

Work Zone Process Review Toolbox

Periodic evaluation of work zone policies and procedures and work zone impacts aids in the process of addressing and managing the safety and mobility impacts of work zones. Process reviews help assess the effectiveness of a program and/or a set of policies and procedures. They enable the agency and respective FHWA Division Office to confirm that a problem does not exist, and to make recommendations to improve situations where shortcomings might exist.

This Work Zone Process Review Toolbox contains tools to help you conduct an effective Work Zone Process Review. The first section of the Toolbox has information to help you determine the purpose/goals and scope of a review, expected outcomes, team members, and possible data sources. This section also contains sets of potential questions that can be used to assess various work zone program areas while doing a work zone process review. The Resources section provides information on training, and includes examples and tips that share what other peers have done. The Frequently Asked Questions (FAQs) section provides answers to some commonly-asked questions about work zone process reviews.

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For general background information on process reviews, see [“ABCs” of Process Reviews](#).

WORK ZONE PROCESS REVIEWS

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A. What is a Work Zone Process Review?

i. What it is:

A process review is an opportunity for an agency to take a step back and look at how the agency's work zone management is performing on a systemwide basis. Periodic evaluation of an agency's work zone policies and procedures, and the work zone impacts of road projects, helps an agency identify, address, and manage the safety and mobility impacts of work zones. Process reviews help assess the effectiveness of a work zone program and/or a set of policies and procedures. The reviews enable the agency and respective FHWA Division Office to confirm that a problem does not exist, to identify systemic problems, to make recommendations to improve situations where shortcomings do exist, and to identify best practices.

The following are examples of questions that a work zone process review may help answer:

- How are work zones performing with respect to mobility and safety?
- Are the best possible decisions in planning, designing, and implementing our work zones being made?
- Are customer expectations being met with respect to maintaining safety and mobility and minimizing business and community impacts both through, and in and around the work zone?
- Can areas for improvement be identified?
- How have areas for improvement that were identified in the past been addressed?
- What has both worked and not worked – which strategies have proven to be either more or less effective in improving the safety and mobility of work zones?
- What other strategies can be considered for implementation?
- Are there certain combinations of strategies that seem to work well?
- Can any work zone safety and mobility trends be identified, at the national level or local level? What can be done to advocate characteristics associated with good trends? What can be done to remedy the problems associated with bad trends?
- How do work zone performance, the effectiveness of strategies, or areas of improvement vary between day work and night work?
- Should agency policies or procedures be adjusted based on what has been observed or measured?
- Can consistency be brought about in the identification of such trends, issues, and problems and in the standardization of tools and guidelines for application at the agency, State, and/or national level?
- Have the recommendations/action plan items from the last review been implemented?

ii. What it isn't:

- It's not a compliance review for traffic control plans – although it may consider/include the results of these field/traffic control reviews. Work zone traffic control reviews can be a rich source of information to make use of in conducting a work zone process review. Work zone traffic control reviews are important and useful for making work zone improvements, however they do not cover all the areas that a process review should cover.
- It's not a training program - although it may include a review of the agency's WZ training program.
- It's not the Work Zone Self Assessment – although it should make use of the WZ SA results from recent years to avoid “plowing over the same ground” again. In fact the agency may find it beneficial to conduct its WZSA as part of its process review every two years. (http://www.ops.fhwa.dot.gov/wz/decision_support/self-assess.htm)
- It's not a review of crash data – although the agency should use available operational and safety data as part of its process review.

B. Work Zone Rule Requirements

Section 630.1008 of the Work Zone Safety and Mobility Rule requires agencies to conduct a process review at least every two years to assess the effectiveness of work zone safety and mobility procedures. The results of the review are intended to lead to improvements in work zone processes and procedures, data and information resources, and training programs so as to enhance efforts to address safety and mobility on current and future projects. According to the Rule, the review may include the evaluation of work zone data at the State level, and/or review of randomly selected projects throughout their jurisdictions. The Rule recommends that the reviews are done using a multi-disciplinary team and in partnership with the FHWA. More information about process reviews can be found in *Implementing the Rule on Work Zone Safety and Mobility*.

C. What are the Steps for a Review?

The following presents a suggested approach and some specific considerations for conducting a work zone process review. More information on the basics of conducting a process review on any program area is presented in [“ABCs” of Process Reviews](#).

1. Assemble multi-disciplinary team.

Effective work zone management starts at the policy level, and pertains to all stages of project delivery – from systems planning through to post-construction. Appropriate representatives from these various DOT departments should have input to the process review. Personnel who represent all the project development stages and the different offices within the agency, as well as FHWA and law enforcement, should participate in work zone process reviews. For example, the workers responsible for implementing and monitoring a TMP in the field are generally following the plan that was developed earlier by agency design or traffic engineering staff, or consultants. Including designers and consultants in some process reviews may help them improve future TMPs. The multidisciplinary team for a process review may be the same team that developed and implements the overall work zone policy and the agency work zone policies and procedures.

It may be helpful and appropriate to include some key non-agency stakeholders – such as TMC operators, emergency services providers, contractors, the public, a trucking company - as participants in the reviews, as appropriate. They can provide a useful perspective and may have insights that agency personnel are not in a position to see. These stakeholders may support the review by providing data and input, such as through interviews, rather than be part of the core review team.

2. Develop a review plan.

A review plan should give the review team a “roadmap” for the review - a clear idea of what is to be accomplished, how, by who, and by when. The Rule allows the following methods, alone or in combination, for conducting the process review:

- Evaluation of work zone data at the agency-level.
- Review of randomly selected projects across a variety of jurisdictions.

Often times, there may be a necessity to use a combination of the two approaches to conduct the process reviews. Evaluation of work zone data at the agency-level involves synthesis and analysis of data from multiple projects. This lends itself to creative clustering and categorization of data and the development of aggregate results to identify trends and develop categorical statistics. Reviewing individual projects helps gain an in-depth understanding of individual project circumstances, the different decision-trees that were involved, the actual impacts, and the performance of the project's work zone transportation management strategies. In either case, reviews should include projects that represent a range of characteristics, such as day and night work; type of work being done; duration of the project; local traffic characteristics; and/or transportation management strategies used.

Purpose and Scope: Function/processes reviewed

Work zone performance assessment aspects addressed in the process reviews may involve two tracks: 1) the overall work zone management process and 2) work zone field performance and management strategies. Four performance measure areas of interest for the work zone process review are safety, mobility, construction efficiency and effectiveness, and public perception and satisfaction.

Example Purpose:

1. Determine if Districts/Regions are complying with xxDOT's work zone safety and mobility policy
2. Determine if project traffic control plans and specifications are complied with on certain construction projects
3. Identify best practices that may warrant use in other Districts/Regions or Statewide
4. Determine if traffic control and other transportation management practices are sufficiently addressing safety and congestion.

Example Purpose:

1. Ascertain the present degree of compliance with the intent of the Work Zone Safety and Mobility Rule (Subpart J), and the MUTCD as it applies to xxDOT's construction projects (work zone safety and mobility, signage and device installation)
2. Determine and document areas of non-compliance and recommend appropriate remedial actions

3. Ascertain which existing XXDOT policies and procedures are effectively working to provide safe, mobile, and compliant work zones, or determine if revised or new policies and procedures are needed
4. Improve the day-to-day quality and safety and mobility of XXDOT work zones
5. Determine the effectiveness of existing work zone training.

The agency and the FHWA Division Office generally work together to identify the scope of review, based on the Stewardship Agreement and a risk assessment.

Example Scope:

1. Conduct a Statewide Work Zone Process Review to evaluate the existing Department, District/Region, and project work zone implementation, policies and procedures
2. Conduct site visits of on-going construction/maintenance work zones in each xxDOT District/Region to determine compliance with work zone specifications
3. Conduct a survey in an attempt to obtain information of recurring work zone problems, concerns, issues and best practices
4. Document and compare review findings with established xxDOT policies, specifications, and the MUTCD
5. Provide a report of the review team findings and recommended corrective action or mitigation to improve public and work force safety within construction work zones
6. Establish subsequent procedures and protocol for conducting periodic work zone reviews.

Expected results

The process review should have clear and concise goals that define what the review is trying to accomplish and identify the expected results. Base the selection of topics on opportunities for improvement and consider a fairly uniform distribution of review topics among the various program areas (safety, worker safety, congestion relief, etc.). Example goals may include:

- Schedule and coordinate work zone operations at the corridor, District/Region, and State level in order to reduce the negative impact of continuous multiple work zones.
- Provide customers real-time work zone information and alternative routes.
- Employ incident management strategies in design and construction.
- Minimize impact of work zones on roadway user, limit traffic delays to 15 minutes or less.
- Reduce the likelihood of crashes by conducting investigations on major work zone crashes and implement improvements where appropriate.
- Use work zone intelligent transportation systems and enforcement strategies to enhance safety.
- Minimize motorist delays and reduce congestion by adhering to the requirements set forth in the Work Zone Lane Closure Analysis Guidelines.

Information needed

Once the purpose, scope, and expected results are identified, the team must determine what information is needed to support the review.

What do we know now? After determining the information the review team needs, it should next assess what information is already available and identify what needs to be generated.

- ***Existing Records*** - Based on the goals of the review, develop a list of existing records and their sources that support the review function. Then determine which existing records are pertinent to the objective of the review. The gaps in data/information

identified in the existing records helps the team determine what needs to be collected by other data collection methods.

Gaps in information and possible sources -There are a variety of sources, methods and tools to collect data. These include interviews, written surveys, and onsite inspections.

- **Interviews** – Interviews are an excellent way to collect information and to judge a manager, organization or situation. Employees may give information more freely during an interview. Interviews are a good technique to fill in gaps.
- **Written Surveys** can be a questionnaire or focused review questions.
 - Questionnaires – Formal written surveys are sent to respondents for their consideration. A benefit is that a larger population can be sampled and any trends identified. One drawback of surveys is that there is little interaction with the review team.
 - Focused Review Guide Questions – These are usually prepared in advance of interviews or inspections. They are sent ahead to assist the team in providing focus and consistency in each similar type of interview or inspection. They can also be sent to others that will not be personally interviewed to supplement information.
- **Inspections** – An actual onsite visit, such as work zone traffic control inspections/compliance reviews, to observe the actual activity, process, or product. Careful consideration should be given to existing review or inspection programs.

A review may include:

- Collection of data including project related information as well as public and stakeholder perception.
- Synthesis and analysis of data at multiple levels (project, local, regional, State, and national) and comparison of findings to performance metrics.
- Application of the analysis results toward continually improving work zone policies and procedures.
- Identification of best practices.

Team members and roles

- **Team Sponsor** – The Team Sponsor can be from the State DOT or FHWA. The sponsor defines the team purpose, chooses the team leader, helps choose team members and checks on progress with the team leader. The sponsor should be a person in a position to implement the changes suggested by the recommendations. The sponsor provides timely guidance, serves as a team enabler and ensures the team is properly resourced.
- **Team Leader** - The team leader essentially works for the team sponsor. The leader helps choose team members, interacts with the team sponsor, works to establish the review plan, helps establish the ground rules, and keeps the team on task.
- **Team Members** – Consider including Team Members from FHWA and State DOT (from both the District/Region and Headquarters level) planning, pre-construction, Construction, Traffic and Maintenance Offices. The make-up of the team members depends on the review topics. Each member should be a local expert in his or her field.
- **Stakeholders** – Stakeholders have an interest in the outcome of the review and are affected by the outcome. They can be a team member and can be used to provide important information during the review. The role of the stakeholder needs to be determined early in the review. Examples of stakeholders could include representatives

from law enforcement, the MPO, local businesses, the media, and others. The representatives to involve will depend on what is being covered in a given review.

Schedule and resources - The review team should also identify target dates for conducting the review and presenting the results, as well as the resources available for the review. Resources should include staff time and expertise, data availability, and budget.

3. Conduct review.

This step involves carrying out the review plan developed by the team. The review team leader should make appropriate assignments among the team members to promote active participation by everyone. It is valuable to document the steps taken and information collected during the review to have a good basis for any conclusions reached and recommendations made. FHWA Division Offices are frequently involved in project inspections on major construction projects. For these projects, it would be beneficial to periodically review the collection and use of work zone mobility and safety data. The results of these periodic reviews can be reviewed in combination during a process review to help identify systemic issues.

4. Analyze and interpret results.

Well-organized data can help draw conclusions and understand what the recommendations should be.

- Use spreadsheets, tables, figures, charts, graphs, questionnaire summaries
- Represent the existing situation
- Show causal interrelationships
- Keep in mind that tabular data can be better than narrative when demonstrating trends over time, etc.

When analyzing the results it is important to not only look for areas needing improvements, but to also look for best practices. Identify what is working well, and how it is developed and implemented. It is important to share best practices with others so they may benefit from the positive experiences.

One of the main goals of a process review is to identify systemic problems. Look at multiple projects to see if there are recurring issues. If possible, look at project records spanning multiple construction seasons, again looking for recurring problems. In looking to understand and address any issues the team identifies, symptoms may need to be addressed, but real change occurs when you solve the root causes of a problem.

Examples of Typical Symptoms:

- Uneconomical or inefficient use of resources (time, money, manpower)
- Loss of potential income or Fed participation
- Funds improperly spent
- Meaningless or inaccurate info/records (e.g., work zone safety/mobility data are not being used to make decisions)
- Ineffectiveness in accomplishing job
- Inadequate control over resources or actions
- Lack of assurance that job is done properly
- Lack of assurance that objectives are being met
- Significant number of TMP-related change orders.

Examples of Root Causes/Systemic Issues:

- Lack of training (e.g., is there any training/a manual on TMP development?)
- Lack of communication
- Unfamiliarity with requirements (e.g., not aware of agency's work zone policy)
- Negligence or carelessness
- Guidance or standards (criteria) that are inadequate, not provided, obsolete, or impractical
- Conscious decision or direction to deviate from requirements
- Lack of resources (staff, inadequate time to prepare, funding)
- Failure to use good judgment or common sense
- Inadequate data management system
- Dishonesty
- Lack of effective or sufficient supervision
- Unwillingness to change
- Lack of planning (e.g., TMP development does not begin until late in Design)
- Faulty or ineffective organizational arrangement or delegations of authority.

5. Develop inferences, recommendations, and lessons learned.

When developing recommendations and solutions ensure they are supportable, directed at solving the problem, focused at the proper level, and supported by data. Implement recommendations at the lowest level of management feasible.

6. Prioritize recommendations and lessons learned.

Recommendations should have substance and have specific actions or products ready for implementation. Recommendations/solutions should be Conceivable, Achievable, Valuable, Manageable, Constructive, and Realistic. Recommendations should be prioritized by those with the greatest impacts (cost-benefit: \$\$, time, resources, and consequences).

7. Present the findings from the review.

The purpose of a closeout report is to summarize the results of the process review, document observations, and document the resolutions discussed at the closeout meeting. Observations in the report can be either positive or negative. Observations in a closeout report should be arranged in order of priority and significance. If the team considers an observation significant, it should be reported and addressed. There is no maximum number of observations in a report. The review team should provide recommendations in the report that will resolve or improve the documented observations. The report also serves as an avenue to share "best practices".

Recommended contents for a closeout report are:

1. Title of Review
2. Purpose of Review
3. Scope of Review
4. Identification of Team Members
5. Executive Summary
6. Observations, including "best practices," in order of significance-each observation should have a recommendation
7. Proposed implementation plan
8. Conclusion
9. Attachments (supporting documentation, example specifications, graphs, photos, etc.)

Recommendations to improve the content of process review closeout reports include:

- Use statistics whenever possible to justify observations (i.e., "In 7 out of 9 Districts/Regions, this procedure was followed...etc.").
- Recommendations should have substance and have specific actions or products ready for recommended implementation.
- If possible, obtain information from other states on their policies and procedures. These can be shared as "best practices" (e.g., sample specifications, procedures, forms).
- Material to back up the observations should be included as attachments to the report. Examples include charts, graphs, sample specifications, checklists, etc.

8. Apply recommendations and lessons learned.

Are the process reviews performed at least every two years to assess the effectiveness of their work zone safety and mobility procedures?

Has the implementation plan been carried out?

Are the process review results used in such a manner that lead to improvements in agency work zone policies and procedures, data and information resources, and training programs, that ultimately enhance efforts to address safety and mobility on current and future projects?

D. Topics to Cover

A work zone process review should address all the areas that influence work zone operations and the agency's whole work zone management program. For some process reviews the agency may evenly spread its efforts across the whole program, while in other years the agency may choose to spend most of its process review focusing on one or two areas. While every work zone process review should at least briefly cover the basics of the whole work zone program, an agency may "zero-in" on one or two particular areas of interest or concern.

i. Basics

Following are some sample sets of questions that could be used by the agency to do a first-level review of the areas indicated. Through this review the agency may decide that a particular area warrant a more in-depth analysis and should be selected as a special focus area in a given process review cycle. Some suggestions for how to select a special focus area are discussed below.

Sample Sets of Questions

- [Overall Work Zone Policy Implementation](#)
- [Impacts Assessment](#)
- [Use of Work Zone Data](#)
- [WZ Training Process Review Questions.doc](#)
- [Significant Projects](#)
- [TMPs](#)
- [Traffic Control Component of TMPs](#)
- [Transportation Operations Component of TMPs](#)
- [Public Information Component of TMPs](#)

ii. Selecting Special Focus Areas

There are several reasons an agency may choose to spend a majority of its review on a particular focus area. The agency may decide that an area warrants a more in-depth review if:

- The review of the basics had indicated that one particular area is not working well.
- During the course of normal project development over the past year or so, one area seems to regularly cause delays or the need to go back and redo earlier work.
- The agency has seen an increase in complaints about a certain element or in a part of the State.
- The agency has not looked in-depth at a certain area, such as TMP development, for a while and has decided to rotate through certain key areas – choosing one for each process review.
- A new process was added since the last process review and the agency wants to look more closely at how the new process is working,

Example – Work Zone Traffic Incident Management as a Focus Area

Last year the agency added a work zone traffic incident management (WZ TIM) program across the State and has begun regularly working with emergency response partners to develop TIM plans for its construction work zones. These plans are now being included in the agency's TMPs for road construction projects. As part of its process review focus area, the agency could assess the overall effectiveness of the incident management strategies and techniques employed and how well the process of developing the plans is working. This review could involve an assessment of a sample of projects and how the WZ TIM strategies in the TMP performed on those projects. Ideally, at the conclusion of each of those projects, the work zone planners, construction personnel, and incident responders would have made some notes as feedback for use in planning for future work zones. For the review, some interviews could be held with those personnel to either gather the information or to ask follow-up questions to any post-construction notes. Construction personnel and incident responders should be asked to evaluate the strategies used against the traffic incident management objectives defined during the work zone planning processes.

Construction personnel and incident responders should specifically assess the following:

- Did the strategies help reduce the time required to detect the presence of incidents in the work zone?
- How did the strategies help expedite the clearance of incidents in the work zone?
- How did the strategies help facilitate or improve incident responses in the work zone area?
- Did the strategies deployed reduce the frequency and severity of crashes and secondary crashes in the work zone?
- Did the strategies reduce the number of public safety personnel needed to respond to the incidents?
- How did the strategies impact incident responder safety, cooperation, and collaboration within the work zone?
- How might customer satisfaction be improved in future work zone traffic incident management efforts?

Steps should also be taken to document the effectiveness of the strategies, wherever possible.

E. Data Sources

Work Zone Self Assessment

The annual Work Zone Self Assessment can be a source of information to utilize in determining areas for improvement in the TMP development and implementation process. By reviewing the responses of the assessment, it should be possible to identify weaknesses in the performance of work zones within the State. These could be either safety or operational problems.

Crash Data - Systemwide

A complete review of all work zone crash data should be conducted. Crash patterns can be used to identify possible problems with work zone traffic operations. The problems could indicate a need to review and possibly revise the agency's work zone policies and procedures. For example, an unusual number of crashes occurring in queues of vehicles approaching work zones could indicate that additional advance warning signs should be included in the plans for future work on those types of facilities. It could also be an indication of a lack of mobility/decreased capacity through the work area versus what was anticipated. This could lead to a review of the agency's method for estimating impacts.

Post - Crash Reports

A review of the crash data gathered at the project level during construction should be undertaken to determine if there are any crash patterns that can be identified and attributed to the work zone activities. The team should review the crash reports from the crashes that occurred in or related to the work zone to determine if there are any work zone related factors that contributed to the crash. Spot checking of each project's post-crash reports could lead to the identification of trends that should be evaluated closer. For example, if agency project files contain a significant number of post-crash reports of rear end crashes that occurred in the activity area of various projects, this could point to operational problems caused by construction traffic ingress/egress at the work area. Such a finding could lead to adjustments to agency traffic control plans.

Operational Data – Project Level

Methods should be developed and utilized to provide information on the operational performance of the work zone design and implementation. These methods could use technology to measure delays through the work zone or the length of the queue. These measures provide an insight into the effect the work zone strategies employed in the TMP had on the impacts caused by the work zone. This data should be analyzed to determine how accurate the estimates are of the impacts for projects. For instance, if the impacts are significant, but the project was not designated as a "significant project", then an adjustment to the criteria for "significant project" could be in order.

Field Observations – Project Level

The construction personnel assigned to the project should be requested to provide an assessment of the effectiveness of the TMP through field observations and provide quarterly reports for the duration of the project. These reports can be used to identify any problems associated with the various phases of the work.

Traffic Control Review Documentation

Project personnel are responsible for making routine inspections of the temporary traffic control on each project. Their documentation records should be reviewed to determine if the temporary traffic control was adequate as designed or if there were field modifications necessary to improve operations. Maintaining effective traffic control during stage or phase changes can be critical. The project documentation should include observations on how well these revisions were accomplished and note any problems. This information should be shared with designers to relay what types of staging works well and what causes problems.

Customer Surveys

Customer surveys can provide an insight into how the public views the performance of the agency in providing for mobility in work zones. Unexpected delays are often one area that the public rates as unsatisfactory. This may be an indication that the agency is not doing a good job of assessing and mitigating the impacts caused by the work zones. Either the process used to estimate the magnitude of the impacts should be reviewed or the decision process on how to apply various strategies to mitigate the impacts may need to be revised.

Work Zone Traffic Control Reviews

The work zone traffic control review is a tool that can be used to determine if the provisions of the TMP are being properly implemented in the field. Improper design or placement of traffic control devices in the Traffic Control Plan can be an indication that the field staff needs additional training in the importance of applying proper traffic control. This review could also be used to determine the effectiveness of the persons responsible for the implementation of the TMP. The reports from these reviews can identify programmatic issues that may need to be addressed through the revision to standards and specifications. Some examples of work zone traffic control checklists are available.

Performance Measures

The policy established by the agency should include goals for safety and mobility in work zones. A review of the actual results compared to the goals will be a good indication of how well the policies and procedures are working. Examples could include the maximum delay encountered in work zones or a reduction in the number of crashes related to the work zone. Not reaching the goals in an area can be an indication of what processes should be included in the review.

Post Project TMP Evaluation and Performance Assessment-

Upon completion of the project, the TMP team will prepare a concise evaluation of the TMP. Include successes and failures, revisions made to the TMP and the results of those revisions, public feedback, actual conditions versus those predicted, cost for implementation of the TMP, and recommended improvements.

RESOURCES

A. Training

FHWA-NHI-310111 Conducting Reviews that Get Results

DESCRIPTION:

To accomplish FHWA's Stewardship Mission, units at every level and in every program area need the expertise to plan, design and carry out, often jointly with partners, reviews to ensure that operational processes are consistent with established standards and expectations, performing at the most effective and efficient level, and that best practices are captured and made available to units at all levels.

Building on FHWA experience and expertise gained through PR/PE's, Process Reviews, and Continuous Process Improvement Reviews, an improved workshop, tailored to the unit's needs is now being offered.

The Workshop consists of assistance, focused on your reviews, in the form of consultation, training and hands on assistance in the methodology and tools for conducting successful reviews.

OUTCOMES:

Upon completion of the course, participants will be able to:

- Use the Team Charter to build partnerships and confidence in the review approach
- Explain the methods of review planning to identify desired results and needed information
- Describe effective data collection methodology
- Describe effective data analysis methodology
- Describe effective presentation and marketing methodology
- Describe how to formulate recommendations that can be implemented.

TARGET AUDIENCE:

Division offices looking to charge up their review programs and Review Teams established and charged with conducting unit process or program reviews, compliance verification reviews, improvement reviews, and/or National Program Reviews. The workshop can be conducted at any critical stage of the review, from planning to implementation.

B. Examples

- **A Review of the Virginia Department of Transportation's Scoping Process and Options for Potential Improvements (May 2008)**

http://www.virginiadot.org/vtrc/main/online_reports/pdf/08-r13.pdf

- **Missouri DOT**

The quality assurance inspections of work zones conducted on a daily basis by Central Office and District staffs cover 23 specific items pertaining to the visibility of work zones and 10 specific items pertaining to traffic flow through work zones. Traffic will review quarterly the ratings of these 33 items to determine where MoDOT is managing work zones well and where improvement is needed. The Work Zone Quality Circle will review statewide work zone trends and evaluate new work zone safety devices, methods, and guidelines. The Work Zone Review Team will conduct audits of work zones in three

different Districts each year. These audits will consist of very detailed inspections, covering the technical aspects of work zones in regards to managing visibility and mobility. Then upon completion of all of the audits for a given year, the results will be shared statewide to assist Districts in assessing and managing their respective work zones.

- **Illinois DOT**

Policy Process Review This process review shall be performed by the Central Office every other year to assess the effectiveness of IDOT's work zone standards, specifications, policies, procedures, TCPs, PIPs, TOPs, TMPs, Significant Projects, and the level of mobility and safety afforded the traveling public. All types of projects shall be reviewed. These shall include day work and night work, all types of traffic characteristics, and the various management strategies that are being utilized. The process review team should consist of personnel who represent the project development stages and the different offices of IDOT who participate in project development and implementation. Bureau of Safety Engineering shall be the lead agency, and the FHWA Office shall be invited.

Work Zone Traffic Control Project Review These project reviews shall be performed by the Central Office every two (2) years, on the opposite years of the Work Zone Safety and Mobility Policy Process Review. This review will consist of a drive-through to inspect the traffic control of construction projects. A random selection of projects will be selected for review. The project review team should consist of personnel who represent the project development stages and the different offices of IDOT who participate in project development and implementation. Bureau of Safety Engineering shall be the lead agency and the FHWA Office shall be invited. The findings of these reviews shall be documented and presented to the District in a closeout meeting.

- **District of Columbia DOT (DDOT)**

DDOT's Work Zone Safety and Mobility Policy specifies how they plan to conduct process reviews. DDOT reviews may include evaluation of work zone crash data and operational data for randomly selected projects. DDOT will maintain the data and information resources needed to support the use of work zone data for the above activities. The results of TMP evaluations can be useful in the process reviews, and vice versa. Collecting, analyzing, and synthesizing findings from multiple projects can help to develop and implement future TMPs. The process review should include an annual work zone traffic control inspection ratings report and an annual work zone crash report. The work zone traffic control inspection rating report should consist of a summary of inspection ratings from the field inspection report of selected significant projects. The annual work zone crash report should present a crash trend analysis and comparison of work zone crashes District-wide. Additionally, the process review should include a review of randomly selected post-evaluation reports of significant projects to assess TMP process and strategies. Appropriate personnel, who represent the project development stages and different offices within the agency, FHWA, and non-agency stakeholders, should participate in the process reviews.

- **Indiana DOT**
Randomly selected reviews will be done every two years in conjunction with the FHWA divisional office. Review team will be comprised of staff from a cross-section of INDOT offices typically including planning, production (design), operations, construction, traffic and communications. The review findings will be used to improve and further develop INDOT work zone policy and procedure and will be reported to the FHWA division office.
- **FHWA WZ Rule Process Review Examples**
http://www.ops.fhwa.dot.gov/wz/resources/final_rule/process_reviews.htm

C. Tips

- **Guidelines for Conducting Process Reviews – Illinois Division Office**
<http://www.fhwa.dot.gov/construction/cpmi04c2.cfm>

D. Lessons Learned

Future Section

E. Best Practices

Future Section

FAQs

A. How will Process Reviews Change as a Result of the Updated Rule?

The updated Rule states that the ultimate objective of the process reviews is to enhance efforts to address safety and mobility on current and future projects. While the basics of process reviews will remain the same, these reviews will also need to include some additional aspects. For example, agencies will now need to use both crash and operational data (level of service, flow, etc.) at the project and procedural levels, which will expand this aspect of process reviews. The new requirement for agencies to identify significant projects may mean that process reviews now include an assessment of the agency's process for determining significant projects and its use of transportation operations and public information strategies for these projects. While agencies were previously required to forward the results of the review to the FHWA Division Administrator for review and approval of the State's annual traffic safety effort, the updated Rule does not include this requirement and instead encourages agencies to include FHWA in the review.

B. How do the process reviews required every 2 years by the updated Rule compare to the annual work zone field reviews required by the former rule? Are they the same? How much does the updated Rule change what is expected?

Some State DOTs use the terms "annual work zone field review" and "process review" interchangeably. Whether the annual work zone field reviews performed under the former rule meet the intent of the process reviews required by the updated Rule depends on what the agency included in its annual field reviews. For some agencies the annual work zone field reviews functioned as work zone traffic control reviews and focused primarily on the traffic control set-ups in a sampling of work zones. These types of reviews are important and useful for making work zone improvements, but they do not cover all the areas that a process review under the updated Rule should cover.

The updated Rule states that, (1) States shall perform process reviews at least every 2 years in order to assess the effectiveness of work zone safety and mobility procedures, and (2) These reviews may include the evaluation of work zone data at the State level, and/or review of randomly selected projects throughout their jurisdictions. The purpose of these process reviews is to use the results to guide improvements in the agency's work zone policy, work zone processes and procedures, data and information resources, and training programs --ultimately enhancing efforts to address safety and mobility on current and future projects. The review team should consist of appropriate personnel representing the different project development stages and the different offices within the State DOT, and FHWA. Other stakeholders can be included as appropriate.

The process review is an opportunity to take a "bird's-eye view" of the agency's overall work zone management efforts to see what is working well, what is not working well and may need adjustments, and to determine how to address any new work zone management challenges that have developed. For example, the agency may review data from a selected set of projects as part of its process review. In reviewing this data, the agency may notice that certain types of projects seem to be having a higher occurrence of crashes than other projects. By looking further into these trends, the agency may determine that some adjustments to its practices would be appropriate, such as changes to standard design specifications for those types of jobs. During a process review an agency might look at a sample of post-construction reports and

identify that work zone traffic delays in one part of the region have been more than what were experienced in the past and have been exceeding department goals. As a result, the agency may decide an update to that region's lane closure policy and permitted lane closure times is needed. During a process review an agency may review its training requirements to determine whether they are still adequate.

These are only examples of the types of issues that might be covered in a process review. While each process review should cover a range of issues, the agency needs to determine what issues are most appropriate for a given review.

C. Can I Combine my Process Review with my Work Zone Self Assessment?

It depends. The agency can choose to do the Work Zone Self Assessment (WZ SA) as part of a process review. The WZ SA is a tool intended to help States evaluate their work zone practices, and to help assess work zone practices nationally. The WZ SA consists of a set of 46 questions designed to assist those with work zone management responsibilities in assessing their programs, policies, and procedures against many of the good work zone practices in use today. The questions in the WZ SA address at a high level many areas that are appropriate for a process review, however the WZ SA does not address all the aspects of the Work Zone Safety and Mobility Rule and it does not go into detail/specifics as much as would be appropriate for a process review.

Many agencies annually gather a group to complete the WZ SA and have a group discussion on each of the questions to assess progress and determine the best rating for each item in the WZ SA. This process could lend itself to being expanded into a process review, with the WZ SA being completed as part of the process review. If an agency uses a less-collaborative process for completing its WZ SA, then combining a process review with the WZ SA would likely not meet the needs or intent of the process review requirement. Keep in mind that the WZ SA is done every year and that the process review is required every 2 years.

D. Can the Process Review Done Every 2 Years Cover Only One Focus Area?

No. A work zone process review should address all the areas that influence work zone operations and the agency's whole work zone management program. Every work zone process review should at least briefly cover these basics. For some process reviews an agency may evenly spread its efforts across the whole program, while in other years the agency may briefly cover the whole program and then choose to spend much of its process review focusing on one or two focus areas. If an agency decides to "zero-in" on one or two particular areas of interest or concern in a review, the agency should still cover the basics in that review.

E. What Information Could be Used in a Process Review?

The information used in a process review can come from many sources, including work zone field/traffic control reviews, other field observations, crash reports, post-construction reports, the agency's Work Zone Self Assessment, and other sources. For example, safety and mobility data the agency has collected to track agency work zone performance measures would be useful in a process review. Data from an existing nearby TMC or from a WZ ITS deployed during a road project can provide data to help an agency assess how work zones are performing and how work zone planning and management efforts are working.

Work zone traffic control reviews can be a rich source of information to make use of in conducting a work zone process review. The annual work zone reviews performed under the former rule often functioned as work zone traffic control reviews and focused primarily on the

traffic control set-ups in a sampling of work zones. These types of reviews are important and useful for making work zone improvements, however they do not cover all the areas that a process review under the updated Rule should cover.

Sample Sets of Questions

- [Implementation of the Agency's Work Zone Policy](#)
- [Impacts Assessment](#)
- [Use of Work Zone Data](#)
- [Work Zone Training](#)
- [Significant Projects](#)
- [Transportation Management Plan](#)
- [Temporary Traffic Control Component of TMP](#)
- [Traffic Operations Component of the TMP](#)
- [Public Information Component of the TMP](#)

Implementation of the Agency's Work Zone Policy

Overall

- Has the District begun to implement the Agency's Work Zone Safety and Mobility Policy (dated xx, found at in yy Document)?
- Who in the District is responsible for compliance with the Policy?
- How many projects have implemented the Policy?
- Has District staff been adequately trained?
- Please address any overall concerns you have with the Policy

Planning

- Has the District discussed the WZSM Policy with the planning partners?
- Does the programming of projects consider the minimization of road user impacts?
- Are projects sequenced to consider the overall network and region-wide impacts?

Project Scoping

- Is consideration given to potential work zone impacts and does that influence the evaluation and selection of a build alternative?

Preliminary Engineering

- On Interstates, freeways, and arterials, how is the analysis of work zone delay impacts being conducted?
 - What software is being used?
 - Is it done by consultant or District staff?
 - Please provide examples.
- For long-term projects on the Interstate within a TMA, have any exception requests been submitted because of low traffic impacts?
- Are submissions made in a timely fashion according to the Policy?
 - Is significance determined and approved before the alternative analysis?
 - Is the alternative analysis prepared and approved before design field view?
 - Is a draft TMP included with the design field view?
- Provide examples of draft TMPs that have been prepared because of work zone impacts that are unacceptable.
- Describe the involvement of FHWA (for Federal Oversight projects) and DOT Bureau of Design.

Final Design and PS&E

- How many TMPs have been developed (or are in the process) since the Policy became effective? Please provide examples.
- How do the TMP requirements get incorporated into the PS&E?
- What transportation management strategies are commonly utilized in this District?
- Has the implementation of the Policy caused you to consider additional or different strategies than what has been used in the past?
- How has the Policy affected project delivery and costs?

Impacts Assessment

One of the major emphasis areas in the revisions to 23 CFR 630 Subpart J that was introduced with the Work Zone Safety and Mobility Rule is assessing the safety and mobility impacts to road users that a project will create. Agencies were encouraged to develop and implement procedures to do an impact assessment early in the project development stage. Design, construction, and traffic management strategies can then be identified to minimize these impacts or reduce them to acceptable levels. The assessment method utilized should also be used to evaluate the various strategies.

The Process Review should determine if this assessment is providing useful results. Some sample questions follow. The responses to these questions should give you an indication if the process is working or what needs to be improved, and can help the agency determine whether a more in-depth review of its impacts assessment processes is warranted.

- Are the impacts assessment methods used by the agency providing realistic and predictable results?
- Is the agency using any analytical tools for impacts assessment?
 - Are they being applied for all projects? Some projects?
 - Have staff been trained in how to use the tools?
- Have the estimated impacts been determined early enough in the project development phase to determine if the project will be significant?
- Has the agency received any complaints concerning delays in work zones?
 - If so, were the processes established by the agency followed?
 - Did the complaints result from exceptions to the policy or shortcomings of the policy?
- Should the agency's policies or procedures be adjusted based upon what has been observed or measured?

Use of Work Zone Data

One of the major emphasis areas in the revisions to 23 CFR 630 Subpart J is the use of work zone data. Work zone data are necessary for any Agency to better understand the impacts of work zones, address problems as they arise, and improve Agency impacts estimation and work zone management for future projects. The updates to the Work Zone Safety and Mobility Rule added operational data to the existing requirement to use work zone data. The Rule now requires agencies to use both safety and operational data to manage the work zone impacts of ongoing projects and to improve the safety and operational efficiency of future work zones. The data should be used at the project level for ongoing improvements as well as to identify trends at the systemwide level.

There are many sources of data that can be utilized: crash records; field observations and operational information such as queue length or average delay, average speeds, or any other operational data measured; project documentation including construction diaries and inspection reports. At the project level, the data should be used to determine if the agency's goals for minimizing impacts are being met on any individual project. If the goals are not being met or if there are a number of crashes that could indicate a problem with the traffic control in the work zone, then personnel should be able to make prompt adjustments to the project to improve the operations. Systemwide, the data should be reviewed to determine if the agency's policies, procedures, or specifications should be revised.

The Process Review should determine if the agency is utilizing the data from all sources effectively to improve work zone safety and operations. Some sample questions follow. The responses to these questions should provide an insight into how the Agency uses the data.

- Are the crash reports reviewed by project personnel during the project? If so, have any adjustments been made to improve the work zone?
- Does the agency have methods in place to collect operational data? If so, how have the data been used?
- How does the Agency store and manage work zone data?
- Has the agency revised any policies, procedures, or specifications based upon the review of any of the data?
- Is there a process in place to review all crash data statewide to determine if there are any trends in crashes in work zones?

Work Zone Training

The requirement in 23 CFR 630 Subpart J specifies that transportation agencies shall require that personnel involved in the development, design, implementation, operation, inspection, and enforcement of work zone related transportation management and traffic control be trained, appropriate to their respective job decisions. Agencies also must require periodic training updates to reflect changing industry practices and the Agency's own processes and procedures. A training plan should be included in the Agency's policy and should identify the sources of training, the frequency that the training should be repeated, and what personnel needs to acquire training in the different areas of the process. The training should include provisions for planning, design, construction, and even maintenance personnel. Law enforcement officers working within the work zone are also required to be trained in the safe practices for performing their duties. The agency's training plan should be reviewed and updated as necessary to ensure effective training is provided and the latest policies and procedures are included.

Some sample questions follow. The responses to these questions should give you an indication of the effectiveness of the training being received by all involved personnel.

- Does the Agency have a training plan? When was it last updated?
- Are all personnel involved in the development, design, implementation, operation, inspection, and enforcement of work zone related transportation management and traffic control aware of the agency's policy and procedures for work zones?
- Have sources of training materials or programs been identified?
- What frequency for retraining has been established and does that seem to be adequate to include any revisions that have been made?
- Have the contractors and consultants involved in design and TMP development and implementation received adequate training?
- How are law enforcement personnel being trained – by the Agency, by their own units, third-party seminars, other?

Significant Projects

The concept of a significant project was introduced to encourage agencies to identify projects that will have major impacts on traffic so that they can focus more of their impacts mitigation efforts on projects expected to have a relatively high level of impacts. Agencies are also encouraged to evaluate alternative methods of handling traffic to see if these impacts can be reduced or eliminated altogether. The earlier significant projects are identified, the easier it is to look at different alternatives and possibly incorporate funds into the project to accomplish these alternatives. They may not always be more expensive, but if they are identified too late in the project development process, they will be rejected since there were not sufficient funds. Each agency was to determine a definition of “significant project” in their policy based upon regional factors and expectations and the guidelines in the Work Zone Safety and Mobility Rule.

This Process Review should assess the concept of the significant project to determine if the criteria established in the agency’s policy are identifying all projects correctly. Some sample questions follow. The responses to these questions should give you an indication if the process is working or what needs to be improved, and can help the agency determine whether a more in-depth review of its significant projects identification process is warranted.

- Is there a well-defined process for identifying significant projects?
 - Is it being implemented as envisioned?
- Is the significant project identification process becoming institutionalized or is it a struggle for each project?
- When are significant projects identified?
 - Is it early enough in the project development process to allow for adequate planning and budgeting to address impacts?
- Have the operational performance goals set by the agency been met on most projects?
- How are the operational effects of the project being measured?
 - Are the measurements accurate and the correct values?
- Have there been projects that had significant road user impacts that were not categorized as “significant” during the development phase?
- Should the parameters for identifying “significant projects” be adjusted based upon performance or changing conditions?

Transportation Management Plan

All Federal-aid highway projects are required to have a TMP, and appropriate provisions for the TMP must be included in the PS&Es. For significant projects, the TMP must contain a Traffic Control Plan (TCP), and Traffic Operations and Public Information components. The TMP can consist of only a TCP on projects where the road user impacts are expected to be minimal. For projects that are not designated as significant projects, but for which the impacts are expected to be more than minimal, Traffic Operations and Public Information components are encouraged for use as appropriate.

The effectiveness of the TMP, both in the design as well as the implementation, should be reviewed during the Process Review. Some sample questions follow. The responses to these questions should give you an indication if the process is working or what needs to be improved, and can help the agency determine whether a more in-depth review of TMP development and implementation is warranted.

- Is there a well-defined process for developing TMPs?
 - Is it being implemented as envisioned?
- Is the TMP process becoming institutionalized or is it a struggle for each project?
- When does TMP development begin?
 - Is it early enough in the project development process to allow for adequate planning and budgeting to address impacts?
- Who is/what offices are involved in TMP development?
 - Are the right parties involved?
- Has a TMP been developed for every Federal-aid highway project?
- Do TMPs for significant projects contain all 3 required components (TCP, TO, and PI)?
- How have the strategies selected to be included in the TMP been determined?
- Have all of the strategies been identified?
- Effectiveness of strategies:
 - What strategies have been effective in minimizing the road user impacts?
 - What strategies have not worked?
 - Is this information being provided to the design staff for future projects?
- Is the overall quality of the plans sufficient to build the project? Has the number of change orders increased or decreased?
- Have post-construction evaluations been held?
 - Have the results of these been provided to all involved in the development of the TMP?

Temporary Traffic Control Component of TMP

The Traffic Control Plan (TCP) is an integral component of all projects. The proper design and implementation of the TCP is critical to the safety and operational efficiency of the project. The TCP should accommodate all road users through the project limits and provide a safe work area for the workers on the project. Traffic control devices should provide a clear message to road users on the pathway they should follow. If a detour is established for the project, it must be signed properly and maintained so that motorists are provided positive directions for the detour.

The Process Review should select a limited number of projects and review the TCP design and implementation to determine how effective the TCP was at providing a safe and operationally efficient work zone. If the project did not operate as anticipated, the TCP could be reviewed to see if there were unanticipated conditions that required major revisions in the field. Some sample questions follow. The responses to the following questions could be an indication of the quality of the TCP's.

- Are TCPs being implemented as designed? Are traffic control devices installed/used properly and in good condition?
- Has the quality of the TCPs as designed been effective to provide a safe and operationally efficient work area?
- Does the Agency have documentation showing that daily inspections of TCPs are being conducted?
- Are major field adjustments required on many projects?
- Is there a feedback mechanism for construction personnel to report problems with the TCP as designed?

Traffic Operations Component of the TMP

The TMP for significant projects requires a component that addresses Traffic Operations issues during the project. Some examples of this are: an incident management plan for the work zone area; improvements to alternate routes to handle additional traffic; traffic signal retiming; temporarily removing parking to allow additional through lanes; the use of ITS; and adding service patrol vehicles. Also, reducing the traffic demand through the work area can reduce the impacts to traffic and improve the safety for workers and motorists.

The Process Review should select a project or two that contained a Traffic Operations component/plan and assess the appropriateness of the various alternatives used and the effectiveness of each. Some sample questions follow. The responses to these questions should give you an indication if the process is working or what needs to be improved, and can help the agency determine whether a more in-depth review of the Traffic Operations component of the TMP is warranted.

- Has the TMP for each significant project contained a TO component?
- Are a variety of TO strategies being used?
 - Do the selected TO strategies seem appropriate for the project?
- Was the funding for the TO plan included in the initial estimate for the project or was it added through change orders?
- Was the implementation of the TO plan achieved correctly (e.g., did the construction personnel understand the goal of the TO plan)?

Public Information Component of the TMP

The TMP for significant projects requires a component that addresses Public Information. Keeping the public advised of the progress of the work and the stages of the Traffic Control Plan go a long way in the public accepting the project. Also advising the public how the day to day operations will affect their travel time is a very popular step to take. One of the basic philosophies of the Work Zone Safety and Mobility Rule is to minimize the disruption to road users, or if that cannot be accomplished, then at least advise them on how it will affect their ability to get through or around to work zone. The need for a Public Information campaign should be identified early in the project development process so that the appropriate level of funding is included in the project to accomplish the task, and the campaign can begin at the appropriate time – which may be a bit in advance of the project.

The process review can assess the effectiveness of the Public Information efforts overall or for a set of projects. Some sample questions follow. The responses to these questions should give you an indication if the process is working or what needs to be improved, and can help the agency determine whether a more in-depth review of the Public Information component of the TMP is warranted.

- Have the methods used to communicate project information been effective?
- Has the agency done this work in house?
 - If so, were the right people involved to make it effective?
- Was the work done through a contract?
 - Was a separate contract developed for this work? Included in the project contract? Which worked better?
- Does the agency have the appropriate staffing to effectively provide this information to the public and media?
- Was the information presented in a timely and accurate manner?
- Was the information updated to reflect the current conditions? Lack of keeping the material current hurts the credibility of the project.

Appendix A: “ABCs” OF PROCESS REVIEWS

A. What is a Process Review?

A process review is an assessment of the functionality and effectiveness of a particular program and the practices and procedures used for carrying out an aspect of an agency’s normal business operations. Reviews can also help ensure that operational processes are consistent with established standards and expectations, performing at the most effective and efficient level, and that best practices are captured and made available to others at all levels.

A process review has several characteristics, including that it is:

- Planned: Preparation is done
- Deliberate: There is a defined purpose and scope for the review
- Organized: A method/approach is followed
- Systemic: Look for trends systemwide
- Multi-disciplinary: It is conducted by a representative team
- Action-oriented: Seeks to identify steps that can be taken (if any) to foster improvement and capture best practices.

B. What are the Steps for a Review?

The following steps present a suggested approach for a conducting a process review:

1. Assemble multi-disciplinary team.

In an agency, there are generally several units, teams, or departments responsible for carrying out a program or operation. It is important that these different perspectives are represented in a process review team. A practice that works well for one unit may cause difficulties for the next unit (e.g., decisions made independently by the design unit could make development of effective TMPs or traffic control plans problematic for the traffic engineers). Or a step that is done by one unit might be more effective if done earlier in the process by another unit (e.g., identifying significant projects). The appropriate personnel, who represent the various project development stages and the different offices within the agency, as well as the FHWA and law enforcement, should participate in the process reviews. Non-agency stakeholders should be invited to participate in the reviews, as appropriate. They can provide a useful perspective and may have insights that agency personnel are not in a position to see.

The maximum effective team size is generally around 8 people. If the team is too large, the participation of some members will likely be limited. Other people can support the review, but not be a member of the core review team. For example, the review team may interview other stakeholders on specific topics of interest or make use of data collected by others.

2. Develop a review plan.

Preparing a review plan can be helpful to ensure that all team members have a common understanding and remain focused on the scope of the review.

What needs to be considered to plan for a review?

- Purpose
- Scope: Function/processes reviewed
- Expected results

- Information needed
 - What do we know now?
 - Gaps in information and possible sources
- Team members and roles
- Schedule and resources.

Purpose and Scope: Having a clear purpose and scope for the review and an agreed upon set of objectives is vital to the success of a review. The scope of the review should identify the limits of the review to ensure it remains focused on the key processes, and should specify the timeframe to be covered by the review (e.g., the most recent 2 years). The agency and the FHWA Division Office generally work together to identify the scope of review, based on the Stewardship Agreement and a risk assessment.

Expected results: The process review should have clear and concise goals that define what the review is trying to accomplish and identify the expected results. Base the selection of topics on opportunities for improvement and consider a fairly uniform distribution of review topics among the various program areas.

Information needed: Information for a review can and should come from a variety of sources. After determining the information the review team needs, it should next assess what information is already available and identify what needs to be generated. Information sources may include field data collection, data records (e.g., crash reports), project logs, interviews with key stakeholders, post-construction reports, and other sources. This may include:

- Collection of data including project related information as well as public and stakeholder perception.
- Synthesis and analysis of data at multiple levels (project, local, regional, State, and national) and comparison of findings to performance metrics.
- Application of the analysis results toward continually improving work zone policies and procedures.

Team members and roles: The team members should also know their roles, limitations, and authority.

Schedule and resources: The review team should also identify target dates for conducting the review and presenting the results, as well as the resources available for the review. Resources should include staff time and expertise, data availability, and budget.

3. Conduct review.

This step involves carrying out the review plan developed by the team. The review team leader should make appropriate assignments among the team members to promote active participation by everyone. It is valuable to document the steps taken and information collected during the review to have a good basis for any conclusions reached and recommendations made.

4. Analyze and interpret results.

In this step, the team should compile and analyze the data information collected, and compare the results against the stated goals of the processes and functions being reviewed to identify the gaps and problem areas. If the goals are not being met in certain areas, then the analysis should attempt to identify the “root cause.” It is valuable to identify the “root cause(s)” as much

as possible, rather than focusing on the symptoms and how to treat them. Symptoms may need to be dealt with, but real change occurs when you address the root causes.

5. Develop inferences, recommendations, and lessons learned.

Once the root causes of problem areas or gaps are identified, the team needs to develop recommended improvements targeting these areas. The team may find it helpful to brainstorm solutions or conduct follow-up interviews to identify or assess alternatives for improvements.

During the review, the team may also identify weaknesses, as well as best practices that should be noted in the findings. Noting best practices is an opportunity to give credit for good things that are discovered, can help build rapport with partners, and may lead to solutions that can be shared.

Recommendations/solutions should be:

- Conceivable
- Achievable
- Valuable
- Manageable
- Constructive
- Realistic.

6. Prioritize recommendations and lessons learned.

The team should suggest a prioritization to the recommendations based on several considerations, including the amount of influence the recommendation will have on the desired outcomes and ability to implement it.

7. Present the findings from the review.

A close-out meeting should be held with the affected stakeholders to present the findings and receive feedback. The review team should provide a brief overview of the process followed; the information considered; and the basis for each recommendation. The review team should be prepared to support its findings and may encounter the need to defend the recommendations.

8. Apply recommendations and lessons learned.

Based on the team's findings and the feedback during the closeout meeting, the team should develop an action plan that identifies the actions, responsible parties, timeframe for implementation, and expected outcomes. The results of the review and carrying out the action plan should lead to improvements in agency policies and procedures.