5. Performance Measures

Various performance measures were evaluated for the potential roadway alignments and compared to the no-build condition. The no-build condition summarizes the impacts of not providing either of the new roadway extensions; however, under this condition low-cost safety improvements to Warren Avenue (and potentially other local roadways) could be pursued to better accommodate traffic along existing routes. These improvements, however, would not achieve the objectives of the new roadway alignments scenarios unless more extensive improvements were provided that would also accommodate truck and bus traffic between Lancaster Avenue and Pennsylvania Avenue, Quaker Lane, and the Malvern train station.

Measures of Effectiveness

Table 7 summarizes the measures of effectiveness of the study alternatives noted above. Categories related to 1) traffic and access issues, 2) safety and alternative travel modes, 3) community character issues, 4) environmental issues, and 5) costs. It is noted that the costs of the project are more thoroughly described in Section 6 of this study and that several of the performance measures will need further evaluation during future phases of the project. As shown in Table 7, this study demonstrates that the Malin Road extension, as well as the Three Tun Road extension, achieve the overall goals of the study while, in contrast, the future no-build, (or current access routes to the study area) do not achieve these goals.

Table 7 | Measures of Effectiveness Comparison Matrix

	Measure of Effectiveness	Do Nothing (No Extensions)	New Roadway Alignments: Scenario 1 Malin Road Extension	New Roadway Alignments: Scenario 2 Three Tun Road Extension
Traffic & Access	Peak Hour Levels of Service (LOS)	↓ LOS at study area intersections will worsen without new road extensions or other improvements.	↑ The overall LOS at most of the study intersections improves.	↑ The overall LOS at most of the study intersections improves.
	Reduction in Vehicle Miles Traveled (VMT)	↓ No change to VMT.	↑ Reduction of 0.7 miles between U.S. Route 30 west of PA Route 320 and Malvern train station.	↑ Reduction of 0.7 miles between U.S. Route 30 west of PA Route 320 and Malvern train station.
	Travel Time Savings	↓ Travel times along existing routes will increase due to background traffic growth and congestion.	↑ Travel times improve with more direct route.	↑ Travel times improve with more direct route.
	Reduction in ADT on local roads	↓ No reductions to ADT on local roads.	↑ Reductions on most local roads including Warren Avenue (-1,400 ADT) and King Street (-700 ADT). ↓ ADT could increase on Malin Road (north of Lancaster Avenue) by about 850 vehicles.	↑ Reductions on most local roads including Warren Avenue (-1,500 ADT) and King Street (-900 ADT). ↓ ADT could increase on Malin Road (north of Lancaster Avenue) by about 850 vehicles.
	Reduction in Heavy Vehicle ADT on local roads	↓ Heavy vehicles will continue to use local roads without weight restrictions.	↑ Heavy vehicles to/from study area have an improved route and do not need to utilize Bridge or Broad Streets.	↑ More direct route provided between Borough, as well as Three Tun business park, and Lancaster Avenue and other major arterials
Safety & Alternative Travel	Sidewalk/trails	↓ Limited facilities outside of Borough. Provision of new pedestrian facilities will result in more property impacts (compared to minor roadway upgrades).	↑ Yes (4,700 feet of new sidewalk/trail proposed on extension). Could tie into future planned Patriot's Path trail. ↓ New (and costly) pedestrian tunnel required under Norfolk Southern rail line.	↑ Yes (2,600 feet of new sidewalk/trail proposed on Three Tun Road extension.)
	Bicycle Access	↓ No defined routes/facilities. Provision of new bicycle facilities will result in more property impacts (compared to minor roadway upgrades).	↑ Paved shoulders/trail provided. Could tie into future planned Patriot's Path trail.	↑ Paved shoulders/trail provided. Could tie into future planned Patriot's Path trail.
	Public Transportation	↓ Circuitous routes for public transportation to Malvern Station and industrial uses. Truck/bus restrictions on Warren Avenue.	↑ New road can accommodate public transportation and provide direct route.	↑ New road can accommodate public transportation and provide direct route.
	Transit-Oriented Development (TOD)	↓ Circuitous access route and unaddressed traffic congestion do not support TOD.	↑ Supports access to TOD and near Malvern Station can accommodate new development.	↑ Supports access to TOD and near Malvern Station can accommodate new development.
Community Character	Historic Resources & Community Facilities	■ No impacts, but potential Warren Avenue upgrades could impact historic resources.	↑ No impacts identified.	↑ No impacts identified.
	Businesses (direct impact)	■ No impacts; however, regional traffic improvements may impact businesses outside the immediate study area.	↓ Right-of-way/property required from several businesses including five lots on Pennsylvania Avenue cul-de-sac.	↓ Right-of-way/property required from several businesses including two or three lots on Three Tun Road cul-de-sac.
	Residences (direct impact)	■ No impacts, but potential Warren Avenue upgrades could impact several properties.	↓ Right-of-way at rear of 16 properties required.	↑ No impacts.
	Land Use	■ No impacts.	↑ No major conflicts with CCPC's *Landscapes2* Plan or local comprehensive plans.	↑ No major conflicts with CCPC's *Landscapes2* Plan or local comprehensive plans.

Table 7 continued.

	Measure of Effectiveness	Do Nothing	New Roadway Alignments: Scenario 1 Malin Road Extension	New Roadway Alignments: Scenario 2 Three Tun Road Extension
ENVIRONMENTAL	**Wetlands**	No impacts.	No NWI wetlands have been identified in the project area; however, soils with partially hydric components are present and may require wetland delineations.	No NWI wetlands have been identified in the project area; however, soils with partially hydric components are present and may require wetland delineations.
	Agricultural Resources	No impacts.	No Productive Agricultural Land is present but there is Prime Farmland soil and soils of Statewide importance are present.	No Productive Agricultural Land is present but there is Prime Farmland soil and soils of Statewide importance are present.
	Stream Crossings	No impacts.	Little Valley Creek and an unnamed tributary, both designated as Exceptional Value and for Migratory Fishes, will be crossed.	Little Valley Creek and an unnamed tributary, both designated as Exceptional Value and for Migratory Fishes, will be crossed.
	Floodplains	No impacts.	No FEMA designated 100-yr floodplains are present within the project study area.	No FEMA designated 100-yr floodplains are present within the project study area.
	Air Quality	No impacts. Increased traffic congestion in future without roadway extensions or without improvements may result in negative impacts to air quality.	N/A – impacts to air quality will have to be evaluated in future studies, but may improve or not worsen due less traffic congestion.	N/A – impacts to air quality will have to be evaluated in future studies, but may improve or not worsen due less traffic congestion.
	Noise	No impacts.	N/A – noise impacts will need to be evaluated in future studies/design.	N/A – noise impacts will need to be evaluated in future studies/design.
	Hazardous Waste	No impacts.	N/A – a more detailed review of hazardous waste sites is necessary during future studies/design.	N/A – a more detailed review of hazardous waste sites is necessary during future studies/design.
	Threatened & Endangered Species	No impacts.	N/A – coordination with U.S. Fish and Wildlife Service is required to determine impacts.	N/A – coordination with U.S. Fish and Wildlife Service is required to determine impacts.
COSTS	**Total Project Costs** *Costs may vary depending on funding source*	$0 but does not include improvements to intersections/roadways required as a result of background traffic growth. Low-cost safety improvements/upgrades to Warren Avenue are estimated to cost approximately $1.5 Million.	Estimated to be in the order of $15 to $19 Million for the extension. Improvements to Pennsylvania Avenue (and at Pennsylvania/ Warren Ave intersection) include an additional $2 to $2.5 Million	Estimated to be in the order of $8.8 to $11 Million.
SUMMARY	**Satisfies Project Goals & Objectives**	**No.** Does not provide a desirable alternative route for trucks and buses, does not reduce neighborhood traffic volumes, and does not support future TOD near train station.	**Yes.** Provides alternative route for trucks/bus traffic, reduces traffic from neighborhood roads, and supports future TOD near train station.	**Yes.** Provides another route for trucks/bus traffic, can further reduce traffic from neighborhoods, and supports TOD near train station.