Too late to fasten your seat-belt

Wearing a seat-belt reduces the risk of being ejected from a vehicle and suffering serious or fatal injury by between 46% - 65%.

Be part of the solution: wear a seat-belt.

www.who.int/roadsafety
In March 2002, the Council for Development and Reconstruction (CDR) and the Youth Association for Social Awareness (YASA) organized a public awareness campaign aiming at reducing fatalities and injuries in work zones and enhancing traffic operation and safety during construction, therefore, improving safety for motorists, pedestrians and construction workers.

Fatalities, injuries, and property damage crashes are expected to increase unless the entire transportation community rallies to meet this challenge!

CDR and YASA have accepted this challenge to significantly reduce the needless loss of human lives, time, and money in work zones and urge others to become partners in this effort. The purpose of the workshop was to modernize and improve the effectiveness of CDR and other governmental body’s policies and procedures in enhancing safety, improving mobility, and the efficiency by reducing traffic congestion and delays during construction and maintenance operations.

- Lebanon’s traveling public is demanding virtually unlimited mobility, and congestion has a significant effect on their mobility.
- Mobility and safety are closely tied together. As congestion builds, crash rates increase and as crashes increase there is more congestion.
- In addition to the safety of the traveling public and highway workers, motorists are delayed when they are not able to travel at the normal operating speed through a work zone.
- While national data on the cost of work zone delays is not readily available, daily road user delay costs, on many roadway and infrastructure reconstruction projects, have been estimated to be very high compared to other countries.
- The number of work zone fatalities in Lebanon, even though not being recorded, is a major concern. It points out the need for continuous emphasis on work zone safety.
• Approximately: 55% of work zone fatalities occur in rural areas. 25% of work zone fatalities involve trucks. Despite these alarming statistics, inconsistencies in defining and reporting work zone crashes make the problem much worse than indicated by the above percentages.
• The fatality rate for highway construction workers is twice the rate for other types of construction. Approximately 35 percent of all highway worker fatalities were directly related to traffic moving through the work zone.
• In addition to these fatalities, there is a sizable number of injuries, unfortunately also, not recorded accurately.

The demands for rehabilitating highways, increased mobility and safety have resulted in many more projects being constructed adjacent to high-speed traffic. These factors significantly increase the exposure of the traveling public, highway workers, and pedestrians to work zone hazards. It is essential to implement a work zone safety program which would improve work zone safety at highway construction sites by enhancing the quality and effectiveness of traffic control devices, safety appurtenances, traffic control plans, and bidding practices for traffic control devices and services.

Roadway Construction, should be to enhance the safety and operational efficiency of highway work zones for all road users (motorists, pedestrians, motorcyclists, bicyclists), and highway workers. It should be applicable to all public highways and streets with early implementation emphasis. The intention is to create a model to be followed when developing or revising a work zone improvement programs.

AIMS AT REDUCING DELAYS AND ENHANCING SAFETY IN WORK ZONES

The workshop team tried to define how projects need to be planned, programmed, and designed. What refinements in scheduling and contracting procedures should be considered?

Identify recommendations for improved construction methods, materials, and equipment; and to define the organizational structure and funding mechanisms needed to support their vision. Government officials, police, CDR, YASA, Consultants and Contractors agreed that
Today’s routine practices couldn’t be continued. Changes must be made if we are going to meet the road users’ increasing need for mobility and safety in work zones and if we are to overcome the backlog of highway needs.

In addition to the engineering aspects, Government Bodies and industries must become actively involved in work zone public education, public information, traffic management, and enforcement if we are to substantially reduce delays and enhance work zone safety.

Additionally, a major shift in emphasis from handling traffic on individual projects to corridor traffic management, a road user focus, contractor input, and public participation in the early traffic management decision making were noted as key ingredients to a successful program of enhancing future operations to minimize delay, reduce congestion, and enhance safety for both the motorists and the roadway worker.

**SPECIFIC OBJECTIVES AND RECOMMENDATIONS OF THE CAMPAIGN**

The specific objectives are:

- Establish an organizational baseline of the CDR role in reducing motorist delays and enhancing the safety of work zones.
- Evaluate the effectiveness of the practices and policies being used to measure, evaluate, and enhance the flow of traffic in work zones.
- Identify the best practices and policies currently being used to enhance the flow of traffic or to accelerate the progress of work in work zones to minimize the exposure to drivers and highway workers.
- Identify effective models for evaluating the effects (risk, cost, and duration) of lane closures and reduced standards in the work zone.
- Identify effective models for balancing road-user cost against the additional cost. This may be used in the project budget for accelerating the progress of work.
- Identify the specific activities CDR has taken to implement the “SAFETY, HEALTH and ENVIRONMENTAL REGULATIONS” Issued 1996.
- Establish a traffic management model program for reducing traffic congestion, minimizing delays, and enhancing the safety in work zones that can be used by Consultants and Contractors.
• Identify any assistance or research needed from CDR to improve activities that enhance safety and reduce traffic congestion in work zones.

Finally, to achieve the state of the art in work zones we have to change organizational mind sets from one of planning, designing, constructing, operating, and maintaining highways to the safe and efficient movement of goods and people.

For that purpose, YASA and CDR recommended the adoption of the following guidelines:

• Emphasize and promote the philosophy of minimizing construction interference with traffic while ensuring safety through its routine activities and in all work zone-related training efforts.
• Encourage research in innovative methods to reduce traffic congestion during construction.
• Continue to provide technical assistance to the Governmental Agencies in developing and implementing programs that promote effective construction traffic management.
• A “National Quality Initiative” should be adopted to represent a major commitment to promote the partnership of all entities that participate in the funding, design, and construction of our roadways and infrastructures.
• Provide an organizational structure that provides crosscutting teams that tap the expertise and proactive involvement of the all disciplines in the development and selection of corridor Traffic Management Plans (TMP), and project Traffic Control Plans (TCP).
• Re-evaluate policies and procedures to ensure:
  o Contractor’s participation in the development of the TCP, responsibility for successful implementation of the TCP, and rewards for exceeding expectations, i.e., a move towards performance-based traffic control specifications.
  o Utilization of road-user costs, economic impacts to the business community, and life-cycle-cost in the decision making process.
  o Public participation during the development and selection of corridor TMPs and project TCPs.
  o Road user feedback and evaluation.
  o Traffic management principles that focus on reducing the exposure of road-users and workers are integrated into all
related manuals and guidelines, such as project development schedules, design manuals, consultant selection, and the Manual on Uniform Traffic Control Devices (MUTCD).

- Develop and deliver training courses in work zone traffic management principles and strategies.

**EDUCATION**

The driving community and elected officials must be well informed, involved, and sensitive to the highway worker and work site safety needs.

Public Relations, Education, and Outreach (General Public, Driver, and Elected Officials)

We are concerned to achieve and help in education. Transportation agencies would need to:

- Assume a proactive leadership role in work zone educational efforts.
- Develop, update, and distribute work zone safety educational materials for:
  - All drivers handbooks and manuals
  - Driver license test questions
  - Driver education courses
  - Media (television, radio, newspaper)
  - Road user groups, insurance companies, rental car agencies (magazines, newsletters, inserts)
  - Elected officials
- Develop media partnerships to educate and inform the public about work zone safety.
- Sponsor national work zone safety awareness initiatives.
- Share work zone public service announcements and educational materials with other government service providers.
- Develop guidance and tools to assist decision makers in balancing the expenditure of additional funds for longer-lasting materials and designs in today’s projects to achieve a faster delivery, a longer service life, and reduce future motorist delay and exposure.
ENGINEERING
Motorist delay, road user, worker safety, and impacts to adjacent communities are assessed on all urban and other high volume corridors.

- Crosscutting teams and multi-interests are used in developing alternatives and selecting the preferred design that minimizes present and future exposure to road users and workers.
- The project development process results in a TCP that provides for shared risk and benefits for owners, contractors, and the traveling public.
- Contract times and motorist delays are minimized through the use of CPM scheduling and accelerated contracting procedures.
- Integrate work zone traffic management principles into the planning process.
- Utilize crosscutting and multi-agency teams to develop corridor traffic management plans.
- Give full consideration to road-user costs and impacts to affected business and residential communities in the selection of the corridor TMP.
- Conduct public relations campaigns that inform the public and involve them in the selection of corridor TMP’s.

To achieve state-of-the-art project development/design, transportation agencies would need to:

- Extend traffic management principles into all construction and maintenance projects adversely impacting traffic, not just high visibility projects.
- Develop tcp options prior to beginning the detailed design.
- Utilize crosscutting teams to develop and evaluate tcps.
- Provide for contractor involvement in the development of the tcp and active public input into the selection of the tcp.
- Use computer modeling to assess the traffic and safety impacts as well as the construction time required for the TCP options being considered.

CONTRACTING AND BIDDING PROCEDURES
Contracting and bidding procedures reward contractors for quality work, innovation, accelerated early completions, minimizing motorist’s delays, and enhancing the safety of road-users and workers. On high-risk, high-visibility, and complex projects contractors are pre-qualified on the basis of quality and past performance.
• Modify project development schedules to reflect development and evaluation of TCP options prior to beginning detailed designs (30 percent stage).
• Consider road-user, life-cycle, and other impact costs in the selection of the preferred design, materials, TCP, and contracting options.
• Utilize CPM scheduling to establish the maximum contract time included in the bid proposal.
• Develop user-friendly computer software to calculate realistic, but expedited contract times.
• Provide CPM scheduling training courses to staff and consultant designers.
• Conduct public relations campaigns to inform the public and involve them in the selection of the preferred TCP.
• To achieve state-of-the-art contracting and bidding, transportation agencies would need to:
  • Utilize time-based bidding and flexible Notice to Proceed dates on all projects which adversely affect the existing level of service.
  • Incorporate the quality and timeliness of a contractor’s past performance into pre-qualification procedures.
  • Update and enhance existing computer software for calculating road-user costs to make it user-friendly and ensure that outputs are realistic and legally defensible.

SPECIFICATIONS AND CONSTRUCTION MATERIALS, METHODS AND PRACTICES

The same level of service is provided through the work zone. Workers are physically separated and are protected from the traffic. Work areas are sufficiently illuminated at night without blinding the motorist and gawk screens are used to prevent the motorists from being distracted during daytime operations. Contractors have a vested interest in quality, timeliness, and road-user safety.

To achieve state-of-the-art construction materials, methods, and practices, transportation agencies would need to:

• Revise prescriptive-type specifications to performance-based specifications.
• Adopt specifications that reward contractors for innovation, quality, and exceeding expectations.
• Develop and utilize performance-based specifications for traffic control.
• Routinely include warranty specifications with bonuses for exceeding the expected life of the end product.
• Require positive barriers to physically separate the workers from the traffic.
• Adopt specifications that require adequate lighting for all nighttime operations, lane shifts, lane drops, and temporary gores.
• Insist on quality work and timely completion of the work.
• Develop short-term testing and modeling for newly constructed highway components to reasonably predict long-term performance and remaining life.
• Develop design specifications, guidelines, and testing methods for composite materials.
• Standardize design details to encourage a greater use of precast materials.
• Provide real time work zone traffic information to road users and workers in sufficient time to make informed decisions.

TRAVELER AND TRAFFIC INFORMATION RELATED TO THE PROJECT

Accurate real-time work zone (construction/maintenance/utility operations) information is provided to the road users in sufficient time to make informed travel decisions.

To achieve state-of-the-art traveler and traffic information at the project level, transportation agencies would need to:

• Monitor work zone traffic conditions on all projects.
• Display real-time work zone traffic conditions on the Internet, Airport, Bus Terminals, major tourist attractions, large parking garages, large office buildings, and other large traffic generators.
• Use changeable message signs, traffic advisory radio, and early warning systems to warn motorist approaching congested work zones.
• Use ITS hardware to safely guide motorists through the work zone.
• Develop media and private sector partnerships that provide real-time work zone information to the public.
ITS AND INNOVATIVE TECHNOLOGY

The ITS systems are used to automatically collect and analyze before, during, and after traffic flows in the work zone; provide accurate real-time information automatically to motorists and to the construction team; enforce speed; as well as safely guide motorists through the work zone.

To achieve state-of-the-art ITS and innovative technology, transportation agencies would need to:

- Enhance the software and communication modules on a continuous basis, in order to provide accurate real-time traffic information automatically to motorists and the construction team.
- Utilize portable or fixed traffic management systems to collect and disseminate real-time information to motorists in all work zones:
  - On high-speed, high-volume facilities,
  - Involving lane and ramp closures,
  - Located in severely restricted areas, and
  - Involving major changes to existing traffic patterns.

Develop effective tools and techniques for safely and efficiently merging traffic approaching a work zone with lane closures.

- Develop effective tools, techniques, and enforcement for slowing down traffic approaching work zones, as well as maintaining a safe speed through work zones.
- Develop automated equipment to perform high-exposure, short-term maintenance operations.

ENFORCEMENT AND EMERGENCY

Work zone trained and qualified, full-time uniformed police officers must be readily available for construction and maintenance operations. State-of-the-art technology is used to maximize effectiveness of these police officers.

1. ENFORCEMENT

To achieve state-of-the-art enforcement, officials would need to:

- Utilize uniformed police officers in all work zones to enforce the law on posted construction speed limits, and regulatory signs.
- Police must restrict:
  - High speed drivers
  - Drivers entering or trespassing restricted construction limits
• Police must assist in redirecting traffic
• Provide training for uniformed police officers in work zone traffic control, completing work zone data on accident and crash report forms, the MUTCD, and incident management.
• Secure dedicated, full-time uniformed police officers for work zone enforcement activities.
• Use automated speed enforcement in confined and high-speed work zones.
• Equip uniformed police officers with state-of-the-art equipment for use in controlling speed, and crash investigation and reporting.

2- EMERGENCY

To achieve state-of-the-art Performance in an Emergency, officials would need to:

• Provide an Emergency Plan with every TCP and TMP designed for the work zone
• Provide training for emergency personnel to deal with construction and traffic accidents in work zones
• Equip Emergency Personnel with state-of-the-art equipment for use in case of an Emergency
• Utilize uniformed police officers to manage and divert traffic as necessary to secure a quick access for Emergency vehicles to the crash site and to assist rescue crews.
• Police should keep away curious people from the accident scene
• Equip uniformed police officers to handle emergency cases, (i.e. Flares, flash lights, reflective vests, etc...) at the same time staying out of harm’s way.

REDUCING DELAYS AND ENHANCING SAFETY IN WORK ZONES

Meeting the road users’ needs for mobility and safety during construction and maintenance operations is the essence of what the transportation industry does--planning, designing, operating, maintaining, rehabilitating, reconstructing, and making improvements to roads and highways are what it’s all about.

Almost everything is manifested in a work zone. What a motorist experiences in a work zone gets down to the very essence of what CDR is and does. Local municipalities and other ministries look to CDR to take a leadership role in reducing delay and enhancing safety in work zones.
SIGNING, PAVEMENT MARKINGS

EVALUATE EFFECTIVENESS OF USING “ATTENTION GETTING” SIGNS IN WORK ZONES, SUCH AS:

“Speed Limit 65 KM/H”
“Slow Down My Dad Works Here”(written in kid font).
• Change the “flagger” symbol on signs, etc., since the “Stop/Slow paddle” is in use today.
• Reevaluate the work zone signing requirements, as work progresses.
• Allow a “Last Exit Before Work Zone” sign for freeways. Also provide pull out/off areas for motorists to plan strategy.
• Develop a good way of identifying exit ramps in work zones.
• Develop a durable temporary pavement marking material that can be easily removed and does not leave a visible residue on the pavement.
• Develop a work zone MUTCD that is tailored to utility companies.
• Experiment with colored symbol variable message signs.

Worker Safety and Protection:
• Develop a longitudinal safety barrier for mobile construction and maintenance operations performed on the road.
• Develop a longitudinal safety barrier for short-term maintenance operations performed adjacent to the shoulder.
• Develop a portable gawk screen for maintenance operations.
• Develop warning system to workers, when a vehicle enters a safe zone.
• Develop a debris removal system.

Awareness and Driver Education
• Conduct a follow-up survey to find out what the public expects in work zones.
• Set up a work zone information display.
• Establish a national symbol/logo (i.e., “Man with Shovel”) for work zone safety which everyone would recognize.
• Post short work zone safety messages on CDR ‘s Homepage. These messages would appear when the Homepage was brought up and would need to be changed periodically, (daily or weekly).
• Establish partnerships with Internet search engines/browsers to place short work zone educational messages on their introductory index pages, i.e., Public Service Announcements on the Internet.
• Get major television networks to do a show and maybe a national television test on work zones.
• Develop generic up-to-date information on work zones that can be incorporated into the driver licensing manuals.
• Develop work zone modules for driver education classes. Develop a set of work zone questions that could incorporated into driver licensing tests.
• Develop an interactive video of driving though a work zone that could be used by driver education and awareness.

Establish a “Nationwide Work Zone Information System” to inform travelers and tourists of work zone information project by project.

“The motorist measures performance by what he experiences in a work zone.”

TRANSITION AREA

The intent of this component is to move traffic out of its normal path. It must be long enough to allow drivers to slow down, and for traffic to merge away smoothly, without creating conflicts or causing accidents.

This component may begin with a directional light arrow or reflective sign. This part of the area shall be bordered with necessary cones or barrels depending on the posted speed or type of roadway.

ACTIVITY AREA

This area is where actual work is being done. The driver tends to get easily distracted in this part of work zone. This component is divided in at least 4 stages:

Longitudinal Buffer Space which must be designed to provide protection for traffic and workers, by installing barricades with flashing lights and reflective ribbons or gawk nets.

Lateral buffer Space, this keeps a horizontal zone to allow a safe distance between the traffic and the machinery/workers moving in the work zone.

TERMINATION AREA

This informs the driver that he is leaving the work zone and lets traffic resume normal driving. Simply install a standard “End of Road Work” Sign at an appropriate distance further away from the actual end of work zone.
CONCLUSION and RECOMMENDATIONS

Meeting the road users’ needs for mobility and safety during construction and maintenance operations is the heart of what CDR does and what it is all about planning, designing, constructing, rehabilitating, reconstructing, operating, and maintaining the highway system. What the motorist experiences in a work zone gets down to the very essence of what CDR is and what it does.

It has been estimated that the majority of the population travels through a work zone at least once every day.

- There is no question that the quality of traffic control devices used in work zones and the uniformity of work zones need to be updated and improved to meet the International Standards, MUTCD and LIBNOR Specifications.
- In order to significantly reduce motorist delays and crashes in work zones, work zone traffic management principles must be applied to the majority of maintenance and construction operations.
- CDR must set a clear vision. This vision must be translated into performance objectives and traffic management integrated into the culture of the organization.
- Work zone traffic management principles must be applied through the life the project.
- Successful work zone traffic management is dependent upon reducing the exposure of the road user and the worker.
- Transportation agencies must focus on the bottom line; reducing the loss of life and limb, the waste of individuals’ time, and the drain on our nation’s economy.
- The road users must be educated on how to behave when driving or walking though a work zone.

CDR’S vision is: “No Delays and No Crashes in Work Zones.”

This vision can only be accomplished, by integrating traffic management principles into the project development process, and by applying these principles to every maintenance and construction operation.

It is up to each of us to make the commitment to make a difference.
For CDR to achieve the strategic goals and objectives for safety, mobility, and productivity, it will have to assume a proactive leadership role in promoting work zone management techniques, dedicate the resources to develop and/or enhance the tools needed by local transportation agencies to achieve the state of the art, create new partnerships for work zone education, and engage all of the stakeholders in a comprehensive cooperative effort.

We have clearly stated the expectations for safety, quality, and mobility. CDR is expected to take a major leadership role. The time is right for CDR to step up and implement the necessary rules and guidelines.

Summary of recommendations

- Integration of Work Zone Traffic Management into the Project Development Process
  - Set the “vision” for work zones
  - Develop a road user driven statewide work zone policy
  - Adopt strategic goals, objectives, and performance measures for delay and crashes
  - Provide an organizational structure that facilitates cross-cutting teams
  - Include public and other agencies in the development of safety policy and selecting the project traffic control plan
  - Dedicate funds for preventive maintenance
  - Sponsor work zone traffic management training courses
  - Facilitate public work zone educational and information programs
  - Involve contractors in phasing the construction (+/- 30% stage)
  - Develop alternate traffic control and alternate corridor traffic management plans with cross-cutting teams
  - Use computer modeling to evaluate alternate traffic control plans
  - Use road-user costs and life-cycle cost in decision making process
  - Inclusion of high performance/low maintenance materials in the design
  - Include additional features in design to mitigate traffic impacts of future construction and maintenance operations
  - Collect and analyze pre-construction delay and crash data
  - Initiate traffic information program
- Include warranties with bonuses in contracts
- Use performance based specifications to minimize traffic delays
- Use time based bidding procedures
- Identify major traffic corridors
- Inventory long range improvements
- Inventory preventive maintenance needs
- Identify alternate routes / modes in corridor
- Use computer modeling to evaluate alternate corridor traffic management plans
- Involve public in selecting the corridor traffic management plan
- Group and sequence projects to minimize exposure
- Conduct work zone traffic management training courses
- Insist on quality work and timely completion of work
- Continue traffic information program
- Use computer modeling to evaluate proposed changes to the traffic control plan
- Use uniformed police in the work zone
- Collect and disseminate real time traffic information
- Report and analyze all work zone crashes
- Encourage value engineering change proposals
- Reward innovations for reducing exposure to motorist
- Monitor delay and crash performance goals
- Pay contractor incentives for exceeding expectations
National Campaign for the Promotion of Children Rights

سلامة المشاة...

PEDESTRIAN SAFETY...

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Respect other road users

EDITORIAL
A salute of appreciation to the Lebanese Army

On the occasion of the Anniversary of the Lebanese Army on August 1st, 2002, we salute all its members and officers on all their efforts and dedication as well as salute the army markets for sacrificing their lives for the country.

YASA would like to highlight the role the army plays to its people and how important it is for all of us to have the soldiers and officers of the Lebanese army play a role model to help us improve safety around the country.

In the effort to improve safety, we salute the army for participating in our nationwide effort to reduce the death toll from unintentional injuries and for adopting the driver guide as a guide and reference book for their drivers.

By Mona Kheiri Aki

Too late to slow down

Speed kills all types of road users – drivers, pedestrians and cyclists. A 5% cut in average speed can reduce the number of fatal crashes by as much as 38%.

Be part of the solution: don’t speed.
Celebrate Safely