

Imperial College London

Railway Safety, a personal perspective

Mr. Vince C. Murtagh (VMA Limited)

Wednesday, 16 February 2011 - 16:00

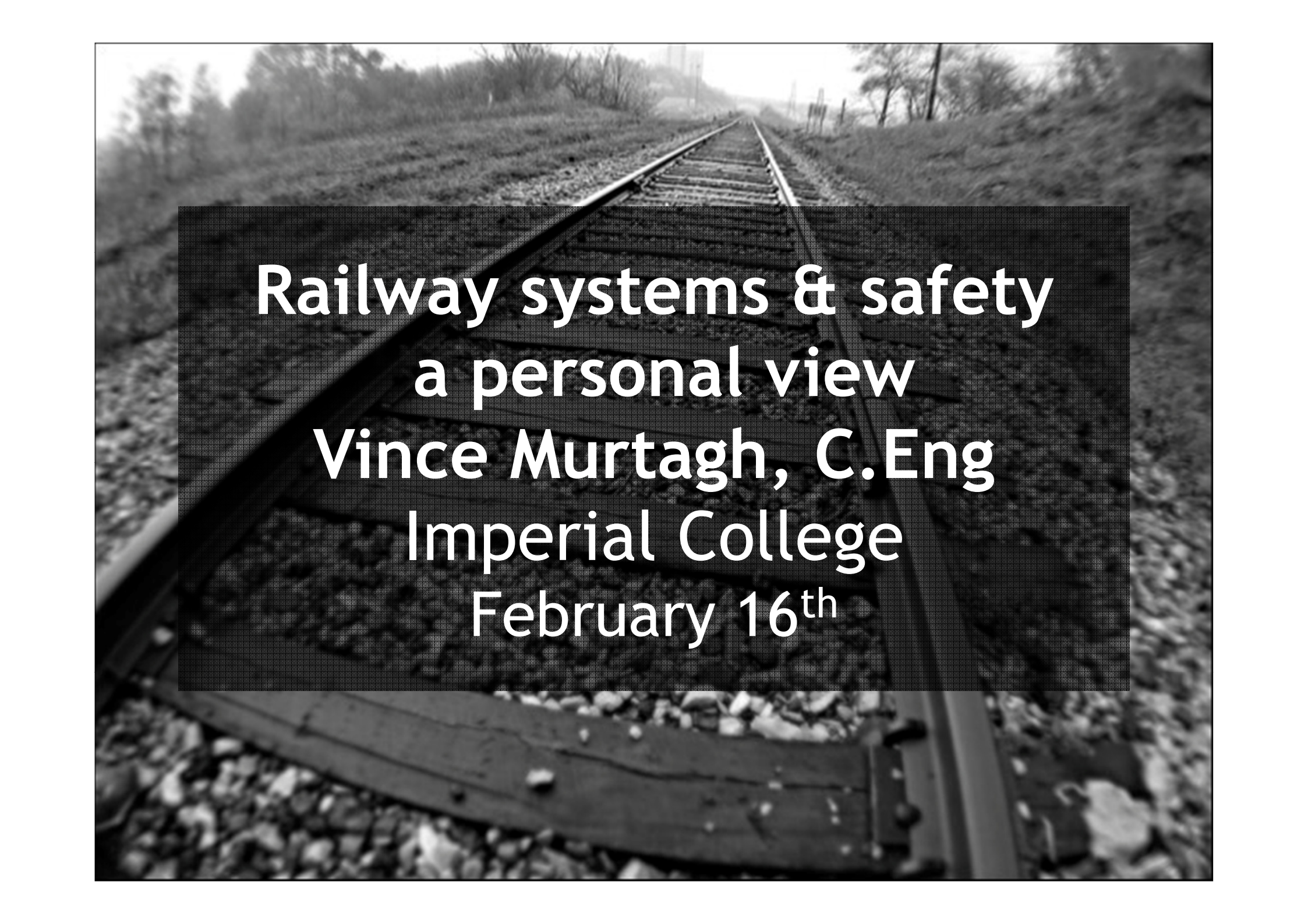
Location: Room 610, Skempton (Civil Eng.) Bldg, Imperial College London

Abstract

Vince will provide a personal view from his 38 years of working within the railway of how the approach to safety and accidents has changed. He will aim to derive a systems view of the railway with regard to accidents in order to help the understanding of the railway.

Biography

Vince has spent 38 years in the railway since graduating from Leicester University. He has worked on the shop floor, as Forman in traction Depots and in Depot management positions. He became High Speed Train fleet engineer (Western) in the 1980s subsequently moving into project management of fleet overhauls. He was Head of train systems for the WCRM project before moving to start up Network rail's Crossrail Engineering team which he headed up for 5 years before retiring.



Railway systems & safety
a personal view
Vince Murtagh, C.Eng
Imperial College
February 16th

Today's Agenda

1973

Legislation

Equipment

The System approach

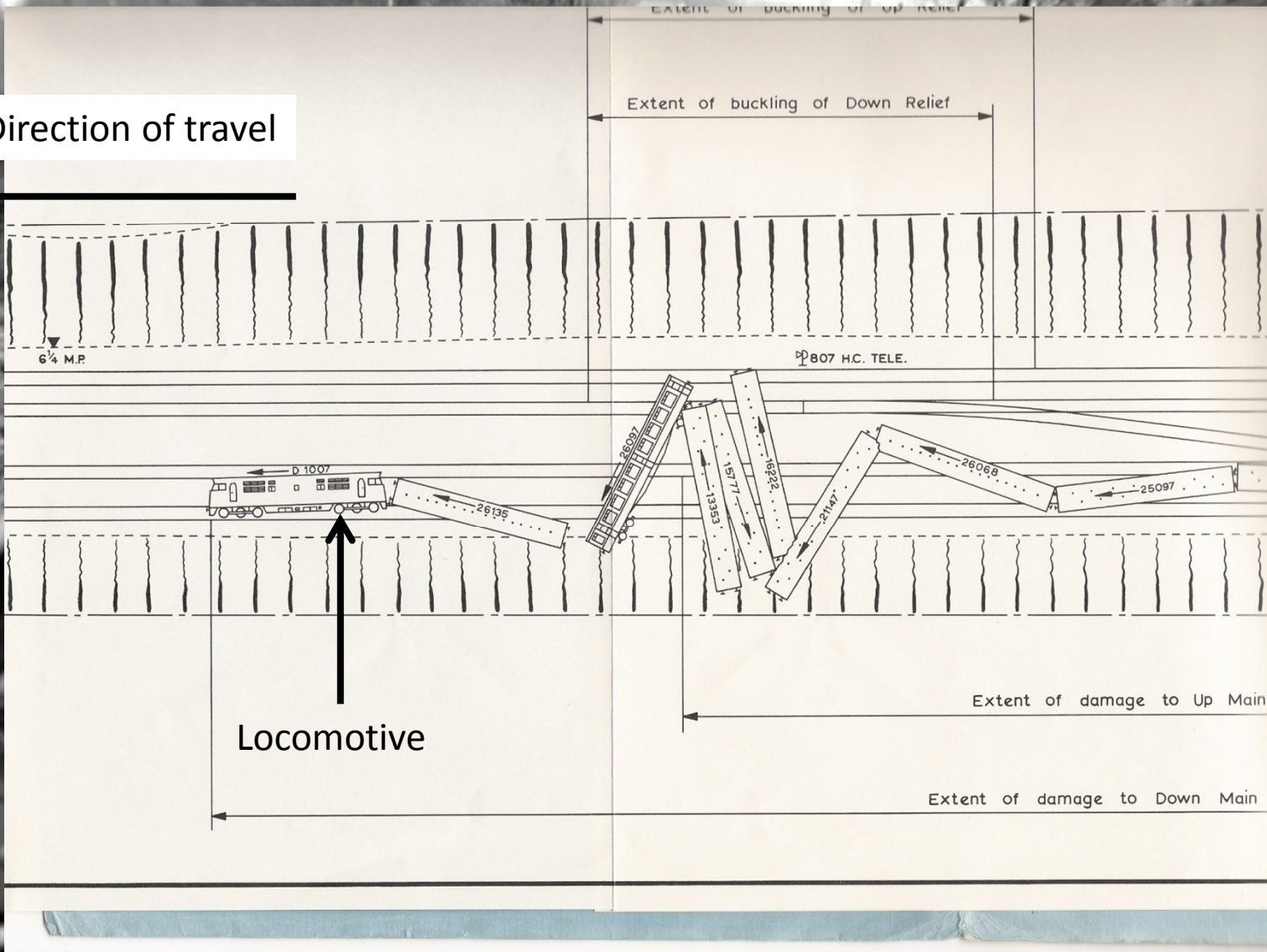
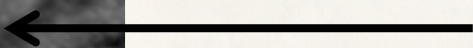
Discussion

Conclusion



December 1973
1718 Paddington to Oxford, 650 passengers

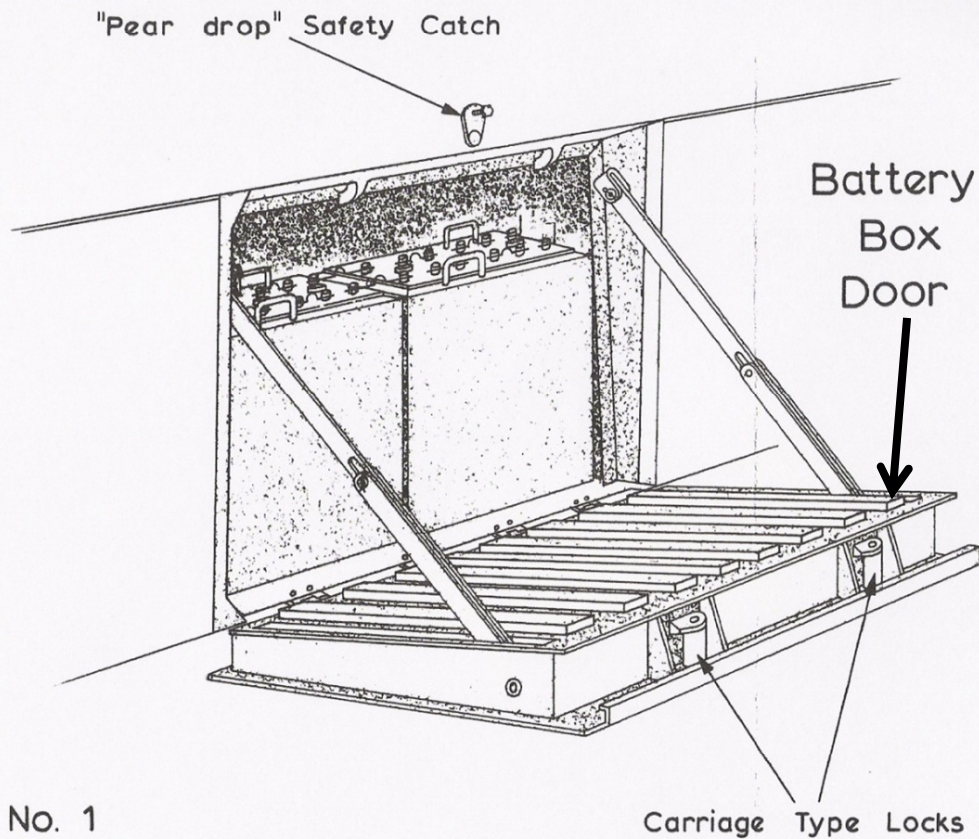
Direction of travel



Extract from Department Of Environment Report
published by HMS Office 1974.

Vince Murtagh

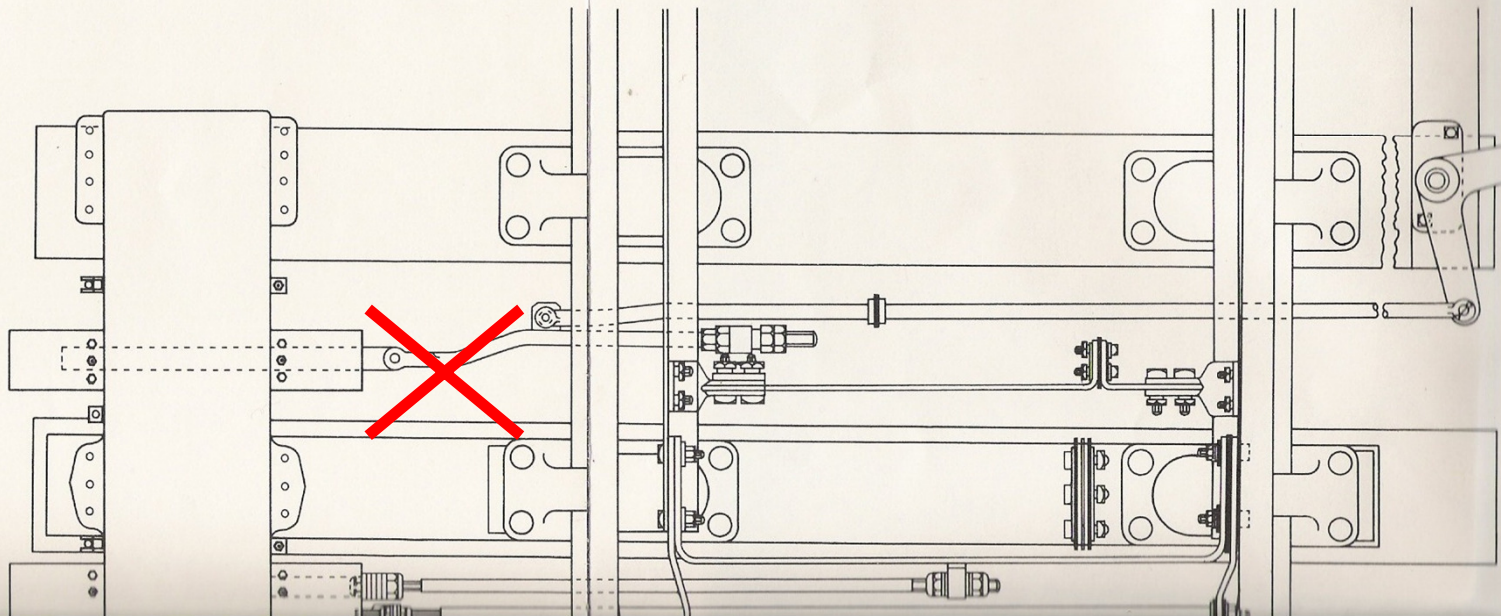
Loco body



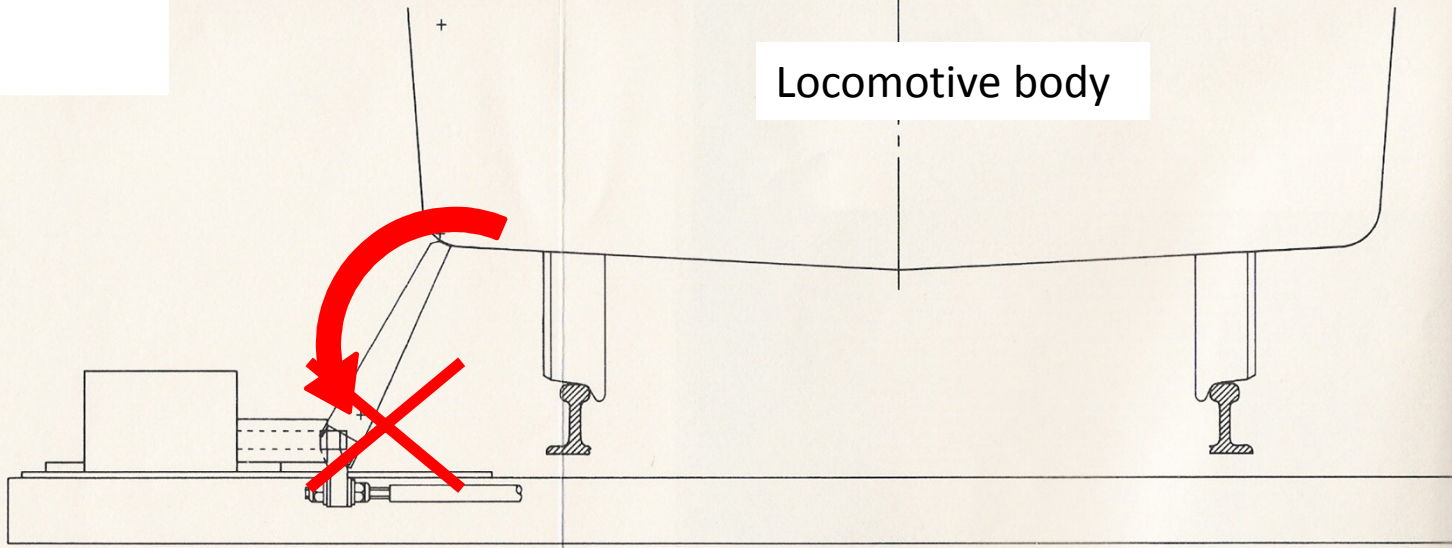
135070 Dd.288495 11/74 M.F.P. •

Extract from Department Of Environment Report published by HMS Office 1974.

Plan
view

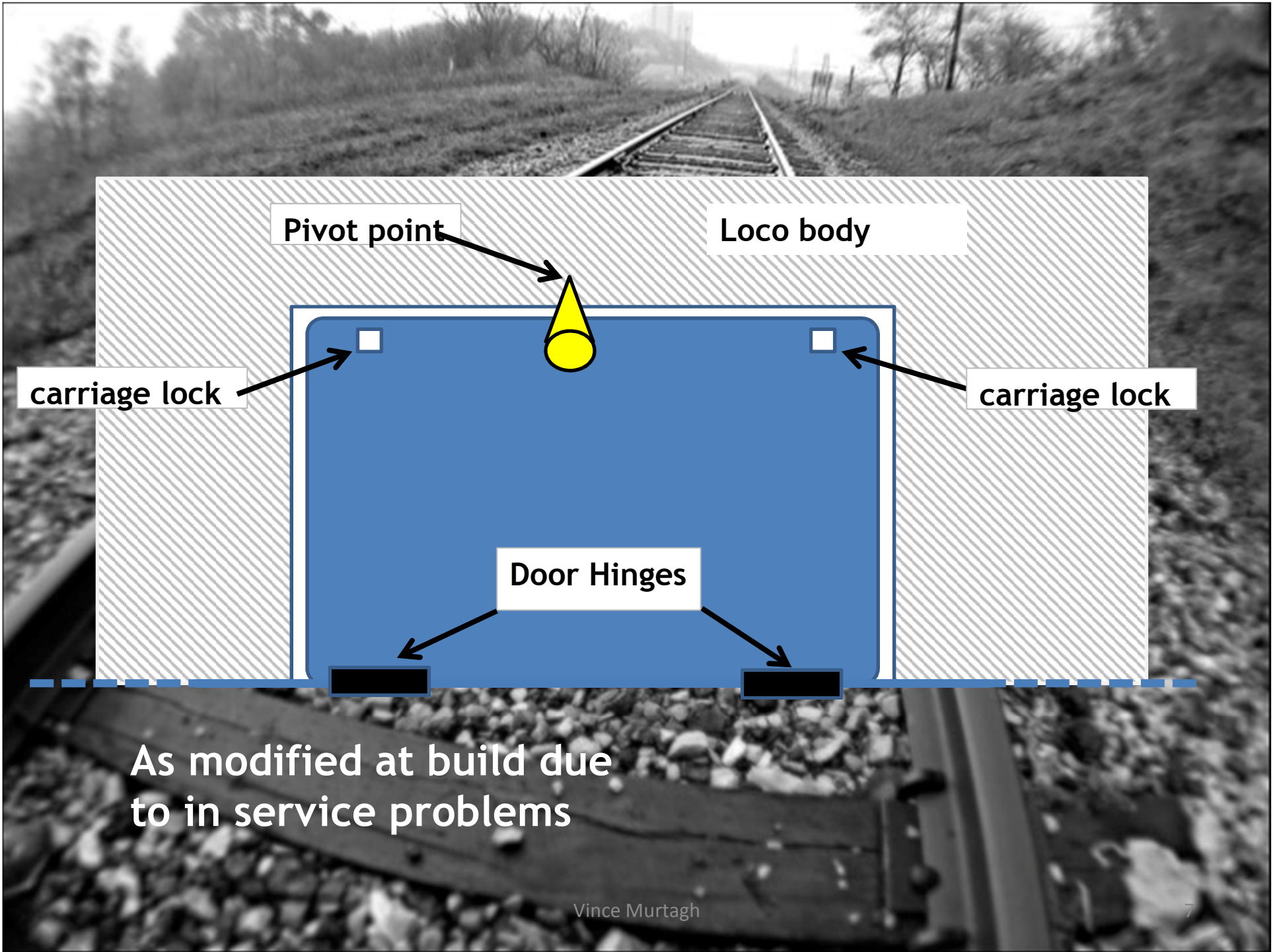


Point Machine
at Longfield Avenue



Locomotive body

Extract from Department Of Environment Report
published by HMS Office 1974.



Pivot point

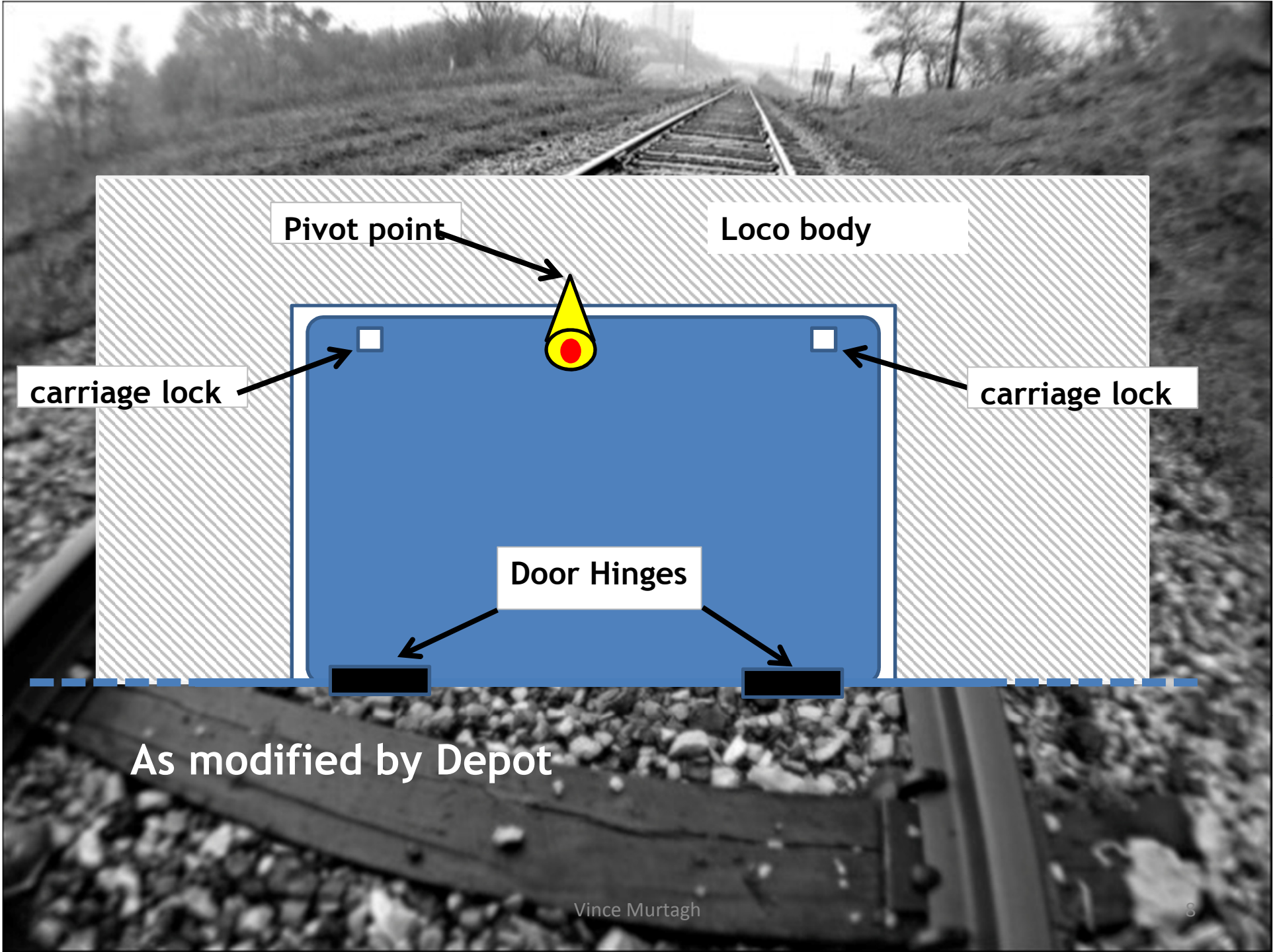
Loco body

carriage lock

carriage lock

Door Hinges

As modified at build due to in service problems



Pivot point

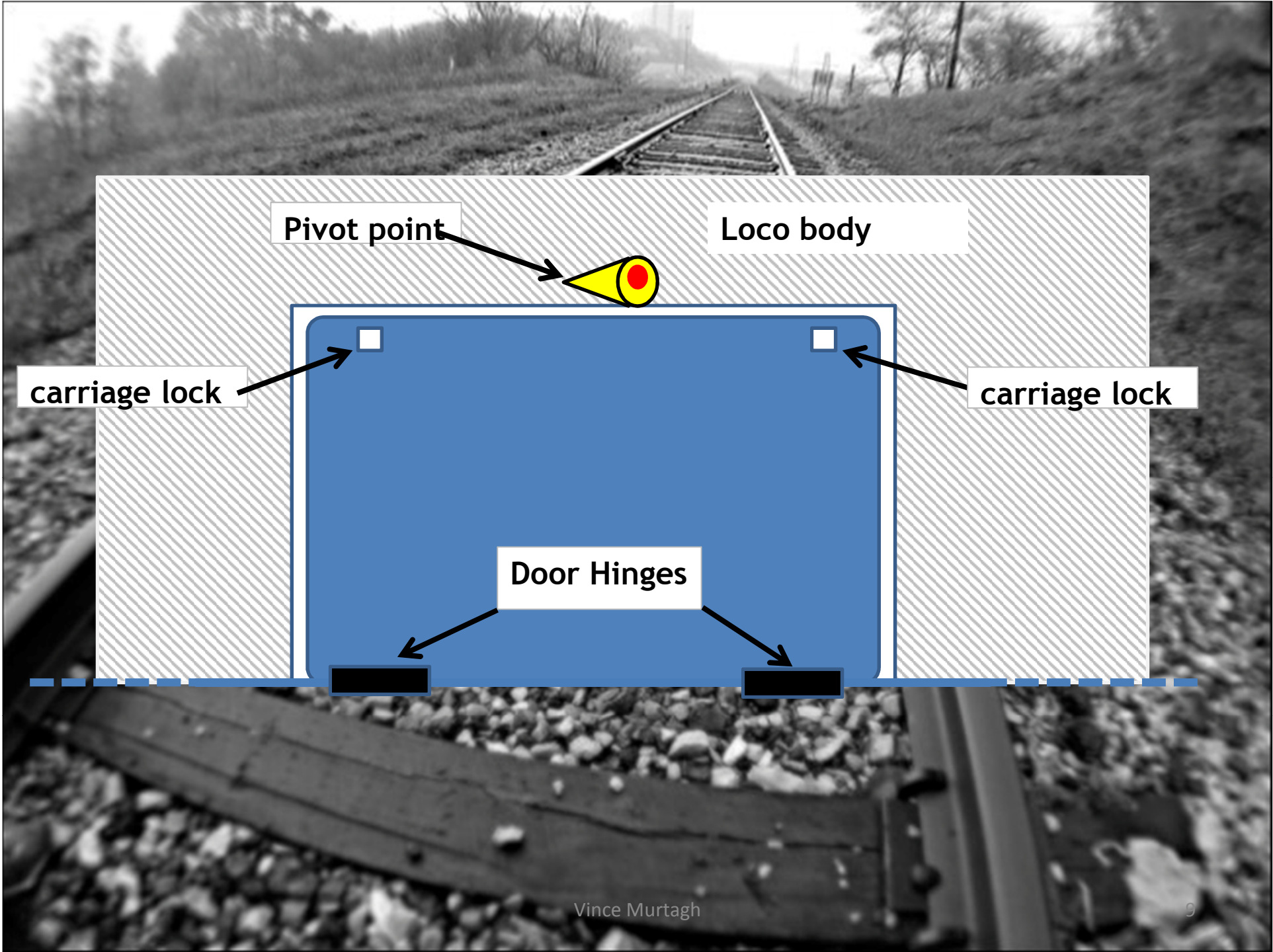
Loco body

carriage lock

carriage lock

Door Hinges

As modified by Depot



Pivot point

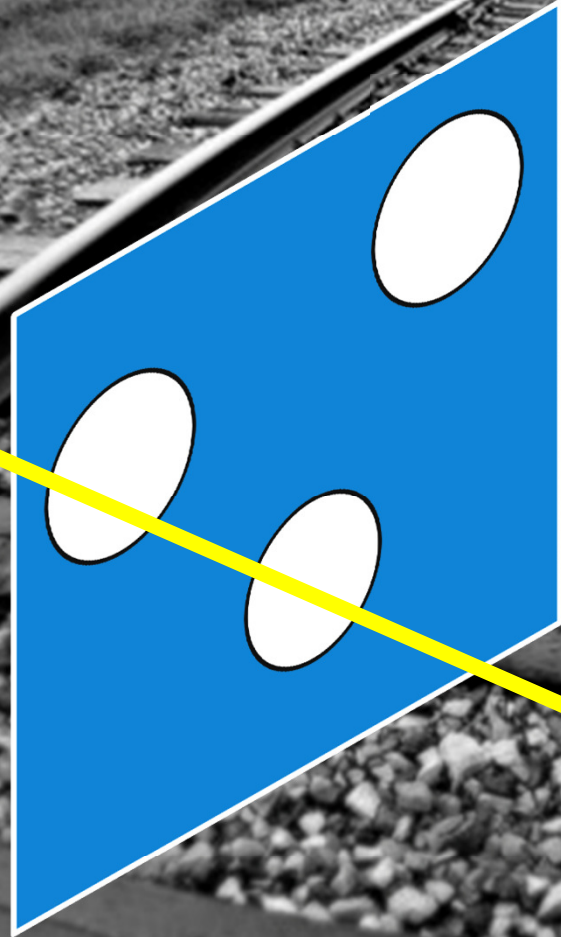
Loco body

carriage lock

carriage lock

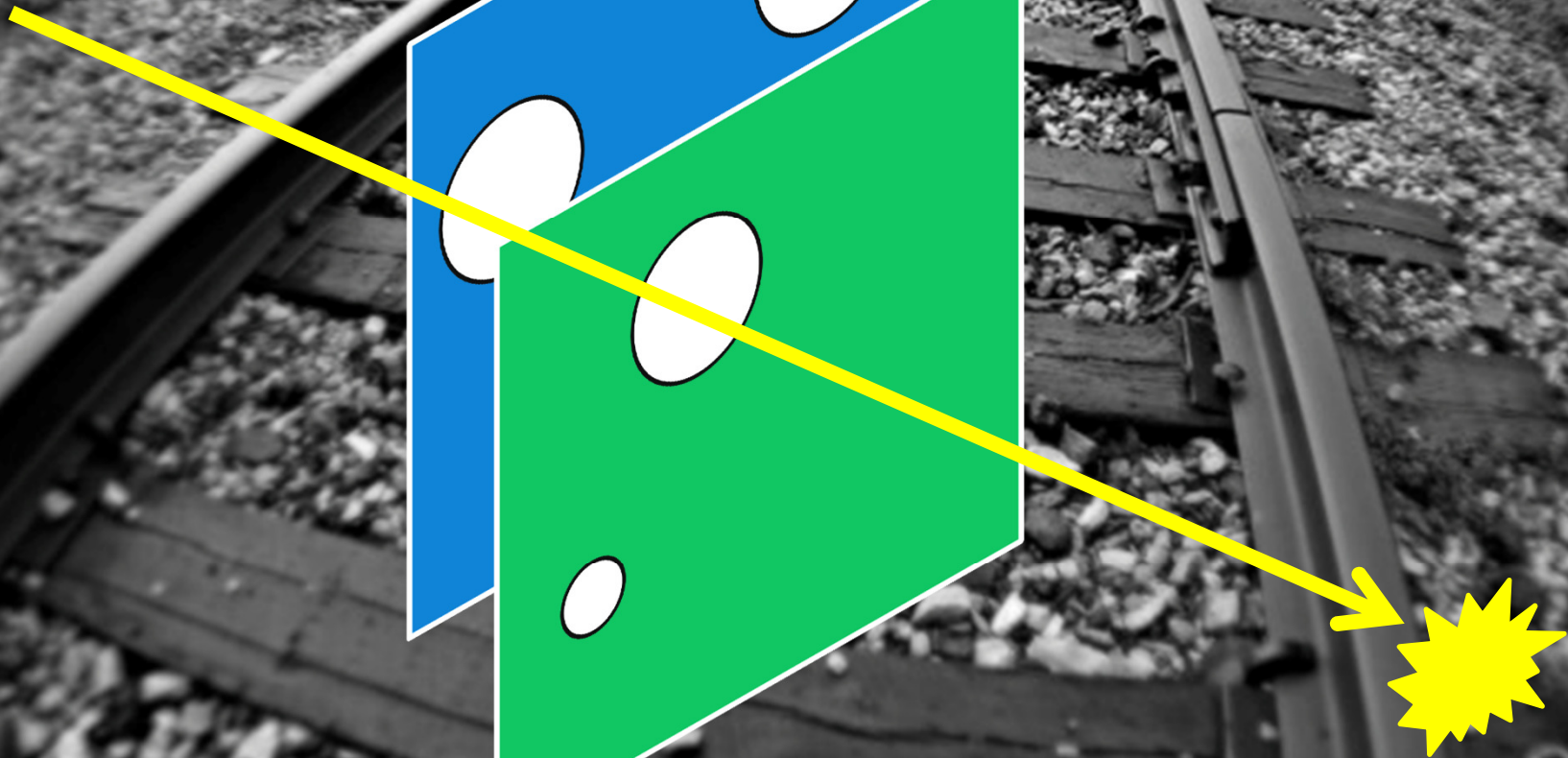
Door Hinges

Local working practices
R 66



Local working practices
R 66

grub screw modification
R 67: Door re-design



Local working practices
R 66

grub screw modification
R 67: Door re-design

Unforeseen
hazard,
unauthorised
mods
R69: reminder
not to do it again

Underlying Cause

Local working practices
R 66

grub screw modification
R 67: Door re-design

Company
attitudes &
behaviours

Unforeseen
hazard,
unauthorised
mods
R69: reminder
not to do it again



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Legislation

Health & safety
at Work Act
1974

Railways (Safety
Critical Work)
regulations 1994

Railways Safety
Cases Regulations
1994

Interoperability
Regulations

Management Of Health & safety
at Work Regulations 1992

Railways & Transport Safety Act 2003
and its 2005 Accident Investigation regulations

The Railway & Other
Transport Systems
(Approvals, Works, plant
& equipment)
Regulations 1994 ROTS

The Railways and Other Guided
Transport Systems (Safety) 2006
ROGS

Construction Design
& Management
1994/2007

Railways (Safety) Regulations 1999

Today's Agenda

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Railway System

Workers

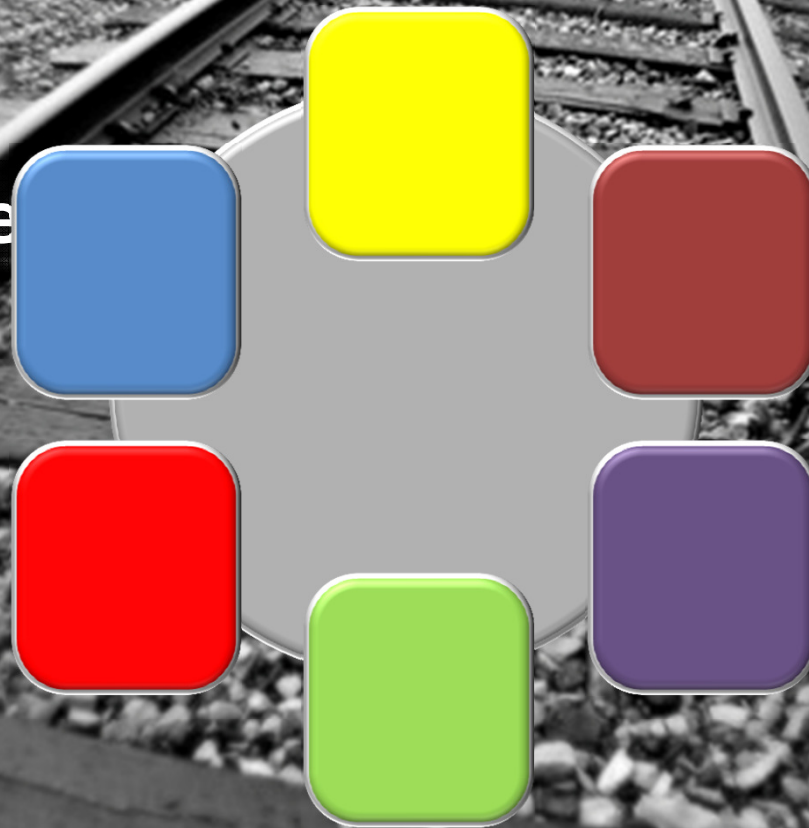
Trespassers

Infrastructure

Customers

Trains

Neighbours

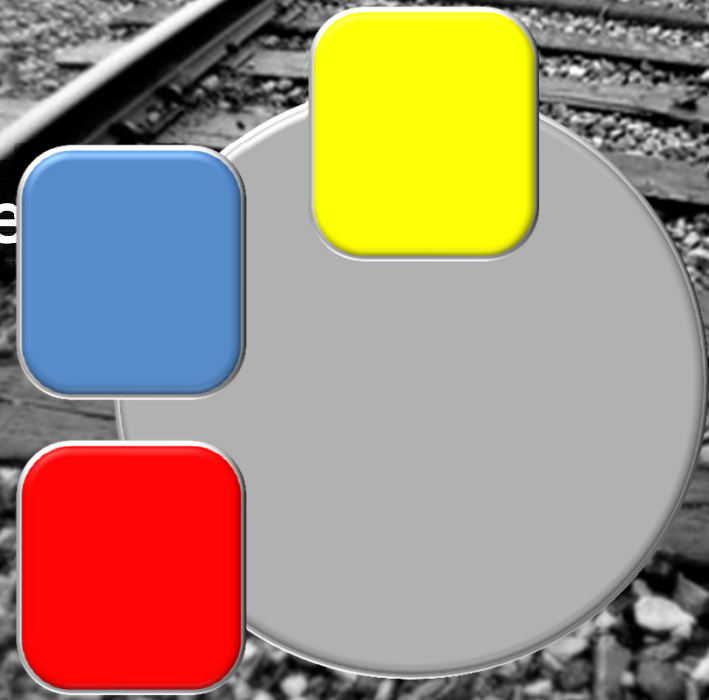


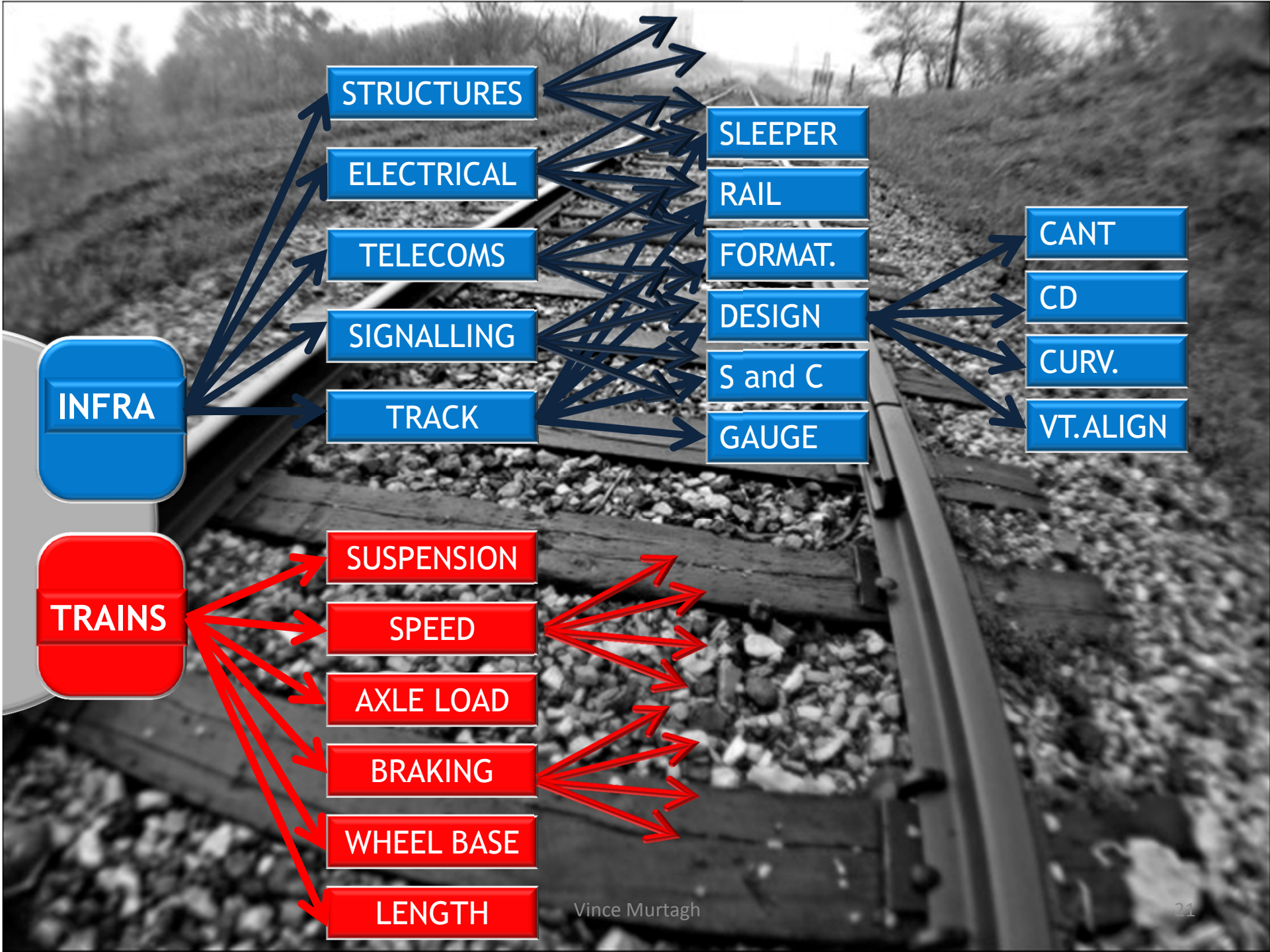
Managed

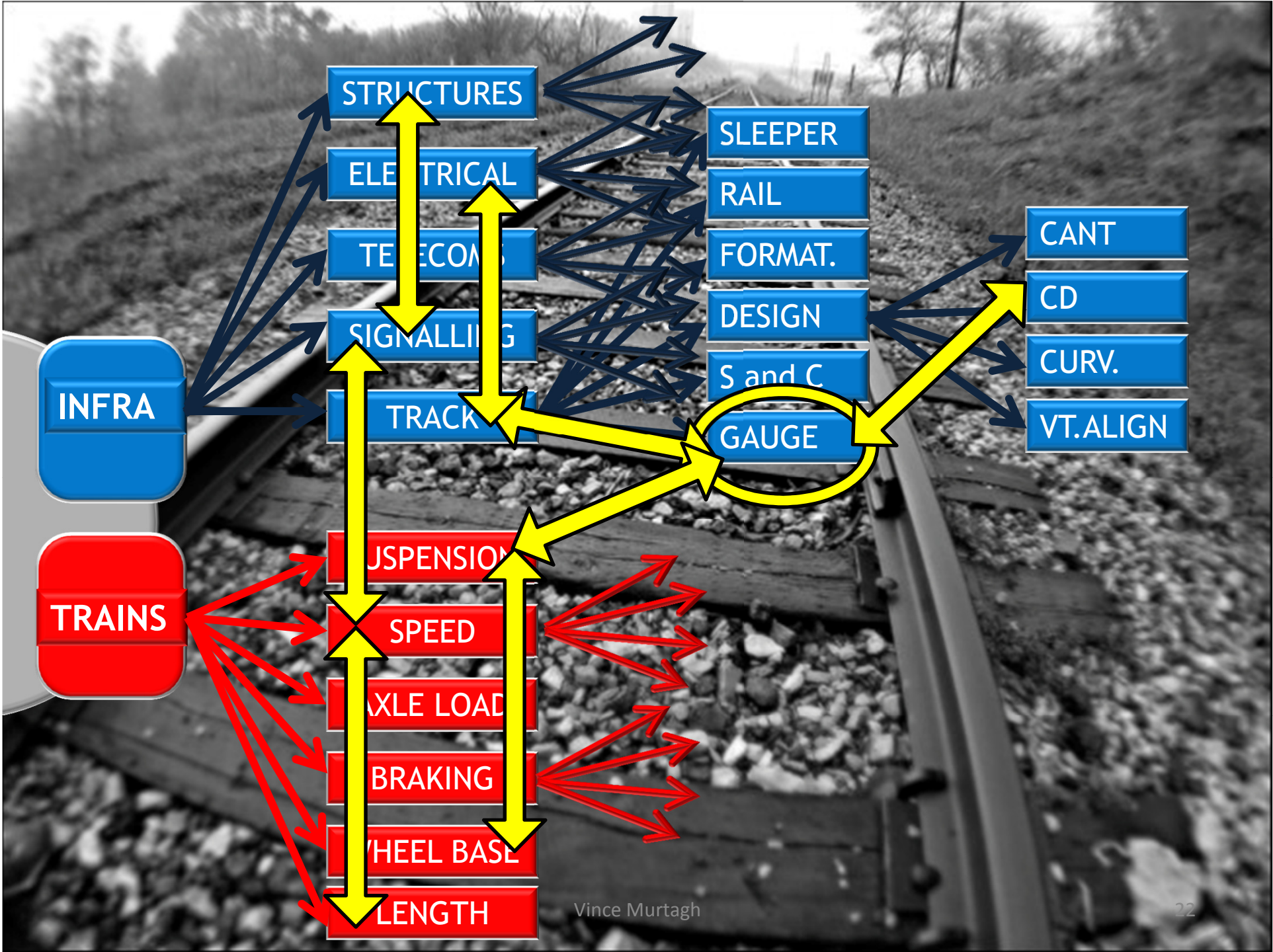
Workers

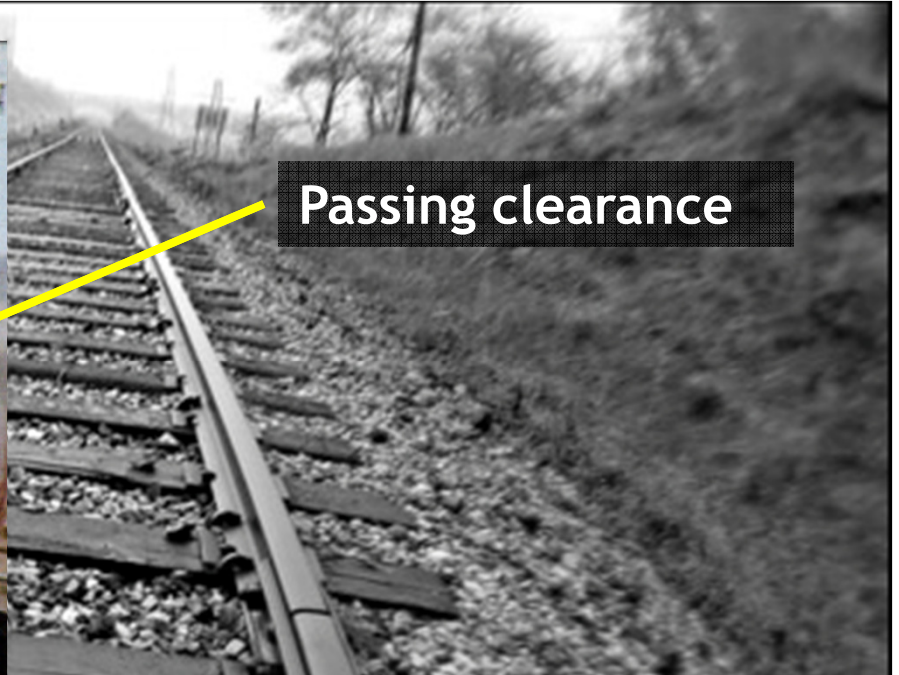
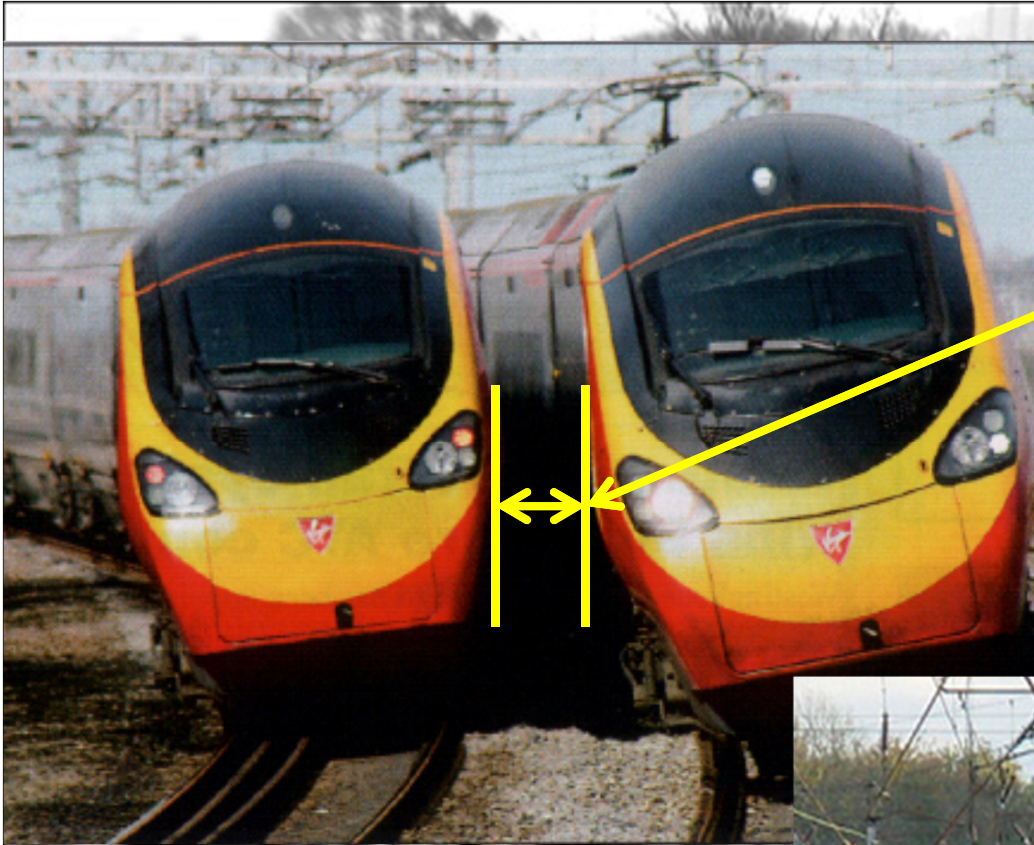
Infrastructure

Trains









Passing clearance



End throw





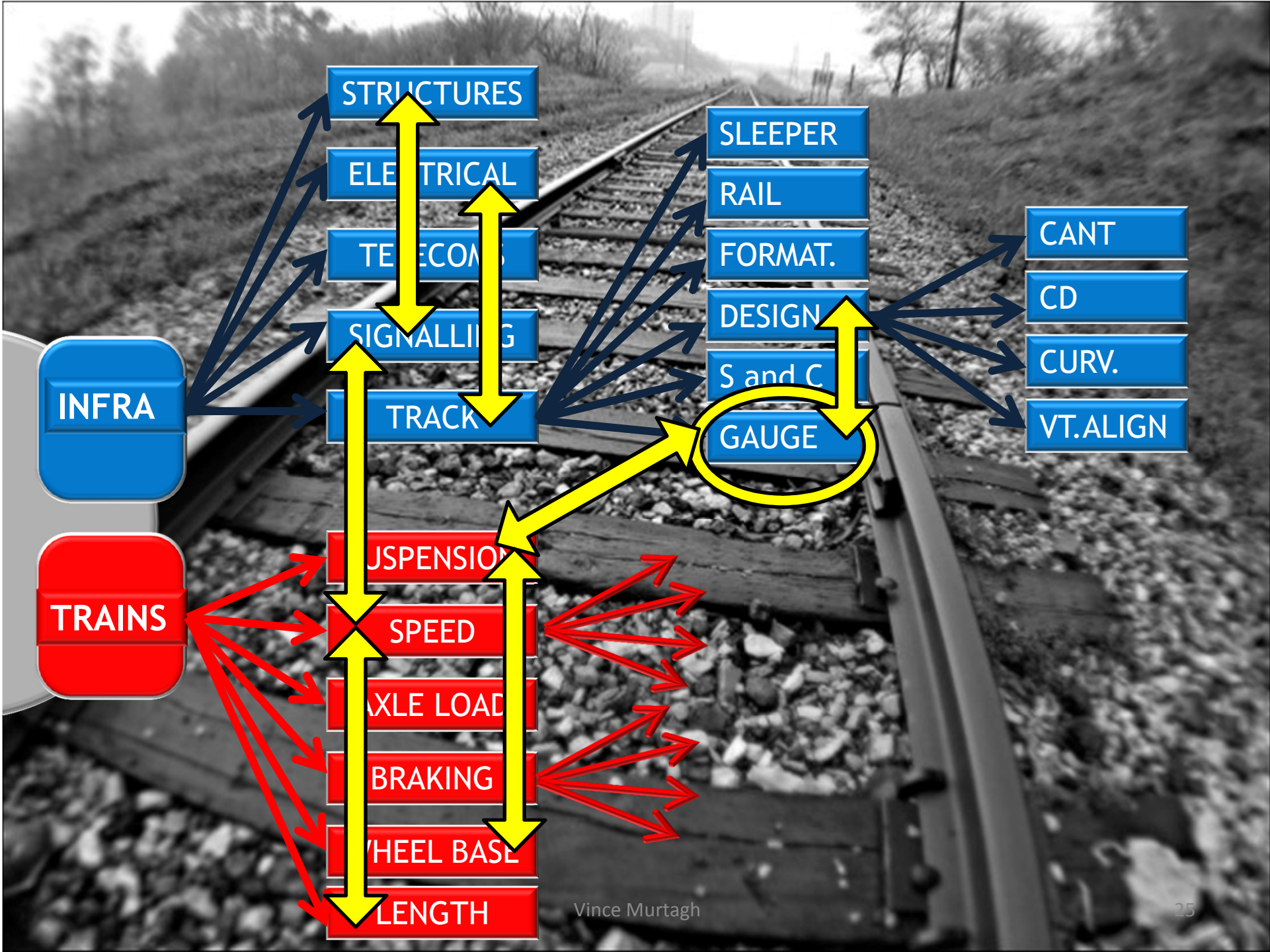
OHLE

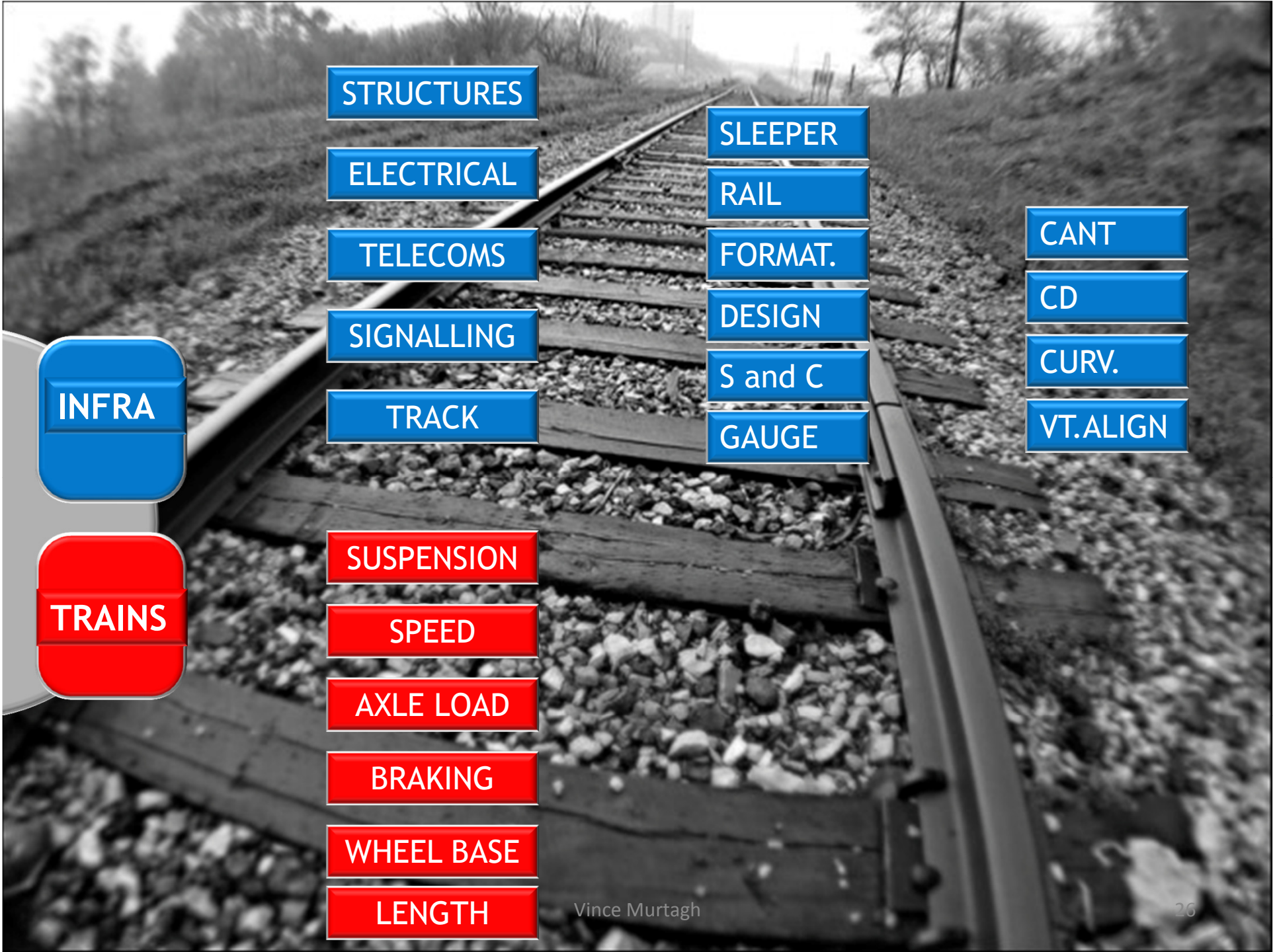
Structures

Signals
& signs

Platform
edges

Track
mounted
equipment





INFRA

TRAINS

STRUCTURES

ELECTRICAL

TELECOMS

SIGNALLING

TRACK

SUSPENSION

SPEED

AXLE LOAD

BRAKING

WHEEL BASE

LENGTH

SLEEPER

RAIL

FORMAT.

DESIGN

S and C

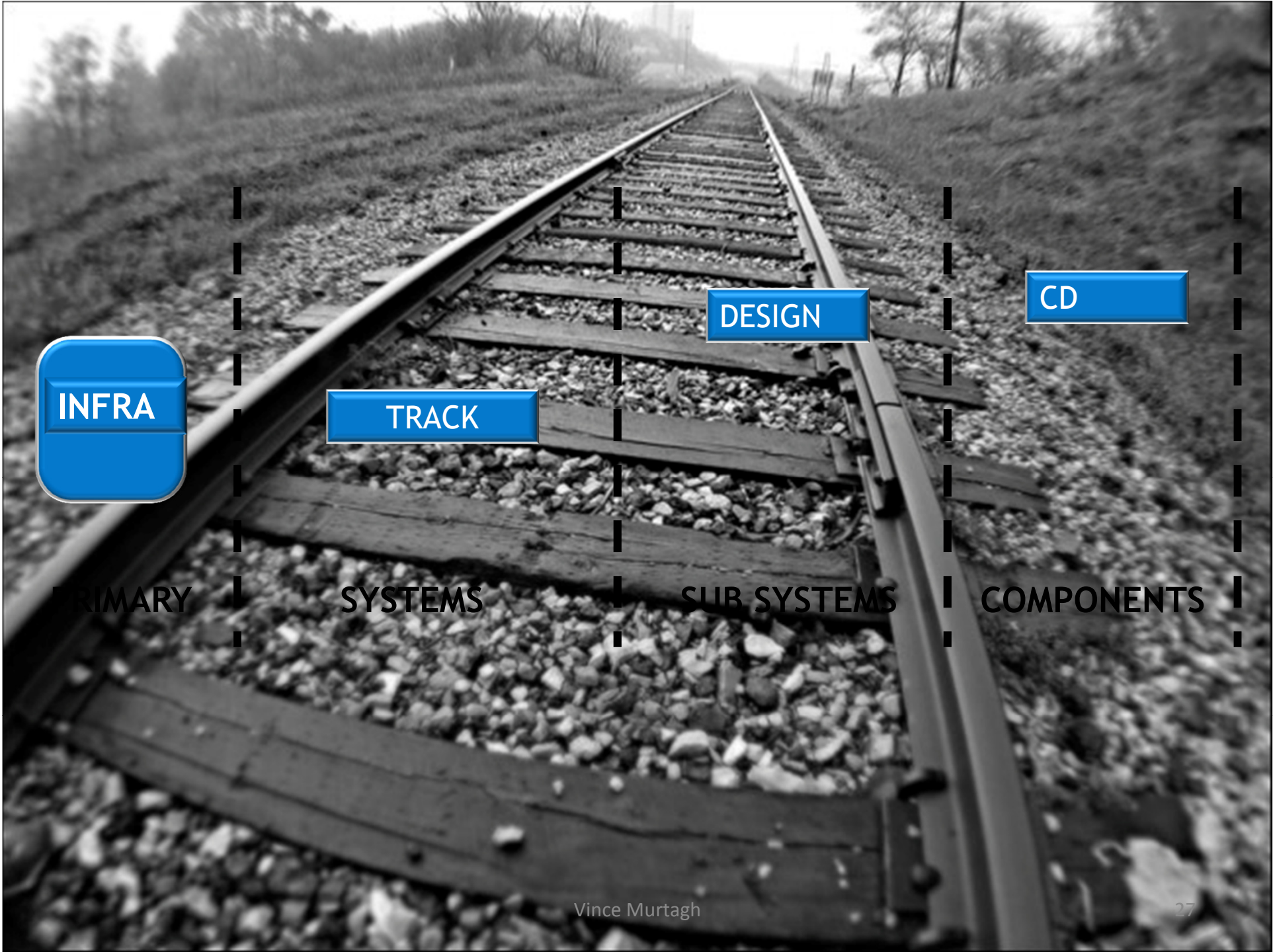
GAUGE

CANT

CD

CURV.

VT.ALIGN



INFRA

TRACK

DESIGN

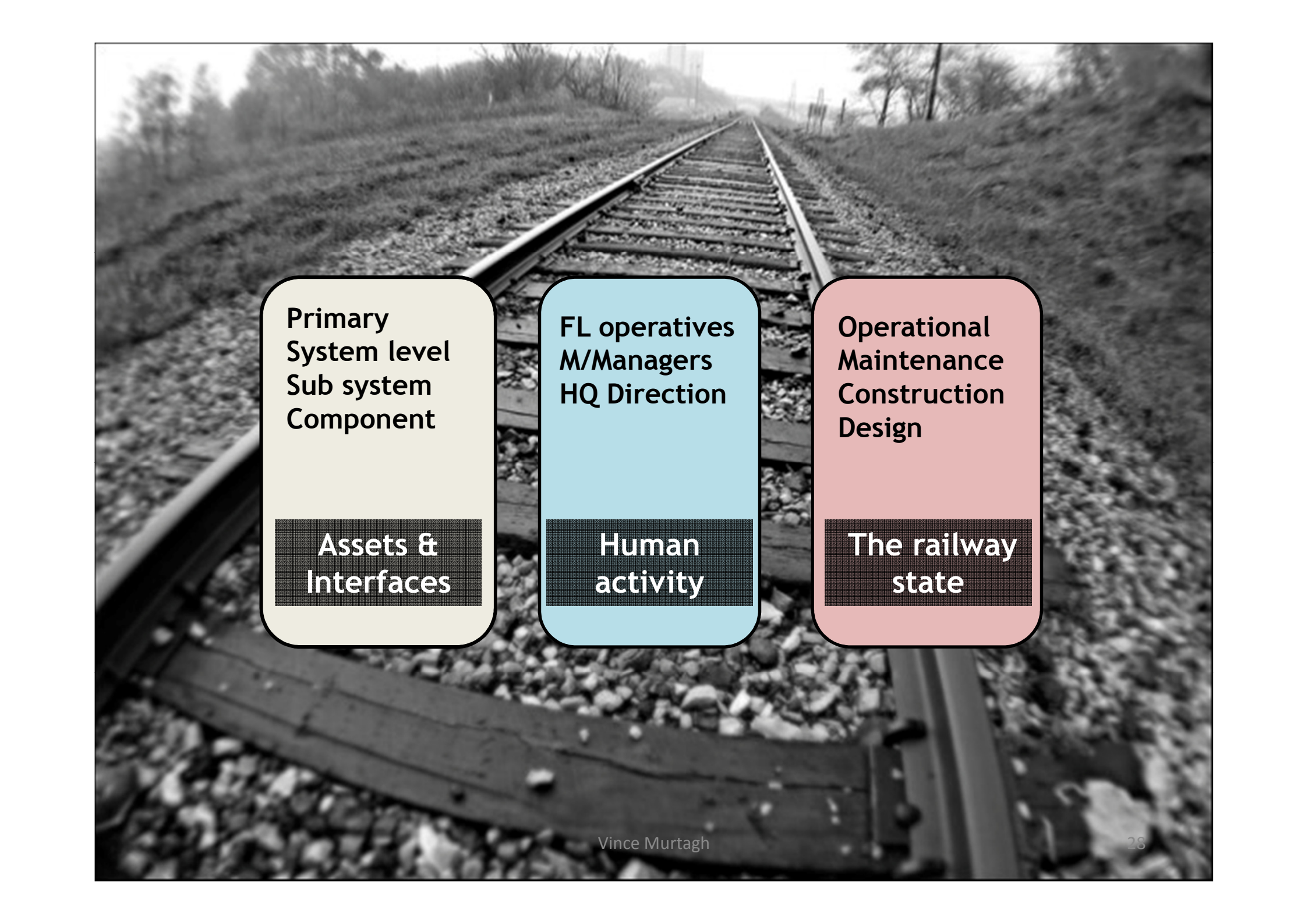
CD

PRIMARY

SYSTEMS

SUB SYSTEMS

COMPONENTS



**Primary
System level
Sub system
Component**

**Assets &
Interfaces**

**FL operatives
M/Managers
HQ Direction**

**Human
activity**

**Operational
Maintenance
Construction
Design**

**The railway
state**

Behaviour & Culture

Standards and Instructions

Primary

Systems

Sub system

Component

Operational

Maintenance

Construction

Design

Front line operatives

Local management

HQ Direction

Customers & Trespassers & Neighbours

Standards and Instructions

Behaviour & Culture

Primary

Systems

Sub system

Component

Operational

Maintenance

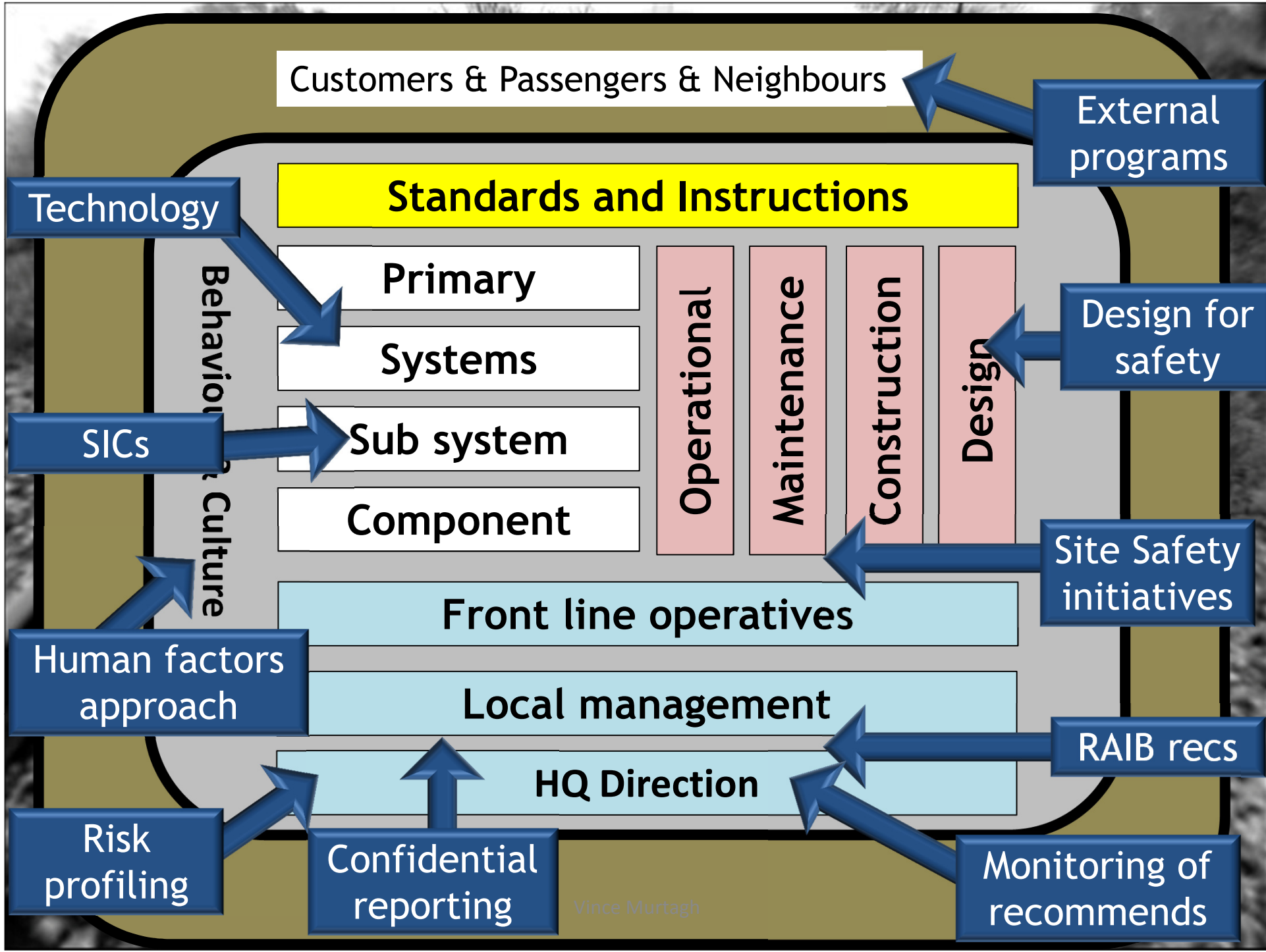
Construction

Design

Front line operatives

Local management

HQ Direction



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December 1973
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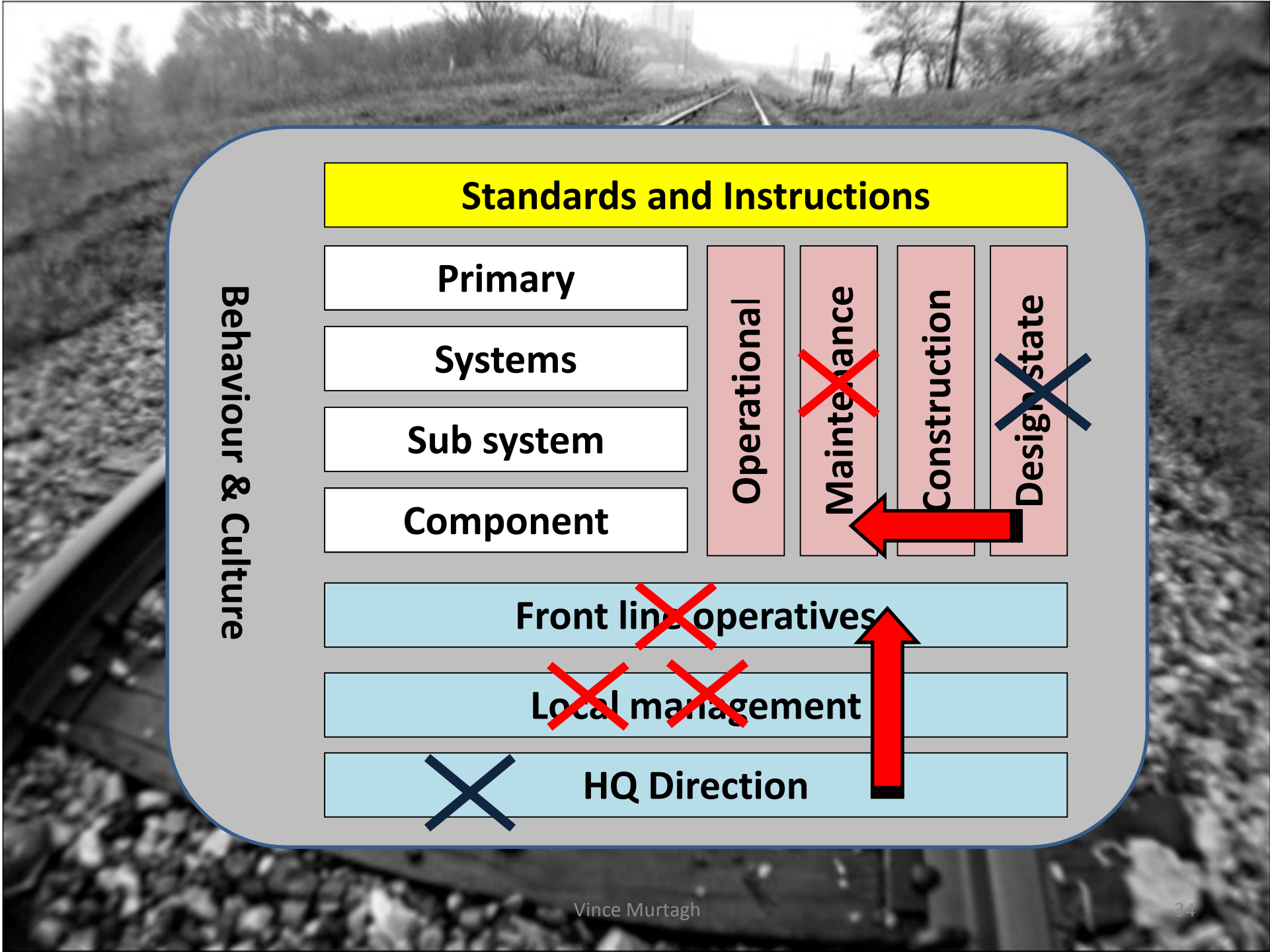




Photo from RAIB 2010

Behaviour & Culture

Standards and Instructions

Primary

Systems

Sub system

Component

Operational

Maintenance

Construction

Design state

Front line operatives

Local management

HQ Direction

Today's Agenda

1973

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Conclusion

Culture & behaviour drives actions

Legislation We have enough!

Equipment Getting better!

Understand the system = understand the safety issues

Discussion

Conclusion

A black and white photograph of a railway track receding into the distance. The tracks are made of steel rails on wooden sleepers, set on a bed of gravel. The track curves slightly to the right in the foreground and then straightens out as it disappears into the distance. The surrounding landscape is hilly and covered with sparse vegetation and trees. The sky is overcast.

Questions