

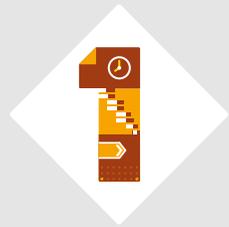


# HEALTH & SAFETY ANNUAL REPORT

## 2016



MOVING LONDON FORWARD



## RESPECT THE BASICS



## ASSESS THE RISKS



## CHECK THE SITE



## FOLLOW SITE REQUIREMENTS



## SUPPORT EACH OTHER

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# INTRODUCTION

**As another year passes, we move ever closer to completion of the new railway. This year's achievements include completion of the running tunnels, a significant increase in the rate of track installation and the construction of the first station platforms to name but a few. We are also well into the transition from heavy civils work, to railway and station fit out, with all the new challenges and changing risks this transition brings. These achievements and our ongoing delivery to plan, have taken place against the backdrop of improving health and safety performance.**

This continued improvement, is we believe, the direct result of the efforts of all involved in Crossrail, to proactively manage health and safety, as well as our attitudes and personal leadership. Health and safety is Crossrail's number one value and we are all striving to deliver our Target Zero principles, which we believe in passionately, everyone has the right to go home unharmed; all harm is preventable; we have to work together to achieve this. There is nothing so important on Crossrail that it cannot be done safely.

Our proactive leadership of the health and safety agenda has this year included the launch of updated Golden Rules, to ensure all working on Crossrail understand the behaviours expected from them, and a new Programme-Wide Induction, ensuring a consistent approach to induction and enabling greater flexibility to move between our sites. We have also increased our focus on activities aimed at better understanding of mental health, how respiratory health can be best managed and how issues relating to diversity and inclusion can impact health and safety performance.

Existing activities, that have become the bedrock of health and safety on Crossrail, have been maintained, but also refreshed to ensure they remain relevant as new members of the supply chain are mobilised to take on the next phase of Crossrail. We have retained 'Stepping Up Week' (a bi-annual, week long, health and safety engagement initiative now in its third year) and the 'Have Your Say' survey, used to measure worker attitudes to health and safety, and this year for the first time, used as a tool to benchmark the health and wellbeing of our workforce.

Our improved performance can be seen in our Health and Safety Performance Index (HSPI), the measure we use as a set of leading indicators, which continues to strengthen. It is also clear through the Accident Frequency Rates (AFRs) and Lost Time Indicator (LTI) which have again fallen, but are not yet zero, meaning despite improving, people have still been harmed whilst at work. Any harm is simply not good enough and is why we are never complacent, or reduce our efforts even when things are 'moving in the right direction'.

This coming year, our focus will include targeting improvements in attitudes towards and the management of mental health and wellbeing. We will also further our understanding of how health and safety performance can be linked to considerations of the unique needs of all of our diverse workforce. The work we are doing to leave a Learning Legacy after Crossrail is completed will gather pace, ensuring future projects gain from our experiences.

We remain committed in our efforts to drive health and safety standards for the whole industry and will continue to focus on eliminating harm and achieving Target Zero.



**Andrew Wolstenholme OBE**  
**Chief Executive**

# CORPORATE OBJECTIVES

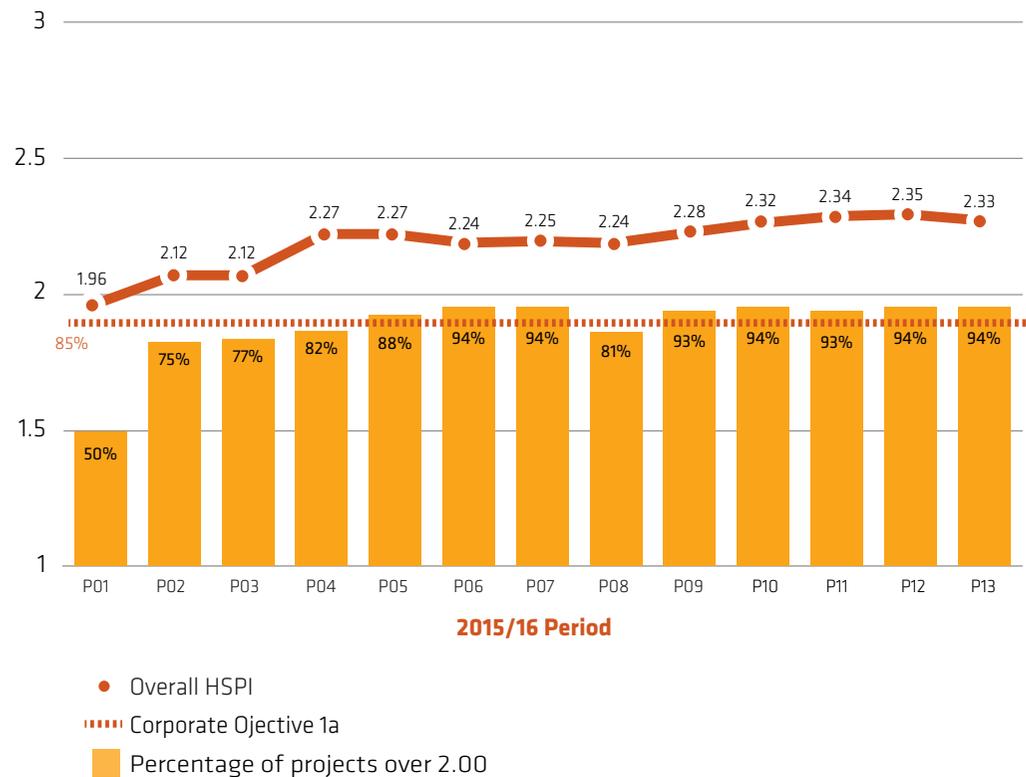
In order to measure our performance against the overall corporate objective to 'Deliver Target Zero', three corporate health and safety objectives were set during 2015/16:

## CORPORATE OBJECTIVE 1A: Strive for excellence in industry health and safety performance through continued focus on HSPI.

Crossrail continued to focus on the Health and Safety Performance Index (HSPI) and Gateway assessment by setting a target requiring 85% of our contracts to achieve an HSPI score equal to, or greater than 2.00 (contractual compliance is equivalent to 1.00). In addition, the annual review of HSPI saw the introduction of new, more challenging leading indicators.

In Period 13 (2015/16), 94% of contracts (16 contracts) scored 2.00 or above, exceeding the corporate objective. The overall average HSPI for CRL, was 2.33 at the end of March 2016, a 19% improvement compared to the HSPI score at the beginning of April 2015.

## PROGRAMME HSPI SCORE



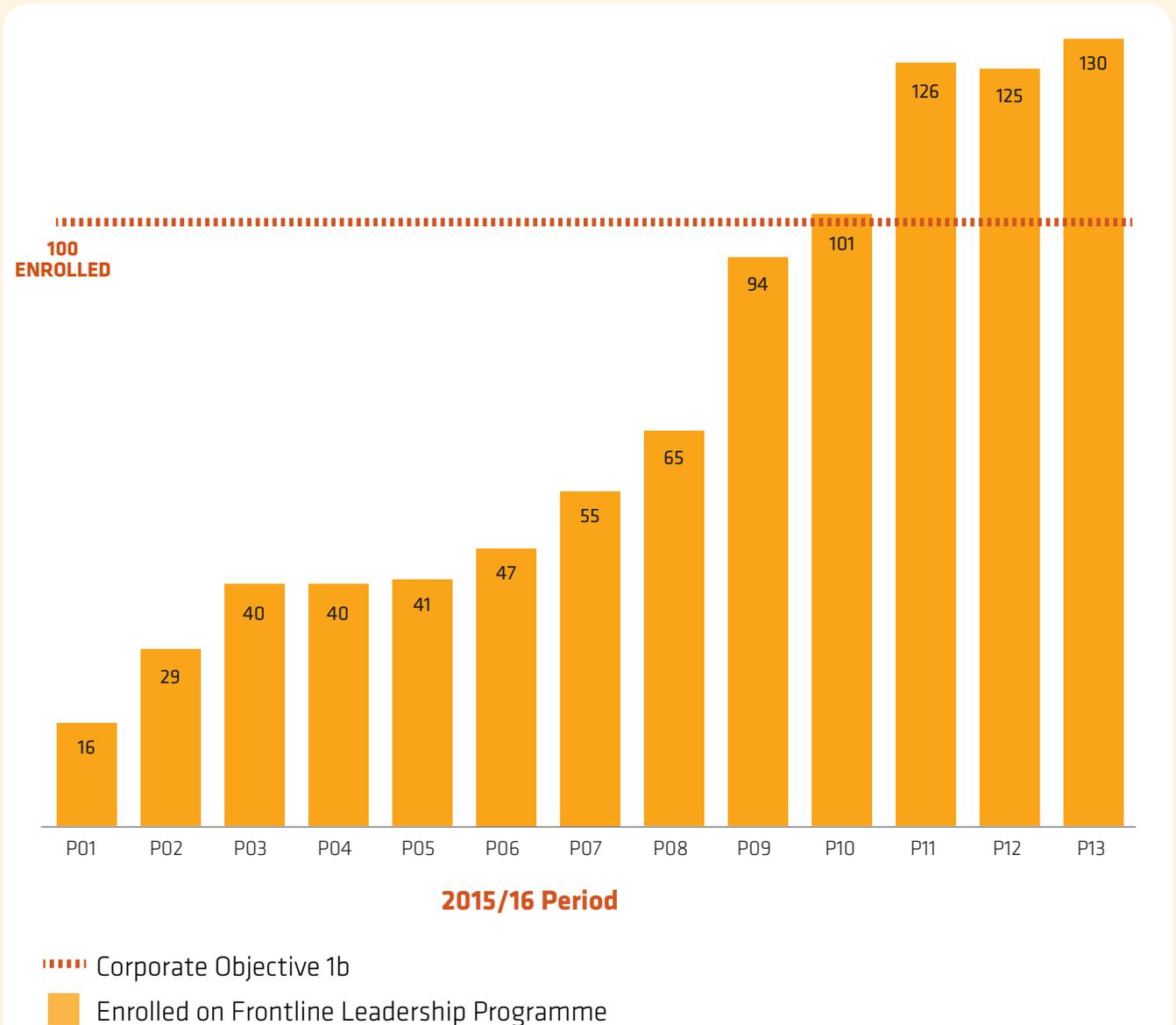
Average HSPI Score for 2015/16 = 2.24

## CORPORATE OBJECTIVE 1B: Strive for excellence in industry health and safety performance through continued focus on FLP.

Using the Crossrail Frontline Leadership Programme (FLP), Crossrail set a target to enrol an additional 100 individuals to promote the development of strong, site-based leaders, ensuring sites are consistently promoting health and safety whilst maintaining high performance.

The commitment to FLP by our contractors was evident, as by the end of March 2016 (Period 13), an additional 130 supervisors had enrolled on the programme, exceeding the corporate objective.

## CUMULATIVE NUMBER OF FLP ENROLMENTS

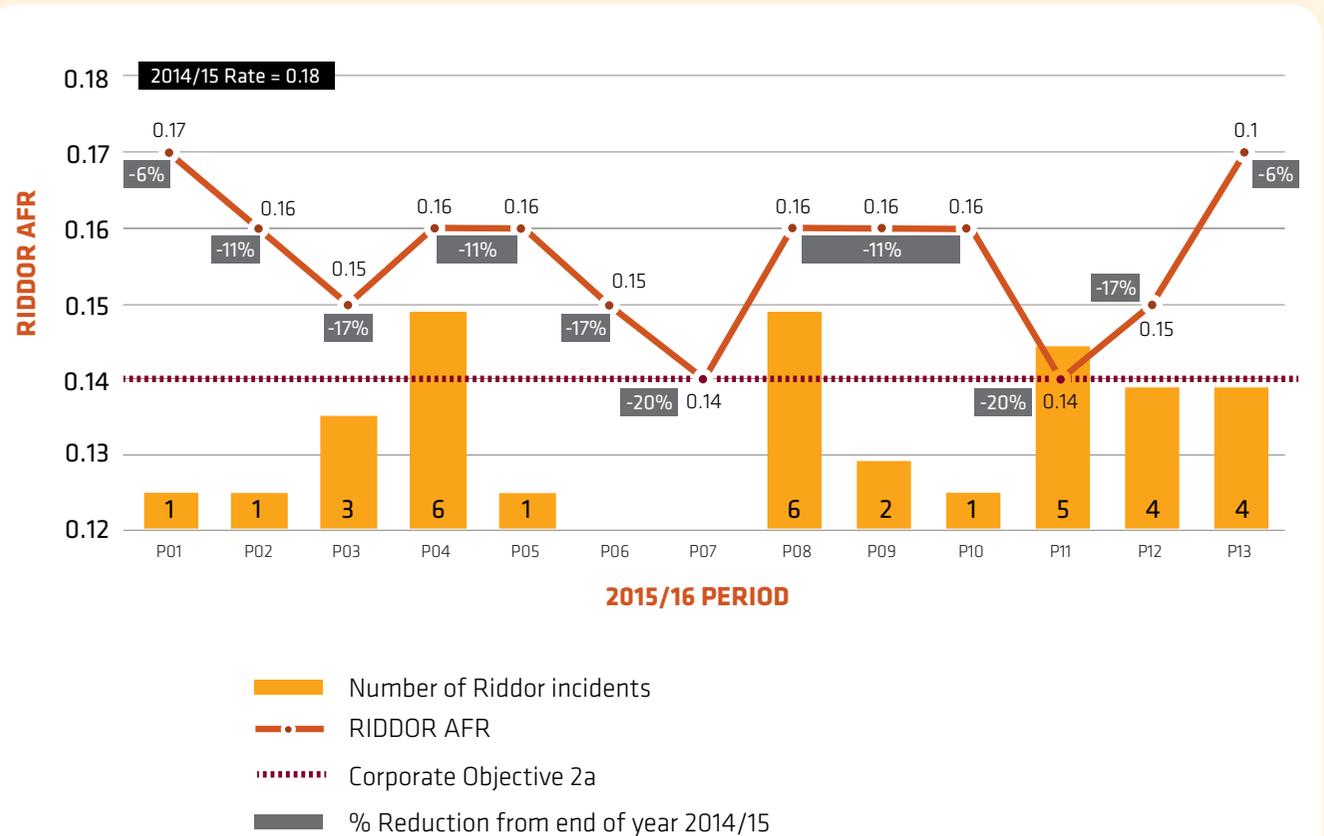


## CORPORATE OBJECTIVE 2A: Reduce the RIDDOR Injury accident frequency rate (AFR) rate from 0.18 (2014/15 rate) to 0.14, a reduction of 20%, by the end of 2015/16.

Crossrail's firm belief, that all harm is preventable, contributed towards the setting of challenging targets for 2015/16 and a commitment to reduce Accident Frequency Rates (AFR) by 20%.

The RIDDOR Injury rate reduced from a year-end of 2014/15 value of 0.18 to 0.17 in Period 13. Whilst this equates to a 6% reduction, it is noted that a 20% reduction was achieved in Periods 7 and 11. The corporate objective was not achieved in this instance, it does not detract from the continuous focus and commitment placed on health, safety and wellbeing on Crossrail.

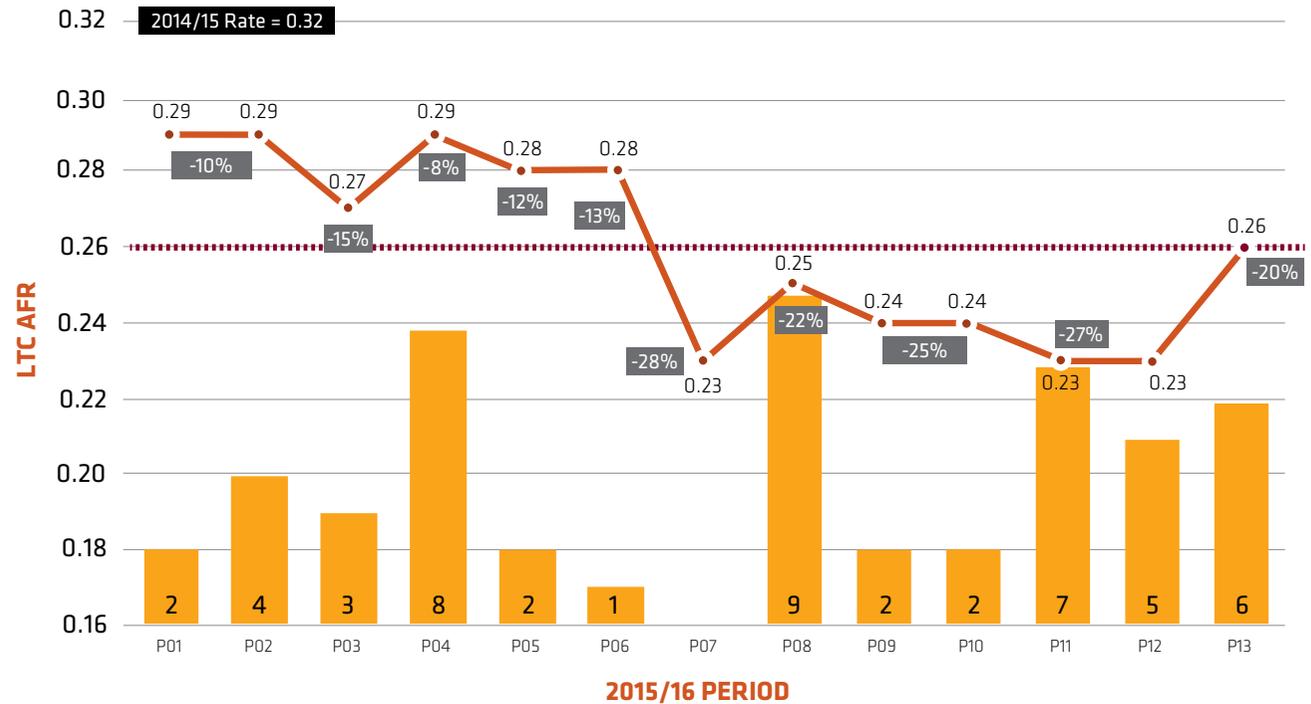
## RIDDOR ACCIDENT FREQUENCY RATE



**CORPORATE OBJECTIVE 2B:**  
 Reduce the Lost-Time Injury accident frequency rate (AFR) rate from 0.32 (2014/15 rate) to 0.26, a reduction of 20%, by the end of 2015/16.

The Lost-Time Case accident frequency rate (LTC AFR) reduced from a year-end of 2014/15 value of 0.32 to 0.26 in Period 13. This equates to a 20% reduction, achieving the corporate objective for 2015/16. It is noted that a reduction of over 20% was achieved from periods 7 to 12.

**LOST-TIME ACCIDENT FREQUENCY RATE**



- Number of LTC incidents
- LTC AFR
- Corporate Objective 2b
- % Reduction from end of year 2014/15

# STRATEGIC OBJECTIVES

Underpinning the corporate objectives are three strategic objectives

## STRATEGIC OBJECTIVE 1:

**Continue to roll out a leadership programme for Crossrail supervisors and develop behavioural training for Crossrail leaders.**

### FRONTLINE LEADERSHIP PROGRAMME (FLP)

The FLP was created in 2012 to provide support, through coaching and mentoring, for those fulfilling supervisory roles on the programme. The FLP is intended to enhance the leadership skills of those that participate, through a series of engagement days, delivered at TUCA, and ongoing practical application and mentoring in the workplace.

The programme is accredited by the Construction Industry Training Board (CITB) and is in the process of being recognised by the Institute of Leadership and Management (ILM).

By the end of 2015/2016, 400 leaders will have completed their FLP programme, 130 of whom were enrolled during the 2015/16 year alone.

### SAFETY AND HEALTH LEADERSHIP TEAM (SHELT)

The SHELT comprises directors from Crossrail and the Tier 1 contractors. It continues to meet every four weeks to discuss health and safety performance, emerging trends and initiatives and agrees the strategic direction of the health and safety improvement programme. SHELT membership has

evolved in line with the changing profile of works and now includes representation from the Systemwide and Station Fit Out contracts.

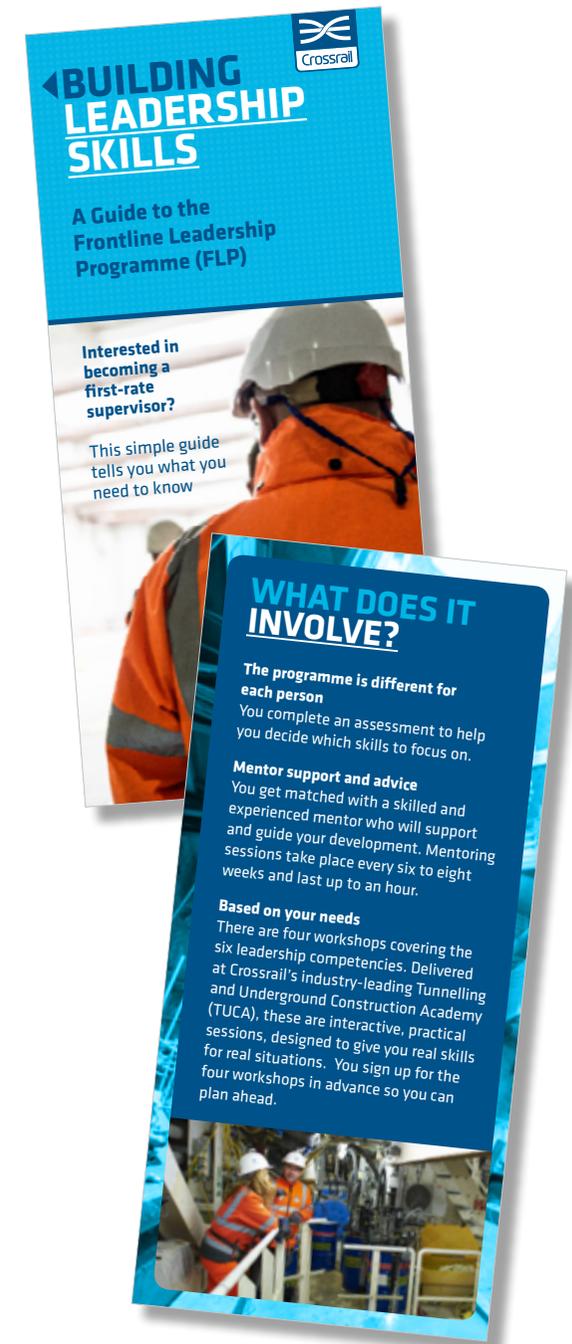
### PRINCIPAL CONTRACTORS' HEALTH AND SAFETY FORUM AND WORKSHOPS

Workshops and forums were again held with Principal Contractors' Health and Safety Managers to develop the scope for each 'Stepping Up Week', to review the results of the 'Have Your Say' survey, to share best practice across the programme and to help ensure coordinated health and safety improvement initiatives.

### BEHAVIOUR INFLUENCES BEHAVIOUR (BIB)

Crossrail's BIB programme was designed to raise health and safety standards and to help achieve the Target Zero goals by encouraging correct safety behaviours. An updated course was delivered throughout 2015/16 to Crossrail employees, Project partners and Project delivery partners, focusing on those in the Technical and Delivery teams.

The updated course examines how client-side employee's behaviour, remote from site though it may seem, can influence that of operatives that are actively engaged in construction work. The course has received consistently positive feedback and will continue in 2016/17.



## STRATEGIC OBJECTIVE 2:

**Achieve world class health and safety standards through innovation and promotion of proactive and progressive health and safety management.**

Crossrail strives to learn from all activities undertaken on the programme and from the wider industry to ensure health and safety standards achieved are world class. During 2015/16, there has been a focus on the changing risk profile of both the work being undertaken and the workforce undertaking that work.

### TARGET ZERO GOLDEN RULES

The 'Target Zero Golden Rules', were reviewed in the latter half of 2014/15, in collaboration with a group of site-based supervisors, ready for launch at the start of 2015/16. This review was undertaken to ensure the evolving workforce had a consistent understanding of what was expected of them and as a result, the Golden Rules changed from task specific activities (such as Lifting Operations etc), to behavioural based rules, as illustrated.

Supporting these Golden Rules, Nine High Risk activities were also agreed and have been incorporated into the Target Zero messaging.

This updated messaging and clarified expectation has been integrated into the programme-wide induction and all health and safety related messaging and initiatives. The updated Target Zero brand has received positive feedback from all levels of the project, with the use of site supervisors to

help devise the concept viewed as a particularly successful element of the development process.

The new Golden Rules and High Risk Activities have been designed to evolve with the programme and will continue to be used to ensure the Target Zero philosophy is fully engrained in all who are involved in the project.



## HIGH RISK ACTIVITIES



PEOPLE & PLANT



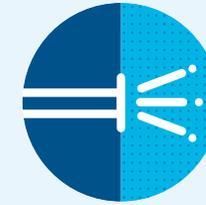
WORKING AT HEIGHT



LIFTING OPERATIONS



CONFINED SPACES



SPRAYED CONCRETE LINING



BREAKING GROUND



ENERGISED SYSTEMS



FIRE/HOT WORK



RAILWAY OPERATIONS

## DIVERSITY AND INCLUSION

Crossrail maintains a vast workforce, both corporate and on-site operatives and plans need to represent all workers. The challenge at Crossrail is to ensure our health and safety policies are inclusive of all our workers, including, but not limited to; ability, race, gender, religion, sexual orientation and nationality. This year a strategy has been developed to do just that.

The key requirements and objectives of this strategy are:

- Being an advocate and leader in diversity and inclusion within construction
- Analysing how the diversity of a construction site can affect health and safety
- Engaging the interest of everyone involved on the project in diversity and inclusion
- Ensuring workplaces are designed to be inclusive for all persons
- Ensuring that the workforce is protected from increased risks resulting from their diverse nature
- Promotion of an interdependent work culture, which emphasises respect and inclusion, ensuring all workers support each other equally.

This year the strategy was delivered by integrating diversity and inclusion components into the existing health and safety strategy, engagement with external organisations, collaborative research, and campaigns directly targeted to specific demographics of visible/non-visible minorities working on site. In addition to including an element of Diversity and

Inclusion in the existing programme-wide Gateway Assessment framework, Crossrail has piloted the introduction of a maturity matrix on five sites to assess the integration of Diversity and Inclusion into existing management plans.



## PROGRAMME-WIDE INDUCTION (PWI)

As the programme has transitioned from multiple, independent worksites, to a single connected structure, access and induction arrangements have required review. The Programme-Wide Induction was developed to offer a consistent message and approach for inducting everyone across the project. The content was developed in consultation with Principal Contractors. It was designed to be interactive and to provide key information on the Crossrail values, health and safety, environment and quality requirements.

Crossrail provided training for those nominated to deliver the PWI to ensure consistency in delivery of the material and an effective and informative introduction to the programme through engagement of those being inducted.

The PWI was launched at the start of 2015/16 and all Principal Contractors are now required to deliver this induction and allow persons that have completed it access to their sites (subject to local induction requirements). The course content is reviewed regularly and further developed to keep pace with the changing programme that is Crossrail.

## GATEWAY ASSESSMENT SCHEME

Gateway is Crossrail's health and safety assessment scheme, providing an opportunity for the project contractors to showcase innovations and inspirational programmes against Crossrail's six Target Zero pillars of health and safety.

The Gateway scheme is designed to drive excellence by promoting the raising of standards and the sharing of good practice. Successful completion

of each assessment cycle leads to the award of Gateway Foundation, Commendation, or Inspiration status. The scheme is reviewed periodically to ensure standards are continually raised, with the Cycle 6 review including a number of changes to assessment criteria across all six pillars.

Foundation status is awarded to contractors who attain a required standard (score one point) on each applicable area within every given Target Zero pillar.

Commendation status is awarded to contractors who achieve good practice (score two points) on each applicable area within three or more Target Zero pillars.

Inspiration status is awarded to contractors that achieve at least Commendation within all six Target Zero pillars and have at least three pillars at Inspiration i.e. all areas scoring at least two and 50% or more areas scoring three.

Recipients of a Gateway Inspiration award must show continuous improvement and excellence in all six Target Zero pillars.

Good practices identified during Gateway assessments are shared across the project to raise awareness of what's working well and encourage the raising of standards across the project.

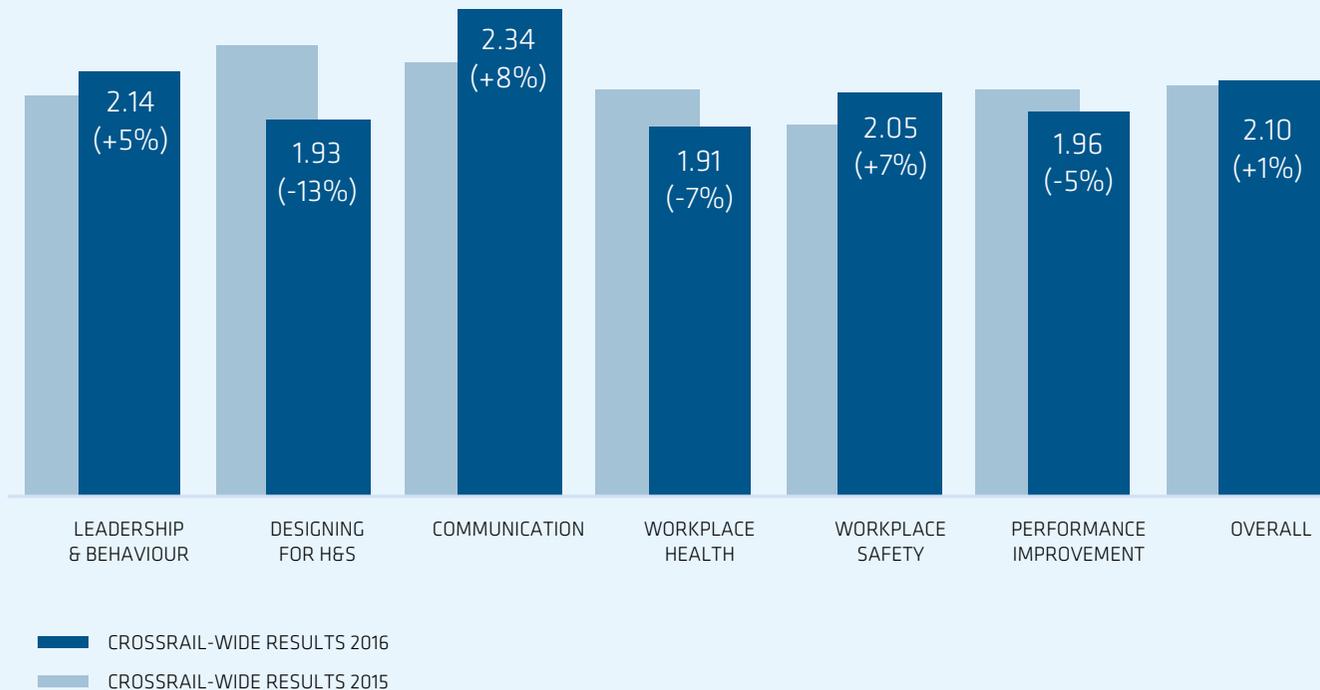
Low scoring areas are identified and improvement plans put in place to increase performance.

Gateway has proven a successful tool to encourage the implementation of best practice. Gateway assessments and awards are used as a vehicle for incentivising, measuring, recognising and celebrating identified health and safety excellence on the



Crossrail Project and within the construction industry. Enhancements and changes to the Gateway process were made following Cycle 6, with Diversity and Inclusion elements now incorporated to understand how our contracts are factoring these as a driver towards a good health and safety culture. In Cycle 6, two contracts achieved Inspiration, 13 commendation and five foundation.

## GATEWAY CYCLE 6 PILLAR SUMMARY



## HEALTH AND SAFETY PERFORMANCE INDEX

The Health and Safety Performance Index (HSPI) is Crossrail's leading indicator measurement programme. The HSPI score is made up of two measures in each of the six Target Zero pillars; the periodic Leading Indicator Performance score (measuring of inputs/activities) and the latest Gateway score (measuring 'effectiveness' as an output of their activities).

The HSPI has changed the way contractors look at performance measurement. Although there is still a focus on the end goal – Target Zero – on a period-by-period basis, the focus has shifted to proactive activity. Healthy competition has developed between the different contracts and Safety Action Teams formed to identify opportunities to improve their performance.

Following a review of HSPI leading indicators, HSPI-Phase 3 was launched at the beginning of 2015/16. Phase 3 moved the focus of performance indicators to encourage engagement at all levels and promote good incident reporting and management.

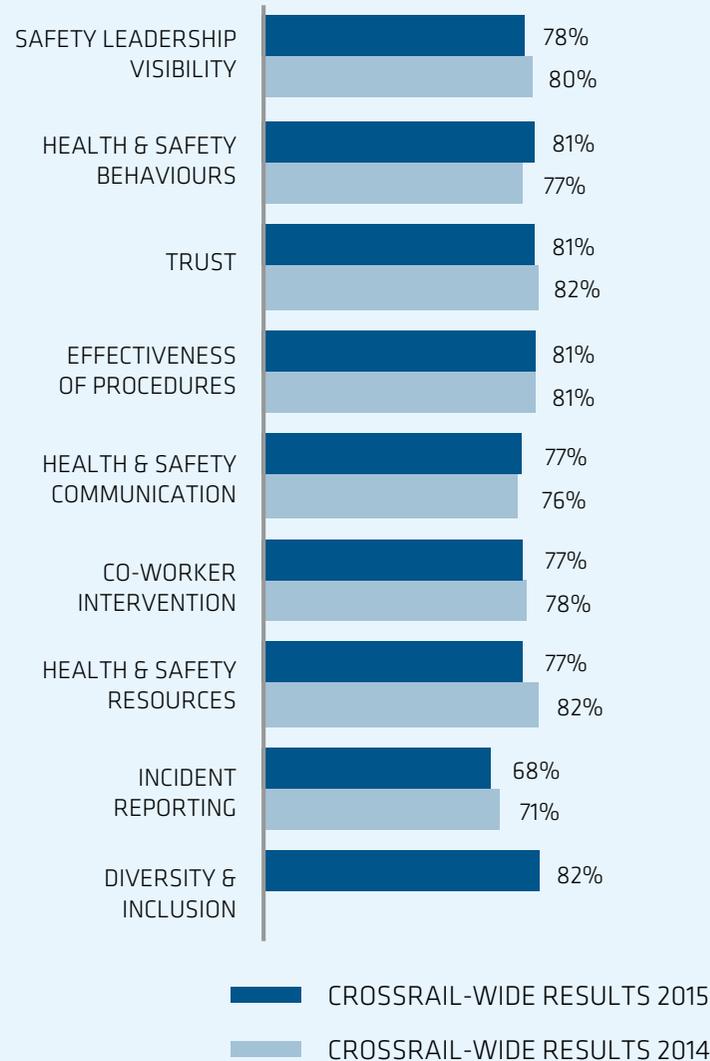
HSPI Scoring is based on the following criteria which is shared with the Gateway Assessment Scheme:

SCORE	DESCRIPTION
<b>0</b>	Does not meet basic contractual expectations
<b>1</b>	Meets contractual expectations
<b>2</b>	Exceeds contractual expectations
<b>3</b>	Demonstrates excellence

## HEALTH AND SAFETY CLIMATE SURVEY

Crossrail conducted the third Health and Safety 'Have Your Say' climate survey in August 2015 and received a return of 4,139 surveys. This year the survey included additional elements related to mental health, wellbeing, diversity and inclusivity. Everyone who completed the survey was provided with a link to their own personal online resilience report.

Both programme-wide and site-specific reports were produced and distributed to enable Crossrail and our principal contractors to incorporate targeted improvements in their plans and provide focussed topics for Stepping Up Week. As can be seen from the chart, a comparison of results between 2014 and 2015 shows there has been little change overall in health and safety culture, with it remaining very positive.



***“This year the survey included additional elements related to mental health, wellbeing, diversity and inclusivity”***

## STEPPING UP WEEK

In 2013, The Safety and Health Leadership Team (SHELT) recognised that, in order to make a positive impact on such a diverse and extensive project, a combined focus was required that showed commitment to health and safety and positively influenced health and safety culture and worker engagement. As a result, 'Stepping Up Week' was launched on Crossrail to meet these requirements and provide a further medium to embed the Target Zero philosophy.

During Stepping Up Week Crossrail is tasked with committing Senior Leadership teams to deliver opening and closing messages at each site. Each of the live sites across the programme are asked to devise their own bespoke schedules which typically include various site-specific activities aimed at engaging the workforce and promoting discussion on health and safety topics relevant to them.

Stepping Up Week (SUW) ran in April (SUW4, focused on the launch of the new Golden Rules) and October 2015 (SUW5, focused on health and wellbeing), with another scheduled for April 2016.

The feedback from the site teams remained overwhelmingly positive and Stepping Up Week is now a firm fixture, with plans for it to continue to occur bi-annually across the programme. In collaboration with our site teams, Crossrail will regularly review the format of Stepping Up Week to ensure it remains relevant and effective for everyone working on the programme.



Leadership Message at C828 Ilford Stabling Yard



Emergency Crane Rescue at C422 Tottenham Court Road



MEWP Awareness at C305 Limmo



Working at Height Workshop at TUCA



Traffic Marshall Practical at C512 Whitechapel



Emergency Responder at C510 Whitechapel



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## CROSSRAIL LEARNING LEGACY AND BEST PRACTICE GUIDES

In February 2016 Crossrail launched its Learning Legacy website <http://learninglegacy.crossrail.co.uk>. The site is aimed at sharing knowledge and insight by publishing case studies and technical papers, providing lessons and recommendations to help others. The website contains documents and templates that have been used successfully on the Crossrail programme and can be 'pinched with pride' by other projects across the world. The site includes details on Crossrail's innovative approach to health and safety management, improvements, health and wellbeing and diversity and inclusion.

In addition, the Learning Legacy site contains examples of the Best Practice Guides produced in collaboration with Crossrail's Tier 1 contractors and other industry specialist bodies. Guides were produced in response to specific project activities and were aimed at raising health and safety standards through the sharing of knowledge and experience of the companies working on the programme. The guides are now in wide circulation both in the UK and internationally.



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***“Passing on the lessons and good practice that we have learned at Crossrail is an absolutely essential part of raising the bar in the delivery of major projects. With an unprecedented number of infrastructure schemes around the corner, now is the time to start sharing what we have learned so the UK can build on its reputation for delivering on time and on budget”***

Andrew Wolstenholme,  
Chief Executive, Crossrail

### STRATEGIC OBJECTIVE 3: Improve the health and wellbeing of those involved in the Crossrail programme.

Despite significant progress in the management of health risks, improvements in the treatment of common health conditions and a rise in the awareness of good mental health and wellbeing, there still remains considerable scope for improvement throughout the UK.

Crossrail continued to engage with its workforce and its Principal Contractors on the sustainable improvement of the management of occupational health and wellbeing. Crossrail's Occupational Health and Wellbeing Strategy incorporates the four-cornerstones for health, with programmes and initiatives implemented in each cornerstone:

#### 1. **Healthy company** – Commitment to the health of our workforce.

Crossrail is committed to:

- Improving understanding of occupational health and wellbeing and developing a culture of wellbeing
- Developing and implementing an Occupational Health and Wellbeing Standard on each site
- Measuring and monitoring key performance indicators
- Implementing a management training programme on health and wellbeing
- Identifying and managing key health risks
- Implementing an appropriate health surveillance programme

- Improving communication regarding health and wellbeing throughout the organisation to increase awareness by all staff
- Co-ordinating health and wellbeing campaigns and initiatives
- Completing the occupational health and wellbeing maturity matrix and gaining year-on-year improvement.

Crossrail performance measures include:

- Crossrail occupational health audit and assurance programme – measuring compliance with mandatory requirements
- Health and Wellbeing Maturity Matrix – baseline assessment enabling each site to commit to a number of priority areas and setting requirements to progress from the 'awareness' category to 'advanced' status
- Have Your Say survey – measuring uptake rates and wellbeing improvement year on year
- Interventions – measuring the take up and evaluation of workshops, training and other activities
- Gateway assessment – assessing implementation of health management
- Health and safety performance index occupational health – measuring key performance indicators
- Review, trending and reporting of occupational health indicators such as sickness absence data, health surveillance and management referral data.



**2. Health risk management** – protecting our workforce from inherent risks and ensuring zero harm.

During 2015, we shared the findings of our research on air quality in tunnelling and made recommendations on maintaining good practice, as well as developing a best practice guide to share throughout the industry.

Further research on the impact of shift work on fatigue continued to support the initial findings and inform our management practices, with the ongoing need for regular awareness training, intervention and monitoring. At a local level, key health risks continue to be controlled and monitored, including: noise, vibration, dust, chemicals and manual handling.

**3. Fitness for work** – managing the effects of health on work.

Early intervention of ill health reduces the negative impact on both the individual and the organisation. In 2015, the audit programme focussed on the processes in place to refer staff for specialist health advice and support, where indicated. We continued to communicate the need for a robust drug and alcohol testing programme to help ensure that we are reducing potential risks and establishing a culture where misuse is not tolerated.

**4. Wellbeing** – providing information and tools to maintain optimal health.

The wellbeing programme focussed on three areas:

- Management of common health conditions i.e. diabetes, high blood pressure and cancer
- Influencing healthy lifestyle choices i.e. healthy eating, being active and stopping smoking
- Raising awareness of mental health and wellbeing.

The local calendar of events and toolbox talks focussed on the first two areas and Crossrail focussed on a long term campaign to provide the knowledge and skills to: address the stigma of mental health, provide practical tools to improve wellbeing and developing networks of support.



***“Crossrail continued to engage with its workforce and its principal contractors on the sustainable improvement of the management of occupational health and wellbeing.”***

# CROSSRAIL HEALTH AND SAFETY MANAGEMENT SYSTEM (HSMS)

There have been several initiatives within Crossrail throughout the past year which have impacted upon the HSMS. Target Zero – The Next Phase has seen the development of new behaviour-based Golden Rules – this has included a revision to the Golden Rules Observation Form (GROF) monitoring assessments, which are now focussed on engagement with staff through the Golden Rules Engagement Form (GREF). Additionally, the establishment of nine High Risk Activities (common across the project) has seen the development of the High-Risk-Activity observation form (HOF) inspection process.

The Programme-Wide Induction (PWI) package has been developed and rolled out across all sites to ensure there is a consistent awareness and understanding of the high standard of Health and Safety on Crossrail, the new Golden Rule behaviours and the High-Risk-Activities. This level of induction provides assurance that the workforce has a baseline level of competence and also drives the importance of positive health and safety behaviours at the earliest opportunity, upon employment on the Crossrail project.

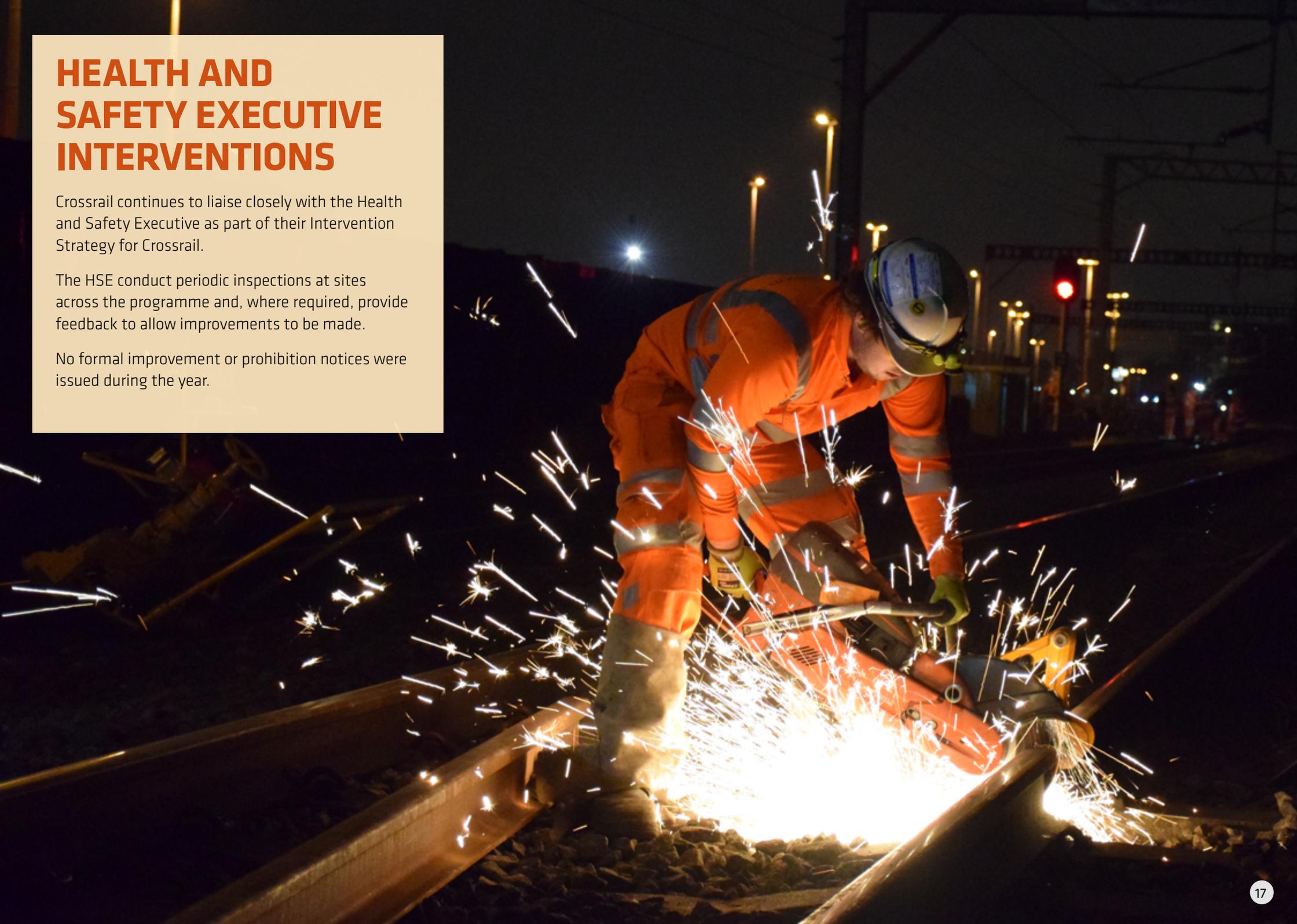


## HEALTH AND SAFETY EXECUTIVE INTERVENTIONS

Crossrail continues to liaise closely with the Health and Safety Executive as part of their Intervention Strategy for Crossrail.

The HSE conduct periodic inspections at sites across the programme and, where required, provide feedback to allow improvements to be made.

No formal improvement or prohibition notices were issued during the year.



# ASSURANCE

## HEALTH AND SAFETY AUDITS

The Health and Safety Assurance audit schedule covered Crossrail's key health and safety risks, compliance with Health and Safety legislation and the requirements detailed in the contract Works Information.

A total of 86 Health and Safety Assurance audits and 20 Occupational Health audits were carried out during the year with each contractor receiving, on average, four Health and Safety Assurance audits and one Occupational Health audit.

Where non-conformances were identified, formal Corrective Action Requests (CARs) were raised; these required the contractors to identify actions and timescales for addressing the deficiencies. A total of 132 CARs were raised from the 106 audits. All of the CARs were closed, and 122 (92%) were closed within the agreed timescale.

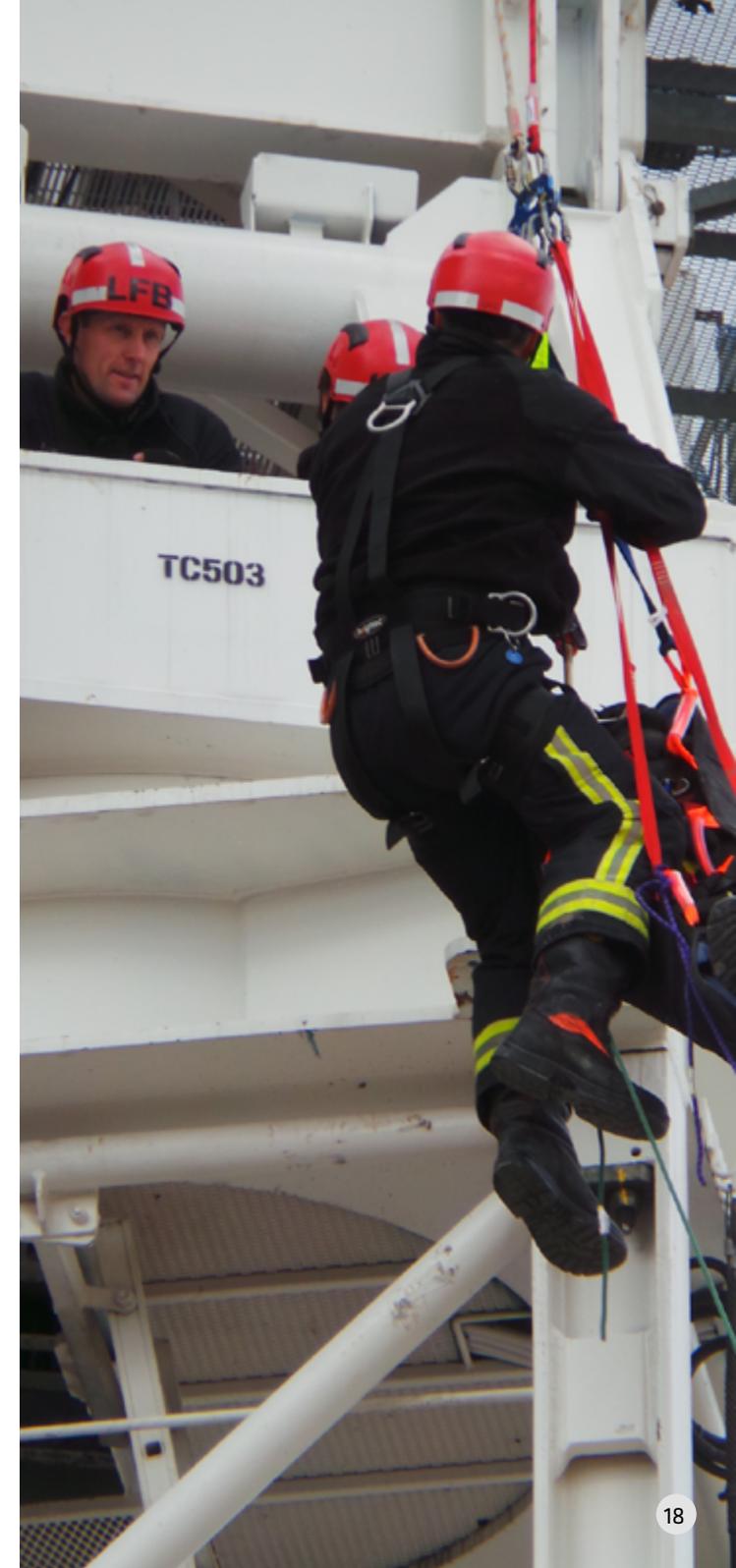
The 2016/2017 assurance Audit Schedule was agreed in February 2016, and consists of 90 audits and assurance assessments (64 Health and Safety Assurance audits, 13 Occupational Health audits and 13 Fire Safety Assurance Assessments); this equates to 4 Health and Safety Assurance audits and one Occupational Health audit for each contractor during the year.

The audit schedule was based on the risk profile of each of the contracts and was compiled collaboratively between the Health and Safety Assurance team and Crossrail Project teams.

## LIAISON WITH THE LONDON FIRE BRIGADE (LFB)

In order to ensure an ongoing and effective liaison, an LFB officer was seconded to the Crossrail Health and Safety Assurance Team in 2014. In addition to providing fire safety support across all sites, the officer has worked with Crossrail to ensure that core LFB requirements are being met. These requirements are:

1. Provision of Channel Five communications, enabling LFB crews to communicate with each other when carrying out activities below ground
2. Provision of fire fighting water at all locations where it may be required by the LFB
3. Standardised reception arrangements for all sites, including (as a minimum) site contacts with up to date information, site register and a site pack, containing site layout maps and other relevant information as required by the LFB
4. Regular emergency exercises conducted at all Crossrail sites to ensure that site personnel are aware of actions to take in the event of an emergency/evacuation
5. Following the implementation of necessary improvements, fire fighting provisions for stations and shafts were found to be compliant with the requirements detailed above. In addition, given the continually changing site layouts and conditions, contractors continue to monitor their sites to ensure these requirements continue to be met, in particular the provision of Channel Five in all tunnels to identify gaps and implement corrective actions.



## FIRE SAFETY ASSURANCE ASSESSMENTS

In addition to the checks carried out on the core LFB requirements, a series of Fire Safety Assurance Assessments were also undertaken by the Crossrail LFB Liaison Officer, during 2015/16, covering fire safety arrangements made by contractors. These assessments not only identified areas for improvement, but also many areas of good practice that were subsequently shared with sites across the programme.

Assurance assessments will continue in 2016/17. In addition to a reviewed set of topics, all principal contractors who are involved with construction works below ground will receive a Fire Safety Assurance Assessment by the Crossrail Fire Liaison Officer.

## CONSTRUCTION DESIGN AND MANAGEMENT (CDM)

Crossrail carried out a full review of CDM related processes and procedures in advance of the introduction of revised CDM Regulations in April 2015. Procedures were updated to reflect the changes and training was delivered to ensure that all duty holders under the new regulations were aware of requirements. The Works Information was updated to ensure that it effectively covered changes to the requirements. With the removal of the role of CDM Co-ordinator in the new regulations, Crossrail has assumed the role of the principal designer. Assurance activities have continued, incorporating changes made to reflect the revised regulations.

## EXTERNAL AUDIT

An integrated surveillance audit was conducted in July 2015 by Lloyd's Register Quality Assurance (LRQA) and confirmed continued certification to the following standards:

- ISO 9001:2008 Quality Management Systems
- ISO 14001:2004 Environmental Management Systems
- BS OHSAS 18001:2007 Occupational Health and Safety Management Systems

The LRQA audit highlighted opportunities for improvement in respect of:

- Crossrail's lone working arrangements,
- Crossrail processes for evaluating legal and other requirements and
- The training provided to the Safety, Health, Environment and Facilities (SHEF) representatives.

Actions to address these issues have been taken and re-audit is planned for July 2016.

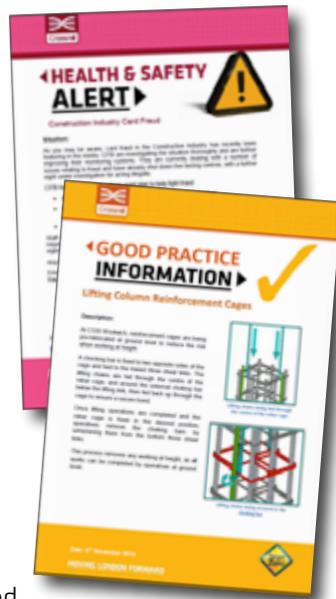
***“The audit schedule was based on the risk profile of each of the contracts and was compiled collaboratively between the Health and Safety Assurance team and Crossrail project teams.”***

# COMMUNICATION

## HEALTH AND SAFETY ALERTS AND GOOD PRACTICE INFORMATION

Health and Safety Alerts are shared across the programme and are issued when Crossrail becomes aware of specific health and safety issues/incidents which, without being addressed, could result in serious injury or ill health. Health and Safety Alerts can be issued on topics related to equipment, processes, procedures or substances or as the result of a notification received from, for example, principal contractors, manufacturers, industry partners, professional organisations, Health and Safety Executive, etc.

In support of continuous improvement, examples of good practice are also shared across the programme and are available on the Sustainability area of the Crossrail website [www.crossrail.co.uk](http://www.crossrail.co.uk)



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## LESSONS LEARNED

Due to the size of the programme and its supply chain, Crossrail has significant potential to gather and share lessons across the industry. To facilitate this, details from incident investigations are shared at a bi-weekly tele conference, attended by

Crossrail and principal contractor construction teams. The programme has also generated working groups to gain better understanding of some issues such as pressurised systems, and lifting operations.



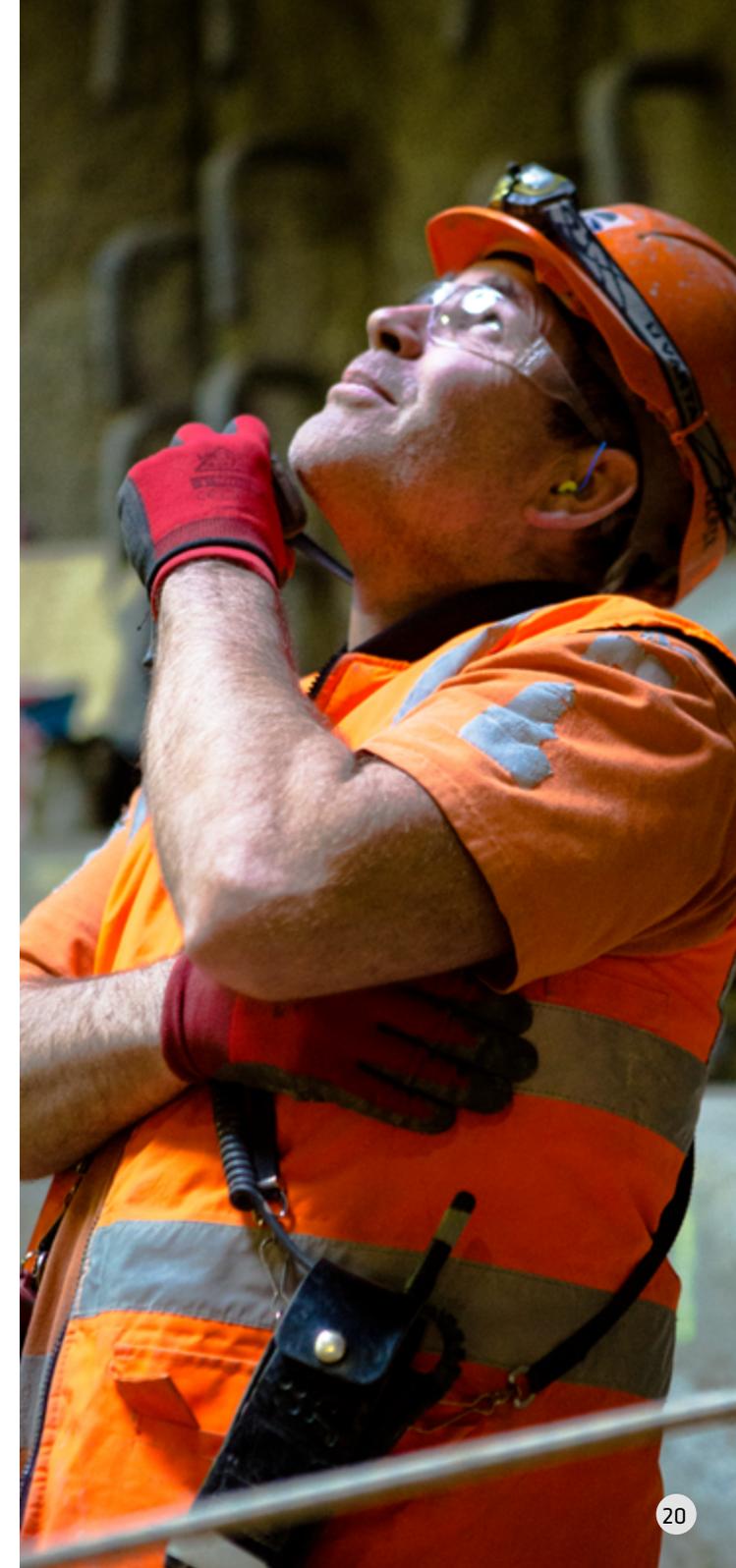
Lessons learned documents are produced for significant learning and distributed prior to, and discussed during the tele conference. Improvement actions are identified and progressed.

## TOOLBOX TALKS PROGRAMME AND CONNECT IN BRIEF

A schedule is in place for toolbox talks, which takes into account our health and safety campaigns. The health and safety team provide material for two talks per period which are made available to our site teams to use.

Connect In Brief, our internal, electronic weekly communication, now has a health and safety message in each issue, along with a good news, best practice or an article on our latest health and safety campaign.

Crossrail's monthly newsletter On-Site also features relevant health and safety information and is distributed in paper format across the programme.



## EMERGENCY PREPAREDNESS

In the past year processes and procedures have been streamlined to ensure they are more easily understood and acted upon by all those with resilience responsibilities. Business Impact Assessments have been reviewed; revised versions reflecting the current business are scheduled to be completed by end Q2 2016.

A number of training exercises have been held over the past year, including briefings and desktop exercises.

Support has been provided to principal contractors as required for their own resilience activities, and the Metropolitan Police Officer seconded to the health and safety team has continued to provide guidance on resilience and security issues.

Crossrail continues to participate in meetings, forums and workshops with a variety of external agencies in support of its resilience activities. Agencies include the Metropolitan, City of London and British Transport Police Services, the Transport for London Gold Support Group and the London Fire and Ambulance Services.



# OPERATIONAL CONTROL

Building a new railway on the scale and complexity of the Crossrail Project, poses an enormous logistical challenge. A ground-breaking approach devised and led by the Logistics team to address the health and safety of the public exposed to risks from the project's transport operations was therefore required.

Using and enforcing stringent contract requirements covering driver training, improving vehicle safety and using the Fleet Operator Recognition Scheme (FORS) as a means of third party due diligence, has led to Crossrail redrawing the boundaries of the traditional model.

Each driver working on the project has been trained, each vehicle has been made safer through fitting additional safety kit and each transport and haulage company involved in Crossrail has been scrutinised independently using FORS. Using a bespoke Vehicle Management Planning System (VMPS) and a PDA platform Crossrail contractors check the safety compliance of all lorries and vans delivering to every worksite.

## CONSTRUCTION LOGISTICS LEADERSHIP

Crossrail continues to maintain its leadership in construction logistics safety and in 2015, was awarded the UK's Most Cycle Friendly Developer / Contractor for the road safety initiatives it had implemented on the project.

The project continues to share its best practice with other construction and civil engineering projects as part of its legacy commitments.

By introducing stringent standards for all vehicles involved in building Crossrail, an estimated 50,000 heavy goods vehicles, and more than 14,000 vans have been made safer.

The fitting of a standard set of safety equipment to all lorries working on the project, along with rigorous compliance checking procedures applied each time a vehicle visits a Crossrail worksite, has set high standards in the construction industry for vehicle safety. Over 600 principal contractor staff across 53 worksites, including lorry holding areas, have been given training and coaching to undertake systematic vehicle safety checks every time a vehicle visits site.

At the end of March 2016, the principal contractor level of vehicle safety compliance across the project was running at 99.6 per cent. This is a testament to the ongoing commitment of Crossrail's supply chains to meet their contractual requirements and to make London safer for vulnerable road users.

## LORRY DRIVER TRAINING (LDT)

Since November 2009, the award winning lorry driver training programme has delivered 561 courses and continues to go from strength to strength, with a total approaching 10,000 drivers attending the one day course up to 31 March 2016. The course remains focussed on 'Sharing London's Roads with Vulnerable Road Users' but is overlaid by key project information covering Crossrail health and safety policies, approved lorry routes and contract requirements covering



vehicle safety requirements. Crossrail continues to host observers from stakeholder organisations, safety managers and company directors from the supply chain. Met Police Officers regularly attend LDT bringing their expertise into the classroom and helping drivers understand the challenges of defensive driving in London's changing urban landscape where cyclists often outnumber motorists in the daily commute.

As Crossrail transitions into a new construction work stream, fewer heavy goods vehicles will be seen as higher numbers of light vans up to 3.5 tonnes will be used. Crossrail has been at the forefront of developing Van Smart, a new driver training standard for van drivers. In collaboration with Transport for London, the design, development and implementation of this new one day course is now complete and is being offered, free of charge to all contractors that operate fleets of vans in Crossrail supply chains.

### **ROAD SAFETY IN THE COMMUNITY**

In January 2016 Crossrail again took the lead in organising a significant stand at the London Bike Show. The exhibit was supported by 25 Construction, Logistics, Cycle Safety (CLOCS) champions who all donated valuable resources to ensure a successful campaign.

Crossrail continues to run its Exchanging Places events with the support of the Met Police at or near its construction sites. To-date Crossrail has been involved in up-skilling over 5000 cyclists to understand the risks associated with sharing London's roads with heavy goods vehicles.



# ANALYSIS

## ACCIDENT STATISTICS - OVERVIEW

All incidents on Crossrail sites are recorded using the RIVO Safeguard incident management system. Using incident data provided by all sites, Crossrail was able to identify the most appropriate time within the business year to conduct focussed initiatives, including the Have Your Say Safety Survey in Period 6 and Stepping Up Week in Periods 1 and 8.

INCIDENT TYPE	2014/2015	2015/2016
Total number of incidents recorded	28,623	46,829 (+63%)
Fatality	0	0
Major (Specified) Injury	11	9 (-18%)
RIDDOR Lost Time (Incl. 3+ days)	24	25 (+4%)
Lost Time Cases (1-3 days)	26	18 (-31%)
Total number of Lost Time cases (1+ days)	56	51 (-9%)
Total Number of injuries without lost-time	465	390 (-16%)
RIDDOR Dangerous Occurrences	2	3 (+50%)
Property Damage	150	105 (-30%)
Total number of Safety Near Misses	3782	6576 (+74%)
Total H&S Observations recorded	22,737	37,772 (+66%)

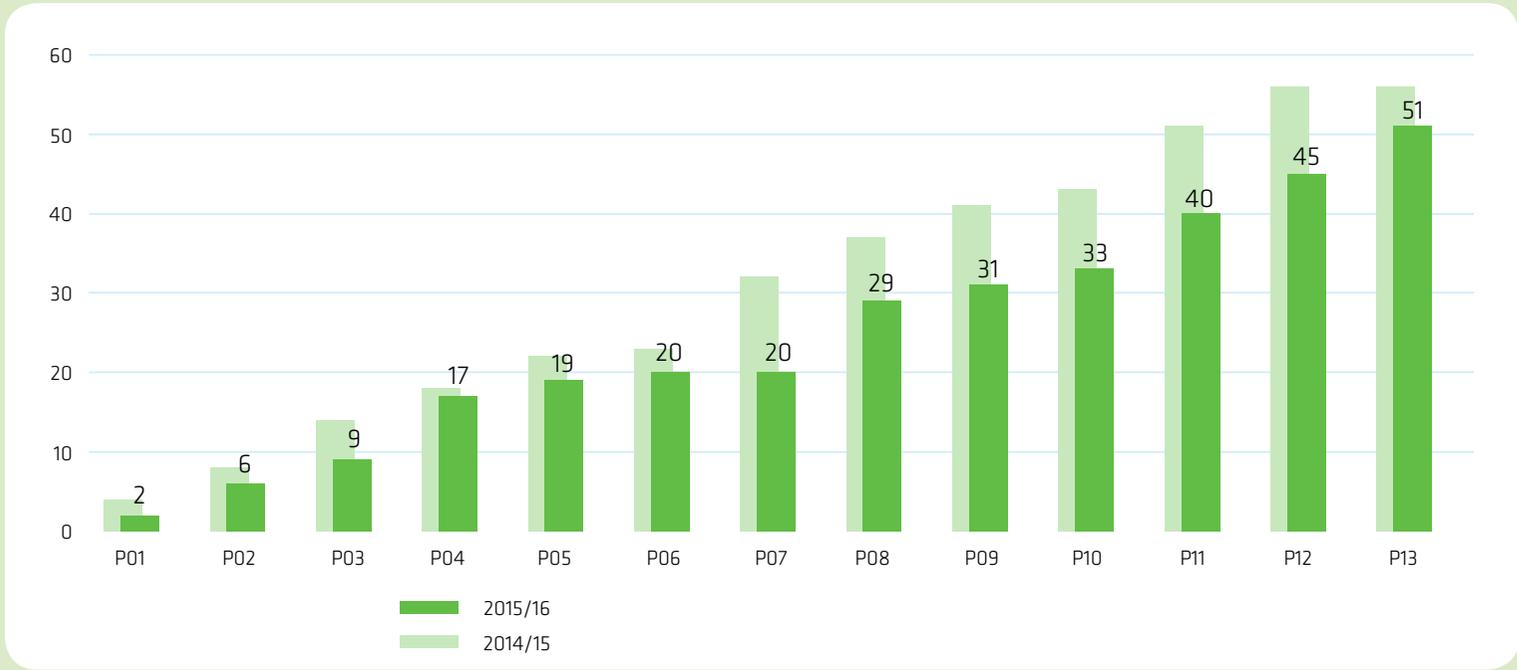
***“There is unequivocal evidence on Crossrail that contracts with the highest levels of near miss and observation reports have the lowest number of injury incidents.”***

The significant increase in health and safety Near Misses and Observations is viewed as extremely positive. There is unequivocal evidence on Crossrail that contracts with the highest levels of near miss and observation reports have the lowest number of injury incidents.

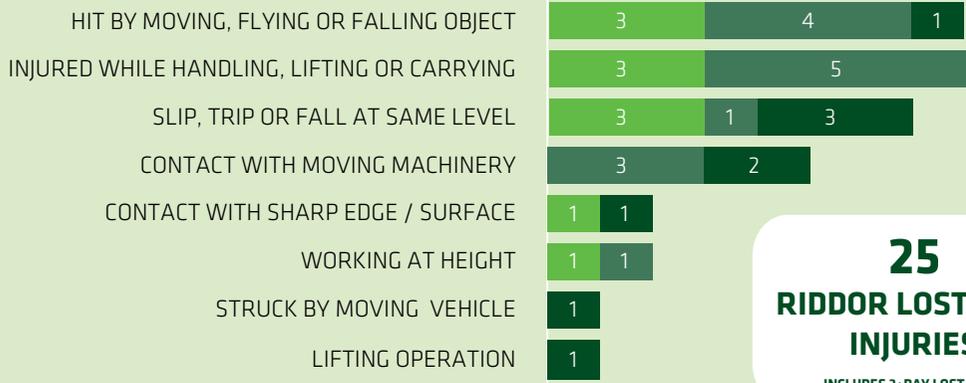
## CUMULATIVE NUMBER OF RIDDOR LOST TIME INJURIES (INCLUDING 3+ DAYS LOST-TIME)



# NUMBER OF LOST-TIME INJURIES PER PERIOD (INCLUDING 3+ DAYS LOST-TIME)



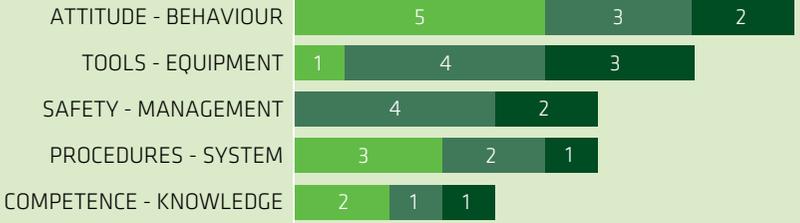
## RIDDOR INJURY CAUSE



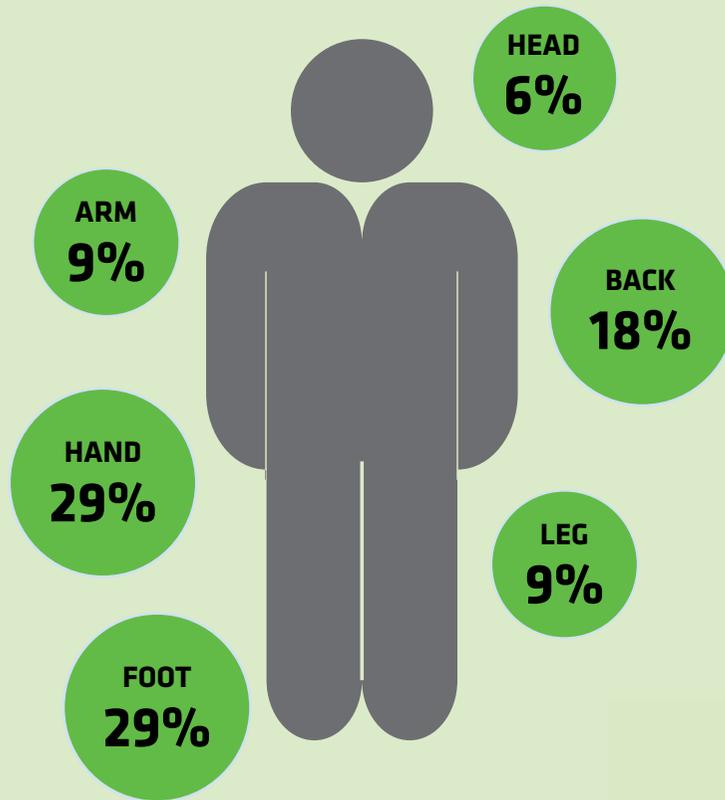
**25**  
**RIDDOR LOST-TIME INJURIES**  
INCLUDES 3+DAY LOST-TIME

3+ DAY LTI  
RIDDOR 7+ DAY LTI  
RIDDOR MAJOR INJURY

## RIDDOR ROOT CAUSES

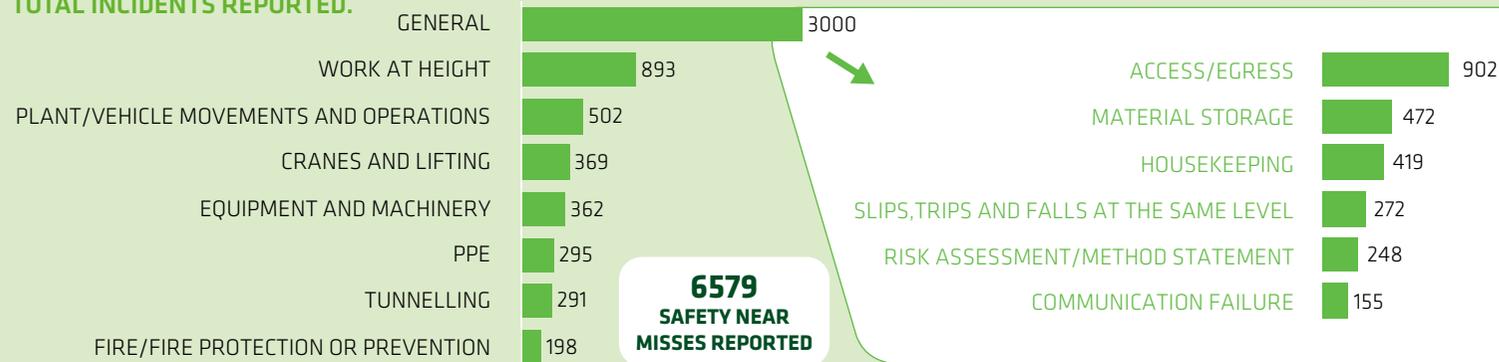


3+ DAY LTI  
RIDDOR 7+ DAY LTI  
RIDDOR MAJOR INJURY



## SAFETY NEAR MISS CAUSE

THIS BREAKDOWN SHOWS CAUSES WHICH CONTRIBUTED TO 90% OF TOTAL INCIDENTS REPORTED.



## SUBCATEGORY: GENERAL BREAKDOWN

THIS BREAKDOWN SHOWS CAUSES WHICH CONTRIBUTED TO 90% OF INCIDENTS WHERE A CAUSE OF 'GENERAL' WAS SPECIFIED

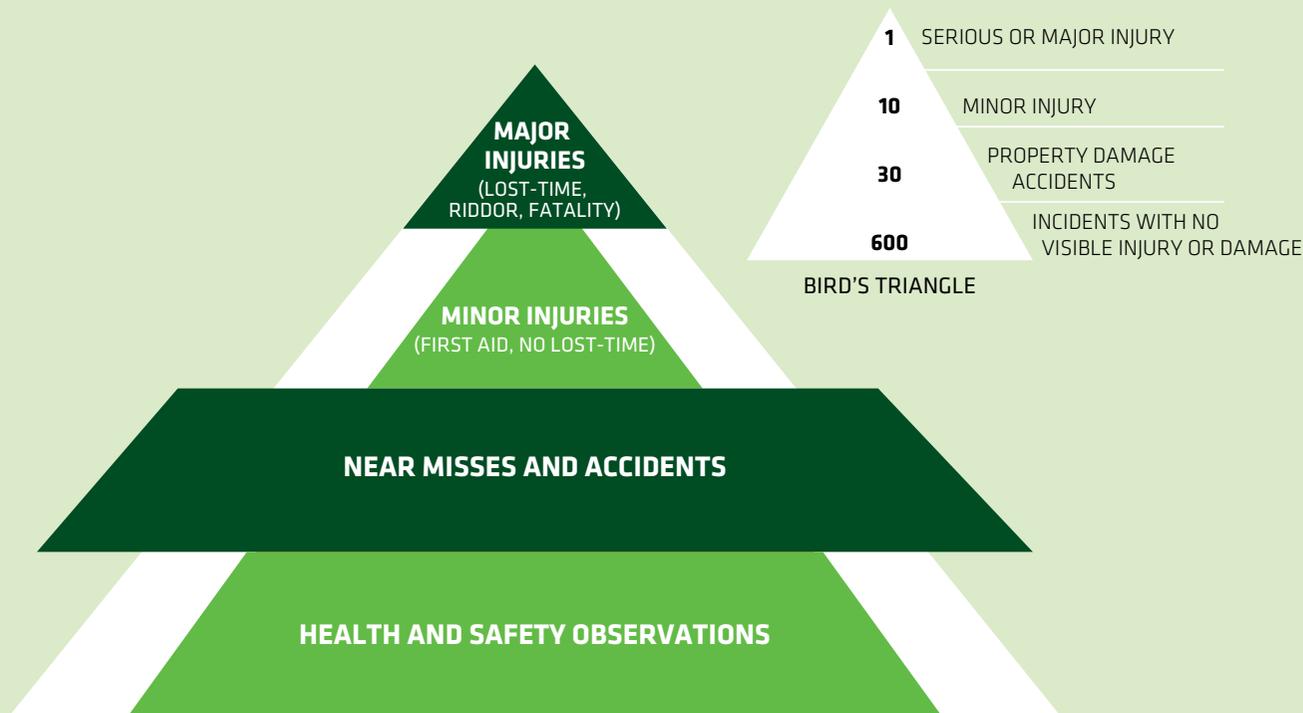
## REPORTING CULTURE ON CROSSRAIL

In the 1930s, H.W. Heinrich undertook analysis that suggested, for every major injury, there were 29 minor injuries and 300 non-injury accidents. In 1969, a study of industrial accidents was undertaken by Frank E. Bird, Jr., who was then the Director of Engineering Services for the Insurance Company of North America.

Bird analysed almost 2 million accident reports by 300 cooperating companies and found that, for every reported major injury (resulting in fatality, disability, lost time or medical treatment), there were 10 reported minor injuries (requiring only first aid). The illustration below is a simplified version of Bird's triangle, showing the relationship between the number

of reported incidents and the injuries reported on the programme.

The white triangle represents the guideline ratio of the reported incidents as would be expected from Bird's analysis, showing that our near misses are higher than might be expected. Overall the excellent reporting culture on Crossrail is evident in the high proportion of near misses, incidents and safety observations reported, with a 74% increase in the number of incidents reported since 2014/15. Crossrail considers this an excellent indication of our interdependent safety culture, where all operatives are encouraged to look after each other and safe working practices are encouraged.





**Target  
Zero**