



NEW OR MODIFIED HIGHWAY INTERCHANGE PROJECTS POLICY

POLICY STATEMENT

Given the resurgent interest in, and proposals for, new or modified highway interchange projects in Northeast Ohio, the Northeast Ohio Areawide Coordinating Agency (NOACA) has established a coordinated approach to review and assess the merits of such proposals. Each proposal will receive thorough examination of its impacts (transportation planning, fiscal responsibility, economic development, environmental protection, safety, quality of life, etc.), which may extend beyond the immediate vicinity of the project site and beyond the completion of the project into the future. In a region with a declining population that has spread out in less dense development patterns since 1970, this policy sets the bar for project sponsors to demonstrate whether a proposed new or modified highway interchange truly results in net regional benefit.

AUTHORITY

Code of Federal Regulations, Title 23, Part 450, Subpart C
United States Code, Title 23, Section 134

HISTORY

Implemented by NOACA Board of Directors Resolution 2020-046
Revised by NOACA Board of Directors Resolution 2025-040

PURPOSE

The purpose of this policy is to establish methodology and criteria to evaluate new or modified highway interchange projects proposed as regional transportation system improvements. Such an approach will facilitate the NOACA Board's fair and comprehensive consideration of these project proposals. This approach will also ensure coordination among project sponsors, the Ohio Department of Transportation (ODOT) and adjacent metropolitan planning organizations (MPOs). This policy will serve as the official, institutional protocol for consideration and evaluation of such proposals and related capital investment decisions by NOACA.

BACKGROUND

NOACA's Regional Transportation Investment Policy (RTIP) is its Board of Directors' policy for planning, programming and prioritizing federal-aid or locally funded regionally significant transportation investments for the region.

The latest version of NOACA's RTIP reflects a New or Modified Highway Interchange Projects Policy, which states:

"All new or modified interchange projects requiring an IMS or IJS are major

projects, and must complete a Feasibility Study or Alternatives Evaluation Report that recommends a preferred alternative. The planning phase of new or modified interchange projects may be considered for amendment to the LRTP and TIP through NOACA PPR and IGRC procedures. After IMS or IJS approval by FHWA and ODOT, funding for the Construction phase of projects may be proposed for amendment to the TIP.”

Revived interest in new or modified highway interchange projects in the NOACA region after several years of relative inactivity raised the question of whether the current policy provides enough clarity about the evaluation necessary for NOACA to adequately consider the projects for approval. Specifically, the current policy focuses on the technical process that includes only study of the immediate area of the interchange.

Through a series of meetings, NOACA's Board Committees determined that the recent development of proposed interchange projects throughout the region necessitated a closer look at the New or Modified Highway Interchange Projects Policy, and members expressed concern that interchange projects advanced prior to NOACA approval and adoption to its Long Range Transportation Plan (LRTP).

Long term, it is important that NOACA establish policy and procedures that guide the evaluation of proposed new or modified highway interchange projects that potentially have significant impacts on the entire region. The policy should explicitly state the types of information the Board needs to make an informed decision about whether a particular project satisfies NOACA Board goals and objectives outlined in the RTIP.

POLICY

NOACA's vision is to **STRENGTHEN** regional cohesion, **PRESERVE** existing infrastructure, and **BUILD** a sustainable multi-modal transportation system to **SUPPORT** economic development and **ENHANCE** quality of life in Northeast Ohio. In furtherance of the vision of NOACA, five goals guide the agency. This policy supports these goals. NOACA commits to be more comprehensive in its planning scope and focus on the relationship of transportation and environmental planning to housing, land use, economic development and health outcomes.

The new or modified highway interchange policy applies to proposed new interchanges, proposed reconfigured interchanges at an existing location, or altered operations at existing interchanges in the five counties of the NOACA region.

New interchange at a new location:

- Complete interchange: Provides access to and from any direction from each facility. Full freeway to street access with a conventional interchange requires a minimum of four ramps (on and off in each direction).
- Partial interchange: An interchange where not all of the turns and traffic movements are possible.

Reconfigured interchange at an existing location:

- Change interchange type (partial interchange to full interchange)
- Add ramp
- Relocate ramp terminal to different road
- Significant operational changes (add C-D roads)

This policy is not intended to apply to the following proposed interchange modifications:

- Install signals at ramp intersections
- Extend turn lane lengths on exit ramp or crossroad
- Mainline thru lane additions
- Improve roadway features to meet current geometric standards (i.e. construct acceleration/deceleration lanes or radii to current standards)
- Add ramp metering
- Alter the number or type of lanes at crossroad ramp intersection
- Road diets
- Turn lane additions
- Change lane type without adding or reducing lanes
- Revise single lane ramps to dual lanes (exit or entrance ramps)
- Add an auxiliary lane between two adjacent interchange ramps where the single auxiliary lane does not function as a mainline travel lane

CRITERIA TO ASSESS PROPOSED NEW OR MODIFIED HIGHWAY INTERCHANGE FOR ADOPTION INTO THE NOACA LONG RANGE TRANSPORTATION PLAN (LRTP)

TRANSPORTATION PLANNING CRITERIA

A proposal for a new or modified highway interchange should begin with an application to NOACA for a comprehensive evaluation. Proposals should be warranted through planning level studies such as feasibility, safety or corridor studies in which the project sponsor has collaborated with NOACA and ODOT prior to application for comprehensive evaluation.

NOACA will identify any adjacent impacted MPOs and other stakeholders. NOACA will coordinate with ODOT and those identified parties, to initiate the comprehensive evaluation process of the NOACA “New or Modified Highway Interchange Policy” criteria. Project development and engineering activities may begin if the project satisfies both the transportation planning criteria and the local and regional impacts criteria of the NOACA “New or Modified Highway Interchange Policy.” NOACA staff will implement the comprehensive evaluation process to determine whether to advance the project for amendment to the LRTP.

First Tier Criteria

The following spacing measures are considered for any proposed new interchanges or ramps. These criteria do not necessarily negate a proposal, but the NOACA Board will consider as evidence in support for or against a project.

Interchange Spacing

Interchange spacing is critically important for safety, mobility purposes and traffic management. Therefore, interchange spacing should follow the American Association of Highway Transportation Officials’ (AASHTO’s) design guidelines as specified in their most recent edition of the Green Book:

“In areas of concentrated urban development, proper spacing usually is difficult to attain because of traffic demand for frequent access. Minimum spacing of arterial interchanges (distance between intersecting streets with ramps) is determined by interchange form, lane configuration, weaving volumes, signing,

signal progression, and lengths of speed- change lanes. A general rule of thumb for minimum interchange spacing is 1 mi [1.5 km] in urban areas and 2 mi [3.0 km] in rural areas. In urban areas, spacing of less than 1 mi [1.5 km] may be developed by grade-separated ramps or by adding collector–distributor roads.”¹

Ramp Spacing

- 400-2,000 feet depending on the ramp-pair combination

Second Tier Criteria

The project sponsor must first demonstrate that the existing system is incapable of accommodating desired access or traffic demands (existing infrastructure cannot be improved to satisfy design year demand traffic), and all reasonable alternatives to a new interchange have been considered. The analysis should include transportation system management and operations, and congestion mitigation strategies (ramp metering, transit, HOV, etc.). A feasibility study, which documents how the preferred alternative is selected, must then be completed and include purpose and need, alternatives considered, safety or operational impact, and comparisons of alternatives.

Analysis Period and Influence Subarea for the Feasibility Study

Roads and highways are considered long term infrastructure investments and their service life is over a quarter-century. Therefore, an analysis period of at least 20 years is defined as the project period and the future traffic volumes of the ‘Build” and “No Build” scenarios are used for the comparison purposes.

Adding freeway access to the highway network will impact traffic in a subarea around the location of the access. NOACA staff define the subarea, primarily based on the origins and destinations of trips that include the interchange (“influence subarea”). Some elements in the cost analysis are estimated based on the traffic volume changes in the defined subarea (see below).

Cost-Benefit Analysis

To ensure the highest and best use of the region’s resources, a cost-benefit analysis is required for each alternative considered, including a no-build alternative in the Feasibility Study. The total construction and operation and maintenance costs are considered as the total cost of the project and the congestion, safety and emission cost savings are the project benefits. NOACA staff will utilize United States Department of Transportation (USDOT) guidelines for its “Benefits/Cost Analysis” for major transportation infrastructure projects, including approach, methods, standards, values, etc. as highlighted below:²

- Congestion cost: As demand approaches the capacity of a freeway (or of the interchanges along the highway), extreme traffic congestion sets in. Traffic congestion

¹ AASHTO, 2018, p. 10-82. *A Policy on Geometric Design of Highways and Streets* (Green Book, 7th ed.).

² US DOT, 2025, *Benefit-Cost Analysis Guidance for Discretionary Grant Programs*, (retrieved from <https://www.transportation.gov/mission/office-secretary/office-policy/transportation-policy/benefit-cost-analysis-guidance>).

impacts the operation and performance of the freeway and causes longer trip times, slower speed and increased delay. As traffic engineering and financial performance indicators, combination of travel delay and wasted fuel due to congestion is considered as the congestion cost.

- **Total Project cost:** Total project cost as a capital investment consists of; preliminary engineering cost, design cost, right of way acquisition cost, and construction cost. If the project includes a tolling segment or involves the private) sector, then the banking interest of the investment for the period of the project service life should be added to the total project cost.
- **Operation and Maintenance costs:** Operation and maintenance cost of the proposed facility are estimated year by year for the defined analysis period and as the total operation and maintenance cost.
- **Safety cost:** The crash risk in the influence subarea of the project will be changed following adding the proposed facility. The reported crashes referenced to the influence subarea are used to identify crash patterns and more specifically, severity, and frequency of crashes. A crash severity scale known as the KABCO scale provided by the Federal Highway Administration, is considered to estimate the potential safety costs of the project. The KABCO injury scale was developed by the National Safety Council (NSC) and frequently used by law enforcement for classifying injuries.³
- **Emission cost:** The emission costs are calculated using the most recent version of the US Environmental Protection Agency's (US EPA) mobile emissions modeling software, named MOVES. Emissions factors for all vehicle class types (e.g. passenger vehicles, buses, heavy-duty trucks) are developed for nitrogen oxides (NOx), volatile organic compounds (VOCs), and fine particulate matter (PM2.5) that are the main mobile emissions of concern in the NOACA region. These emission factors estimate the grams of each pollutant released per mile (g/mi) for each vehicle class, under various parameters. The subarea total Vehicle Miles Traveled (VMT) is multiplied by the selected emission factors or the "Build" and "No Build" alternatives. In order to calculate the mobile emission costs, first the estimated grams per day for each alternative are converted into total metric tons per year and then multiplied by the most recent costs per ton for NOx, VOCs, and PM2.5 from the Federal Highway Administration.

Microscopic Simulation

Microscopic simulation models have increasingly become operational analysis alternatives, especially for complex highway networks and geometric conditions including closely spaced interchange ramps. Documents and planning tools such as the Highway Capacity Manual, AASHTO design guidelines, and NOACA Travel Forecasting Model are macroscopic (based primarily on relationships between average measures and speed, density, and flow rates). In contrast, microscopic simulation models are based on vehicle- to-vehicle car-following phenomena and individual driver and vehicle characteristics. A microsimulation of the influence subarea with focus on the proposed freeway interchange access is required to visualize the operations and performance of the freeway, interchange, and surrounding streets at the micro

³ Federal Highway Administration (FHWA), *Highway Safety Improvement Program Manual*, 2010. "KABCO" Injury Scale is frequently used by law enforcement for classifying injuries and also can be used for establishing crash costs. (K – Fatal; A – Incapacitating injury; B – Nonincapacitating injury; C – Possible injury; and O – No injury.) (retrieved from <https://highways.dot.gov/safety/hsip/highway-safety-improvement-program-manual>).

level. Consistency between the results of macro and micro levels is required. In other words, the outputs of the macro and micro level models should be within a statistically acceptable margin of difference.

LOCAL AND REGIONAL IMPACT CRITERIA (IF TRANSPORTATION PLANNING CRITERIA SATISFIED)

For each listed criterion, NOACA will analyze the proposal through a set of rubrics (see attachment) to demonstrate whether the new or modified highway interchange:

1. Maximizes transportation related benefits across all impacted communities. In accordance with the stated rubrics, NOACA staff will:
 - a. Identify the impacted communities for either positive or negative impact.
 - i. The community in which the new or modified highway interchange will exist, but also its immediate neighbors. These are the communities that may experience new transportation impacts and new development, or land use impacts, because of the new or modified highway interchange.
 - ii. There are other communities within the region, possibly not within the vicinity of the new interchange, which may experience a loss of existing or potential development or a gain of such development because of the new interchange. Some communities may realize these gains/losses immediately based on development driving the new or modified highway interchange (e.g. the relocation of an existing company within the region). Some communities may realize gains/losses at a future time. Losses are particularly critical to the analysis if regional population growth remains stagnant. In this scenario, the new interchange may create development opportunities within its vicinity that were not previously available or as desirable. Such opportunities may draw development from communities where it currently exists or entice future development to locate near the new interchange versus another community where that development may have occurred if the new interchange were not built.
 - b. Identify the benefits/costs to the impacted communities (including the condition of existing regional transportation assets, socioeconomic impacts, and cost of development incentives packages at local, regional and state level as well as cost of capital infrastructure investment).
 - i. Community within which the new interchange will exist
 - ii. Communities in close proximity to the new interchange
 - iii. Communities potentially far from the new interchange that may experience impact from existing and future development shifts from their locations to the vicinity of the new interchange.
2. Enhances the inter-relationships of communities within the region. In accordance with the stated rubrics, NOACA staff will:
 - a. Identify how the new or modified highway interchange supports or strengthens the relationships among the impacted communities identified in Regional Impact Criteria #1.
 - b. Identify how the new or modified highway interchange does, or does not, support the relationships among the impacted communities identified in Regional Impact Criteria #1.
 - c. Ensure consistency with state, regional and local economic development priorities, policies and strategies.
 - d. Support retention and expansion of Northeast Ohio businesses in areas with existing

- infrastructure and attract new businesses to Northeast Ohio.
- e. Promote regional cooperation in the areas of economic development and job retention.
3. Preserves or maintains existing infrastructure that serves currently developed areas of the region. In accordance with the stated rubrics, NOACA staff will:
 - a. Ensure approximately 90% of the region's transportation and infrastructure funding maintains and preserves existing investments
 - b. Consider life-cycle costs and regional fiscal sustainability
 - c. Achieve levels of infrastructure investment that do not exceed the region's financial capacity
 - d. Minimize the economic burden of transportation investments on the region's taxpayers
 4. Facilitates improvements that connect existing activity centers and reinvigorates existing communities of the region, including:
 - a. Improved access to regional job centers, employment opportunities, and city centers (and does not draw development away from such areas)
 - b. Improved access to primary and secondary schools, colleges, universities and other educational opportunities
 - c. Development in higher density areas.
 - d. Redevelopment of declining and abandoned areas
 - e. Transit-Oriented Development (TOD) in higher density urban corridors and other higher density areas and retrofits TO elements in appropriate lower density areas
 5. Provides for the movement of goods essential to the economic viability of the region
 6. Promotes environmental sustainability:
 - a. Reduces energy use and improves air quality
 - b. Reduces greenhouse gas emissions
 - c. Integrates the control of storm water, protection and improvement of water quality, and control of development in floodplains
 - d. Preserves agricultural lands, open space and important habitat areas, woodlands, and wetlands
 7. Enhances and improves coordination for public transit, rail, pedestrian and bicycle transportation (could incorporate these elements into new development associated with new interchange, but need to also show that new interchange does not draw development away from areas already well-served by public transit and active transportation infrastructure, such as bike lanes, sidewalks, etc.):
 - a. Facilitates intermodal transportation connections
 - b. Reduces reliance on auto travel
 8. Ensures and enhances safety
 9. Enhances the public's access to and enjoyment of the region's parks, cultural assets and recreational activities; promotes healthy and active living

Regional Air Quality Conformity Criteria

The Federal Clean Air Act and the transportation planning provisions of Title 23 and Title 49 of

the United States Code are intended to ensure that integrated transportation and air quality planning occurs in the areas that do not or previously have not met the National Ambient Air Quality Standards (NAAQS). Transportation conformity ("conformity") is a way to ensure that Federal funding and approval goes to those transportation activities that are consistent with air quality goals. Conformity applies to transportation plans, transportation improvement programs (TIPs), and projects funded or approved by the Federal Highway Administration (FHWA) or the Federal Transit Administration (FTA) in areas that do not meet or previously have not met air quality standards for ozone, carbon monoxide, particulate matter, or nitrogen dioxide.

NOACA is responsible for demonstrating that the transportation investments, strategies, and programs included in the Plan and TIP are consistent with air quality goals established in State Implementation Plans (SIP) for achieving the NAAQS. Conformity demonstrations show that emissions from projects in transportation plans and programs do not exceed the SIP targets ("budgets") for emissions from mobile sources.

Projects defined as Regionally Significant in 40 CFR 93.101 are required to be analyzed for regional air quality conformity, including new full or partial interchange projects. Projects that are exempt from regional conformity analysis are defined as exempt projects contained in 40 CFR 93.126 Table 2 and 40 CFR 93.127 Table 3. For the purposes of this policy, unless the proposed interchange improvement meets the definition of an exempt project, it will be subject to regional air quality conformity requirements to be demonstrated to and approved by the NOACA Board at the time of Plan and/or TIP adoption.

PROJECT DEVELOPMENT COORDINATION WITH NOACA

If the proposed new or modified interchange project satisfies the above criteria and has been approved for adoption into the NOACA LRTP, the project sponsor may begin specific project development activities. Project development activities must be consistent with the current ODOT five-phase Project Development Process (PDP). The project sponsor must submit a request to NOACA for amendment to the Transportation Improvement Program (TIP) and Statewide Transportation Improvement Program (STIP) when funding is secured for each phase, irrespective of source. Once the project phase is amended to the TIP and STIP, the project sponsor may initiate phase task activities.

As the project advances through the PDP, coordination is required to ensure that NOACA transportation planning requirements are satisfied. The table below contains the PDP phases and tasks required for NOACA coordination and the resulting action.

PDP Phase	PDP Tasks Required for NOACA Coordination	NOACA Action
Planning	<ul style="list-style-type: none"> • Internal meeting with sponsor • Traffic data • Concept, scope and budget estimates • Public Involvement Plan (PIP) • Feasibility Studies 	<ul style="list-style-type: none"> • FHWA and ODOT Traffic Forecasting Manual consider the NOACA travel forecasting model “the model of record” for the NOACA region. NOACA will provide supporting documents, inputs, assumptions and outputs of the model to ODOT, project sponsor and other collaborating partners. • Concurrence with project scope and estimate • Participation in the project PIP • Concurrence with feasibility studies

Preliminary Development Preliminary Engineering	<ul style="list-style-type: none"> • Alternatives Evaluation Report (AER) • IMS/IJS/IOS studies Stage I design plans 	<ul style="list-style-type: none"> • Concurrence with IMS/IJS/IOS studies; AER; Stage I plans • Regional Air Quality Conformity, if amendment required
Preliminary Development – Environmental Engineering	Review of final NEPA document	Review and comment on NEPA draft document
Right of Way	None	None
Final Engineering	Review final design plans	Review and comment on final plans, specifications and estimate package
Construction	None	None

FUNDING

Projects subject to this policy must be evaluated and incorporated into the NOACA LRTP prior to the request for NOACA acknowledgement and/or support for internal or external funding consideration.

NOACA-administered funding for capacity projects is limited to no more than 50% of the requested project phase(s) (i.e. NOACA can only fund up to 50% of any phase for a capacity project).

REGIONAL IMPACTS ANALYSIS OBJECTIVES AND RUBRICS

NOACA REGIONAL STRATEGIC PLAN OBJECTIVE	ANALYSIS RUBRICS
Maximize transportation benefits across all impacted communities.	<ol style="list-style-type: none"> 1. Change in average delay time across Northeast Ohio compared to change in average delay time within interchange influence area (ratio); 2. Change in average commute time to interchange location from sample of starting points throughout Northeast Ohio; 3. Change in mode distribution throughout Northeast Ohio (car vs. transit vs. bike vs. pedestrian vs. telecommute); 4. Change in safety for motorists and pedestrians across Northeast Ohio compared to change in safety for motorists and pedestrians within the vicinity of interchange (ratio); 5. Change in mobile emissions for the region. Possible to measure long-term changes as well as short-term changes?
Enhance the inter-relationships of communities within the region.	<ol style="list-style-type: none"> 1. Change in total population and APP population within a XX-minute commute time of intersection location; 2. Number of jobs that move in association with the interchange; 3. Change in travel time to the jobs that move in association with the interchange; 4. Change in income tax among all communities as a result of interchange (both short-term and long-term); 5. APP population in "leaving" communities versus APP population in "receiving" communities. NOACA may need to

	hire an economist to assess ripple effects of job shift and change in access on both "leaving" communities and "receiving" communities.
PRESERVE EXISTING INFRASTRUCTURE OBJECTIVES	ANALYSIS RUBRICS
Preserve or maintain existing infrastructure that serves currently developed areas of the region.	<ol style="list-style-type: none"> 1. Is the proposed interchange within the 1970 development footprint of Northeast Ohio (show location on map of 1970 development footprint)? 2. Will the proposed interchange cause development on previously undeveloped land? If yes, how many acres? 3. Will the proposed interchange reduce utility of currently developed land? If yes, how many acres? 4. What is the total transportation infrastructure investment related to the interchange (CY dollars)?
Facilitate improvements that connect existing activity centers and reinvigorate existing communities	<ol style="list-style-type: none"> 1. Will the proposed interchange stimulate development on previously developed, but currently underutilized, land? If yes, how many acres? How many of these acres qualify as brownfields? 2. Is the proposed interchange within one mile of an existing jobs hub? If not, will the proposed interchange create a new jobs hub? 3. What is the anticipated level of investment in economic development within influence area of proposed interchange (CY dollars)?
Facilitate development in higher density areas.	<ol style="list-style-type: none"> 1. Change in residential density within influence area of proposed interchange (compare to residential densities within influence area of other interchanges); 2. Change in employment density within influence area of proposed interchange (compare to employment densities within influence area of other interchanges).
Promote environmental sustainability.	<ol style="list-style-type: none"> 1. Change in mobile emissions for the region (A15); 2. Change in impervious surface within the influence area of proposed interchange; 3. Will the proposed interchange cause development on previously undeveloped land? If yes, how many acres (A22)?
Devote approximately 90% of the region's transportation and infrastructure funding to maintain and preserve existing investments	What percentage of the region's transportation and infrastructure funding for the TIP is the funding dedicated to the proposed interchange (include planning, design, construction, maintenance, (incentives?))?
Monitor the condition of existing regional transportation assets and evaluate socioeconomic impacts of investments	<ol style="list-style-type: none"> 1. Change in condition of average pavement condition rating (PCR) across Northeast Ohio compared to the average PCR within the influence area of the interchange(A17); 2. Change in APP population within a XX-minute commute time of intersection location;

	<ol style="list-style-type: none"> 3. Number of jobs that move in association with the interchange; 4. Change in income tax among all communities as a result of interchange (both short-term and long-term); 5. APP population in "leaving" communities versus APP population in "receiving" communities. NOACA may need to hire an economist to assess ripple effects of job shift and change in access on both "leaving" communities and "receiving" communities.
Conduct benefit-cost analyses of all projects to insure that life-cycle costs and regional fiscal sustainability are considered.	Reference Cost-Benefit Analysis outlined earlier in the policy (i.e. the Cost-Benefit Analysis will be complete and satisfied before NOACA staff consider the Regional Impacts Analysis).
SUSTAINABLE MULTIMODAL SYSTEM OBJECTIVES	ANALYSIS RUBRICS
Enhance and improve coordination for public transit, rail, pedestrian and bicycle transportation	<ol style="list-style-type: none"> 1. Change in public transit service to/within the influence area of proposed interchange (existing/proposed transit stops, park & ride facilities, etc.); 2. Change in bicycle infrastructure within the influence area of proposed interchange; 3. Change in pedestrian infrastructure within the influence area of proposed interchange; 4. Change in transit and non-motorized (bicycle/pedestrian) commute time to interchange location from sample of starting points throughout Northeast Ohio.
Improve access to regional job centers, employment opportunities, and city centers	<ol style="list-style-type: none"> 1. Change in average commute time to interchange location from sample of starting points throughout Northeast Ohio (A15); 2. Number of jobs that move in association with the interchange (A30); 3. Is the proposed interchange within influence area of an existing jobs hub? If not, will the proposed interchange create a new jobs hub (A24)? 4. What is the anticipated level of investment in economic development within influence area of the proposed interchange (CY dollars) (A24)?
Facilitate intermodal transportation connections	<ol style="list-style-type: none"> 1. Change in public transit service to/within influence area of proposed interchange (existing/proposed transit stops, park & ride facilities, etc.) (A37); 2. Change in bicycle infrastructure within influence area of proposed interchange; 3. Change in pedestrian infrastructure within influence area of proposed interchange; 4. Change in non-vehicle (transit/bicycle/pedestrian) commute time to interchange location from sample of starting points throughout Northeast Ohio.

Reduce energy use and improve air quality	<ol style="list-style-type: none"> 1. Change in mobile emissions for the region (A15); 2. Change in VMT for the region.
Reduce greenhouse gas emissions	NOACA staff should prepare a Greenhouse Gas Emissions Analysis specific to proposed interchange; they already do this for the NOACA Air Quality Trends Report and Cuyahoga County.
Reduce reliance on auto travel	<ol style="list-style-type: none"> 1. Change in VMT for the region (A43); 2. Change in public transit service to/within influence area of proposed interchange (existing/proposed transit stops, park & ride facilities, etc.) (A37); 3. Change in bicycle infrastructure within influence area of proposed interchange (A37); 4. Change in pedestrian infrastructure within influence area of proposed interchange (A37); 5. Change in non-vehicle (transit/bicycle/pedestrian) commute time to interchange location from sample of starting points throughout Northeast Ohio (A37).
SUSTAINABLE MULTIMODAL SYSTEM OBJECTIVES	ANALYSIS RUBRICS
Integrate the control of storm water, protection and improvement of water quality, and control of development in floodplains	<ol style="list-style-type: none"> 1. Change in impervious surface within influence area of proposed interchange (A27); 2. Change in newly developed acres within influence area of proposed interchange (A22); 3. Is influence area of proposed interchange within an Area of Concern (AOC) subwatershed? 4. Is influence area of proposed interchange within a subwatershed with Beneficial Use Impacts (BUIs)? 5. Is influence area of proposed interchange within a designated floodplain or flood hazard zone?
Ensure and enhance safety	Reference Cost-Benefit Analysis outlined earlier in the policy (i.e. the Cost-Benefit Analysis will be complete and satisfied before NOACA staff consider the Regional Impacts Analysis).
Encourage TOD in higher density urban corridors and other higher density areas and retrofit TO elements in appropriate lower density areas.	<ol style="list-style-type: none"> 1. Change in residential density within influence area of proposed interchange (compare to residential densities within influence area of other interchanges) (A26); 2. Change in employment density within influence area of proposed interchange (compare to employment densities within influence area of other interchanges) (A26); 3. Change in public transit service to/within influence area of proposed interchange (existing/proposed transit stops, park & ride facilities, etc.) (A37); 4. Change in bicycle infrastructure within influence area of proposed interchange (A37); 5. Change in pedestrian infrastructure within influence area of proposed interchange (A37); 6. Change in non-vehicle (transit/bicycle/pedestrian) commute time to interchange location from sample of starting points

	throughout Northeast Ohio (A37).
Achieve levels of infrastructure investment that do not exceed the region's financial capacity.	<ol style="list-style-type: none"> 1. Reference Cost-Benefit Analysis outlined earlier in the policy (i.e. the Cost-Benefit Analysis will be complete and satisfied before NOACA staff consider the Regional Impacts Analysis) (A32); 2. What percentage of the region's transportation and infrastructure funding is the funding dedicated to the proposed interchange (include planning, design, construction, maintenance, etc.) (A28)? 3. What is the cost of incentives from jurisdictions within Northeast Ohio (both development and infrastructure) related to the proposed interchange project? 4. What funding sources will meet increased maintenance with the addition of interchange and related expanded transportation infrastructure within influence area (request financial plan (including maintenance budget) from project sponsor)?
SUPPORT ECONOMIC DEVELOPMENT OBJECTIVES	ANALYSIS RUBRICS
Provide for the movement of goods essential to the economic viability of the region	<ol style="list-style-type: none"> 1. Change in freight truck travel times across Northeast Ohio compared to the freight truck travel times within the influence area of the proposed interchange; 2. Change in freight transportation costs due to proposed interchange.
Are consistent with state, regional and local economic development priorities, policies and strategies.	<ol style="list-style-type: none"> 1. Which local jurisdiction economic development priorities, policies and strategies does proposed interchange support or not support? 2. Which Northeast Ohio region economic development priorities, policies and strategies does proposed interchange support or not support? 3. Which Ohio economic development priorities, policies and strategies does proposed interchange support or not support?
Support retention and expansion of Northeast Ohio businesses in areas with existing infrastructure and attract new businesses to Northeast Ohio.	<ol style="list-style-type: none"> 1. Will the proposed interchange maintain certain businesses in Northeast Ohio (expected number of retained jobs and tax revenue)? 2. Will the proposed interchange expand certain businesses in Northeast Ohio (expected number of new jobs and increased tax revenue)? 3. Will the proposed interchange attract certain businesses to Northeast Ohio from outside the region (expected number of new jobs and increased tax revenue)?
Promote regional cooperation in the areas of economic development and job retention.	<ol style="list-style-type: none"> 1. Change in APP population within a 30-minute commute time of intersection location (A17); 2. Number of jobs that move in association with the interchange;

	<ol style="list-style-type: none"> 3. Change in income tax among all communities as a result of interchange (both short-term and long-term); 4. APP population in "leaving" communities versus APP population in "receiving" communities. NOACA may need to hire an economist to assess ripple effects of job shift and change in access on both "leaving" communities and "receiving" communities.
ENHANCE QUALITY OF LIFE OBJECTIVES	ANALYSIS RUBRICS
Promote the redevelopment of declining and abandoned areas	<ol style="list-style-type: none"> 1. Is the proposed interchange within the 1970 development footprint of Northeast Ohio (show location on map of 1970 development footprint) (A22)? 2. Will the proposed interchange stimulate development on previously developed, but currently underutilized, land? If yes, how many acres? How many of these acres qualify as brownfields (A24)? 3. Will the proposed interchange cause development on previously undeveloped land? If yes, how many acres (A22)? 4. Will the proposed interchange reduce utility of currently developed land? If yes, how many acres (A22)? 5. What is the total transportation infrastructure investment related to the interchange (CY dollars) (A22)? 6. Is the proposed interchange within influence area of an existing jobs hub? If not, will the proposed interchange create a new jobs hub (A24)? 7. What is the anticipated level of investment in economic development within influence area of the proposed interchange (CY dollars) (A24)?
Provide improved access to primary and secondary schools, colleges, universities and other educational opportunities	<ol style="list-style-type: none"> 1. Change in travel time to primary and secondary schools within influence area of the proposed interchange; 2. Change in travel time to colleges and universities within influence area of proposed interchange; 3. Change in travel time for workers to reach regional colleges and universities if their job location changes as a result of development dependent on the proposed interchange; 4. Does the proposed interchange enhance mode choice to reach schools, colleges and other educational opportunities?
Enhance the public's access to and enjoyment of the region's parks, cultural assets and recreational activities	<ol style="list-style-type: none"> 1. Change in travel time to local and regional parks within influence area of the proposed interchange; 2. Change in travel time to cultural assets within influence area of the proposed interchange; 3. Change in travel time to recreational activities within influence area of the proposed interchange; 4. Does the proposed interchange enhance mode choice to reach parks, cultural assets and recreational activities?
Preserve agricultural lands, open space and important habitat	<ol style="list-style-type: none"> 1. Change in agricultural land (acres) within influence area of the proposed interchange due to catalyzed development;

areas, woodlands, and wetlands	<ol style="list-style-type: none"> 2. Change in open space and important habitat area (acres) within influence area of the proposed interchange due to catalyzed development; 3. Change in woodlands (acres) within influence area of the proposed interchange due to catalyzed development; 4. Change in wetlands (acres) within influence area of the proposed interchange due to catalyzed development.
Promote healthy and active living	<ol style="list-style-type: none"> 1. Change in bicycle infrastructure within influence area of proposed interchange (A37); 2. Change in pedestrian infrastructure within influence area of proposed interchange (A37); 3. Change in active transportation (bicycle/pedestrian) commute time to interchange location from sample of starting points throughout Northeast Ohio (A37); 4. Change in travel time to recreational activities within influence area of the proposed interchange (A87); 5. Does the proposed interchange enhance mode choice to reach parks, cultural assets and recreational activities (A87)?
Make prudent and necessary infrastructure improvements to minimize the economic burden of transportation investments on the region's taxpayers	Reference Cost-Benefit Analysis outlined earlier in the policy (i.e. the Cost-Benefit Analysis will be complete and satisfied before NOACA staff consider the Regional Impacts Analysis).
Ensure that safety factors are considered in the development of regional infrastructure.	Reference Cost-Benefit Analysis outlined earlier in the policy (i.e. the Cost-Benefit Analysis will be complete and satisfied before NOACA staff consider the Regional Impacts Analysis).

*APP = Areas of Persistent Poverty, as defined by US DOT and/or US Census Bureau