SECONDS MATTER NY

RESEARCH REPORT

Color Recognition, Courtesy Lights, and Volunteer EMS

The Case for Retiring Green and Aligning New York Vehicle and Traffic Law §375(41)(5) with the Predominant National Convention

PUBLISHED BY

Seconds Matter NY

An unincorporated nonprofit association exempt under IRC § 501(c)(3)

secondsmatterny.org · July 2026

EXECUTIVE SUMMARY

The case in brief

New York is one of a small minority of states that authorize green courtesy lights for volunteer EMS personnel. Since 2022, the state has also authorized green for snowplows, ice-removal vehicles, and mobile crisis teams—diluting whatever volunteer-EMS-specific recognition value the color once carried. The human-factors evidence, the predominant national convention, and the recent precedent of Connecticut all support a statutory amendment retiring green for volunteer EMS in favor of blue.

Background. New York Vehicle and Traffic Law (VTL) §375(41)(5) authorizes members of volunteer ambulance services to affix a green courtesy light to a personal vehicle while responding to emergencies. Volunteer firefighters, by contrast, are authorized under VTL §375(41)(4) to display blue. Since 2022, New York has expanded the lawful use of green flashing lights to non-emergency contexts, including municipal snowplows and ice-removal vehicles (Chapter 504 of 2022) and members of mobile crisis teams (Chapter 530 of 2023). In 2021, New York extended VTL §1144-a (the Move Over Law) to cover volunteer responders displaying blue or green lights, increasing the operational stakes of correct driver recognition.

Methods. This report synthesizes (a) a structured review of the peer-reviewed and grey literature on emergency-vehicle warning-light color, conspicuity, and recognition (1995–2025); (b) a survey of statutory provisions in all fifty U.S. states governing volunteer-EMS courtesy-light color, with verification through primary statutory sources where possible; and (c) a legislative-history analysis of New York and Connecticut courtesy-light statutes from 2020 through 2025.

Findings. Three findings are robust. First, the predominant U.S. convention authorizes blue (or red, or red-and-white)—not green—for volunteer EMS courtesy lights. New York is one of a small minority of states that retain green for volunteer EMS. Second, the human-factors literature distinguishes detection (whether a vehicle is seen) from categorization (what kind of vehicle a driver judges it to be); color carries categorization information through learned schema, and inconsistent color-to-function mapping degrades categorization even when detection is preserved. Third, in 2023, Connecticut—the only neighboring state to share New York's green-volunteer-EMS history—enacted

Public Act 23-135 §40, allowing volunteer ambulance association members to use a flashing green *or* blue light, consolidating the volunteer-responder schema around blue.

Implications. New York's continued reservation of green for volunteer EMS, combined with statutory expansions of green to non-emergency uses, produces a foreseeable categorization problem for the driving public. A statutory amendment retiring green for volunteer EMS in favor of blue would align New York with the dominant national convention, with the Connecticut precedent, and with the human-factors principle that color codes function best when they map consistently onto a single vehicle category.

KEYWORDS *emergency vehicle visibility · courtesy lights · volunteer EMS · color recognition · human factors · Move Over law · New York Vehicle and Traffic Law · warning beacons · traffic incident management*

1 Introduction

Volunteer firefighters and volunteer emergency medical services (EMS) personnel in much of the United States respond to calls in their personal vehicles, traveling either to an ambulance station to staff an apparatus or directly to the scene. To improve the conspicuity of these private vehicles and to communicate to the driving public that the operator is engaged in an emergency response, most states authorize a single-color "courtesy" light — distinct from the multi-color emergency lighting carried by ambulances, fire apparatus, and police vehicles. Unlike authorized emergency-vehicle lighting, a courtesy light does not confer right-of-way or exempt the volunteer from ordinary traffic regulations; its function is purely communicative (Hannigan, 2020; Tolland Volunteer Fire Department, n.d.).

Because courtesy-light recognition depends entirely on the driving public's ability to associate a particular color with a particular type of responder, the choice of color is a public-safety design decision. New York Vehicle and Traffic Law (VTL) §375(41) embodies one such decision: blue for volunteer firefighters; green for volunteer ambulance personnel. New York's pairing has historical roots in an era when only two single-color schemes were widely available, and when blue had already been claimed by volunteer fire services in the Northeast. In the more than five decades since green was first authorized for volunteer EMS in New York, three developments have changed the policy environment in which the original choice was made.

First, the human-factors and transportation-research literature on driver recognition of warning lights has matured. A series of studies, including a federally commissioned visibility and conspicuity report (FEMA/USFA, 2009), peer-reviewed laboratory and field experiments by Bullough and colleagues (2022, 2023, 2024), and the National Cooperative Highway Research Program's Report 1085 (Ullman et al., 2024), now provide a coherent framework distinguishing detection from categorization and emphasizing the importance of consistent color-to-function mapping. Second, beginning in 2022, the New York Legislature expanded the lawful use of green flashing lights to a series of non-emergency contexts: municipal snowplows and ice-removal vehicles (Chapter 504 of 2022); members of mobile crisis teams (Chapter 530 of 2023). Third, in 2021 New York extended the Move Over Law (VTL §1144-a) to require drivers to slow down and change lanes for vehicles displaying blue or green lights stopped on the shoulder (Chapter 134 of 2021). The legal consequences of misidentifying a green light therefore now extend beyond a missed yield: drivers who pass a stopped volunteer responder without moving over face a traffic infraction, while volunteers and their patients face the underlying struck-by risk that motivates the Move Over framework in the first place.

Against this backdrop, this report examines whether New York's continued reservation of green for volunteer EMS courtesy lights remains supported by the available evidence on warning-light recognition, by the predominant national pattern of statutory color assignment, and by the trajectory of recent state amendments. The report is organized as follows. Section 2 sets out the New York statutory and regulatory framework. Section 3 describes the methods used in the literature and statutory survey. Section 4 presents results in five subsections: New York's current scheme and its legislative trajectory; a fifty-state comparison of volunteer-EMS courtesy-light authorizations; the human-factors literature on color recognition; the post-2022 expansion of green to non-emergency uses in New York; and the 2023 Connecticut precedent. Section 5 discusses the policy implications and addresses counterarguments. Section 6 sets out limitations. Section 7 offers recommendations for legislators, EMS leadership, and the field. Section 8 concludes.

2 Background: The New York Statutory and Regulatory Framework

VTL §375(41) governs the affixing and display of colored and flashing lights on vehicles in New York. Five paragraphs are most relevant to the present analysis.

Paragraph 2 authorizes red and combination red-and-white lights on authorized emergency vehicles, including police vehicles, fire vehicles, ambulances, emergency-ambulance-service vehicles, and county emergency-medical-services vehicles. Paragraph 4 authorizes a single blue light on a motor vehicle owned by a volunteer member of a fire department, subject to written authorization by the chief of the department; subparagraph (b) authorizes rear-facing blue lights on the multi-color authorized emergency vehicles enumerated in paragraph 2; subparagraph (b-1), added in 2020, authorizes rear-facing blue or combination blue-and-amber lights on tow trucks and certain safety-service-patrol vehicles. Paragraph 5 authorizes a single green light on a motor vehicle owned by a member of a volunteer ambulance service, subject to written authorization by the chief officer of that service. Paragraph 5 has been amended repeatedly: Chapter 504 of 2022 added subparagraph (c), authorizing green and combination green-and-amber lights on hazard vehicles owned and operated by the state or by a county, city, town, or village and designed for ice and snow removal. Chapter 530 of 2023 (S.5397/A.5604, Harckham/Magnarelli) extended green-light authorization to members of mobile crisis teams; a 2024 chapter amendment (Chapter 71 of 2024) refined that authorization to run through the team's director. Pending legislation in the 2025–2026 session (S.214, Helming/Tedisco) would further amend paragraphs 4 and 5 to

permit more than one blue or green light per vehicle. Paragraph 3 authorizes amber lights on hazard vehicles.

The implementing regulations appear at 15 NYCRR Part 44. Section 44.4 specifies that authorization to affix a blue light must be in writing from the chief of the fire department or company, that authorization for a green light must be in writing from the chief officer of the volunteer ambulance service, and that the authorization must be carried by the operator whenever the lights are displayed (15 NYCRR §44.4(c)). The regulation also restricts the display of more than one such light at a time and prohibits strobe lighting (15 NYCRR §44.4(i)–(m)).

VTL §1144-a, the Move Over Law, was originally enacted in 2010 to require drivers to exercise due care and, on parkways and controlled-access highways, change lanes when approaching a stopped authorized emergency vehicle on the shoulder. Chapter 134 of the Laws of 2021 expanded §1144-a to require the same slow-down-and-move-over response when approaching a stopped vehicle displaying a blue light under paragraph 4 or a green light under paragraph 5. A further amendment, effective March 27, 2024, extended Move Over duties to all stopped vehicles, regardless of lighting; the volunteer-light provisions of §1144-a(c) nevertheless remain in effect and are independently enforceable.

Two features of this framework are central to the analysis below. First, New York's color scheme assigns one private-vehicle color to each volunteer category — blue to fire, green to EMS — within a larger system that also uses red and white (authorized emergency vehicles), amber (hazard), and rear-facing blue (tow and safety service). Second, paragraph 5's green has, since 2022, ceased to be EMS-specific within the statute. It now also denotes municipal snow and ice removal and, since 2023, mobile crisis response.

3 Methods

3.1 Literature review

The authors conducted a structured search of the transportation-safety, human-factors, and emergency-services literature on warning-light color, intensity, flash characteristics, vehicle markings, and driver recognition. Databases searched included Transportation Research Information Documentation (TRID), the SAE Mobilus technical-paper repository, PubMed, Google Scholar, and the official publication catalogs of the Federal Highway Administration (FHWA), the U.S. Fire Administration (USFA), the Federal Emergency Management Agency (FEMA), the Emergency Responder Safety Institute (ERSI), the AAA Foundation for Traffic Safety, and the National Academies' Transportation Research Board. Searches were conducted between January 2025 and

June 2026. Inclusion criteria were peer-reviewed articles, federally commissioned reports, and SAE technical papers addressing emergency or service-vehicle lighting color, conspicuity, or driver categorization. Studies focused exclusively on internal cab lighting, emergency aviation lighting, or unrelated automotive signaling were excluded.

3.2 Fifty-state statutory survey

To compare New York's volunteer-EMS courtesy-light authorization with those of other U.S. jurisdictions, the authors compiled a fifty-state inventory of the statutes and regulations governing personal-vehicle warning lights for members of volunteer ambulance services or volunteer EMS organizations. The primary sources consulted were each state's vehicle code or transportation code (accessed through the official state legislative website or, where unavailable, through Justia, FindLaw, the Cornell Legal Information Institute, or LexisNexis). Where a primary source could not be located, two secondary sources widely used in the emergency-lighting industry — the Extreme Tactical Dynamics State Statutes Guide and the Guardian Angel Devices State Statutes Guide — were consulted as starting points, with the cited statute then verified directly. States in which volunteer EMS personnel are authorized to use the same authorized-emergency-vehicle lighting as a paid ambulance service (typically red or red-and-white) were classified accordingly. Entries that could not be primary-source verified are flagged in Table 1.

3.3 Legislative-history analysis

For New York and Connecticut — the two states whose courtesy-light regimes form the comparative core of this report — the authors traced statutory amendments by retrieving the text of each enacted bill and its sponsor's memorandum, where available, from the New York State Senate's Open Legislation portal and the Connecticut General Assembly's bill-tracking system. The Office of Legislative Research's 2023 report (Connecticut General Assembly, 2023) was consulted as a secondary summary of Connecticut's amendment history.

4 Findings

4.1 The current New York statutory and regulatory framework: a single color, three populations of users

As of July 2026, paragraph 5 of VTL §375(41) authorizes a green flashing light on three categorically different classes of vehicles or operators:

1. Personal motor vehicles owned by members of a volunteer ambulance service, used while engaged in emergency operation (subparagraph (a));

2. Personal motor vehicles owned by members of a mobile crisis team, used while the team is deployed (subparagraph (a), added by Chapter 530 of 2023 and refined by a 2024 chapter amendment); and
3. Hazard vehicles owned and operated by the state or a county, city, town, or village and designed for ice and snow removal, displaying green or combination green-and-amber lights (subparagraph (c), added by Chapter 504 of 2022; the statute requires these vehicles to display green only in combination with the amber lights already required during hazardous operations).

The New York State Thruway Authority confirmed in November 2024 that more than 250 of its heavy-duty snowplows are now equipped with green hazard lights pursuant to the 2022 amendment (New York State Thruway Authority, 2024). Mobile crisis teams operate principally in non-roadway settings but are statutorily entitled to display green flashing lights when responding.

The result is that, within a single statutory paragraph, a green flashing light may now signal: (a) a volunteer EMT en route to a cardiac arrest, requesting voluntary yield from other drivers and triggering the Move Over Law if stopped on the shoulder; (b) a mental-health clinician traveling to a behavioral-health emergency; or (c) a 35-mile-per-hour Thruway snowplow spreading salt during a winter storm. Although the operational contexts differ, the color signal does not.

4.2 Fifty-state comparative analysis

Table 1 summarizes the authors' fifty-state survey of the lighting authorized for volunteer-ambulance or volunteer-EMS personnel operating personal vehicles in emergency response. Three patterns emerge.

First, *blue* is the most common single-color courtesy-light authorization for volunteer EMS personnel. In states where volunteer EMS personnel may use a single courtesy color on a private vehicle as a separate category from authorized emergency vehicles, blue is the dominant authorization. Pennsylvania's 75 Pa.C.S. §4572(a) authorizes "ambulance personnel" together with volunteer firefighters to operate up to two flashing or revolving blue lights on a privately owned vehicle. New Jersey's N.J.S.A. §39:3-54.7 et seq. authorizes blue emergency warning lights for members of "a volunteer fire company or volunteer first aid or rescue squad." Connecticut, since 2023, authorizes green or blue for volunteer ambulance association members under CGS §14-96q(d) (see §4.5 below).

Second, in many states volunteer EMS personnel either fall under the same authorized-emergency-vehicle lighting as their paid counterparts (typically red or red-and-white, sometimes with sirens) or have no separately defined category. This pattern is common in states where the regulatory distinction between paid and volunteer ambulance

services is less salient than in the Northeast — for example, Maine (29-A M.R.S. §2054), Massachusetts (M.G.L. c. 90 §7E), Vermont (23 V.S.A. §1252), and Ohio (Ohio Rev. Code §4513.17), each of which authorizes red or red-and-white lights on personal vehicles of fire-department members or members of an emergency medical service.

Third, *green* as a volunteer-EMS courtesy color is comparatively rare, confined principally to New York, Indiana (Ind. Code §9-19-14.5-1, by written permit of the state department of homeland security), New Hampshire, and Rhode Island. The closest structural analog to New York — and the only neighboring state to share its green-only history — was Connecticut, which for decades reserved a flashing green light for volunteer ambulance association members (CGS §14-96q(d)). Connecticut amended that scheme by Public Act 23-135 §40 in 2023 (see §4.5 below).

Table 1. *Volunteer EMS / volunteer ambulance service personal-vehicle courtesy-light color authorizations, by state (July 2026).*

STATE	COLOR AUTHORIZED FOR VOLUNTEER EMS	PRIMARY CITATION	VERIFIED
Alabama	None separate; red authorized for emergency vehicles	*Ala. Code §32-5-240*	Secondary
Alaska	Red/red-and-white as authorized emergency	*Alaska Stat. §28.35.140*	Secondary
Arizona	None separate; red and amber by permit	*Ariz. Rev. Stat. §28-947*	Secondary
Arkansas	Blue authorized for volunteer fire/EMS by permit	*Ark. Code §27-36-305*	Secondary
California	Red authorized as authorized emergency vehicle	*Cal. Veh. Code §25252*	**Primary**
Colorado	Red authorized as authorized emergency vehicle	*Colo. Rev. Stat. §42-4-213*	Secondary
Connecticut	**Green or blue (volunteer ambulance association members)**	*CGS §14-96q(d), as amended by P.A. 23-135 §40*	**Primary**
Delaware	Blue authorized for volunteer fire/EMS by permit	*21 Del. C. §4106*	Secondary
Florida	Red for volunteer firefighters by permit; blue restricted to law enforcement	*Fla. Stat. §316.2398*	Secondary
Georgia	Red authorized for volunteer EMTs	*O.C.G.A. §40-8-92*	Secondary
Hawaii	None separate	*Haw. Rev. Stat. §291-31.5*	Secondary
Idaho	Red authorized as authorized emergency vehicle	*Idaho Code §49-910*	Secondary
Illinois	Red/white emergency; blue for volunteers by permit	*625 ILCS 5/12-215*	Secondary
Indiana	**Green for certified EMS personnel by state permit; blue for volunteer firefighters**	*Ind. Code §9-19-14.5-1; §9-19-14-11*	**Primary**

STATE	COLOR AUTHORIZED FOR VOLUNTEER EMS	PRIMARY CITATION	VERIFIED
Iowa	Blue authorized for volunteer firefighters/EMS	*Iowa Code §321.423*	Secondary
Kansas	Blue authorized for volunteers	*K.S.A. §8-1722*	Secondary
Kentucky	Red authorized as authorized emergency vehicle	*KRS §189.910 et seq.*	Secondary
Louisiana	Red and blue authorized for volunteers	*La. R.S. §32:327*	Secondary
Maine	Red/red-and-white for fire and EMS members	*29-A M.R.S. §2054*	**Primary**
Maryland	Blue and red for volunteer fire; red for EMS	*Md. Transp. Code §22-218*	Secondary
Massachusetts	Red/red-and-white for fire/EMS members	*M.G.L. c. 90 §7E*	**Primary**
Michigan	Red for volunteer firefighters; red for ambulance	*Mich. Comp. Laws §257.698*	**Primary**
Minnesota	Red authorized for fire/EMS volunteers	*Minn. Stat. §169.64*	Secondary
Mississippi	Red/blue authorized for volunteers	*Miss. Code §63-7-19*	Secondary
Missouri	Red authorized for volunteer fire/EMS	*Mo. Rev. Stat. §307.175*	Secondary
Montana	Blue authorized for volunteer firefighters; red EMS	*Mont. Code §61-9-402*	Secondary
Nebraska	Red authorized for volunteers	*Neb. Rev. Stat. §60-6,229*	Secondary
Nevada	Red/blue authorized as authorized emergency vehicle	*Nev. Rev. Stat. §484A.480*	Secondary
New Hampshire	Blue volunteer fire; green ambulance personnel by permit	*RSA §266:78-a; RSA §266:78-c*	Secondary
New Jersey	**Blue for volunteer fire and volunteer first-aid/rescue squad**	*N.J.S.A. §39:3-54.7 to 54.13*	**Primary**
New Mexico	Red authorized for volunteers	*N.M. Stat. §66-3-835*	Secondary
New York	**Green for volunteer ambulance, mobile crisis, snow/ice removal**	*VTL §375(41)(5); 15 NYCRR §44.4*	**Primary**
North Carolina	Red volunteer fire/EMS; blue restricted to law enforcement	*N.C. Gen. Stat. §20-130.1*	**Primary**
North Dakota	Red authorized for volunteers	*N.D. Cent. Code §39-21-23*	Secondary
Ohio	Red/red-and-white as authorized emergency / public safety	*Ohio Rev. Code §4513.17; §4511.01*	**Primary**
Oklahoma	Red authorized for volunteers	*Okla. Stat. tit. 47 §12-218*	Secondary

STATE	COLOR AUTHORIZED FOR VOLUNTEER EMS	PRIMARY CITATION	VERIFIED
Oregon	Red authorized; blue restricted to law enforcement	*Or. Rev. Stat. §820.350*	Secondary
Pennsylvania	**Blue for volunteer firefighters and ambulance personnel**	*75 Pa.C.S. §4572(a)*	**Primary**
Rhode Island	Red/green authorized for volunteer firefighters/ambulance	*R.I. Gen. Laws §31-23-12*	Secondary
South Carolina	Red authorized for volunteers	*S.C. Code §56-5-4700*	Secondary
South Dakota	Blue authorized for volunteer fire/EMS	*S.D. Codified Laws §32-15-4*	Secondary
Tennessee	Blue for volunteer firefighters; red EMS	*Tenn. Code §55-9-414*	Secondary
Texas	Red authorized for volunteer firefighters; ambulance red	*Tex. Transp. Code §547.305*	Secondary
Utah	Red authorized as authorized emergency	*Utah Code §41-6a-1616*	Secondary
Vermont	Red/red-and-white for volunteer fire/EMS by permit	*23 V.S.A. §1252*	**Primary**
Virginia	Red/red-and-white for volunteer fire/EMS	*Va. Code §46.2-1024*	**Primary**
Washington	Red authorized as authorized emergency	*Wash. Rev. Code §46.37.190*	Secondary
West Virginia	Red/blue authorized for volunteer fire/EMS	*W. Va. Code §17C-15-26*	Secondary
Wisconsin	Red/white as authorized emergency vehicle	*Wis. Stat. §347.25*	**Primary**
Wyoming	Red authorized for volunteers	*Wyo. Stat. §31-5-927*	Secondary

Note. *"Verified" indicates whether the statutory citation was confirmed against the primary statute (legislative website, official codification, or LII). Entries marked "Secondary" are based on aggregator sources and should be confirmed against the most current state statute before being relied upon for legislative drafting. The table reflects volunteer EMS personnel acting as such; in many states these individuals may also operate authorized emergency vehicles under different statutory provisions when crewing an ambulance. States marked with an asterisk (Connecticut, Indiana, New Jersey, New York, Pennsylvania) are highlighted for comparative emphasis.*

The substantive finding is unchanged when accounting for the verification limitations: New York is one of a very small group of states — alongside Indiana, New Hampshire, and Rhode Island — that authorize green for volunteer EMS personal-vehicle courtesy

lights, and the only one of the four whose legislature has simultaneously expanded green to snowplow and municipal hazard-vehicle use. The dominant convention nationally is blue for both volunteer fire and volunteer EMS, or red/red-and-white as authorized emergency lighting for both. The green choice is distinctive, and the one peer state whose scheme most closely mirrored New York's — Connecticut — abandoned it in 2023.

4.3 The human-factors literature: detection, categorization, and learned schema

4.3.1 Foundational distinction: detection versus categorization

The transportation-safety literature on emergency-vehicle warning lights consistently distinguishes two driver tasks. *Detection* asks whether a vehicle is visible at a given distance under given ambient conditions. *Categorization* (sometimes called recognition or identification) asks whether the driver, having detected the vehicle, can correctly classify it — e.g., "police pursuit," "fire apparatus at incident scene," "highway maintenance," or "private vehicle running tail-lights." Detection is largely a function of luminance, contrast, and flash characteristics. Categorization depends on the driver's prior associations between the perceived signal and a category in long-term memory.

This distinction is articulated in the FEMA/USFA Emergency Vehicle Visibility and Conspicuity Study (USFA, 2009; FA-323) and reinforced throughout subsequent peer-reviewed work. Rea and Bullough's (2016) paper in Transportation Research Part F: Traffic Psychology and Behaviour established performance specifications for flashing warning beacons that explicitly account for both functions. Kersavage et al.'s (2018) Accident Analysis & Prevention article on flashing and intensity characteristics advanced the same framework for vehicle-mounted beacons. NCHRP Research Report 1085 (Ullman et al., 2024) consolidates the framework into the most recent practitioner-facing guideline document.

4.3.2 Color carries categorization information through learned schema

Because color in the warning-light context is a learned code rather than an intrinsic affordance, the categorization function depends on consistent statutory and operational pairing of color with vehicle type. Ullman (2000) demonstrated empirically — using surveys of Texas drivers and field studies in Houston and San Antonio — that motorists strongly associate amber with road work and red and blue with emergency response, and that introducing a non-conventional color in a non-emergency context creates confusion and ambiguous behavior. Bullough, Skinner, and Rea (2023, SAE Technical Paper 2023-01-0839) found that driver perception of the function of a service vehicle was significantly improved when the color of the flashing lights and the color of the vehicle markings were coordinated — that is, when the perceptual information about category was consistent across cues. Bullough, Skinner, and Rea (2024, SAE Technical Paper

2024-01-2229) extended this work to a laboratory study of scaled roadway scenarios, finding that drivers' judgments of whether a vehicle was responding to an emergency were affected systematically by color in addition to flash rate. Bullough, Das, Skinner, Guler, and Rea (2024), in Transportation Research Record, reported that the *consistency* of subjective judgments — that is, whether participants made the same categorization decision across repeated trials — was higher when the vehicle color matched the flashing-light color than when the two were mismatched.

The implication for policy is direct: an inconsistent color-to-function mapping degrades the precision and reliability of driver categorization, even when each individual signal would, in isolation, be detected and decoded correctly. The signal value of a color depends on the driver's having learned that the color reliably indicates one specific class of road user.

4.3.3 Color recognition in low-light and degraded conditions

Solomon (1990; *Journal of the American Optometric Association*) and Solomon and King (1995; *Journal of Safety Research*) demonstrated that the relative luminance of warning colors interacts with ambient illumination in non-trivial ways; the human eye's spectral sensitivity shifts toward the green portion of the spectrum under scotopic and mesopic conditions (the Purkinje shift), making green among the most luminous colors at night and dawn/dusk. Although Solomon and King's specific analysis concerned fire-apparatus body color (lime-yellow versus red), the underlying perceptual mechanism is relevant: green is highly luminous in low-light conditions, which makes it an attractive choice from a pure detection standpoint but does not address the categorization problem.

4.3.4 Conspicuity and the diminishing-returns problem

Several recent studies caution against assuming that a brighter, more numerous, or more aggressively flashing array of warning lights uniformly improves driver response. The Emergency Responder Safety Institute's 2019 *Fire Apparatus Emergency Lighting Study* (ERSI, 2019), Bullough, Miller, Baker, and Rea's (2022, SAE 2022-01-0801) study of intensity and synchronization, and the FHWA's "Brighter Is Not Better" communication (FHWA, 2024) converge on the finding that excessive luminance can produce glare, disability, and the so-called "moth-to-flame" phenomenon in which following drivers steer toward the bright source. Hiebner (2022) and Bullough, Parr, Hiebner, and Sblendorio (2025; published in the *SAE International Journal of Transportation Safety* after Hiebner's underlying thesis) reported similar effects in closed-course experiments. The lesson for a courtesy-light scheme is that improving recognition is not a function of adding more light or brighter light; it is a function of preserving the categorization signal.

4.3.5 Driver compliance with Move Over laws and roadside-vehicle lighting

Two recent AAA Foundation for Traffic Safety publications bear on the operational stakes of correct categorization. The 2024 *Slow Down, Move Over Laws: Investigating Factors Influencing Drivers' Behavior and Compliance* report found that, across all fifty states and the District of Columbia, approximately one in three drivers fails to comply with Move Over laws when passing a stopped roadside responder (AAA Foundation for Traffic Safety, 2024). Struck-by incidents kill dozens of emergency responders on U.S. roadways each year, according to the Emergency Responder Safety Institute's national fatality tracking. Drivers were significantly less likely to slow down or move over for tow trucks and stranded vehicles than for police vehicles, suggesting that perceived category — not merely detection — drives compliance behavior. Shaw, Carrick, and colleagues (2025) reviewed the broader scientific literature on roadside-vehicle lighting for the AAA Foundation; Carrick, Srinivasan, and Jermprapai's earlier (2018) work on Florida Road Rangers similarly identified driver recognition of the responder's role as a key variable in safety outcomes. Bullough and Parr (2024, *Transportation Research Record*) found that retroreflective markings interact with light recognition; markings carry independent categorization information that can either reinforce or contradict the color signal of the lights.

These findings together suggest that any factor that degrades categorization — including non-conventional or shared-with-other-uses color signaling — operates on the margin of an already low-compliance baseline.

4.4 The expansion of green to non-emergency uses in New York

The 2022 amendment authorizing green flashing lights on snowplows and ice-removal vehicles (Chapter 504 of 2022) was supported by safety arguments that drew explicitly on the same human-factors literature reviewed above. Fakhrmoosavi, Saedi, Jazlan, Zockaie, Ghamami, Gates, and Savolainen (2021), in *Transportation Research Record*, evaluated the effectiveness of green warning lights with different flashing patterns for winter maintenance operations and reported improved snowplow conspicuity under certain conditions. The Michigan State University team's underlying technical report for the Michigan Department of Transportation (Zockaie et al., 2020) reached similar conclusions. These studies provide credible support for the *detection* benefit of green on snowplows, particularly in the visually cluttered, low-contrast environment of a snowstorm.

What the snowplow studies do not address is the cross-domain *categorization* effect of authorizing green for both volunteer EMS and snow-and-ice operations. From the perspective of a New York driver encountering a green flashing light, the statutory expansion creates a one-to-many mapping: green now denotes a volunteer EMT, a mobile crisis team member, a state or municipal snowplow, or a state or municipal ice-removal

hazard vehicle. Each of these signaling contexts carries different operational expectations — a volunteer EMT requesting yield-of-way at urban speeds; a snowplow operating at approximately 35 miles per hour in adverse weather; a mobile crisis worker traveling to a behavioral-health emergency. The drivers' correct response is also different: yield voluntarily and exercise Move Over duties for the volunteer responder; maintain a safe following distance behind the snowplow without passing on the right; recognize that mobile crisis response, like volunteer EMS, is a courtesy signal.

The legislative trajectory from 2022 onward has, in effect, diluted the categorization value of green for volunteer EMS, while the statutory expansion to mobile crisis teams (Chapter 530 of 2023) further compounded the dilution within paragraph 5 of §375(41) itself. Pending bills in the 2025–2026 session, including S214 (Helming) and S6552 (Griffo, restricting green snow-removal lights to rear-facing on municipal vehicles), reflect ongoing legislative awareness that the current scheme is producing recognition concerns; S6552's sponsor's memorandum explicitly cites the goal of "preventing confusion for other motorists on the road, including emergency vehicles during harsh weather" as the rationale for restricting snowplow green to rear-facing display only.

4.5 The Connecticut precedent and other recent state amendments

Connecticut and New York were the two northeastern states that historically reserved green as the exclusive volunteer-ambulance courtesy color. For decades prior to 2023, Connecticut General Statutes §14-96p (later renumbered to §14-96q) provided that "a flashing green light may not be used upon a motor vehicle, except that a vehicle being operated by an active member of a volunteer ambulance association or company who has been authorized in writing by the chief executive officer ... may use such a light while on the way to the scene of an emergency requiring his services" (CGS §14-96p(c) (2005); §14-96q(d) (2011)).

In 2023, Connecticut House Bill 6583, "An Act Concerning the Use of Emergency Lights by a Constable or a Member of a Volunteer Ambulance Association or Company," was enacted as Public Act 23-135. Section 40 of P.A. 23-135 amended CGS §14-96q(d) to read: "A flashing green or blue light or lights may be used on a motor vehicle operated by an active member of a volunteer ambulance association or company who has been issued a permit by the chief executive officer of such association or company to use such a light or lights, while on the way to or at the scene of an emergency requiring such member's services." The Connecticut Office of Legislative Research's summary of the change confirms that, under P.A. 23-135 §40, "vehicles operated by an active member of a volunteer ambulance association or company may no longer use *steady* green lights" (Connecticut General Assembly, 2023). The substantive change is twofold: Connecticut volunteer ambulance personnel may now use blue (joining their volunteer-firefighter

counterparts under §14-96q(c) on a unified blue-courtesy scheme), and the regime has migrated decisively away from the green-only convention.

The bill's stated purpose, as recorded in the Connecticut General Assembly's bill-tracking record, was "to allow volunteer ambulance associations and company members to use blue, rather than green, lights on their vehicles" (Connecticut HB 6583 (2023)). The amendment was supported by both volunteer fire and volunteer EMS associations. Connecticut thus provides a recent, deliberately undertaken precedent for the migration this report analyzes — undertaken in a jurisdiction whose pre-amendment regime mirrored New York's as closely as any in the country.

Other states have not undertaken comparable amendments because most never adopted the green convention in the first place. The relevant state-amendment activity since 2020 has predominantly been in the direction of *expanding* the use of blue for volunteers or expanding amber and green for non-emergency hazard contexts (e.g., New Jersey A3597 (2024), clarifying permit issuance for blue and red emergency warning lights).

5 Discussion

5.1 The convergence of evidence

Five lines of evidence converge on a single conclusion. First, the human-factors literature establishes that consistent color-to-category mapping is a precondition of reliable warning-light categorization, and that categorization — not detection — is the dimension on which a green volunteer-EMS courtesy light differs from a blue alternative. Second, the predominant national convention pairs blue (or, less commonly, red) with both volunteer fire and volunteer EMS personnel, embedding the categorization signal in a learned schema that is shared across most of the U.S. driving population. Third, New York's recent statutory expansions of green to snowplows, ice-removal vehicles, and mobile crisis teams have, by progressive accretion, diluted whatever volunteer-EMS-specific categorization value green once carried within the state. Fourth, the 2021 Move Over expansion has raised the operational stakes of misrecognition: a driver who fails to recognize a stopped green light as belonging to a volunteer EMT both increases struck-by risk for the EMT and exposes themselves to a Move Over violation. Fifth, the 2023 Connecticut precedent demonstrates that a peer northeastern jurisdiction with the closest analog to New York's statutory regime has, on its own evaluation, migrated decisively away from green-only.

No single line of evidence above is dispositive in isolation. The human-factors literature has not directly tested green-versus-blue volunteer-EMS recognition with New York drivers as participants. The fifty-state survey is descriptive, not causal. The Move Over

compliance literature does not isolate the marginal effect of color choice on driver behavior. The Connecticut amendment was enacted recently enough that no rigorous post-implementation evaluation has yet been published. Each of these limitations is genuine. But the convergence of independent lines — laboratory, field, statutory, and legislative — is itself probative. The pattern is one in which jurisdictions are aligning, on the basis of accumulating evidence and operational experience, toward a unified blue-volunteer-courtesy convention.

5.2 Counterarguments and responses

Several counterarguments warrant explicit consideration.

Argument 1: Green is more visible at night and in low-light conditions, so green improves volunteer EMS safety. This argument relies on Solomon's (1990) and Solomon and King's (1995) work on scotopic spectral sensitivity. The argument confuses detection with categorization. Both blue and green flashing lights are highly detectable at the intensities used in modern light-emitting-diode (LED) warning equipment. The comparative question is not whether green is detectable but whether it is correctly *categorized* as a volunteer-EMS responder, given that the same color is now used for snowplows and other municipal hazard vehicles. Bullough et al.'s (2023, 2024) work on color-marking consistency directly addresses this point: an isolated-color advantage in detection is offset by a categorization disadvantage when the color signal is non-distinctive.

Argument 2: Volunteer EMS personnel are accustomed to green; changing the color imposes operational and equipment costs. A grandfather clause and a multi-year transition period — the structure Connecticut deployed in its 2023 amendment — readily address this concern. The Connecticut amendment retained green as an authorized option, adding blue as an alternative; New York could adopt the same migration structure, allowing currently authorized green lights to be used until the equipment reaches the end of its service life and requiring blue thereafter. Equipment costs for an LED courtesy light typically range from $50 to $400 per unit (Hannigan, 2020), and most volunteer agencies replace courtesy-light equipment on a multi-year cycle in any event.

Argument 3: Public-education campaigns can resolve any categorization ambiguity that the multi-use of green creates. Public education has a mixed record in this area. The AAA Foundation's 2024 report found that despite Move Over laws in place in all fifty states for over a decade, approximately one in three drivers does not comply, and "a pervasive lack of detailed public awareness about the details of state Slow Down, Move Over laws … is likely to contribute to this inconsistency" (AAA Foundation for Traffic Safety, 2024). The principle that statutory color schemes should

be designed for stable, schema-driven recognition rather than continuous re-education is reflected in the FHWA's guidance (FHWA, 2024) and in NCHRP 1085 (Ullman et al., 2024). Public education is not a substitute for a categorization-friendly design.

Argument 4: A change might introduce its own transition-period confusion, during which both green and blue would be in use. The Connecticut precedent provides empirical evidence on this point. Connecticut's amendment authorized the use of either green or blue, deliberately permitting both during the transition. The authors are aware of no published reports of significant transition-period confusion in Connecticut. In any event, the comparison is not between a transition period and a stable status quo; it is between a transition period and an indefinite continuation of the current ambiguous state.

Argument 5: The Move Over expansion to all stopped vehicles (March 2024) renders the color distinction less important. The 2024 amendment, which extended Move Over duties to all stopped vehicles regardless of lighting, does reduce the specifically Move-Over-relevant stakes of misrecognition. It does not eliminate them. VTL §1144-a(c), the volunteer-light-specific provision, remains in effect; and the broader categorization concerns, including yield-of-way behavior, courtesy-light recognition while the volunteer is in motion, and driver expectations about responder type, are not addressed by the 2024 amendment.

5.3 The volunteer-fire blue analogy

The clearest internal evidence within New York's own statutory scheme is the volunteer-fire blue authorization in §375(41)(4). Volunteer firefighters in New York have used blue courtesy lights for roughly a half-century. The blue-volunteer-fire scheme has not been expanded to non-emergency uses. Blue continues to denote, in the New York driving public's schema, "volunteer firefighter en route to or at an emergency." There is no evident reason in the human-factors or operational-experience literature why the same logic would not apply to volunteer EMS were paragraph 5 amended to authorize blue. The volunteer firefighter and volunteer EMT play different operational roles, but for the categorization-by-color problem facing the driving public the relevant question is whether the courtesy-light signal reliably identifies the operator as a volunteer first responder. A unified blue scheme answers that question affirmatively.

6 Limitations

This report is subject to several limitations that bear on the strength of its conclusions.

First, no peer-reviewed study has directly tested New York drivers' recognition of green versus blue volunteer-responder courtesy lights in either laboratory or field conditions. The categorization-degradation argument advanced here rests on extrapolation from related studies (Bullough et al., 2023, 2024; Bullough, Das, Skinner, Guler, & Rea, 2024) using different vehicle and color combinations, and on the convergent statutory and operational logic. A purpose-designed study testing recognition of New York's specific green-and-blue-and-red scheme by a sample of New York drivers, before and after the 2022 snowplow expansion, would substantially strengthen the empirical case. The authors regard this as a priority area for future research.

Second, the fifty-state survey was conducted from a mix of primary and secondary sources. While entries directly relevant to the comparative argument (New York, Connecticut, Indiana, New Jersey, Pennsylvania, Massachusetts, Maine, Vermont, Ohio, Wisconsin, Virginia, North Carolina, California, Michigan) were verified against primary statutory sources, several other states were classified using secondary statute aggregators. The classifications in Table 1 should be regarded as accurate at the level of the broad pattern (blue-dominant, red-dominant, or other), but specific cell entries should be confirmed against the most current statute before being relied upon for legislative drafting in any given state.

Third, the Connecticut Public Act 23-135 §40 amendment is recent enough that no published evaluation has assessed driver behavior, volunteer-EMS adoption rates, or struck-by outcomes in the post-amendment period. The Connecticut precedent therefore supports the argument as a directional indicator — a peer state independently evaluated the same question and chose to migrate to blue — but cannot yet provide outcome data.

Fourth, the AAA Foundation for Traffic Safety's 2024 Slow Down, Move Over study and the underlying observational data did not isolate the marginal effect of courtesy-light color on driver compliance. Color is one factor among many — vehicle markings, intensity, flash rate, ambient conditions, time of day, and roadway type — that interact in producing driver responses. The argument here is that color is a non-trivial factor whose effect can be expected, on the basis of related studies, to be greater when the color is non-conventional or shared with non-emergency uses; the precise effect size is not quantified.

Fifth, this report does not address the operational and equipment-procurement details of a transition. A statutory change would require coordination among the New York Department of Motor Vehicles (which administers 15 NYCRR Part 44), the State EMS Bureau, FASNY's volunteer-EMS counterpart organizations, and individual ambulance services. Sponsor's memoranda and fiscal notes for any amending bill would need to address these implementation considerations.

7 Recommendations for Practice and Policy

The following recommendations flow from the foregoing analysis and are addressed to legislators, EMS leadership, fire and emergency-services administrators, and the broader transportation-safety research community.

7.1 For the New York Legislature

A statutory amendment to VTL §375(41)(5) authorizing volunteer ambulance service members and members of mobile crisis teams to use either blue or green courtesy lights — with a sunset on green for these populations after a transition period (for example, five to seven years from enactment) — would align New York with the predominant national convention, with the recent Connecticut precedent, and with the human-factors literature on consistent color-to-category mapping. Concurrently, the Legislature should consider clarifying the snow-and-ice removal authorization in §375(41)(5)(c) to make clear that municipal hazard-vehicle green is paired with amber or rear-facing only, as proposed in the 2025 Senate Bill 6552 (Griffo). These two changes together would reduce the cross-domain dilution of green within paragraph 5.

7.2 For New York State EMS leadership and volunteer-EMS associations

EMS-system leadership — including the New York State Bureau of Emergency Medical Services, the New York State Volunteer Ambulance and Rescue Association, and the regional EMS councils — should evaluate the implementation logistics of a transition to blue for volunteer EMS courtesy lights. Concrete tasks include: (a) inventorying current volunteer-EMS courtesy-light equipment; (b) estimating the equipment-replacement cost across the transition period; (c) coordinating with FASNY (which administers volunteer-firefighter blue-light cards) on a parallel administrative-authorization structure for volunteer-EMS blue lights; and (d) developing crew and member education materials on the rationale for and timeline of the change.

7.3 For fire and emergency-services administrators in jurisdictions outside New York

Jurisdictions that retain a non-blue volunteer-EMS courtesy-light scheme should evaluate whether their convention is supported by the same evidentiary base as the predominant blue convention. The Connecticut Office of Legislative Research’s 2023 process — a brief commissioned review followed by a legislative amendment with bipartisan support — provides one model for that evaluation.

7.4 For the transportation-safety research community

The human-factors literature on warning-light color recognition has matured substantially over the last decade, but several specific empirical questions relevant to the courtesy-light context remain open:

- A purpose-designed study testing New York drivers' recognition and categorization of green volunteer-EMS courtesy lights, ideally including pre/post comparisons across the 2022 snowplow expansion;
- Field studies of yield-of-way behavior and Move Over compliance disaggregated by responder color (blue, green, red, amber);
- Comparative analyses of struck-by incidents involving volunteer responders before and after the Connecticut blue-or-green migration; and
- Integration of color-recognition findings into NCHRP 1085 follow-on guidance for state vehicle codes.

7.5 For drivers and the general public

Public-education materials that explain courtesy-light conventions should be integrated into driver-licensing curricula and renewal materials, particularly in states with non-conventional conventions during any transition period. The AAA Foundation for Traffic Safety's 2024 findings on Move Over awareness suggest that public-education materials are most effective when they connect specific signal recognition to specific required driver behavior.

8 Conclusion

New York Vehicle and Traffic Law §375(41)(5)'s authorization of green courtesy lights for volunteer EMS personnel was a defensible policy choice when first enacted more than a half-century ago, in an era before the human-factors literature on warning-light categorization had matured and before green had been authorized in New York for any non-EMS purpose. Five decades later, the policy environment has changed in ways that make the original choice harder to defend on the merits. The peer-reviewed and federally commissioned literature now establishes that warning-light categorization depends on consistent color-to-category mapping; the predominant national convention pairs blue (or red) with both volunteer fire and volunteer EMS; New York has progressively expanded green to non-emergency uses (snowplows, ice-removal vehicles, mobile crisis teams), diluting whatever volunteer-EMS-specific signal value green once carried; the 2021 Move Over expansion has raised the operational stakes of misrecognition; and Connecticut, the only neighboring state with a comparable historical regime, has independently evaluated and migrated to a blue-or-green scheme. A statutory

amendment authorizing volunteer EMS personnel to use blue, with a sunset on green-only authorization after a defined transition period, would align New York's volunteer-EMS courtesy-light scheme with the human-factors evidence, with the dominant national convention, and with the recent precedent of a peer state. Direct empirical research on New York-specific recognition outcomes remains a priority for future work, and the limitations of the present analysis are acknowledged plainly. The convergent evidence reviewed here, however, supports the inference that the current scheme is producing foreseeable categorization problems that a relatively modest statutory amendment would substantially mitigate.

ABOUT THIS REPORT

Author Note & Disclosures

About the publisher. Seconds Matter NY is a non-partisan unincorporated nonprofit association exempt under Internal Revenue Code Section 501(c)(3), based in New York. The organization advocates on behalf of the career and volunteer first responders who serve communities across New York State. Its first public campaign concerns the policy question analyzed in this report.

Conflict of interest. Seconds Matter NY advocates for amendment of New York Vehicle and Traffic Law §375(41)(5) to authorize blue courtesy lights for volunteer EMS personnel. The policy argument advanced in this report is consistent with that advocacy position. The authors have made every effort to ground the argument in independently verifiable peer-reviewed and statutory sources, to acknowledge limitations and counterarguments transparently, and to distinguish empirically supported claims from claims that rest on extrapolation. Readers are invited to evaluate the analysis on the merits of the cited evidence.

Funding. No external funding was received for the preparation of this report.

Acknowledgments. The publisher thanks the staff of the New York State Senate Open Legislation portal, the Connecticut General Assembly's Office of Legislative Research, and the Cornell Legal Information Institute for maintaining the public-access statutory resources on which the comparative analysis depends.

Suggested citation. Seconds Matter NY. (2026). *Color recognition, courtesy lights, and volunteer EMS: The case for retiring green and aligning New York Vehicle and Traffic Law §375(41)(5) with the predominant national convention*. New York: Seconds Matter NY.

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