West Anglia Routes

Results from

WARG station surveys

Autumn 2010

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Reasons for survey

- New long-term Greater Anglia franchise in next 1-3 years
  - now confirmed as 2013
- Good evidence base needed to argue business case for key improvements
  - competition for funding resources with other rail projects
- Doubts about ORR ticket sales-based data
  - this is also two years' old - 2008-09
- Survey may make case for additional gating:
  - 5 WA stations gated now, new revenues can help fund WA schemes
- Baseline to assess impact of future changes / investment

Choice of stations

- Mix of Greater London and Home Counties locations
- Various routes / branches, so stations on each route
- Variety of station user types and London zones
- Some stations all day survey (at least to early evening)
- Others AM or PM including peaks and some off-peak
  - covering more locations with available resources
- Hackney Council also expanded existing surveys

See separate map for route coverage

Survey methodology

- Counts at station or platform entrances
  - NXEA and LOROL approval (thanks to both)
- 2 people for most counts (a few with 3, thanks Roger…)
- Train-by-train boarders and alighters at most stations
  - a few are 5 minute time intervals where high volume + multi-platform (eg Bishops Stortford, Hackney Downs)
- Gross up detailed data in 2 ways to Monday-Friday total - then gross x 300 for year, central estimate from range
  - TfL moderated results and is satisfied with accuracy

Survey detail – example of raw data

HIGHAMS PARK		Original survey				Original survey	
Tuesday 12 October 2010		TOTAL SB (to London)				TOTAL NB (from London)	
(06:20-11:30)			Pass	Pass			Pass	Pass
	Train	Actual	on	off	Train	Actual	on	off
PRE AM PEAK								
	05:14							
	05:29							
	05:44							
	05:59							
	06:14							
	06:29		92	0	06:23		0	5
Extra in aggregate?								
TOTAL PRE AM PEAK			**92**	**0**			**0**	**5**
AM PEAK								
	06:46		104	0	06:53		0	2
	07:01		143	0				
	07:16		146	0	07:23		1	19
	07:31		203	0				
	07:46		324	0	07:51		0	20
	07:58		280	0	08:08		0	36
	08:16		382	3	08:21		4	24
	08:31		285	0				
	08:36		108	0	08:38		2	33
	08:46		148	2	08:53		1	25
	09:01		129	1	09:08		1	15
	09:16		109	1	09:23		1	4
	09:31		115	1				
Extra in aggregate?								
TOTAL AM PEAK			**2476**	**8**			**10**	**178**
Interpeak 1st Hour								
	09:44		44	0	09:38		2	12
	09:59		48	1	09:53		0	16

Survey detail – example of grossing

TOTAL MF ALL DAY											
original survey:	**3229** (06:20-11:30)		**2911**	**15**			**24**	**279**			
modified estimate:	**3399** (incl build up pre AM peak)										
Grossing to all day: (1) itemised basis											
	S/B trains	N/B trains									
Missing early AM	170	0	notional allocation in modified estimates								
Rest of early AM	92	5									
AM peak (Lon arr 7-10)	2484	188									
1st offpeak hour	188	52									
Next offpeak hour	162	58									
Next 3¾ offpeak hours	373	352	taken as last ¾ hour of 2nd offpeak hour (lower passenger numbers), multiplied to 3¾ hours with flows reversed from 13:30								
PM build up hour	52	188	taken as 1st offpeak hour (reversed), with schoolchildren within PM peak (at 50% of offpeak rate)								
PM peak (Lon dep 4-7)	396	2111	reversed flows, with N/B taken as 85% of AM peak S/B, and allowance for more travel to Central London for evening activities								
PM peak shoulder hour	50	258	10% of that 15% in London + light offpeak (say 60, primarily to London)								
Evening offpeak	50	805	nominal offpeak volume + rest of return from London (over 5 hours until last train)								
	4,017	**4,017**									
TOTAL DAY (itemised)	**8,034**										
Grossing to all day: (2) proportional basis											
Survey total 05:15 to 12:00	3,399		6¾ hours, includes notional pre AM peak build up								
x 2 for return flows	3,399		= 13½ hours								
Missing offpeak period	450		3 hours offpeak at 150 passengers per hour								
Evening period	200		nominal extra travel in late PM and evening								
TOTAL DAY (proportional)	**7,448**										
Indicative daily volume	**7,450**	**8,050**	Indicated lower / upper range								
Grossing to year	**2,235,000**	**2,415,000**	300	day to year multiplier	**2,325,000**	central estimate					
ORR entry + exit 2008/09	**1,591,470**										
ORR entry + exit 2007/08	**1,726,941**										
WARG survey % change	**+40%**	**+52%**	ORR 2008/09 to Autumn 2010		**+46%**						
	+29%	**+40%**	ORR 2007/08 to Autumn 2010		**+35%**						

Overall results

WEIGHTED AVERAGE CHANGES IN STATION USE ON WEST ANGLIA ROUTES

based on WARG surveys Autumn 2010
usage is only shown for stations surveyed
(excl Hackney Interchange, Stratford LV)

	ORR 2008/09 entry+exit volume	WARG 2010 central estimate	% Growth from ORR average	% Growth from ORR rounded
Greater London stations	**7,878,296**	**15,108,300**	92%	
Inner London Zone 2	1,612,588	3,655,800	127%	**125%**
Inner London Zone 3	1,199,674	2,452,500	104%	**100%**
Outer London Zones 4, 5, 6	5,066,034	9,000,000	78%	**75%**
Home Counties stations	**4,781,296**	**5,752,500**	20%	
Middle range to Hertford East	1,534,988	1,965,000	28%	**25%**
Outer range to Cambridge	3,246,308	3,787,500	17%	**15%**

Greater London results – Zones 1-3

Survey location	Local authority	Oyster Zone	ORR 2008/09 entry+exit volume	WARG 2010 central estimate	% Growth from ORR central	% Growth from ORR range
WHITE HART LANE	Haringey	3	649,274	1,170,000	80%	69-92%
ST JAMES' STREET	Waltham Forest	3	550,400	1,282,500	133%	129-137%
HACKNEY DOWNS	Hackney	2	1,277,974	2,137,500	67%	60-74%
HACKNEY INTERCHANGE	Hackney	2	130,725	165,000	26%	21-32%
LONDON FIELDS (incl Sunday as 50% Sat)	Hackney	2	184,394	846,525	359%	329-359% excl or incl Sun
CAMBRIDGE HEATH (incl Sunday as 50% Sat)	Tower Hamlets	2	150,220	671,775	347%	327-347% excl or incl Sun

London Fields and Cambridge Heath based on LBH 2 x year counts May + Nov/Dec, with Saturday counts in Autumn 2010

			NXEA 2006 one day with-flow peaks only	WARG 2010 equiv part of all-day counts	% Growth	WARG 2010 all year
STRATFORD LEA VALLEY	Newham	3	991	2,189	121%	1,308,300
			Autumn 2006	Autumn 2010	2006>2010	

Greater London results – Zones 4-6

Survey location	Local authority	Oyster Zone	ORR 2008/09 entry+exit volume	WARG 2010 central estimate	% Growth from ORR	
					central	range
ENFIELD LOCK	Enfield	6	839,516	1,905,000	127%	118-136%
BUSH HILL PARK	Enfield	5	648,074	1,410,000	118%	104-131%
EDMONTON GREEN	Enfield	4	1,986,974	3,360,000	69%	68-70%
HIGHAMS PARK	Waltham Forest	4	1,591,470	2,325,000	46%	40-52%

Home Counties results

Survey location	Local authority	Miles Liv St	ORR 2008/09 entry+exit volume	WARG 2010 central estimate	% Growth from ORR central	% Growth from ORR range
AUDLEY END	Uttlesford Essex	41¾m	765,608	877,500	15%	14-16%
BISHOPS STORTFORD	East Herts Hertfordshire	30¾m	2,480,700	2,910,000	17%	15-20%
HERTFORD EAST	East Herts Hertfordshire	24¾m	613,476	735,000	20%	12-27%
WARE	East Herts Hertfordshire	22¾m	921,512	1,230,000	33%	32-35%

Other surveys

Enfield Lock level crossing open periods, PM peak

Time barrier open during PM peak 2½ hours

51:14 mins:secs

So only open $^{1}/_{3}$ of time, closed $^{2}/_{3}$

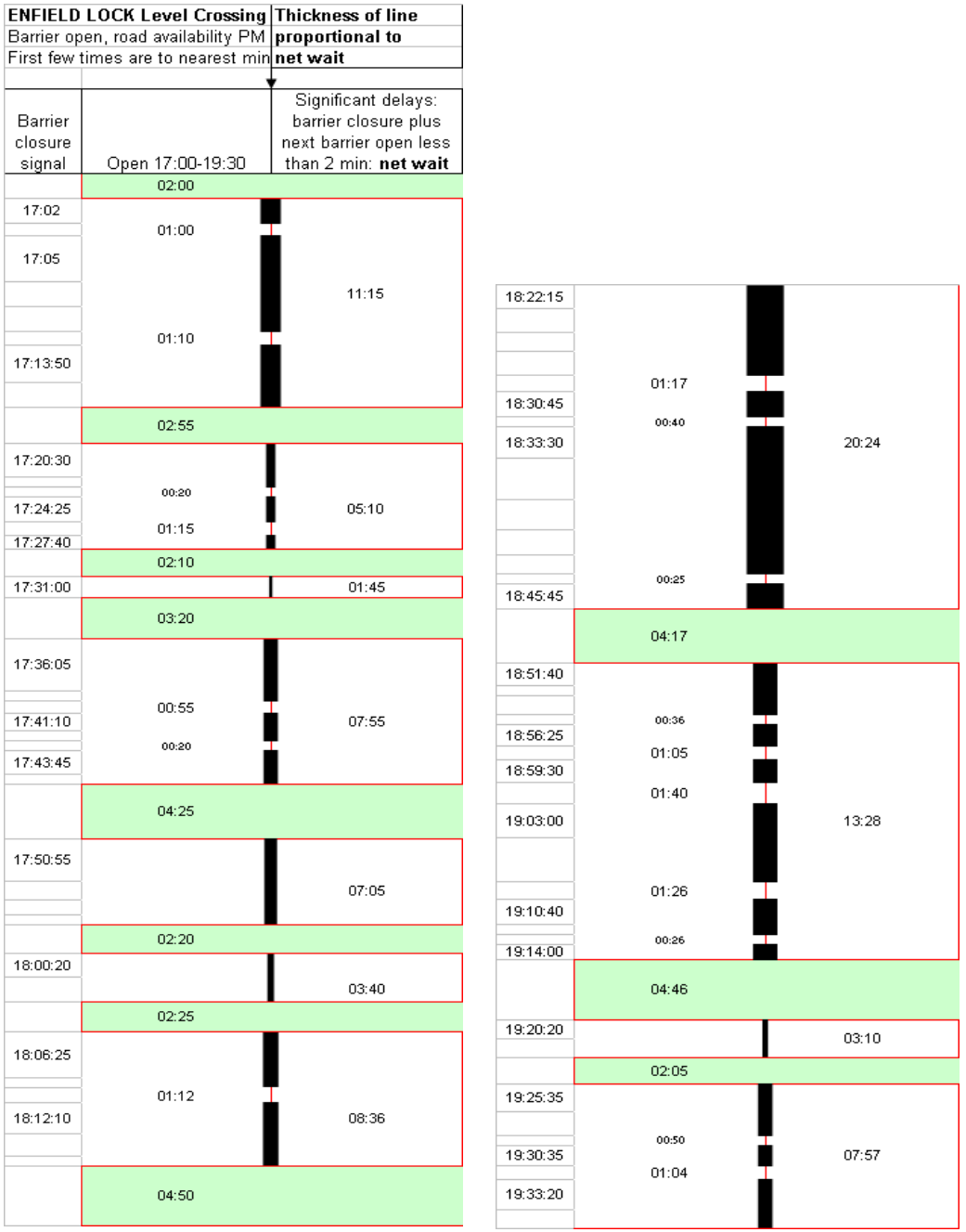
Good' open periods - better than 2 mins

33:33 mins:secs

green time slots on graph

Most useful crossing periods limited to

21% of 2½ hours



Other surveys

Interchange sample survey between Hackney Downs and Hackney Central

Interchange volume between Hackney Downs and Central	
6-8%	**of overall sample**
WARG 2010 volume for Hackney Downs	
central	**range**
2,302,500	**2,205,000-2,400,000**
of which	
165,000	**Average interchange flow per year**
130,725	**ORR 2008/09**
26%	**% Growth from ORR**

				Interchange %	
Hackney Downs volumes				**Entry**	**Exit**
	HD sample (exit only)	Entry>D	Exit>C	% rate	% rate
Start>					
6:00>					
	4		1	0%	25%
6:30>					
	19	2	4	11%	21%
7:00>					
	18	5	5	28%	28%
7:30>					
	37	2	3	5%	8%
8:00>					
	37	1	4	3%	11%
8:30>					
	21	0	2	0%	10%
9:00>					
		0			
9:30>					
	12		0	0%	0%
10:00>					
	37	4	2	11%	5%
11:00>					
	47	3	2	6%	4%
12:00>					
		2			
13:00>					
	30	0	0	0%	0%
14:00>					
	53	1	0	2%	0%
15:00>					
	57	3	1	5%	2%
16:00>					
	16	2	2	13%	13%
16:30>					
	29	5	1	17%	3%
17:00>					
	22	2	3	9%	14%
17:30>					
	26	7	2	27%	8%
18:00>					
	34	0	0	0%	0%
18:30>					
	17	2	1	12%	6%
19:00>					
Totals	**516**	**41**	**33**	**8%**	**6%**

Other surveys

Proportion of flows to/from stations north of survey location (against main flow)

FLOW ESTIMATES to/from stations South and North

from survey station

no directional survey at Hackney Downs

	South %	North %	Applied to grossed up central estimate (all year) entries/exits	to/from South	to/from North
HIGHAMS PARK	99%	1%	2,325,000	2,298,323	26,677
BUSH HILL PARK	95%	5%	1,410,000	1,346,101	63,899
ENFIELD LOCK	89%	11%	1,905,000	1,694,182	210,818
BISHOPS STORTFORD	86%	14%	2,910,000	2,515,670	394,330
WARE	85%	15%	1,230,000	1,046,125	183,875
EDMONTON GREEN	85%	15%	3,360,000	2,845,306	514,694
ST JAMES' STREET	84%	16%	1,282,500	1,076,121	206,379
AUDLEY END	82%	18%	877,500	718,198	159,302
WHITE HART LANE	81%	19%	1,170,000	946,651	223,349
STRATFORD LV	66%	34%	1,308,300	864,300 sb AM, nb PM	444,000 nb AM, sb PM
HERTFORD EAST	58%	42%	735,000	426,087 sb AM, nb PM	308,913 nb AM, sb PM
LONDON FIELDS	51%	49%	846,525	428,015	418,510
CAMBRIDGE HEATH	12%	88%	671,775	80,399	591,376
	78%	22%		16,285,477	3,746,123

Preliminary conclusions

- Much greater passenger numbers than ORR suggests
- Causes? ORR methodology, Oyster PAYG, avoiding fares
- TfL London Rail agrees WARG data + grossing is robust
- Sliding scale of extra use Inner London > Home Counties
- Greater London stations roundly **2x** busier than official data
- Home Counties stations have also seen growth, **15-33%**
  - Hertford East line merits more attention
- Rail planning may seriously under-value user volume and business cases for inner and middle range services

Opportunities to use data

- Stimulus to change estimation of London rail volumes
- Evidence for commentary on NXEA timetable changes
- Basis for revising project priorities and business cases
  - local Lea Valley track and services, station improvements, better services via Edmonton Green, Hertford East line
- Input for transport element of spatial change (eg, ULV), LSE 2nd Generation strategy > HLOS2 / CP5
- New high capacity inner trains needed sooner
- Stronger case for station gating raising more revenue
  - to re-invest in the railway

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