TRAFFIC SAFETY MANAGEMENT ASSESSMENT

KOSOVO

MAY 2016

EXECUTIVE SUMMARY

At the request of the United States Department of Justice, International Criminal Investigative Training Assistance Program (ICITAP), a traffic safety assessment team from Iowa traveled to Kosovo to facilitate and conduct a Traffic Safety Management Assessment. The assessment team consisted of Patrick Hoye, retired Colonel of the Iowa State Patrol and current Bureau Chief of the Governor's Traffic Safety Bureau (GTSB), Major Randy Kunert, Operations Major for the Iowa State Patrol, and Traffic Safety Engineer Steve Gent from the Iowa Department of Transportation.

On behalf of the assessment team we are honored to have been given the opportunity to work with ICITAP and Officials from Kosovo. Being provided the chance to visit with members of the Judicial Council, Engineers, Kosovo Police, and Directors from other traffic divisions was very beneficial. In addition, traveling and observing firsthand the traffic conditions of Kosovo made conducting our assessment much more comprehensive. It provided outstanding background data and information to assist the assessment team in identifying traffic safety issues and thereon develop traffic safety recommendations designed to reduce death and serious injury on Kosovo's highways.

The assessment team focused on three main areas: engineering, enforcement, and judicial. The assessment team will be providing training and equipment recommendations that should be beneficial but also with the understanding that budgetary issues may provide an impediment to implementation.

The recommendations and findings that are contained in this assessment report are the opinion of the assessment team only and not that of ICITAP or any other United States agency.

LAW ENFORCEMENT

The assessment team was very impressed with the professionalism and passion that was displayed by the Kosovo Police. From the Command Staff to the officers working the streets, it was very apparent that there was a strong sense of pride in their jobs and a desire to reduce crashes through their work.

Crash data that was reviewed showed that fatality trends are headed in the right direct with a very positive decrease. For example, in 2011, 157 traffic fatalities were reported, in 2015 the number of fatalities had dropped to 129 which is a 17% decrease.

Police enforcement efforts are increasing with over 300,000 traffic citations being issued in 2015 and the Department has placed a priority on doing community policing efforts, such as in the Kosovo schools. Although the Police Department's enforcement efforts are increasing, there is a strong sense of frustration with the judicial outcome of the citations that are being issued. Police feel it is difficult to change driver behavior with enforcement efforts if there are few consequences for violating the law.

After reviewing crash data and interviewing Kosovo Police, Command staff, and front line officers, it was determined that the major cause of crashes are related to speeding, improper passing, impaired driving, unsafe vehicles, and poor road conditions. Unregistered vehicles are also a major concern. Pedestrian crashes are increasing and with higher traffic counts, will conceivably continue to be a more serious issue than it is currently.

The following are recommendations from the assessment team that if implemented should have a positive impact on crash reduction:

High visibility enforcement must be continued and increased in certain areas. Kosovo's low seat belt compliance rate is apparent and will be a strong hindrance to successfully reducing fatalities if compliance is not increased. There is a strong correlation between seat belt use and drivers surviving crashes. The National Highway Traffic Safety Administration advises that the chances of surviving a traffic crash are 45% higher when properly restrained in a seat belt. Likewise, a stronger motorcycle helmet use rate would reduce fatality rates.

Additionally, addressing speeding will need to remain a top priority. Locating high crash zones and placing increased patrols in these zones should continue. Purchasing additional LIDAR/lasers would assist in this effort and the newest version of laser does capture and record the violator's speed which then can be used as evidence in court.

Secondary crashes (crashes that occur due to the original crash) are a serious concern and are often times more serious than the original crash. Quickly removing crashes from main travel lanes and other activities designed to protect the scene should be reviewed and implemented. All law enforcement agencies should be encouraged to attend and implement Traffic Incident Management training (TIMs) for their agencies. Training additional officers in technical crash investigation will enhance the standardization of crash reporting.

Minor property damage crashes during peak travel time are a concern. The policy that requires the vehicles to remain at the crash scene unmoved until the Police arrive contributes to additional secondary crashes, often times much more serious than the original minor crash. Allowing the drivers to remove their vehicles to the shoulder of the road to allow free flow of traffic would be safe and prudent.

Social media can have a strong impact in traffic safety and should be considered with the relatively young Kosovo population. All aspects of social media should be explored to expand public awareness and traffic safety campaigns. Traditional media outlets are not as effective for younger drivers. Training officers to provide new safety programs in the Kosovo schools will have benefits as these young students become new drivers.

Impaired driving crashes in certain regions of Kosovo are common. Preliminary breath test devices are not in sufficient supply and thus hampers arrests because of evidence concerns. Purchasing these devices would certainly assist in prosecution of impaired drivers.

Another concern in the area of impaired driving is the length of time that is required to secure a search warrant to draw a subject's blood for blood alcohol concentration (BAC) testing. Officers said it routinely takes 3 to 4 hours to obtain the warrant and often times that is enough for the blood test to come back under .05. Working with judges to shorten the process is an important step.

Driver's education was mentioned numerous times as being an area of concern for law enforcement. Having a standardized curriculum would be a good start as most of the training is done by private companies. Collaboration between Police and these training companies could be very beneficial.

JUDICIAL

The importance of a strong judicial system can't be understated. Public confidence must remain strong in their courts and the importance of a fair and balanced system is imperative. Just as the citizens must have faith in the legal system, a professional relationship between law enforcement and the judicial system is equally important. A more in-depth review of the judicial system would be better obtained from a different assessment team comprised of assessors with stronger judicial backgrounds but our assessment team felt there were basic proposals that could be made by our team.

The assessment team had the opportunity to meet members of the Judicial Council and discuss issues that may have an outcome on the effectiveness of traffic enforcement.

Kosovo Police officials have expressed some frustration over the lower than what they deem acceptable percentage of traffic citations that reach a guilty/not guilty verdict. Their concerns are that citations are being dismissed if violators don't pay the fines. Another source of frustration was with their current equipment, such as LIDAR /laser, not capturing on video the speed of the violator, some judges are subsequently dismissing these cases for lack of evidence.

It was very apparent to the assessment team after interviewing members of the judicial council that their workload is extremely heavy and includes more than traffic cases. In Pristina, 15 judges used to preside over traffic cases and now that number is down to 9 with talk of reducing even further. In 2012, for example, over 67,000 cases were heard but 12,000 citations were transferred to the next year.

The following are recommendations from the assessment team that if implemented should have a positive impact on crash reduction:

Both the Judicial Council and the Kosovo Police advised that prior to 2014 (in 2014 it was ruled a human rights violation to seize a violator's driver's license) when a violator was stopped for a traffic violation

their driver's license was held until the outcome of the citation had been completed. This proved effective as violators were quicker to pay their fines or appear in court to contest the citation. It was after this 2014 ruling where the system became unbalanced.

Preventing renewal of a vehicle registration for an owner who has unpaid traffic citations may produce the same result as holding the violators driver's license and should not present the same human rights issues.

Additional support staff, due to the current workload will be required for the courts. These support staff members would only being doing administrative duties so would not need a legal background to be able to assist.

A ride a long program, where judges ride with police should be encouraged as it will provide them a firsthand look at how police tactics are employed so they have that background when officers testify in their courtrooms.

Raising fines for those who don't meet the court's order to appear would serve as a deterrent.

COUNTERMEASURES THAT WORK

In 1970, 912 lives were lost in traffic crashes on Iowa roadways. Over the past 5 years, the average fatality count has been 336. This significant reduction in traffic fatalities can be attributed to an aggressive traffic safety strategy that employs strong countermeasures that have proven to be successful.

Although some of the measurers mentioned below may not be feasible at this time in Kosovo, it does show that with the proper implementation of new strategies a significant reduction in traffic fatalities is obtainable.

Alcohol-impaired driving:

In the 1970's approximately 50% of all fatality crashes were alcohol related, and today the percentage has dropped to approximately 30%. The following measurers were implemented to address impaired driving:

- High visibility saturation patrols
- Preliminary breath test devises became more widely used by law enforcement
- Sobriety checkpoints were operated
- Installing ignition interlock devices on cars of a driver that has been convicted of drunk driving
- The BAC level for prosecution dropped to .08
- A strong mass-media campaign was launched with slogans like: "Friends don't let friends drive drunk" and it became extremely recognizable.
- A strong designated driver push was launched

Seatbelt use:

In 1986 Iowa passed a primary seat belt law. Observation studies of seat belt use showed that just prior to Iowa's seat belt law passing only 18% of Iowans were buckling their seat belts. Today, 93% of Iowans are buckled in, one of the best percentages in the USA.

The huge increase in belt use is a large contributor to the fatality reduction in Iowa. The National Highway Traffic Safety Administration advises that the chances of surviving a traffic crash are 45% higher when properly restrained in a seat belt.

- Strong enforcement of the seat belt law is imperative to increase compliance rates
- A strong mass-media campaign was launched with slogans like "click it or ticket" that became extremely recognizable
- School programs by law enforcement officers reinforced the importance of seat belt use

Speed:

Just as in Kosovo, speeding is a major contributing factor in Iowa crashes.

- Strong enforcement of speeding laws
- Maintaining safe speed limits, states in the USA have recently began raising speed limits and have seen an increase in fatalities
- Increased number of LIDAR/lasers for law enforcement
- Automated speed and red-light traffic control devices have had positive impact in some jurisdictions
- Speed trailers that flash the speed of vehicles in areas like school zones are not used for enforcement but seek to slow vehicles by flashing their speeds as they travel past, mostly an educational or public awareness tool

Graduated driver licensing:

The leading cause of death for teenagers in the USA is traffic crashes. So having a strong driver's education program and a graduated driver's license system has proven effective in reducing youth fatalities.

- Have an approved curriculum taught to all new drivers
- Lengthen the time new drivers must drive with a licensed driver
- Have a passenger restriction for new drivers for the first 6 months
- Restrict night time hours for the first 6 months

Road design:

Without question one of the leading causes of fatality reduction in Iowa has been the improvement in Iowa road infrastructure. Here are some of the most important projects completed:

- Barrier cable installation
- Expansion of divided highways (4 lanes)
- Rumble strips at intersections
- Chevrons installed on curves

SAFETY ENGINEERING COUNTERMEASURES

Pavement Markings

Markings on highways provide critical guidance and information for the road user. Many of the newer multi-lane rural roadways have good pavement markings including center line and edge line markings. However, many of the two-lane rural roadways had worn center lines and often no edge lines. Placing edge lines on rural paved roadways have been shown to reduce all crashes by 15% (link to research: http://www.cmfclearinghouse.org/study_detail.cfm?stid=381). This low-cost safety measure can significantly reduce injuries and deaths. Crashes on these types of roadways are generally more severe than urban crashes as speeds are higher.

Markings must be visible at night. Unless a marking is located in an area with roadway/street lighting, the markings should be retroreflective. Retroreflectivity is accomplished by placing glass beads on the freshly painted marking. The glass beads sink partially into the marking material and provide retroreflectivity at night. Without the beads, a marking is very dark at night regardless how good it looks during the day.

Suggestions to consider:

- Place edge lines on rural roadways
- Ensure pavement markings have sufficient coverage of glass beads to provide nighttime retroreflectivity

Rural roadway with no edge line markings

Roadway with badly worn markings

Excellent urban pavement markings that provide clear guidance to motorists

Pedestrians

Although all types of road users are at risk of being injured or killed in a road traffic crash, "vulnerable" users such as pedestrians and bicyclists are at greater risk than vehicle occupants. Children, elderly, and disabled people are particular vulnerable, as their physical and mental skills are either not fully

developed or they are especially fragile. Children and older people are often overrepresented in traffic fatalities, especially as vulnerable road users.

Typical dangerous situations for pedestrians are drivers travelling too fast, distracted drivers, impaired drivers, pedestrians not able to judge the speed when choosing a 'gap' in the traffic to cross the road. It was observed that Kosovo does an excellent job of providing visible and wide crosswalks marked with Zebra pavement markings.

Suggestions to consider:

- Provide pedestrian refuge when possible…pedestrians should not have to cross more than two lanes of traffic at a time without a central median provided for refuge, allowing the pedestrians to cross the road in two stages
- The safety of zebra crossings (where pedestrians are supposed to be granted immediate priority over approaching vehicles) rely heavily on driver compliance. Therefore, education and public programs are needed to improve understanding and awareness while enforcement can help motivate correct behavior of motorists.
- In low speed areas, raised pedestrian crossings have the potential benefits of reducing approach speeds and increasing driver awareness.
- To improve nighttime visibility of pedestrians and to enhance the awareness of approaching drivers, providing lighted crosswalks can improve crossing safety.
- Prevent vehicles from parking on sidewalks…as noted in the "Parking" section of this report
- For higher-speed facilities with pedestrian crossing movements, provide clear marking locations with bright pavement markings, lighting and pedestrian refuge.
- To provide extra emphasis at a crossing, install larger pedestrian warning signs in advance of crossings.
- Something we are installing in Iowa are pedestrian activated flashing warning systems

- Evaluate locations where pedestrians do not use marked crosswalks (see the 2nd picture below as an example) and consider engineering, education and/or enforcement options.

- Here is a good document with more pedestrian safety information.
http://safety.fhwa.dot.gov/ped_bike/ped_focus/docs/fhwasa0512.pdf

Good crosswalk on a busy street

Pedestrians walking in roadway, not at a marked crossing

Pedestrians walking in the street

No pedestrian crossings provided, so locals removed section of guardrail

Good use of a raised pedestrian crossing

Signing

Regulatory, warning and guide signs provide critical information to motorists. The most critical class of signing for safety are warning signs as they alert drivers to unexpected conditions that might warrant a reduction in speed or other action to safely proceed. Although signs should generally not be overused, in areas with higher crash rates, extra or enhanced signing may be warranted.

Suggestions to consider:

- Provide a curve warning sign on more critical curves
- Install chevrons around critical curves
- Install more speed limit signs to help drivers understand the expected speed
- At high-crash intersections, add advance warning signs, use larger signs, add flags or a flashing light to provide emphasis

Consider adding chevron signs behind guardrail on tight ramps.

Rural regulatory signs

Parking

Many urban areas in Kosovo have seen huge increases in population as people move from rural areas to urban areas. This migration results in more cars, pedestrians, buildings and infrastructure. A serious concern for the safety of the people of Kosovo is the lack of safe and available parking. The construction of thousands of illegal/non-permitted buildings have been constructed, most with little or no parking on-site. This results in cars being parked on sidewalks, in the travelled lanes, and anywhere they can get away with it. This parking issue results in pedestrians having to walk in the road as parked cars are on

the sidewalks and roadways being more congested as traffic cannot flow through streets where cars are partially blocking the traffic lanes. Solving this problem is very complex and will require much work.

Suggestions to consider:

- Continue the program to place vertical posts to prevent parking on sidewalks
- Require all new buildings to provide adequate off-street parking on the property
- Somehow encourage existing building owners to provide more on-site parking
- Build park-and-ride facilities with bus service
- Increase the regulation of illegal parking, place clear No Parking signs as needed and increase enforcement of no parking zones

Excellent use of steel posts to prevent parking on sidewalk

Public/Private parking ramp

Parking on sidewalks

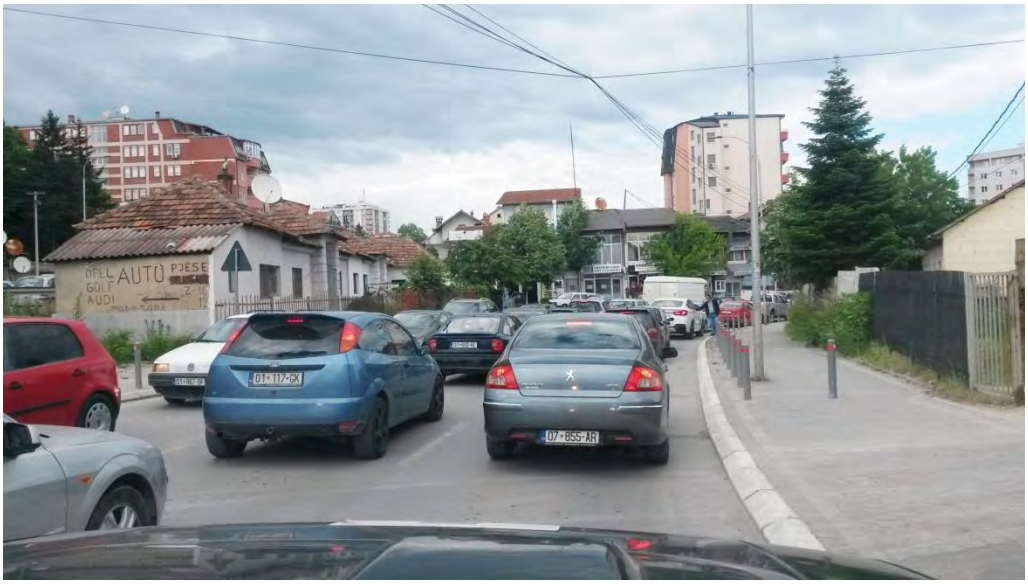
Parking issues impact normal traffic and force pedestrians to walk in roadway

Relieving Traffic Congestion

Especially in the afternoons, many of the urban streets are congested and delays are significant for motorists. There are no easy ways to reduce this type of congestion on urban streets and corridors, especially during periods of significant growth. Obviously, building more and wider streets is one way, but not often practical.

Suggestions to consider:

- Work to improve the public bus transportation system. This includes new and more reliable busses and building safe "pull-out lanes" to load/unload passengers
- Consider requiring trash removal and business deliveries to occur at low traffic times (as not to block streets and cause traffic delays)
- Encourage employers to allow variable work hours…for example, employees could start work at 7:00, 7:30, 8:00 or 8:30 resulting in less traffic congestion in the afternoons as employees get off work at various times



Congested streets in afternoon

Public transportation on a new roundabout

Land Use Planning

The land that streets and sidewalks are built upon need to be planned, designed, engineered and protected to provide safe travel for motorists and pedestrians for years to come. Too often we saw situations such as a poor design or private buildings infringing onto a sidewalk.

Suggestions to consider:

- Use zoning of land and good planning practices to ensure transportation facilities are built and protected from infringement.
- Always use good engineering in the design and construction of transportation facilities.
- Possibly consider converting two parallel streets and make each of them a one-way street…resulting in what we call "one-way pairs".

Poor engineering design of a roadway and Illegal buildings (warning signs and traffic barriers should be placed to warn and protect roadway users of the unexpected pavement sink holes along this section).

Excellent example of a new street design with trees and well-marked pedestrian crossing, and pedestrian/bike facility

Poor design resulting in parking, utility and pedestrian challenges

Guardrail

Guardrail is critical safety devices that are used to prevent an errant vehicle from impacting roadside obstacles, running off the road and down a steep embankment, or veering off the road into oncoming traffic.

Suggestions to consider:

- Conduct a system-wide evaluation of existing guardrail and develop a project to upgrade/repair damaged guardrail and to replace old guardrail. This would include evaluating all barrier designs and end-treatments to ensure the systems installed meet current standards.

Unrepaired guardrail

Guardrail in need of repair

In the picture above, the "turned-down" end treatments used for the guardrails on both sides of this ramp would not be an approved system for new installations in America. Crash tests done with similar systems here have shown that vehicles can vault up and over the "turned down" end treatment resulting in a severe crash. We are not familiar with European guardrail requirements/standards so reviewing standards may be part of your evaluation.

Safety Studies – Crash Data

The Kosovo police do an excellent job of reporting crashes. However, many of these crash reports do not sufficiently document the location of the crash. When conducting a safety analysis, it is critical to determine the location of the crashes -- to the exact intersection or roadway segment location. This allows engineers to identify, prioritize, and determine the correct safety countermeasure for the "high-crash" locations.

Suggestion:

- Work together to collect accurate location for all crashes.

Roundabouts

The roundabouts in Pristina and throughout Kosovo seemed to work very well. Continue to expand the use of roundabouts as they are a very efficient and safe intersection design.

Roundabout in small community

Traffic Actuated Traffic Signals

Our short time in Kosovo did not allow a review of traffic signals. It appeared the signals were a simple "fixed-time" design…meaning the main/major roadway always gets a certain amount of green time (say 60 seconds) and the minor roadway always gets a fixed amount of green time (say 30 seconds).

Suggestion:

- We assume the signals have more than one timing plan for mornings, afternoons, overnight, etc. to account for directional traffic needs. If not, then these should be implemented.
- Consider adding detection to the minor roadway and upgrading signal controllers to allow for "traffic-actuated" signals. This allows for the major roadway to have more green time and priority and the minor roadway to only get green time after traffic arrives on the side street.
- Looking at the signal in the picture below, one could improve the visibility of the traffic signal heads by installing a signal head over each lane, adding back plates on the signals to provide more visual impact, and separate the guide and warning signs from the traffic signal installation.

Urban signal

Divided Roadway

Divided roadways (see pictures below) are a safe design for a narrow urban corridor. The outside lane is used by slower moving traffic and accommodates access to businesses and minor streets. The inside lanes efficiently and safely move through traffic along a corridor. Very few of these designs exist in America…but after seeing it here, I hope to find a location to implement in Iowa.

Very good application of a divided roadway

Divide roadway (guardrail on right could be removed)

Rumble Strips

Run-off-the-road crashes are the most prevalent and severe crash type throughout America and it appears that these same types of crashes are occurring on rural Kosovo roadways. The most effective safety countermeasure to reduce these types of crashes is the installation of rumble strips or rumble stripes.

Longitudinal rumble strips are an effective countermeasure for preventing roadway departure crashes, including both run-off-road and opposite direction sideswipe crashes. Rumble strips are milled patterns near the edge line or center line of the roadway that provide both an audible warning (rumbling sound) and a physical vibration to alert drivers that they are leaving the roadway or crossing into opposing traffic. Rumble strips placed underneath center line or edge line striping are referred to as "rumble stripes."

> **Shoulder rumble strips and edge line rumble stripes** are primarily used to prevent run-off-the road (ROR) crashes by warning drivers that they are drifting onto the roadside. While shoulder and edge line rumble strips perform the same function, the placement sets them apart. Shoulder rumble strips are historically common on freeways and other divided highways, but the decision to use one or the other on two-lane roads is made based on a number of factors. The edge line rumble stripe aligns the rumble strip with the pavement marking and thereby improves the visibility of the marking in wet, dark conditions. By placing the rumble strip closer to the travel lane, it alerts the driver sooner that they are leaving the roadway. Shoulder rumble strips and edge line rumble stripes have been shown to reduce single vehicle, run-off-road fatal and injury crashes by 29 percent on rural two-lane roads.

Edge line rumble strips

Edge line rumble stripes

Center line rumble strips or stripes can prevent head-on collisions and opposite-direction sideswipes, often referred to as cross-center line crashes. They are primarily used to warn drivers who are drifting into an opposing travel lane. While they are most often used on rural two-lane, two-way roadways, they can also be applied to multilane, undivided facilities. Center line markings are typically placed on center line rumble strips, which have an added benefit of improving the visibility of the marking in wet, dark conditions. Center line rumble strips have been shown to reduce head-on and opposite-direction fatal and injury crashes by 44 percent on rural two-lane roads.

Images of center line rumble stripes

CONCLUSION

The Iowa assessment team would like to thank all officials who worked with us as we completed our assessment. The data, information, and firsthand knowledge you provided made our assignment easier to complete. The assessment team is also extremely grateful for the kindness and generosity that we were shown during our stay, it is deeply appreciated!

The assessment period of five days was short and unfortunately did not allow our team to adequately address all of the issues that pertain to traffic safety but we believe that our report will highlight recommendations that will be beneficial. Although there are certainly challenges that must be addressed, many of the issues facing Kosovo are similar to other countries and even to our home state of Iowa.

It is the assessment team's opinion that continued trainings facilitated by ICITAP will be critical in reducing traffic fatalities and serious injury crashes in Kosovo. For law enforcement, trainings such as Advanced Roadside Impaired Driving Enforcement (ARIDE), technical crash investigation, and Traffic Incident Management (TIM's) training should be seriously considered. Public Resource Officers could share their expertise in educational and public awareness programs. Additionally, certain equipment purchases need to be a priority such as additional preliminary breath test devices (PBT's) and Lidar/laser speed detection devices that record the violator's speed for evidentiary purposes.

For Judicial support, most state's Attorney General Offices throughout the US have an attorney assigned to their state's Traffic Safety Bureau. In Iowa, this attorney provides training and law updates for judges and prosecutors. This has worked to streamline the judicial process here in Iowa. A similar implementation in Kosovo would be beneficial, and should be able to make sound recommendations to the judicial process.

While numerous engineering topics such as pavement markings, pedestrian traffic, and signing were discussed in detail in the assessment, a more in-depth and overall engineering assessment would certainly be helpful. Unlike the law enforcement and judicial component, it might be more beneficial for engineers from Kosovo to travel to Iowa for additional insights into our engineering designs.

The assessment team considers it an honor to have been given the opportunity to conduct this assessment and please feel free to contact members of the assessment team if any clarification is needed.