

PennDOT District 8-0 Bridge and Roadway Project Prioritization Process for 2025-2028 TIP

Bridge

State and Federal policy has shifted in recent years from an emphasis on “reducing the number of structurally deficient bridges” (i.e. worst-first replacements) to an emphasis on obtaining “Lowest Lifecycle Cost” (LLC). In response to this policy shift, District 8-0 direction for the 2025 TIP update and beyond will be switching from programming bridge candidates in a “worst-first” ranking over to a Lowest Lifecycle Cost (LLC) ranking. Through a comprehensive exercise the District 8-0 Bridge Unit analyzed the entire state-owned bridge network in District 8-0. During the review of state-owned bridges, the Bridge Unit determined that a number of current bridge projects on the Twelve-Year Program (TYP) could be re-scoped as preservations to follow the LLC approach and provide additional capacity for future funding.

PennDOT’s Bridge Asset Management (BAMS) Tool is named Bridge Care and seeks to develop a LLC program weight according to Bridge Risk Score. The Bridge Risk Score Calculation is shown below and can best be thought of as a bridge “importance score” primarily based on the size of the bridge and the amount of traffic using it. This software, along with extensive manual review of potential candidates, was used to determine the bridge candidates to submit to the MPO’s for consideration in the 2025 Transportation Improvement Program (TIP) update. After the MPO’s received the candidates from District 8-0, they compared them to their scoring process to see how they ranked against their bridge priorities for programming.

Bridge Risk Score Calculation

The risk score for each bridge is calculated using the formula below. Appendix Table J.2 defines the factors and the parameters that determine factor values.

$$\text{Bridge Risk} = (\sqrt{\text{Deck Area} * \text{Annual Average Daily Traffic}}) * F_s * F_{fc} * F_{det} * F_{aadtt} * F_{flood}$$

Appendix Table J.2: Bridge Risk Score Factors

| Factor | Definition | Parameter | Factor Value |
|--------------------------|---|--|--------------|
| F_s | Scour Factor | Scour Rating = A | 1.2 |
| | | Scour Rating ≠ A | 1.0 |
| F_{fc} | Fracture Critical Factor | Fracture Critical Rating < 5 | 1.4 |
| | | Fracture Critical Rating ≥ 5 | 1.0 |
| F_{det} | Detour Length Factor | Detour Length > 30 miles | 2.0 |
| | | Detour Length ≥ 10 miles | 1.5 |
| | | Detour Length < 10 miles | 1.0 |
| F_{aadtt} | Annual Average Daily Truck Traffic Factor | Truck traffic > 20% total traffic | 2.0 |
| | | Truck traffic ≥ 10% total traffic | 1.5 |
| | | Truck traffic < 10% total traffic | 1.0 |
| F_{flood} | Bridge Closed for Flooding Event Factor | Bridge has been closed for flooding | 3.0 |
| | | Bridge has been overtopped due to flooding | 1.5 |
| | | Bridge has not been closed or overtopped due to flooding | 1.0 |

Pavement

District 8-0 utilized data from the Roadway Management System (RMS) along with input from our County Maintenance Managers to identify our TIP and A-409 pavement candidates for the 2025 TIP update. Both our District Maintenance Services Manager and District Maintenance Program Manager analyzed segments of roadway on our four business plan networks based on International Roughness Index (IRI), Overall Pavement Index (OPI), Average Daily Traffic (ADT), Average Daily Truck Traffic (ADTT) and last year of resurfacing. The County Maintenance Manager identified pavement priorities for their county and shared the list with our District Maintenance Services Manager and District Maintenance Program Manager, which were compared with the RMS data to identify the candidates for the A- team rides.

County A-Team rides were conducted including the following staff: District Executive, Assistant District Executive-Design and Maintenance, District Maintenance Services Manager, District Maintenance Program Manager District Highway Design Engineer, District Traffic Engineer, and County Maintenance Manager. The A-Team ride provides the District staff within person knowledge of the priorities to help determine the needs. Maintenance Staff then conducted a meeting to discuss the priorities and funding availability from both maintenance and Transportation Improvement Programs (TIP) with the Planning and Programming Manager. Projects deemed to be more appropriate for TIP Funding were shared with the MPO for funding consideration. A-409 considered projects were also shared with the MPO for any specific feedback.