

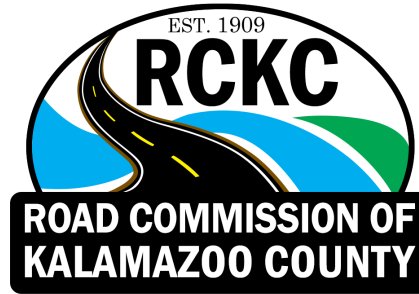


Michigan is a national leader in road building; the State boasts the nation's first mile of rural concrete highway and many other landmark infrastructure firsts. As infrastructure asset owners, the Michigan Department of Transportation (MDOT), Road Commissions, Cities, and Villages may even work with the Federal Highway Administration (FHWA) on projects. We routinely partner with many contractors, vendors, and industry associations to bring the very latest products and techniques to all aspects of our infrastructure.

Considering the State's long history with the automobile, it is easy to understand how we have some of the oldest roads and bridges in the nation. Like our cars, as time passes, many roads and bridges reach the end of their service life. After many oil changes and repairs, the maintenance costs no longer provide value, and it is time to invest in a new car. This same concept can be seen with our infrastructure. After many chip seal applications, crack fill, and hot mix asphalt (HMA) overlays to keep that road in good shape, it is time to invest in a new road.

Unfortunately, moving a project from plans to placement of HMA is not as easy as heading over to the dealership to buy a new car. While great strides have been made in construction that have reduced project timelines, a next-day delivery option is not currently within the capabilities of our industry. Road or bridge improvements can be complex and contain several moving parts, much like a car's engine. Including all the steps necessary to rebuilding infrastructure, like rebuilding an engine, would be challenging to fit into this brochure. Instead, we will focus on some of the critical steps for a typical road or bridge project.

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FROM PLANS TO PAVEMENT: HOW A ROAD IS BUILT



PHASE 1: PLANNING

RCKC infrastructure projects begin 2-3 years before any contractors show up on the site. Professional engineering teams start this process by evaluating the transportation system, considering things like the road network priorities, strategic planning, funding, the timing of funding, and overall project conditions. As this process begins to filter through our road network, we ask additional questions to narrow down further into specific projects.

Infrastructure asset owners consider:

- Does a project require purchasing land?
- Are there known environmental issues?
- What utilities might be affected?
- How will we fund the project?
- How can this project be designed to be an asset in the community?
- What is the right fix at the right time?
- How can we preserve the roadway today and plan for construction in the future?

Identifying funding for a project is key and pending the source may include other requirements. Typical funding sources used by the RCKC are the Michigan Transportation Fund (MTF), federal funding or local revenue such as a road millage or special assessment. We have a separate funding brochure available funding with more information on this topic.

If there are no funds available in the current budget for a project, it may be considered in future years. This highlights the importance of having a 5-year road/bridge capital improvement plan. This also allows for transparency in priorities and provides options should dollars need to be adjusted. As you can see, our team does a lot of work behind the scenes to gather information, develop an implementation plan, and recommend projects to our Board for approval.

Preliminary Engineering/Estimating can have various levels of effort required depending on the project scope. Our team reviews elements such as location, terrain and soil properties, drainage capabilities, traffic volume, the ratio of cars/trucks/busses, possible future development in the area, non-motorized applications, and effects on the environment and nearby residents. This may require an engineering survey to be completed, and routinely needs field work by staff. When federal funds are used, additional reviews are necessary, and this frequently involves more design time and increased costs.

With completed design plans, estimates, and other necessary approvals, the RCKC will proceed to bid out a project. Depending on the funding source, this will happen either locally or through the MDOT bid letting process. Generally, projects are awarded to the lowest qualified bidder.

PHASE 2: CONSTRUCTION

Construction has begun and will likely take a little while until it is completed. A project could probably be built faster if the roads were closed, and the contractors turned loose. However, not all streets allow for this, and most projects must be constructed while the road remains open to traffic. Additionally, weather can delay a project, as can contractor or teamwork load elsewhere. Large projects have a target completion date which is key to scheduling and organizing the various phases of construction.

During construction, the RCKC team inspects and tests materials to ensure project are built to our requirements. Whether being performed by the Road Commission team, or a contractor, earthwork is one of the most critical road and bridge construction elements because it establishes a stable foundation. Much like a tuned-up engine in your car, a sound foundation will allow the road to operate smoothly for many years into the future. The last thing any of us would want is a nice new paint job on that car, but an engine in need of constant maintenance.

Since this work involves effort under the pavement, culverts may also need to be replaced during this phase.

Typically, the following steps occur during this phase;

- Embankments are built by bringing in or hauling out material.
- A grader or bulldozer levels the screened dirt/aggregate to create a flat surface that will support the infrastructure above.
- The dirt is typically treated with water and compacted to prevent future settling.

PHASE 3: FINALIZE

This is the most visible phase of the project as the road finally begins to take shape. Curbing may be placed, drainage covers are adjusted to their finished height, and asphalt is placed. This all may start to look like the finished roadway, yet some essential items still need to be completed before traffic can use the road. Shoulder gravel, signs, pavement markings, and repair of the disturbed areas can't be finished until after the asphalt is in place.

PHASE 4: OPEN

Finally, the road is open to traffic! For many of us, this couldn't come soon enough. Remember, while there are short-term inconveniences, this is a long-term investment using our limited funding available for roads. We all would like high-quality infrastructure, just like we all would like a new car. However, like the car, we need to devote time and resources to keep them maintained and in good condition.