

## **Intersection Design Considerations for the Fairview and Chapel Hill Intersection**

### **Design Considerations:**

1. There is decreased maintenance for a roundabout compared to a signal.
2. The current intersection with all way stop control has a Level of Service (LOS) = F. After the roundabout is constructed, LOS will be B with current traffic and is estimated to be LOS = D after 22 years. The roundabout design is based on 20 years of vehicle projections (22% increase).
3. Fuel savings (peak hr.): 10 gallons (23 gal for all-way stop & 13 gal for roundabout).
4. Emission reduction (CO) (peak hr.): 0.71 kg (1.59 kg for all-way stop & 0.88 kg for roundabout).
5. Roundabouts are safer for pedestrians than a 4-way stop since pedestrians only need to cross one leg of traffic at a time and pedestrians have a better understanding of traffic movement since traffic is only going one way through the roundabout.
6. A four-leg single-lane roundabout has 75% fewer vehicle conflict points compared to the 4-way stop.
7. The geometry of roundabouts provide for slow entry speeds and consistent speeds through the roundabout by using deflection.
8. If the intersection was signalized, the collision rate might increase slightly given the historical trends of signalizing intersections due to queues at the light.
9. Given the available sight distance in all directions for opposing movements, it appears that permissive left turns would not be acceptable for Chapel Hill Road if the intersection was signalized. This would mean that the signal would need to be "split-phase" (one direction of Chapel Hill would proceed and then the other would proceed). The split-phase is necessary from a collision perspective, but not as efficient from a traffic movement perspective.
10. Dedicated left turn lanes would be needed since split signal phasing is not an ideal use for this intersection. This would be accomplished by widening the intersection.
11. The treeline will need to be removed along the southeast side of the intersection to allow for westbound traffic on Chapel Hill Road to see the signal.
12. The grade on Chapel Hill Road is problematic for queuing vehicles during winter weather conditions. A roundabout will allow vehicles to keep slowly moving instead of coming to a complete stop on the hill as would be required with a stop sign or signal.
13. The alignment of the intersection could allow for an eastbound vehicle traveling on Chapel Hill Road to jump the hill and cross into the eastbound lane if the vehicle goes through the intersection too fast.