



EXPERTS TALK

Safe System Approach to Improve Road Safety with **Beth Wemple** and **Olivia Polinsky**



Beth Wemple



Olivia Polinsky

With more than three decades of experience managing traffic engineering and road safety projects, **Beth Wemple** focuses on bringing state-of-the-art safety analysis methods to practitioners to develop a safer transportation system for all users. She was the project manager on the first edition of the AASHTO Highway Safety Manual and is on the team developing a second edition of the manual. **Olivia Polinsky**, a traffic engineer, supports the development and analysis of operations and safety projects throughout the country. She is passionate about implementing data-driven safety strategies that create a more accessible, equitable and efficient transportation system for users of all modes and abilities. In this interview, they discuss the history of SSA, the difference from traditional roadway design and how it can become a gamechanger in the U.S.

The Comprehensive Approach to Designing Roads for All Users and How It Can Become a Gamechanger

The United States Department of Transportation has over the last several years committed to a goal of zero deaths on its transportation system and has embraced the Safe System Approach, also known as the SSA, as the means to achieve this goal. The SSA calls for the development and delivery of transportation infrastructure that recognizes that people are vulnerable and will make mistakes, but the outcome of their mistake should not result in a serious injury or a fatality. The SSA is a framework for considering safety throughout the lifecycle of a transportation project.

Q. What is a Safe System Approach to design and how is it different from conventional roadway design approaches?

Wemple: The Safe System Approach is a principles-based approach to transportation planning, design, construction and maintenance that recognizes:

- Death and serious injury are unacceptable
- Humans make mistakes
- Humans are vulnerable
- Responsibility is shared
- Safety is proactive
- Redundancy is crucial

Through these principles, the SSA acknowledges that all road users are human beings, and humans will inevitably make mistakes that may lead to crashes. Recognizing that all users have a responsibility to conduct themselves in a safe manner, the goal of the SSA is to plan, develop and construct a transportation system so that in the event of a crash, there are no fatalities.



In the SSA, road safety is a shared responsibility. Transportation professionals have a personal and professional responsibility to keep ourselves and others safe on the roads.

The method provides a framework for explicitly considering safety in every stage of every road project. Throughout project development, the team should ask themselves “What can I do to remove severe conflicts, manage speeds to the surrounding context, separate modes (i.e., pedestrians, bicyclists and motorists) in time and space, and increase attentiveness and awareness of road users?” Traditionally, planners and engineers would ask questions related to roadway capacity, congestion, travel speeds and other traffic operations performance measures. In the SSA, we are asking ourselves those questions plus the safety questions.

Polinsky: Along with the six principles of the SSA, there are five complementary and holistic elements that must work together to achieve zero traffic deaths:

- Safer road users
- Safer vehicles
- Safer speeds
- Safer roads
- Post-crash care

The principles and elements of the approach provide a

shift from conventional road safety practice. Rather than considering all crashes, including those with only minor property damage, the SSA shifts attention to life-altering crashes: fatalities and serious injuries. As transportation planners and traffic engineers using the SSA, we are refocusing the planning, design and operations of our transportation system to anticipate human mistakes and reduce impact forces to reduce the severity of a crash and save lives.

Q. Where did the Safe System Approach originate?

Polinsky: The SSA was originally developed in the 1990s, with Sweden and the Netherlands recognized as the earliest adopters of the approach. Between 2009 and 2019, following the adoption of the approach into road projects, Sweden and the Netherlands saw a [nearly 50% reduction in traffic fatalities, compared to the U.S.](#) reduction of less than 6%. Other early adopters of the SSA, like Norway, France, Australia and New Zealand have all experienced similar impressive reductions in traffic fatalities since adopting its principles. This isn't a new approach and it's been incredibly [successful at improving road safety throughout the world](#). Our challenge is adapting these success stories to the American context and planning our transportation systems to save lives.



The HDR designed NE Spring Boulevard Multimodal Corridor in Bellevue, Washington improves mobility for people who walk, bike, drive or take transit.

Q. What will it take to make this approach to road design more prevalent in our industry and our communities?

Wemple: The most important piece of achieving the paradigm shift and proactively applying SSA concepts will be working within our agencies and with the public to understand why this is good for our communities. Further, transportation agency leadership must commit to prioritizing road user safety and empower and support practitioners, such as engineers and planners, as infrastructure evolves from focusing on capacity and speed to focusing on safe mobility for all. There will be difficult decisions to make that may not be popular with the public; however, if we are truly committed to saving lives we will need to make these decisions. Leadership will need to focus on the importance of road safety, saving lives and reducing serious injuries at every opportunity. That dialogue creates a message that can successfully change minds and hearts that safety is important.

We also need to create momentum where the public is asking for a safer system. This way, solutions that lead to fewer crashes — such as protected bike lanes, roundabouts, J-turns, medians and rumble strips — become the first choice of the public and planners and designers.

At the same time, practitioners involved with day-to-day projects need to be using the SSA framework of considering crash exposure, likelihood and severity, while communicating about options and integrating solutions meeting SSA principles.

Polinsky: There's currently more funding available for transportation safety projects than ever before with the addition of the federal Safe Streets and Roads for All, or SS4A, program and continued funding of the Highway Safety Improvement Program. Those two programs alone fund billions of dollars annually for safety work in the U.S., and they're the tip of the iceberg when it comes to funds designated for improving our transportation infrastructure. As our profession continues to invest in safer transportation infrastructure, using the SSA to do so will maximize the benefits of the investment.

Q. What are the challenges associated with implementing the SSA in transportation projects?

Polinsky: Adoption of the SSA requires a reframing of traffic safety culture and how transportation professionals approach engineering solutions. At a surface level, the approach shifts the focus of traffic safety from reduction of all crashes to the reduction of fatal and serious injury crashes. But deeper than that, the method requires all transportation professionals to consider and prioritize safety at every phase of a project. This shift will require our profession to integrate predictive road safety considerations at the beginning of alternatives development alongside traffic operations, design and environmental considerations rather than at the tail end of the design development process.

Wemple: The SSA solutions are also sometimes met with opposition from the public. The safest solutions are often ones that the general public dislikes the most, such as roundabouts, reduced speed limits, or managed and removed access points. More often than not, the unpopularity of safety solutions is rooted in misconceptions. For example, as compared to a signalized intersection, roundabouts are more efficient for motor vehicles and safer for pedestrians and motorists; and road diets (reducing the number of lanes on a road) [can reduce motor vehicle injury crashes and keep traffic moving efficiently](#), if applied in the appropriate context.

It's going to take time and a lot of effort to continue to educate all transportation professionals of the benefits of the SSA, implementation approaches, and best practices for communicating traffic safety to the public and other stakeholders to obtain project buy-in.

Q. What can agencies and practitioners start doing right now to better align their projects with the SSA?

Polinsky: Engagement and education are critical so that all stakeholders have a baseline understanding of what the SSA is, why the shift to the approach is important and how it's different. Arguably, the most important piece to education and engagement about the approach is explaining how various stakeholders can and should implement the SSA in their day-to-day roles. For planning and engineering stakeholders, that likely means [sharing available tools and resources](#), as well as relevant project examples that highlight where the SSA aligns with what they're already doing.

For non-engineering stakeholders, implementation looks different and isn't quite as simple as introducing updated engineering tools and guidance.

For example, many law enforcement officers are unaware that their crash reporting data is not only used for insurance claims, but it's also a crucial element of traffic safety analysis that is required to receive funding to construct safer infrastructure. In addition, law enforcement and emergency service responders can be included in concept development to understand needs related to responding to a crash or other significant road event. Engagement and education efforts with law enforcement will result in improved solutions

development. This isn't something that happens overnight and these engagement and education efforts take time, trial and error.

Wemple: We also need to focus on educating leadership and practitioners that prioritizing road safety is beneficial to our communities and that all users deserve services making it possible to safely walk, bike, take transit or drive to errands, work or recreation. A challenge here is that the safer decision may require sacrifices that may not be initially desirable to the general public. Staff will need the support of agency leaders and elected officials to convey the importance and priority of road safety. they're already doing.

Further, practitioners need to understand that we are not reinventing the wheel. The SSA gives us the framework to proactively consider safety for all modes on any project at any stage in project development and the framework to readily compare tradeoffs (e.g., safety, capacity and environmental impacts) between different transportation system choices. This approach enhances our toolkit.





Q. What sparked your interest in transportation planning and traffic engineering?

Polinsky: I had a construction surveying internship where I got exposure to the transportation world and immediately loved it. When I joined the HDR traffic team, I quickly gravitated toward safety work because it's human-centric. Every single person relies on some form of transportation in their daily lives and deserves to get home safely every night. My purpose as a safety professional is driven by saving lives on our transportation system, which makes for a fulfilling career.

Wemple: I have always been interested in bridges and cities. Bridges led me to civil engineering; cities led me to my master's in city planning and transportation engineering. I really started having fun in my career when I was the project manager on the first edition of the Highway Safety Manual, and I'm now on the team developing the second edition of the HSM. From my perspective, working to save lives on our transportation systems is very rewarding.

Q. What advice do you have for traffic engineers who want to focus more of their career on developing safer solutions for road users?

Wemple: Dive in and start looking at and using the various tools available through the Federal Highway Administration, particularly the project-based and policy-based Safe System Approach Alignment Framework. Both of these resources were released in April 2024 and show how simple it can be to integrate the SSA into our projects. From my perspective the SSA really is an exciting framework for proactively considering safety in our projects.

Polinsky: I'm still early in my career and trying to figure out the best way to do this myself. I would say the most important thing is to be a sponge and soak up as much knowledge from those who are recognized as safety leaders in our industry (like Beth). FHWA is continuing to publish more resources on the SSA and data-driven safety strategies that I'd encourage all transportation professionals to stay up to date on. I'd also encourage

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