

KENTUCKY STATEWIDE TRUCK NETWORK PROCEDURES STUDY

Final Report

July 2021



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1.0 INTRODUCTION

The Kentucky Statewide Truck Network Procedures Study was initiated by the Kentucky Transportation Cabinet (KYTC) to examine current regulations affecting Kentucky's truck network and to recommend criteria and procedures that should be followed when considering inclusion or exclusion of a route from the truck network.

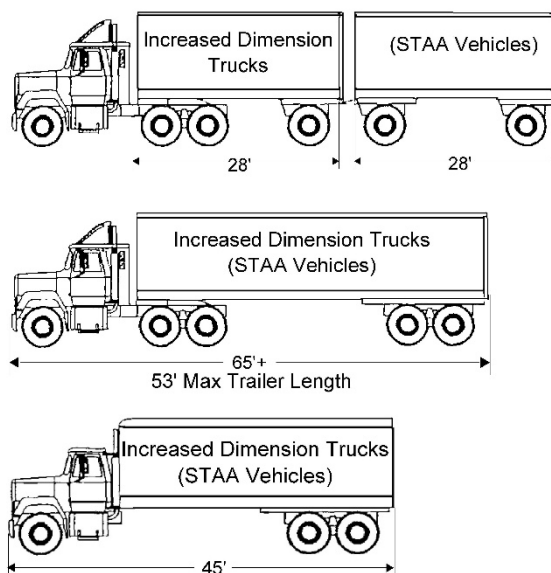
Requests for modifications to the established Kentucky truck network are infrequent, and the process for making such a request is not well documented. Once a request is received, the process to evaluate the requested change is also not well defined (at least publicly). The purpose of this document is to better explain the process and establish more meaningful truck network evaluation criteria and thresholds for adding and removing routes.

1.1 SURFACE TRANSPORTATION ASSISTANCE ACT (STAA) OF 1982

The Surface Transportation Assistance Act (STAA) of 1982 authorized the establishment of a National Truck Network (NN) for oversized vehicles. This network includes more than 200,000 miles of interstates and other, specified non-interstate highways serving to link principal cities and densely developed areas on high volume roads utilized extensively by large vehicles for interstate commerce. STAA width and length limits for oversized vehicles established in Federal Regulation 23 CFR § 658 apply, although states may enact more stringent limits. Designations are made based on qualifying factors, such as volume of truck traffic, geometrics, and the absence of any characteristics that would otherwise present a safety risk. The Federal Highway Administration (FHWA) has the authority to rule upon all requests to add or remove routes from the NN.

STAA TRUCK CHARACTERISTICS

- Truck Width between 96 and 102 inches
- Length of Truck Tractor-Semitrailer Combination between 45 and 48 feet
- Length of Truck Tractor-Semitrailer-Trailer Combination less than or equal to 65 feet
- Length of Bus less than or equal to 45 feet



1.2 KENTUCKY TRUCK NETWORK

In compliance with the STAA of 1982, Kentucky established a network of highways to comprise the Kentucky National Truck Network, shown in **Figure 1**. The Kentucky National Truck Network includes 2,694 miles of federally authorized routes and 991 miles of the state authorized roads.

KENTUCKY DESIGNATED NATIONAL TRUCK NETWORK (NN)

(For use by increased dimension or STAA trucks)

A listing of the Designated Network can be obtained at:
<http://transportation.ky.gov/Planning/Pages/National-Truck-Network.aspx>
or by writing:
Kentucky Transportation Cabinet
Division of Planning
200 Mero St., 5th Floor
Frankfort, KY 40622

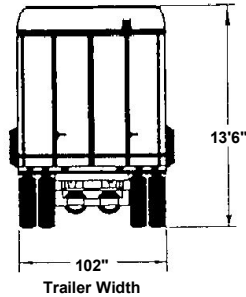
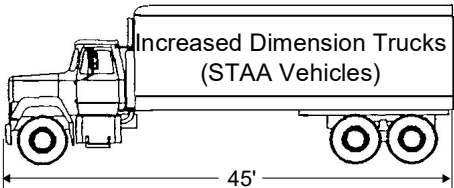
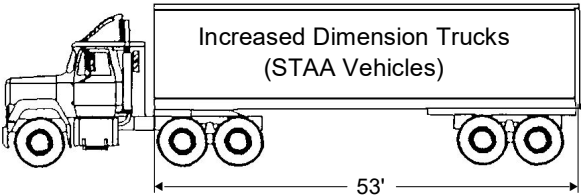
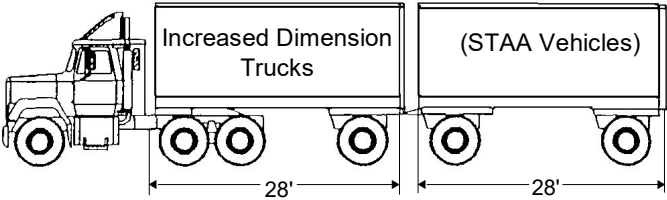
Federal Authorized Route
Multilane highway
Two lane highway
State Authorized Route
Multilane highway
Two lane highway

- | | | | |
|------------|--|-----------|--|
| AU | Audubon Parkway | EB | Edward T. Breathitt Pennyryle Parkway |
| BG | Martha Layne Collins Bluegrass Parkway | JC | Julian M. Carroll Purchase Parkway |
| LN | Louie B. Nunn Cumberland Parkway | WN | William H. Natcher Parkway |
| HR | Hal Rogers Parkway | WK | Wendell H. Ford Western Kentucky Parkway |
| MTN | Bert T. Combs Mountain Parkway | | |

In compliance with the Surface Transportation Assistance Act of 1982 (STAA) and DOT Appropriations Act of 1983 and KRS 189.222, Kentucky has established a network of highways on which motor vehicles with increased dimensions (STAA vehicles) may operate.

Motor vehicles with these increased dimensions shall be allowed on state-maintained highways five (5) driving miles from the designated system and fifteen (15) miles from an interstate or parkway exit for the purpose of attaining reasonable access to terminals, facilities for food, fuel, repairs, or rest. The allowed access is reduced to one (1) driving mile from the designated system on public use highways which are not state-maintained.

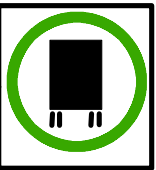
Latest Kentucky Designated National Truck Network Revision: 11/17/2020
Latest Map Revision: 2/1/2021



Increased Dimension Trucks (STAA Vehicles)

Weight
Single axle weight: 20,000 pounds
Tandem axle weight: 34,000 pounds
Gross vehicle weight : 80,000 pounds
Compliance with the Federal Bridge Formula

National Truck Network (NN) Signs



Designated Truck Network Route (STAA Vehicles)



Increased Dimension Trucks Prohibited (No STAA Vehicles)



Figure 1: Kentucky National Truck Network(NN)



KENTUCKY STATEWIDE TRUCK NETWORK PROCEDURES STUDY

In Kentucky, the National Truck Network includes federally authorized routes (shown in blue) regulated by FHWA and 23 CFR § 658 and state authorized roads (shown in green) regulated by KYTC and 603 Kentucky Administrative Regulation (KAR) 5:250. Major freight routes in Kentucky include the interstate system (I-24, I-64, I-65, I-69, I-71, I-75, I-165, I-264, I-265, I-275), the parkway system, and other state-maintained arterials. While the FHWA sets minimum allowable lengths for truck combinations, certain states have “grandfathered” maximum length limits. Kentucky has a “grandfathered” allowable maximum semitrailer length of 53 feet.

Access to the NN is automatically granted for destinations on state-maintained highways that are five miles from the NN or 15 miles from an interstate or parkway interchange. Exceptions to the rule in Kentucky include the following:

- KY 146 in Jefferson County (MP 4.198 – MP 5.784). This route in Anchorage has an 87-degree curve / turn at a railroad crossing.
- KY 418 in Fayette County (MP 2.864 – MP 6.089).
- KY 1973 in Fayette County (MP 0.000 – MP 1.866).
- US 119 in Letcher County (MP 8.837 – MP 15.772). This route was restricted after a tractor-trailer collided with a school bus in 2000.

Destinations on non-state-maintained highways one mile from the NN are also granted reasonable access. Exceptions include following locally maintained roadways in the City of Anchorage in Jefferson County which adopted ordinances that exempt these roadways from the one-mile access provision for safety reasons:

- Evergreen Road
- Bellewood Road
- Lucas Lane
- Old Harrods Creek Road

1.3 REPORT GOALS

The purpose of the Kentucky Statewide Truck Network Procedures report is to examine current regulations affecting Kentucky’s truck network and to recommend specific criteria and procedures that should be followed when considering inclusion or exclusion of a route from the truck network. Interpretation of the language of the established criteria creates in the review of routes for potential inclusion or exclusion. This study aims to establish meaningful evaluation criteria and thresholds for adding and removing routes.

GOALS AND OBJECTIVES

- Review the existing **laws and regulations** involving truck restrictions.
- Review the **policies and procedures of other states**.
- Recommend **evaluation criteria and thresholds for adding** a route to the truck network.
- Recommend **evaluation criteria and thresholds for removing** a route from the truck network.
- Work with KYTC to **document a recommended policy** for review and network changes.
- **Assess criteria implications**; and
- Recommend a strategy to support the (?) Surface Transportation Assistance Act (STAA) **truck restriction signage**

2.0 CURRENT REGULATIONS

The initial focus of the study was to research and summarize all relevant State and Federal laws and regulations as well as previous Kentucky studies related to freight, focusing on studies that included an evaluation of highway freight routes. A complete summary of the findings can be found in the Literature Review in **Appendix A**.

603 KAR 5:250 includes a provision allowing an applicant (intended to be the owner or operator of an STAA vehicle) to request approval to operate STAA vehicles on publicly owned roadways to access facilities that are beyond the five-mile / 15-mile threshold discussed in **Chapter 1.2**. Section 6 of 603 KAR 5:250 defines the application process, indicating the applicant is to submit a written request to the KYTC Division of Planning that clearly defines the roadways / roadway segments. The route definition is to include both a map of the route along with a written description of the roadways and turns required to reach the destination. In addition, justification for the specific requested route(s) is to be included along with a description of the STAA vehicles that would travel the route, if approved. If necessary, the KYTC has authority to request the applicant to supply a representative vehicle to demonstrate its operation and performance along the requested route.

Section 9 of 603 KAR 5:250 outlines the general criteria that should be considered during the review of routes or route segments for potential inclusion on the truck network. These criteria are summarized below. At issue is the definition and application of many of these criteria.

Section 9, 603 KAR 5:250 “REASONABLE ACCESS REVIEW” ENGINEERING AND SAFETY CRITERIA

- **Any one of the following shall disqualify a route:**
 - a. Weight classification 80,000 pounds minimum
 - b. Lane width 10 feet minimum
 - c. Bridge allowance 80,000 pounds minimum
 - d. Underpass vertical clearance 13'-6" minimum
 - e. Bridge width minimum 22' curb to curb
 - f. Passing sight distance >50% of any segment has < 1,500'
 - g. Insufficient turning radii In urban areas
 - h. Crash history Suggests safety concerns for STAA vehicles
- **A combination of any two or more of the following shall disqualify a route:**
 - a. Roadway curvature High degree of horizontal OR vertical
 - b. Roadway shoulders 4' minimum
 - c. Narrow bridge(s) Undefined by KAR

2.1 POLICIES OF OTHER STATE'S

Existing truck policies and procedures of other state departments of transportation (DOTs) were investigated through online research, a survey, and a series of interviews. A survey was sent to freight officials from 16 DOTs with a request for a follow-up interview. Eight responded, with officials from Florida and Illinois indicating they had not had a request for an addition or deletion to their truck network and did not have a defined process. A summary of the survey results from the six responding states is shown in **Table 1**.

Most of the freight officials interviewed were not familiar with specific details regarding their truck network policies and procedures. Officials noted that requests for changes to designated truck networks are not common, so most states have not needed a defined process. Those that have received requests for changes review them on a case-by-case basis. Designation of separate Federal and State truck networks, as done in Kentucky, did not appear to be common.

The North Carolina Department of Transportation (NCDOT) is the exception. All freight-related information, including STAA guidelines and a comprehensive NN application process (with application form), is well documented and can be found on the NCDOT website¹. North Carolina is also unique in that they don't have county roads. All roadways in the state are maintained by the state or municipality (city street).

State DOTs Contacted

*Indicates a response

- Alabama*
- Arkansas
- Florida*
- Georgia
- Illinois*
- Indiana*
- Louisiana
- Mississippi
- Missouri
- North Carolina*
- Ohio*
- South Carolina*
- Tennessee*
- Texas
- Virginia
- West Virginia

3.0 EVALUATION CRITERIA

After completing the literature review and collecting the survey results, the project team compiled available roadway data from the KYTC Highway Information System (HIS) database, Bridge Maintenance database, and the National Bridge Inventory System (NBIS). These data are largely available in Geographic Information System (GIS) shapefile format or could be readily converted to GIS files for mapping and overlaying. The NBIS database is an annually updated repository of information summarizing the results of bridge evaluations and inspections across the state. For this report, the 2019 database for Kentucky was used. Collectively, these GIS data were analyzed and used to examine possible criteria and thresholds for safe STAA truck operation (and consequently, inclusion on the truck network).

An iterative network screening process was performed to ascertain how application of particular roadway characteristics might impact the eligibility of corridors to provide safe and efficient truck operations. Initial criteria and thresholds for the first round of network screening were developed based on analyses of the available data discussed above and the findings from the literature review. These criteria include both roadway segment values and point-based features such as bridge characteristics.

¹ <https://connect.ncdot.gov/business/trucking/Pages/Truck-Access-Designation.aspx>

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Table 1: Summary of State DOT Freight Policy Survey Results

	Alabama	North Carolina	South Carolina	Tennessee*	Ohio	Indiana	Illinois	Florida
1) Separately defined State/Federal Truck Network?	No	Yes	No	No	No	No	No	No
2) Restricted truck routes?	2 restricted routes - tunnels	Yes	Yes	No	No	No	No	No
Who maintains list?	Maintenance	Transportation Mobility & Safety	Oversize/Overweight Permit Office	N/A	N/A	N/A	N/A	N/A
Special signage?	No	No	No	No	No	No	No	No
3) What is the process for adding/removing a route?	FHWA process	FHWA & State Regs (documented online)	FHWA process	FHWA process	FHWA process	FHWA process	FHWA process	FHWA process
Different process for state vs. federal?	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A
Defined in state regulations or DOT policy?	N/A	State Regs	N/A	N/A	N/A	N/A	N/A	N/A
Who approves changes?	FHWA	FHWA/DOT	FHWA	FHWA	FHWA	FHWA	FHWA	FHWA
Does it include adding/removing signs?	No	No	No	No	No	No	No	No
4) Have there been any changes to the NN in the past 5 years?	No	No	No	No	No	No	No	No
5) Does your state have an STAA program coordinator?	No	Yes	No	No	No	No	No	No

*TDOT is working on a formal way to document restricted truck routes in the Tennessee Roadway Information System (TRIMS) database

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Criteria included minimum values for lane and shoulder widths, roadway grades, horizontal and vertical curvature, superelevation rates, and bridge load limits, among others. Using GIS software, the entire Kentucky roadway system was analyzed through an iterative process of determining which routes would be included in the truck network based on the thresholds for each criterion. The recommended criteria and thresholds were determined by the project team, as shown in **Table 2**. Also shown are the KYTC HIS or bridge-related GIS layers used to evaluate each criterion.

Table 2: Recommended Criteria and Thresholds for Truck Network Designation

Criterion	Comments	GIS Layer
Functional Class	All segments must be Major Collector or higher Functional Class	Functional System (FS)
Bridge Weight Posting	No bridges posted for loads < 80,000 pounds	KYTC Bridge Maintenance (BrM)
Weight Class	All segments, weight class must be "AAA" (80,000 pounds)	Truck Weight Classification (TW)
Bridge Width	Roadway width on structure should be $\geq 24'$ curb to curb	National Bridge Inventory (NBI)
Bridge Clearance	Roadway vertical clear over structure must be $> 14'$	National Bridge Inventory (NBI)
Lanes	Two-lane roadways: Lane width should be ≥ 11 feet OR Combined Lane + Shoulder width ≥ 14 ft	Through Lanes (LN)
Shoulders		Shoulders (SH)
Grades	No segments with Grade Class = "F" (8.5%+) unless auxiliary lanes are present	Grades / Vertical Curves (GR)
Auxiliary Lanes		Auxiliary Lanes (AL)
Horizontal Curves	Curve classes should be D or better (E = 14-28 deg., F = 28+ deg.)	Horizontal Curves (CU)

In practical terms, the criteria outlined above provide guidance for a reviewer but may not necessarily be the sole determining factors concerning a route's capacity to safely and efficiently accommodate STAA vehicles. In specific cases, note the use of the word "should" rather than "must". In these instances, it is generally agreed upon by the engineering community and agencies that satisfaction of all the criteria above would suggest a route should provide satisfactory truck accommodation.

In the cases where "should" is applied to a criterion, a limited occurrence where that particular criterion alone is not satisfied may not warrant excluding an otherwise sufficient route from consideration. For example, if a short section of a potential route has a lane width of at least 10

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feet and/or a combined lane and shoulder width that is slightly less than 14 feet in width, but that segment comprises a minority of the overall route and does not appear to represent a safety concern, the reviewer has some flexibility to allow the overall route to be considered eligible. Conversely, where “must” is applied, any roadway segment (regardless of length) that does not satisfy the criterion would disqualify the overall route. As an example, if any bridge along a route is posted for a maximum load of less than 80,000 pounds, the route would not be eligible.

While these criteria provide general standards for truck network routes, engineering judgement must also be used. For example, if class “E” or “F” curves (See Table 2 above) are limited to a small section of the proposed route, it may be prudent to consider the entire length as a whole. Because the KYTC HIS database does not include a comprehensive summary of curve data, evaluation of as-built plans / record drawings may be necessary if roadway curvature is deemed to be a possible concern. Additionally, roadway functional class, by itself, should generally not be used as a disqualifying criterion for a truck route because functional classification is a somewhat subjective characterization for a roadway.

Finally, a broader examination must be used in considering truck route eligibility in the overall context of the transportation network. If an applicant requests inclusion (or possibly, exclusion) of a roadway that connects facilities that are already served by a more appropriate (and potentially, already listed) truck route, the applicant may be advised to instead use the more appropriate facility. An example could include the construction of a bypass around a community that may provide a more geometrically appropriate opportunity for STAA trucks to travel through / around the community.

3.1 OTHER CRITERIA CONSIDERED

The project team discussed other criteria that could be considered in evaluating the sufficiency of a route to accommodate STAA trucks. However, in many cases applying criteria that could be considered subjective results in ambiguity or could be relatively indefensible. As an example, the project team considered crash history as outlined in 603 KAR 5:250. Experience suggests that multi-vehicle crashes tend to occur more frequently where exposure is the highest (i.e., where traffic demand is highest). However, if a significant percentage of the historical crashes involve commercial vehicles, the review process should consider the contributing factors behind such crash occurrences. If roadway geometry appears to be an issue, the criteria outlined in **Table 2** would most likely not be met. If other factors such as congestion appear to contribute to a higher-than-expected number of multi-vehicle crashes that involve trucks, that by itself should not be the sole determinant of truck route eligibility.

As the focus for this evaluation is to use available information and datasets, there exists the possibility for future criteria to be added to the evaluation process.

3.2 AUTOMATIC INCLUSION / EXCLUSION CRITERIA

The project team discussed possible criteria that could automatically qualify (or disqualify) a roadway for inclusion on the truck network. The intent was to determine if any existing roadway classification could be used to quickly determine eligibility for inclusion. For example, if the route requested for inclusion is part of the National Highway System (NHS), would that, on its own, merit inclusion on the Kentucky National Truck Network? To answer that specific question, the project team overlaid the current truck network atop the statewide NHS system routes as shown on **Figure 2**.

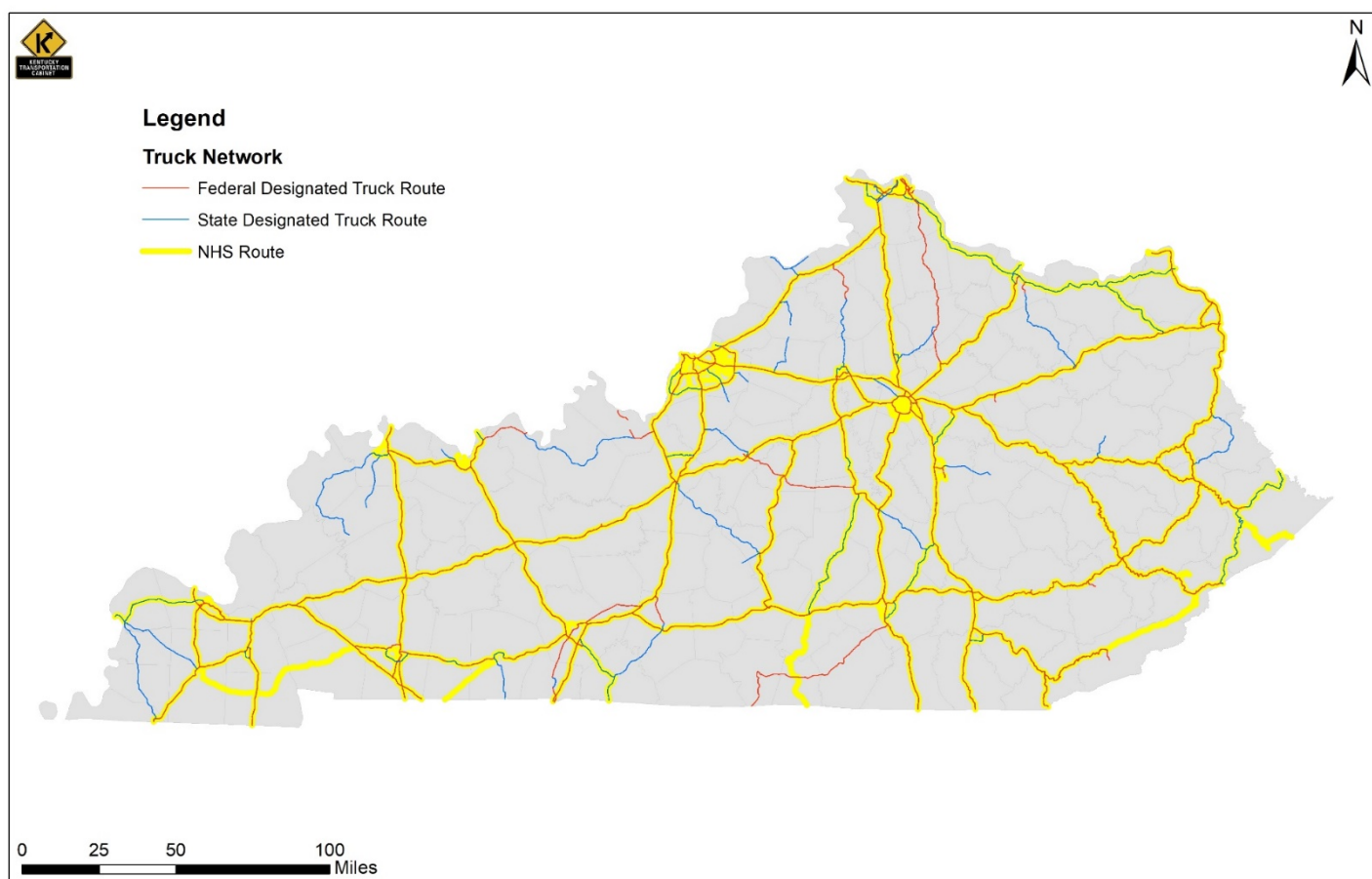


Figure 2: Kentucky National Highway System (NHS) and Truck Routes

As demonstrated, there is some correlation between the NHS and currently designated truck routes, but there are significant portions where there is no overlap. Therefore, while listing on the NHS may be considered as part of the route evaluation process, it cannot serve on its own as an automatic inclusion criterion.

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The entirety of the interstate and parkway system in Kentucky is already listed on either the Federal or State truck network, as such routes were specifically designed for high levels of mobility and larger design vehicles. Future construction of such facilities (for example, the proposed I-69 Ohio River Crossing between Henderson, KY and Evansville, IN), would seemingly result in automatic inclusion on future versions of Kentucky's truck network.

4.0 MODIFYING THE KENTUCKY NATIONAL TRUCK NETWORK

This section provides the proposed process for modifying the Kentucky National Truck Network. This process was determined based on a review of previous Kentucky studies, a review of existing State and Federal regulations, survey of other state's processes, an examination of evaluation criteria, project team input, and engineering judgement.

4.1 PROPOSED PROCESS FOR KENTUCKY NATIONAL TRUCK NETWORK MODIFICATIONS

An application must first be submitted to the KYTC Division of Planning in Frankfort, Kentucky. The proposed application is shown in **Figure 3**. A complete copy is provided in **Appendix B**. A map indicating the beginning of the route, the end of the route, and all turns to be made along the route must be included with the application along with any other supporting documentation. If the application is not complete and correct, a response letter will be drafted by the KYTC Division of Planning - Systems Branch for approval/signature by the State Highway Engineer (SHE) to explain the reasons for denial.

If the application is complete and correct, the KYTC Division of Planning - Systems Branch will then perform an evaluation of the route. At the discretion of the reviewer, the Systems Branch may request the applicant to provide a typical STAA vehicle intended to travel the proposed route and a driver. This may help address concerns related to the potential operation of trucks along the route, focusing on issues related to turning radii or curves where off-tracking may occur. Once the evaluation is complete, the Systems Branch will meet with the District Office and the Project Development Supervisor of the roadway's KYTC district to discuss if the route is suitable for Kentucky National Truck Network modification. If the request is denied, a response letter will once again be drafted by the Systems Branch for the SHE's signature to explain the reasons for denial.

If the route is deemed suitable for modification by the Systems Branch and the District, the recommendation will be sent to the SHE for review. If approved, the route is added to or removed from the Kentucky National Truck Network. If the request involves the National Network, a request will be sent to FHWA for approval. Once the Official Order has been completed, it should be routed to the email address kytc.gis@ky.gov to correspond with GPS mapping companies and the KY Trucking Association.

A flow chart depicting the designation process is shown in **Figure 4**.

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Kentucky Transportation Cabinet
Division of Planning – Systems
Branch

For Official Use Only:

Date Received: _____

Application No: _____

Date Verified: _____

Application for Kentucky National Truck Network Route Modifications

This application is used to request modifications to the Kentucky National Truck Network. If approved, the route is added to or removed from the Kentucky National Truck Network, where STAA-dimensioned vehicles legally operate without special access permission. One application is required for each route being requested.

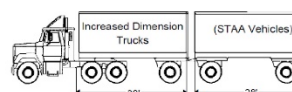
See 603 Kentucky Administrative Regulation (KAR) 5:250 at <http://legislature.ky.gov> for additional information.
Please contact _____ at (502) 564-7183 if you have any questions.

Route Information

County (list all): _____ Route: _____

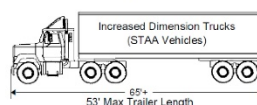
From (Begin intersection or milepoint): _____

To (End intersection or milepoint): _____



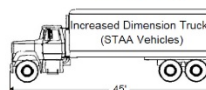
Request Type

- ☐ Route Added to the Kentucky National Truck Network
- ☐ Route Removed from the Kentucky National Truck Network



Designation Type Requested

- ☐ All STAA-dimensioned Vehicles
- ☐ Trucks with maximum 53'-Long Semitrailers Only



Requester Information (who is requesting designation)

Name: _____ Title: _____

Company: _____

Address: _____

City: _____ State: _____ Zip: _____

Daytime Phone: (____) _____ E-mail: _____

Signature: _____ Date: _____

Map and Supporting Documentation

All applications must be complete and include map(s) indicating the beginning of the route, the end of the route, and all turns to be made along the route. All maps must be submitted on letter size (8.5" x 11") paper, must be of a scale sufficient to indicate roads, streets, and turns, must be legible, and must clearly highlight the proposed route. Other supporting documentation may be included for consideration by the KYTC.

Submit Application To:

KY Transportation Cabinet
Division of Planning - Systems Branch
200 Mero Street, 5th Floor
Frankfort, KY 40622

Figure 3: Application for Kentucky National Truck Network Modifications

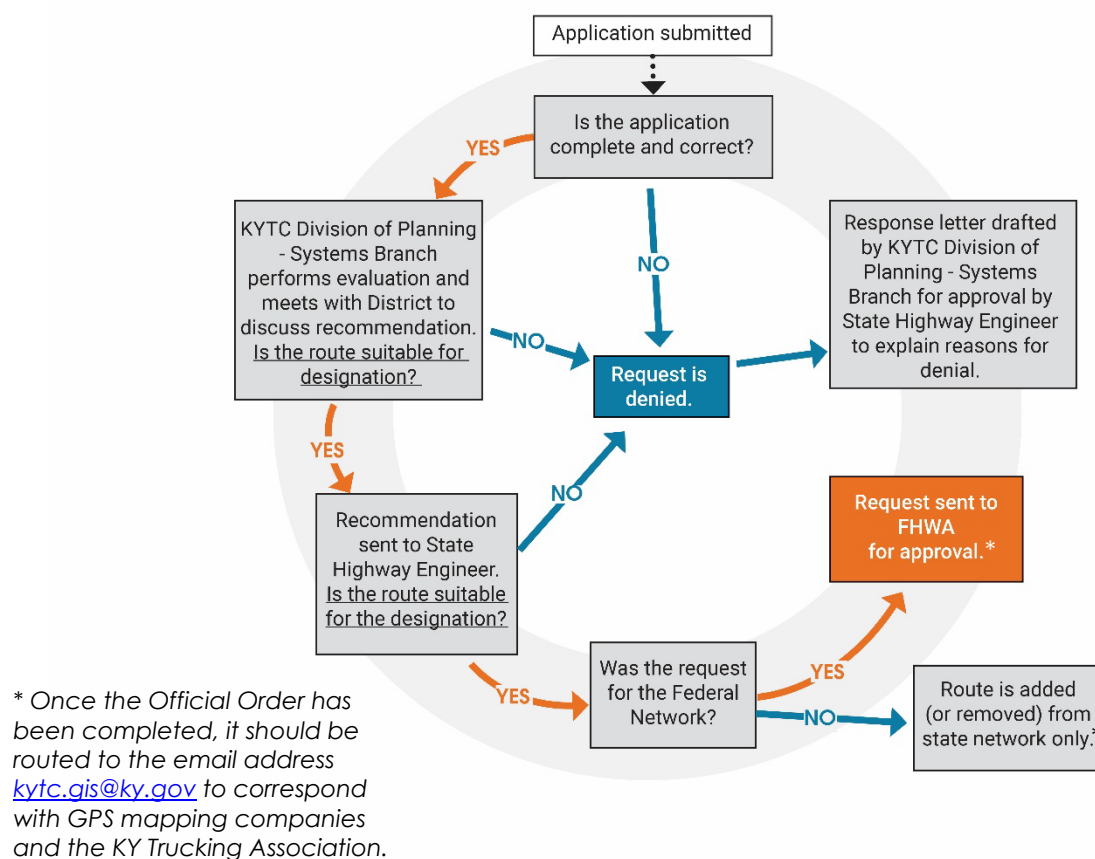
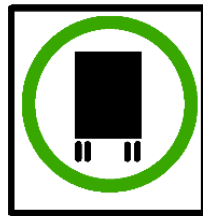


Figure 4: Process to Modify the Kentucky National Truck Network

5.0 SIGNING STRATEGIES

Current STAA signing strategies were reviewed to determine if alternative signage would help truck drivers better navigate the Kentucky National Truck Network. All signage must comply with the Manual on Uniform Traffic Control Devices (MUTCD). Currently, NN signs designate between STAA vehicles and non STAA vehicles, as shown in **Figure 5**. Discussions with trucking operators were conducted to better understand how current signage could be improved. From these discussions, it was apparent that drivers did not always understand the definition of an “STAA truck”. They did, however, know the dimensions of the truck or truck/trailer combinations they drove. **Figure 6** presents alternative signing options for a route excluded from the NN. The MUTCD does not allow the use of symbols that are not included in the manual, but the language on regulatory signs (black text on a white background) can be modified as needed to convey the intended message. In these examples, instead of displaying “No STAA Vehicles,” the signs define the maximum length of trailer allowed on the route. This type of signage would reduce confusion when drivers do not know the definition of an STAA vehicle.

National Truck Network (NN) Signs



**Designated Truck
Network Route
(STAA Vehicles)**



**Increased Dimension
Trucks Prohibited
(No STAA Vehicles)**

Figure 5: Current National Truck Network Signs



Figure 6: Proposed Example National Truck Network Exclusion Signs

Similar placards could be used under the truck route symbol to designate routes with width restrictions and to designate the requirement of a permit.

Based on guidance from the MUTCD, regulatory signs should be located on the route and green guidance signs on the adjacent NN to identify which intersecting routes can be used by STAA trucks. Regardless of location, the signage should be clear and consistent for all truck routes. An example of the recommended signing strategy affecting an Interstate interchange is shown in **Figure 7**.

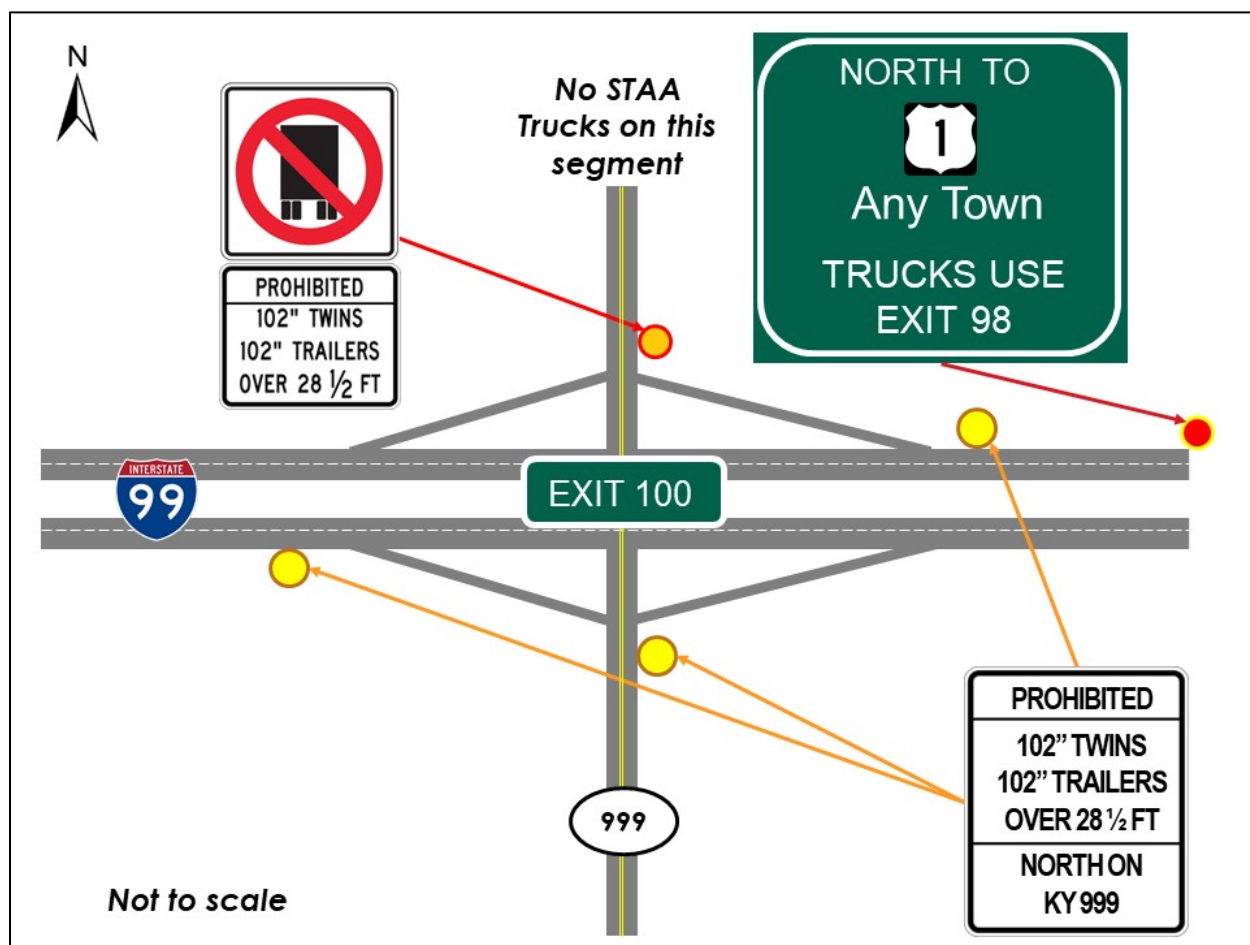


Figure 7: Example Truck Signage Placement

In this example, STAA trucks are not allowed to use KY 999 north of I-99 to access fictional Any Town, Kentucky. To the south, KY 999 is not a designated truck route, but STAA trucks are not expressly prohibited per the five-mile / 15-mile thresholds. Three key messages are provided. First, the truck prohibition is clearly noted on the route itself, at the beginning of the prohibited section. Second, the prohibitions are announced on all approaches to the prohibited section, in advance of decision points that would allow truck drivers ample opportunity to avoid entering the prohibited section. Finally, in this case the designated truck option is highlighted for westbound trucks through a guide sign, indicating drivers should instead use Exit 98 and US 1 to the west to travel north to Any Town.