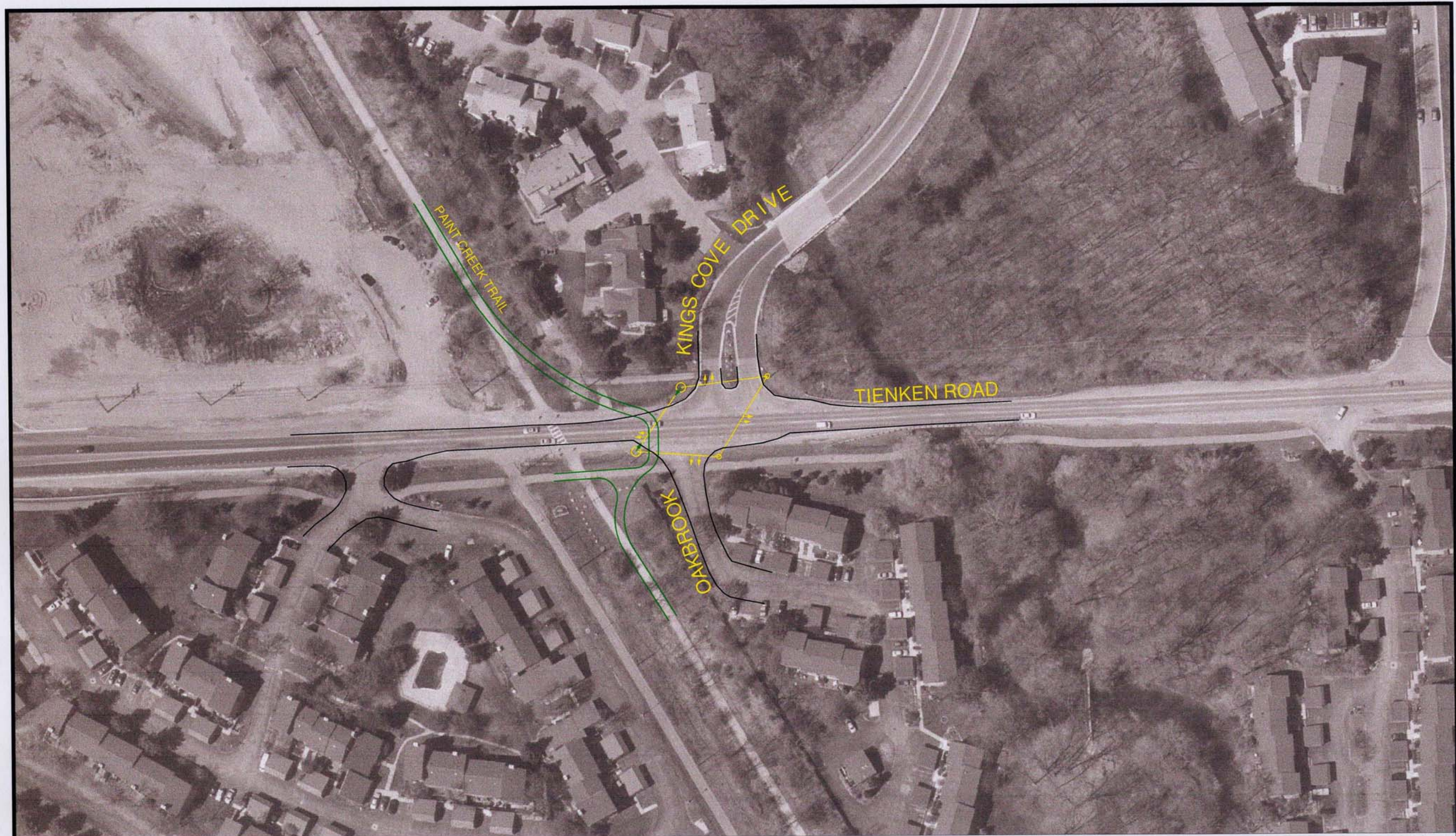
HRC has concluded that there are other factors which bear on the need for a traffic signal at this location. A speed study done in 1999 for Tienken Road indicated that the 85<sup>th</sup> percentile speed is over 44 mph as compared to the posted speed of 40 mph. The combination of higher speeds and heavy volume on Tienken Road results in very few gaps of sufficient length for either vehicles from the side streets to enter the main road or pedestrians at the Paint Creek Trail to cross the main road safely. The non-motorized traffic consists of walkers, skaters and bicyclists of all ages and abilities. Regardless of the day of week, the majority of trail users must wait to cross Tienken Road and often cross without an acceptable gap of 20 seconds to cross safely. Lastly, sight distance is an important factor. Kings Cove enters Tienken Road at the low point of a sag vertical curve. The Kings Cove driveway does not meet

AASHTO Case III criteria for visibility to the east. HRC calculated that the actual sight distance at the driveway is just one-third of the minimum sight distance required by AASHTO. A signal at this location would address these safety concerns.

### **Relocation of Paint Creek Trail Crosswalk**

When a signal is installed, HRC recommends that the crosswalk over Tienken Road for the Paint Creek Trail be relocated to the signalized intersection. Noting the high volume of pedestrian traffic identified in HRC's Tienken Road Corridor Study from March 2000, pedestrian traffic is a major consideration when designing the intersection and signal. A push button type pedestrian signal will provide a safer passage for non-motorized traffic. In addition, when there is no pedestrian traffic, the traffic signal controller will skip the pedestrian phase and provide maximum time to Tienken Road. Seamless connections between the Paint Creek Trail and the safety paths on either side of Tienken Road will need to be made. See Figure 6. HRC recommends that the old trail path to the Tienken crossing point be blocked to discourage jaywalking.





NOT TO SCALE

**PROPOSED TRAFFIC SIGNAL LOCATION**



JOB NO.  
20020367  
DATE  
DECEMBER 2002

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