

BASELINE ASSESSMENT OF AUTOMATED PERMIT SYSTEMS

FHWA-HOP-22-064

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SI* (MODERN METRIC) CONVERSION FACTORS

APPROXIMATE CONVERSIONS TO SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
LENGTH				
in	inches	25.4	millimeters	mm
ft	feet	0.305	meters	m
yd	yards	0.914	meters	m
mi	miles	1.61	kilometers	km
AREA				
in ²	square inches	645.2	square millimeters	mm ²
ft ²	square feet	0.093	square meters	m ²
yd ²	square yard	0.836	square meters	m ²
ac	acres	0.405	hectares	ha
mi ²	square miles	2.59	square kilometers	km ²
VOLUME				
fl oz	fluid ounces	29.57	milliliters	mL
gal	gallons	3.785	liters	L
ft ³	cubic feet	0.028	cubic meters	m ³
yd ³	cubic yards	0.765	cubic meters	m ³
NOTE: volumes greater than 1,000 L shall be shown in m ³				
MASS				
oz	ounces	28.35	grams	g
lb	pounds	0.454	kilograms	kg
T	short tons (2,000 lb)	0.907	megagrams (or "metric ton")	Mg (or "t")
TEMPERATURE (exact degrees)				
°F	Fahrenheit	5 (F-32)/9 or (F-32)/1.8	Celsius	°C
ILLUMINATION				
fc	foot-candles	10.76	lux	lx
fl	foot-Lamberts	3.426	candela/m ²	cd/m ²
FORCE and PRESSURE or STRESS				
lbf	poundforce	4.45	newtons	N
lbf/in ²	poundforce per square inch	6.89	kilopascals	kPa
APPROXIMATE CONVERSIONS FROM SI UNITS				
Symbol	When You Know	Multiply By	To Find	Symbol
LENGTH				
mm	millimeters	0.039	inches	in
m	meters	3.28	feet	ft
m	meters	1.09	yards	yd
km	kilometers	0.621	miles	mi
AREA				
mm ²	square millimeters	0.0016	square inches	in ²
m ²	square meters	10.764	square feet	ft ²
m ²	square meters	1.195	square yards	yd ²
ha	hectares	2.47	acres	ac
km ²	square kilometers	0.386	square miles	mi ²
VOLUME				
mL	milliliters	0.034	fluid ounces	fl oz
L	liters	0.264	gallons	gal
m ³	cubic meters	35.314	cubic feet	ft ³
m ³	cubic meters	1.307	cubic yards	yd ³
MASS				
g	grams	0.035	ounces	oz
kg	kilograms	2.202	pounds	lb
Mg (or "t")	megagrams (or "metric ton")	1.103	short tons (2,000 lb)	T
TEMPERATURE (exact degrees)				
°C	Celsius	1.8C+32	Fahrenheit	°F
ILLUMINATION				
lx	lux	0.0929	foot-candles	fc
cd/m ²	candela/m ²	0.2919	foot-Lamberts	fl
FORCE and PRESSURE or STRESS				
N	newtons	2.225	poundforce	lbf
kPa	kilopascals	0.145	poundforce per square inch	lbf/in ²

*SI is the symbol for International System of Units. Appropriate rounding should be made to comply with Section 4 of ASTM E380. (Revised March 2003)

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LIST OF ACRONYMS

ERWG	Emergency Route Working Group
FHWA	Federal Highway Administration
OS/OW	oversize and overweight

CHAPTER 1. INTRODUCTION

BACKGROUND

Section 5502 of the Fixing America's Surface Transportation (FAST) Act (Pub. L. No. 114-94) required the U.S. Department of Transportation to create the Emergency Route Working Group (ERWG) to provide advice and recommendations to the Secretary of Transportation on "best practices for expeditious State approval of special permits for vehicles involved in emergency response and recovery."

This report addresses the recommendations made by the ERWG to incentivize States to modernize their permitting systems to provide for automated permitting so that permits are available 24 hours per day and 7 days per week (24/7). This 2021 assessment of automated permitting systems provides a baseline for the researchers at the Federal Highway Administration (FHWA) to fully understand what is required to modernize and expand the capability of State-automated oversize and overweight (OS/OW) permit systems.

After major disasters occur, emergency response and recovery activities depend on the expeditious movement of utility service vehicles and other trucks, emergency supplies, medicine, food, fuel, and infrastructure repair materials into the affected area. Responses to disasters rely on the timely receipt of equipment and workers that may be traveling through multiple States. Each State has its own laws specifying the maximum weight and size parameters for OS/OW vehicles traveling on State-owned roadways. Immediately before, during, and after a declared emergency, an increased number of OS/OW carriers require State-issued permits to transport emergency relief supplies and equipment to the affected area. OS/OW carriers responding to an emergency may encounter obstacles that add time and expense when efficient delivery of resources is critical. For instance, it may be difficult to obtain OS/OW permits to move equipment and supplies on short notice.

In 2018, the ERWG provided a report that included the seven recommendations summarized below:¹

1. Incentivize States to modernize their permitting systems to provide for automated permitting so that permits are available 24/7.
2. Fund a study that examines a multistate emergency route scenario for vehicles involved in emergency response and recovery.
3. Encourage the development of a preclearance process that preidentifies a set of vehicles that are part of response and recovery.

¹ERWG. 2018. *Emergency Route Working Group Report of Recommendations to the Secretary of Transportation*. Washington, DC: FHWA. <https://ops.fhwa.dot.gov/fastact/erwg/reports/erwgreport/erwgreport.pdf>, accessed January 22, 2024.

4. Study the feasibility of setting up a nationwide alert system to notify State and local authorities of emergency response convoy movements through their region.
5. Coordinate the development of an online resource with all relevant permitting and regulatory compliance information that can be accessed by those participating in emergency response and recovery operations.
6. Collaborate with external stakeholders to identify opportunities to reduce impediments to utility service vehicle movements for emergency response and recovery efforts.
7. Inform Congress that expanding coverage of the section 1511 provision in the Moving Ahead for Progress in the 21st Century Act (Pub. L. No. 112-141) to emergencies declared by a Governor of a State may positively affect emergency response and recovery efforts.

Based on the ERWG recommendations, the project team at FHWA pursued the following research and feasibility studies to enhance permit automation and emergency routing and consider approaches that will bring about increased standardization and enhanced communication:

- Study of multistate emergency route scenarios
- Assessment of automated permitting systems
- Research on the National Bridge Inventory
- Resources on Federal regulations related to emergency response
- Research on preclearance processes
- Feasibility study of nationwide emergency vehicle alert system
- Feasibility of emergency routing Web tool

AUTOMATED PERMITTING SYSTEMS

This research report comprises the assessment of automated permitting systems identified in the list of research studies listed in the prior section. Permits are often required from multiple States for OS/OW vehicles. Obtaining permits for an entire route may be delayed by a single State that does not have an automated permitting system. Manual permit processing procedures can cause significant delays, especially if an emergency occurs over a weekend or holiday.² Delays in obtaining OS/OW permits can delay the movement of vehicles engaged in emergency response and recovery. During an emergency, obtaining a permit can be difficult if one needs a manual intervention from the permitting official during nonbusiness hours. In some cases, emergency numbers are available to reach permitting officials during nonbusiness hours, but this contact information may not be readily available.

The ERWG recommends improving permit automation as one potential solution. Automated permitting systems allow users to apply and receive permits online for vehicles exceeding a given State's legal weight or legal dimensional envelope. To encourage the adoption of

²FHWA. 2018. *Best Practices in Permitting Oversize and Overweight Vehicles – Final Report*. FHWA-HOP-17-061. Washington, DC: FHWA.

automated permitting systems, the first step in this process is to understand the current state of permit automation across the United States. Researchers at FHWA will use this information to continue working with States and encourage further implementation of automated permitting.

Full routing and permitting automation functionality includes the ability of the permitting system to issue valid, routed OS/OW permits without human intervention. Establishing a dimensional envelope for this self-issue function is within a State's jurisdiction; however, ideally, encouraging the use of automated systems should also entail encouraging States to use the maximum available functionality provided by their automated permitting systems. Several States that have automated permitting systems have set their systems' parameters at such a low level that very little positive impact can be realized from using the system. Some States simply do not turn on the self-issue aspect of the automated system. More widespread use of automated permitting systems could offer the potential for States to realize increased time and cost efficiencies and for carriers to obtain accurate permits expeditiously.

CHAPTER 2. BASELINE ASSESSMENT OF AUTOMATED PERMITTING SYSTEMS

As of December 2021, 40 States have an automated permitting system for OS/OW vehicles that allows a user to apply for and receive a permit online for a defined dimensional envelope. The following section provides an assessment of automated permitting systems deployed in the United States.

STATUS OF AUTOMATED PERMITTING SYSTEM DEPLOYMENT

Permit automation can be defined in different ways. Automation can occur at each or all of the following distinct phases of the permitting process:

- Accepting information online
- Analyzing the route
- Processing the permit application
- Issuing permits

Table 1 shows information available as of 2021 for State automated permitting systems, and figure 1 shows the States with automated permitting systems as of 2021. These systems allow a user to apply and receive a permit for a vehicle (and load) exceeding a State's legal weight or legal dimensional envelope online. Generally, more States are planning to deploy new systems or expand the capabilities of their existing systems.

Existing automated permitting systems have different thresholds for permit automation. The following table shows the specific thresholds (width, height, length, weight) for which systems can autoissue permits. In general, dimensions and vehicle weights closer to Federal standards for an interstate system are more likely to be able to use automated permitting across multistate routes. Permitting authorities consider OS/OW loads that exceed these thresholds riskier and thus may require manual reviews of the route, utility notification, and other actions.

An analysis by the American Transportation Research Institute concluded that moving OS/OW permitted loads around States with differing weight thresholds increases transportation costs by 45–82 percent.¹ As a result, establishing a common weight threshold within a region for issuing permits during a disaster would help expedite multistate movements of emergency supplies and equipment as carriers would not need to plan extensive detours to accommodate their OS/OW loads.

At least 22 States meet a common threshold of 14 ft high; 14 ft, 6 inches wide; 110 ft long; and 150,000 lb. Multistate cross-country routes are significantly restricted by States that do not meet this threshold. Most east coast States do not autoissue permits to this threshold, which may delay movements of emergency supplies and equipment. For example, while one State's automated system may permit loads up to 16-ft high, 18-ft wide, 110-ft long, and 150,000 lb, other States surrounding it may have lower size and weight thresholds.

¹American Transportation Research Institute. 2018. *Assessing the Cost and Operational Impacts of State Practices for Minimum Quad Axle Weights Granted for Routine Over-Weight Permits*. Washington, DC: ATRI.

Regional agreements among the States on acceptable gross and axle weights, as well as required axle spacings for vehicles directly involved in delivering emergency response and relief, could facilitate and perhaps expedite delivery of such loads. For vehicles meeting harmonized size and weight standards, the self-issuance of OS/OW permits could be expedited through State agreements that these loads will not require load-rating analysis by bridge engineering staff. Loads that exceed these parameters could be designated for an expedited load-rating analysis completion.

Table 1. U.S. States oversize and overweight automated thresholds, 2021.

State	Autoissue Permits	Maximum Size and Weight Permit with Automated System			
		Width	Height	Length	Weight
AK	Yes	16 ft, 6 inches	16 ft	85 ft	125% legal load
AL	Yes	16 ft	18 ft	150 ft	250,000 lb
AR	Yes	14 ft	14 ft	90 ft	120,000 lb
AZ	Yes	14 ft	16 ft	120 ft	250,000 lb
CA	No	N/A	N/A	N/A	N/A
CO	Yes	14 ft	15 ft, 3 inches	110 ft	150,000 lb
CT	No	N/A	N/A	N/A	N/A
DC	-	-	-	-	-
DE	Yes	15 ft	15 ft	120 ft	120,000 lb
FL	Yes	16 ft	18 ft	150 ft	Tractor-trailer 199,000 lb; crane 140,000 lb
GA	Yes	16 ft	16 ft	100 ft	150,000 lb
HI	No	N/A	N/A	N/A	N/A
IA	Yes	11 ft	14 ft, 6 inches	120 ft	120,000 lb
ID	Yes	18 ft	16 ft	120 ft	250,000 lb
IL	Yes	16 ft	17 ft	200 ft	299,000 lb
IN	Yes	16 ft	3 inches less of lowest VC on route—15 ft	110 ft	120,000 lb
KS	Yes	16 ft, 6 inches	15 ft	126 ft	120,000 lb
KY	Yes	8 ft, 6 inches	13 ft, 6 inches	Legal	120,000 lb
LA	Yes	16 ft	15 ft, 6 inches	125 ft	232,000 lb
MA	Yes	12 ft	13 ft, 6 inches	80 ft	130,000 lb
MD	Yes	13 ft	14 ft, 6 inches	90 ft	200,000 lb
ME	Yes	16 ft, 1 inch	16 ft	125 ft	177,000 lb; depends on axles and spacings
MI	No	N/A	N/A	N/A	N/A
MN	Yes	14 ft, 6 inches	14 ft, 6 inches	110 ft	36,000 lb tandem; 54,000 lb tridem
MO	Yes	16 ft	16 ft	150 ft	160,000 lb
MS	Yes: Daylight	16 ft	15 ft, 6 inches	120 ft	180,000 lb
	Yes: 24-hour movement	12 ft	13 ft, 6 inches	99 ft	150,000 lb
MT	Yes	18 ft	17 ft	150 ft	175,000 lb noninterstate, 250,000 lb interstate
NC	No				
ND	Yes	18 ft	17 ft	200 ft	250,000 lb
NE	Yes	16 ft, 1 inch	16 ft	150 ft	180,000 lb
NH	Yes	15 ft	13 ft, 6 inches	110 ft	149,999 lb
NJ	Yes	No trigger	15 ft	100 ft	250,000 lb

Table 1. U.S. States oversize and overweight automated thresholds, 2021. (continuation)

State	Autoissue Permits	Maximum Size and Weight Permit with Automated System			
		Width	Height	Length	Weight
NM	Yes	16 ft	15 ft, 5 inches	120 ft (Trailer not greater than 90 ft)	170,000 lb (Max axle width 8 ft, 6 inches)
NV	No	N/A	N/A	N/A	N/A
NY	Yes	16 ft	13 ft, 11 inches	99 ft, 11 inches	Load effect over 150% of an HS-20 vehicle ²
OH	Yes	14 ft	14 ft, 6 inches	No limitation	160,000 lb
OK	Yes	16 ft	15 ft	110 ft	200,000 lb; weight—as long as they match OL-1 drawing ³
OR	No	N/A	N/A	N/A	N/A
PA	Yes	16 ft		160 ft	201,000 lb
RI	Yes	12 ft, 4 inches	13 ft, 6 inches	80 ft	130,000 lb
SC	No	N/A	N/A	N/A	N/A
SD	Yes	14 ft	18 ft	100 ft	130,000 lb
TN	Yes	16 ft	14 ft, 6 inches		150,000 lb
TX	Yes	20 ft	18 ft, 11 inches	125 ft	254,300 lb
UT	Yes	14 ft	14 ft, 6 inches	105 ft	125,000 lb
VA	Yes	14 ft	14 ft	100 ft	115,000 lb
VT	No	N/A	N/A	N/A	N/A
WA	Yes	16 ft	16 ft	125 ft	200,000 lb
WI	Yes	14 ft	14 ft, 6 inches	125 ft	250,000 lb
WV	Yes	16 ft	15 ft	150 ft	250,000 lb
WY	No	N/A	N/A	N/A	N/A

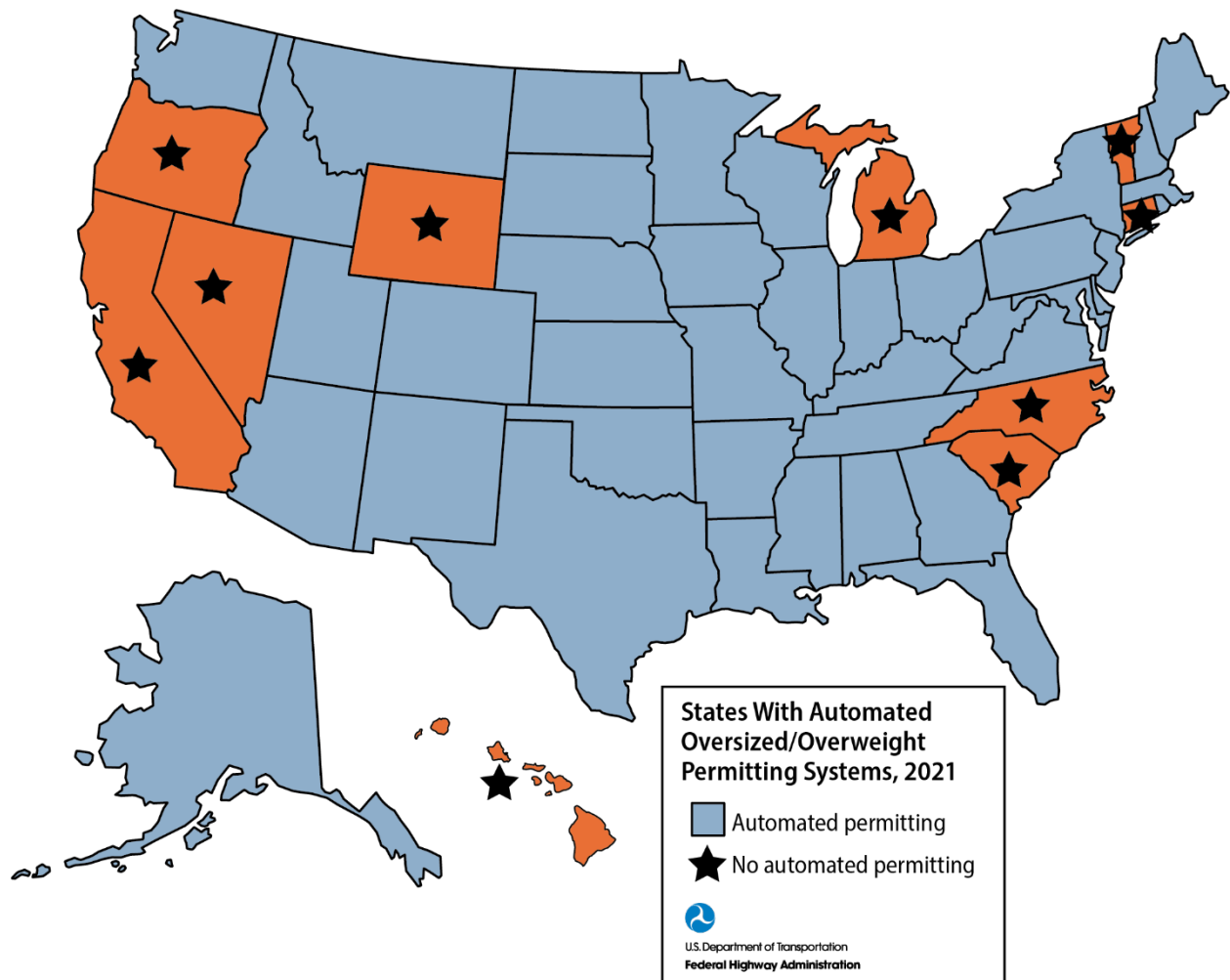
N/A = not applicable; VC = vertical clearance.

¹No information.

²HS-20 is the minimum design load configuration recommended by AASHTO for bridges on Interstate 1 highways. This loading is based on a hypothetical vehicle with one 8,000-lb axle and two 32,000-lb axles.

³OL-1 drawings refer to the set of vehicle configurations that are permitted by law on roadways in Oklahoma.

Sources: FHWA, Specialized Carriers and Rigging Association, American Association of State Highway and Transportation Officials, 2021.



Source: FHWA.

Figure 1. Map. States with automated oversize and overweight permitting systems, 2021.

CHAPTER 3. CONCLUSIONS

This research describes available information on the status of OS/OW autoissue permit system implementation. While many States have implemented this technology, the state of the practice is continually evolving.

States that choose to implement automated permitting systems for OS/OW permits may realize extensive time, cost, and staffing efficiencies. Expanding the universe of vehicles and loads that have access to autoissue permits may also offer widespread cost and time benefits both to States and carriers. Such an expansion involves broadening the size and weight thresholds covered by automated permitting systems, harmonization of permits, and enabling issuance of multistate permits.

The continued certainty of future natural disasters necessitates advancing solutions for emergency response and recovery. Enhancing resilience supports the goals of the National Highway Freight Program to improve the safety, security, efficiency, and resiliency of the transportation system and the Nation. Automated permitting and other systems support resilience by facilitating rapid, legal emergency routing and response.

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