

Temporary Safety Measures Inspections



Pat Phelan

NRA HD16/12

- **Temporary Safety Measures Inspection (TSMI) - safety procedure for road works that was introduced by the NRA to comply with the EU Directive on Road Infrastructure Safety Management (EU RISM).**
- **Standard addresses the requirements of the EU Directive 2008/96/EC on RISM and its transposition into Irish Law under S.I. No. 472 of 2011.**

NRA HD16/12

- **The purpose of a TSMI is to ensure that the standards applying to TSM at Road Works are properly applied and to record impacts of Road Works on the safety of traffic flow**
- **TSMI are required on all National Roads**

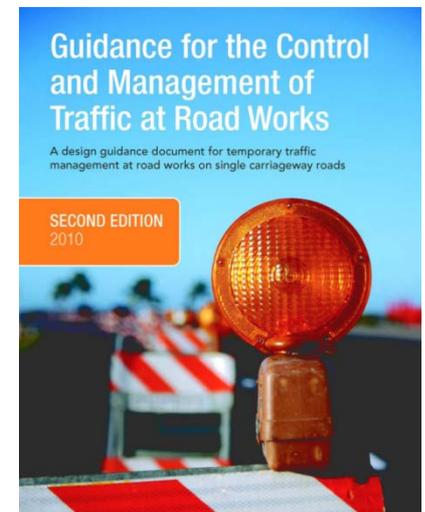
Temporary Safety Measures – Guidance Docs

- Chapter 8 of the Traffic Signs Manual
- Guidance for the Control and Management of Traffic at Road Works



8. Temporary Traffic Measures and Signs for Roadworks

CHAPTER 8



NRA HD 16/12 : TSMI – By whom?

- **NRA will undertake TSMI on projects sanctioned/or procured by the NRA.**
- **Local Authority (LA) will undertake TSMI on projects sanctioned and/or procured by the LA.**
- **Statutory Undertaker/Road Operator will undertake TSMI on projects under their management.**

NRA HD 16/12 : TSMI – By whom?

- The NRA will carry out random inspections of LA, Road Operators and Statutory Undertaker's TSM to verify that TSMI are being carried out in accordance with HD16.

NRA HD 16/12 : TSMI – Frequency?

- The frequency of TSMI shall be subject to the following minimum requirements:

Duration of Road Works	% of sites to be inspected per annum	Frequency of Inspection
Exceeding 1 year in duration	100% of sites to be inspected	Quarterly
1 month to 1 year in duration	50% of sites to be inspected	Single Inspection
Greater than 1 day, less than 1 month	10% to 20% of sites to be inspected	Single Inspection
1 day in duration	Random	Single Inspection

NRA HD 16/12 : TSMI – Inspection Team

- **An Inspection Team member shall be an Engineer or safety professional with seven years post graduate experience and a minimum of five years in the design or construction of road projects.**
- **They should have traffic management experience and shall have attended a minimum two day certified course in the design or auditing of Temporary Traffic Management.**

NRA Procured Works - examples

- Major Projects
- Signs and Road Markings
- Motorway Maintenance and Renewal Contracts (MMaRC)
- Eirspan
- Traffic Calming



Inspection Forms - Examples

NRA An tUdarás um Bóithre Náisiúnta National Roads Authority		TEMPORARY SAFETY MEASURES (TSM) INSPECTION SYSTEM REPORT																
TIME AND DATE OF INSPECTION: 16:00 21st August 2013		ROUTE NUMBER: 2018	ROAD AUTHORITY: Donegal Co. Co.															
ROADWORKS START DATE: Mid July 2013		EXPECTED DATE OF COMPLETION OF ROADWORKS: Mid September 2013																
CONTRACTOR (if applicable): Wills Bros Ltd		TSM DESIGNER: Wills Bros Ltd	ROADWORKS TYPE (Construction / Non-Construction): Construction															
PSDG: Wills Bros Ltd Contact Details: 004 9256221		PSDG: Borac Consulting Contact Details: 0044 926 9033443	ROADWORKS SAFETY OFFICER / COORDINATOR: Lorraine Tammill Contact Details: 004 9256221															
Roadworks Description: Enspan 2013 North West Bridge Rehabilitation Programme. Bridge repairs. 100 Kph. Road Works Speed Limit Order of 50 Kph. Single lane travelling Southbound. Northbound traffic diverted onto old N18.																		
<table border="1"> <thead> <tr> <th>Safety</th> <th>Colour Coding</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>Acceptable</td> <td>Green</td> <td>Safety systems in place and operated appropriately</td> </tr> <tr> <td>Improvement Required</td> <td>Yellow</td> <td>Systems or operation of systems requiring improvement</td> </tr> <tr> <td>Unacceptable</td> <td>Red</td> <td>Conditions requiring immediate corrective / improvement action.</td> </tr> <tr> <td>Not Reviewed</td> <td>White</td> <td>Item not reviewed during inspection</td> </tr> </tbody> </table>				Safety	Colour Coding	Definition	Acceptable	Green	Safety systems in place and operated appropriately	Improvement Required	Yellow	Systems or operation of systems requiring improvement	Unacceptable	Red	Conditions requiring immediate corrective / improvement action.	Not Reviewed	White	Item not reviewed during inspection
Safety	Colour Coding	Definition																
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Unacceptable	Red	Conditions requiring immediate corrective / improvement action.																
Not Reviewed	White	Item not reviewed during inspection																
TSM Temporary Safety Measures (TSM) for Roadworks																		
Evidence available that sufficiently trained staff are present to design and implement the TSM?																		
TSM1	Does the Design conform to the Traffic Signs Manual (DoT) and does the TSMs installed conform to the design layout and parameters?																	
TSM2	Have all hazards been assessed in the TSM?																	
TSM3	Has allowance been made for the delivery and removal of materials, and have these been adequately signed?																	
TSM4	Have Gardaí been informed of any traffic lights or stoppage system in use?																	
TSM5	Have Gardaí been informed of speed limits being introduced for the duration of the works?																	
TSM6	Are all traffic management equipment in good condition for purpose (easily understood by the general road user) and in accordance with the Traffic Signs Manual (i.e. size/height, colour, reflectivity)?																	
TSM7	Are sign sightlines in accordance with the requirements of the TSM and are sightlines adequate for all other signs (i.e. free from bends, hill/dips in the road, parked vehicles, hedges etc)?																	
TSM8	Will the site be safe during hours of darkness and adverse weather conditions?																	
TSM9	Is the carriageway/footway being kept clear of mud and surplus equipment?																	
TSM10	Are materials placed correctly and safety stored?																	
TSM11	Is there safe access/egress to adjacent private premises and local roads/junctions?																	
TSM12	Does signing and guarding meet the changing site conditions?																	
TSM13	Are traffic control arrangements working at their optimum level to reduce traffic delays?																	
TSM14	Are all misleading permanent signs & road markings covered?																	
TSM15	Have all signs been positioned correctly to eliminate a potential hazard to the general public?																	
TSM16	Have the needs of pedestrians and other vulnerable road users (disabled pedestrians, blind, cyclists, horses etc) been addressed in the layout? If existing public routes have been blocked, have suitable alternatives been provided?																	
TSM17	Is the Work Area clearly defined to the road user?																	
<table border="1"> <thead> <tr> <th>13</th> <th>12</th> <th>11</th> <th>10</th> </tr> </thead> <tbody> <tr> <td>Photo TSM1</td> <td>Photo TSM2</td> <td>Photo TSM3</td> <td></td> </tr> <tr> <td>Photo TSM4</td> <td>Photo TSM5</td> <td>Photo TSM6</td> <td></td> </tr> </tbody> </table>		13	12	11	10	Photo TSM1	Photo TSM2	Photo TSM3		Photo TSM4	Photo TSM5	Photo TSM6						
13	12	11	10															
Photo TSM1	Photo TSM2	Photo TSM3																
Photo TSM4	Photo TSM5	Photo TSM6																
Summary of Inspection: Traffic management working well with minimal disruption to the road user.																		
Selected Photos Travelling South <ul style="list-style-type: none"> • VMS erected in advance of the Works. Good practice. (See Photo TSM 6). • Advance signage (See Photo TSM 7). • No right turn sign 600mm. Although this size complies with CHS, consideration should be given to the erection of a larger (750mm) at this location to avoid cars turning down the one-way diversion. (See Photo TSM 8). • Works Area (See Photo TSM 9 to 12). • Works area until. Additional rotating reflectors/tamps required to comply with CHS Section 8.2.5.6. (See Photo TSM 9 to 11 and Item 2 above). 																		

NRA An tUdarás um Bóithre Náisiúnta National Roads Authority		TEMPORARY SAFETY MEASURES (TSM) INSPECTION SYSTEM REPORT (Supplementary Information)	
Photo TSM 7		Photo TSM 8	
Photo TSM 10		Photo TSM 11	
Photo TSM 13		Photo TSM 14	
Photo TSM 16		Photo TSM 17	
		Photo TSM 18	
		Click here to insert photo	
Notes on Supplementary Information: Selected Images Travelling North			
<ul style="list-style-type: none"> • Diversion of N18. Consideration should be given to the erection of barrier boards to demonstrate that the lane ends and the erection of additional chevrons. In addition, as this area is outside the streetlight zone, consideration should be given to the erection of temporary tower lighting at the commencement of the diversion (See Photo TSM 13). • 80Kph speed limit sign on diversion. Consideration should be given to the covering of this sign as a Road Works Speed Order of 50Kph is in place on the N18 post exiting the diversion (See Photo TSM 14). • Potholes to diversion (See Photo TSM 14 & 15). • Unclear if road user is meant to stop rejoining the N18 at the end of the diversion. Stop sign has been turned but road markings remain. In addition, consideration should be given to closer spacing of the cones on the N18 centreline at this point (See Photo TSM 16). • End of Roadworks sign should be repositioned further north from the end of the diversion. Not easily visible in verge at end of diversion. • 100Kph repeater sign not covered within 50 Kph Road Works Speed Limit (See Photo TSM 14 & Item 15 above) 			
General <ul style="list-style-type: none"> • For the Mayo/Galway bridges, 3 number supervisors have the Signing, Lighting and Guarding ticket. However, it appears that no operative at this site was in possession of a Signing, Lighting and Guarding and/or an assisting in the implementation of health and safety at roadworks ticket. This does not comply with Regulation 97 of the SAFETY, HEALTH AND WELFARE AT WORK (CONSTRUCTION) (AMENDMENT) (No. 2) REGULATIONS 2006 and should be rectified. 			

Inspection Forms - Examples

NRA An tÚdarás um Bóithre Náisiúnta National Roads Authority		TEMPORARY SAFETY MEASURES (TSM) INSPECTION SYSTEM REPORT											
TIME AND DATE OF INSPECTION: 12:00pm 08th October 2013		ROUTE NUMBER: N59	ROAD AUTHORITY: NRA										
ROADWORKS START DATE: Not Recorded (NR)		EXPECTED DATE OF COMPLETION OF ROADWORKS: NR											
CONTRACTOR (if applicable): Exterior	TSM DESIGNER: NR	ROADWORKS TYPE (Construction / Non-Construction): Construction											
PCSC: Exterior Services Ltd.	PCSP: RPS	ROADWORKS SAFETY OFFICER / COORDINATOR: Ráile Devane											
Contact Details: 084 7728116	Contact Details: 01 4882900	Contact Details: NR											
Roadworks Description: Excavation for sign post bases on the N59 at Leenane. 100 Kph speed limit.													
Rating:	Colour Coding:	Definition:											
Acceptable	Green	Safe systems in place and operated appropriately											
Improvement Required	Yellow	Systems or operation of systems requiring improvement											
Unacceptable	Red	Conditions requiring immediate corrective / improvement action.											
Not Reviewed	Grey	Item not reviewed during inspection											
TSM - Temporary Safety Measures (TSM) for Roadworks													
Evidence available that sufficiently trained staff are present to design and implement the TSM?	NR	R	O	G	Acceptable								
TSM.1													
TSM.2		X											
TSM.3		X											
TSM.4		X											
TSM.5		X											
TSM.6		X											
TSM.7			X										
TSM.8			X										
TSM.9		X											
TSM.10				X									
TSM.11		X											
TSM.12		X											
TSM.13		X											
TSM.14			X										
TSM.15		X											
TSM.16		X											
TSM.17		X											
<table border="1"> <thead> <tr> <th>Green</th> <th>Yellow</th> <th>Red</th> <th>Grey</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>4</td> <td>2</td> <td></td> </tr> </tbody> </table>						Green	Yellow	Red	Grey	2	4	2	
Green	Yellow	Red	Grey										
2	4	2											
Summary of Inspection: Traffic management causing a serious hazard to the road user. Low traffic volumes observed at the time of inspection. Works crew consists of 2 operatives, van, mini-digger and flatbed truck with trailer.													
Travelling West <ul style="list-style-type: none"> 1st advance roadworks sign obscured by vegetation. Also, frame appears incorrect. (See Photo TSM 5 & 6 and Item 7 & 8 above). 2nd advance roadworks sign obscured by vegetation. (See Photo TSM 7 & 8 and Item 8 above). 3rd advance roadworks sign. (See Photo TSM 9). Works vehicles and site (See Photo TSM 10). 4th advance roadworks sign. Sign damaged. (See Photo TSM 11 & Item 7 above). Truck obstructing carriageway (See Photo TSM 12 & 13 & Item 3 above). 													

NRA An tÚdarás um Bóithre Náisiúnta National Roads Authority		TEMPORARY SAFETY MEASURES (TSM) INSPECTION SYSTEM REPORT (Supplementary Information)	
Photo TSM 7		Photo TSM 8	
Photo TSM 9		Photo TSM 10	
Photo TSM 11		Photo TSM 12	
Photo TSM 13		Photo TSM 14	
Photo TSM 15		Photo TSM 16	
Photo TSM 17		Photo TSM 18	
Summary of Inspection continued: <ul style="list-style-type: none"> Excavation ongoing for sign post base. Mini-digger obstructing carriageway. Road user has to cross the white line on a blind bend to manoeuvre past mini-digger. (See Photo TSM 14 to 16 & Item 2 & 3 above). 			
Travelling East <ul style="list-style-type: none"> Work site (See Photo TSM 17 & 18). 			

Recurring Issues – Inadequate TSM



- **100 Kph Road**
- **Solid White Line**
- **Poor Forward Visibility**
- **Priority(Yield Sign) in use**

Recurring Issues – Inadequate TSM



- 100 Kph Road
- Solid White Line
- Road User Has to Cross White Line on Bend

Recurring Issues – Inadequate TSM



- **100 Kph Road**
- **One Advance Roadworks Sign on Approach**
- **Four Advance Signs and a Lateral Safety Zone of 1.2 Metres Required**

Recurring Issues – Inadequate TSM



- 100 Kph Road
- Three Advance Roadworks Signs on Approach
- Work Site Poorly Defined

Recurring Issues – Inadequate TSM



- **100 Kph Road**
- **Short Duration Stop (<5 mins)**
- **Only Works Vehicle Visible**
- **Work Site Poorly Defined**

Recurring Issues – Misleading Signs/Markings



- **60 Kph Road Works Speed Limit**
- **Which Direction?**
- **Night-time?**

Recurring Issues – Misleading Signs/Markings



- **60 Kph Road Works Speed Limit**
- **Which Direction?**
- **Night-time?**

Recurring Issues – Misleading Signs/Markings



- **One-way System in Operation**
- **No Left-turn**
- **Direction Sign Not Covered**

Recurring Issues – Misleading Signs/Markings



- Road Closed
- Direction Sign Not Covered

Recurring Issues – Misleading Signs/Markings



- End of No Overtaking Sign Erected
- Solid Permanent Road Marking

Recurring Issues – Misleading Signs/Markings



- End of No Overtaking Sign Erected
- Permanent No Overtaking Sign
- Solid Permanent Road Marking



Recurring Issues – Exiting Vehicles



- **Speed Limit
100Kph & 120
Kph**

- **Lateral Safety
Zone of 1.2metres
Required**



- **Where Possible,
Exit/Enter Vehicle
on Non-traffic
Side**

Recurring Issues – Lateral Safety Zone



- **Speed Limit 60Kph, Lateral Safety Zone of 0.5 metres Required**



- **80Kph, Lateral Safety Zone of 1.2metres**
- **Safety Zone Must be Kept Clear**

Recurring Issues – Sightlines (Single Carriageway)



- **Speed Limit 60Kph, Sign Visibility of 50metres**



- **80Kph, Sign Visibility of 120metres**

Recurring Issues – Damaged Signs



Other Considerations – Temporary Situation



Prior to Construction

During Construction

- **Additional Hazards Introduced?**

Other Considerations – Temporary Situation



Prior to Construction



During Construction

- **Additional Hazards Introduced?**

Other Considerations – Day V Night



Other Considerations – Day V Night



Good Practice



- **Good Visibility**
- **Reflective Material Clean**
- **Warning Vehicle in Advance of Works Vehicle**
- **Work-site Well Defined**

Good Practice



- **Good Visibility**
- **Equipment Well Maintained**
- **Work-site Well Defined**

Good Practice



Advice Notes

- Available for download from the Publications Section of the NRA website.

Temporary Traffic Measures - Block Vehicle

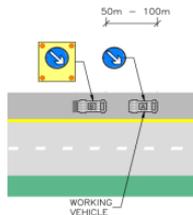


This Advice Note acts as a reminder to persons involved in the implementation of Temporary Safety Measures with regard to the correct positioning of the block vehicle.

- For mobile lane closures, block vehicles should be in accordance with Section 8.5.3 Chapter 8 of the Traffic Signs Manual,
- In accordance with Chapter 8, the distance between the block vehicle and the Working Vehicle should be 50 – 100 metres,
- Where there is a risk of traffic entering the area between the block vehicle and the working vehicle, the distance between these vehicles should be 150 metres,



- To minimise the risk of the block vehicle being shunted into the working vehicle the distance should never be less than 50 metre.



Temporary Traffic Measures - Exiting Vehicles



This Advice Note acts as a reminder to persons involved in the construction and maintenance of the road network in relation to exiting/entering vehicles in close proximity to live traffic:

- A method statement and risk assessment should be prepared for all works activities,
- A site safety induction should be completed for all operatives involved in a work activity,
- The procedure for and the method of safe access and egress to the workplace should be addressed in the method statement and risk assessment and briefed to operatives as part of the site safety induction,



- Where it is necessary to exit a works vehicle in close proximity to a live carriageway lane, a safe system of access and egress should be used,
- Temporary Safety Measures should be utilised in accordance with Chapter 8 of the Traffic Signs Manual,
- Operatives should exit /enter vehicles from the side furthest away from live traffic i.e for hard shoulder works - the near-side,
- Operatives should be aware of weather conditions, road speed and lateral safety zones,
- Operatives should be aware of approaching traffic.

Temporary Traffic Measures - Lighting



This Advice Note has been prepared to advise on best practice with respect to lighting at Temporary Traffic Measures

Chapter 8 of the Traffic Signs Manual gives guidance on the use of rotating and reflective lighting to be used at Temporary Traffic Management layouts.

- Maintain the temporary traffic measures during the works and clean traffic management equipment during the works including cones, signs and reflectors.
- At night, lines of cones in un-lit areas should be fitted with steady state lamps with amber light or a combination of steady amber lamps & rotary amber reflectors at regular intervals.



Rotating reflectors may be used in place of steady state lamps on the longitudinal sections of cones or barriers adjacent to the trafficked edge but may not be used on lead in tapers.

These amber lamps or rotary reflectors may be mounted on cones provided the apparatus does not block any of the reflective strips of the cones or protrude onto the carriageway.

Where public lighting is not provided along the site, steady beacons, rotating reflectors or reflective strips should be installed on barriers to highlight their presence

Further Guidance is given on Lighting in the Control and Management of Traffic at Road Works – Second Edition 2010

Any Questions?