



CREATIVITY BEYOND ENGINEERING

MEMORANDUM

DATE: June 23, 2025

TO: Brett Wallace, PE
Engineering Services Manager
Waukesha County

FR: Pat Hawley, PE, PTOE, RSP, raSmith

CC: Rachel Ketterhagen, PE, raSmith

RE: County K (County JK to Brookfield Road) Preliminary Scoping Study
Expansion Evaluation Summary Memo

Introduction

Waukesha County retained raSmith to conduct a preliminary scoping study for County K (Lisbon Road) from County JK (Lynndale Road) to Brookfield Road¹. As part of these services, raSmith evaluated multiple factors to assess whether County K should be expanded to a four-lane divided roadway. This memorandum identifies these factors, summarizes the evaluation and provides a recommendation on the potential expansion.

Traffic Capacity

- There has been significant development in northeast Waukesha County, which has led to increased traffic volumes along the County K corridor. County K is expected to exceed the capacity of a two-lane undivided corridor by the year 2055.
- The design year 2055 forecast County K daily traffic volumes (AADT of 13,000-16,700 vehicles per day) push the planning level capacity thresholds used by WisDOT and SEWRPC for two-lane undivided roadways (3,500-16,800 vehicles per day). The upper end of the WisDOT and SEWRPC capacity ranges reflect optimal conditions in terms of lane and shoulder width, truck percentages, passing zones and traffic characteristics. Given the less than optimal conditions along County K, the design year daily forecasts are expected to exceed the capacity thresholds for a two-lane undivided rural roadway.
- Most of the study intersections will experience failing movements during the design year 2055 peak hours with the existing geometry and traffic control.
- The Maple Avenue and County F intersections require expansion to a four-lane divided roadway to provide acceptable peak hour operating conditions in the design year 2055.
- The County JK, County V and County Y intersections will require a mix of additional travel lanes and/or enhanced traffic control to provide acceptable peak hour traffic conditions in the design year 2055.
- The numerous stop-controlled tee intersections are expected to continue to operate unacceptably in the design year with the existing two-lane County K geometry and minor street stop control. A four-lane median divided roadway would improve operations at these intersections by accommodating two-stage left turns from the minor streets, shortening platoons of vehicles along County K to create more gaps, and in some instances, limiting the side-street to right-in/right-out movements.
- Increasing the capacity of the County K corridor will improve the operation of the north-south movements at signalized intersections by allowing additional green time to be allocated to these movements.

¹ The east project limits have been extended from Lannon Road (County Y) to Brookfield Road. The safety and operational analysis of the County K segment between Lannon Road and Brookfield Road is currently underway. This expansion evaluation summary will be updated if the additional analysis requires modifications to the memorandum.

Safety

- Key historic crash findings (2020-2024):
 - The existing County K corridor crash rate of 285.34 crashes per 100 million vehicle miles traveled (HMVMT) exceeds the statewide average of 84.07 HMVMT for similar roadway facilities.
 - Four fatalities occurred along the corridor, including two at the Maple Avenue intersection.
 - There was a concentration of 17 crashes near the Duplainville Road intersection and the railroad crossing.
 - Fatal and injury crashes represented 47% of all midblock and minor intersection crashes, which is higher than normal and is a point of concern.
- Predictive safety analysis shows a four-lane divided roadway would have fewer crashes than a two-lane undivided roadway.
- Raised medians provide safety benefits mid-block by physically separating opposing movements and limiting driveways and minor intersections to right-in/right-out movements.
- The raised median provides safety benefits at unsignalized intersections by allowing minor street left-turn vehicles to complete the movement in two stages.
- The expansion to four lanes provides safety benefits at unsignalized intersections by minimizing long platoons of vehicles, which creates additional acceptable gaps in traffic and minimizes the pressure to execute risky minor street maneuvers.

Railroad

- The County K study is evaluating the potential to grade separate the existing railroad crossing located east of Duplainville Road. If a grade separated overpass is constructed, County K is expected to divert some traffic from adjacent parallel routes with at-grade crossings such as Silver Spring Drive (County VV), Main Street (County F) and Weyer Road to take advantage of the improved travel time reliability. Therefore, the County K design year 2055 forecasts could be even higher than currently shown with the railroad grade separation.
- If a grade separated overpass is constructed, a four-lane bridge would be constructed to take advantage of the bridge structure's 75-year design life. A four-lane County K roadway would be consistent with the four-lane overpass.
- If the crossing remains at-grade, a four-lane divided roadway would provide operational and safety benefits.
 - The additional travel lane in each direction would provide increased queue storage, which would be especially beneficial for eastbound traffic due to the proximity of the County F signalized intersection.
 - The additional travel lanes would allow the queues to disperse quicker after the arm gates are lifted.
 - The raised median would provide a positive deterrent for vehicles attempting to bypass the railroad gate arms.

Regional Significance

- SEWRPC's Vision 2050 currently shows County K as a future four-lane roadway east of Brookfield Road and it recommends reserving right-of-way for a future four-lane roadway between Brookfield Road and Lannon Road (County Y). Waukesha County has formally requested an update to the SEWRPC 2050 Plan to show County K as a four-lane facility between Brookfield Road and CTH JK (Lyndale Road) on the Arterial Street and Highway Network.
- County K is one of a few Waukesha County roadways spanning nearly the entire county from 124th Street to WIS 67 in Oconomowoc. It provides connectivity to 11 Waukesha County communities.
- Providing additional capacity along County K would enhance regional connectivity and route options.
- County K is a National Highway System (NHS) route throughout the project limits (County JK to Brookfield Road). NHS routes are critical to the nation's economy, defense, and mobility providing a primary network for movement of goods and services through the nation. The NHS network supplements the national interstate system.

Other Considerations

- There is an existing half mile section of four-lane divided roadway near WIS 164 that would remain.

- Heavy trucks have slower operating speeds, acceleration rates and deceleration rates. They occupy more roadway and require more turning room. These factors cause heavy trucks to have a greater impact on operations than passenger vehicles. Roadway counts along the corridor recorded up to 1,800 trucks per day on a weekday from 6:00am to 7:00pm. Trucks volumes are highest and have the greatest impact near the quarries (between Swan Road and County V). Through traffic on County K often needs to slow along the corridor behind turning, accelerating or decelerating trucks. Therefore, the heavy truck traffic adversely impacts operations by increasing delay and travel time to all roadway uses. There is a direct correlation between speed differential and crash frequency, which means the heavy truck traffic is likely a contributing factor to the higher crash rates along the corridor. Expanding to a four-lane divided roadway would provide County K traffic the ability to safely pass and avoid slower moving trucks, which would improve operations and safety.
- A four-lane divided roadway would enhance east-west freight connectivity in Waukesha County. The additional capacity will also enhance north-south freight connectivity along County F by reducing delay at the County K intersection.
- Private driveways have an adverse impact on corridor safety and operations. There is a direct correlation between access density and crash rates, and an inverse correlation between access density and corridor mobility. Constructing a raised median along County K would convert many of these existing full access driveways to right-in/right-out operations, which would eliminate conflicts and improve safety and operations.
- Providing a continuous four-lane divided roadway improves corridor operations and enhances safety by eliminating the multiple merges that would be required to transition between a mix of four-lane and two-lane sections.
- Many of the comments received from local officials and the public are concerns that would be addressed with the expansion to a four-lane divided facility. Initial public feedback shows support for adding capacity to CTH K.

Conclusions

The above factors highlight the justification to expand the County K corridor to a four-lane divided roadway from Lynndale Road (County JK) to Brookfield Road. Some of the factors are location specific and there is strong justification for expansion at these defined locations, such as the operational needs at County F and Maple Avenue. Other factors provide a broader corridor-wide support for the expansion, such as the safety benefits associated with a four-lane divided roadway. When these factors are layered and viewed holistically, there is justification to reconstruct County K as a four-lane divided roadway along the entire corridor.