

# ***Building the foundation for a Work Zone Program at EFLHD***

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**Abstract** — *This article summarizes the findings of a project with the goal to improve work zone practices at the Eastern Federal Lands Highway Division. A gap analysis was conducted reviewing current practices and procedures to identify missed opportunities in the project development process related to work zone impact mitigation. The current work zone related practices at the division are not enough to provide a good understanding of the safety and mobility impacts the division construction program faces. Current gaps found were related to performance management, data collection and communication among the construction field staff and the safety and transportation operations staff. Recommendations to bridge the gaps included improving the work zone safety review practices, adding new data collection procedures, and the establishment of new performance measures. These recommendations are viable solutions to build the foundation for a work zone safety program at Eastern Federal Lands Highway Division.*

**Key Terms** — *Federal Highway Administration, Operations, Safety, Work zone*

## **INTRODUCTION**

The Federal Highway Administration (FHWA), Office of Federal Lands Highway, Eastern Federal Lands Highway Division (EFLHD) delivers highway construction projects for a variety of federal lands management agencies within thirty-three states and territories including Puerto Rico, the Virgin Islands and the District of Columbia. Highway construction projects have inevitable impacts in the operation and safety of a roadway. Operational or mobility impacts include congestion and traffic delays. Safety impacts include crashes within the work zone area and the creation of hazardous conditions for drivers and construction

workers for the duration of the project. These impacts can be managed by the use of proper mitigation measures. The first step to effectively apply mitigation measures is to understand the extent and the nature of these impacts. Safety and mobility data assessments provide a better understanding of work-zone impacts.

The current state of practice at EFLHD is to sporadically perform work zone safety reviews only on projects that are within approximately 50-mile radius from the division office located in Sterling, Virginia. This practice does not provide a comprehensive understanding of the safety and mobility issues generated by the entire construction program and only provides limited information based on a handful of projects.

## **OBJECTIVE**

The objectives of this project are to build the foundation for a work zone safety program at EFLHD by reviewing current practices, identify gaps in the project development process and identify opportunities for new processes to be established.

## **METHODOLOGY**

The methodology used for this project consisted in conducting a gap analysis of the current work zone related practices at EFLHD throughout the project development process. The review provided important information for improvement opportunities and challenges of the program. A literature review was conducted to evaluate multiple mitigations measures that can be implemented at ELFHD. These mitigation measures were evaluated for program compatibility based on ELFHD program capabilities and limitations.

## GAP ANALYSIS

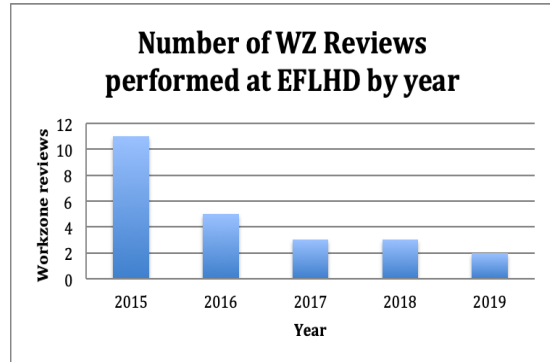
A gap analysis was conducted to identify shortcomings in the work zone practices and procedures at EFLHD that are preventing the ability to have an adequate work zone safety program. Several internal documents and processes were reviewed including: the Work Zone Safety Review Guidelines, the Federal Lands Construction Manual Chapter 3 and the work zone safety review log. These are the main documents where guidance related to work zone safety is found for EFLHD. Chapter 3 of the Federal Lands Construction Manual addresses the responsibilities of FLH staff and contractor to ensure the health and safety of its employees and the public. Section 3.3.5.1 in the manual provides guidance and reporting procedures for when a crash occurs within the work zone. Some data collection and reporting responsibilities are assigned to the construction engineer. However, there is no milestone in the project development process that will identify a responsible party for analyzing data while the project is in construction.

Also, when reviewing performance measures related to work zones, it was found that a goal for the agency does not exist, but rather some measures at the employee performance level.

### Work zone reviews

Work zone reviews are an important tool for data collection and constant monitoring of safety and mobility issues during the construction of highway projects. They can be conducted at any stage of the construction. As part of the internal processes reviews, data of the number of work zone reviews completed over the past 5 years was collected. The amount of work zone reviews was reduced significantly from 2015 to 2019. In year 2015 a total of eleven work zone safety reviews were completed in contrast with year 2019 were only two reviews were completed. Figure 1 below summarizes the findings on the frequency of work zone reviews per year. It is worth noting that over the course of the past 5 years there has been changes in personnel and several vacancies in the

safety and transportation operations office that might have contributed to the decline of work zone reviews performed by year.



**Figure 1**  
Graph showing the number of work zone reviews for the past 5 years

The declining number of work zone reviews over the last five years is concerning and demonstrate lack of attention to this focus area. Not having a defined work zone program may be a contributing factor to the lack of attention to work zone reviews.

Current gaps identified during the analysis were summarized and separated in three categories shown in Table 1.

**Table 1**  
Gaps identified

Performance Management
The Division does not have a performance measure related to work zone safety.
Data
A central database does not exist for work zone safety and mobility data. Data collected on work zone reviews is not being recorded for future evaluation.
Communication and Processes
Crash incidents are not reported to the Safety and Transportation Operations team. Current process only requires the reporting of this information to the Construction Operations Engineer (COE).

## FHWA GUIDANCE

A literature review focused mainly on existing FHWA guidance was completed. FHWA Office of

Safety calls on transportation officials to provide safe and efficient flow of traffic through work zones by developing mechanisms to mitigate fatalities and injury crashes in the work zones and enhance safety and traffic operations within. One of the documents that helped form the recommendations for this project is the Targeted Work Zone Engagement Framework Guidance Document. This document presents an effective way to assess and identify work zone safety and mobility mitigation needs.

After evaluating the current state of practice at EFLHD, with the use of the Framework it can be established that Federal Lands Highway is in the first emphasis area: “lack of quantitative and/or qualitative evaluation of current work zone policies or practices.”[1] The first step in better managing work zone safety and mobility issues is to understand the extent of their impact. Setting an agency goal is of utmost importance. After that, realistic performance measures can be established for the division. Several mitigation strategies are presented as viable to achieve a clear understanding of the safety and mobility challenges the agency faces. These are the mitigation strategies for consideration:

- Work zone planning and traffic analysis tools and models
- Crash data collection and performance measure reporting
- Congestion data collection and performance measure reporting
- Process reviews
- Work zone safety audits (reviews) [1]

## **RECOMMENDATIONS**

In order to manage work zone safety and mobility impacts, the division needs to first identify what are the challenges it is facing. The strategies discussed in the previous section are viable options to focus on. The first recommendation will be to establish a division performance goal to require action on work zone impact mitigation. For example, a performance goal can be: Identify

work zone safety and mobility issues generated by the construction program by the end of 2020 and select mitigation measures for future implementation.

One tool already utilized by the division is work zone safety reviews. However, as noted previously the frequency of these reviews and the data collected is not enough to quantify the issues faced by the entire construction program by year. A recommendation that can be implemented in a short timeframe is to increase the frequency of work zone safety reviews, and strategically select projects for evaluation.

It is also recommended the creation of a new process in which projects with higher risks for negative work zone impacts are identified during the design stage. Factors that increase the risks of crashes are speed, traffic volumes, geometric alignment and configuration among others. These are elements that can be identified ahead of time so that projects with higher risks are in a priority list for work zone reviews.

Another recommendation is to expand the location range of work zone reviews to include the entire construction program and not just the projects that are located closer to the office. EFLHD has projects in 33 states and territories including the District of Columbia and Puerto Rico. Current practice covers only projects within four states closer to the office in Virginia.

While increasing the amount of work zone reviews is necessary, it would not be entirely beneficial if data is not recorded and analyzed to improve future work zone operations. A work zone review database can be created to serve as the one repository of information collected in the field. This central location can serve as a guide for future projects in similar locations and give insights of what temporary traffic control strategies work best for certain locations.

Work zone safety reviews are more qualitative in nature. In order to quantify the work zone impacts to safety and mobility, safety and traffic data should be collected. That means that having a good handle on crash data and traffic conditions is

of utmost importance. The division must collect good data before engaging in safety management tools. That is why even when the use of analysis tools and models are great goal to strive for, it is not recommended as a short-term solution due to the lack of quality quantitative data.

Recommend that on a monthly basis project engineers will provide a summary of crashes occurred in within their projects. Based on existing procedures, project engineers should be reporting to their COEs any incidents occurred in the project. One opportunity would be to enforce this process by having personnel in charge of collecting this information and making project engineers accountable for sharing safety data. Improvements and updates to the current process should be made so that the responsibilities are clear to all construction and office personnel.

Once data is collected on a regular basis, establish bi-annual process reviews using the work zone review and crash data available. Process reviews should engage a multidisciplinary team [2]. It is recommended the selection of a process review team with representatives from construction administration, highway design, traffic operations, traffic safety, design consultants, and federal lands partners.

Table 2 summarizes the recommendations addressing the gaps identified in the work zone safety practices at EFLHD.

**Table 2**  
**Recommendations to improve work zone safety practices at ELFHD**

<b>Performance Management</b>
Establish a performance goal focused on the identification of safety and mobility issues. Establish bi-annual process reviews and designate a process review team
<b>Data</b>
Create a database for crash data and work zone review qualitative data. Increase the range of location for work zone reviews.
<b>Communication and Processes</b>
Review current practices and establish a communication protocol for the dissemination of crash data, modify construction manual and other internal procedures as necessary.

## **Implementation Challenges**

Several challenges are identified as potential roadblocks in the implementation of mitigation measures for the establishment of a work zone program at EFLHD. These challenges are listed and discussed below:

- **Funding/ Budget:** The federal lands program authorizes funding for project construction but normally activities such as work zone reviews are not identified in the project budget. Funding will have to be allocated to cover for the work of EFLHD personnel involved in work zone management activities.
- **Staffing:** a work zone safety program is likely to be led by the Safety and Transportation Operations Team that faces a short staff situation at the time of this review. There is a need to identify positions dedicated to the management of this program.
- **Diversity of projects and partners:** EFLHD delivers construction highway projects to partners in very different geographical locations and with different transportation needs. This situation may affect the selection of mitigations measures that will benefit the program as a whole.

## **CONCLUSION**

After the completion of this project many opportunities for improvements were identified that can help address the safety and mobility impacts generated by the EFLHD construction program. This project did not provide an exhaustive list of recommendations but rather looked into what recommendations are more readily available to implement based on the existing capabilities of the EFLHD. After some recommendations are implemented within ELFHD, an evaluation of the effectiveness adequacy of such recommendations will be necessary. The creation of a formal work zone program may take some time to be established, but the recommendations presented in this article are an opportunity to work towards the foundation for such program.

## REFERENCES

- [1] Ullman, J., et al, "*Targeted Work Zone Engagement Framework Guidance Document*", FHWA-HOP-18-081, 2018, pp 13-30..
- [2] Ullman, G., et al. "Guidance for Conducting Effective Work Zone Process Reviews", FHWA-HOP-15-013, 2015, pp 5-11.