

NHTSA’s highway safety grant program: An opportunity to improve emergency medical services response and safety.

A team of emergency medical service (EMS) experts describes the path toward meeting the National Highway Traffic Safety Administration’s zero crash fatalities, post-crash care objectives.

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Executive Summary

Since 2015, the annual number of crash fatalities has exceeded 35,000, with millions more injured every year. NHTSA’s mitigation goals include: enhance the survivability of crashes through expedient access to emergency medical care; and, create a safe working environment for the vital first responders. The nation’s paramedicine clinicians are partners in this process and the first responders to roadway crashes, providing treatment and transportation for the injured. But these clinicians face two large obstacles: they themselves have an extremely high crash related occupational fatality rate, and the EMS system in the U.S. is grossly underfunded.

In order to meet NHTSA’s objectives, the EMS system will require a new funding model and a mechanism to reduce occupational risks for the clinicians. As a step toward those goals, this Bill should provide funding for the State EMS offices to collect the data described in the questions section below, and require that in the event that any grantee or sub-grantee has not obligated any funds provided by this Act by the end of the third quarter of the grant year, all such funds shall be re-allocated to the relevant state or territorial emergency medical service office to be used for any general purpose related to highway traffic safety objectives.

Only if they have a safe working environment and adequate system funding can paramedicine clinicians provide the best possible care to their patients and the best possible support for meeting NHTSA’s objectives.

Introduction

This paper is in response to Federal Register Docket (NHTSA-2022-0036), Uniform Procedures for State Highway Safety Grant Programs, created by the National Highway Traffic Safety Administration (NHTSA).¹

NHTSA notes the need for such a program by describing that in the first half of 2021, 20,160 people died in crashes, up 18% from

the previous year.² NHTSA’s National Roadway Safety Strategy (NRSS) reports that, “more than 370,000 people died in transportation incidents over the last decade (2011-2020) in the United States” and “Since 2015, the annual number of fatalities has exceeded 35,000, with millions more injured – sometimes permanently – each

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year³.³(page 1) In 2020, there were 5.25 million police reported crashes and the number of people injured on U.S. roads was 2.28 million.⁴

The nation's paramedicine clinicians were the first responders to these crashes, providing treatment and transportation for the injured. But Valente and Perez report that paramedicine clinicians who respond to these vehicle collisions are challenged by receipt of untimely and inaccurate information, communication technology incompatibilities, traffic, and scene safety concerns that impede response.⁵

The NRSS and the Department's ongoing safety programs are working towards a future with zero roadway fatalities and serious injuries. The guiding paradigm of the NRSS is the Safe Systems Approach⁶, which addresses roadway safety by building and reinforcing multiple layers of protection to prevent crashes and minimize the harm caused to those involved when collisions occur. It is a holistic and comprehensive approach because it focuses on human mistakes and human vulnerability.

Two of NHTSA's NRSS post-crash care objectives are:

- 1) Enhance the survivability of crashes through expedient access to emergency medical care,
- 2) Create a safe working environment for vital first responders.³

These are important objectives and the nation's paramedicine clinicians have a strong professional, and personal, connection to the issues surrounding transportation risks. They not only respond to and care for the millions of transportation incident victims, but that service imposes a terrible toll on the clinicians as it results in a transportation related occupational fatality

rate that is five times higher for the clinicians than the rate for all workers in the U.S.⁷

This paper will describe the changes that are necessary in order for our nation's EMS system to achieve the NHTSA objectives.

Background

EMS development in the U.S.

The almost one million paramedicine clinicians in the U.S. include emergency medical technicians (EMT), advanced EMTs and paramedics; these clinicians.^{8,9}

Paramedicine clinicians primarily work in the over 20,000 EMS agencies in the U.S. and respond to 40 million calls for assistance each year.⁸ As recently as the 1980s, the EMS system in the U.S. was an example to the world of what an EMS system could look like and what it could achieve. Since then, due to a lack of support, the EMS system in the U.S. has fallen far behind the systems that exist in other countries. For example, in other countries paramedicine clinicians are paid equivalent to or more than nurses, fire fighters and police, compared to in the U.S. where their average salary is about half of those other professionals.¹⁰ In other countries a bachelor's degree is the minimum level of education for entry into the profession and advanced paramedicine clinicians with clinical master's degrees provide care in patient's homes. Then, instead of leaving the patient for hours on a hospital emergency department stretcher, the advanced clinicians provide care at home and schedule follow-up care with the patient's provider, allowing the patient to remain at home. Countries with these advanced paramedicine clinicians found that they were enormously valuable during the pandemic because they could treat patients at home and help keep non-critical patients out of overwhelmed

hospitals.¹¹ Professionally autonomous EMS systems are a hallmark of what is found in countries that provide advanced EMS care.¹²

Precursors to meeting the DOT goals

Two main issues influence the EMS system's capabilities to achieve the NHTSA objectives. The first is the occupational risks faced by the paramedicine clinicians. Those risks include fatality and serious injuries. The second is system support.¹³ The lack of support has resulted in tremendous barriers to system success including inadequate salaries, short careers, inequity and inadequate agency funding.

Occupational risks

Fatalities

Occupational fatalities among paramedicine clinicians result from incidents such as homicides, falls and transportation incidents. Transportation incidents include ambulance crashes, air ambulance crashes, and clinicians who are struck and killed by a vehicle.

In 2002, the first research to examine the risks of fatalities among paramedicine clinicians found that their rate of occupational fatality was far above the national average for all workers and was comparable to the rates for police and fire fighters.⁷ In 2013, researchers found that about 12 paramedicine clinicians were killed on duty every year, and that 86% of those deaths were due to transportation-related events.¹⁴ Based on those findings, we can estimate that from 2011 to 2020, there were approximately 120 occupational fatalities among paramedicine clinicians, and about 103 of them were due to transportation related incidents. We know almost nothing about the circumstances of these deaths; every one of them should be investigated with the goal of preventing future fatalities.

Injuries

In 2005, researchers published the first study to determine how the risks of occupational injury among paramedicine clinicians compares to the rates for other professions. They found that the occupational injury rate for paramedicine clinicians was seven times higher than the rate for all workers in the U.S., six times higher than the rate for health care workers, and 1.5 times higher than the rate for fire fighters.¹⁵ Paramedicine clinicians have very high rates of transportation-related injuries, back injuries and assaults.¹⁵⁻²⁰

COVID-19

The pandemic has taken a terrible toll on the nation's paramedicine clinicians. It had resulted in high rates of occupational fatalities^{21,22}, illnesses²³⁻²⁶ and disability²⁷.

Other occupational risks

The measured risks described above are likely the tip of the iceberg in terms of the true occupational risks experienced by paramedicine clinicians. For example, we know little about what may be an enormously high suicide rate²⁸, or the risks of post-traumatic stress, anxiety and other mental health issues for paramedicine clinicians. We know nothing about how mental health risks impact outcomes such as provider health, provider career length or patient care. We know that even being on the scene and witnessing the injuries sustained in motor vehicle crashes takes an enormous toll on the mental health of paramedicine clinicians, but we have little in the way of resources to mitigate these risks.

System support

An inadequately financed system is unable to meet the objective of providing expedient access to emergency medical care. In

addition, an inadequately funded system impedes the efforts of paramedicine clinicians to provide the best possible medical care. Some of the most egregious examples of this inadequate system support are the clinician's salaries, the clinician's career length, poor education and training opportunities, racial equity and support for EMS operations and public health partnerships.

Salaries

The national average salary of \$34,320 is not much more than half of what other emergency services personnel are paid nationally.¹⁰ Locally, EMS personnel are also paid less than other emergency services personnel.²⁹ In countries with advanced EMS systems, paramedicine clinicians are paid almost three times the equivalent U.S. salary, and are paid salaries equal to or greater than the salaries for police, fire fighters and nurses in their areas.¹⁰

Career length

Prior to the COVID-19 pandemic, about a quarter of paramedicine clinicians left the job every year.³⁰ Since then, the turnover rate may have increased dramatically.^{31,32} A system whose senior members have four or five years of experience is not a system that can be developed or sustained. Clearly, without better recognition and support, there will be no emergency medical support at the scene of motor vehicle crashes in the future.

Education and training

The low salary for paramedicine clinicians in the U.S. seems likely to be the prime reason that only about a quarter of the clinicians have a bachelor's degrees.³³ Even though the credit-hours for paramedic education exceeds the credit-hours for nursing education at the same colleges³⁴, it may be difficult for individuals to justify taking on a large debt to work in a job that

pays \$34,000. The lack of education impacts EMS system development because advanced education is a necessary prerequisite for paramedicine clinicians to take on advanced care responsibilities.³⁵ In other countries a bachelor's degree is a minimum requirement, and there are clinical master's degree programs for advanced paramedics.³⁶⁻⁴⁰

Equity

According to the U.S. Department of Labor (DOL), Bureau of Labor Statistics, there were 206,000 emergency medical technicians (EMTs) and paramedics employed in 2019; of them, 86.6% were White, 10.5% were Black, 0.8% were Asian, and 11.5% were Hispanic or Latino.⁴¹ However, those statistics may vary greatly by agency. For example, in the New York City Fire Department's emergency medical services division, only 30% of the emergency medical technicians are White.⁴² Although we know the demographics of the workforce are changing, we know nothing about how these changes effect outcomes such as safety and salaries. Some emergency medical services workers say gender and racial discrimination keep their wages low.⁴³

Operations

Another glaring example of inadequate system funding are the many reports of ambulances being held together with duct tape, and ambulance agencies having to hold bake sales to pay for fuel.^{44,45} In some agencies in the U.S., paramedics have to steal hospital supplies in order to stock critical supplies on their ambulance.⁴⁶ Other examples include ambulance agencies that provide no sick leave or health insurance benefits for their employees.⁴⁷ Some private ambulance agencies have abruptly gone out of business.⁴⁶ Inadequate and decreasing reimbursement from Medicare has exacerbated an already critical shortage of

operating funds.^{48,49} A 2016 NHTSA report documented that EMS in the U.S. is grossly underfunded.⁵⁰

Operations, from a systems perspective, is a tremendous challenge for many organizations. For example, during the pandemic, services competed against hospital systems and one another for PPE.⁵¹ Now the same thing is happening for medications.⁵²

Even clinical operations are faced with daunting hurdles. The face of trauma care and the ability to resuscitate patients can be vastly improved with the implementation of prehospital use of blood and blood products (e.g., lyophilized plasma).⁵³ Yet the operational logistics are staggering. Implementation for many organizations would require full time personnel to manage the acquisition, distribution, monitoring of the administration, and collection of unused blood product. Implementation of this type of program is out of reach of most EMS organizations due to insufficient system funding.

An adequately funded EMS system could: incorporate the use of drones (for initial scene information and on-going scene safety); develop special vehicle crash response programs to better educate and equip those paramedicine clinicians called to the scene; develop on-call systems to ensure fast response; create a network of crash responses including air response and specially equipped ambulances to provide high-level care at the scene and during transport; include cutting edge technology such as smart glasses to provide telehealth capabilities in the field; and a workforce that includes first responders to advanced clinical providers, all designed to meet the needs of the patients within their environments. In an adequately funded

system paramedicine clinicians would have the resources to work on crash prevention programs.

Research

Twenty years ago researchers documented the tremendous risks associated with the paramedicine profession.⁷ Yet since then, little has been done to mitigate those risks. For example, we know that more than 10 paramedicine clinicians are killed every year, but we know little about the circumstances of those deaths. Each one should be investigated with the goal of preventing future risks.

Public health

A final failure of the current system is the lack of support and recognition for paramedicine clinicians as partners in the public health system. As long ago as 1994, researchers documented the dramatic effects that paramedicine clinicians could have on public health. At that time, in Pinellas County Florida, paramedicine clinicians instituted a process that ultimately reduced the rate of pediatric drownings in their county by 50%.⁵⁴ Imagine the dramatic effects that paramedicine clinicians could have, for example, on teenage drunk driving. Who better to talk to groups of young people about the dangers of drinking and driving than someone who has spent a bunch of Saturday nights pulling teenage bodies out of crashed vehicles? With a little support, these clinicians could be powerful partners in NHTSA's quest to prevent roadway fatalities.

Recommendations to NHTSA.

Ultimately, before the EMS system will be capable of meeting the NRSS objectives, these two objectives must be met:

- 1) NHTSA should establish and fund a National EMS Safety, Center of

Excellence focused on improving safety for paramedicine clinicians.

- 2) As the lead federal agency for EMS, NHTSA should assume the responsibility to develop a new national EMS funding strategy.

We recognize that fully meeting those objectives is beyond the scope of this Bill. Therefore, we suggest that this Bill begin the process of achieving those goals by instituting these rules:

- 1) Provide funding for the State EMS offices to collect the data described in the section below.
- 2) In the event that any grantee or sub-grantee has not obligated any funds provided by this Act by the end of the third quarter of the grant year, all such funds shall be re-allocated to the relevant state or territorial emergency medical service office to be use for any general purpose related to highway traffic safety objectives.

The NHTSA notice requests responses to these specific questions:

1. How can NHTSA, States, and their partners successfully implement NRSS and the SSA within the formula grant program to support the requirements in Bipartisan Infrastructure Law, enacted as the Infrastructure Investment and Jobs Act (Pub. L. 117-58)?

NHTSA, the States and EMS professionals should work together to develop a long-term plan aimed at developing the EMS system to be able to meet the objectives of the new law. The working group should begin with the understanding that the current EMS system in the U.S. can provide neither expedient care for patients nor

a safe working environment for its clinicians. Paramedicine clinicians should be on every committee that is formed to implement NRSS and the SSA.

The goal of "expedient access to emergency medical care" should be explicitly included as one of the five points of the NRSS.

State Performance Measures should be expanded to include EMS response time and transport time for patients with serious injuries. As the NRSS notes, almost 2/3rd of all fatal crashes occurred in rural areas, where EMS response times are "generally higher," with one of the Key Department Actions including "Improve the delivery of EMS throughout the nation in collaboration with the Federal Interagency Committee on Emergency Medical Services and the National Emergency Medical Services Advisory Council by focusing on shortening ambulance on-scene response times." Research has documented that "longer emergency medical service response times were associated with higher rates of motor vehicle crash mortality"⁵⁵ In order to measure improvement, response, on-scene and transport times must be measured.

State Performance Measures should be expanded to include EMS level of care for serious injuries (EMT, Advanced EMT, Paramedic). As the NRSS notes, 20% of crash deaths are preventable while 40% of victims who died were still alive on EMS arrival. The level of pre-hospital care available should correspond with increased survival of victims with

specific, treatable conditions such as tension pneumothorax, but it must be measured.

Reducing the death and disability in patients with an Injury Severity Score (ISS) score greater than 15 and monitoring the Under 5 Mortality Rate (U5MR) as a predictor for EMS system efficacy and efficiency are two critical measures that should be used to identify system opportunities for improvement.

Response time and on scene time are two critical measures of roadway death and disability progress. The ability to adequately roster and deploy sufficient EMS resources to meet the response time and on-scene dynamics are crucial to ensuring survivability of major trauma.⁵⁶⁻⁵⁸ EMS is care waiting for patients, for major trauma patients it is never patients waiting for care. The ability to rapidly respond, stabilize, immediately transport, and continue life-saving care enroute, are core to the essential survival of patients with major trauma.

State Performance Measures should be expanded to include EMS primary transport to an American College of Surgeons (ACS) Level I or Level II Trauma Center for serious injuries and EMS secondary transport (post-initial stabilization at community hospital) to an ACS Level I or Level II Trauma Center for serious injuries. As the NRSS notes, although there is a 25% increase in survival for severely injured patients taken directly to an ACS Level I trauma center, 1/3 of victims were not taken directly to a trauma center, while the number of secondary transports is not known.

Measures should be developed within the overarching consideration of developing regional systems of care. The systems of care recognize that urban and rural communities have different emergency medical needs and that solutions must meet those different needs. Today there are over 20,000 EMS agencies providing care in the U.S. but there are very few systems of care. Those systems should develop standards not only for how many ambulances are needed in a community but what level of care and mix of providers are needed in order to meet NHTSA's objective of expedient care. The system should also consider the quality of care. For example, community paramedic programs are developing sporadically across the country, but more planning is needed in order for them to help create the best possible health outcomes for patients.

2. What non-traditional partners and safety stakeholders can the States work with to implement NRSS and SSA?

States should work with universities to 1) develop, test and implement EMS system improvement initiatives; and 2) measure risks, and develop, test and implement risk reduction interventions.

Traffic crashes are a leading cause of death for teenagers in America and disproportionately impact Black people, American Indians, and rural communities. Section 24102 of the Bipartisan Infrastructure Law requires State highway safety programs to provide "meaningful public participation and engagement from

affected communities, particularly those most significantly impacted by traffic crashes resulting in injuries and fatalities.”

In addition, Section 24102 requires that States “as part of a comprehensive program, support—(i) data-driven traffic safety enforcement programs that foster effective community collaboration to increase public safety; and (ii) data collection and analysis to ensure transparency, identify disparities in traffic enforcement, and inform traffic enforcement policies, procedures, and activities.”

3. How can the Sections 402, 405, and 1906 formula grant programs contribute to positive, equitable safety outcomes for all? How can states obtain meaningful public participation and engagement from affected communities, particularly those most significantly impacted by traffic crashes resulting in injuries and fatalities?

Making specific and direct grant funding available to community-based EMS agencies to support staff capacity to participate in the highway safety planning process.

4. How can the formula grant program require practices to ensure affected communities have a meaningful voice in the highway safety planning process?

This objective too can be met by making specific and direct grant funding available to community-based EMS agencies to support staff capacity to participate in the highway safety planning process.

5. What varied data sources, in addition to crash-causation data, should States be

required to consult as part of their Highway Safety Plan problem identification and planning processes to inform the degree to which traffic safety disparities exist on their roadways?

Relevant state-level data submitted to the National EMS Information System, as noted in the National Roadway Safety Strategy, Key Departmental Actions to Enable Safer Post-Crash Care, “3. Expand the use of and support for the National Emergency Medical Services Information System — the national database that is used to store EMS data from the U.S. States and Territories — by funding applied research and data quality improvements.” (page 30)

Beginning in FY 2024, States will be required to submit a Highway Safety Plan (HSP) once every three years. The HSP is a statewide, coordinated behavioral safety plan that provides a comprehensive framework for reducing highway fatalities and serious injuries. The HSP identifies a State's key behavioral safety needs and guides investment decisions towards strategies and countermeasures with the most potential to save lives and prevent injuries. As set out in the Bipartisan Infrastructure Law, the longer-term HSP should be designed to allow the States to better reflect on the countermeasures to be implemented and inform annual project selections to combat these increasing trends.

Although NHTSA has created the Fatality Analysis Reporting System (FARS) as a tool to measure fatal crashes, a review of state reporting

forms finds inconsistencies related to identification of involved vehicle. For example, there may be no data field to identify an ambulance or other emergency vehicles, and many states just list emergency vehicles with no subcategories. Of interest is that some states present some very specific vehicle types like Motor Homes, ATV's, Mopeds, and snowmobiles, while others list special vehicles such as school buses. Still others leave a fill in field for the recording individual to list the vehicle but provide no legend or guidance. This latter issue creates a scenario whereby if an ambulance operated by a fire department is in a crash there is high probability it will be reported as a fire department crash and not an EMS or ambulance collision. Moreover, a third service government operated ambulance agency could be reported as a generic government vehicle and a hospital or private sector ambulance could be captured simply as a commercial vehicle based upon the vehicle registration. In order to have reliable national data, a national standard for data collection should be established.

The only national data set on injuries and fatalities among paramedicine clinicians is operated by the Bureau of Labor Statistics. However, they only report on a quarter of the EMS workforce and it is likely that many injuries and fatalities among paramedicine clinicians are recorded as incidents to fire fighters. Therefore, in order to meet NHTSA's objective of safety for EMS personnel, occupational injuries and fatalities among paramedicine clinicians should be collected from each agency by the state and reported to a national EMS

Safety Center of Excellence for analysis and to use for the development and implementation of EMS safety initiatives.

6. How can the triennial cycle best assess longer-term behavior modification progress and connect year-to-year activities in a meaningful way?

Require (and audit) for accurate measurement and phase in a linkage between future funding and incremental improvement.

9. What data elements should States submit to NHTSA in their annual grant application to allow for full transparency in the use of funds?

Percentage of funding dedicated to each of the five objectives in the National Roadway Safety Strategy, specifically Post-Crash Care. Currently, many states channel a significant portion of Highway Traffic Safety funds to law enforcement and only a minimal portion to emergency medical services. Data on the number of dollars specifically provided to emergency medical services agencies should be reported annually.

10. What types of data can be included in the annual grant application to ensure that projects are being funded in areas that include those of most significant need?

Each state should support a database that contains up-to-date data on all paramedicine clinicians in the state. The following data should be collected and reported annually by each state:

- The number of paramedicine clinicians

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- The number of occupational fatalities among paramedicine clinicians
- Transportation related fatalities among paramedicine clinicians
- Transportation related injuries among paramedicine clinicians
- Proportion of EMS services provided by full time paramedicine clinicians
- Proportion of full-time paramedicine clinicians who have five years and 10 years of full-time EMS experience
- Proportion of full-time paramedicine clinicians whose annual salary is equal to the average of local police and firefighter salaries by years of experience
- EMS response, on-scene and transport time for patients with serious injuries
- EMS level of care provided for serious injuries (e.g., EMT, A-EMT, paramedic)
- EMS primary transport to an American College of Surgeons (ACS) Level I or Level II Trauma Center for serious injuries.
- EMS secondary transport (post-initial stabilization at community hospital) to an ACS Level I or II Trauma Center for serious injuries.
- Total EMS calls, including
 - o Patients transported
 - o Patients treated and not transported
- Total EMS funding dollars from:
 - o Federal
 - o State
 - o Local government
 - o Health insurance
 - Medicare
 - Medicaid

- Other government (e.g., VA, IHS, etc.)
- Private health insurance
- Other

NHTSA should establish a National EMS Safety, Center of Excellence (CoE) to host a national EMS database where the State data would be collected and analyzed. The CoE should produce annual reports that document:

- The EMS occupational fatality rate by state
- The EMS transportation related fatality rate by state
- The EMS occupational injury rate by state
- The EMS transportation related injury rate
- Proportion of EMS services provided by full time paramedicine clinicians
- Proportion of full-time paramedicine clinicians who have five years and 10 years of full-time EMS experience
- Number of full-time paramedicine clinicians per 100,000 state residents
- EMS funding dollars by source per call and by state

11. Should these measures be revised? If so, what changes are needed?

State Performance Measures should be expanded to include mandatory reporting of EMS response time and transport time for patient with serious injuries. As the NRSS notes, almost 2/3rd of all fatal crashes occurred in rural areas, where EMS response times are "generally higher," with one of the Key Department Actions

including "Improve the delivery of EMS throughout the nation in collaboration with the Federal Interagency Committee on Emergency Medical Services and the National Emergency Medical Services Advisory Council by focusing on shortening ambulance on-scene response times." But in order to measure improvement, response, on-scene and transport times must be measured.

State Performance Measures should be expanded to include mandatory reporting of EMS level of care for serious injuries (EMT, Advanced EMT, Paramedic). As the NRSS notes, 20% of crash deaths are preventable while 40% of victims who died were still alive on EMS arrival. The level of pre-hospital care available should correspond with increased survival of victims with specific, treatable conditions such as tension pneumothorax, but it must be measured.

State Performance Measures should be expanded to include mandatory reporting of EMS primary transport to an American College of Surgeons (ACS) Level I or Level II Trauma Center for serious injuries and EMS secondary transport (post-initial stabilization at community hospital) to an ACS Level I or Level II Trauma Center for serious injuries. As the NRSS notes, although there is a 25% increase in survival for severely injured patients taken directly to an ACS Level I trauma center, 1/3 of victims were not taken directly to a trauma center, while the number of secondary transports is not known.

12. Section 24102 of the Bipartisan Infrastructure Law requires performance targets "that demonstrate constant or improved performance." What information should NHTSA consider in implementing this requirement?

Occupational injury and fatality rates among paramedicine clinicians per year
Average salaries for EMTs, A-EMTs and paramedics in the state
Ambulance response times to crashes with serious injuries
Proportion of serious crash injuries treated on scene by paramedics
Proportion of serious crash injury patients transported directly to a Level I or II trauma center
Proportion of paramedicine clinicians with more than 5 years of EMS experience
Proportion of paramedicine clinicians with an associate's degree
Proportion of paramedicine clinicians with a bachelor's degree

13. What should be provided in the Annual Report to ensure performance target progress is assessed and that projects funded in the past fiscal year contributed to meeting performance targets?

In order to document progress toward NHTSA's objectives of expedited care and provider safety, the annual report should aggregate the state data noted above, provide analyses of trends over time and document how individual states compare for each data element.

Conclusions

The EMS system in the U.S., once a shining example of potential, has now fallen far

below the standards in other countries. That outcome is the largely the result of national and local funding models that have not recognized or covered the true system costs. In order for the EMS system to successfully support NHTSA's goals, a new funding model will have to be created. That funding model must support sustainable EMS system development, with special focus on increased salaries and new occupational safety programs for providers. Toward that end, NHTSA, as the EMS lead agency in the U.S., should plan to establish and fund a National EMS Safety Center of Excellence and it should commit to the creation of a new funding model to support EMS agencies that are seeking to meet NHTSA's goals.

Paramedicine clinicians must continue to be a key stakeholder in any effort to improve programs aimed at ensuring a future with zero roadway fatalities and serious injuries. These clinicians have a long history of being proactive, successfully addressing hazards, and developing effective solutions. Paramedicine clinicians are part of the system and therefore part of the solution; however, the challenges faced by EMS must be recognized by NHTSA and addressed in this plan.

Only if they have a safe working environment and adequate system funding can paramedicine clinicians provide the best possible care to their patients and the best possible support for meeting NHTSA's objectives.

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