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| SERVICE: Highways and Transportation | | | LOCATION: Victoria Road / Water Lane / Great Wilson Street Area | | | | |
| ACTIVITY: Review of management for high wind events in the vicinity of the Bridgewater Place Building | | | | | | | |
| Responsible Manager | | Andrew Hall | Signature | | | Date | |
| Assessment by | Working Group | Signature | Andrew Hall (Chair) | Date | January 2014 | Review Date March 2014 | |
| What are the hazards? | Who might be harmed and how | Evaluate the risks. What are you already doing? | | What further action is necessary? | Action By Whom? | Action By When? Complete Y/N (Date) | |
| The impact of high winds causing sudden gusts and turbulence associated with the Bridgewater Place buildings. Causes unpredictable conditions for pedestrians, cyclists and drivers. | Vehicles particularly high sided vehicles of being blown over and off course with potential for serious injury to driver and other vehicle occupants, pedestrians or cyclists. | <p>Risk of injury to road users potentially serious or fatal.</p> <p>Permanent traffic signs in place (wind sock)</p> <p>Mitigation plan amended following consideration of coroner's recommendation and experience of 5th December 2013 for road closure to be implemented when high winds exceeding 45 mph forecast (gust speed) using Met Office weather forecast for Bridgewater Place.</p> <p>Manual erection and removal of signs during high wind events in operation.</p> <p>VMS sign message warning of high winds and gusts in operation.</p> <p>Procured bespoke Met Office data and provision of anemometer to provide year round forecast and improve responsiveness of the present arrangements.</p> <p>Reviewed thresholds for intervention against available information and consider that Coroner's recommendation should be followed and monitored.</p> <p>Options appraisal for signing / traffic management measures undertaken including:</p> <p>Mandatory closure of Victoria Bridge environs to all vehicles during extreme wind events Mandatory closure to HGVs & PSVs during high wind events Advisory diversion of high sided vehicles</p> | | <p>Alternative options appraised. Manual implementation of diversion to continue until replaced with automated signage.</p> <p>VMS sign process initiated at winds of 35mph</p> <p>Installed and forecast data received – no further action</p> <p>Use anemometer and Met Office data now available to develop detailed understanding of wind condition and fine tune present arrangements. Forecast accuracy report required.</p> <p>Consideration of improved response for extreme wind events 65+ mph gust speeds. Confirm protocol for police and PEPU involvement and circumstances where full closure of the road could be merited.</p> | <p>UTMC</p> <p>Highway Maintenance / Vaisala</p> <p>Highway Maintenance</p> | <p>Further review completed December 2013</p> <p>Process in place</p> <p>Review of data series emerging from anemometer. Need high wind events to provide data for correlation</p> <p>RM to formalise process for extreme events. Meeting taken place with police and PEPU Oct 2013, protocol being updated.</p> | <p>Yes - 2011</p> <p>Yes</p> <p>Yes</p> <p>Yes – July 2012</p> <p>Ongoing</p> <p>High Wind Protocol v3 updated December 2013 to provide road closure at wind speeds exceeding 45mph from westerly direction</p> |

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| | | <p>Permanent LGV and/or HGV ban on Victoria Bridge and environs VMS signing options as appropriate Other alternative automatic signing arrangements Options for static signing</p> <p>Snap shot commercial vehicle surveys completed.</p> | <p>Completed review of practice elsewhere in relation to high sided vehicles and PSV's</p> <p>Proposal for HGV ban on Victoria Road being pursued by Traffic Management Team.</p> <p>Permanent signage for high-sided vehicle diversion</p> <p>Permanent signage for high sided vehicle diversion – flip down signs</p> | <p>Buro Happold / Transport Strategy</p> <p>Traffic Engineering</p> <p>Traffic Engineering</p> <p>Traffic Engineering</p> | <p>Completed study</p> <p>Order advertised June 2013</p> <p>Order implemented – Summer 2013</p> <p>Summer 2013</p> <p>Summer 2013</p> | <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes and post implementation monitoring undertaken October 2013</p> <p>Yes</p> |
| | <p>Risk to pedestrians being blown over or into the path of other traffic.</p> | <p>Risk of injury potentially serious or fatal.</p> <p>Pedestrian guard railing provided along all frontages to the Bridgewater Place building with gaps at designated pedestrian crossings.</p> <p>Options appraisal for pedestrian (and cycle) specific protective measures for high wind events and potential extreme events concluded including feasibility / desirability for:</p> <p>A total closure of Victoria Bridge during extreme wind events. Local diversion to use less exposed East footway at Victoria Bridge. Closure of the pedestrian crossing points. Relocation of crossings outside areas of greatest wind exposure. Signing arrangements such as fixed warning signs, concealed signs etc. Consider local planting to shield pedestrians from wind</p> | <p>Option Appraisal review completed September 2012</p> <p>No practical proposal for pedestrian interventions beyond existing guardrail measures other than work to mitigate wind strength by work to canopy / screen / baffles by building owner</p> <p>Design and deliver agreed signing option for pedestrians and cyclists asap.</p> <p>Agreement reached to move pedestrians onto eastern footway of Victoria Road and close Water Lane junction to all users at road closure wind threshold (>45mph).</p> <p>Reviewed BH advice from summer 2012 – no proposals</p> | <p>Building Owner / LCC baffle design procurement</p> <p>Traffic Engineering</p> <p>No further action</p> | <p>Planning application by CPPI – Autumn / Winter 2013/14</p> <p>Completed – May 2013</p> | <p>Ongoing</p> <p>Yes</p> |
| | <p>Risk to cyclists from being blown over or into the path of other traffic.</p> | <p>Risk of injury potentially serious or fatal.</p> <p>Option appraisal considering scope for additional protective measures for high wind events and potential extreme events completed including feasibility / desirability for:</p> | <p>Option Appraisal review completed September 2012</p> | | | |

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| | | <p>A total closure of Victoria Bridge and environs during extreme wind events. Cyclists specific warning signs and advisory diversion Advisory signing for cyclists to dismount and use adjoining footway through exposed area.</p> <p>Provisionally concluded that signing arrangements tied with those for pedestrians plus final selected option for traffic provide the most effective option.</p> | <p>Design and deliver agreed signing option for pedestrians and cyclists asap.</p> <p>Design of permanent signage for high-sided vehicle diversion</p> | <p>Traffic Engineering</p> <p>Traffic Engineering</p> | <p>Completed – May 2013</p> <p>Autumn 2013</p> | <p>Yes</p> <p>Yes</p> |
| | <p>Pedestrians, particularly elderly or disabled people pedestrian may have extra difficulty moving safely around the area</p> | <p>Risk of injury.</p> <p>Extensive guard rail in place can be used to gain extra stability when moving through the area in high winds.</p> <p>Options assessments indicate signing can most effectively be considered within the general mitigation measures now being considered as resulting from the option appraisals described above.</p> | <p>Design and deliver agreed signing option for pedestrians and cyclists asap.</p> | <p>Traffic Engineering</p> | <p>Completed - May 2013</p> | <p>Yes</p> |
| | <p>Operatives engaged in working on highways (erecting temporary signage, traffic signal maintenance)</p> | <p>Risk of injury.</p> <p>Erection of temporary signs in advance of the time high winds are forecast.</p> <p>LCC operatives and contractors to withdraw from site if winds are too hazardous to work in.</p> | <p>Option Appraisal review completed September 2012.</p> <p>Permanent diversion to be pursued to replace manual scheme</p> | <p>Traffic Engineering</p> | <p>Autumn 2013</p> | <p>Yes</p> |
| <p>Risk of wind related incidents on the diversionary routes.</p> | | <p>Not aware these routes are susceptible to wind issues. Will monitor situation.</p> | <p>Identification / risk assessment for any identified mitigation including localised wind measurements on alternative routes for comparative purposes. Wind readings taken but not conclusive.</p> | <p>Highway Maintenance / Vaisala</p> <p>Traffic Engineering</p> | <p>Wind measurements have proved inconclusive. Ongoing monitoring of incidents to take place</p> | <p>Ongoing</p> |
| <p>Wind damage to buildings and street furniture potential cause of further hazard to highway users.</p> | <p>Risk to road users from blown detritus.</p> | <p>Potential for physical injury. Windsack warning signs in place. No further practical signing measures feasible. In extreme events Police should be advised and treated as an incident.</p> | <p>Extreme events referred to PEPU and police in terms of additional hazards to public safety in line with protocol.</p> | <p>Highways Maintenance to liaise / assist PEPU and Police as required</p> | | |
| <p>Lost drivers</p> | <p>Risk of incident on the diversionary route.</p> | <p>Risk of road user injury. Assessment of alternative routes for risks – there are no highway risks on the alternative routes which are “A” classified roads. Relatively low volumes of traffic will be re-routed.</p> | <p>To keep under review.</p> | <p>Traffic Engineering & UTMC</p> | <p>Continuous</p> | <p>Ongoing</p> |

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| Consequential risks to highways users arising from the mitigation measures (i.e. bus users) | Risk of incident on the diversionary route. | Risk of road user injury arising from road users being directed to unfamiliar locations or routes. Alternative routes are well signed on main roads. Safety audit to be undertaken within 1 and 3 years of implementation | Assessment of implications of any additional proposals as they are prepared. To keep under review. Identification / risk assessment for any identified mitigation. | Traffic Engineering / Road Safety Road Safety | Review following HGV diversion Review 1 and 3 years after implementation of HGV ban | Ongoing July 2014 July 2016 |
| | Claims or actions by bus companies / vehicle operators in terms of diverted services or traffic. | Cost and reputational risk to the Council. | Assessment of implications of any additional proposals as they are prepared. Use of associated publicity for measures. Stakeholder dialogue with Metro, bus operators etc. | Bus companies informed of diversion routes. PEPU and press office informed. Leeds Travel info website and twitter updated to inform of diversions | Review completed – Need standby / weekend contacts And action ongoing | Yes January 2014 |

* RA to be read in conjunction with options appraisal documentation.