

**Rural Safe Efficient Advanced Transportation (R-SEAT) Center**

<p><b>Research Project Name:</b> Evaluating Post-Crash Care Accessibility of Emergency Medical Services (EMS) to Elderly Groups in Rural Areas</p>
<p><b>Recipient/Grant (Contract) Number:</b> Florida A&amp;M University; Cleveland State University</p>
<p><b>Center Name:</b> Rural Safe Efficient Advanced Transportation (R-SEAT) Center</p>
<p><b>Research Priority:</b> Improving Mobility of People and Goods</p>
<p><b>Principal Investigator(s):</b> Emmanuel Kidando, Josiah Owusu-Danquah and Angela Kitale</p>
<p><b>Project Partners:</b> Ohio Emergency Medical Services</p>
<p><b>Research Project Funding:</b> \$97,300 (Federal request); \$50,230 (Non-Federal cost share)</p>
<p><b>Project Start and End Date:</b> October/1/2024 to September/31/2025</p>
<p><b>Project Description:</b> Rural areas face unique challenges following crashes due to longer emergency medical service (EMS) response times and limited access to advanced healthcare facilities. These delays can put the lives of elderly crash victims at greater risk, making timely care critical to their survival. Particularly for aging populations are particularly susceptible to severe injuries. As an individual's age, physical fragility worsens the severity of injuries sustained in crashes. This makes it essential to ensure that older adults receive prompt and reliable post-crash care to improve their chances of survival. Despite ongoing efforts to improve transportation safety, gaps remain in understanding how post-crash care impacts survival and how EMS infrastructure can be optimized to reduce fatalities in rural settings. This research aims to address these critical gaps, focusing on survival analysis and EMS location optimization to enhance post-crash care accessibility. Post-crash care plays a vital role in saving lives and is a key focus of the Safe System Approach embraced by the USDOT to prevent fatalities and severe injuries.</p>
<p><b>US DOT Priorities:</b> This project supports the USDOT priorities by addressing accessibility to emergency medical services (EMS) for rural populations, aligning to improve mobility and safety for all. By optimizing EMS locations and reducing response times, the research directly contributes to eliminating fatalities and enhancing post-crash care, a key element of the Safe System Approach. Through the integration of survival analysis and location optimization techniques, the project engages in transformative research, leveraging advanced methodologies to drive innovative solutions for life-saving emergency response improvements.</p>
<p><b>Outputs:</b> The primary objective of this study is to evaluate the survival outcomes of older drivers in terms of EMS efficiency in rural crashes. Furthermore, determine ideal EMS locations through optimization techniques, therefore, improving accessibility for high-risk rural areas. There is an established partnership with Ohio EMS, which has committed to providing detailed data on response times, crash locations, and patient outcomes for the project. This collaboration ensures access to high-quality, real-world data critical for analyzing post-crash care accessibility and survival outcomes. The partnership also facilitates alignment with EMS stakeholders, enhancing the practical applicability of the research findings to improve emergency response systems in rural Ohio. The findings of this study will be shared with Ohio EMS to inform on their strategies.</p>
<p><b>Outcomes/Impacts:</b></p>

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Findings will inform proposed strategies to EMS location planning, potentially leading to faster response times and reduced fatalities. Findings of this research will also inform policy decisions regarding the allocation of resources for EMS infrastructure, particularly in rural areas, enhancing the overall reliability and responsiveness of the transportation system. Multiple papers were submitted for publication and presented at TRB.

- Balyagati, P., Ngereza, A., Kidando, E., Owusu-Danquah, J., Kitali, A, Kalambay, P., “Hierarchical Bayesian Analysis of Rural-Urban Settings in EMS Prehospital Timelines for Elderly Crash Victims” Presented at the 105th Annual Meeting of the Transportation Research Board, Washington, D.C., 2026. Accepted for publication – *Journal of Safety Research*
- Balyagati, P., Masanja, N., Ngereza, A, Rajabu, F., Kidando, E, Kitali, A. “Predicting Collision Patterns Among Elderly Drivers Using Kolmogorov Arnold Networks and FARS Data” Presented at the 105th Annual Meeting of the Transportation Research Board, Washington, D.C., 2026. Under Review – *Journal of Advanced Transportation*
- Balyagati, P., Sakaza, T., Ngereza, A, Kidando, E., Owusu-Danquah, J., Kitali,, (1st Review) “Joint EMS-Hospital Coverage Optimization for Elderly Rural Crash Victims” Under Review- *Case Studies on Transport Policy*.

**Final Research Report:** Submitted