



# *GN/GE Update:*

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29th November 2012*

# *Background & Purpose:*

- Answer Questions raised from industry, in particular in relation to Network Change,
- Provide more visibility on benefits, ie journey times, capacity etc.,
- To move forward with Network Change,
- To identify other discussions/conversations/actions that need to take place.
- No Fire Alarm test – will be escorted from building if it sounds.
- Ask questions as we go.



# Delivery Plan Statement:

## Network Rail's obligation

Our obligation is to deliver this project in CP4 with the exception of work associated with providing a suitable capacity connection at the south end of the GN/GE route.

## Scope of works

The current requirements of the project are:

- ✓ gauge clearance for W9, W10 (with an option for W12) at linespeed between Werrington Junction (exclusive) and Doncaster Decoy North (exclusive);
- ✓ development of a solution including consideration of the consents strategy that avoids Down freight trains accessing the Spalding line and Up freight trains from the Spalding Line to East Anglia having to cross both the Up and Down ECML fast lines in one movement;
- ✓ provision for 775m freight train operation;
- ✓ mitigation measures (including closures of level crossings), taking into account the increase in speed and numbers of trains operating, provide that current levels of level crossing safety risk are maintained or improved; and
- ✓ infrastructure works as required to deliver the journey time outputs (southern access connection exclusive).

An Infrastructure Planning Commission (IPC) application will be required if a grade separated option is selected at the south end of GN/GE.

# Delivery Plan Statement:

The output shall be achieved without a worsening of overall freight running times when compared to direct operation via the East Coast Main Line (ECML). The target time for a class 4 (class 66 locomotive with 1600 tonne trailing load) is as follows:

- ✓ • Down Train = 02hrs 05min Between Werrington Junction (exclusive) and Doncaster Decoy North Junction (exclusive); and
- Up Train = 02hrs 02min Between Doncaster Decoy North Junction (exclusive) and Werrington Junction (exclusive).

✓ Notwithstanding the above journey time commitments, an understanding of the affordability of providing a 2hr 2min journey time in each direction shall be gained and shared with key freight operators.

✓ Two freight paths each way per hour, over and above existing traffic levels on all sections of the route from Werrington Junction (exclusive) to Doncaster Decoy North Junction (exclusive), will be provided with one capable of being a class 6 (timed as class 66 + 2000 tonnes trailing) and one being class 4 (timed as class 66 + 1600 tonnes trailing). In preparing for future traffic the capability being provided shall assume a train length of 775metres for each of these paths.

# *Delivery Plan Statement:*

## **Key assumptions**



- W10 gauge clearance from Pyewipe Junction to Doncaster Decoy North Junction is to be funded from an additional funding source (HPUK). This funding from HPUK will not be available within the time frame of this project and so Network Rail will identify a mechanism whereby interim funding arrangements are established such that the holistic outputs for the GN/GE route are delivered in the timescales below. The commercial arrangements will need consideration;
- some necessary level crossing works will require external planning agreements such as level crossing section orders, which could impact on the completion timescales for increased linespeeds and capacity on certain sections of the route;
- the facility to provide access of the required capacity at the south end of GNGE will continue to be developed during CP4 with delivery assumed in CP5; and
- the full CP4 Delivery Plan 18:01 outputs are dependant on the delivery of the full scope of work, including any capacity connections works at the south end of GNGE.

# Gauge:

- Total of 57 Bridges in programme
- Some for gauge, others to remove HAWs, or prevent HAWs
- Track lowering under certain bridges
- Will provide W9 and W10 as a minimum
  - Where a bridge being reconstructed – W12 will be provided
  - W12 throughout? – no funder identified
  - Clearance for electrification? – no funder found
  - Clearance to W9 and W10 from Pyewipe – Doncaster – Yes, funder found

# *775meter capability:*

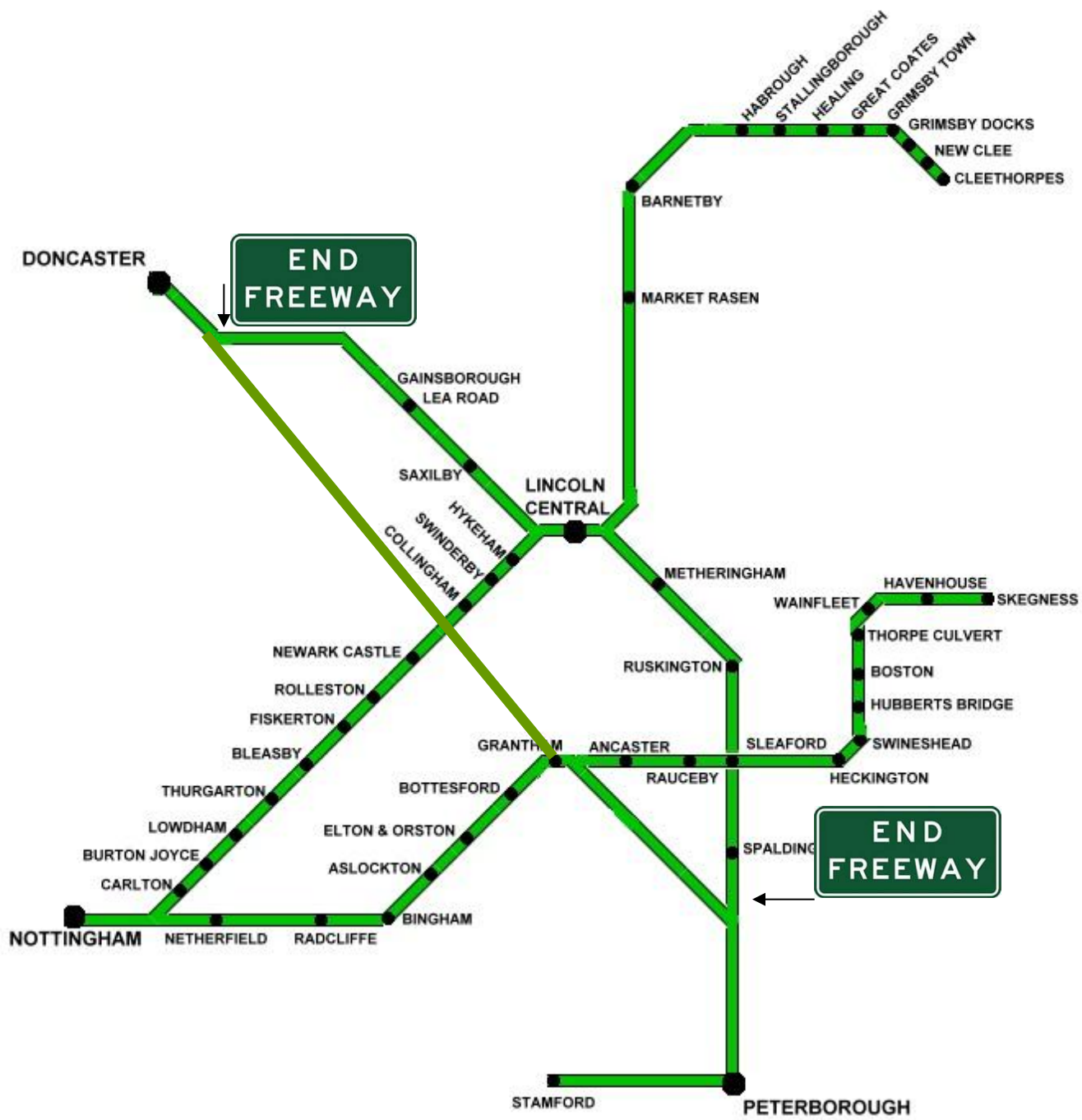
- Yes – capacity and journey time developed on basis of one 775metre train following another 775metre train
- Modelling shows free flow of freight and passenger services
- .....



# Outcomes...

- Parable – winners and losers....
- The steady runner and the sprinter both win..... How?

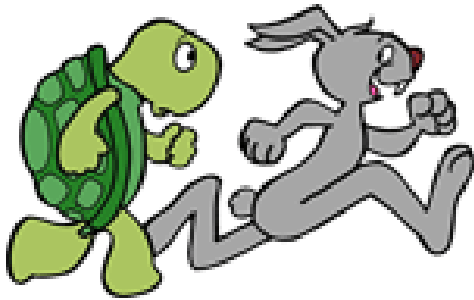




# *No passing?*



# Options:



The Hare keeps stopping....

Tortoise goes slower, or

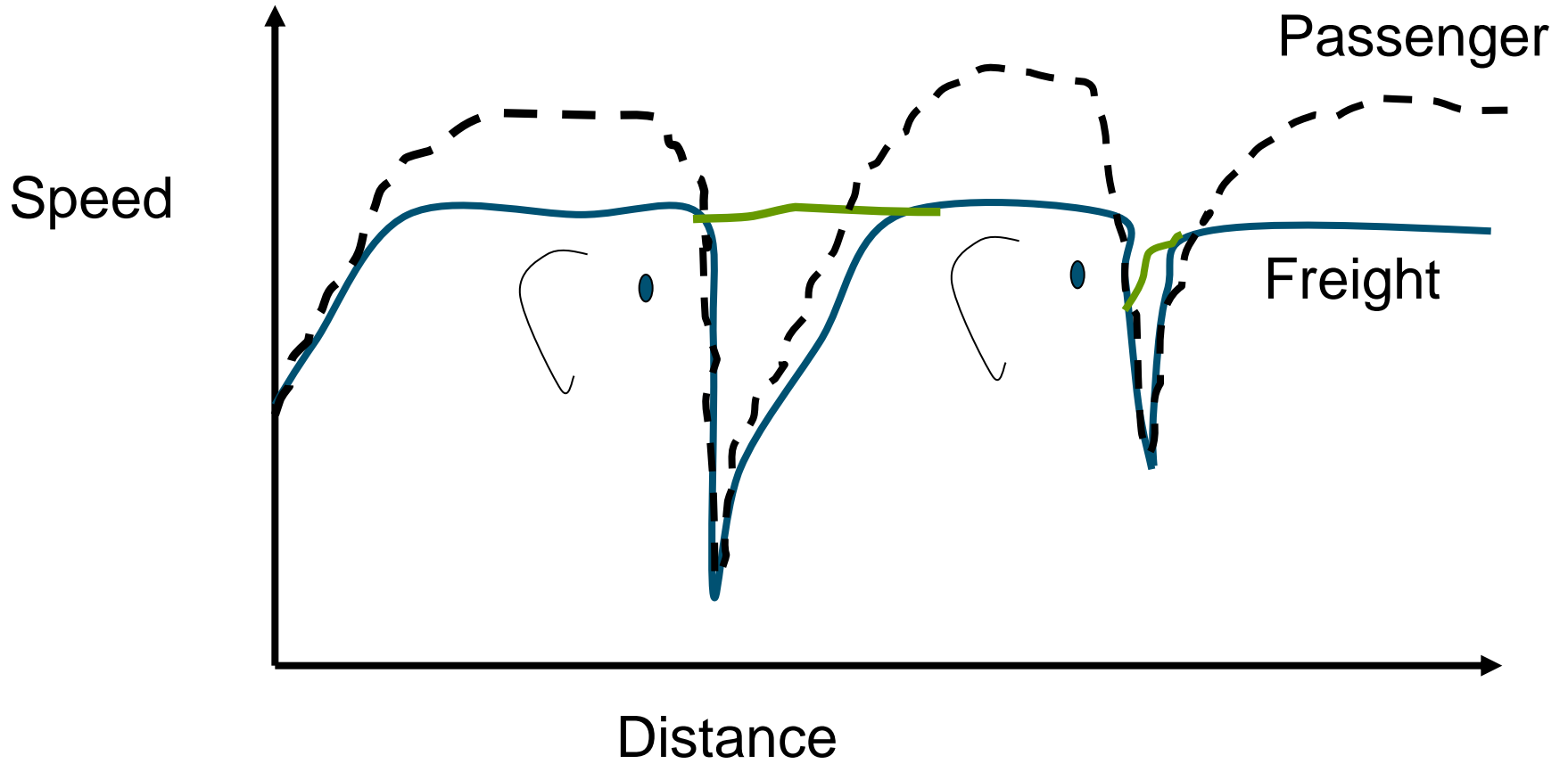
Hare goes faster between stops?

Answer: Hare goes faster, and reaches destination faster. Tortoise still achieves a 'personal best'

# *Elephants and areas:*



# Lines speed profile

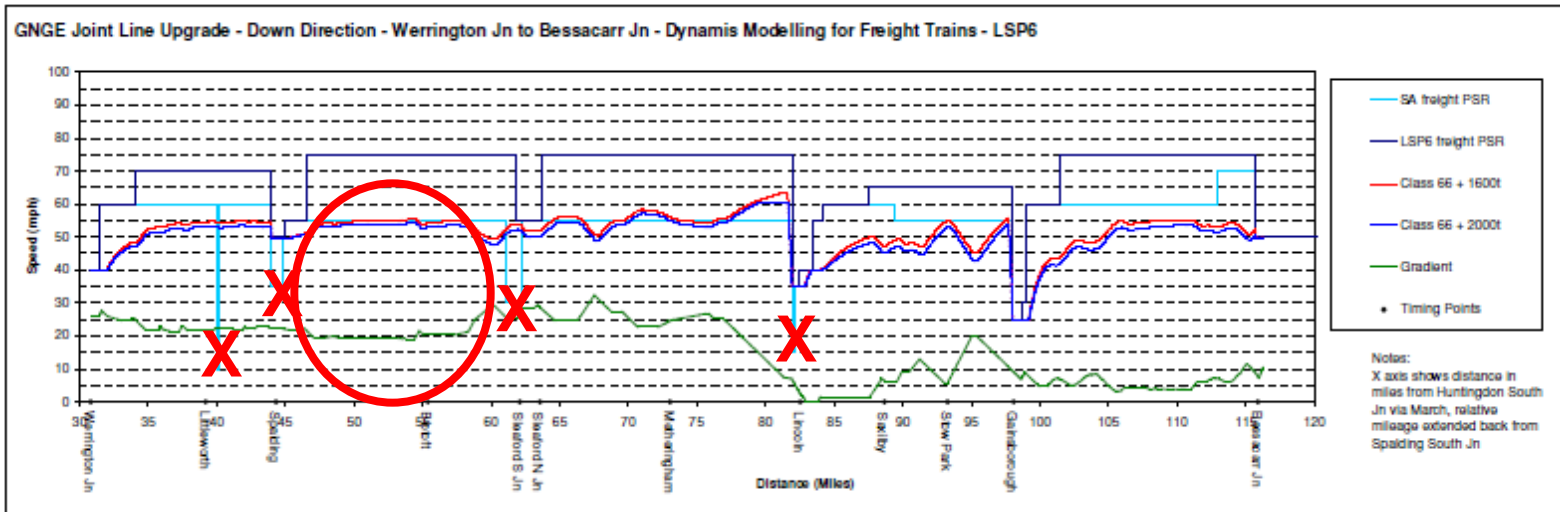


# *Linespeed profile:*

We agreed to investigate:

- 1 Minimise acceleration and braking ✓
- 2 Provide a “steady journeys at steady speeds”, ✓
- 3 Close the gap between Class 4 and Class 6 timings ✓
- 4 Integrate with a passenger service, and improve the timings where practicable ✓

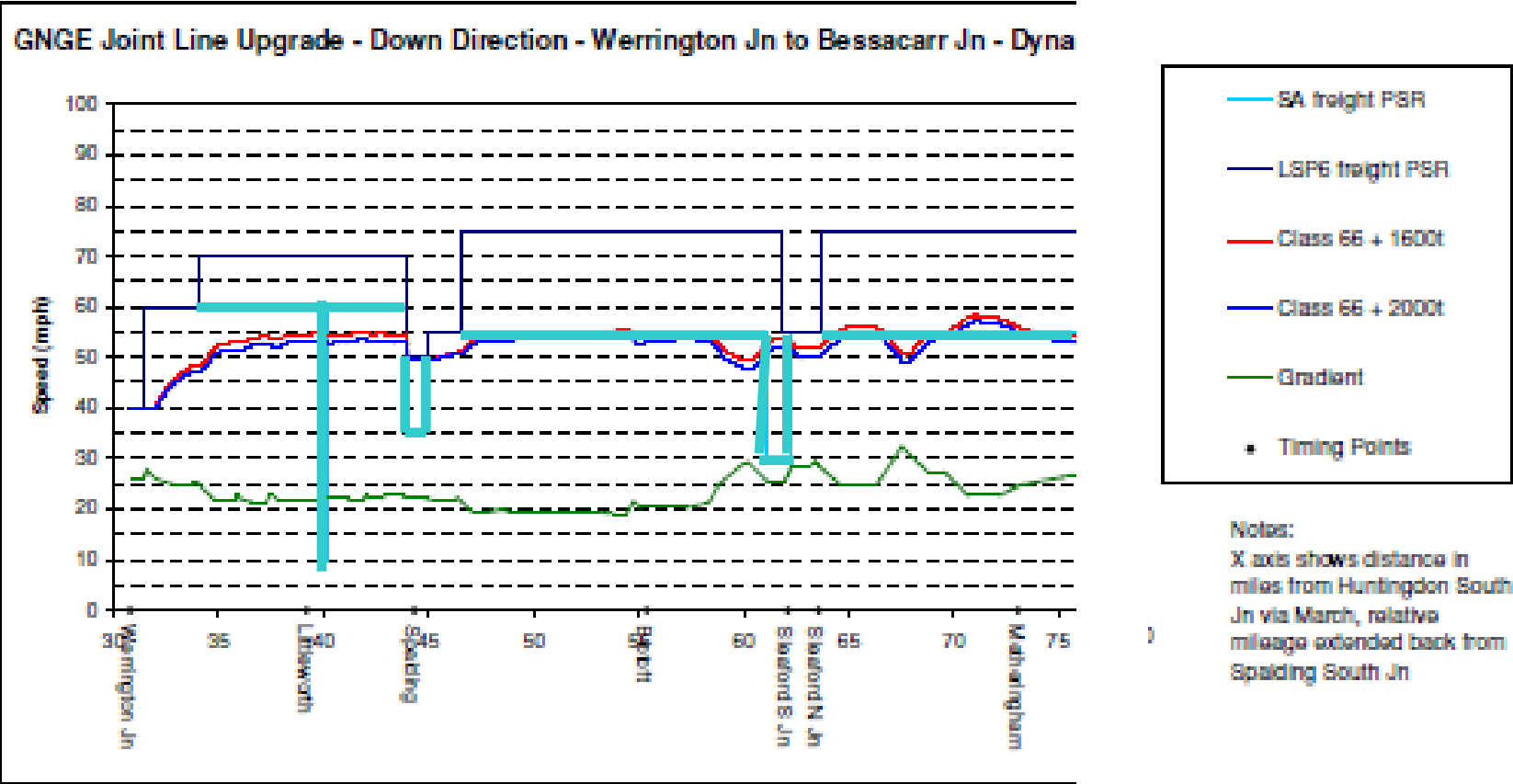
# Linespeed profile (freight North Bound):



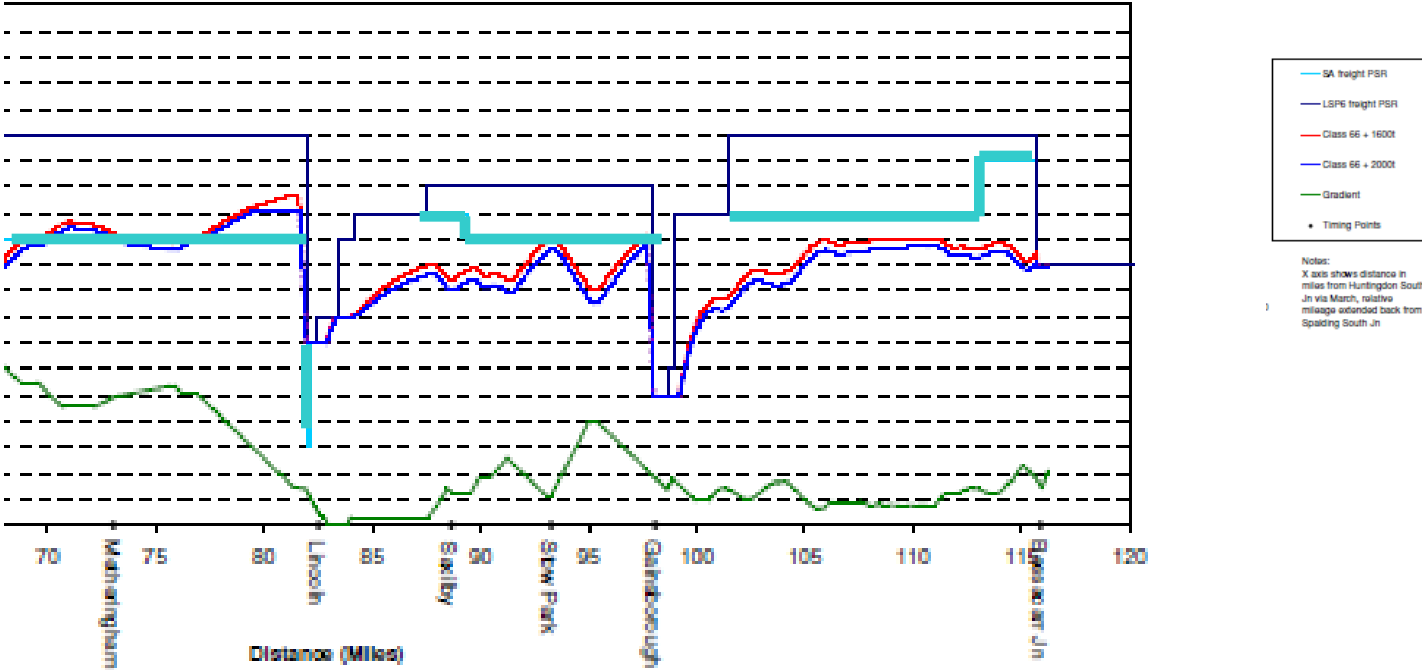
Dynamis modelling – pessimistic?



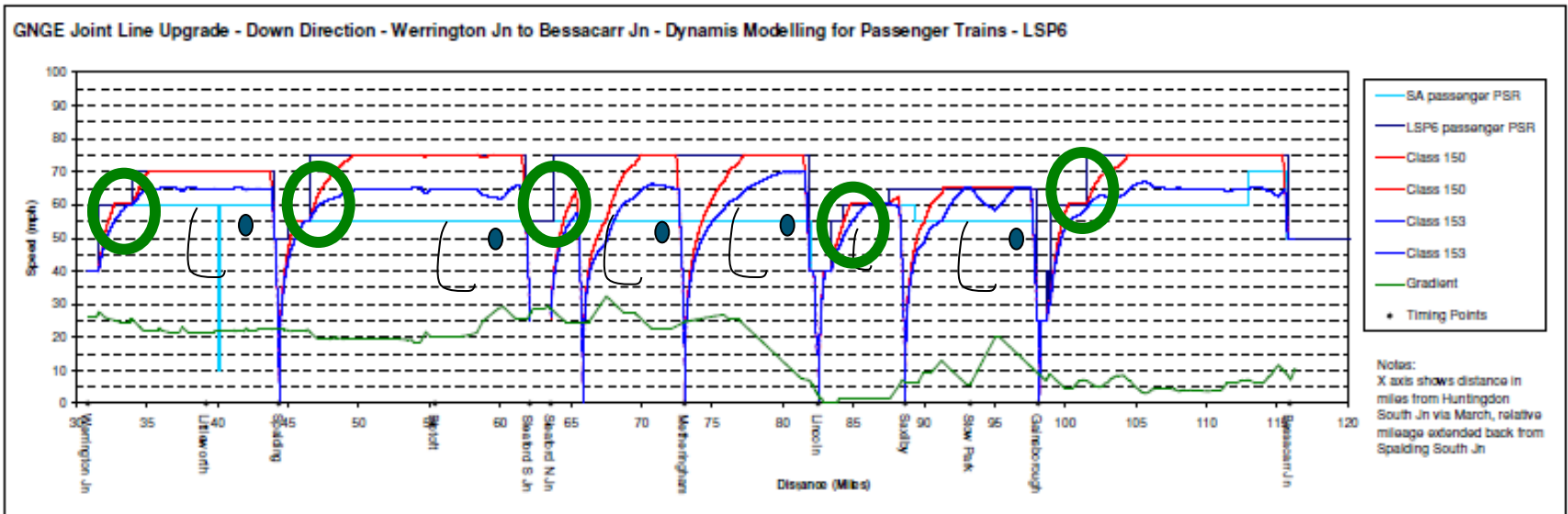
# Linespeed profile (freight North Bound):



# Linespeed profile (freight North Bound):



# Linespeed profile (Passenger North Bound):



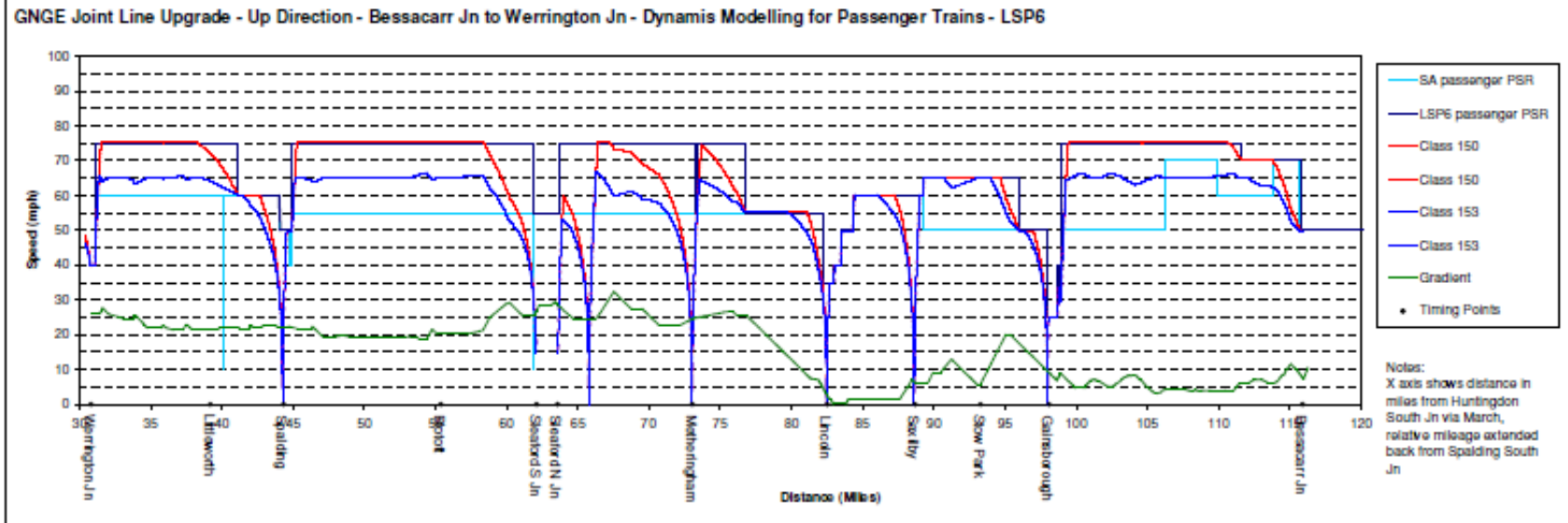
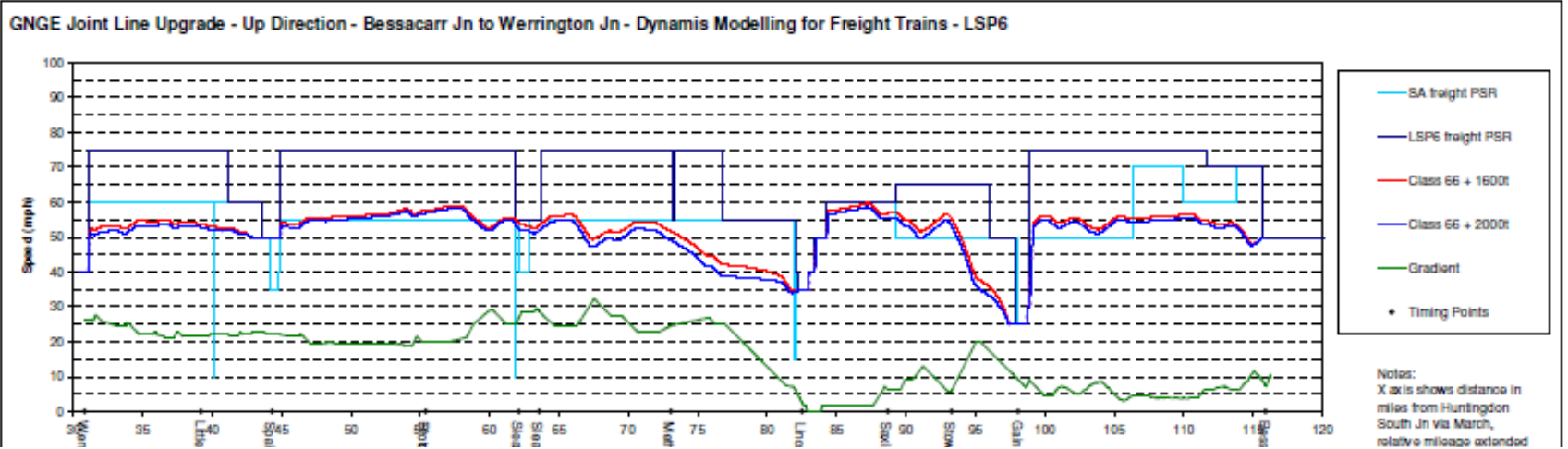
## Headways:

- They vary.....
- Interactions at Spalding, Sleaford and particularly Lincoln and Gainsborough.
- Minimums:

Infrastructure	Direction	Section requiring longest headway	Minimum headway for this section
Base (Existing)	Down	Ruskington - Metheringham	12 mins
Base (Existing)	Up	Pelham Street Jn - Metheringham	18 mins
Re-signalling + LSP6	Down	Blotoft Crossovers - Sleaford South Jn	9 mins
Re-signalling + LSP	Up	Gainsborough Lea Road - Stow Park	10 mins

Table 6. Minimum headway values for the most restrictive section between Werrington Jn and Decoy Water Jn, calculated for Class 66 + 2000 tonnes followed by the same.

# Linespeed: Up direction



# Journey Times, Freight:

## Down Direction

Train Class	Location 1	Location 2	Werrington Jn Passing Time	Decoy N Jn Passing Time	Journey Time	Pathing Time
Class 4	Werrington Jn	Decoy North Jn	10:05:00	11:52:00	1:47:00	0:00:00
Class 4	Werrington Jn	Decoy North Jn	11:05:00	12:52:00	1:47:00	0:00:00
Class 4	Werrington Jn	Decoy North Jn	12:03:00	13:54:00	1:51:00	0:00:04
Class 4	Werrington Jn	Decoy North Jn	13:10:00	14:57:00	1:47:00	0:00:00
Class 4	Werrington Jn	Decoy North Jn	14:05:00	15:52:00	1:47:00	0:00:00
Class 4	Werrington Jn	Decoy North Jn	14:48:00	16:35:00	1:47:00	0:00:00
Class 4	Werrington Jn	Decoy North Jn	16:05:00	17:52:00	1:47:00	0:00:00
Class 4	Werrington Jn	Decoy North Jn	17:05:00	18:52:00	1:47:00	0:00:00

Train Class	Location 1	Location 2	Werrington Jn Passing Time	Decoy N Jn Passing Time	Journey Time	Pathing Time
Class 6	Werrington Jn	Decoy North Jn	9:35:00	11:28:30	1:53:30	0:00:04
Class 6	Werrington Jn	Decoy North Jn	10:35:00	12:24:30	1:49:30	0:00:00
Class 6	Werrington Jn	Decoy North Jn	11:35:00	13:24:30	1:49:30	0:00:00
Class 6	Werrington Jn	Decoy North Jn	12:35:00	14:24:30	1:49:30	0:00:00
Class 6	Werrington Jn	Decoy North Jn	13:35:00	15:28:00	1:53:00	0:00:03
Class 6	Werrington Jn	Decoy North Jn	14:35:00	16:24:30	1:49:30	0:00:00
Class 6	Werrington Jn	Decoy North Jn	15:05:00	16:54:30	1:49:30	0:00:00
Class 6	Werrington Jn	Decoy North Jn	16:35:00	18:24:30	1:49:30	0:00:00

# Journey Times, Freight:

## Up Direction

Train Class	Location 1	Location 2	Decoy N Jn Passing Time	Werrington Jn Passing Time	Journey Time	Pathing Time
Class 4	Decoy North Jn	Werrington Jn	9:50:00	11:37:30	1:47:30	0:00:00
Class 4	Decoy North Jn	Werrington Jn	10:52:00	12:39:30	1:47:30	0:00:00
Class 4	Decoy North Jn	Werrington Jn	11:42:00	13:29:30	1:47:30	0:00:00
Class 4	Decoy North Jn	Werrington Jn	12:24:00	14:11:30	1:47:30	0:00:00
Class 4	Decoy North Jn	Werrington Jn	13:46:00	15:33:30	1:47:30	0:00:00
Class 4	Decoy North Jn	Werrington Jn	14:53:00	16:40:30	1:47:30	0:00:00
Class 4	Decoy North Jn	Werrington Jn	15:51:00	17:38:30	1:47:30	0:00:00
Class 4	Decoy North Jn	Werrington Jn	16:21:00	18:08:30	1:47:30	0:00:00

Train Class	Location 1	Location 2	Decoy N Jn Passing Time	Werrington Jn Passing Time	Journey Time	Pathing Time
Class 6	Decoy North Jn	Werrington Jn	10:34:00	12:29:00	1:55:00	0:00:05
Class 6	Decoy North Jn	Werrington Jn	11:02:00	12:52:00	1:50:00	0:00:00
Class 6	Decoy North Jn	Werrington Jn	12:00:00	13:52:00	1:52:00	0:00:02
Class 6	Decoy North Jn	Werrington Jn	13:28:00	15:22:00	1:54:00	0:00:04
Class 6	Decoy North Jn	Werrington Jn	14:39:00	16:29:00	1:50:00	0:00:00
Class 6	Decoy North Jn	Werrington Jn	15:30:00	17:22:00	1:52:00	0:00:02
Class 6	Decoy North Jn	Werrington Jn	16:00:00	17:50:00	1:50:00	0:00:00
Class 6	Decoy North Jn	Werrington Jn	16:39:00	18:29:00	1:50:00	0:00:00

# Capacity:

- Up direction example:

LOCATION	Arr/Dep	2 Freight	3 Freight	4 Freight	2P63 150	2K29 153	5 Freight	6 Freight	2P65 150	4R17 Freight	7 Freight	2K35 153
DECOY NORTH JUNCTION	Depart	10/34	10/52	11/02	-	-	11/42	12/00	-	-	12/24	-
DECOY SOUTH JUNCTION	Depart	10/35	10/53	11/03	-	-	11/43	12/01	-	-	12/25	-
BESSACARR JUNCTION	Depart	10/36	10/54	11/04	-	-	11/44	12/02	-	-	12/26	-
GAINSBOROUGH TRENT JNS	Depart	10/56	11/13	11/24	11/36½	-	12/03	12/22	12/36	11/48	12/45	-
GAINSBOROUGH LEA ROAD	Arrive	-	-	-	11:38½	-	-	-	12:38	11:51	-	-
GAINSBOROUGH LEA ROAD	Depart	10/57½	11/14½	11/25½	11:39½	-	12/04½	12/23½	12:39	11:53	12/46½	-
STOW PARK	Depart	11/06	11/22½	11/34	11/45	-	12/12½	12/32	12/44½	12/00	12/54½	-
SAXILBY	Arrive	-	-	-	11:50	-	-	-	12:49½	-	-	-
SAXILBY	Depart	11/12	11/28½	11/40	11:50½	-	12/18½	12/38	12:50	12/06	13/00½	-
PYEWIPE JN	Depart	11/17½	11/34½	11/45½	11/58½	-	12/24½	12/43½	12/58	12/12	13/06½	-
BOULTHAM JN	Depart	-	-	-	-	-	-	-	-	-	-	13/24½
WEST HOLMES JN	Arrive	-	-	-	-	-	-	-	-	-	-	-
WEST HOLMES JN	Depart	11/18½	11/35½	11/46½	12/00	-	12/25½	12/44½	12/59½	12/13	13/07½	13/25½
EAST HOLMES JN	Arrive	-	-	-	-	-	-	-	-	12:17	-	-
EAST HOLMES JN	Depart	11/19½	11/36½	11/47½	12/01	-	12/26½	12/45½	13/00½	>>>	13/08½	13/27
LINCOLN CENTRAL	Arrive	-	-	-	12:02½	12:10	-	-	13:02	-	-	13:28
LINCOLN CENTRAL	Depart	11/20	11/37	11/48	12:02½	12:10	12/27	12/46	13:02	-	13/09	13:31
PELHAM STREET JN	Depart	11/20½	11/37½	11/48½	-	12/10½	12/27½	12/46½	-	-	13/09½	13/31½
METHERINGHAM	Arrive	-	-	-	-	12:21½	-	-	-	-	-	13:42½
METHERINGHAM	Depart	11/35	11/50½	12/03	-	12:22	12/40½	13/01	-	-	13/22½	13:43
RUSKINGTON	Arrive	-	-	-	-	12:30½	-	-	-	-	-	13:51½
RUSKINGTON	Depart	11/47	11/58½	12/11½	-	12:31	12/48½	13/09½	-	-	13/30½	13:52½
SLEAFORD NORTH JUNCTION	Depart	11/50½	12/01	12/14	-	12/34½	12/51	13/12	-	-	13/33	13/57
SLEAFORD WEST JN	Depart	-	-	-	-	12/38	-	-	-	-	-	14/00½
SLEAFORD	Arrive	-	-	-	-	12:39	-	-	-	-	-	14:01½
SLEAFORD	Depart	-	-	-	-	12:40	-	-	-	-	-	14:03
SLEAFORD EAST JN	Depart	-	-	-	-	12/41½	-	-	-	-	-	14/04½
SLEAFORD SOUTH JUNCTION	Depart	11/52½	12/02½	12/15	-	12/42½	12/52½	13/13	-	-	13/34½	14/05½
BLOTOFT CROSSOVERS	Depart	12/00½	12/10	12/22½	-	12/50	13/00	13/20½	-	-	13/42	14/13
SPALDING STATION	Arrive	-	-	-	-	13:01	-	-	-	-	-	14:24
SPALDING STATION	Depart	12/12½	12/22	12/34½	-	13:02	13/12	13/32½	-	-	13/54	14:25
LITTLEWORTH	Depart	12/18½	12/28	12/40½	-	13/08	13/18	13/38½	-	-	14/00	14/31
WERRINGTON JN	Depart	12/29	12/39½	12/52	-	13/17	13/29½	13/52	-	-	14/11½	14/40
PETERBOROUGH WESTWOOD SIDINGS	Depart	-	-	-	-	13/19½	-	-	-	-	-	14/42½
PETERBOROUGH	Arrive	-	-	-	-	13:22	-	-	-	-	-	14:45





# Impacts: passenger running times

- Possible changes

Up Direction					Base Timetable		Variant (LSP6) Timetable	
Train ID	Origin	Destination	In-Model Start Location	In-Model End Location	In-Model Start Time	In-Model End Time	In-Model Start Time	In-Model End Time
2P53	Sheffield	Lincoln	Retford Low Level	Lincoln	7:24:00	8:04:00	7:24:00	8:02:30
2P35	Sheffield	Lincoln	Retford Low Level	Lincoln	8:09:30	8:49:30	8:09:30	8:48:00
2P59	Sheffield	Lincoln	Retford Low Level	Lincoln	9:23:30	10:03:30	9:23:30	10:02:00
2P61	Hatfield & Stainforth	Lincoln	Retford Low Level	Lincoln	10:23:30	11:03:30	10:23:30	11:02:00
2P63	Hatfield & Stainforth	Lincoln	Retford Low Level	Lincoln	11:24:00	12:03:30	11:24:00	12:02:30
2P65	Hatfield & Stainforth	Lincoln	Retford Low Level	Lincoln	12:23:30	13:03:30	12:23:30	13:02:00
2P67	Hatfield & Stainforth	Lincoln	Retford Low Level	Lincoln	13:23:30	14:05:00	13:23:30	14:02:00
2P69	Hatfield & Stainforth	Lincoln	Retford Low Level	Lincoln	14:23:30	15:03:30	14:23:30	15:02:00
2P71	Hatfield & Stainforth	Lincoln	Retford Low Level	Lincoln	15:23:30	16:05:00	15:23:30	16:03:00
2P73	Hatfield & Stainforth	Lincoln	Retford Low Level	Lincoln	16:23:30	17:03:30	16:23:30	17:02:00
2P75	Hatfield & Stainforth	Lincoln	Retford Low Level	Lincoln	17:23:30	18:03:30	17:23:30	18:03:30
2P79	Hatfield & Stainforth	Lincoln	Retford Low Level	Lincoln	18:25:30	19:07:00	18:25:30	19:04:00
2K35	Newark Northgate	Peterborough	Newark Northgate	Peterborough	13:02:00	14:53:00	13:02:00	14:45:00
2K45	Newark Northgate	Peterborough	Newark Northgate	Peterborough	15:36:00	17:24:00	15:36:00	17:15:00
2L53	Nottingham	Peterborough	Newark Castle	Peterborough	7:30:00	9:27:00	7:30:00	9:19:30
2L75	Leicester	Sleaford	Newark Castle	Sleaford	16:49:30	17:47:00	16:49:30	17:47:00
2K25	Doncaster	Lincoln	Doncaster	Lincoln	10:22:00	11:16:00	10:22:00	11:10:00
2K37	Doncaster	Lincoln	Doncaster	Lincoln	13:04:00	13:54:00	13:04:00	13:50:00
2K43	Doncaster	Lincoln	Doncaster	Lincoln	14:28:00	15:18:00	14:28:00	15:15:00
2K13	Lincoln	Peterborough	Lincoln	Peterborough	9:10:00	10:31:00	9:10:00	10:22:30
2K17	Lincoln	Peterborough	Lincoln	Peterborough	10:15:00	11:41:00	10:10:00	11:22:30
2K23	Lincoln	Peterborough	Lincoln	Peterborough	11:10:00	12:34:00	11:10:00	12:22:30
2K29	Lincoln	Peterborough	Lincoln	Peterborough	12:08:00	13:32:00	12:10:00	13:22:00
2K39	Lincoln	Peterborough	Lincoln	Peterborough	14:41:00	16:09:00	14:43:00	15:57:00
2K41	Lincoln	Sleaford	Lincoln	Sleaford	15:12:00	15:43:00	15:12:00	15:42:00
2K53	Lincoln	Sleaford	Lincoln	Sleaford	18:12:00	18:43:00	18:12:00	18:42:00
2K03	Spalding	Peterborough	Spalding	Peterborough	7:00:00	7:25:00	7:00:00	7:21:00
2K07	Spalding	Peterborough	Spalding	Peterborough	8:00:00	8:25:00	8:00:00	8:21:00
2K51	Spalding	Peterborough	Spalding	Peterborough	18:02:00	18:27:00	18:02:00	18:23:00

1.5 min

1.5 min

2 - 9 min

7.5 min

0 min

3 - 6 min

8.5 - 12 min

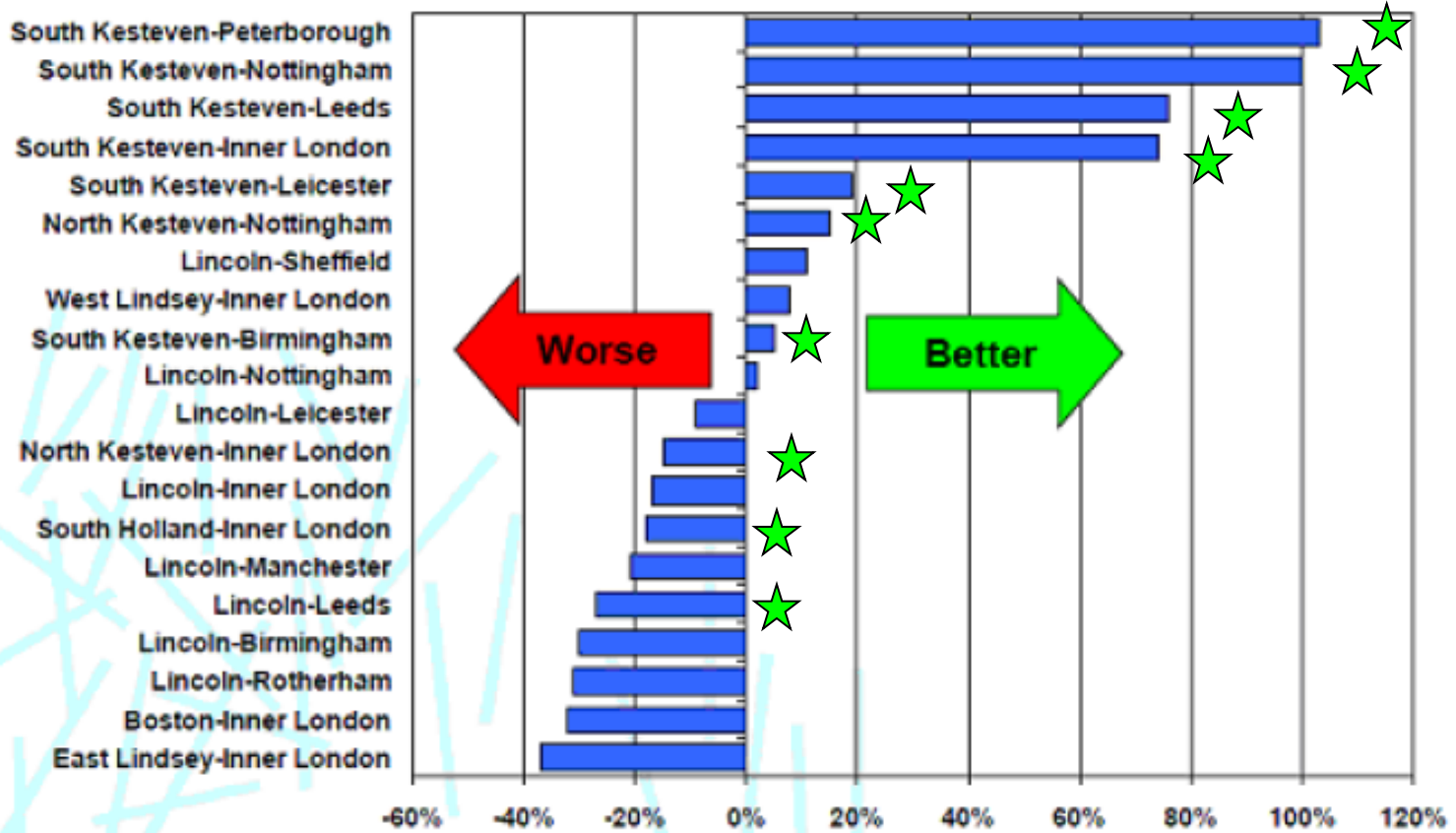
1.0 min

4.0 min

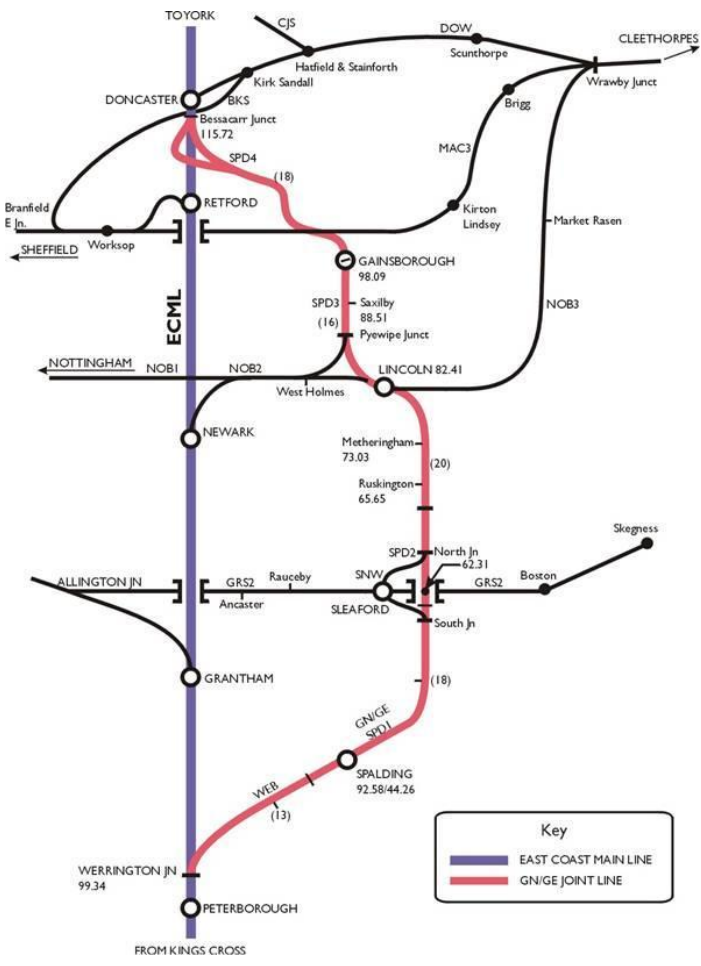
# Journey Times:

From LCC: Lincolnshire Rail Strategy: 2010

How the most important strategic connections for Lincolnshire (2030) measure up against benchmark rail generalised speeds



# Impacts: Diversionary Route



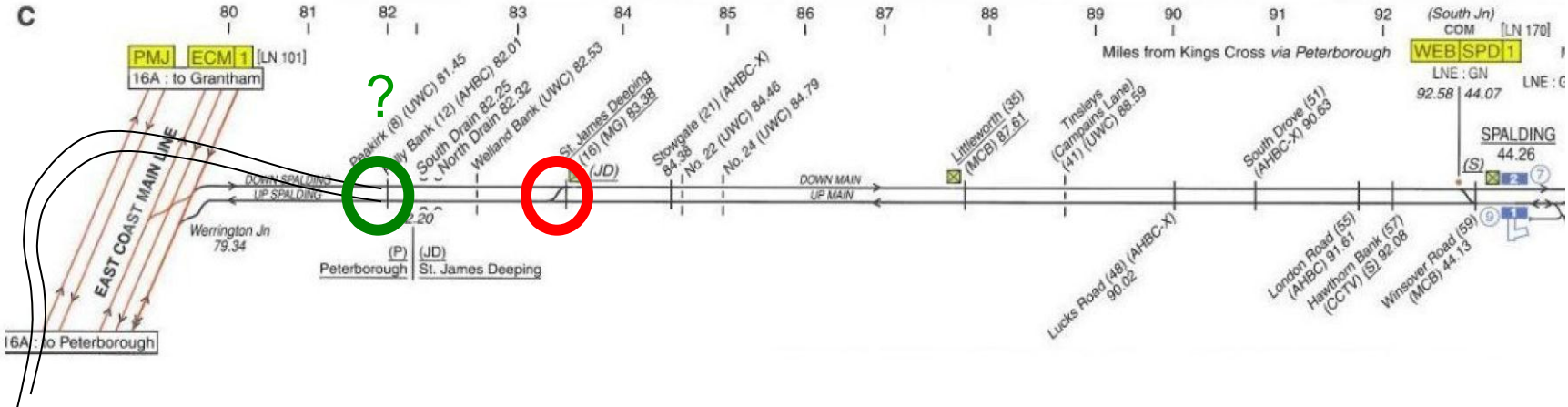
- Remains Non-electrified,
- Current diversionary journey time circa 2hrs 15min?

# Signalling Control:

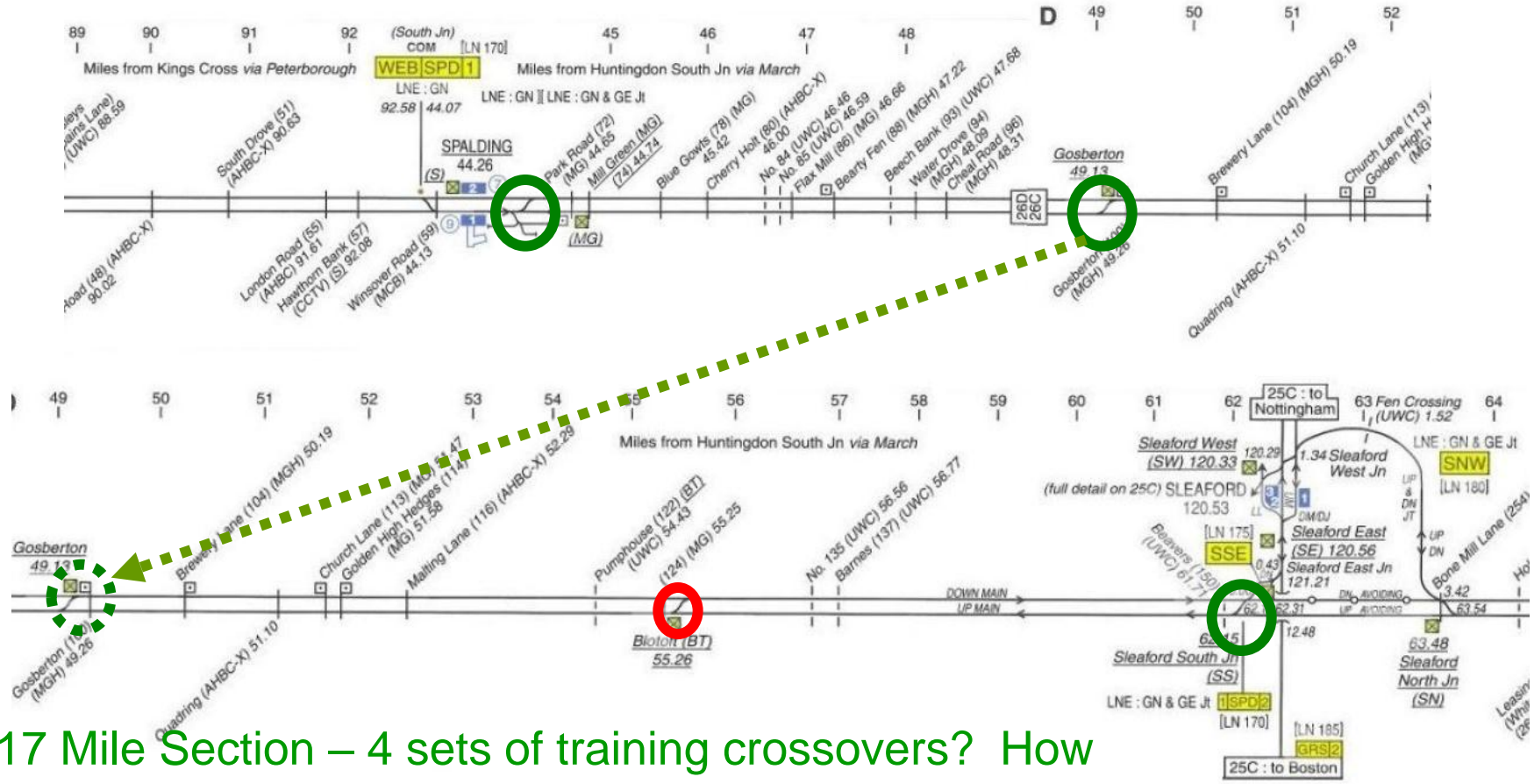
We agreed to investigate:

- 1 Efficiency of the railway,
  - 2 Ability to path trains at short notice,
  - 3 Use of the line as a diversionary route for ECML traffic
- ✓ Secured additional funding
  - ✓ Move point of control to Lincoln (Werrington & Gainsborough Trent Exclusive)
  - ✓ Can be easily staffed 24/7
  - ✓ Improved reliability, and response times.

# Impacts: Abandonments



# Impacts: Abandonments



17 Mile Section – 4 sets of training crossovers? How and when would we use them?



# Maintenance Access:

- Proposal: circa 22:00 to 06:00 weeknights, plus Saturday nights
- No detriment to current enjoyment.



# *Other Questions:*

- ?



# *Reflection:*

- Answer Questions raised from industry, in particular in relation to Network Change,
- Provide more visibility on benefits, ie journey times, capacity etc.,
- To move forward with Network Change,
- To identify other discussions/conversations/actions that need to take place.

- End

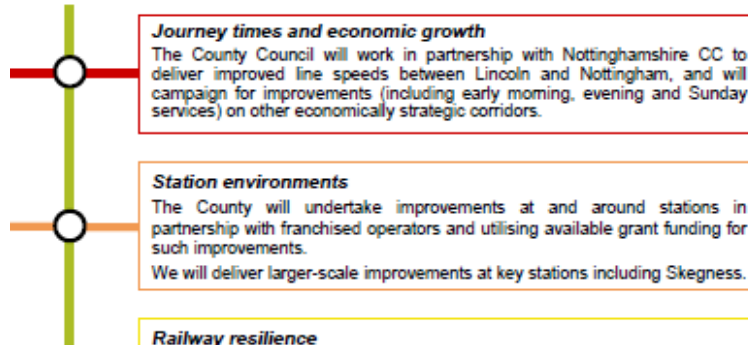
# *Benefits:*

## Passenger

- Opportunity for improved journey times between stations – compressing distances
- Free flow through historic problems and restrictions
- Journey optimised for track curvature and geography
- Smoother and quieter ride quality
- Opportunity for extended opening hours, early morning and late evening
- Greater number of train paths – opportunity for changes to frequency and service pattern.

# Alignment to Lincolnshire Rail Strategy:

## Medium term targets (to 2021)

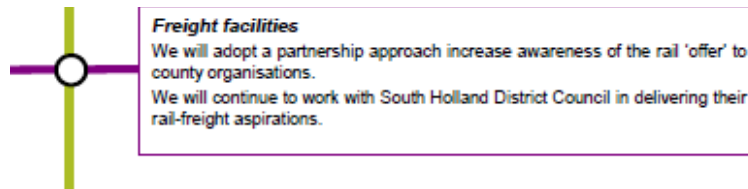


Journey Times

Station Environments

## The Policy

**To improve rail services further for both passengers and freight throughout Lincolnshire to support our local economy, including tourism.**



Freight Facilities

work

# *Station Environments:*

Primarily safety driven:

- Introduction of accessible footbridges
- Removal of passive 'barrow' crossings

Note, user experiences improve when passenger numbers increase....

# *Resilience:*

- New track bed, sleepers and rail
- New signalling system (LED bulbs, available spares etc)
- New level crossing control mechanisms
- Improved highway design and layouts on approach to level crossings
- Improved methods of managing failed trains
- Removal of reliance on track circuits (no more 'leaves on line')
- Improved highway safety through better containment barriers and parapets.

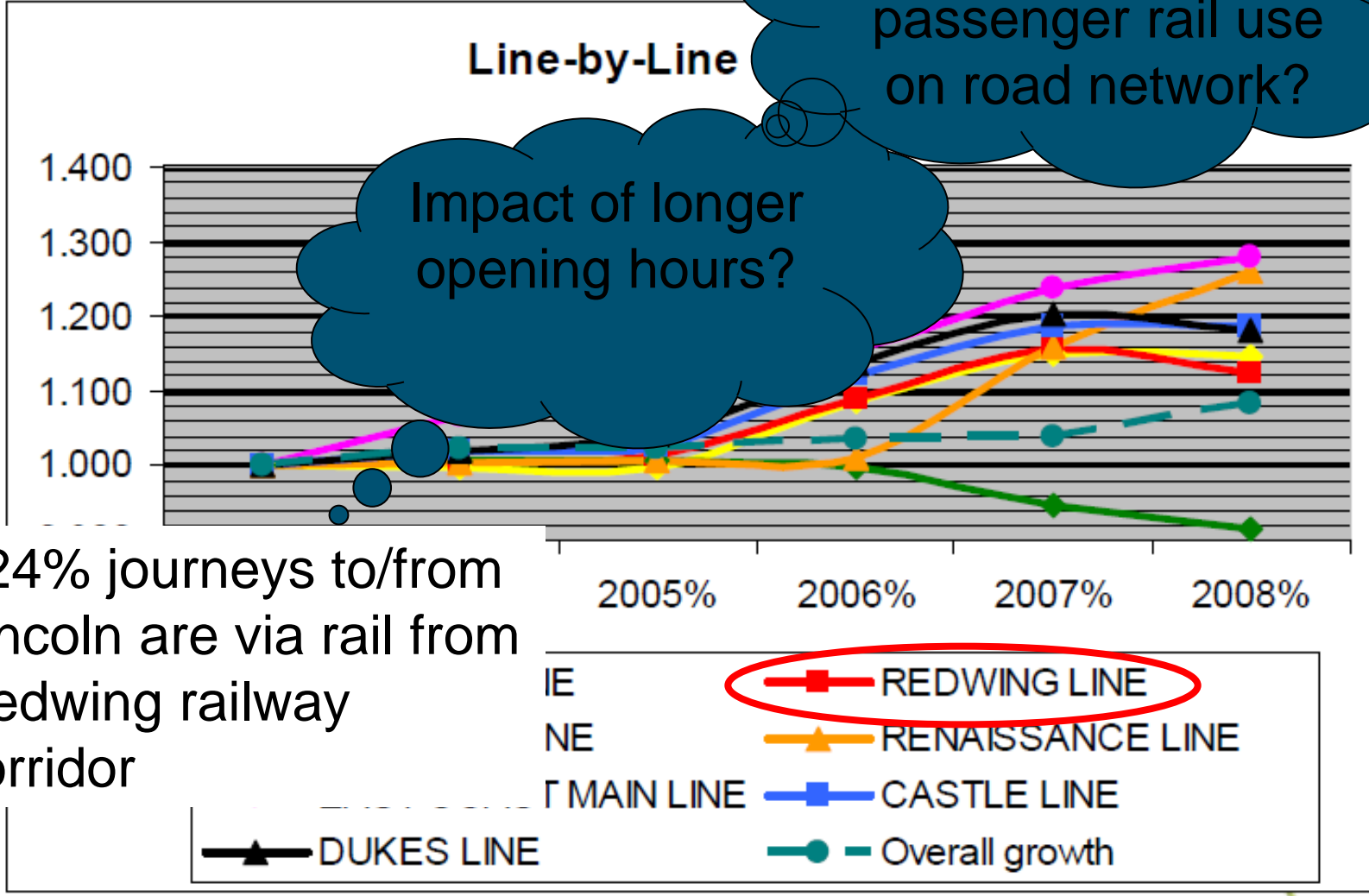
# *Capacity:*

- 2 additional train paths in each hour, in each direction
- Opportunity for a change in service pattern
- Opportunity for extended passenger train operating hours

# South of Lincoln

Impact of increased passenger rail use on road network?

Impact of longer opening hours?

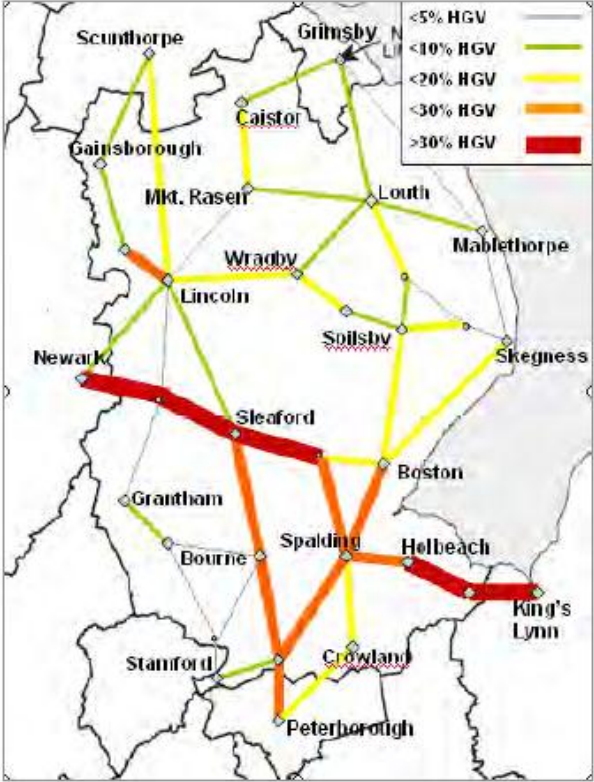


~24% journeys to/from Lincoln are via rail from Redwing railway corridor

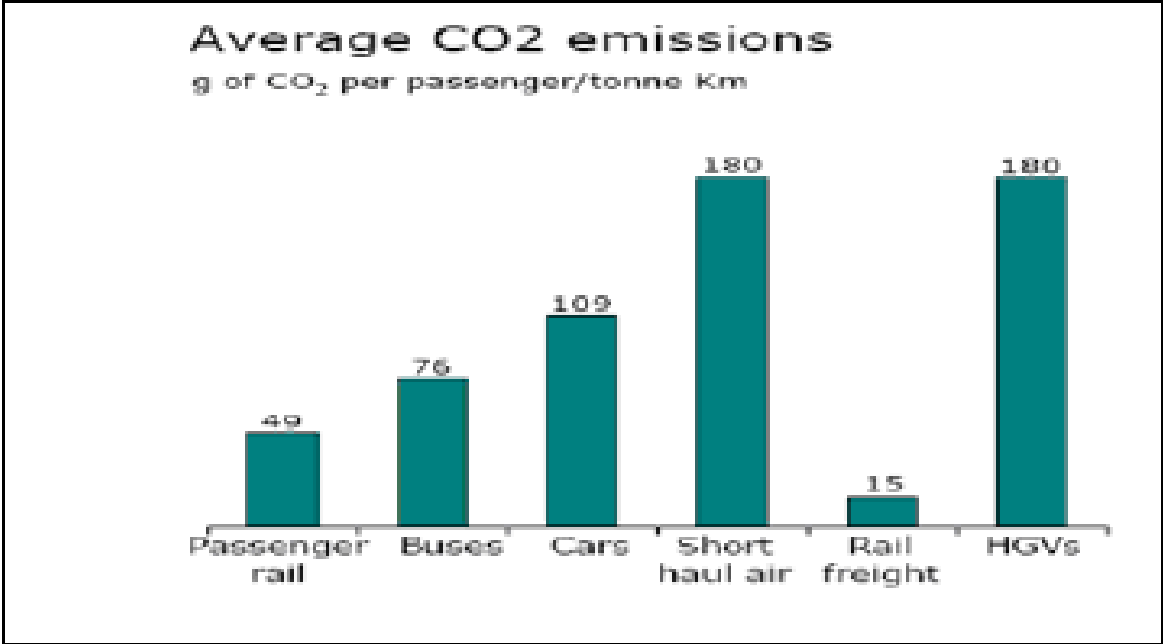


# Freight:

Proportion of HGVs on the Lincolnshire road network.



# Environment:



Lincolnshire is working to reduce its carbon emissions by 20% as part of the Local Area Agreement, and reducing traffic congestion by encouraging a shift to rail can considerably help to drive this reduction.

# *Discussion:*



“The quality of life offer from communities has the potential to attract top-end commuters from London if the quality of

## e Policy

***To improve rail services further for both passengers and freight throughout Lincolnshire to support our local economy, including tourism.***

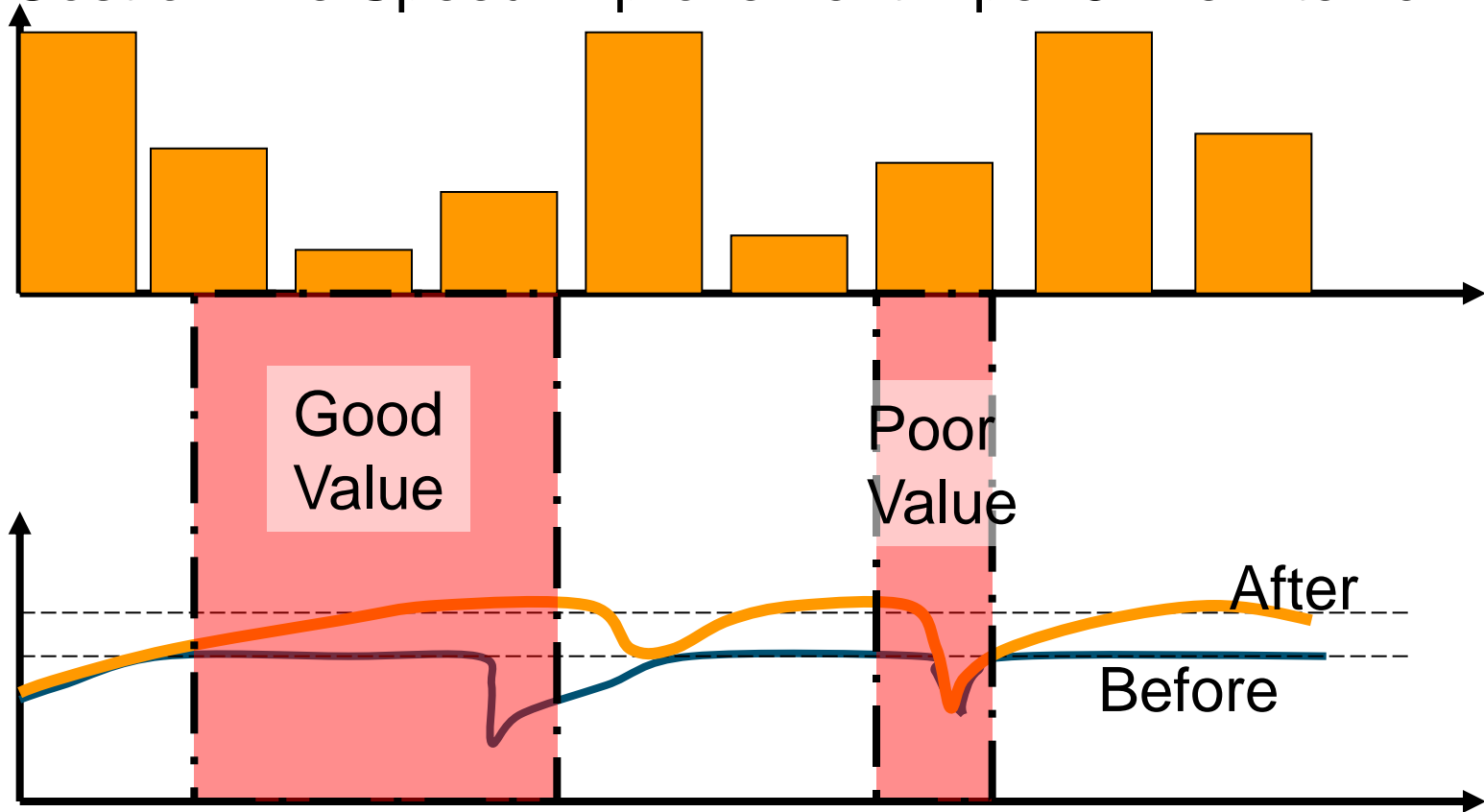
is busiest port (in terms of total freight throughput) will lead to an increase in storage and handling requirements. This will require the infrastructure not only to manage the freight movements to and from the port through the County but also to provide access to the employment opportunities this will offer.

# *Benefits*

## Freight

- Opportunity for improved road/rail/port connectivity
- Fuel consumption and emissions minimised
- Reduced track noise (removal of jointed track)
- Reduced train noise (braking, acceleration)
- Consistent journey time

# Cost of Line Speed improvement – per 5mile interval



Before/After Line speed curves (some constraints remain)

