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Emergency Medical Services in Washington State

In 2024, the Washington State Legislature directed the Washington State Institute for Public Policy (WSIPP) to examine the landscape of emergency medical services (EMS) in Washington, including an assessment of historic trends and forecasted demand for EMS in the state.[1] In addition, the assignment directed WSIPP to identify regions with long EMS response times and to estimate the cost of delivering timely service. WSIPP was also directed to explore alternative EMS funding models used in other states. The full assignment language is presented in Exhibit 1.

In Section I, we provide background on EMS systems and describe the EMS landscape in Washington. Section II describes EMS delivery and funding models in the United States. In Section III, we describe historical trends in EMS use and forecast future demand statewide and by county. In Section IV, we identify regions in Washington where EMS response times exceed 25 minutes. Section V discusses the costs of EMS readiness, and we summarize limitations and key takeaways in Section VI.

Summary

Emergency medical services (EMS) provide urgent prehospital care and transport. In Washington State, they operate within a decentralized system shaped largely by local decisions. This report examines EMS delivery and funding in Washington in the context of national models, analyzes statewide and county-level trends, forecasts demand for EMS services, and identifies regions with prolonged response times (e.g., exceeding 25 minutes). It also outlines approaches for estimating the cost of ensuring adequate EMS preparedness.

The findings highlight that, although EMS licensing and training requirements are relatively standardized, service delivery, funding, and resource availability vary substantially across jurisdictions. There is no widespread reliance on state or federal funding; instead, EMS systems depend heavily on local funding sources and fee-for-service reimbursement. Forecasting results suggest that demands for EMS services will increase over time. Response time analyses highlight persistent geographic disparities, with some regions consistently experiencing prolonged response times—rural regions generally face longer on-scene and transport times, while urban regions face longer hospital offload times.

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[1] Substitute Senate Bill 5986, Chapter 218, Laws of 2024.

EMS Service Provision

Services are provided in the following ways:[18]

Dispatch. Initial requests for EMS may come from the public, through 911, or police or fire services. EMS dispatch in Washington State is handled by local and regional public safety answering points (PSAPs), which are 911 centers that dispatch police, fire, and medical services, with oversight and standards set by the state's 911 Program and Department of Health.[19]

Washington has 78 PSAPs covering all 39 counties. Each PSAP is connected to the statewide network, which delivers location and other relevant information about the 911 caller.[20]

Dispatching aid or ambulance services is based on relevant situational factors such as a preliminary understanding of medical needs or EMS resources that are currently available.

Assessment. Once on-site, EMS staff conduct an assessment of the patient's health condition. This is typically carried out by the first response agencies that are dispatched to a medical emergency to provide immediate, on-scene stabilization.

After assessment, there are three typical approaches towards patient care:

1) **Treat and refer to services**. A patient is treated on-site and is referred to secondary sites for additional care.
2) **Transport to an emergency department**. A patient may be transported to an emergency department for additional medical care. Transport of patients directly from an emergency scene can only be done by licensed and verified ambulance services.

   Transportation may or may not be provided by the first responding EMS agency.
3) **Transport to alternative sites.** Patients may be transported to destinations other than a hospital emergency department when clinically appropriate. For example, legislation enacted in 2015 authorized emergency ambulances in Washington to transport individuals directly from the scene to alternative behavioral health destinations.[21] Medicaid, and more recently, commercial insurers,[22] reimburse ground ambulance transport to qualifying behavioral health emergency service providers when the patient voluntarily agrees to transport.[23]

18 OIC (2023).

19 The WA State Department of Military provides oversight of state 911 activities. Most commonly, local 911 centers are managed through the sheriff's office, but models of local oversight of 911 vary. Washington Military Department. (n.d.). *Emergency medical services*.

20 Washington State. (n.d.). Public safety answering points (PSAP) boundaries. Retrieved April 14, 2026.

21 Substitute House Bill 1721, Chapter 157, Laws of 2015.

22 Second Substitute Senate Bill 6228, Chapter 366, Laws of 2024.

23 Clients detained under the Involuntary Treatment Act (ITA)/Ricky Garcia Act are eligible for transportation coverage within the state. ITA transport—by ambulance or local police/sheriff—is generally reimbursed by HCA from a dedicated fund. Note, HCA does *not* guarantee payment for involuntary ambulance transportation that was not pre-authorized by a designated crisis responder (DCR). Washington State Health Care Authority. (2025). *Ambulance transportation billing guide*.

Separately, ambulance transport may also occur as scheduled interfacility transport (IFT), in which a patient is moved between healthcare facilities, often when a higher or more appropriate level of care is needed.

Types of Transport. Various types of ambulances and specialized medical transportation services cater to different patient needs. Below are examples of primary transport types.[24]

- **Non-emergency ambulance transport (NEAT)** is used for scheduled appointments (e.g., dialysis, therapy) or stable transfers.
- **Emergency transport** is used in incidents where a patient's life is in immediate danger, and they require rapid intervention. This can be done by an ALS, ILS, or BLS ambulance.
- **Specialty care transfer (SCT)** is used for high-risk patient transport or when the patient requires intensive monitoring.[25] SCT ambulances are equipped with special equipment, such as cardiac monitors and mechanical ventilators, that allow for safe transportation during advanced medical treatment. SCT ambulances are commonly used for interfacility transport from one hospital to another.[26]

Operations of EMS Agencies

In Washington, EMS agencies are operated by multiple types of collaborating entities. EMS agencies can be grouped into 14 organization types and three broader groups (Exhibit 7).[27]

Exhibit 7

EMS Agency Operating Entities

Public	Private
Airport Fire (1)	Private for Profit (55)
City Fire Department (72)	Private Non-Profit (4)
City/Fire District Combination (9)	Private Volunteer Association (5)
EMS District (11)	
Federal Fire Department (3)	
Fire District (247)	**Tribal**
Hospital District (14)	Tribal EMS (7)
Industrial Fire Department (6)	
Military (1)	
Municipality (24)	

Note:
Three EMS agencies are listed as other organizational types.

Of the 462 licensed EMS agencies, 388 are publicly operated, 64 are privately operated, and seven are tribal organizations. We discuss EMS organization types and delivery systems in further detail in Section II.

Tribal EMS in Washington State consists of tribally operated agencies delivering localized care, supported by the Indian Health Service and Bureau of Indian Affairs, and integrated with county, state, and regional EMS/Trauma Council systems.[28]

[24] LifeLine EMS. (n.d.). *Understanding the different types of ambulance services and when to use them*.
[25] WAC 182-546-0125.
[26] Tri-Med Ambulance & Transportation, LLC. (n.d.). *Critical care transport (CCT)*.
[27] OIC (2023).
[28] U.S. Department of Health and Human Services, Indian Health Service. (n.d.). *Emergency medical services (EMS) program*.

Regional EMS and Trauma Care Councils

Washington State is organized across eight EMS and trauma care regions (Exhibit 8). Each region convenes an EMS & Trauma Care Council responsible for developing and maintaining regional EMS & Trauma Care Plans (regional plans).[29] These councils are composed of representatives of hospital and prehospital trauma care, EMS providers, local elected officials, consumers, local law enforcement, and local government agencies involved in the delivery of EMS and trauma care.[30] Regional plans are used to assess and analyze regional needs for care and resources for medical emergencies.

Regional care plans incorporate a minimum/maximum planning framework to guide the appropriate number and level (e.g., BLS, ILS, ALS) of EMS and trauma services within a region, based on needs and available resources. These plans inform designation and authorization decisions made by the DOH and local EMS authorities, in coordination with regional councils and local jurisdictions.[31] These planning processes generally do not apply to interfacility transport providers, whose services are scheduled and driven by hospital and market demand rather than emergency response requirements.

EMS Boundaries

Local EMS agencies are the smallest service units licensed by a state EMS office. Each agency is authorized to operate within a specific geographic area.[32] These service areas vary widely in size, ranging from large jurisdictions such as counties to smaller areas, such as the response area of a single EMS station, as is common in Washington State.

Emergency response service areas are geographic regions that delineate which agencies are responsible for providing EMS within a given jurisdiction. Exhibit 8 displays these service areas within Washington's trauma regions.[33]

In Washington State, EMS service areas are established through a collaborative, multi-layered framework involving state statute, regional planning, and local authority, with the goal of ensuring timely access to emergency care across the state.

EMS agencies, particularly public agencies, generally operate within their designated boundaries, with exceptions such as mutual aid agreements. Mutual aid agreements are formal pacts between agencies that allow the sharing of personnel, equipment, and resources for EMS response under defined circumstances.[34] For example, the Seattle Fire Department has a mutual aid agreement with the Shoreline Fire Department.[35] In contrast, interfacility transport services are not constrained by these boundaries and routinely operate across jurisdictions to move patients between facilities.

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[29] RCW 70.168.100.

[30] Washington State Department of Health. (n.d.). *Regional EMS and trauma care councils*.

[31] RCW 70.168.060.

[32] Federal Interagency Committee on Emergency Medical Services. (2011). National EMS assessment: Demographics 2011. U.S. Department of Transportation, National Highway Traffic Safety Administration.

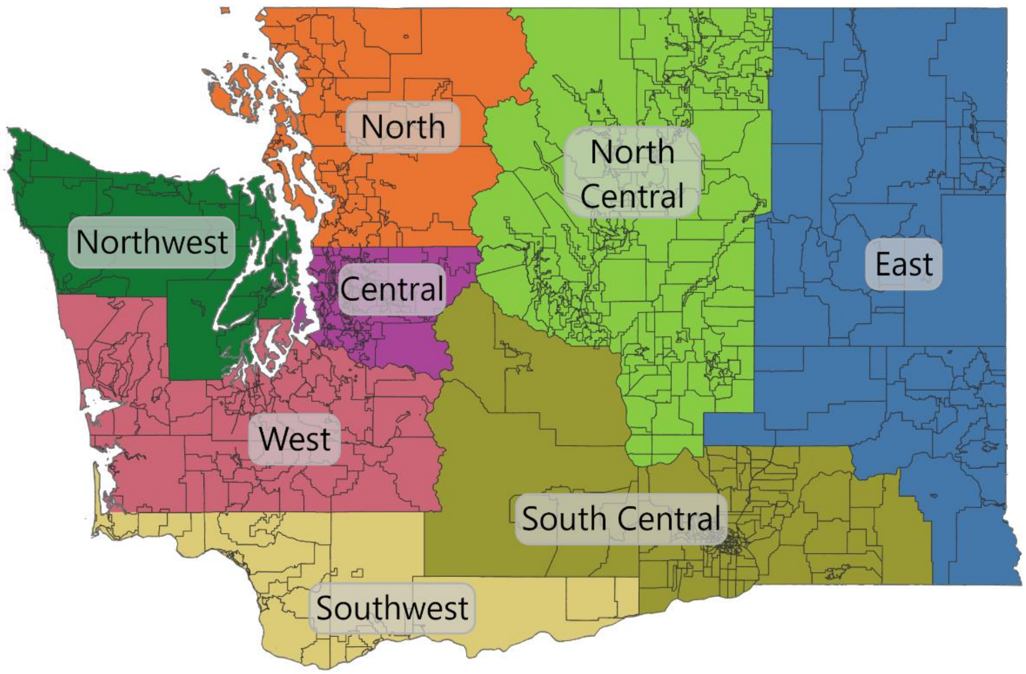
[33] Response boundaries were extracted from WA E911, a state-managed emergency response system.

[34] RCW 38.52.091.

[35] CB 119431.

Exhibit 8

Washington Regional EMS and Trauma Regions and Emergency Response Boundaries



Note:
Sourced from WaTech GIS Washington State Geospatial Portal (accessed 02/02/2026).

II. EMS Delivery and Funding in the U.S.

In this section, we discuss U.S. emergency medical services (EMS) delivery models and funding strategies. Because funding mechanisms are closely tied to how services are organized and delivered, an understanding of delivery models provides essential context for how EMS systems are financed. We also examine structural and financial challenges facing EMS systems, as well as emerging and alternative strategies for service provision.

EMS Delivery Models

EMS delivery systems and their integration into broader healthcare systems vary widely across the United States. This variation reflects differences in geography, population density, governance, and financing. Despite this variability, EMS delivery in the United States generally follows one of six common models.[36]

Fire-based EMS leverages the existing staffing, facilities, and operational infrastructure of communities with fire services. Many fire departments employ *dual-role* personnel who are cross-trained to provide both fire suppression and emergency medical services. This is a common delivery model in the U.S. The 2020 National EMS Assessment estimated 39% of U.S. EMS agency ownership was fire department-based.[37]

In Washington, more than 70% of licensed agencies are operated by fire departments (Exhibit 7).

Private EMS providers may contract with local government to provide emergency and non-emergency services. Private EMS may be run as **for-profit** or **not-for-profit** organizations.

In Washington State, private not-for-profit EMS agencies, particularly ground ambulance services, are uncommon. One prominent example is Airlift Northwest, a nonprofit air medical provider operated by UW Medicine that delivers critical care transport as part of the state's EMS and trauma system.[38] Nationwide, nonprofit EMS agencies are most common in rural communities.[39]

In 2020, private (for-profit and nonprofit) entities accounted for 34% of EMS agency ownership nationally. In Washington, private agencies represent a smaller share—approximately 14% of agencies (Exhibit 7). Despite this, they operate a disproportionate share of resources, owning 40% of ambulance vehicles and accounting for 29% of certified EMS personnel (Exhibit 3 and 4).

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36 Williams, D.M. (2006). *The myth of the perfect model*. EMS World.
37 NASEMSO & NHTSA (2020).
38 UW Medicine. (n.d.). *Airlift Northwest*.
39 Patterson, D.G., Skillman, S.M., & Fordyce, M.A. (2015). *Prehospital emergency medical services personnel in rural areas: Results from a survey in nine states* (Final Report No. 149). WWAMI Rural Health Research Center, University of Washington.

Third-service EMS describes a stand-alone EMS department—separate from fire and police—within the existing local government structure. This is a less common EMS delivery model.

In Washington, King County Medic One is an example of a third service model. King County Medic One, which delivers ALS services, is directly operated by the EMS Division of Public Health—Seattle & King County.[40]

Other national examples include Boston EMS in Massachusetts[41] and Cleveland EMS in Ohio.[42] In 2020, 11% of EMS agencies nationwide followed a third service model.

Hospital-based EMS is a declining delivery model in which a hospital or health system operates ambulance and prehospital services directly. This model can support closer integration with hospital care and leverage hospital resources for training and oversight. Hospital-based EMS is more often found in areas with limited local ambulance availability or where continuity of care is a priority. As of 2021, approximately 22% of U.S. Critical Access Hospitals[43] operated ambulance services.[44] In 2020, only 6% of national EMS agencies in the United States were hospital-based.

Most hospital-based EMS models in Washington exist under public hospital districts—community-created, governmental entities authorized by state law to deliver health services.[45] In Washington, 14 EMS agencies operate under a hospital district. This includes Whidbey Health, which operates a Critical Access Hospital in Coupeville and serves as the primary provider of hospital-based care on Whidbey Island. Other examples include Lake Chelan Health and Cascade Medical Center.

Public utility model (PUM) uses a separate quasi-governmental ambulance authority to oversee EMS within a community—setting rates, owning or managing assets, and establishing service standards—while contracting day-to-day operations to a private provider.[46] Designed to treat EMS as a public utility, the authority typically holds exclusive control over ambulance services, reports to participating cities and counties, and is advised by a public physician advisory board. While services are usually delivered by a private (often for-profit) contractor, some authorities own the ambulance fleet and retain the ability to assume operations if contractual standards are not met.

PUM systems represent a small minority of EMS systems nationwide. To our knowledge, no jurisdiction in Washington State currently employs a PUM EMS model.

[40] King County. (n.d.). *Medic One*.
[41] Hudson, M. (2021, November 11). *Prehospital tradecraft: BLS before ALS*. EMS World (JEMS).
[42] Cleveland Association of Rescue Employees (CARE) Local 1975. (2021). *A public official's guide to emergency medical services in Cleveland*.
[43] Acute care hospitals with fewer than 25 beds in rural areas may be federally designated as critical access hospitals (CAH). CAHs are often the central hub of health services in their communities, providing primary care, long-term care, rehabilitation, and other services in addition to emergency and acute care. WA DOH. *Critical access hospitals*.
[44] Rural Health Information Hub. (n.d.). *Rural emergency medical services (EMS) and trauma*.
[45] Association of Washington Public Hospital Districts. (n.d.). *What is a public hospital district?*
[46] Bryan E. Bledsoe. (2003). *EMS myth #8: Public utility models are the most efficient model for providing prehospital care*. EMS World.

Some jurisdictions have modified or moved away from public utility model EMS systems toward greater public control or hybrid structures, often citing financial pressures, workforce recruitment and retention challenges, and system performance concerns.[47] For example, in 2025, Fort Worth, Texas, transitioned from a PUM-style system to a fire department–based EMS model,[48] and a recent City of Tulsa report describes its EMS authority as transitioning toward a third-service structure in 2022.[49]

There is limited rigorous evidence comparing the effectiveness of PUM systems to alternative EMS delivery models. Existing research is largely descriptive, and system performance likely depends on local implementation and context.

Regardless of the delivery model, EMS systems generally emphasize rapid response times and advanced life support (ALS) staffing.[50]

Public-Private EMS Arrangements

In Washington, it is common for local response areas to be serviced by a collaboration between fire and private-based agencies (i.e., "public-private" partnership).[51]

Public agencies typically act as the initial responders for 911 medical calls, with private ambulance companies supporting or taking over patient care and transport.
The exact implementation of these public-private partnerships varies between Washington communities.[52] In "tiered"[53] counties like King, Pierce, and Thurston, fire departments typically provide the first response and retain ALS transport capabilities.[54]

In counties such as Spokane, Yakima, and Clark, most municipalities utilize a model where fire departments provide initial stabilization, but exclusive transport rights are franchised to private ambulance providers.[55]

In the less common "private-as-primary" model, municipalities rely on a for-profit private ambulance company as the primary EMS response and transport agency, with fire departments offering supplemental response as needed.

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[47] City of Fort Worth. (2024). *Emergency medical services system evaluation and recommendations*. Fitch & Associates and Ward, M. (2025, July 13). *3,300, high-performance EMS and clinically significant response times.* Company Commander.

[48] Anglin, D., Ellenberger, P., & DeLatte, T. (2025, July 2). *Fort Worth Fire Department takes over MedStar ambulance services*. FOX 4 News.

[49] City of Tulsa. (2025). *RFP 25-722: EMS system targeted research.*

[50] Joint Task Force on EMS Response Staffing Configurations. (2025). *Rethinking emergency medical services: Applying evidence and data to redesign response models for a resilient and sustainable future.*

[51] Communication with local EMS agency representatives (including private ambulance agencies and fire departments).

[52] These public-private partnerships are authorized under RCW 35.21.766 and RCW 36.01.100.

[53] Tiered response in EMS is a system that dispatches different levels of care—typically BLS and ALS—based on the acuity of the 911 call. In the tiered response system, paramedic (ALS) units are staffed to cover several regionally approximate communities, one large urban area, or some combination of both. This tiered-response model is supported by the provision of BLS care either by the fire service or private EMS.

[54] RCW 84.52.069.

[55] A notable exception is the Camas–Washougal Fire Department, which remains the sole fire-based transport provider in Clark County. Beginning July 2026, Spokane County Fire District 9 (SCFD9) will operate its own ambulance service.

For example, for 911 calls in Wenatchee, a Ballard or Lifeline ambulance is often the first and only unit dispatched, with the fire department “dual-dispatched” only in cases where extra support is required.[56] Interfacility and specialty care transport (SCT) is primarily handled by private ambulance companies.[57]

Funding EMS

The 1981 Omnibus Budget Reconciliation Act replaced categorical federal funding for EMS with block grants to states for preventive health services.[58] By ending targeted federal support, responsibility for funding and oversight was transferred to state and local governments. Today, EMS is primarily funded at the local level through taxes, municipal budgets, and insurance reimbursement.[59]

Fee-for-Service (Insurance Billing)

Insurance reimbursement from a third-party payer—including Medicare, Medicaid (known as Apple Health in WA), and commercial health carriers—is a prominent EMS revenue source. However, this model traditionally only pays when a patient is *transported* to a hospital.

EMS agencies bill the patient’s insurance for the medical care provided and the miles traveled. Reimbursement policies and payment structures vary substantially across payer types, as described below:

Commercial health carriers: In Washington, commercial health carriers reimburse ground ambulance services at negotiated in-network rates that vary by plan, region, provider, and service type. However, relatively few ground ambulance providers participate in carrier networks, so many ambulance transports are reimbursed as out-of-network services. As of January 2025, Washington law prohibits patients from being balance billed for out-of-network ground ambulance services.[60] Washington State law also establishes a reimbursement methodology for these out-of-network services under fully insured commercial, opted-in self-funded group, and public employee health plans.[61]

Medicare: The federal Centers for Medicare and Medicaid Services (CMS) sets fixed rates for services.[62] It has been documented that Medicare reimbursement consistently falls below actual operating costs.[63]

[56] Ballard Ambulance. (n.d.). *About*.
[57] OIC (2023).
[58] Institute of Medicine. (2007). Supporting a high-quality EMS workforce. In *Emergency medical services: At the crossroads* (pp. 31-72). The National Academies Press.
[59] Levy, M. (2025). How should we fund and reimagine EMS to support sustainable rural health infrastructure? *AMA Journal of Ethics*, *27*(7), 503-509.
[60] This expansion of the Washington Balance Billing Protection Act ensures that policyholders are only responsible for in-network cost-sharing amounts, such as copays or deductibles, even if the EMS provider is out-of-network. The law applies to all state-regulated health plans, state and school employee benefit plans, and self-funded group health plans that opt in to Washington's law. WA Rev Code § 48.49.200 (2025).
[61] This formula requires payment at the locally established or contracted rates, and if no local rate exists, it is the lesser of providers' billed charges or 325% of the current published rate for ambulance services as established by CMS for that geographic region.
[62] Centers for Medicare & Medicaid Services. (n.d.). *Ambulance fee schedule public use files*.
[63] Centers for Medicare & Medicaid Services. (2024). *Medicare ground ambulance data collection system (GADCS) report: Year 1 and Year 2 cohort analysis* and U.S. Government Accountability Office. (2007, May 23). *Ambulance providers: Costs and expected Medicare margins vary greatly* (GAO-07-383).

Nationally, in 2025, the average Medicare reimbursement for ground ambulance services was approximately $329, while some estimates suggest a funding gap as high as $2,344 per transport relative to actual expenses.[64]

Medicaid: In Washington, Apple Health pays fixed rates for covered services. Apple Health rates often cover only a portion of the total service cost.

Washington's Medicaid base reimbursement rates for ground ambulance services are among the lowest in the nation.[65] In 2025, the base rate for emergency BLS transport was roughly $115.[66] Given low fixed rates, there are two additional federal funding sources to supplement Apple Health payments for ground ambulance services.

1) *Ground Emergency Medical Transportation (GEMT*) is an optional program that allows public agencies—such as local fire departments—to recover the actual costs of providing emergency services to Medicaid patients.[67] It allows agencies to combine local funding with federal matches to move toward "cost-recovery" for Medicaid transports. Currently, 150 agencies (approximately 38% of eligible public EMS agencies) participate.[68]

2) *Ambulance Transport Quality Assurance Fee Program (QAF*) uses a "provider tax" model to increase Medicaid reimbursement for private and nonprofit emergency ground ambulance providers.[69] Ambulance providers pay a mandatory fee of $19.60 for each emergency transport they perform. The state then uses these funds to obtain matching federal Medicaid dollars, which are used to increase reimbursement rates for eligible Apple Health emergency ambulance transports.[70] Under this program, eligible transports currently receive a supplemental add-on payment of $231.23 per transport. [71]

For context, in fiscal year 2025, 185 public EMS agencies in Washington experienced the following payer mix: Medicare 56%, Medicaid 20%, commercial 18%, and self-pay (uninsured) 6%.[72] This payer mix has been generally consistent over the last five years. The total amount collected in reimbursement in fiscal year 2025 was about $177 million, with 37% coming from Medicare, 40% from Medicaid, 23% from commercial payers, and less than 1% from uninsured patients.

[64] PWW Advisory Group. (2025, February 17). *Quantifying the gap between expenses and revenue for EMS services*. EMS1.
[65] American Ambulance Association. (n.d.). *Medicaid reimbursement*.
[66] Washington State Health Care Authority (2025).
[67] RCW 41.05.730.
[68] A. Cole Section Manager, Hospital Finance, Hospital Rates and Drug Rebate, Health Care Authority (personal communication, March 5, 2026).
[69] RCW 74.70.
[70] QAF is being updated via HB 2531 (signed March 11, 2026) to remain in compliance with HR 1. Under the new state law, the tax rate ($19.60) is effectively permanent and cannot be raised. Instead, the reimbursement add-on ($231.23) will now be adjusted annually by HCA starting July 1, 2026.
[71] The enhanced payment is not made for non-emergency transport or mileage, but it can be made for specialty care transports.
[72] J. Braus, CEO, Systems Design West (personal communication, January 23. 2026)

Local Government Funding

In Washington, local government funding is only directly available to public EMS agencies. For these agencies, local funding, such as levies, typically represents a much larger share of revenue than fee-for-service reimbursement.

Within the state, three general funding sources allow local and county governments to fund public EMS services:

1. **Levy:** The most common in local funding source in Washington, a levy is a voter-approved property tax that provides dedicated funding for emergency medical care, including EMS personnel, ambulances, and equipment. In Washington, local governments can impose a property tax levy of no more than $0.50 per $1,000 of assessed value of property for emergency services.[73] Levies must be voter-approved and can last for six years, ten years, or be permanent.[74]
2. **Utility fee:** Local governments create a fee structure that can fund ambulance transport services for all users or residents (i.e., like the monthly fee for waste disposal services).[75] Examples of Washington municipalities with an EMS utility fee include Aberdeen,[76] Hoquiam,[77] and Richland.[78]
3. **Local government general funds:** Allows municipalities (or counties) to appropriate a portion of their general funds to the EMS budget.[79] For example, Seattle Fire Department's Medic One is funded through the City of Seattle's general fund.[80] Fire departments in Yakima and Union Gap receive funding from the city's general fund to support EMS services.[81]

EMS Subscription Programs

Subscription programs allow households and businesses to pay an upfront, established fee to offset future emergency medical transport expenses. In Washington, Airlift Northwest offers services on a membership basis ($60 per year per household).[82] Acadian Ambulance operates membership programs across Texas, Louisiana, Tennessee, and Mississippi.[83] In Pennsylvania, several nonprofit and volunteer EMS agencies, such as Geisinger EMS and EmergyCare, utilize membership programs to bridge the gap between insurance reimbursements and operating costs.[84]

[73] RCW 84.52.069.
[74] Levy revenue cannot increase by more than 1% over the course of one year, also referred to as the 1% cap.
[75] RCW 35.21.766.
[76] City of Aberdeen. (n.d.). *Emergency medical services*.
[77] City of Hoquiam. (2024). *Municipal code ch. 1.45: Ambulance service*. Municipal Code Corporation.
[78] City of Richland. (n.d.). *Municipal code ch. 13.06: Medical and ambulance service*. Code Publishing Company.
[79] RCW 35.21.766.
[80] City of Seattle. (2023). *2023 adopted and 2024 endorsed budgets: Seattle Fire Department*.
[81] Emergency Services Consulting International. (2013). *Regional fire authority fiscal analysis: Yakima, Union Gap, Yakima County Fire Districts #10 and #11, Washington*. Municipal Research and Services Center.
[82] U.W. Medicine. (n.d.). *Airlift Northwest membership*.
[83] Acadian Ambulance Service. (n.d.). *About Acadian membership*.
[84] EmergyCare. (n.d.). *About our membership program*.

State Funding

No state in the United States operates a fully state-funded EMS system. A 2023 research memorandum identified nine states that provide state funding for EMS, utilizing dedicated revenue streams (e.g., motor vehicle fees) and direct appropriations.[85]

Hawaii assumes primary responsibility for providing and funding county EMS services. While state-funded, the operation is managed through contracts with the counties. Hawaii funds EMS services with both general and special funds.

Delaware and New Mexico share responsibility for funding EMS with counties. Both states appropriate state general funds to support county EMS services.

Six states (Colorado, Idaho, Maryland, Ohio, Pennsylvania, and Virginia) supplement local EMS funding with state special EMS funds. These states generate revenues for EMS special funds through motor vehicle fees, traffic violation fees, EMS/EMT licensure and certification fees, or other state fees.

EMS as an Essential Service. While fire and police services are considered essential in all 50 states, EMS has historically lacked this statutory mandate, meaning that local governments are not legally required to ensure emergency medical services are available to their residents.

We identified 22 states and the District of Columbia that have designated EMS as an essential service.[86]

In several states with legislation designating EMS as an essential service, funding is still primarily left to counties and local governments. While the designation encourages, mandates, or provides mechanisms for better local funding, it rarely implies a state-funded system.

State Funding in Washington. Washington, like most other states, relies primarily on local funding and fee-for-service reimbursement. In Washington, EMS is not a state-mandated service, and the state does not provide primary or matching general fund support for county operations.

While state-level operational funding is limited, *public* EMS agencies can access several targeted grants. These typically focus on rural sustainability, trauma care, and specific innovations rather than on the general daily cost. Examples of Washington state-level EMS funding and grant programs include Trauma Care and EMS Grants,[87] Emergency Medical Services and Trauma Care System Trust Account,[88] and Behavioral Health Innovation Grants.[89]

These grants are sometimes competitive and serve as a supplementary rather than a core funding source.

[85] Wyoming Legislative Service Office. (2023). *Emergency medical services in Wyoming and other states: Designation of EMS as an essential service and funding* (Research Memorandum No. 23RM015).

[86] National Conference of State Legislatures. (2025, June). *State policies defining EMS as essential*.

[87] RCW 70.168.130 and RCW 70.168.135.

[88] RCW 70.168.040.

[89] Behavioral Health Crisis Outreach Response and Education (BHCore). (2025). *Fire/EMS agencies 2024–2025 innovation grants*.

Federal Funding

No state relies primarily on federal funding for the daily, routine operation of EMS. Federal funding for EMS is rarely provided as direct, annual operating subsidies.[90] Instead, federal support is mainly delivered through Medicare/Medicaid reimbursements and targeted, competitive grants and programs rather than guaranteed operating subsidies.

A significant portion of federal grant funding is limited to public and nonprofit EMS agencies. These prioritize specific projects over daily operations. Some examples include:

- **SIREN/Rural EMS:** Targets rural training and equipment for local/tribal agencies.[91]
- **FLEX EMS Supplement:** Funds state-led strategies for rural personnel recruitment and retention.[92]
- **FEMA Assistance to Firefighters Grant (AFG):** Provides competitive funding for vehicles, gear, and training to fire and non-affiliated EMS.[93]
- **NHTSA Safe Streets and Roads for All (SS4A):** Funds "post-crash care" improvements—such as dispatch tech and specialized vehicle systems—as part of local roadway safety plans.[94]

Despite consistent research evidence that EMS financing is fragmented and readiness costs are underfunded,[95] no systematic evaluations of comprehensive EMS financing models were identified in our review of relevant literature. A recent report similarly concludes that the "financing and cost-effectiveness of emergency medical services remain poorly understood despite affordability and financial barriers comprising some of the most significant obstacles to (system) development."[96]

Structural Challenges

In this section, we review key challenges affecting the sustainability of EMS delivery and funding in the United States.

Rural EMS

EMS access disparities are driven by geographic isolation and economic constraints.[97] "Ambulance deserts," defined as areas where residents are more than 25 minutes from the nearest ambulance station, affect an estimated 4.5 million people across 41 states.[98]

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[90] Fitch, J.J., Knight, S., & Griffiths, K. (2019). *EMS: Demonstrating value in a changing healthcare system*. Gov1.
[91] LaSala, K. (2024, September 19). *Congress passes SIREN Act reauthorization to assist rural EMS*. International Association of Fire Chiefs.
[92] Health Resources and Services Administration. (2024). *Rural EMS training and equipment assistance program (HRSA-24-006)*. U.S. Department of Health and Human Services.
[93] Federal Emergency Management Agency. (2025). *Assistance to firefighters grants program*. U.S. Department of Homeland Security.
[94] U.S. Department of Transportation. (n.d.). *Safe streets and roads for all (SS4A) grant program*.
[95] National EMS Advisory Council (NEMSAC). (2013). *EMS System Funding and Reimbursement.* U.S. Department of Transportation.
[96] Delaney, P.G., Offorjebe, O.A., & Arudo, J. (2024). Financing and cost-effectiveness of emergency medical services in low- and middle-income countries. *Surgery*, *176*(4), 1302-1304.
[97] EMS World. (2025). *EMS access disparities: Lessons from underserved communities and historical inequities*.
[98] Zuckerman, R., Gale, J.A., & Coburn, A.F. (2023). *Ambulance deserts: Geographic disparities in emergency medical services provision*. Maine Rural Health Research Center.

Many agencies, particularly in rural or underfunded areas, face limited budgets and struggle to maintain equipment and staffing. These challenges are compounded by constrained healthcare infrastructure, longer response and transport times due to distance and geography, higher per-unit costs driven by low call volumes, and fragmented regional coordination that limits system efficiency.[99]

Reimbursement Models

The Centers for Medicare & Medicaid Services and many private insurers classify EMS primarily as a transportation service rather than a healthcare provider.[100]

This structure means that when EMS provides treatment on scene without transporting a patient—commonly referred to as treat-no-transport (TNT)—those services are often not reimbursed.[101] As TNT encounters become more common, particularly for low-acuity and behavioral health calls, this creates financial challenges for both transport agencies when no transport occurs and for non-transporting aid agencies that deliver on-scene care.

Furthermore, a transport-based reimbursement model does not adequately account for the fixed costs associated with maintaining continuous EMS readiness.

As a result, private ambulance agencies often rely on a mix of emergency response and interfacility transport, with the latter generally providing a more predictable source of demand within the broader healthcare system.[102]

EMS Workforce Capacity

Workforce recruitment and retention can influence EMS operational capacity and response timeliness. Challenges vary across communities, but commonly reported factors include personnel safety concerns, declining volunteer participation, long ambulance offload times, responder burnout associated with trauma exposure, increasing encounters with evolving and complex patient populations (including individuals affected by opioid use, homelessness, or mental health crises), and growing service demand.[103]

EMS Community Risk Reduction Programs

In response to structural challenges, EMS systems have adopted alternative service delivery approaches to better manage demand and improve care coordination. Strategies such as treatment in place, behavioral health co-response, and community paramedicine aim to reduce unnecessary 911 calls and emergency department use by directing patients to more appropriate care settings, consistent with a "right care, right time, right setting" framework.

[99] MacKinney, A.C., Mueller, K.J., Coburn, A.F., Knudson, A., Lundblad, J.P., & McBride, T.D. (2021). *Characteristics and challenges of rural ambulance agencies: A brief review and policy considerations*. Rural Policy Research Institute (RUPRI) Health Panel.
[100] Louisiana Department of Health, Office of Public Health, Bureau of Emergency Medical Services. (2020). *What is EMS?*
[101] Washington State Office of the Insurance Commissioner. (2025). *Ground ambulance services organizations: Treat but no transport report.*
[102] Heaton, J., & Kohn, M.D. (2025). *EMS inter-facility transport. In StatPearls*. StatPearls Publishing.
[103] Based on conversations and emails with EMS agencies and the Washington State Council of Firefighters (WSCFF). Minge, A.W. (2025). *The EMS workforce is sounding the alarm: 2025 EMS trend survey*. Pulsara.

Treatment in Place

Treatment in Place (TIP) is a clinical and billing model that permits EMS personnel to provide definitive care on-scene for low-acuity conditions or use telehealth to consult with physicians for a "treat and release" or "treat and refer" outcome. The objective is to treat patients on-scene or navigate them to alternative care settings without an ER visit. TIP represents a fundamental shift in EMS from a transport-based model to a care-focused model.[104]

The federal CARE Act (introduced in late 2025) is the primary national legislative vehicle aimed at expanding TIP and providing a permanent federal funding model (currently, the CARE Act provides a transitional, five-year pilot model rather than a permanent entitlement).[105]

Behavioral Co-Response

Behavioral co-response is an emergency response model where human services professionals (such as social workers or behavioral health clinicians) partner with traditional first responders (police, fire, or EMS) to respond to calls for service involving behavioral health issues and complex medical needs.[106] These partnerships provide immediate, on-scene crisis response. In addition to 911 response, co-response programs can provide follow-up, case management, and prevention services.

The goal is to divert individuals with behavioral health issues from traditional EMS and the criminal justice system.

A 2022 survey identified 61 co-response programs operating across 44 cities in 14 counties in WA, responding to nearly 60,000 unique client encounters. Co-response programs vary in the breadth of offered services and in the types of situations to which they respond.[107] Emerging evidence on EMS-led behavioral health co-response models suggests they are associated with reductions in unnecessary emergency department transports and improvements in on-scene triage and matching to appropriate care, while maintaining patient safety.[108]

Mobile Integrated Health and Community Paramedics

Mobile integrated health (MIH) and community paramedic programs are complementary to acute crisis response models. They are a long-term healthcare response designed to manage chronic conditions over weeks or months to prevent 911 calls.

Mobile integrated health provides healthcare services—such as wound care and vaccinations—outside traditional medical facilities, often through multidisciplinary teams. Community paramedicine expands the role of EMTs and paramedics beyond emergency response to include preventive and primary care, patient assessment, and connections to medical and social services, particularly for underserved populations and individuals with ongoing care needs.

[104] Centers for Medicare & Medicaid Services (CMS). (2019). *Emergency Triage, Treat, and Transport (ET3) Model*.
[105] H.R 2538/S. 3145.
[106] Co-Response Outreach Alliance (CROA). (2023). *What and where is co-response in Washington State?* (Issue Brief No. 1).
[107] CROA (2023).
[108] Substance Abuse and Mental Health Services Administration. (2020). *National guidelines for behavioral health crisis care: Best practice toolkit*. Rockville, MD.

CARES Programs in Washington

In 2017, Washington authorized fire departments to receive Medicaid reimbursement for certain community health services provided through Community Assistance Referral and Education Services (CARES) programs.[109] More than 50 agencies have implemented CARES programs such as co-response, mobile integrated health, and community paramedicine to reduce nonemergency 911 use, particularly among frequent utilizers.[110] Evidence suggests these programs improve patient outcomes and reduce costs by connecting patients to appropriate care and avoiding unnecessary transports.[111]

Although the State Department of Health provides general EMS oversight, no statewide entity currently tracks or regulates CARES programs. However, in 2019, DOH submitted a report to the Legislature outlining recommendations to standardize and strengthen CARES programs in Washington State.[112]

[109] RCW 35.21.930.
[110] Washington State Auditor's Office. (2025). *Reducing nonemergency use of emergency systems* (Report No. 1038046). State of Washington.
[111] Bradley, K.W.V., Esposito, D., Romm, I.K., Loughnane, J., Ajayi, T., Davis, R., & Kuruna, T. (2016). *The business case for community paramedicine: Lessons from Commonwealth Care Alliance's pilot program*. Center for Health Care Strategies.
[112] Washington State Department of Health. (2019). *Reimbursement for health care services (CARES): Report to the legislature*. State of Washington.

III. EMS in Washington: Trends and Projected Demand

In this section, we summarize historical trends in EMS demand and present forecasts of expected demand over the next two years.

EMS Response Data

We obtained data about EMS responses, occurring between January 1, 2019, and December 31, 2024, from the Washington Emergency Medical Services Information System (WEMSIS) provided by the State DOH.[113] WEMSIS is the state's prehospital data repository for electronic patient care records.

Our data included information on 5,023,904 EMS incidents, where each incident represents a single emergency event and includes information on all responding EMS vehicles and patients involved.

For each incident, the data capture:

- **Timing and location** (e.g., the incident address, when the call was received, when EMS arrived on scene, and when care was transferred to a hospital).
- **Vehicle-level characteristics**, including care capability (e.g., ALS or BLS) and whether services were delivered by each responding unit.
- **Patient information**, including condition and demographic characteristics.

For this analysis, we summarized counts of EMS incidents by quarter at the state and county level to examine trends and forecast future demand.

Some EMS agencies were excluded from these analyses because they did not report data consistently to WEMSIS across all study years (2019–2024). Our final sample included responses from agencies representing approximately 55% of licensed EMS agencies. Of the 539 agencies identified as operating during the study period, 119 did not appear in WEMSIS at all, and 135 did not report data every year. Although the precise extent of missing records cannot be independently verified, the WEMSIS website indicates that our sample likely captures at least 74% of EMS records statewide.[114] Accordingly, the results presented in this section should be interpreted cautiously, as they likely understate the true level of statewide EMS demand.

Additional details about data processing and missing agencies are provided in Appendix Section I.

[113] Washington State Department of Health (2026) and *Washington EMS Information System (WEMSIS)*.

[114] Washington State Department of Health (2026).

Statewide Trends

Exhibit 9 presents the statewide number of EMS incidents (green) and incidents resulting in transport (orange), by quarter, in our study sample. On average, there were approximately 209,000 EMS incidents per quarter (about 823,000 annually), with a marked decline during the COVID-19 pandemic followed by a gradual increase in subsequent years.

Approximately 60% of EMS incidents result in transport, representing about 128,000 transports per quarter (approximately 512,000 annually). Trends in transport closely mirror overall EMS incident patterns.

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Exhibit 9

EMS Responses and Transports, WEMSIS 2019-2024

Note:
Washington State Department of Health, *Washington EMS Information System (WEMSIS)* (2026).

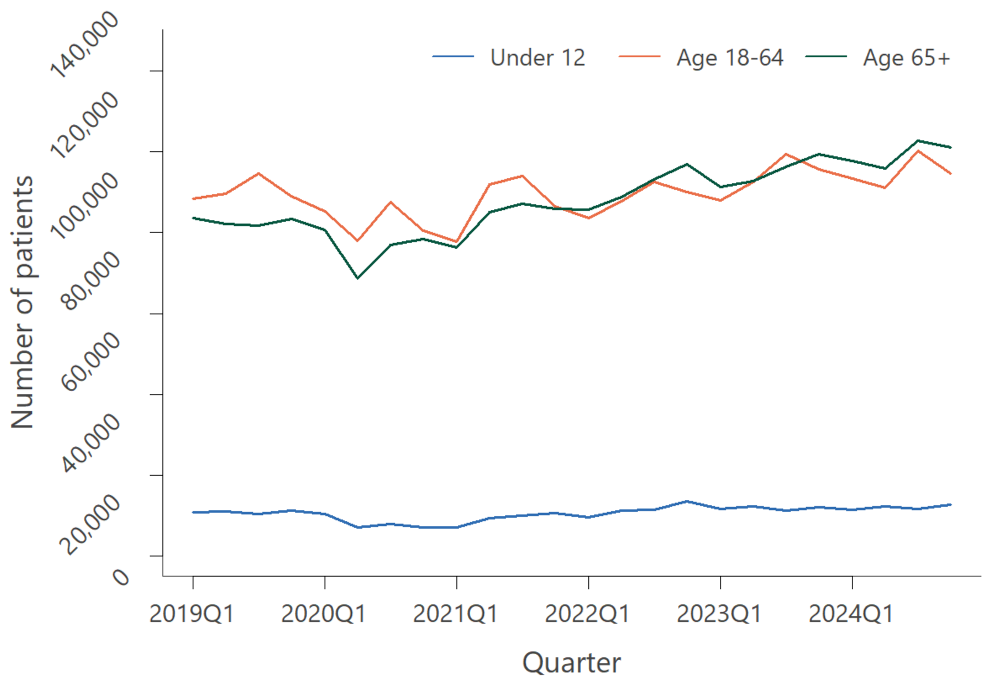
Response by Age

Exhibit 10 depicts EMS responses by age group: 12 and under, 18-64, and 65 and older.[115]

While tracking closely at about 88,000 responses per quarter, by the end of the study period, adults ages 65 and older are involved in slightly more EMS incidents annually than adults ages 18–64, despite representing a much smaller share of the population—adults ages 18-64 represent more than three times the population of adults ages 65 and older.

Exhibit 10

EMS Response by Age, WEMSIS 2019-2024



Note:
Washington State Department of Health, *Washington EMS Information System (WEMSIS)* (2026).

[115] When multiple patients are associated with the same incident, each patient is counted separately.

Transport Type

Exhibit 11 presents the number of transports by vehicle capability (ALS versus BLS).[116] ALS transports have declined since 2021, while BLS transports steadily increased, reaching levels comparable to ALS transports by 2024.

In our sample, about 55% of transports were conducted by a private ambulance organization—about 47% of ALS transports and 63% of BLS transports.[117]

Exhibit 11

ALS and BLS Ambulance Transports, WEMSIS 2019-2024

Notes:
Washington State Department of Health, *Washington EMS Information System (WEMSIS)* (2026).
There was a gap in reporting from AMR Spokane in 2024 Q2.

[116] We cannot differentiate ILS transport vehicle capability from ALS and BLS transport vehicle capability in the WEMSIS data.

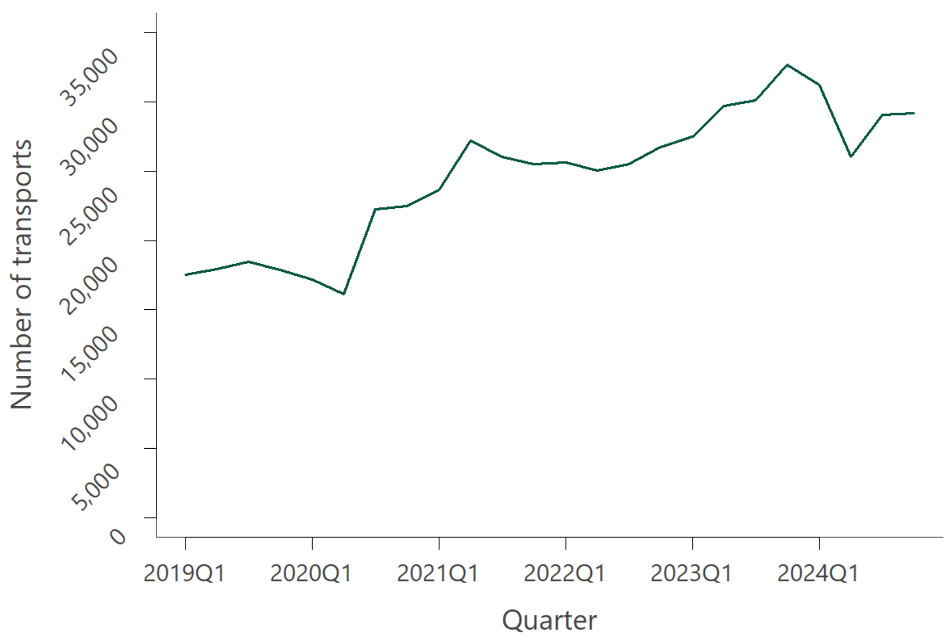
[117] Supplement Appendix SA4 indicates the percentage of transports by private EMS across counties.

Interfacility Transport. Exhibit 12 depicts the number of interfacility transports (IFT). An IFT is the movement of a patient between two healthcare facilities (e.g., hospital to hospital, or hospital to nursing home) to access specialized care, higher-level services, or for administrative reasons. In Washington, these transports were primarily completed by private ambulance organizations. In our sample, about 60% of IFTs were conducted by a BLS-capable vehicle.

In our sample, there was an average of approximately 24,000 IFTs per quarter (about 98,000 annually). However, these figures should be interpreted with caution. Some agencies may not have consistently classified IFTs accurately, particularly in earlier years, and the extent of any misclassification cannot be determined. Changes in reporting practices likely explain at least part of the sharp increase observed after 2021 and the decline in 2024. As a result, apparent changes over time may reflect reporting differences as well as actual changes in transport volume.

Exhibit 12

Interfacility Transports, WEMSIS 2019-2024



Note:
Washington State Department of Health, *Washington EMS Information System (WEMSIS)* (2026).

Treat-No-Transport

Last, we examine recent trends in treat-no-transport (TNT) responses (Exhibit 13). TNT refers to services rendered at the scene of an incident in response to a 911 call when an EMS agency dispatches an ambulance or aid unit, but the patient is not transported to a hospital or behavioral health emergency services provider. On average, there were 56,000 TNT responses quarterly (over 200,000 annually), gradually increasing after 2020.

Overall, EMS responses and transports increased over the past five years, with a sharp decline during the COVID-19 pandemic, likely reflecting changes in healthcare utilization and hospital capacity during that time. These trends were consistent with national trends. However, incomplete reporting limits these findings—observed volumes represent a lower bound and likely understate true EMS demand in Washington State.

Exhibit 13

Treat-no-Transport Responses, WEMSIS 2019-2024

Note:
Washington State Department of Health, *Washington EMS Information System (WEMSIS)* (2026).

County Patterns

Demand for EMS services varied widely across the state and was strongly associated with population size. King County had the highest average annual number of EMS responses in our sample (232,651 annual average), while Garfield County had the lowest (282 annual average).

Annual county-level EMS incident counts from 2019 to 2024 can be found in Supplemental Appendix Exhibits SA5-SA8. However, the previously noted data limitations are more pronounced at the county level, where incomplete reporting can substantially distort local trends and make year-to-year changes difficult to interpret.

Forecasted EMS Demand

Using the same WEMSIS data from 2019 to 2024, we conducted forecasting analyses to project EMS response volumes over the next three years.[118]

Because only a limited number of historical observations are available—and because recent utilization patterns were affected by disruptions such as COVID-19—these forecasts are subject to substantial uncertainty. As a result, they should be interpreted as indicating the likely direction and approximate magnitude of future demand rather than precise future counts.

[118] Predicted values are estimated using an ARIMA model. For more information about our methodology and results from alternative forecasting methodologies, refer to Appendix Section II.

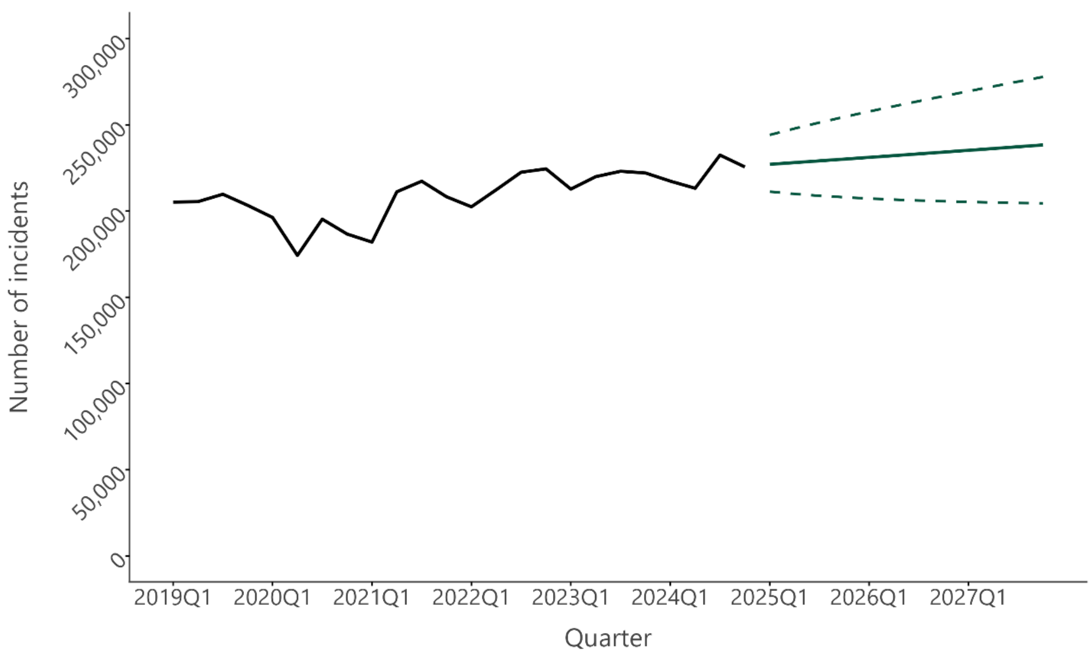
Statewide Projections

Exhibit 14 presents projected quarterly statewide EMS response volume for 2025–2027 (green line), together with the upper and lower bounds of the 80% prediction interval (dashed green lines).[119] This prediction interval reflects the range of plausible future values given uncertainty in the estimates.

Overall, statewide EMS demand is projected to increase by 2.6% annually through 2027. However, the relatively wide prediction interval indicates that slower growth or temporary declines are possible. Accordingly, the precise projected values should be interpreted with caution.

Exhibit 14

Forecasted Demand for EMS responses



Notes:
Analyses use data from the DOH WEMSIS (2019-2024).
The solid green line denotes forecasted values, and the 80% upper and lower bounds of the prediction interval are denoted by the dashed lines.

[119] Because WEMSIS data are currently available only through 2024, estimates for 2025 are forecasted rather than observed.

Exhibit 15 (Panel A) summarizes these estimated values as annual projections over the next two years. We estimate an average annual increase of approximately 24,000 EMS incidents between 2026 and 2027.

We also project growth in transports (2.5% annually), interfacility transports (11% annually), and treat-no-transport incidents (4.2% annually). However, the projected increase in interfacility transports should be interpreted with particular caution and is likely overstated, as historical growth in this category may partly reflect changes in reporting and classification practices rather than true increases in volume.

County Projections

County-level data are more variable and more sensitive to reporting inconsistencies than statewide totals. To ensure reliability, we present forecasts for overall EMS demand only in counties where the model demonstrated acceptable predictive performance.[120]

Exhibit 16 presents EMS demand projections for 17 counties. County-level EMS responses are projected to range from modest declines of about 1% to increases of approximately 10% over the next two years.

Exhibit 15

Forecasted Demand for EMS responses

Year	Forecasted count	Change in counts	Lower 80% prediction interval	Upper 80% prediction interval
Panel A: All EMS responses				
2026	937,672	23,606 (2.6%)	874,727	1,005,144
2027	961,887	24,214 (2.6%)	897,317	1,031,102
Panel B: EMS transports				
2026	575,636	14,070 (2.5%)	534,040	620,473
2027	590,059	14,423 (2.5%)	547,420	636,018
Panel C: Interfacility transports				
2026	154,960	15,427 (11%)	135,826	176,790
2027	172,094	17,134 (11%)	150,845	196,337
Panel D: Treat-no-transport				
2026	248,937	10,067 (4.2%)	228,923	270,700
2027	259,428	10,492 (4.2%)	238,572	282,109

Note:
Analyses use data from the DOH WEMSIS (2019-2024).

[120] Model performance across counties is summarized in Appendix Exhibit A6.

Exhibit 16

Forecasted Volume of EMS Responses, by County

County	Year	Forecasted count	Change in counts	Lower 80% prediction interval	Upper 80% prediction interval
Adams	2026	2,379	146 (7%)	2,131	2,657
	2027	2,535	156 (7)	2,270	2,831
Asotin	2026	4,184	307 (8)	2,838	6,177
	2027	4,516	331 (8)	2,766	7,377
Chelan	2026	7,708	272 (4)	6,928	8,577
	2027	7,990	282 (4)	7,181	8,891
Clark	2026	51,985	-397 (-1)	46,595	58,002
	2027	51,591	-394 (-1)	45,205	58,882
Ferry	2026	475	25 (6)	366	616
	2027	502	27 (6)	387	651
Garfield	2026	345	16 (5)	292	408
	2027	362	17 (5)	306	428
Grays Harbor	2026	13,163	609 (5)	11,537	15,020
	2027	13,801	638 (5)	11,792	16,154
Island	2026	12,809	585 (5)	11,366	14,434
	2027	13,422	613 (5)	11,910	15,125
Kitsap	2026	36,500	441 (1)	33,478	39,797
	2027	36,946	446 (1)	33,220	41,092
Lincoln	2026	1,048	71 (7)	916	1,199
	2027	1,124	76 (7)	983	1,286
Mason	2026	11,719	1,066 (10)	1,0786	12,733
	2027	12,891	1,172 (10)	1,1865	14,006
Pend Oreille	2026	2,631	265 (11)	2,218	3,121
	2027	2,925	295 (11)	2,466	3,470
Pierce	2026	93,185	2,262 (2)	7,9645	109,031
	2027	95,503	2,318 (2)	7,9864	114,208
San Juan	2026	3,336	199 (6)	2,647	4,204
	2027	3,547	211 (6)	2,815	4,470
Skagit	2026	21,013	497 (2)	1,9756	22,351
	2027	21,522	509 (2)	2,0234	22,892
Skamania	2026	1,457	40 (3)	1,270	1,670
	2027	1,497	41 (3)	1,306	1,717
Whatcom	2026	32,378	1,211 (4)	26,505	39,563
	2027	33,637	1,258 (4)	26,241	43,124

Note:

Analyses use data from the DOH WEMSIS (2019-2024).

IV. EMS Response Times in Washington State

In this section, we present our analysis of EMS response times in Washington State.

Response Times

Response time is commonly defined as the duration from receiving a 911 call to an ambulance's arrival on scene. It is a commonly used performance metric for EMS systems, in part because it is easily recorded and measured in comparison to other incident outcomes.[121] There is also evidence that rapid access to EMS services is associated with improved medical outcomes.[122] In recent years, researchers and practitioners have highlighted the issue of "ambulance deserts," commonly defined as areas without access to EMS services within 25 minutes.[123]

Calculating Response Times

An EMS response can be divided into multiple phases. First, an EMS vehicle is dispatched to an incident and travels from its starting location to the incident location. EMS personnel then locate any patients, evaluate them, and administer treatment. Next, patients requiring further treatment are transported to a medical facility. Upon arrival, EMS personnel transfer patient care to medical facility personnel.

We use data in the 2024 WEMSIS records[124] to calculate the following durations:[125]

- Response time: the duration from EMS unit notification to arrival at the incident location for the first responding unit.
- Transport time: for incidents that involve patient transport, the duration from the transporting unit leaving the incident location to its arrival at the destination.
- Ambulance patient offload time (i.e., wall time): the duration from arrival at the medical facility to transfer of patient care.

Incident Location

We obtained geographic coordinates for each incident using incident address data in WEMSIS records. We then identified which emergency response boundary each incident occurred in. We also identified whether an incident occurred in an urban or rural designated census block.[126]

[121] Al-Shaqsi, S.Z.K. (2010). Response time as a sole performance indicator in EMS: Pitfalls and solutions. *Open access emergency medicine: OAEM*, *2*, 1.
[122] Eisenberg, M.S., Bergner, L., & Hallstrom, A. (1979). Cardiac resuscitation in the community: importance of rapid provision and implications for program planning. *Journal of the American Medical Association, 241*(18), 1905-1907.
[123] Jonk, Y., Milkowski, C., Croll, Z., & Pearson, K. (2023). *Ambulance deserts: geographic disparities in the provision of ambulance services*. Portland, ME: Maine Rural Health Research Center.
[124] These data do not include EMS responses that were not submitted to WEMSIS. Of agencies licensed with DOH in 2024, 17% did not have WEMSIS data. DOH estimates that WEMSIS records captured between 92% and 98% of total EMS responses in 2024. DOH. *Data requests.*
[125] For all durations, we omit incidents with negative or extreme values from our analysis. We follow Washington State DOH guidance in defining extreme values as durations longer than five hours. See Exhibit A3.
[126] U.S. Census Bureau. (2024). *Block-level Urban Area information for the 2020 Census*.

Response Type

We estimate response times separately for 911 responses (emergency/scene responses) versus interfacility transports (IFT). While 911 calls prioritize the fastest possible arrival, IFTs often involve coordination between medical facilities and specialized equipment, which results in scheduled response times and longer patient preparation times.

Response Time

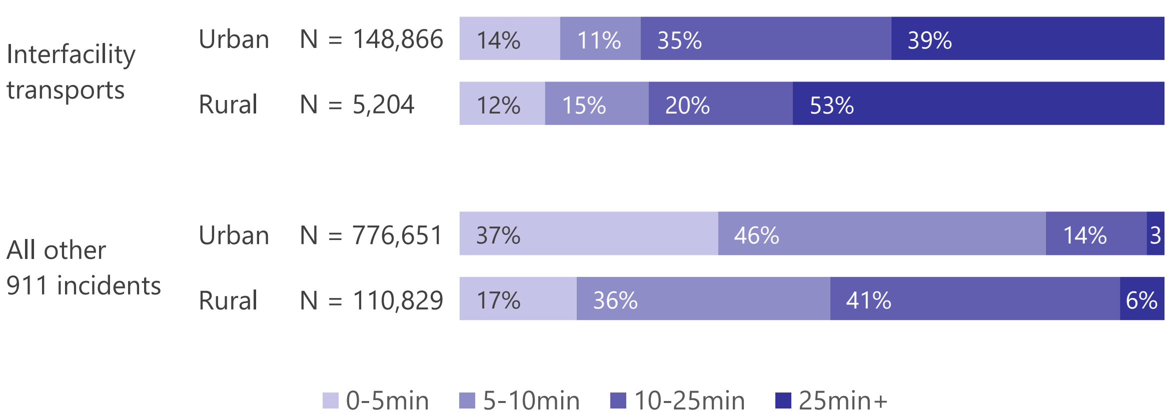
In 2024, the average response time for interfacility transports was 25.4 minutes. The average response time for all other 911 incidents was 8.2 minutes.

Response times varied significantly by region—Exhibit 17 depicts the distribution of response times by region. About 6% of 911 incidents in rural areas featured response times of more than 25 minutes, versus 3% for 911 incidents in urban areas.[127] Similarly, about 37% of incidents in urban areas featured response times of five minutes or less (i.e., rapid response) versus 17% of incidents in rural areas.

Average response times for IFT were also longer in rural areas relative to urban areas. County-specific response time distributions are summarized in Supplemental Appendix Exhibits SA9-SA12.

Exhibit 17

Average Response Times in Washington State



Notes:
Response times are based on WEMSIS records from calendar year 2024.
Urban/rural designations are based on the census block in which incidents occurred.

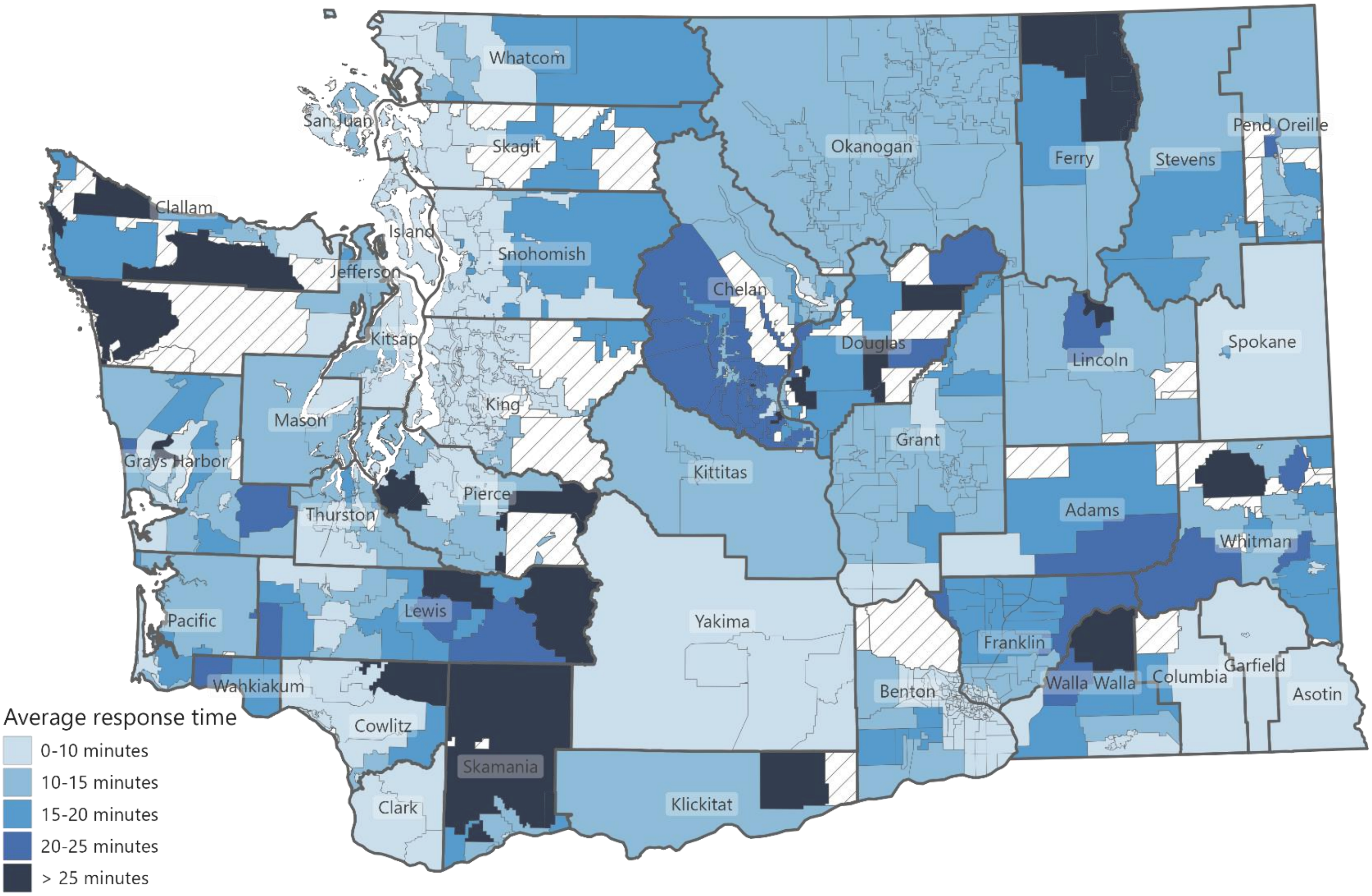
[127] In 2024, 0.6% of rural 911 incidents (N = 689) and 0.4% of urban 911 incidents (N = 3,334) had a response time of more than 60 minutes.

Exhibit 18 depicts the average 911 response time by EMS response boundary.[128] About 6% of EMS boundaries report an average response time greater than 25 minutes.

Areas with the longest response times tended to be less populated and less geographically accessible, such as areas in the Olympic Peninsula, northeastern Washington, and the Cascade Mountain range.[129]

Exhibit 18

Average 911 On-Scene Response Time



Note:
Hatched lines indicate emergency response boundaries with fewer than 10 recorded incidents in 2024.

[128] 101 out of 481 response boundaries were censored due to incident counts below ten in 2024.
[129] One emergency response boundary near Crystal Mountain in Mt. Rainier National Park had an average response time of over 60 minutes for non-interfacility incidents.

Transport Time

In 2024, 68% of EMS incidents resulted in patient transport. Approximately 14% of these transports were interfacility transports (IFTs). Among the remaining 911-related transports, roughly 50% were conducted by Advanced Life Support (ALS) ambulances and 50% by Basic Life Support (BLS) ambulances. The average transport time for IFTs was 33.8 minutes. Among other 911 responses, the average for ALS transports was 15.4 minutes, and the average for BLS transports was 16.5 minutes.

Exhibit 19 presents the distribution of transport times by transport type and region type. Transport times exceeding 25 minutes were more than twice as prevalent for incidents occurring in a rural area.[130]

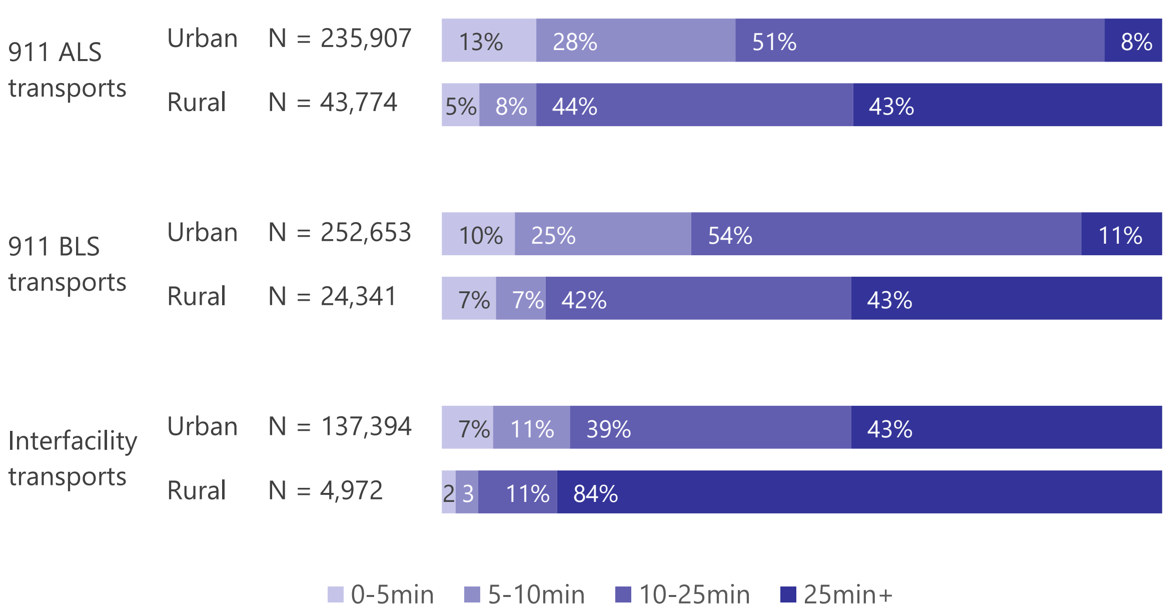
We do not observe large differences in transport times based on ALS or BLS unit level of care.[131]

Interfacility transports feature much longer transit times than 911 responses. 911 responses generally prioritize patient transport to the nearest facility, while IFT involves transport to a facility based on patient needs.

Supplemental Appendix Exhibits SA19 and SA20 present maps of transport times in Washington State. Like before, longer transport times were associated with lower population density and geographic accessibility.[132]

Exhibit 19

Average Transport Times in Washington State



[130] In 2024, 1.8% of rural 911 transports (N = 2,032) and 0.7% of urban 911 transports (N = 5,622) had a transport time of more than 60 minutes.
[131] County-level transport time distributions are summarized in Supplement Appendix Exhibits SA13-SA18.
[132] Of the 481 emergency response boundaries, 179 were censored for ALS transports, and 212 were censored for BLS transports due to transport counts below ten in 2024.

Ambulance Patient Offload Time

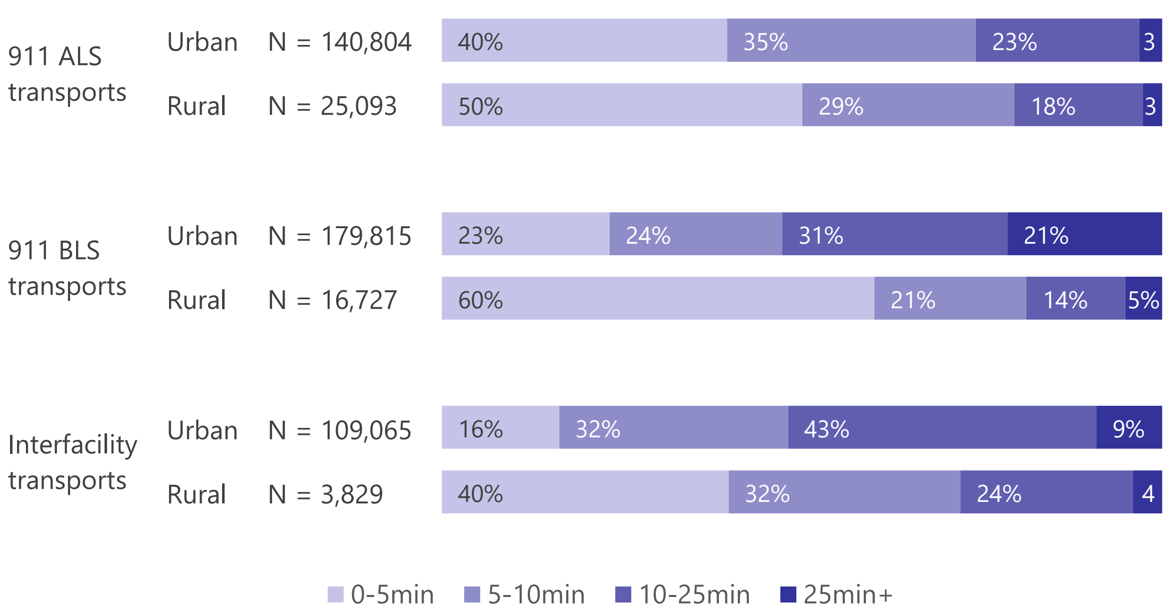
The ambulance patient offload time (APOT), or wall time, is the interval from an ambulance's arrival at a hospital to when the patient is transferred to hospital staff. Increasing APOTs due to hospital capacity constraints extends the total time EMS units spend responding to incidents before returning to service. Among 911 responses, the average APOT for ALS ambulances was 8.2 minutes, and the average for BLS ambulances was 18.1 minutes.[133] The average APOT for interfacility transports was 13.2 minutes.

Exhibit 20 presents the distribution of APOT by transport and region type. Urban areas, on average, experience longer APOT, and ALS ambulances experience a significantly shorter APOT relative to BLS ambulances. For example, in urban areas, 3% of ALS ambulances experienced an APOT greater than 25 minutes versus 21% of BLS ambulances.[134] This pattern is expected, given that ALS ambulances are primarily utilized for higher-acuity patient transport.[135]

Supplemental Appendix Exhibits A27 and SA28 present maps of average APOT in EMS response areas in Washington State. We can only summarize the average APOT for about 40% of EMS response areas. Among those represented in our analysis, response areas in and around Seattle faced the longest BLS APOT (Exhibit SA28). This likely reflects hospital capacity constraints.

Exhibit 20

Average Ambulance Patient Offload Time in Washington State



[133] In 2024 WEMSIS records, the time stamp for patient transfer of care was missing for 32% of transports, so APOT values may be less generalizable than response time or transport time values.

[134] In 2024, 0.3% of rural 911 transports (N = 316) and 1.4% of urban 911 transports (N = 11,160) had an ambulance patient offload time of more than 60 minutes.

[135] County-level APOT time distributions are summarized in Supplement Appendix Exhibits SA21-SA26.

V. Cost of EMS Preparedness

WSIPP's legislative assignment requested estimates of the "cost to address gaps in emergency medical services so all parts of the state are assured a timely response." However, we were unable to produce reliable cost estimates of this nature for several reasons. Most notably, a comprehensive cost analysis would require identifying the underlying drivers of delayed response times, which likely vary by community. These may include staffing shortages, limited vehicle capacity, hospital crowding, geographic barriers, or limited proximity to EMS agencies or hospitals. These factors vary across communities and are not fully observable with available data.

In lieu of precise estimates, this section outlines the data and methods needed to conduct a comprehensive cost analysis and provides illustrative estimates of field personnel readiness in Washington State.

Identifying Costs of EMS: A Theoretical Framework

This section is informed by the report *An Economic Toolkit for Identifying the Cost of Emergency Medical Services (EMS) Systems: Detailed Methodology of the EMS Cost Analysis Project (EMSCAP)*.[136]

The following discussion summarizes the methodological approach presented in that report to provide a structured framework for estimating community-focused EMS system costs.

Define the Community and the Corresponding EMS System

The first step for identifying regional costs for adequate EMS delivery is to define the community (i.e., geographic boundaries) for which costs are being calculated and identify all agencies that contribute to that community's EMS system.

Estimate the Proportion of Time Each Agency is Involved in EMS

EMS agencies, such as fire departments, often serve multiple functions and operate across jurisdictions. As a result, estimating EMS costs within a specific community requires carefully allocating shared resources. Assigning full agency costs to EMS would overstate costs, while excluding shared infrastructure would understate them, making accurate cost attribution a key challenge.

[136] Brooke Lerner, E., Garrison, H.G., Nichol, G., Maio, R.F., Lookman, HA., Sheahan, W.D., Franz, T.R., Austad, J.D., Ginster, A.M., & Spaite, D.W. (2012). An economic toolkit for identifying the cost of emergency medical services (EMS) systems: detailed methodology of the EMS cost analysis project (EMSCAP). *Academic Emergency Medicine*, *19*(2), 210-216.

Calculate Costs

A comprehensive EMS cost analysis would need to account for several major components. These include personnel costs for both clinical staff and administrative/support roles, based on required staffing hours, wages, and benefits.

Facility-related costs would include expenses associated with stations, training centers, and administrative offices. Costs include depreciation, utilities, maintenance, and insurance, with shared facilities apportioned appropriately.

Vehicle costs would encompass both fixed expenses (e.g., depreciation, leasing, insurance) and variable costs (e.g., fuel and maintenance). Equipment costs would include both durable medical and operational equipment, accounting for depreciation and maintenance, as well as consumable supplies that must be regularly replaced.

Estimated Costs

Because precise, community-specific estimates of the costs to address EMS service gaps were not feasible with available data, we instead estimated the personnel costs required to staff a response-ready ambulance on a 24/7 basis—these estimates and corresponding discussion can be found in Appendix Section III. Although these estimates do not capture the full cost of EMS delivery, they illustrate that ensuring timely EMS response requires substantial ongoing investment in readiness capacity independent of call volume.

VI. Conclusion

In this report, we examine EMS delivery and funding in Washington State in the context of national models. We also analyze trends and forecast demand for EMS services statewide and by county. Last, we identify regions with prolonged response times (e.g., exceeding 25 minutes) and outline approaches to estimating the cost of ensuring adequate EMS preparedness.

Limitations

This study is subject to several important limitations. First, the data used to analyze trends and forecast demand do not capture all EMS agencies in the state, and reporting practices vary over time. In addition, the available data only go back to 2019, limiting the precision of demand projections.

Second, the limited availability of detailed, community-level data on resources and costs prevented a rigorous assessment of the investments that would be needed to ensure timely EMS response.

Despite these limitations, this study makes several important contributions. To our knowledge, it is the first to use WEMSIS data to systematically describe statewide EMS response times and utilization trends. It also provides a detailed overview of EMS delivery and funding structures nationally, placing Washington's system in a broader context.

Key Takeaways

Key takeaways include the following:

- Although EMS licensing and training requirements are relatively standardized, EMS systems are highly decentralized, resulting in substantial variation in service delivery, funding, and resource availability across jurisdictions.
- State and federal funding for EMS systems is limited. Funding relies heavily on local sources and fee-for-service reimbursement. Many jurisdictions in WA have adopted a public-private partnership for EMS delivery.
    - Fee-for-service reimbursement is tied to patient transport, which does not fully account for non-transport care, 24/7 readiness costs, or lower public payer reimbursement rates.
- There is limited rigorous evidence available to identify or support a single optimal EMS delivery or funding model.
- Rural areas tended to experience longer EMS response and transport times, while urban areas faced longer patient offload times.
- Demand for EMS services is likely to increase in the next two years, but projections had a large amount of uncertainty due to data limitations.

Future Work

Future research could examine broader measures of EMS system performance beyond response times and utilization, including patient outcomes. Additional work is also needed to better understand the drivers of regional variation in EMS performance, including the roles of workforce shortages, hospital offload delays, geographic barriers, and local system capacity.

As additional years of WEMSIS data become available and reporting consistency improves, future studies could also reassess long-term EMS demand projections and system trends. Last, there is a need for more rigorous evaluation of the comparative efficacy of different EMS delivery, funding, and reimbursement models.

Acknowledgments

The authors would like to thank staff at the Washington Department of Health for their support in understanding how EMS systems operate in Washington and obtaining the administrative data required to facilitate this work. In particular, we thank Catie Holstein, Dawn Felt, Jason Norris, Adam Rovang, and John Nokes. We also thank Sydney Rogalla (Office of the Insurance Commissioner) and Mandy Stahre (Office of Financial Management) for their support throughout the duration of this project. We thank Abby Cole at Health Care Authority.

We also thank members and affiliates from the following organizations: National Association of State EMS Officials (NASEMSO), Camas-Washougal Fire Department, Ballard Ambulance, Olympic Ambulance, American Ambulance Association, Seattle Fire Department, Washington State Council of Fire Fighters, American Medical Response (AMR), Global Medical Response (GMR), Systems Design West, Lacey Fire District 3, Central Grays Harbor Professional Firefighters Local 315, Spokane County Fire District 8, King County (Crisis Systems Medical Director), and Cowlitz County Fire District 5.

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Appendices

Emergency Medical Services in Washington State

Appendices

Appendix I. WEMSIS Data

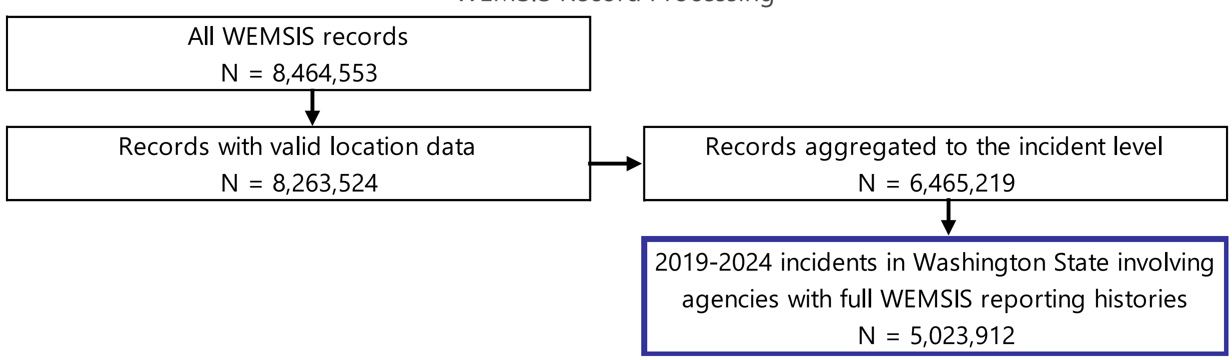
Our analyses of EMS trends, projected demand, and response times in Sections III and IV rely on EMS data maintained by the Washington State Department of Health (DOH).[137]

Constructing the Analytic Dataset

Our analysis includes prehospital EMS incidents from 2019 to 2024 that took place in Washington State. Data were processed to construct analytic samples for use in describing trends in EMS use, forecasting demand, and summarizing response times. Exhibit A1 illustrates the steps involved in data processing.

Exhibit A1

WEMSIS Record Processing



[137] Washington State Department of Health. (2026). *Washington EMS Information System (WEMSIS)*.

Identifying a Single EMS Incident

Each WEMSIS record represents a single response by an EMS unit—multiple records in the data are created when multiple EMS units are dispatched to the same patient for the same incident. To identify a single incident in the data, we identified records with identical coordinates[138] where the responding agencies were notified of the event within 12 hours of each other. If the incident took place in a communal location—such as medical facilities, schools, parks, apartment buildings, and other public areas—we included additional information such as the number of patients and corresponding demographic characteristics (i.e., age and sex). Data were then aggregated to the incident level, maintaining relevant information across all records.

Excluding Data from Agencies with Incomplete WEMSIS Reporting Histories

Prior to 2025, reporting to WEMSIS was not mandatory for EMS agencies in Washington State, so data coverage increased over time as more agencies began submitting records. To avoid interpreting improved reporting as growth in actual EMS incidents, we excluded agencies with incomplete WEMSIS reporting histories, identified by comparing WEMSIS submissions with DOH licensing records. After applying this restriction, the sample used for the trend and forecasting analyses included incidents with responses from about 55% of licensed EMS agencies, which, based on the WEMSIS website, likely account for at least 74% of total EMS records. This exclusion was not applied to response-time analyses. County-level WEMSIS reporting status is summarized in Exhibit A2.

[138] Each WEMSIS record contains incident address data. We used Esri ArcGIS Pro software to convert incident addresses into latitude and longitude coordinates. We excluded records with invalid or missing coordinates.

Exhibit A2

WEMSIS Reporting Status by County

County	WEMSIS status	Number of agencies			Number of vehicles		Number of personnel		
		Total	ALS	BLS/ILS	Ambulance	Aid	BLS	ILS	ALS
Adams	Reporting	2	0	2	42	0	146	30	8
Asotin	Reporting	3	1	2	42	30	186	31	75
	Not reporting*	3	2	1	75	1	170	31	220
Benton	Reporting	12	7	5	266	207	1,543	196	711
	Not reporting	3	0	3	0	16	159	3	1
Chelan	Reporting	6	3	3	92	175	915	6	161
	Not reporting	10	1	9	63	150	550	1	79
Clallam	Reporting	5	3	2	160	59	749	76	325
	Not reporting	4	1	3	44	18	330	17	47
Clark	Reporting	4	3	1	230	220	1,302	3	760
	Not reporting	8	4	4	262	343	1,391	0	928
Columbia	Reporting	1	0	1	18	6	83	4	0
	Not reporting	1	0	1	0	6	17	0	0
Cowlitz	Reporting	8	5	3	107	42	295	0	127
	Not reporting	4	2	2	42	94	647	2	250
Douglas	Reporting	1	0	1	10	12	64	0	0
	Not reporting	5	0	5	18	32	256	0	0
Ferry	Reporting	1	0	1	19	1	101	0	3
	Not reporting	1	0	1	18	0	39	8	1
Franklin	Reporting	4	2	2	129	76	695	158	228
Garfield	Reporting	1	0	1	16	0	133	8	0
Grant	Reporting	6	4	2	136	78	521	17	199
	Not reporting	14	0	14	71	169	811	54	3
Grays Harbor	Reporting	9	7	2	162	64	619	0	361
	Not reporting	16	3	13	106	117	407	1	102
Island	Reporting	3	2	1	103	71	393	1	245
	Not reporting	3	0	3	0	61	611	4	0
Jefferson	Reporting	6	4	2	101	92	529	37	122
	Not reporting	1	0	1	12	18	41	6	0
King	Reporting	32	6	26	1,520	1,425	20,888	6	22
	Not reporting	11	0	11	397	54	2,620	6	1
Kitsap	Reporting	7	7	0	278	111	2,121	17	667
	Not reporting	2	0	2	21	0	89	0	15
Kittitas	Reporting	5	2	3	89	63	479	0	159
	Not reporting	7	0	7	8	95	143	0	0

Note:
"Not reporting" counts agencies that did not report in *all* years of WEMSIS.

Exhibit A2, Continued

WEMSIS Reporting Status by County

County	WEMSIS status	Number of agencies			Number of vehicles		Number of personnel		
		Total	ALS	BLS/ILS	Ambulance	Aid	BLS	ILS	ALS
Klickitat	Reporting	4	1	3	31	19	100	16	90
	Not reporting	14	0	14	23	87	324	2	5
Lewis	Reporting	21	8	13	263	106	986	83	359
	Not reporting	2	0	2	3	0	10	0	0
Lincoln	Reporting	4	0	4	39	20	186	32	10
	Not reporting	5	0	5	24	38	218	43	0
Mason	Reporting	8	3	5	127	64	595	26	247
	Not reporting	5	0	5	17	64	202	1	0
Okanogan	Reporting	3	2	1	113	73	338	140	83
	Not reporting	7	0	7	47	43	199	50	0
Pacific	Reporting	2	1	1	36	15	166	0	78
	Not reporting	6	2	4	100	39	456	13	205
Pend Oreille	Reporting	4	2	2	79	115	432	18	79
	Not reporting	5	0	5	14	49	77	5	1
Pierce	Reporting	19	12	7	562	537	4,921	2	1,988
	Not reporting	16	8	8	313	400	3,209	6	791
San Juan	Reporting	3	3	0	53	41	451	0	80
	Not reporting	2	0	2	12	45	125	0	0
Skagit	Reporting	13	5	8	143	126	913	0	390
	Not reporting	19	0	19	25	332	811	2	1
Skamania	Reporting	3	2	1	24	36	135	12	71
	Not reporting	2	0	2	0	30	18	0	0
Snohomish	Reporting	20	12	8	782	290	6,662	145	1,761
	Not reporting	9	2	7	101	34	313	0	39
Spokane	Reporting	16	8	8	327	959	4,741	232	1,558
	Not reporting	11	4	7	18	235	724	16	609
Stevens	Reporting	4	2	2	23	50	298	141	17
	Not reporting	11	1	10	68	182	506	82	24
Thurston	Reporting	4	1	3	148	8	460	3	2
	Not reporting	17	4	13	242	556	2,535	0	437
Wahkiakum	Reporting	2	0	2	36	7	124	15	0
	Not reporting	2	1	1	11	19	12	0	4
Walla Walla	Reporting	8	3	5	69	100	670	7	241
	Not reporting	2	0	2	0	12	19	9	0
Whatcom	Reporting	12	2	10	308	170	2,646	37	417
	Not reporting	5	1	4	36	27	272	0	7
Whitman	Reporting	12	1	11	108	152	895	78	128
	Not reporting	5	0	5	0	51	80	0	0
Yakima	Reporting	6	3	3	238	184	1,151	44	292
	Not reporting	16	1	15	0	343	1,372	7	4

Note:
"Not reporting" counts agencies that did not report in *all* years of WEMSIS.

Excluding Records With Excessive Response Times

In consultation with DOH, we exclude durations of longer than five hours from our response time average calculations presented in Section IV. Response times of this nature were rare. Exhibit A3 illustrates incidents excluded from our response time analysis.

Exhibit A3

Incident Exclusions From Response Time Analysis, WEMSIS 2024

	Missing		Negative		More than 5 hours	
Variable	**Count**	**Percent**	**Count**	**Percent**	**Count**	**Percent**
Response time	24,250	2.27%	31	< 0.01%	652	0.06%
Transport time	3,139	0.44%	15	<0.01%	534	0.08%
Ambulance patient offload time	228,268	32.21%	81	0.01%	229	0.03%

Outcomes

Exhibit A4 describes incident-related outcomes used in Sections III and IV.

Exhibit A4

WEMSIS Derived Outcome Variables (2019-2024)

Outcome	Description	NEMSIS variables	Proportion/Mean (SD)
*Patient age groups**			
0-17	Any patient aged 0-17	ePatient.15	5%
18-64	Any patient aged 18-64	ePatient.15	43%
65+	Any patient aged 65+	ePatient.15	42%
Transport	At least one unit provided treatment, no units provided transport	eDisposition.27 - eDisposition.30	25%
ALS	ALS capability of the transporting unit	eDisposition.30, eResponse.07, eResponse.15	34%
BLS	BLS capability of the transporting unit	eDisposition.30, eResponse.07, eResponse.15	28%
Interfacility	Type of service: "interfacility transport" or "hospital-to-hospital transfer"	eResponse.05	13%
Treat-no-transport	At least one unit provided treatment, no units provided transport	eDisposition.27 - eDisposition.30	25%
*Durations***			
Response time	Duration from unit notification by dispatch until unit arrival on scene	eTimes.03, eTimes.06	10.8 (14.1)
Transport time	Duration from unit departure from the scene until unit arrival at the destination	eTimes.09, eTimes.11	19.6 (22.2)
Ambulance patient offload time	Duration from unit arrival at destination until transfer of care to destination healthcare staff	eTimes.11, eTimes.12	13.4 (18.3)

Notes:
*Some incidents do not result in patient contact, so values do not sum to 100%.
**Durations only correspond to data from 2024.
NEMSIS variables come from the National Emergency Medical Services Information System. (n.d.). *EMSDEMSTATE*. National EMS Data Dictionary Version 3.5.0.

Incident Location

Washington State is divided into several hundred EMS response boundaries, with different agencies responsible for service in each boundary. For our geographic analysis of response times in Section IV, we use a shapefile maintained by the WaTech Geospatial Program Office to identify the emergency response boundary in which each incident occurred.[139] Using a shapefile maintained by the U.S. Census Bureau,[140] we identify the urban/rural status of the census block in which each incident occurred.

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[139] Washington State Geospatial Portal. (2024). *Emergency response boundaries*. Retrieved February 4, 2026.
[140] United States Census Bureau. (2024). *Urban and rural*.

Appendix II. Forecasting EMS Demand

Here, we describe the forecasting methodology used to predict EMS call volume over the three years in Washington State.

Given the limited sample size (2019–2024), the long forecast horizon, and the structural disruption associated with the COVID-19 pandemic, relatively parsimonious statistical forecasting models were prioritized.

Model Selection

ARIMA

ARIMA models are a popular choice for forecasting analyses. An ARIMA model, represented as *ARIMA*(*p*,*d*,*q*), is a mixture of an autoregressive component of order *p*, a moving average component of order *q*, and nonseasonal differences (needed for stationarity) of order *d*.

Exponential Smoothing (ETS)

Exponential smoothing is a straightforward series forecasting method that uses weighted averages of past observations to predict future values, with more recent observations receiving higher weights. Unlike simple moving averages that treat all past observations equally, exponential smoothing applies exponentially decreasing weights to historical data, making it more responsive to recent changes while still incorporating information from the entire history.

Exponential smoothing and ARIMA are widely used forecasting approaches that provide complementary methods. Exponential smoothing models focus on modeling components such as level, trend, and seasonality, while ARIMA models focus on modeling the autocorrelation structure of the series. These classical time-series methods are widely used and frequently perform as well as or better than more complex alternatives in univariate forecasting settings, particularly when historical data are limited.[141]

BSTS

We also estimate Bayesian structural time series (BSTS) models to provide a complementary modeling framework. Bayesian structural time series (BSTS) models forecast data by decomposing it into key components—such as long-term trends, seasonal patterns, and the influence of external factors—and allowing these components to evolve over time.[142] Unlike traditional time series models, this approach combines information from the observed data with prior assumptions about how these patterns typically behave, producing a range of plausible future outcomes that reflect uncertainty in both the data and the model.

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[141] Panagiotelis, A., Athanasopoulos, G., Gamakumara, P., & Hyndman, R.J. (2021). Forecast reconciliation: A geometric view with new insights on bias correction. *International Journal of Forecasting*, *37*(1), 343-359; Makridakis, S., & Hibon, M. (2000). The M3-Competition: Results, conclusions and implications. *International Journal of Forecasting*, *16*(4), 451-476; and Makridakis, S., Spiliotis, E., & Assimakopoulos, V. (2018). Statistical and Machine Learning forecasting methods: Concerns and ways forward. *PloS one*, *13*(3).
[142] Bayesian structural time series models were implemented using the *bsts* package in R and Scott, S.L. (2021). *bsts: Bayesian structural time series* (R package).

Comparable studies have found that BSTS models perform well in capturing structural shifts (e.g., COVID-19) and may produce more accurate forecasts and better interval coverage than ARIMA or exponential smoothing models.[143]

Our estimation strategy combines parsimonious models with more flexible alternatives to evaluate forecast performance and ensure robustness to differing assumptions about underlying trends.

Forecast Accuracy

To evaluate forecast performance, models were compared (across different outcomes) using rolling-origin cross-validation.[144] Beginning with an initial training window of 12 quarterly observations, each candidate model was re-estimated sequentially as the sample expanded by one quarter at a time. At each step, a 4-quarter-ahead forecast was generated, and forecast errors were calculated by comparing predicted values to the subsequently observed outcomes.[145] Forecast errors from all evaluation windows and forecast horizons were pooled to compute the mean absolute scaled error (MASE) and the mean absolute percentage error (MAPE). MAPE expresses errors as a percentage of the observed values, and MASE scales the mean absolute error relative to the average one-step naïve forecast error. These measures allow comparisons across outcomes with different magnitudes.[146] Estimates across models and outcomes are presented in Exhibit A5.

[143] Chen, C.W., Hsieh, L.L., & Chu, B.X. (2025). Structural time series modelling for weekly forecasting of enterovirus outpatient, inpatient, and emergency department visits. *Plos one*, *20*(5) and Xu, G., Fan, T., Zhao, Y., Wu, W., & Wang, Y. (2024). Predicting the epidemiological trend of acute hemorrhagic conjunctivitis in China using Bayesian structural time-series model. *Scientific Reports*, *14*(1), 17364.
[144] Hyndman, R.J., & Athanasopoulos, G. (2021). Forecasting: Principles and practice (3rd ed.). OTexts.
[145] Rolling cross-validation is preferred to a single holdout split in short time series because it more efficiently utilizes available data and provides a more stable estimate of out-of-sample predictive performance. By evaluating models repeatedly across multiple forecast origins, this approach reduces sensitivity to any single period—this is particularly important given the structural disruption associated with COVID-19.
[146] Makridakis, S., Spiliotis, E., & Assimakopoulos, V. (2020). The M4 Competition: 100,000 time series and 61 forecasting methods. *International Journal of Forecasting*, *36*(1), 54-74.

Exhibit A5

Mean Absolute Percentage Error (MAPE) & Mean Absolute Scaled Error (MASE)

	ARIMA (0,1,0) with Drift	ARIMA (0,1,1) with Drift	ARIMA (1,1,1) with Drift	Linear Holt	Damped Holt	BSTS with semilocal trend
Panel A: MAPE						
All responses	3.607	3.145	3.683	3.346	3.059	3.389
Interfacility transport	8.314	8.562	8.736	9.911	8.478	8.231
All transport	3.799	3.786	4.984	4.715	4.005	3.877
Treat-no-transport	5.244	4.983	5.241	5.068	5.094	4.990
Average MAPE	*5.241*	*5.119*	*5.661*	*5.760*	*5.159*	*5.122*
Panel B: MASE						
All responses	0.790	0.690	0.802	0.731	0.671	0.742
Interfacility transport	1.844	1.880	1.878	2.103	1.887	1.829
All transport	0.866	0.859	1.134	1.057	0.912	0.880
Treat-no-transport	1.002	0.953	1.011	0.970	0.978	0.954
Average Mase	*1.125*	*1.095*	*1.206*	*1.216*	*1.112*	*1.101*

Note:
Data for these estimates come from WEMSIS (2019-2024).

The ARIMA(0,1,1) model produced the lowest average MAPE and MASE and was selected as the primary forecast specification (reported on in Section III). Given similar predictive accuracy, forecasts from the damped Holt and BSTS models are presented in this section for comparison purposes.

Results

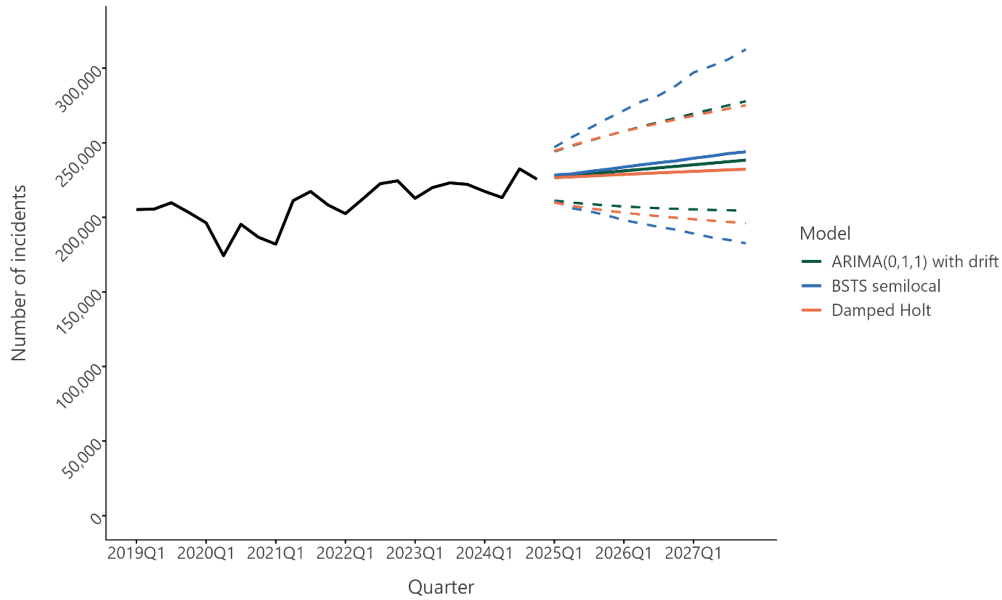
Exhibit A6 presents forecasts and 80% prediction intervals for each outcome across all three models.[147] For the ARIMA and Damped Holt models, prediction intervals are based on the estimated distribution of forecast errors and can be interpreted as follows: over many repeated forecasts, approximately 80% of the intervals would contain the true future value. For the BSTS model, prediction intervals are derived from the posterior predictive distribution and represent the range of values consistent with both the observed data and model assumptions; under this framework, there is an 80% probability that the true future value lies within the interval. These interpretations assume that the models adequately capture underlying trends; if the models are misspecified or conditions change, the intervals may not fully reflect the true uncertainty.

[147] Forecasted quarterly values and corresponding prediction intervals across all models and outcomes are available upon request.

Exhibit A6

Forecasted Demand for EMS Services

a) All EMS Incidents



b) All Ambulance Transports

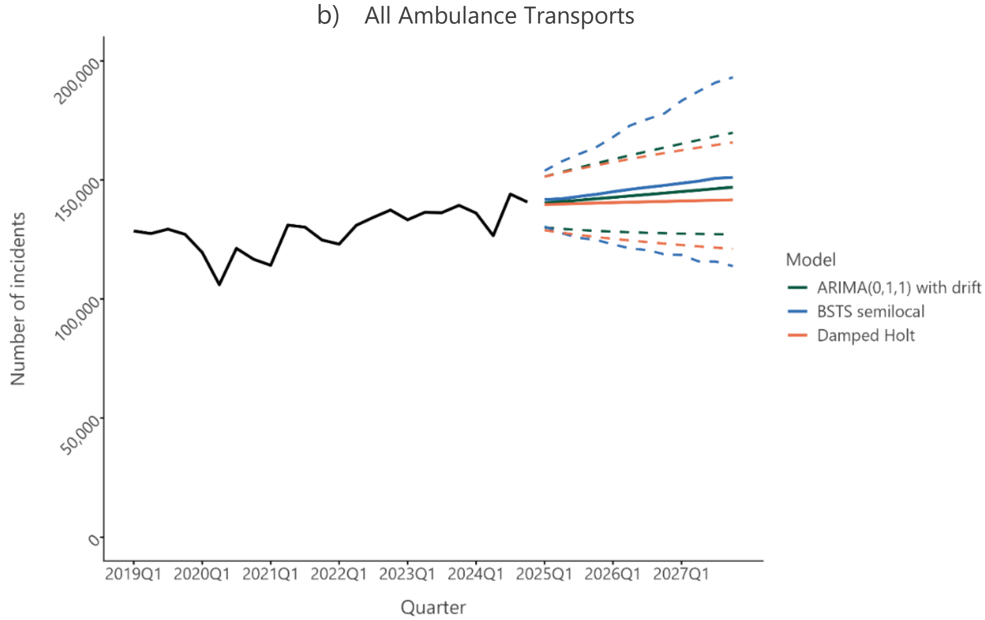
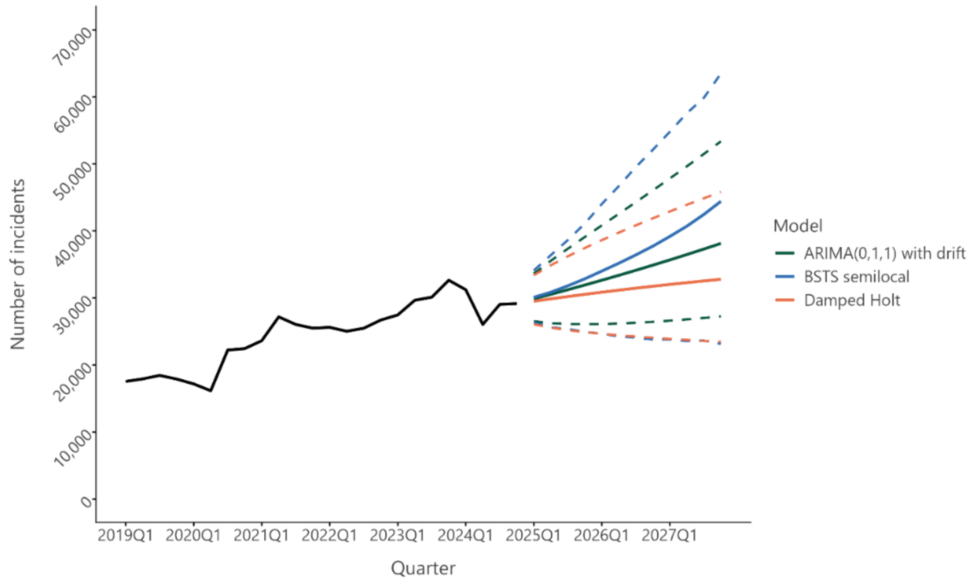


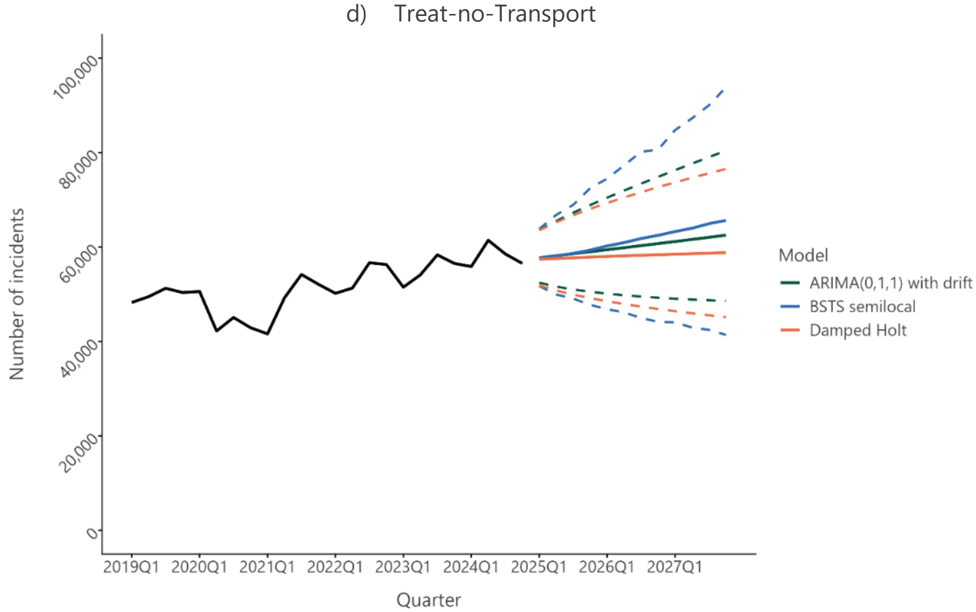
Exhibit A6 Continued

Forecasted Demand for EMS Services

c) Interfacility Transports



d) Treat-no-Transport



County-Level Forecast Model Accuracy

Exhibit A7

EMS Responses Mean Absolute Scaled Error (MASE), by County

County	MASE	County	MASE
Adams	0.908	Lewis	1.234
Asotin	0.903	Lincoln	0.734
Benton	1.845	Mason	0.773
Chelan	0.660	Okanogan	2.906
Clallam	1.833	Pacific	1.486
Clark	0.837	Pend Oreille	1.006
Columbia	1.358	Pierce	0.510
Cowlitz	2.621	San Juan	0.668
Douglas	1.696	Skagit	0.741
Ferry	0.980	Skamania	1.042
Franklin	1.726	Snohomish	1.266
Garfield	0.965	Spokane	1.774
Grant	1.940	Stevens	1.698
Grays Harbor	0.952	Thurston	0.661
Island	0.629	Wahkiakum	4.023
Jefferson	3.965	Walla Walla	1.902
King	1.011	Whatcom	0.761
Kitsap	0.786	Whitman	1.154
Kittitas	1.852	Yakima	2.338
Klickitat	1.790		

Notes:
Data for these estimates come from WEMSIS (2019-2024).
Assesses forecast performance of an ARIMA(0,1,1) model using rolling-origin cross-validation.
We estimate forecasts only for counties with a MASE below 1 (Exhibit 16).

Appendix III. Cost of Labor Readiness

EMS costs include both the direct costs of individual responses and the readiness costs associated with maintaining continuous response capability.[148] These costs include 24/7 staffing, ongoing training to maintain competency, equipment and supply acquisition and maintenance, and administrative and operational support. They are influenced by factors such as call volume, response time standards, and level of service (e.g., advanced life support versus basic life support).

The limited body of published research on EMS costs tends to focus on ground ambulance service providers and often reports only the *cost per transport*, rather than the cost of maintaining system readiness. Recent cost data from the Medicare Ground Ambulance Data Collection System (GADCS) indicated that the national average cost per ambulance transport was approximately $2,673,[149] with higher costs among governmental providers ($3,127) compared to private for-profit providers ($1,778).[150] However, these estimates reflect average costs per service and do not isolate the cost of maintaining EMS readiness independent of call volume.

[148] National Emergency Medical Services Advisory Council. (2016). *EMS system performance-based funding and reimbursement model: Final advisory*. U.S. Department of Transportation, National Highway Traffic Safety Administration.
[149] In FY 2022, the average cost per transport among public agencies participating in the GEMT program in Washington was $2,742. Washington State Health Care Authority. (n.d.). *Ground Ambulance Supplemental Payment Programs* [PowerPoint slides].
[150] Centers for Medicare & Medicaid Services. (2024, December). *Medicare ground ambulance data collection system (GADCS) report: Year 1 and Year 2 cohort analysis*. U.S. Department of Health and Human Services.

Cost of Readiness

Labor Cost. Personnel costs, including salaries and benefits, represent the largest component of EMS operating expenses, at about 70%.[151] Exhibit A8 presents average hourly wages for EMTs and paramedics in Washington State (both statewide and for selected regions), based on data from the state Employment Security Department.[152]

Exhibit A8

Average Hourly Wage Estimates for EMS Personnel (2024-2025)

Region	Average hourly wage ($)	
	Paramedic	EMT
Washington	48.59	24.57
Eastern Washington nonmetropolitan area	35.51	21.5
Western Washington nonmetropolitan area	43.6	23.78
Bellingham, WA	55.13	--
Bremerton-Silverdale-Port Orchard, WA	56.22	--
Kennewick-Richland, WA	46.31	33.72
Longview-Kelso, WA	48.12	--
Mount Vernon-Anacortes, WA	50.25	--
Olympia-Lacey-Tumwater, WA	49.12	22.56
Portland-Vancouver-Hillsboro, OR-WA	39.07	24.93
Seattle-Tacoma-Bellevue, WA	60.31	26.02
Spokane-Spokane Valley, WA	34.25	22.43
Walla Walla, WA	45.99	--
Wenatchee-East Wenatchee, WA	37.27	21.17
Yakima, WA	--	19.76

Note:
Source is ESD (Accessed 03/24/2026).

[151] Centers for Medicare & Medicaid Services (CMS), 2024.
[152] Washington State Employment Security Department. (n.d.). *Occupational employment and wage statistics (OEWS)*.

In Exhibit A9, we provide rough, illustrative estimates of the annual labor cost required to maintain a fully staffed ALS and BLS unit on a continuous (24 hours per day, 365 days per year) basis. These estimates are intended to approximate the *EMS responder cost of readiness*.

To generate these estimates, we applied consistent assumptions across all regions regarding staffing levels, employee benefits, and shift coverage requirements.[153] As a result, differences in estimated costs across regions reflect differences in underlying wage levels.
Under these assumptions:

- The annual personnel cost of readiness for an ALS unit ranges from approximately $866,000 to $1,524,000, with a statewide average of about $1.22 million.[154]
- The annual personnel cost of readiness for a BLS unit ranges from approximately $499,000 to $852,000, with a statewide average of about $646,000.

These estimates should be interpreted with caution, as they rely on simplifying assumptions and do not account for variation across agencies in staffing models, overtime, or local cost structures.[155]

Other Costs. While labor represents the majority of EMS readiness costs, additional components include vehicles, facilities, equipment, and administrative overhead. One study estimates that capital costs account for approximately 2% of total readiness costs, while administrative and overhead costs account for an additional 12%.[156] However, unlike wage data, these non-labor costs were not consistently available across agencies. As a result, we did not estimate these components, and the readiness cost estimates presented in this section only reflect personnel costs rather than the full cost of maintaining EMS response capacity.

Although a comprehensive estimate of the cost of timely EMS response was not feasible, the labor readiness cost estimates provide insight into a primary cost driver. Ensuring a timely response requires maintaining continuous staffing and response capacity, regardless of call volume. These readiness costs, therefore, represent a foundational component of the total cost needed to address service gaps, even though additional investments, such as infrastructure or system coordination, would also be required.

[153] We assumed a BLS unit is staffed with two EMTs and an ALS unit is staffed with two paramedics. (National Fire Protection Association. (2020). *NFPA 1710: Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*). We assumed benefits and taxes were 35% of base wages, that 4.5 FTE were required to cover a single seat 24 hours a day, 365 days per year (a minimum of 4.2 FTE adjusted to account for non-productive time, such as vacation), and there were two seats per unit.
[154] To calculate labor readiness costs for an ALS unit in Washington we completed the following calculations: $48.59 x 1.35 (benefits multiplier) = 65.60 (total hourly compensation). $65.60 x 2,080 (standard working hours for one FTE) = $136,448 per FTE per year. To get the total cost for the unit multiply that by the 9 FTEs and we get $1,228,032 annually (first row, first column, Exhibit 22).
[155] We assume a Three-Platoon Regime (24/48 or 48/96 shifts), a common standard in US emergency services, where the workforce is split into three teams to provide constant coverage.
[156] Brook, M. (2024, August 21). *Behind the sirens: The hidden costs of EMS readiness*. EMS World.

Exhibit A9

Average Cost Per Staffed Ambulance, by Care Level (2024-2025)

Region	Average annual cost ($) ALS	BLS
Washington	1,228,032	646,205
Eastern Washington nonmetropolitan area	897,409	543,348
Western Washington nonmetropolitan area	1,101,859	600,968
Bellingham, WA	1,393,245	
Bremerton-Silverdale-Port Orchard, WA	1,420,792	
Kennewick-Richland, WA	1,170,346	852,172
Longview-Kelso, WA	1,216,089	
Mount Vernon-Anacortes, WA	1,269,918	
Olympia-Lacey-Tumwater, WA	1,241,361	570,136
Portland-Vancouver-Hillsboro, OR-WA	987,377	630,031
Seattle-Tacoma-Bellevue, WA	1,524,154	657,577
Spokane-Spokane Valley, WA	865,566	566,851
Walla Walla, WA	1,162,259	
Wenatchee-East Wenatchee, WA	941,887	535,008
Yakima, WA		499,375

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