

Richard Paul Jr

From: Gesch, Peter <PGesch@ruekert-mielke.com>
Sent: Wednesday, March 9, 2022 1:18 PM
To: David De Angelis; Richard Paul Jr
Cc: Petersen, Anthony
Subject: Gebhardt Road Relocation Concept
Attachments: 20220309 Gebhardt Road Relocation Concept - F_C.pdf; 20220309 Gebhardt Relocation Cross Sections - F_C.pdf; zGebhardt Road Reconstruction - Project Split Estimate 20220309.pdf

Dave and Richard –

At the last PWUC meeting, we were given direction to review and draft a concept for relocating Gebhardt Road 5-FT south of its existing location, with a dedicated left turn lane capable of queuing 2-3 vehicles. Along with this review, we were to evaluate the impacts to landscaping, varying cross sections, drainage, as well as prepare a cost estimate and evaluate the feasibility of splitting this reconstruction project into two separate projects. I've attached three documents for you to review and share with the PWUC for our meeting on March 14th:

- Concept Layout for Gebhardt/Highland Intersection.
- Two Typical Cross Sections
- Updated Cost Estimate Breakdown for splitting the project.

Concept Layout:

As discussed, we evaluated shifting Gebhardt Road 5-FT to the south near the intersection to facilitate better drainage on the north half of the road. The following design components were analyzed:

- **Corner Radii at the intersection:** The minimum radius that should be used is 30-FT, which is what is shown in the solid lines. A 30-FT radius facilitates comfortable turning movements for passenger vehicles as well as the occasional truck or bus. Since both roads are signed "No Thru Truck Traffic", this size radius should work for both passenger vehicles and school buses. A 30-FT radius also increases pedestrian visibility as well as stop sign visibility to be aligned more with the travel lane approaching the intersection. A 40-FT radius is shown as the dashed line around the corners. A 40-FT radius is feasible and would provide more than enough room for trucks and buses to make turns without significant encroachment. A 40-FT radius would push the stop sign slightly further off of the direct travel line approaching the intersection.
- **Stop Signs/Stop Bars:** The stop signs are located at the "desired" set-back (10-FT) from Highland per the previous discussion we had regarding sight lines and vision triangles.
- **Dedicated Left Turn Lane:** A dedicated left turn lane was added with a queuing/storage length of 60-FT which will facilitate at least 3-cars to be stacked in the turn lane. The main travel lane turns into a dedicated right turn lane at the intersection. The Village has the option to choose whether the travel lane turns into the dedicated left or right turn lane. This would simply involve moving the dashed taper line that starts the turn lane. Ideally, the main travel lane would turn into the dedicated turn lane that has the most vehicle movements – this could be analyzed through a 2-hour traffic count during peak hours in the morning and a 2-hour traffic count during peak hours in the afternoon/evening, to make this determination.
- **Road Shift Deflections:** The 100-FT and 125-FT taper shifts shown on the drawing follow the AASHTO Green Book and Wisconsin FDM guidelines for maximum deflections angles to shift the roadway and subsequently add an additional lane. You can see that these shifts comfortably fit within the area between the intersection and the first set of driveways on the north and south side of the road, directly west of the intersection.

- **Pedestrian Pathway:** The pathway location has been modified to be closer to the roadway than previously shown on the drawings. The alignment has also been set to minimize landscaping and drainage impacts.
- **Landscaping Impacts:** You can see that there are three primary landscaped areas affected by the road shift and pedestrian pathway. Two trees near the corner lot and a grouping of trees near the first lot line will need to be removed. However, you can see the larger grouping of trees near the corner lot as well as the grouping of trees on either side of the first driveway to the west of the intersection, on the south side of the road, are called out to remain. We do not anticipate needing to remove these trees which will save some of the mature landscaping in this area. At the very most, a tree or two in the grouping adjacent to the corner lot may need to be removed depending on final grades needed to match into the pathway.
- **Curb & Gutter:** Curb & Gutter is shown on the south side of the road to a point where runoff can dump into a ditch line. This is discussed further with the cross sections below.
- **Ditches:** The green lines on the drawing represent ditch lines for drainage in this area of roadway. On the north side, there is now ample room to facilitate proper ditch drainage. There are, however, utility poles which will need to be reviewed further if they need to be moved at all or not. On the south side of the road, you can see that the curb and gutter will dump into a ditch line and continue west through ditches/driveway culverts. Small storm sewer will be needed to get the small amount of ditch runoff on the southwest side of the intersection to drain around the corner with the newly configured pathway and road alignment.

Cross Sections

Two cross sections are shown. Cross section “A” shows what the typical roadway and ditch cross section will look like just before the roadway widens to add the turn lane. The road is shifted 5-FT south at this point and it can be seen that the ditches and pathway match in comfortably with minor grading needed. Cross section “B” shows the three lanes near the intersection with curb and gutter on the south side of the roadway. We were asked to evaluate whether the south side of the road could be a “high side” cross section and drain everything to the north side. In review of the two different cross sections, we are recommending the curb & gutter cross section for various reasons:

- **Snow Melt:** With the south side elevated and all drainage going across the roadway to the north, this will cause significant hazards in the winter when there is snow melt and then the snow melt freezes at the intersection.
- **Drainage Pattern Change:** Right now, the natural drainage pattern of this area is to the north/northwest. Today, there is a significant ditch on the south side of the road that carries a large amount of water to the west where it crosses Gebhardt to the north through a culvert. Directing all of this flow to the ditch on the north side of the road will require a larger ditch cross section which may not match well into the existing driveway culverts or relocated roadway. It is recommended to keep drainage patterns similar to how they are now to avoid any possible issues.
- **Safe Buffer:** Curb & gutter provides a safe buffer between a traveling vehicle and the pedestrian pathway. The pathway is closer to the roadway to avoid landscaping impacts and to align better at the intersection. If a vehicle were to begin to veer off the roadway in this location, the curb and gutter has a high chance of catching the wheel of the vehicle and redirecting to stay on the roadway, rather than heading directly at and onto the pathway adjacent to the road.

Utilizing a “high side” cross section near the intersection to avoid installing curb & gutter does not provide any benefit to grading impacts in this area – the change that you would see in this is minimal. Curb & gutter does provide benefits to alleviate possible safety hazards in this location, as mentioned above. Curb & gutter is also a minimal cost add-on to the project for the benefit it provides.

Cost for Splitting Project:

The cost estimate for this project was updated based on the updated concept for relocation of the road in this area. The cost estimate was further split into Phase 1 and Phase 2. Phase 1 is from Pilgrim to Berkshire and encompasses all of the

planned pulverize and overlay, slight road widening, pathway installation, and ditch reconstruction. Phase 2 would be from Berkshire to Highland, including the work on Highland. Phase 2 work would involve the pulverizing of the road east of Berkshire, road relocation, intersection improvements, pedestrian pathway, pulverize/overlay of Highland, and cutting down the hill on Highland to improve sight distances.

As is shown on the last page of the cost estimate, splitting the project into two different phases is feasible and, including engineering, is estimated to be less than \$1M per project phase. While it is possible to split the roadway into two parts, there are various items to consider:

- The Village will see cost benefits with combining the two phases such that there are higher quantities and a Contractor typically provides a lower cost for higher quantities.
- Paving all of Phase 1 prior to constructing Phase 2 poses the risk of damaging Phase 1 during Phase 2 construction. There are options to shift the surface paving of Phase 1 into Phase 2.
- The costs in this estimate are in projected 2022 dollars. These costs will likely increase slightly due to inflation/economic impacts with the project pushed to 2023 and that may be enough to put Phase 2 over \$1M.

Berkshire was chosen as the splitting point because it's roughly halfway of the entire project and it also provides better connectivity of the pedestrian pathway from Pilgrim to at least Berkshire, rather than splitting the project elsewhere along the corridor.

We can discuss any of these items in more detail at the meeting on Monday, but wanted to provide a summary and a list of key points prior to the meeting.

Please let me know if you have any questions or need anything else at this time.

Thanks!

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