

TIDEWAY, TRANSFORMING THE THAMES

NIALL FARIS

PROJECT CONTROLS EXPO, LONDON

16th NOVEMBER 2017

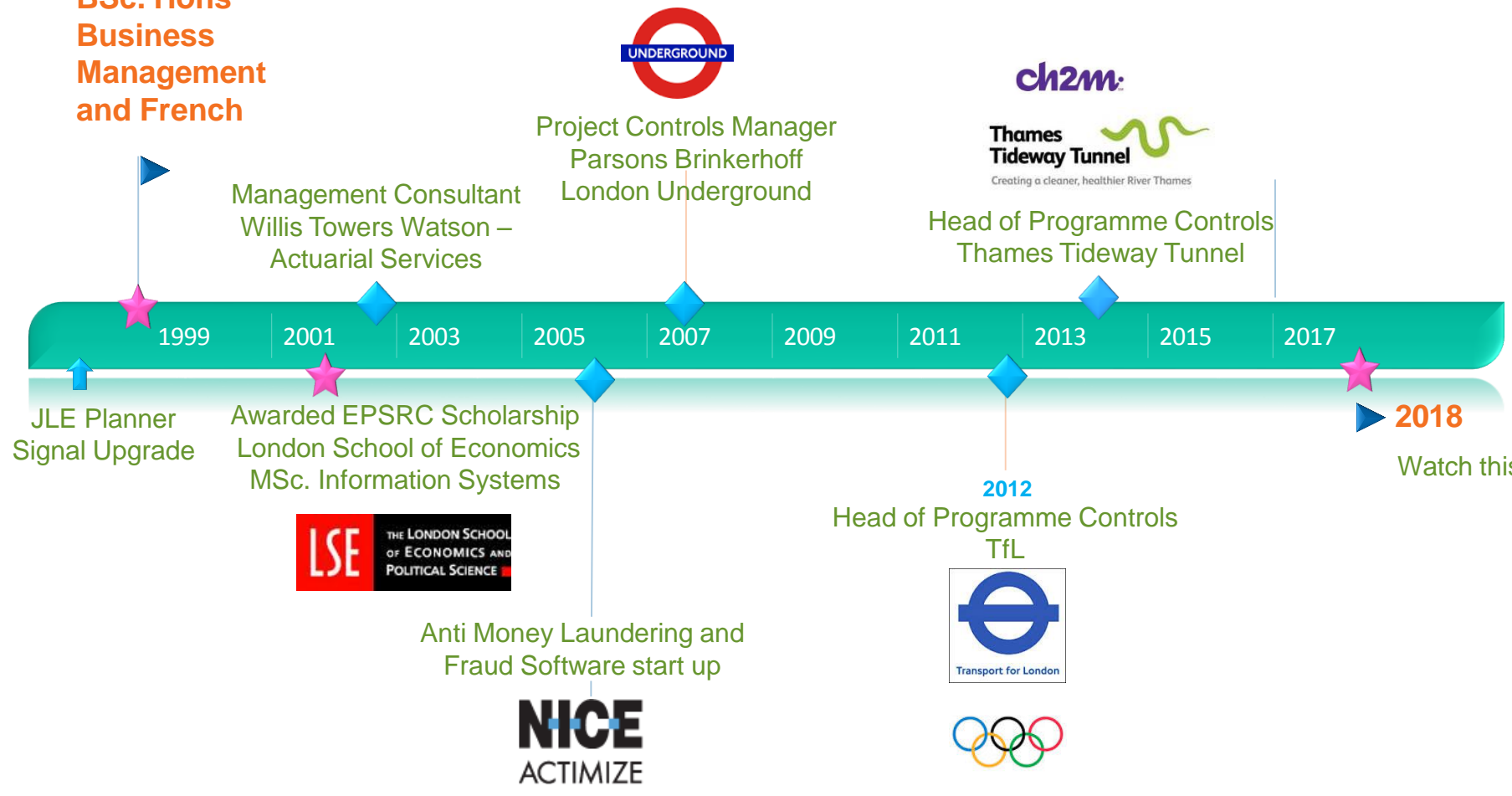
EFFRA



Tideway

Niall Faris MSc.

**BSc. Hons
Business
Management
and French**



Learning : JLE Planner



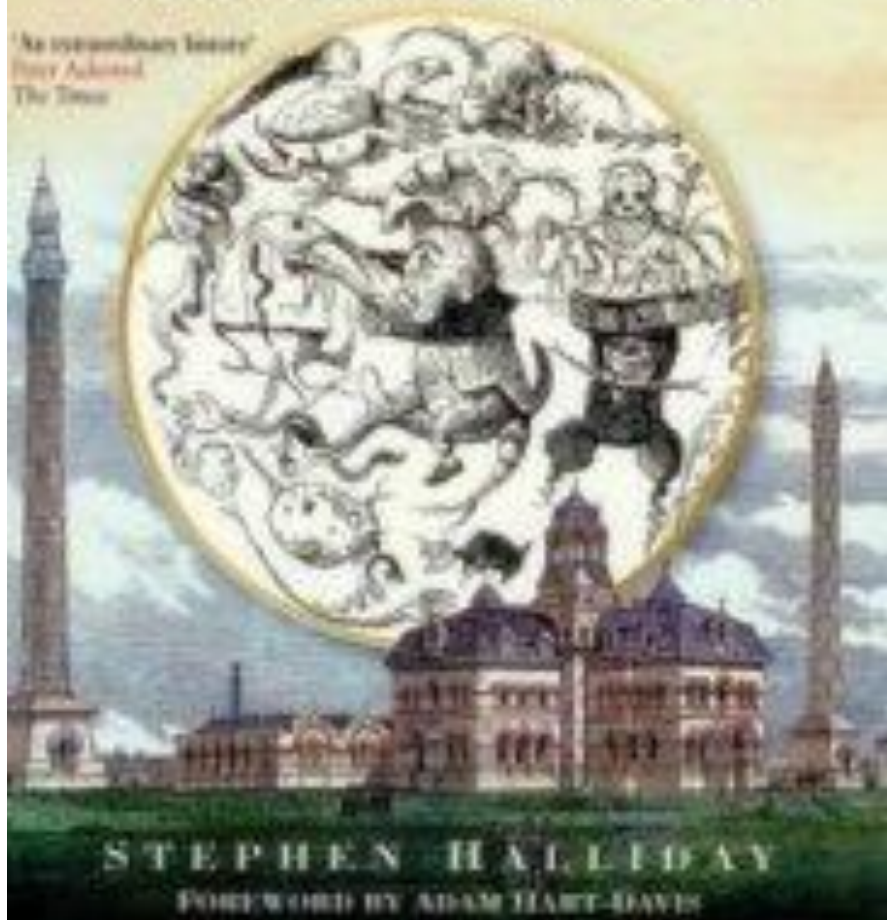
Head of Controls: TTT £4.2bn

HISTORY OF LONDON'S SEWERS

THE GREAT STINK of LONDON

SIR JOSEPH BAZALGETTE
AND THE CLEANSING OF THE
VICTORIAN METROPOLIS

'An extraordinary history'
Daily Telegraph
The Times



PUNCH, OR THE LONDON CHARIVARI.—July 3, 1858.

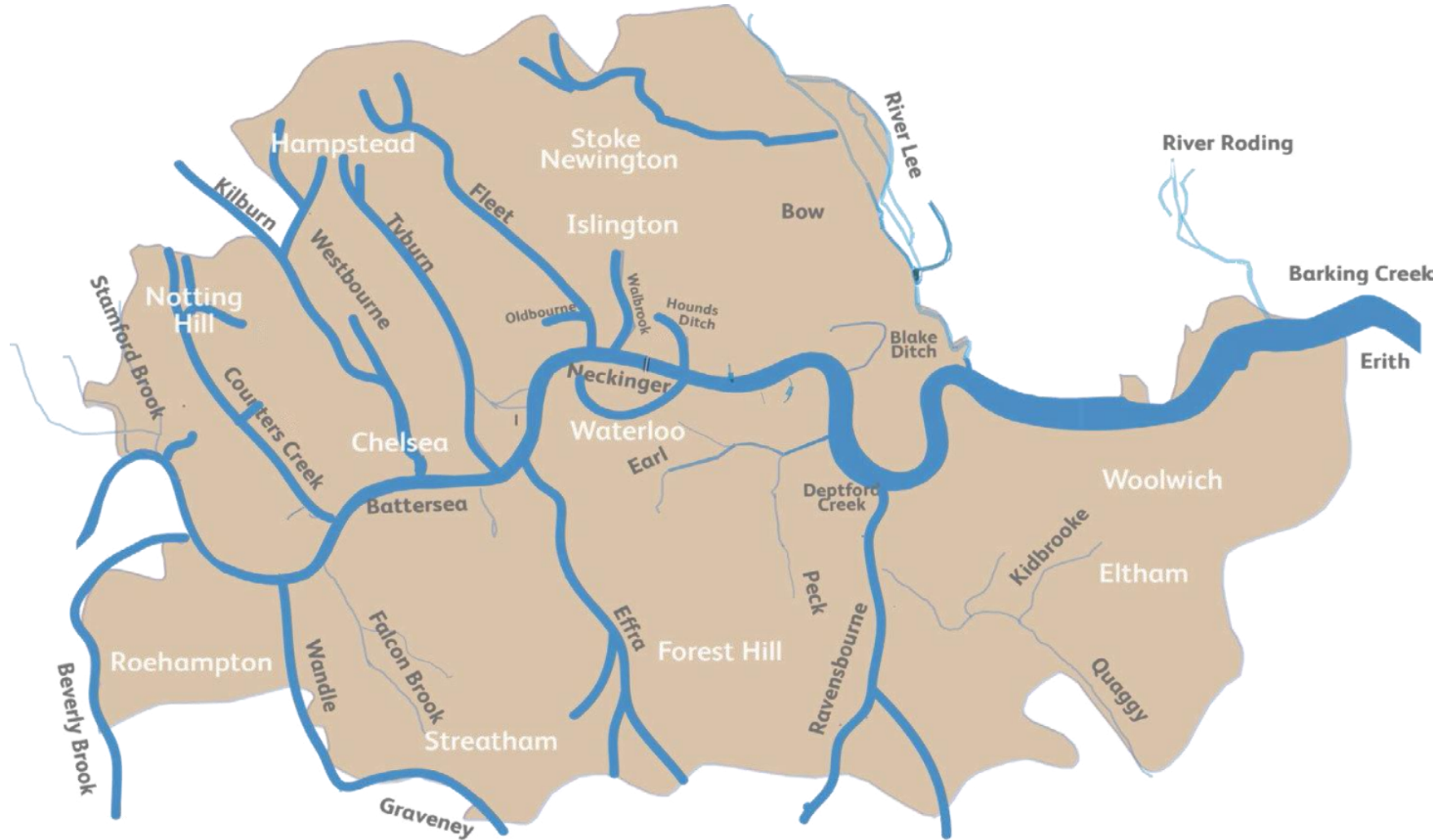


DYSENTERY. SCURVY. CHOLERA.

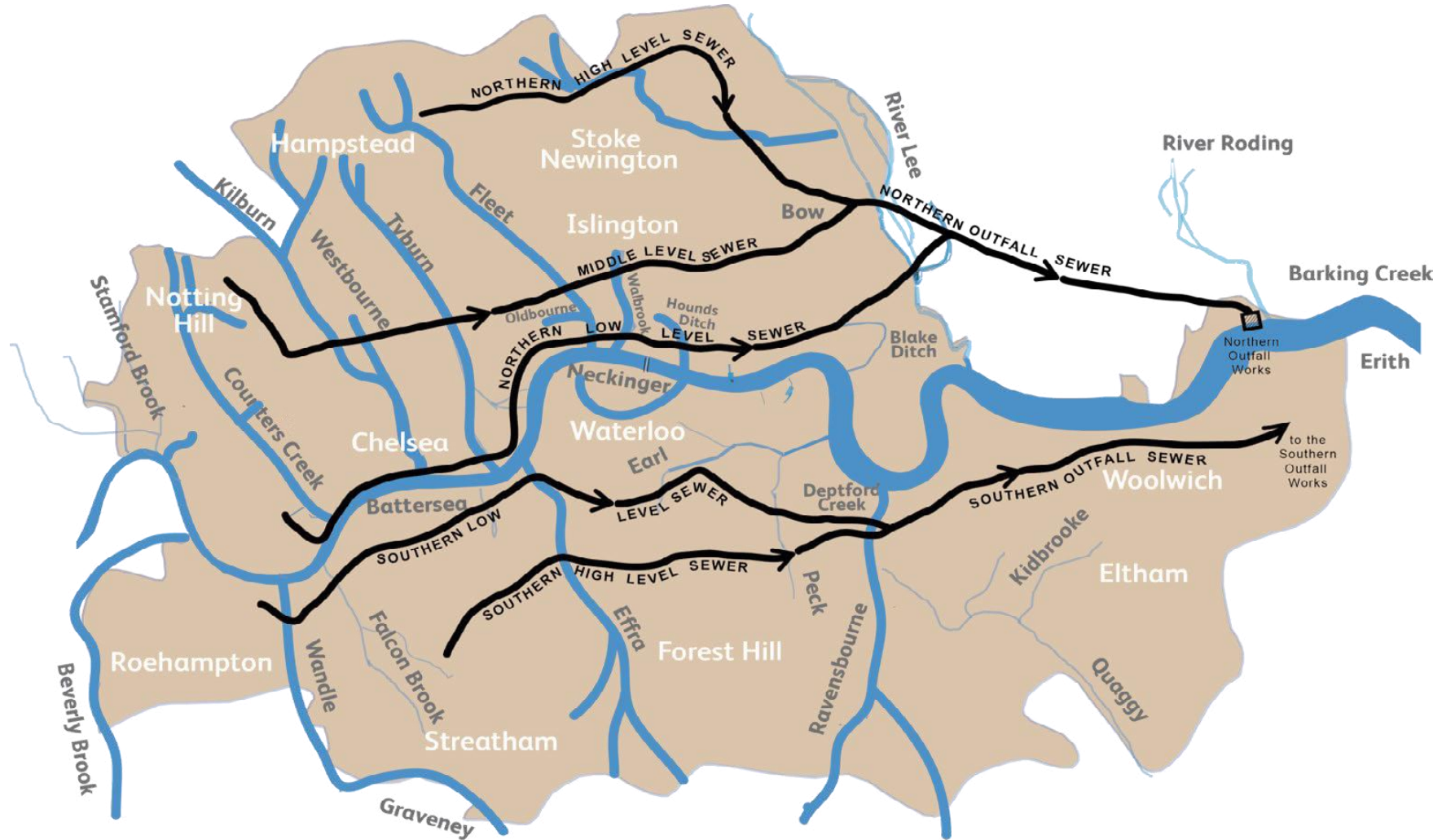
FATHER THAMES INTRODUCING HIS OFFSPRING TO THE FAIR CITY OF LONDON.

(A Design for a Fresco in the New Houses of Parliament.)

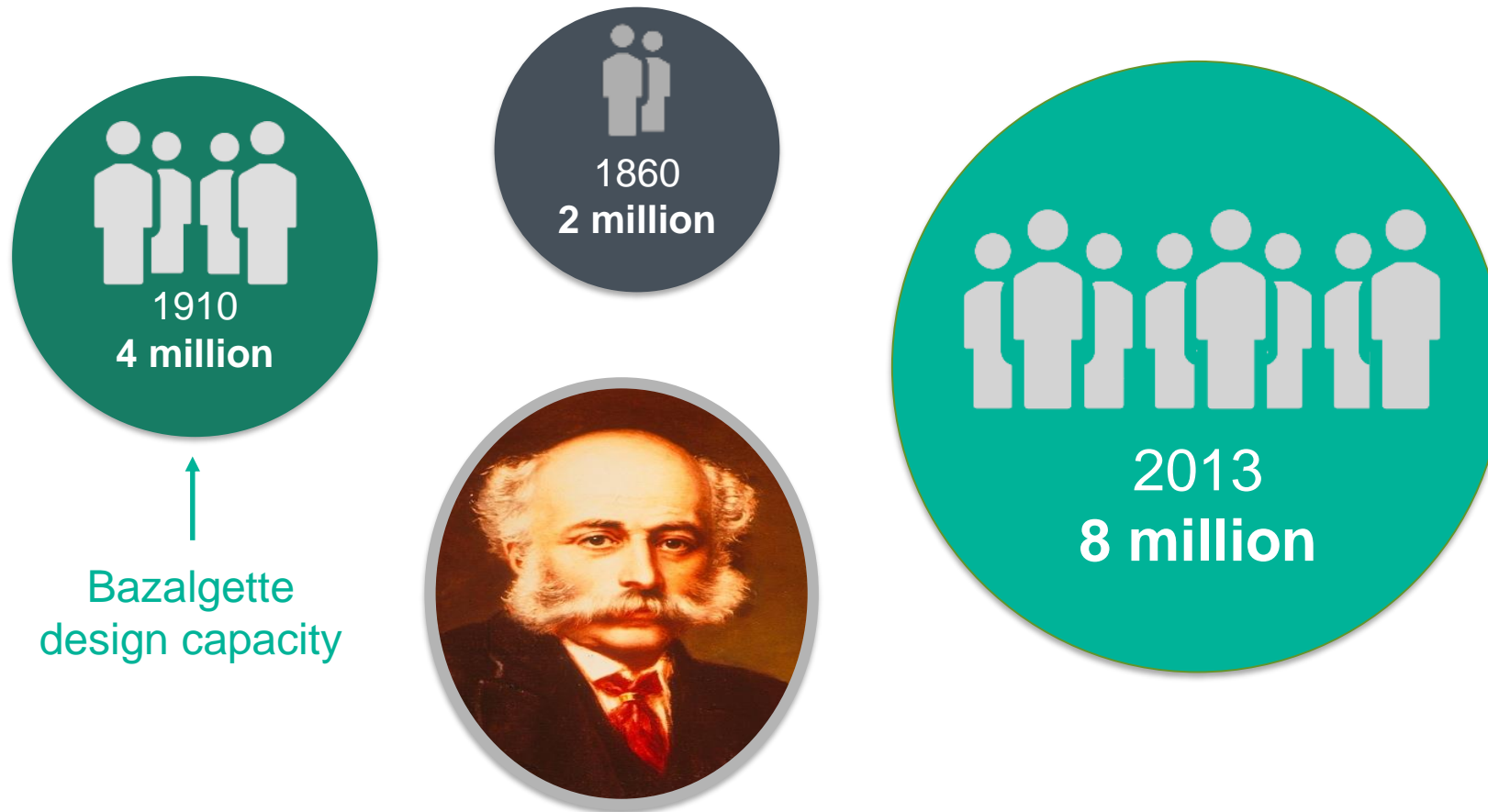
Lost 'rivers' of London



Bazalgette's interceptor sewers



Population of London



- In 2014, **62 million** cubic metres of sewage discharged to the tidal River Thames.
- 50 discharges on average in a typical year

FINDING A SOLUTION

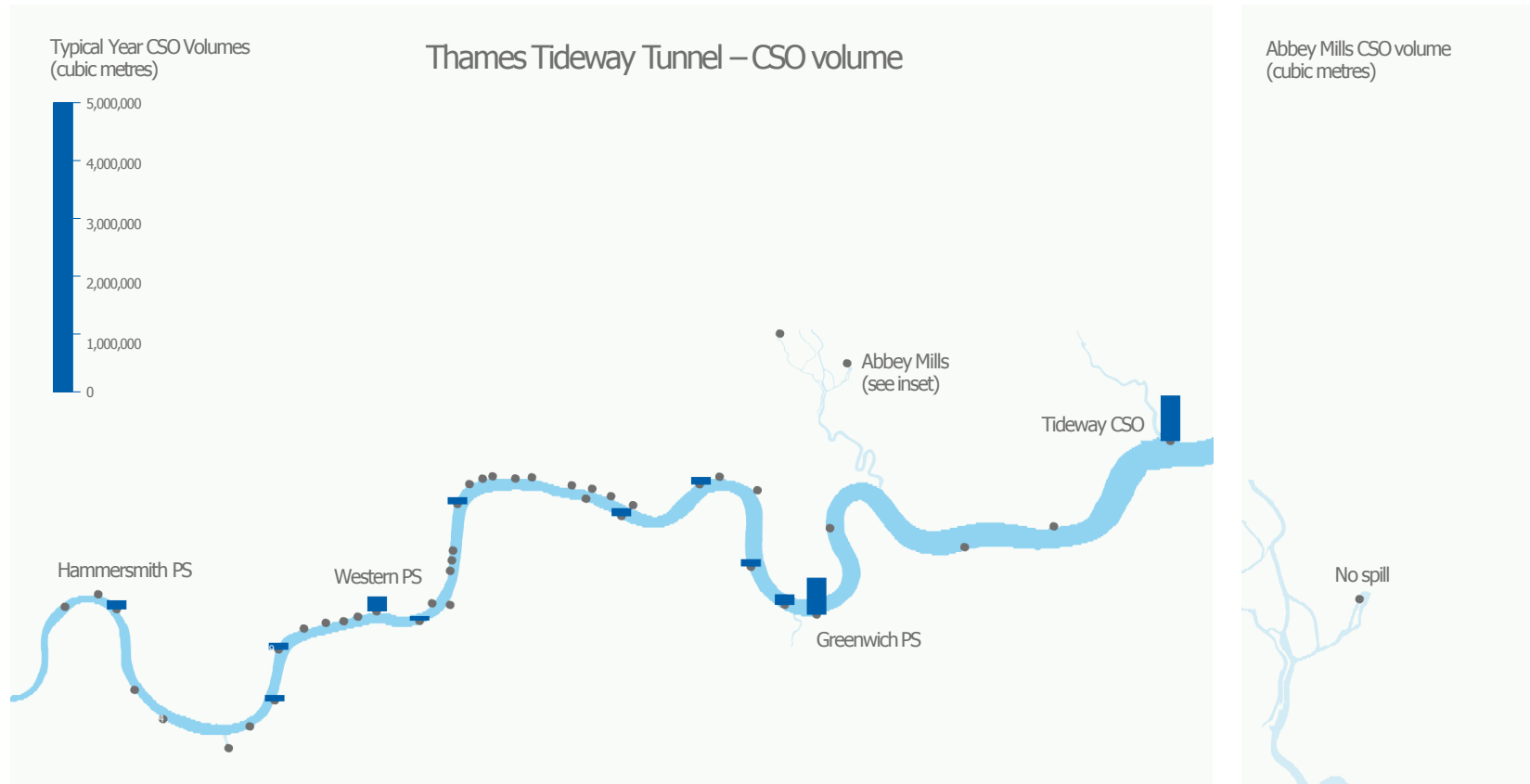
London Tideway Improvements



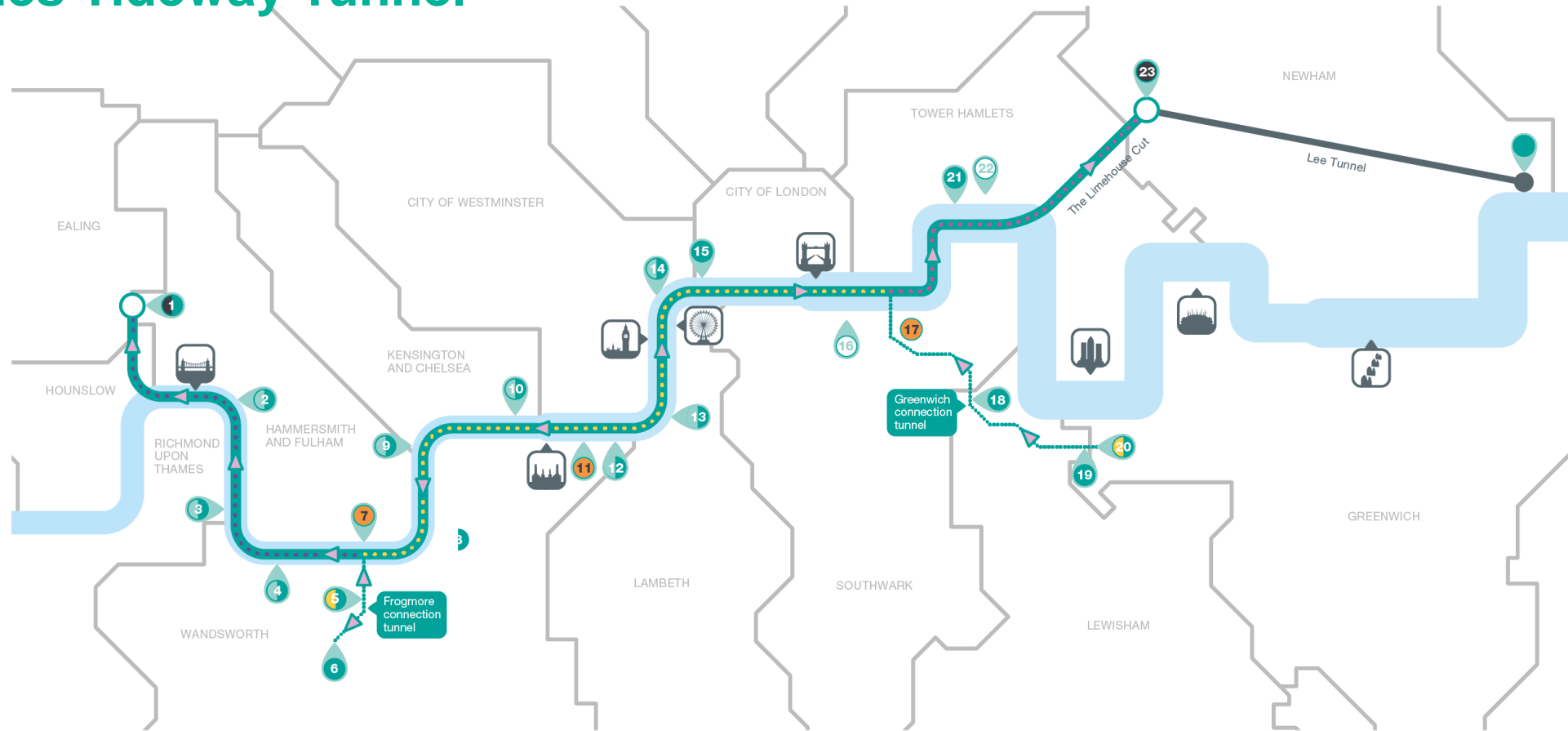
Impact of improvements



Impact of improvements



Thames Tideway Tunnel



Map key

- | | | | | |
|------------------------------------|---------------------------------|-------------------------------|----------------------------------|--|
| Main tunnel drive site | Main tunnel | 1 Acton Storm Tanks | 9 Cremorne Wharf Depot | 17 Chambers Wharf |
| Main tunnel reception site | Long connection tunnel | 2 Hammersmith Pumping Station | 10 Chelsea Embankment Foreshore | 18 Earl Pumping Station |
| CSO site | Lee Tunnel (under construction) | 3 Barn Elms | 11 Kirtling Street | 19 Deptford Church Street |
| Short connection tunnel drive site | Proposed drive direction | 4 Putney Embankment Foreshore | 12 Heathwall Pumping Station | 20 Greenwich Pumping Station |
| Long connection tunnel drive site | West works site | 5 Dormay Street | 13 Albert Embankment Foreshore | 21 King Edward Memorial Park Foreshore |
| System modifications | Central works sites | 6 King George's Park | 14 Victoria Embankment Foreshore | 22 Bokesbourne Street |
| | East works site | 7 Carnwath Road Riverside | 15 Blackfriars Bridge Foreshore | 23 Abbey Mills Pumping Station |
| | | 8 Falconbrook Pumping Station | 16 Shad Thames Pumping Station | 24 Beckton Sewage Treatment Works |



Length: 25 kilometres

Diameter: 7.2 metres

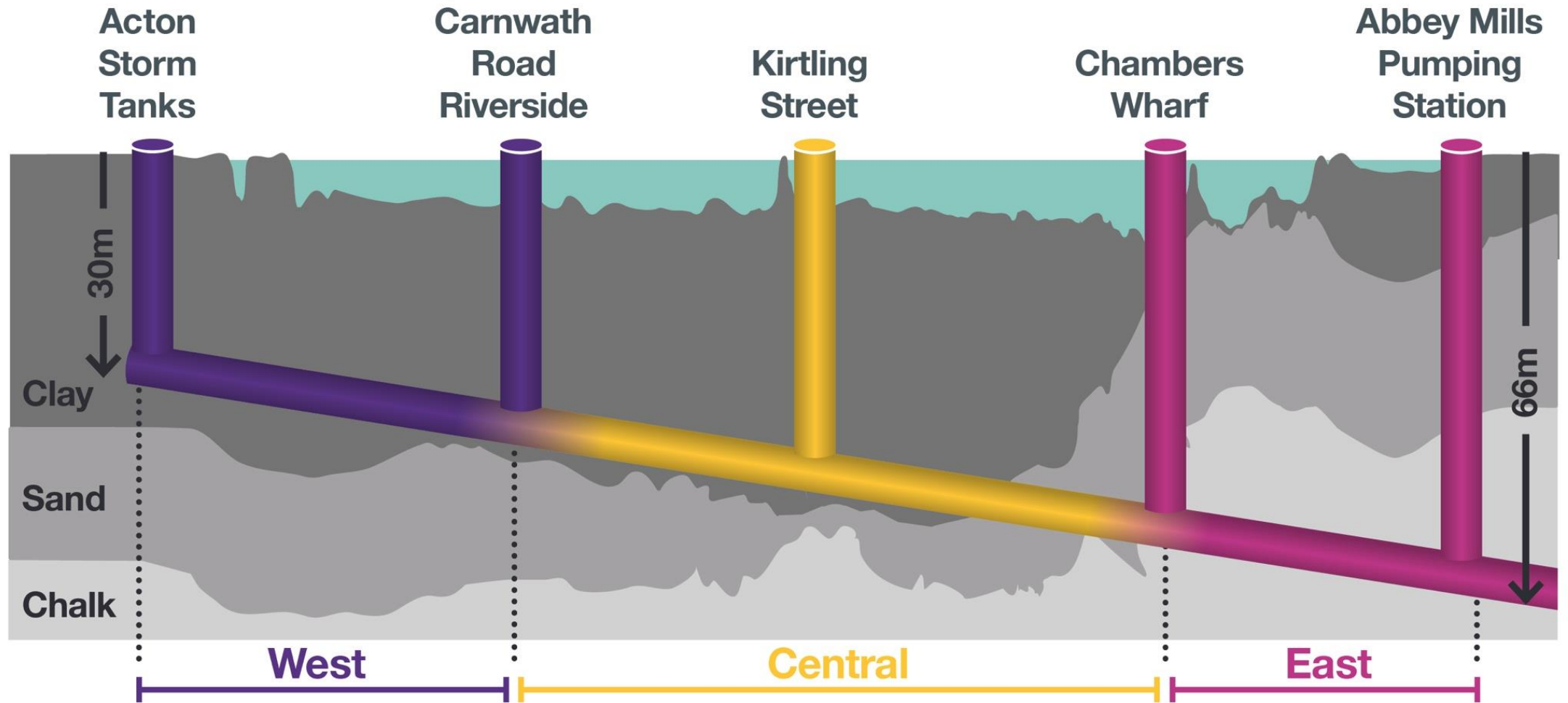
Depth: 30 metres to 65 metres

Volume: 1.6 million cubic metres (include Lee Tunnel)

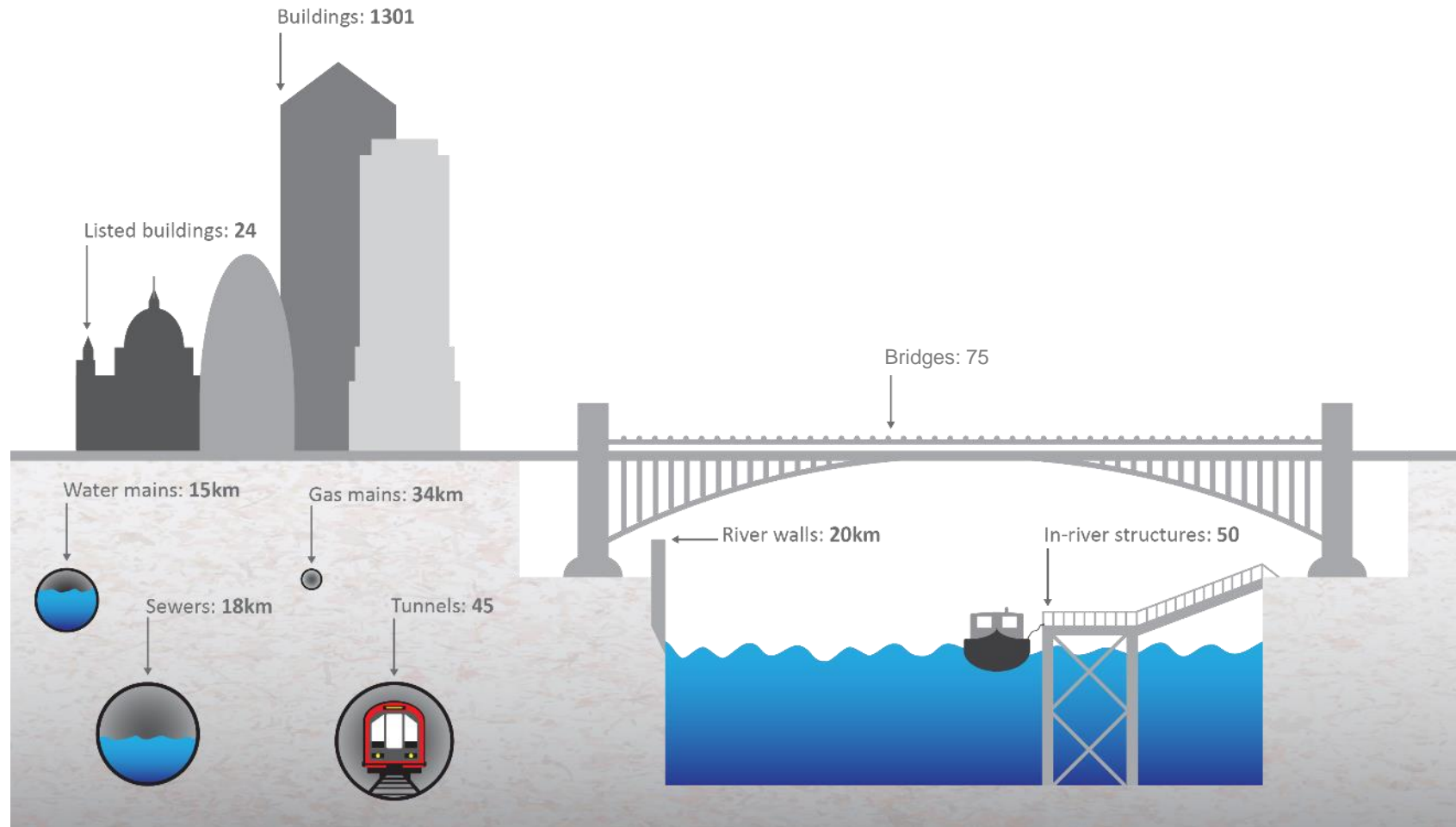
Gradient: Falls one metre every 790 metres for self-cleansing

ENGINEERING CHALLENGES

Tunnelling through London



Interfaces with existing infrastructure



Victoria Embankment



PLANNING AND CONSULTATION

Planning and consultation



Application for Development Consent



OUR VISION

Leaving a legacy

Environment

- Dramatic reduction in discharges from more than 50 to only 3 or 4 in a typical year

Health and Safety

- Right Way: We do things safely or not at all
- Introduce leading lorry and cycling safety initiatives

Economy

- Use river transport to remove 90 per cent of spoil from main drive sites
- Engage local businesses and SMEs

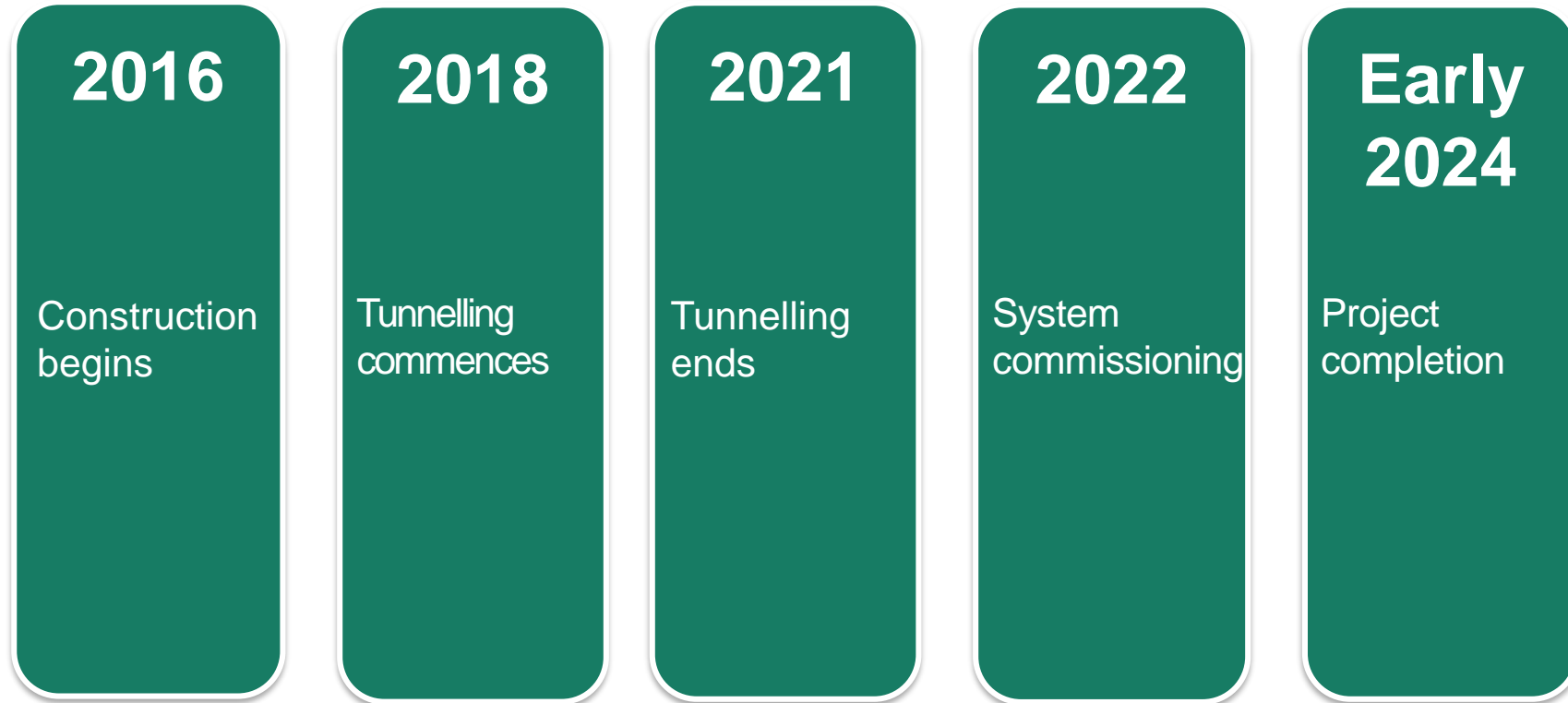
People

- 4,000 direct, sustainable jobs
- 1:50 apprentice and 1:100 ex-offenders

Place

- Three acres of new foreshore
- Enhance Thames Path

Timetable



ECONOMY



ENVIRONMENT



HEALTH AND SAFETY



PEOPLE

PLACE

Reconnecting London with the Thames

- Our challenge is to build a new sewer for London, to prevent the frequent pollution of the River Thames.



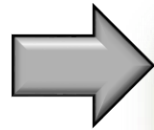
- Our vision is not just to clean up the Thames but to promote a change in the relationship between London (and Londoners) and their river.

“Nice
slides....what’s it
got to do with
Project Controls?”

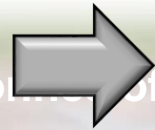


Everything!

Pressure for Change



Search for a solution



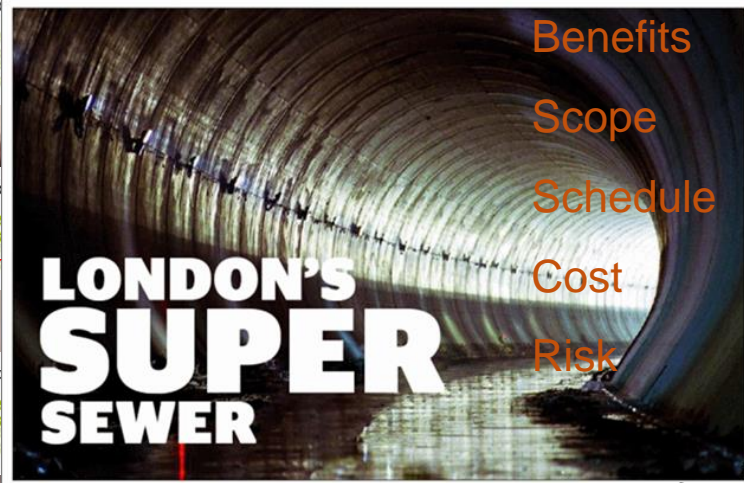
Select a solution



Business Case

35 million tonnes of raw sewage

Action before water enters the sewer:



LONDON'S SUPER SEWER

Benefits
Scope
Schedule
Cost
Risk

Interception of Overflow

Basis of Investment Decision

Solutions considered 8	Estimated timeline 6 years	Estimated cost £4.2bn
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10 Years +

Delivery Model foundations rely on Control

- Ch2M engaged from day one to enforce Programme Management Approach and implement Programme Controls
- Thames Water and Ch2M worked with the Government and Ofwat to consider a range of models to ensure a value for money solution
- A new regulated Infrastructure Provider (IP) has been formed under the Flood and Water Management Act 2010
- Regulated by Ofwat
- Tendered through a competitive process to build, manage and maintain the tunnel. Thames Water will operate the Tunnel
- Government Support Package for 'catastrophic' risks
- £1.1bn of investment will be from Thames Water, £3.1bn will be from the IP
- Licence award was given on 24 August 2015.

Bazalgette Tunnel Limited (BTL)

The new Infrastructure Provider is the first Wastewater only company in the UK. It is made up of a consortium of investors comprising funds managed by:



The investor group includes a significant proportion of UK pension funds through which over 1.7 million UK pensioners will have an indirect investment in Tideway.

Controls is key to maintain investor confidence and protect Thames Water Bill Payers

Our Main Contractors

West



Central



East



System Integrator



The need for Project Controls

Implementing the 'Control Loop' is the role of the **Project Controls** function

“Methodology that operates to enable, stimulate and promote informed decision making at the earliest opportunity to:

- ✓ Maximise certainty of outcome
- ✓ Minimise risk / maximise opportunity
- ✓ Drive sustained improvement
- ✓ Drive Delivery
- ✓ Maintain Investor/Stakeholder Confidence



Controls driving the Programme

N Inside: Formula 1 technology for civils _{p41} / Analysis: Climate change debate _{p14}

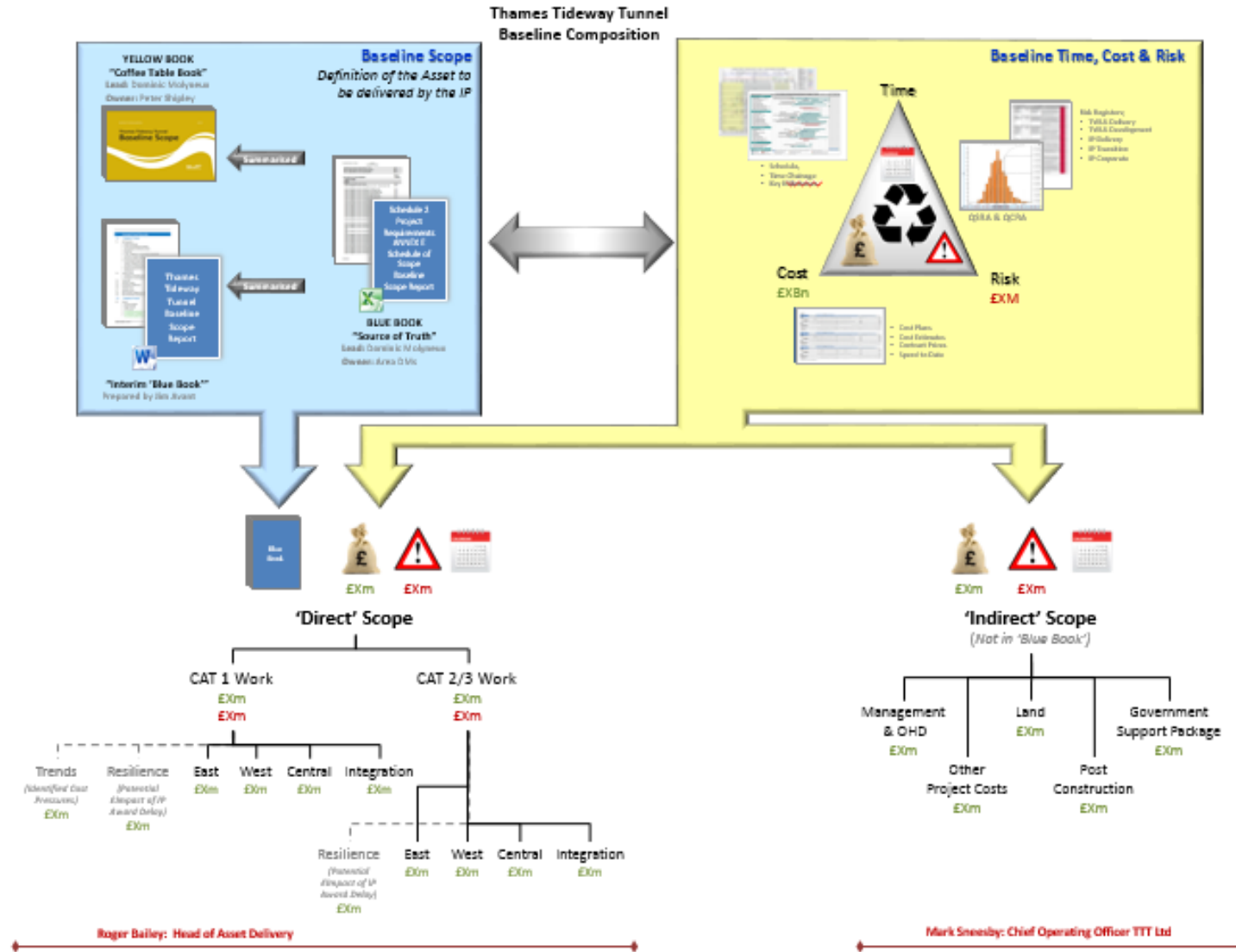
New Civil Engineer

JULY 2016



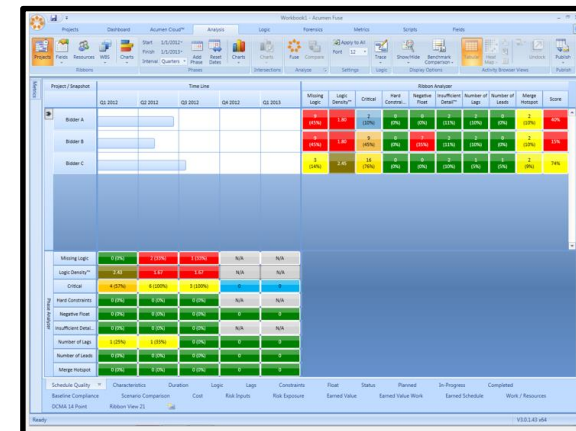
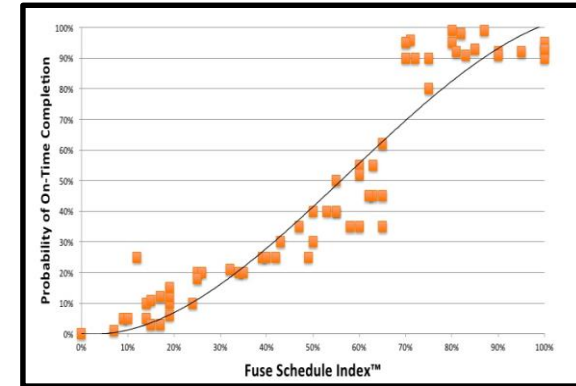
It probably arrived as a shock to the six companies involved to find out that by 'faster' Mitchell meant that he wanted the project to begin six months earlier and for the tunnel to be turned on two years ahead of schedule

Controls Corner Stone



Programme Focus – quality in, quality out

- Schedule Quality and Schedule Delivery are correlated
- Private Investment demands a best in class Project Management
- Employers NEC3 Requirement
- Gamification to drive competition
- Forensic capabilities
- Early Opportunity Identification
- Roll up quality – support Alliance Summary Programme and Incentive Regime



Tideway - PMP Construction Integrated Programme - September 2017 Update (Mitigated)

West, Central and East are based on the CDB September 17 updated PMPs



TIG Works	
Early Works (MWC)	
Mobilise Shaft Site	
Shaft Excavation & Build	
(Above Ground) Structures	
TBM Assembly	
TBM Launch	
Main Tunnel Drive	
TBM Strip Out	
Tunnel Secondary Lining	
Short Connection Tunnel	
Meica, T&C	
Finishings	

- █ Critical Path highlighted in RED
- █ CDB highlighted in GREY
- ◆ Early Access Date
- ◆ Planned Completion of Works

This Time Chainage Programme relates to the latest Contractor's Construction Programme captured in the PMPs

Tideway Milestone Date 1 (12.5 Km of Tunnelling)

Target: 12 Nov 18 (12.5 Km Completed)
Current Forecast CF: (3.253 Km Completed)

Previous: 18 Jul 19 (12.5 Km Completed)
CF: 18 Jul 19 (12.5 Km Completed)

*** Includes all 4 Main Tunnel Drives started including 2 rings installed in the ground**

*** C&S EAST - Launch TBM 18 Jul 19 CF**

Tideway Milestone Date 2 (Main Tunnel Complete)

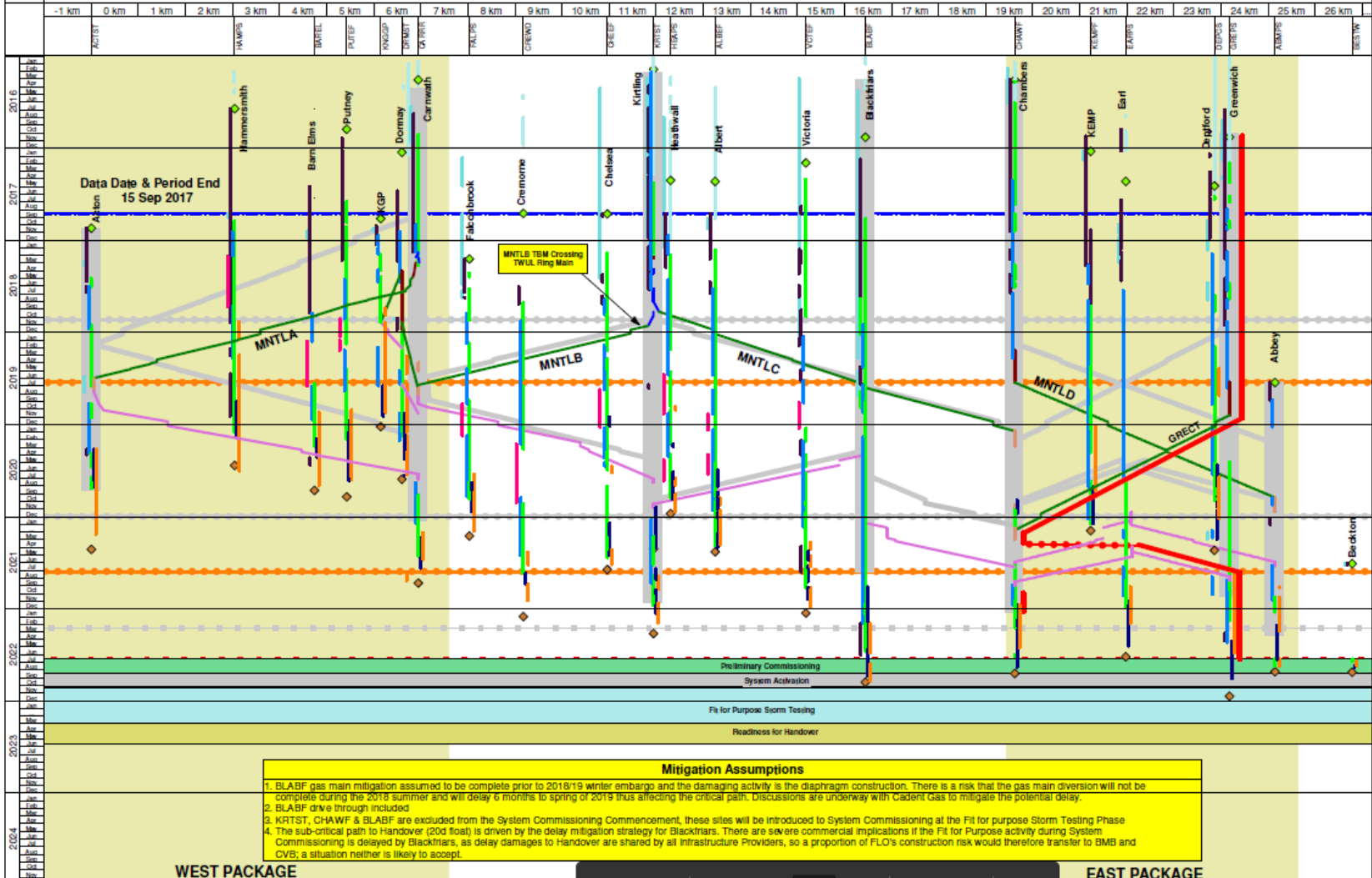
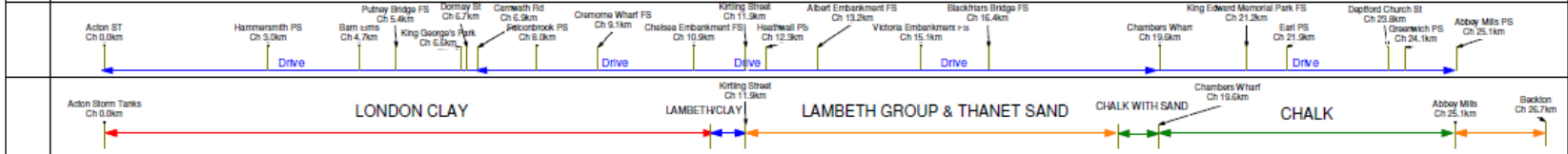
Target: 31 Dec 20 (including Secondary Lining)

Previous: 17 Jul 21 (including Secondary Lining)
CF: 16 Aug 21 (including Secondary Lining)

System Commissioning Commencement

CDB Target Date: 16 Mar 22

Previous Period: 11 Apr 22
Current Forecast: 19 Jul 22



Mitigation Assumptions

1. BLABF gas main mitigation assumed to be complete prior to 2018/19 winter embargo and the damaging activity is the diaphragm construction. There is a risk that the gas main diversion will not be complete during the 2018 summer and will delay 6 months to spring of 2019 thus affecting the critical path. Discussions are underway with Client Gas to mitigate the potential delay.
2. BLABF drive through included
3. KRTST, CHAWF & BLABF are excluded from the System Commissioning Commencement, these sites will be introduced to System Commissioning at the Fit for purpose Storm Testing Phase
4. The sub-critical path to Handover (20d float) is driven by the delay mitigation strategy for Blackfriars. There are severe commercial implications if the Fit for Purpose activity during System Commissioning is delayed by Handover, as delay damages to Handover are shared by all Infrastructure Providers, so a proportion of FLO's construction risk would therefore transfer to BMB and GVS; a situation neither is likely to accept.

WEST PACKAGE

EAST PACKAGE

Navigation icons: Home, Print, Up, Down, 4 / 85, Previous, Next, Refresh

ALLIANCE PROGRAMME MASTER PROGRAMME

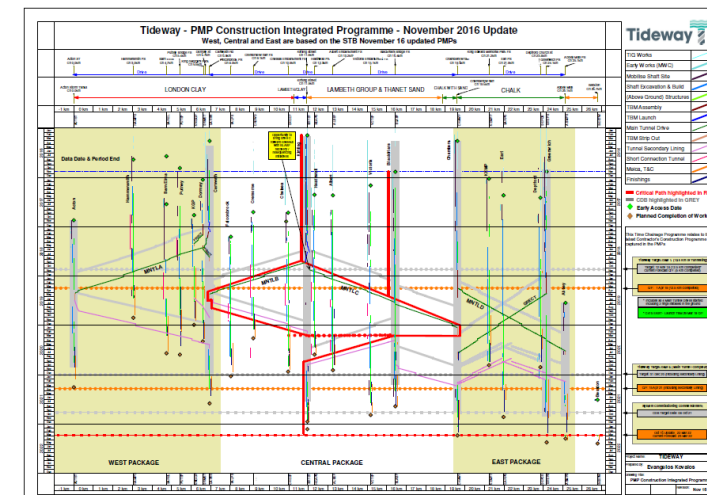
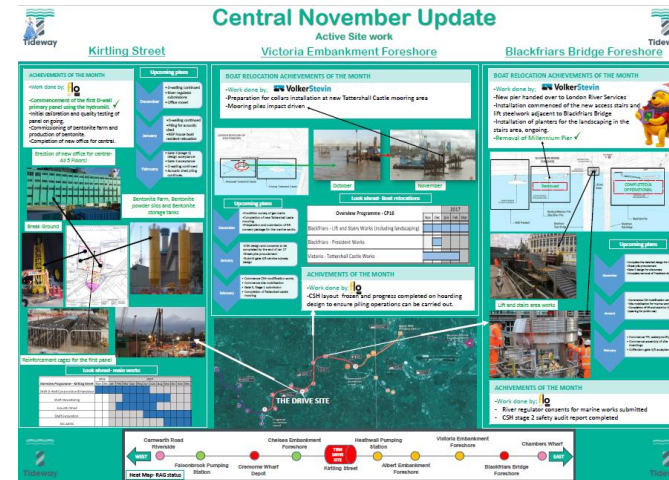
Project Name:	TIDEWAY
Prepared by:	Manish Patel
Drawing Title:	PMP Construction Integrated Programme
INT.PMP.PE0917-LP-M	Revised: September 17m

Recruit, Retain, Recognise and Reward Controls People

- 'Stand up company' in vibrant market
- Collaboration/Alliance Model
- Tekers / Talent
- Invest in people
- Rotate roles
- Learn from others!



Embed Controls / Make part of DNA /Demystify



TOOL KIT FOR PROJECT CONTROLS

Info: centralprojectcontrols@tideway.london


 **ASITE** Contract Admin & Doc. Management

 **SharePoint** Collaboration

 **ASSAI** Doc. Management, Legacy and TIG

 **ORACLE**
PRIMAVERA RISK ANALYSIS  **ARM** Risk Management
 Active Risk Manager

 **PRIMAVERA P6** Schedule

 **ACUMEN** Schedule, Analytics, Forensics
Proven. Project Analytics.

 **EcoSys** Cost Management

Single Source of Truth

- Implementation of Control Cube pre-contract award
- Agile data adoption
- BI as a service
- Pragmatic controls:
 - Quants for example

Business Intelligence Reports



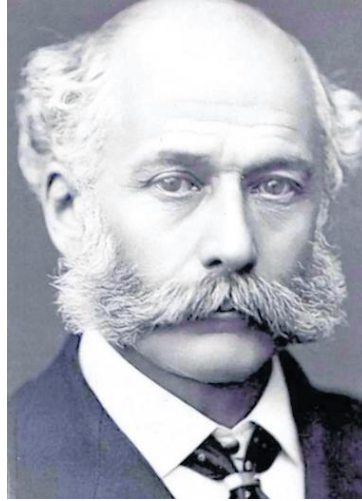
Business Intelligence Team

Click on a box to be taken to the relevant report, feel free to click the available buttons within the file to filter each report – your changes won't be saved. When first opened and a button is pressed or a drop down is changed, the reports will take approximately 30 seconds to run initially, after that they should update within 1-2 seconds. If you get an error message or have a question/request, please get in touch with james.shanahan@tideway.london, peter.wilford@tideway.london or stephen.forgan@tideway.london

Cost	Legacy	Risk
Time Phased EAC Data Source: Ecosys / Data Warehouse Updated: Periodically <ul style="list-style-type: none">• Time phased EAC broken down to Level 8 (Work Type)• Taken from a sum of the Ecosys field 'Declared Forecast• Ability to switch between the inflated (TT_Declared_Forecast_Outturn) and uninflated position (TT_Declared_Forecast)• Includes Resolved and Unresolved trends.• Current period data only	Legacy 'Report Builder' Data Source: Legacy Team / Data Warehouse Updated: Periodically <ul style="list-style-type: none">• Fixed format reports that allow the user to select contract or all contracts and see performance against several metrics• BPR tables have been automated in this report also	Risk KPI Report Data Source: ARM / Data Warehouse Updated: Periodically <ul style="list-style-type: none">• Several core KPIs against Risks held on the ARM system
Time Phased BCWS Data Source: Ecosys / Data Warehouse Updated: Periodically <ul style="list-style-type: none">• Time phased Budgeted Cost of Work Scheduled down to Level 8 (Work Type)• Taken from the Declared Budget field in Ecosys• Current period data only	Legacy: Query Tool Data Source: Legacy Team / Data Warehouse Updated: Periodically <ul style="list-style-type: none">• Allows Pivot tables to be generated against each data type (e.g. skills and employment, apprentices) so the user can create their own queries• Experience of Pivot table manipulation required	Other
ACWP Report Data Source: Ecosys / Data Warehouse Updated: Periodically <ul style="list-style-type: none">• Actual Cost of Work Performed by period, broken down to Level 8 of the PBS (Work Type)• Current period data only	Legacy: Query Tool Data Source: Legacy Team / Data Warehouse Updated: Periodically <ul style="list-style-type: none">• Allows Pivot tables to be generated against each data type (e.g. skills and employment, apprentices) so the user can create their own queries• Experience of Pivot table manipulation required	Schedule Playbook Data Source: Integrated PMP Updated: Quarterly <ul style="list-style-type: none">• PowerPoint based 'animation' of the key components of the integrated PMP schedule over the next three years• Key components include: Dropshaft excavation complete, tunnel drive, secondary lining• Click the relevant button below: West Central East
3 Period Performance Report Data Source: Ecosys / Data Warehouse Updated: Periodically <ul style="list-style-type: none">• A comparison of BCWS, BCWP, ACWP, Schedule Variance (SV) and Cost Variance (CV) over three periods	Skills and Employment Borough Dashboard Data Source: Legacy Team / Data Warehouse Updated: Periodically <ul style="list-style-type: none">• An automated dashboard that graphically shows performance across a number of Skills and Employment metrics• User has the ability to select contractor and quarter	Reporting Calendar Data Source: Various Updated: Upon Request <ul style="list-style-type: none">• A SharePoint calendar with key events in the Tideway Performance Reporting Cycle to be seen with their <i>indicative</i> dates on a monthly calendar; this does not replace the actual meeting invite as should be used as a guide for general planning purposes• This calendar can be viewed on SharePoint or, more powerfully, be imported into Outlook. Please read the 'Connection Guide' to do so. Outlook Connection Guide SharePoint Calendar
	Integrated Audit Programme	
	Integrated Audit Dashboard Data Source: Integrated Audit Updated: On Demand <ul style="list-style-type: none">• A series of automated, interactive tables and charts to analyse Tideway performance in respect of audits and their associated findings <p>Please note:</p> <ul style="list-style-type: none">• You may receive an error message when opening the file if you don't have the excel add-in 'Power Query'. This will not stop you using the file but it won't contain the latest data.• If you do have 'Power Query' installed then upon opening the file, several queries will run in order to update each tab in the file, this will take 3-4 minutes to complete and should be allowed to complete before you being using the file.	

The wrap up

- We have come a long way however....
- Mega Programmes are not where they should be
- We do not compare favourably to other industries in terms of:
 - Innovation
 - Recruiting Talent
 - Retaining Talent
 - Business Transformation speed and success
- However, the world is our lobster...
 - Unprecedented levels of Capital Investment
 - Innovative Funding Models
 - Shoots of change
 - A new generation of Project People



QUESTIONS?

PLEASE CONNECT

<https://www.linkedin.com/in/niallfaris>