



Ticketless Travel Survey
For DfT – South Central Franchise Specification
June-July 2008
Final Report

11th August 2008
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Results Summary: Fare evasion rates

Weighted average for all Southern suburban service groups

Low, Central, High Cases

Day/ Time	Low Case % Fare evasion	Central Case % Fare evasion	High Case % Fare evasion
Mon - Fri	7.2%	8.0%	10.9%
0600-1000	8.7%	9.5%	11.7%
1000-1600	5.8%	6.5%	8.0%
1600-1900	6.2%	7.2%	12.5%
1900-2400	8.9%	10.1%	14.2%
Saturday	7.4%	8.1%	10.6%
Sunday	7.5%	8.2%	10.9%
Overall (weighted average)	7.2%	8.0%	10.9%

High during 0600-1000 Mon-Fri due to high level of passengers using ticket at invalid time (e.g. Off-peak tickets, railcards not valid in AM peak)

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Survey Scope

Survey Scope

- As agreed with DfT, survey focussed on Southern suburban network
- 5 routes were surveyed:
 - London Victoria - Sutton (via West Croydon)
 - London Bridge - Beckenham Junction (via Crystal Palace)
 - London Victoria - Epsom (via Mitcham Junction)
 - East Croydon - Caterham / Tattenham Corner
 - London Bridge - London Victoria (via Denmark Hill / Streatham Hill)
- Survey Timetable
 - 43 shifts between 27th June and 6th July 2008
 - Detailed shift schedule provided
 - Morning shift: 06:00 - 15:00
 - Afternoon shift: 15:00 - 23:00

Survey Timetable

- All planned engineering works were considered and avoided when designing survey timetable.
- Due to planned engineering works at the weekend, could only survey Victoria - West Croydon section of Victoria - Sutton route on Sunday.
- Days/routes with no service or planned engineering highlighted in timetable below.
- There is no service on London Bridge - Beckenham Junction route on Sundays, therefore no results collected for this route on Sundays.

	June 27th	28th	29th	30th	July 1st	2nd	3rd	4th	5th	6th
	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Victoria - Sutton / West Croydon (am)	X	X	X	X		X				
Victoria - Sutton / West Croydon (pm)		X	X		X		X			
London Bridge - Beckenham (am)					X	X	X		X	
London Bridge - Beckenham (pm)	X	X		X						
Victoria - Epsom via Mitcham Junction (am)	X			X			X		X	X
Victoria - Epsom via Mitcham Junction (pm)					X	X			X	X
E Croydon to Caterham/Tattenham Corner (am)	X		X		X	X			X	
E Croydon to Caterham/Tattenham Corner (pm)		X		X			X			X
Victoria - London Bridge via Denmark Hill (am)			X	X	X		X		X	
Victoria - London Bridge via Denmark Hill (pm)			X							
Victoria - London Bridge via Streatham Hill (pm)	X	X				X				
Total	5	5	5	5	5	5	5	0	5	3

Survey Methodology

Survey Methodology

- I Computerised Survey
 - Handheld computers
 - Dedicated Software

- I Surveyors
 - Full briefing provided by SDG and Southern
 - Detailed shift schedule provided, indicating exact trains and route sections to survey
 - Recorded information for every passenger in a train carriage, including alighters and those refusing to show their ticket

- I Debrief with fieldwork contractor and a representative from Southern
 - Observed that there were lots of alighters who were believed to be getting off at their stop, due to surveyed routes being busy suburban routes.
 - Observed that at busy times of day, once one passenger refused, others often followed suit and refused to take part in survey.

- I Data analysed and cleaned
 - Any miscoded passenger classes were changed

Ticket and Pass Types

- Surveyors coded passengers' tickets under the following ticket categories:
 - Single
 - Return
 - PERTIS (Permit to Travel)
 - Rail Season Ticket
 - Oyster Travelcard
 - Paper Travelcard
 - Oyster Pre-Pay
 - Freedom Pass
 - Staff Pass / British Rail Ticket
 - Police Pass
 - Other Pass / Ticket
- Further details were recorded about the exact type of ticket/pass (e.g. Open Return, Young Persons Railcard) and its validity

Passenger Class

I Irregularity Profile

- 16 Passenger Irregularity Types
- Aggregated:
 - Valid
 - No Ticket (Non-payment)
 - Invalid Ticket (see next slide for breakdown)
 - Refused
 - Alighted

Invalid Ticket Categories

Invalid Ticket

Non-payment	The passenger cannot produce a ticket of any kind
Used at invalid time	The ticket or pass is being used at the wrong time of day
Child impersonation	The passenger has a child ticket or pass, but is clearly an adult
Used on invalid departure	The ticket is being used invalidly on a restricted service
Journey taken after valid date	The ticket or pass has expired
Journey taken before valid date	The pass is not yet valid
Overriding	The passenger has travelled further than the destination shown on their ticket
Forged/Altered	The ticket/pass/photocard has been tampered with/forged, defaced or altered
Invalid Class	The passenger is travelling in First Class but has a Standard ticket / pass
Misuse of railcard	The passenger has a ticket or pass that requires a railcard, but does not possess the appropriate card
No photocard	The passenger has a pass but no valid photocard
Transferred use	The passenger is using someone else's pass (photocard does not match)
Invalid use of Oyster Pre-pay	The passenger is trying to use an Oyster card with pre-pay money stored on it
Refusal	Passenger refuses to take part in survey

Survey Results (after data cleaning)

Survey Results

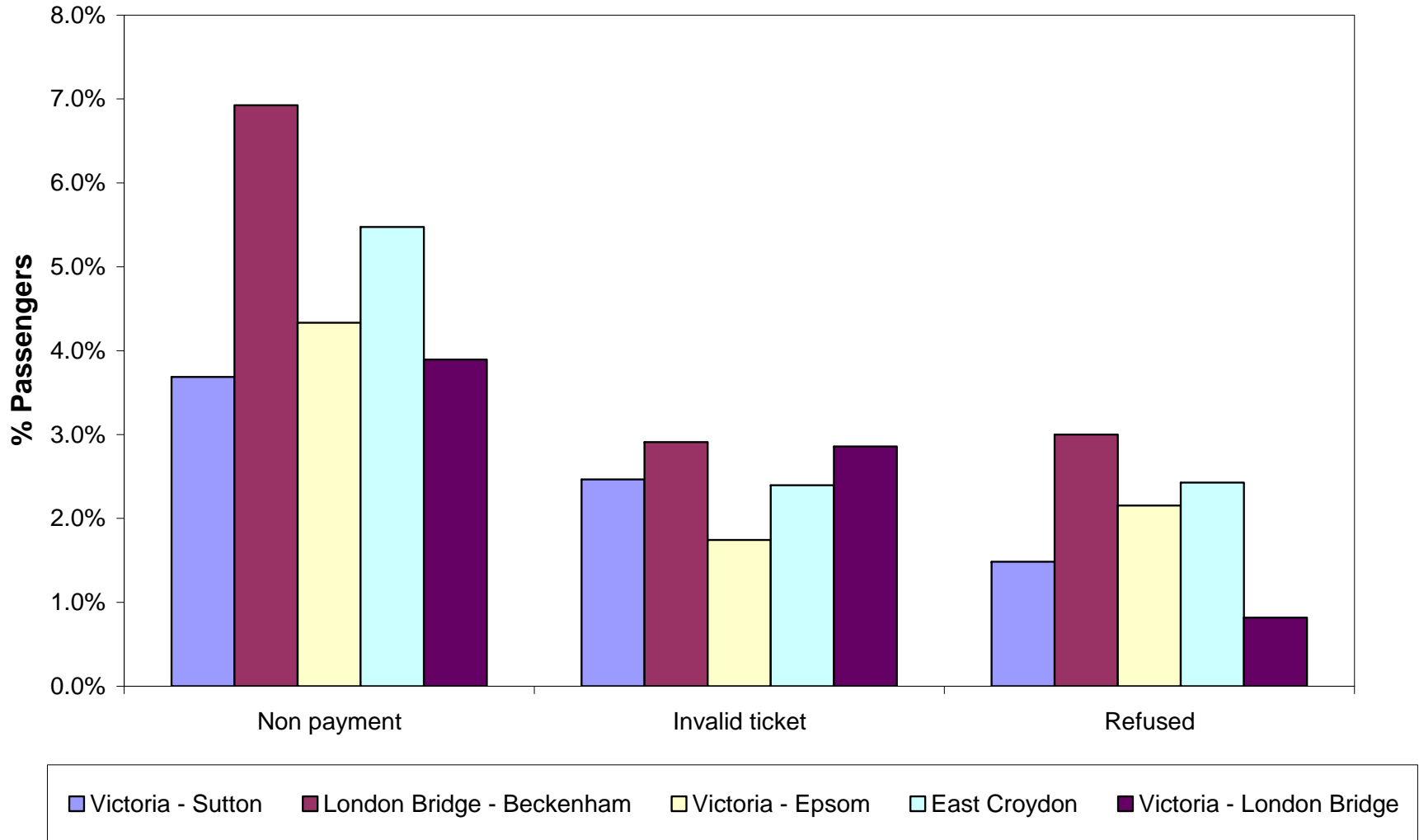
I Overall

- 20,032 Observations
- 319 (1.6%) Refusals
- 2,926 (14.6%) Alighters
- 17,106 excluding Alighters

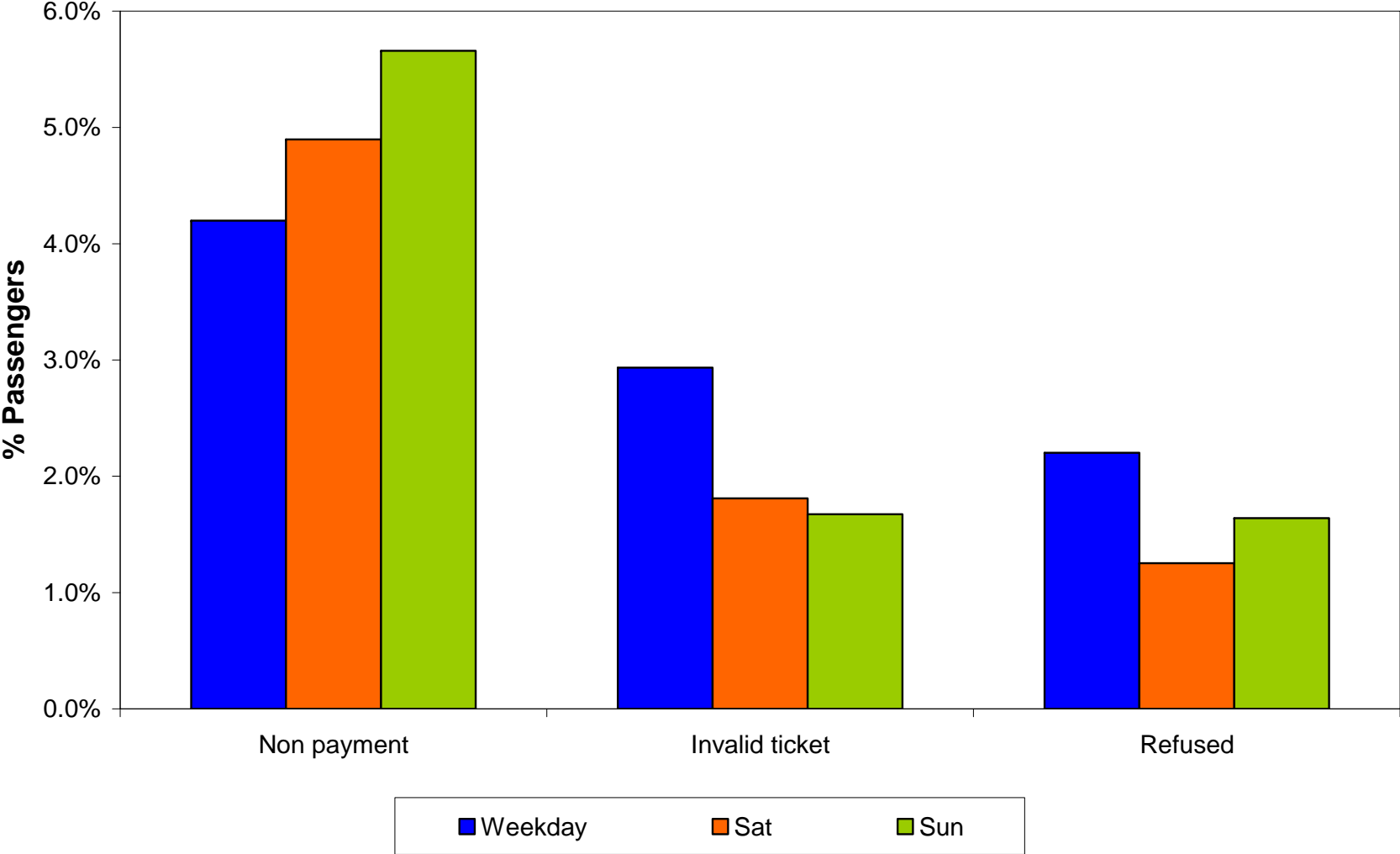
Observations by Route

Passenger Class / Route	Valid	No ticket	Invalid ticket	Refused	Alighted	Total
Victoria - Sutton	3,859	154	103	62	718	4,896
London Bridge - Beckenham Junction	1,976	157	66	68	365	2,632
Victoria - Epsom	3,579	169	68	84	669	4,569
East Croydon - Caterham/ Tattenham Corner	2,770	169	74	75	388	3,476
Victoria - London Bridge	3,395	143	105	30	786	4,459
All routes	15,579	792	416	319	2,926	20,032

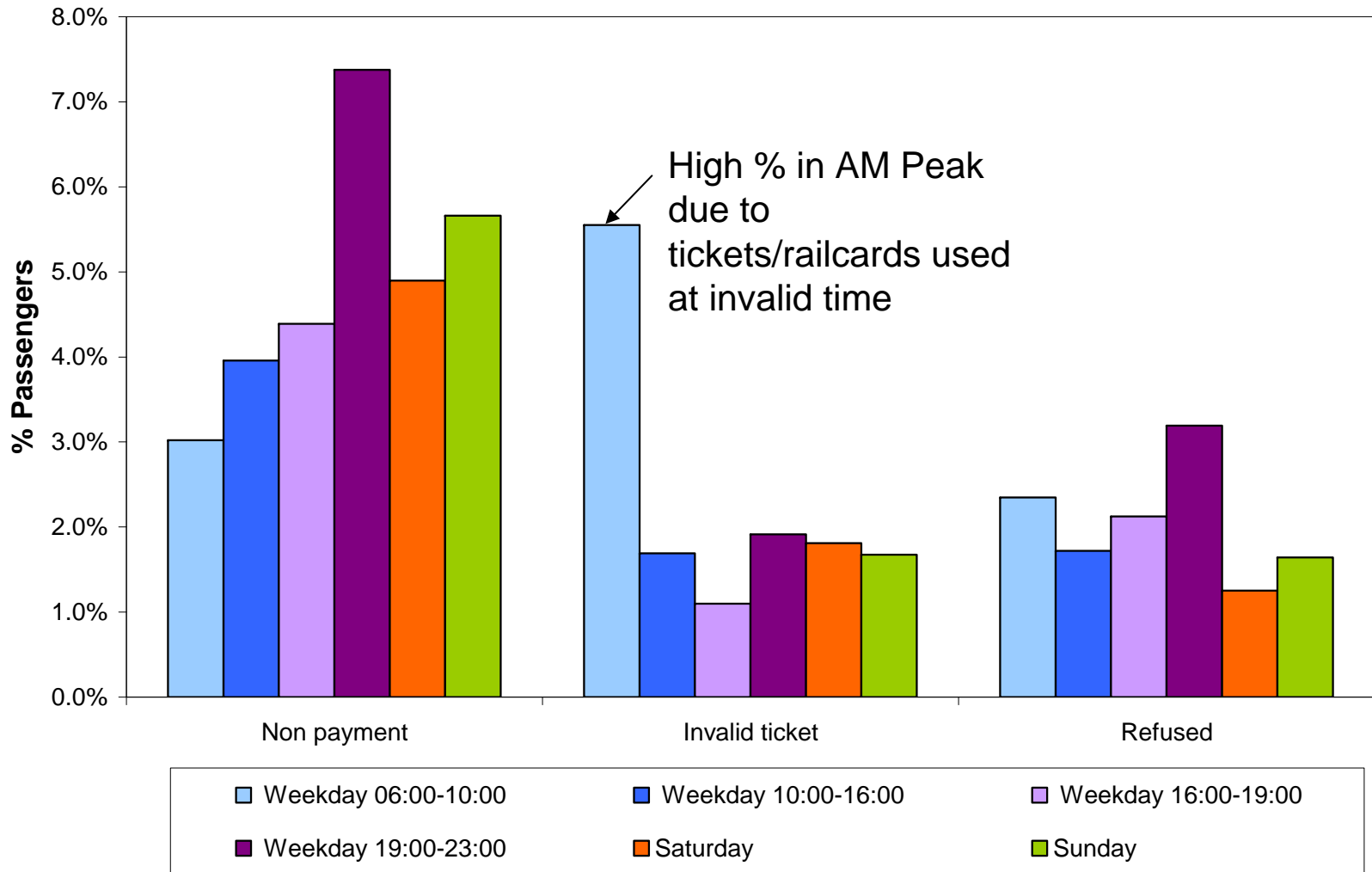
Ticket Irregularities - by Route



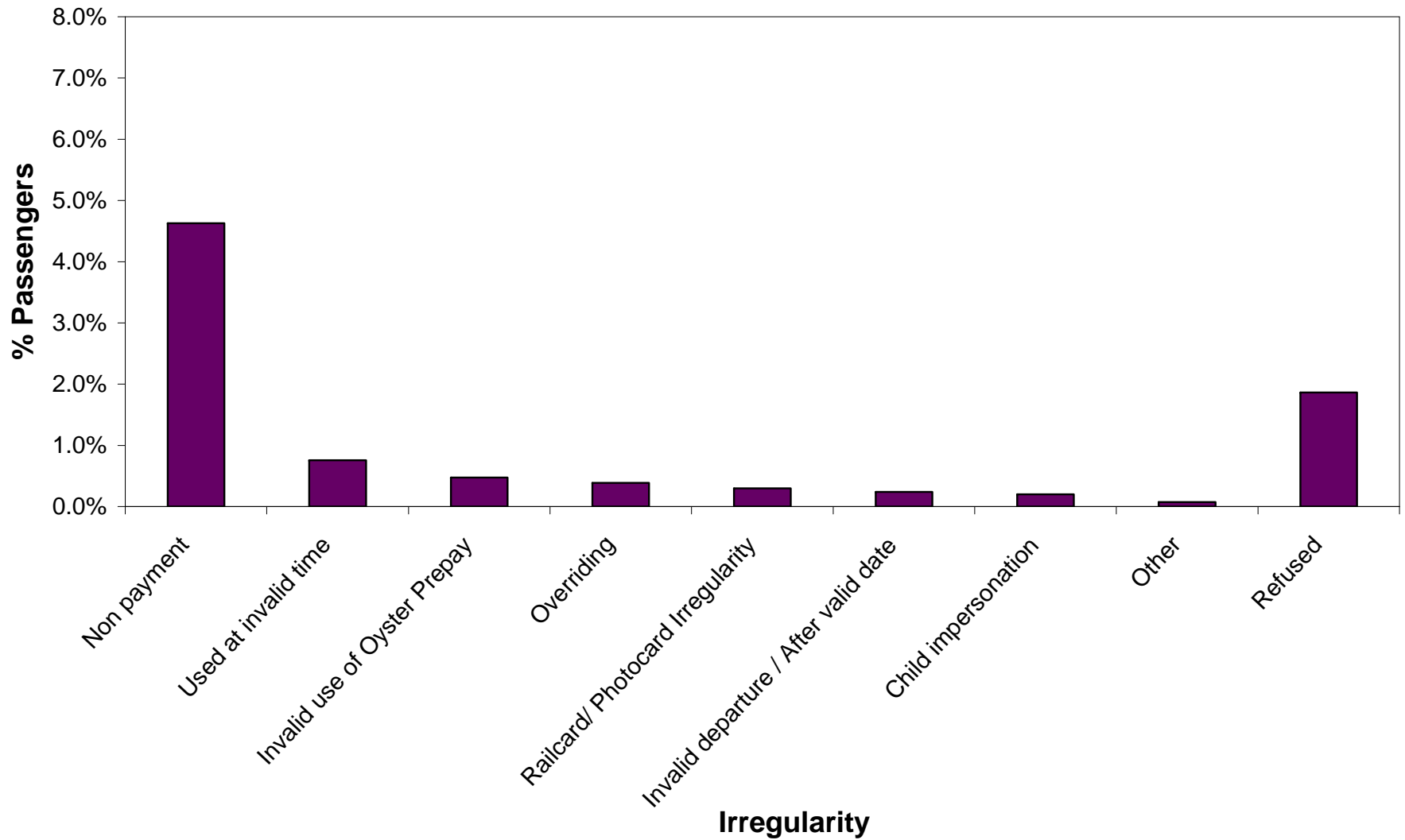
Ticket Irregularities - by Day Type



Ticket Irregularities - by Day Type and Time Band



Specific Irregularities - All Routes



Refusals & Alighters Assumptions

Refusals & Alighters Assumptions

- Three sensitivities on assumptions regarding proportion of refusals and alighters that are fare evaders:

Assumptions for Refusals & Alighters	% Refusals Fare Evaders	% Alighters Fare Evaders
High Case	75%	25%
Central Case	50%	Same as average
Low Case	Same as average	Same as average

- Since a large number of observations in this survey were alighters (14.6%) compared to refusals (1.6%), results are more sensitive to fare evasion assumptions on alighters than refusals.

Weighted Fare Evasion Results

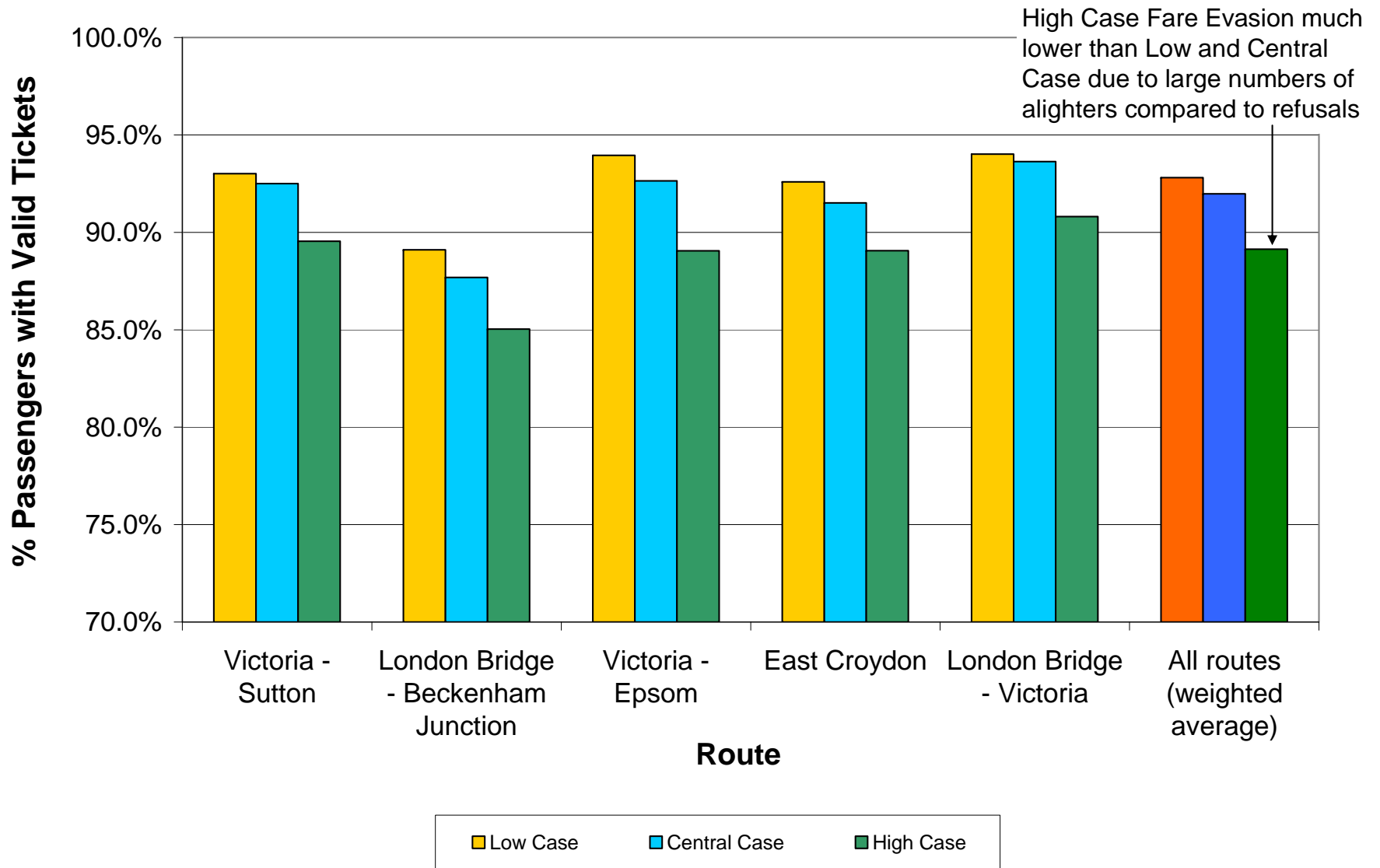
Fare evasion rates: Central Case

(Central Case: 50% refusals fare evading, % alighters fare evading same as average)

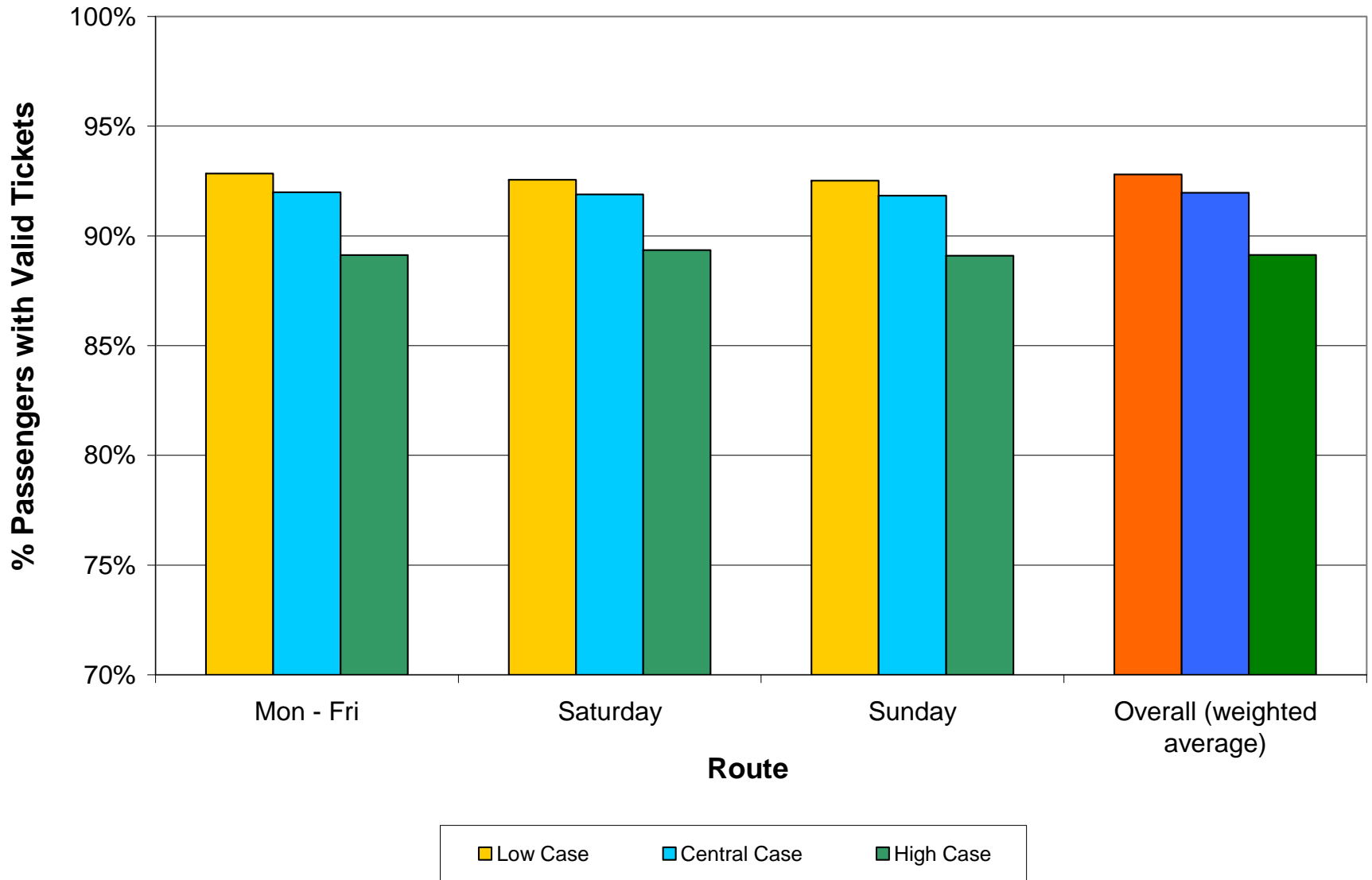
Fare evasion rates by time of day						
	Victoria - Sutton	London Bridge - Beckenham	Victoria - Epsom	East Croydon	London Bridge - Victoria	All routes (weighted average)
Mon - Fri	7.7%	12.5%	7.5%	8.2%	6.3%	8.0%
0600-1000	9.9%	11.6%	9.3%	9.2%	8.7%	9.5%
1000-1600	4.1%	12.9%	5.6%	6.4%	5.8%	6.5%
1600-1900	7.7%	7.8%	4.5%	12.4%	3.5%	7.2%
1900-2400	12.3%	18.6%	10.5%	8.2%	6.0%	10.1%
Saturday	5.2%	8.3%	5.3%	12.2%	8.2%	8.1%
Sunday	6.9%	8.2% *	8.8%	8.6%	8.5%	8.2%
Overall (weighted average)	7.5%	12.2%	7.4%	8.5%	6.4%	8.0%

* The % fare evasion is an average of that on other four routes on Sundays, since no service on Sundays on surveyed route in the London Bridge – Beckenham service group.

% Valid Tickets by Service Group (High, Central, Low Cases of fare evasion)

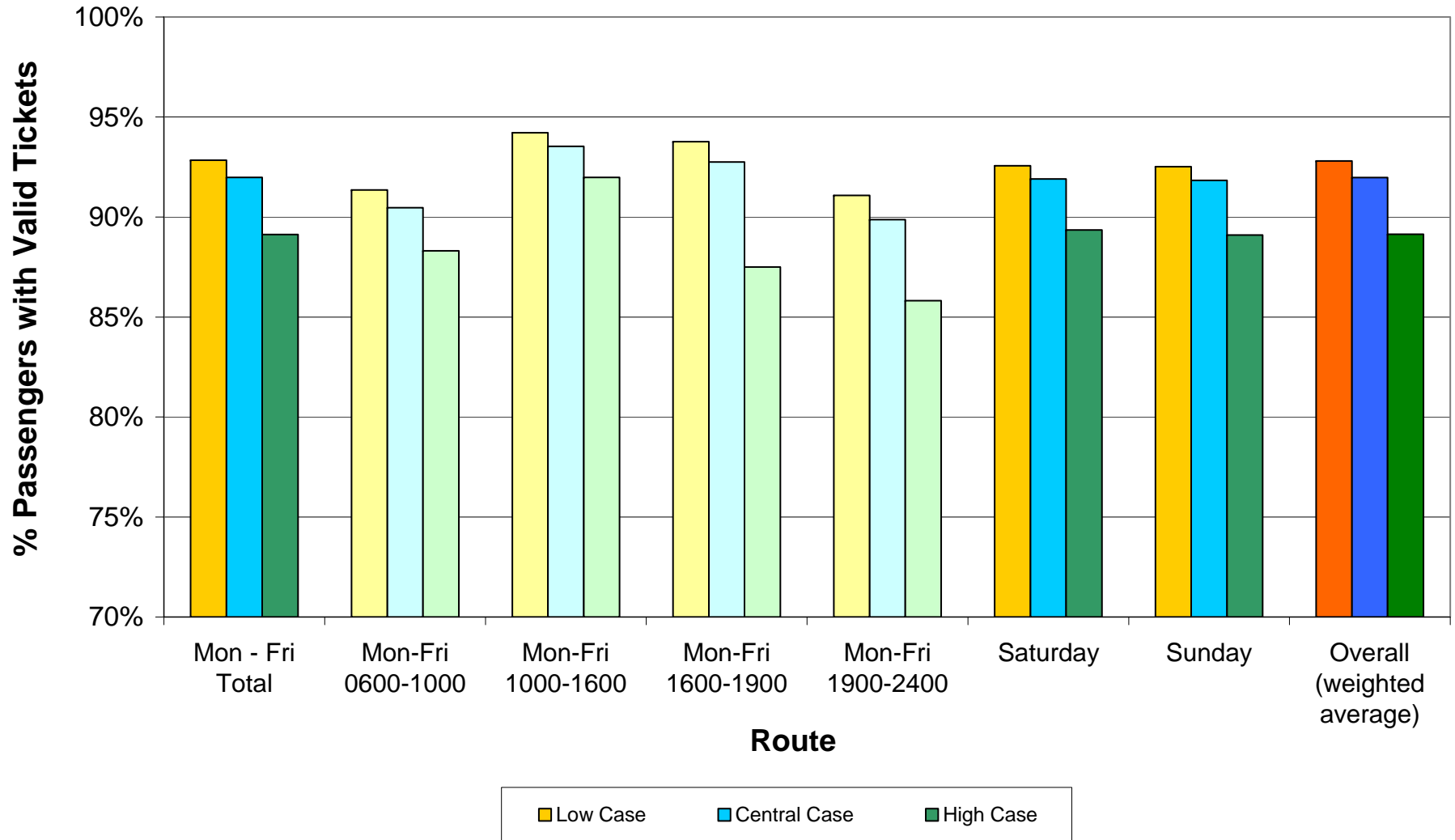


% Valid Tickets by Type of Day (High, Central, Low Cases of fare evasion)

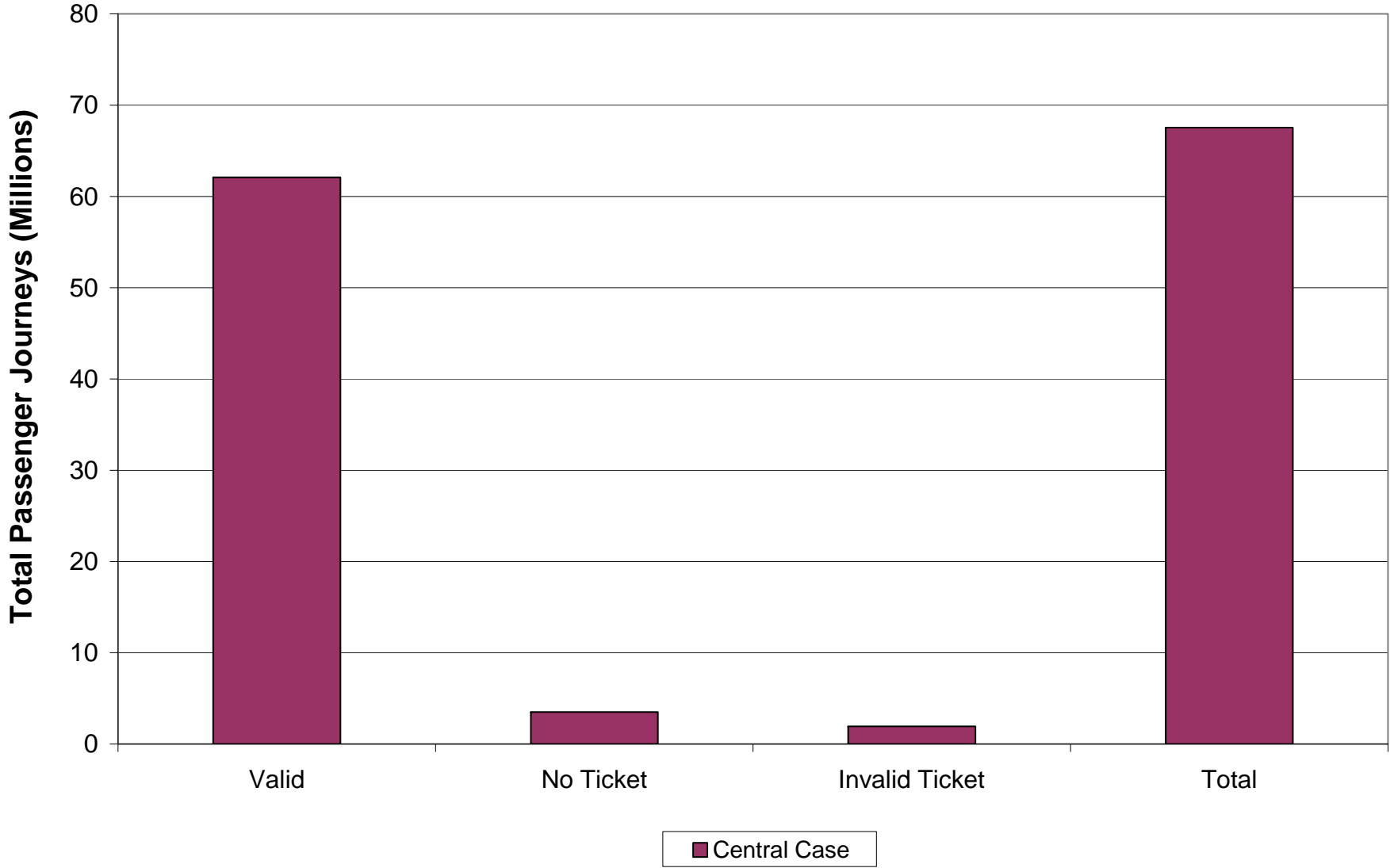


All routes

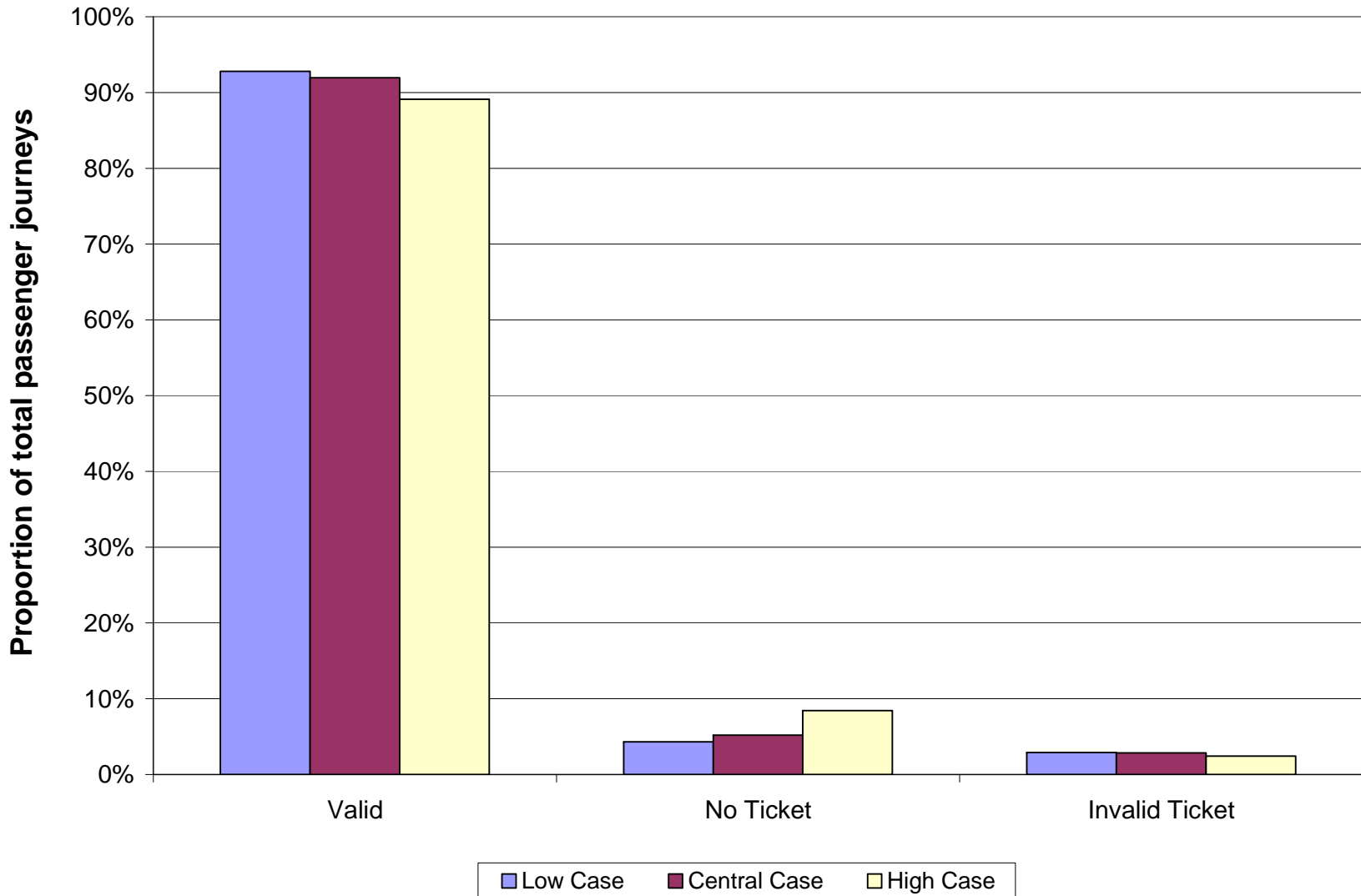
% Valid Tickets by Time of Day (High, Central, Low Cases of fare evasion)



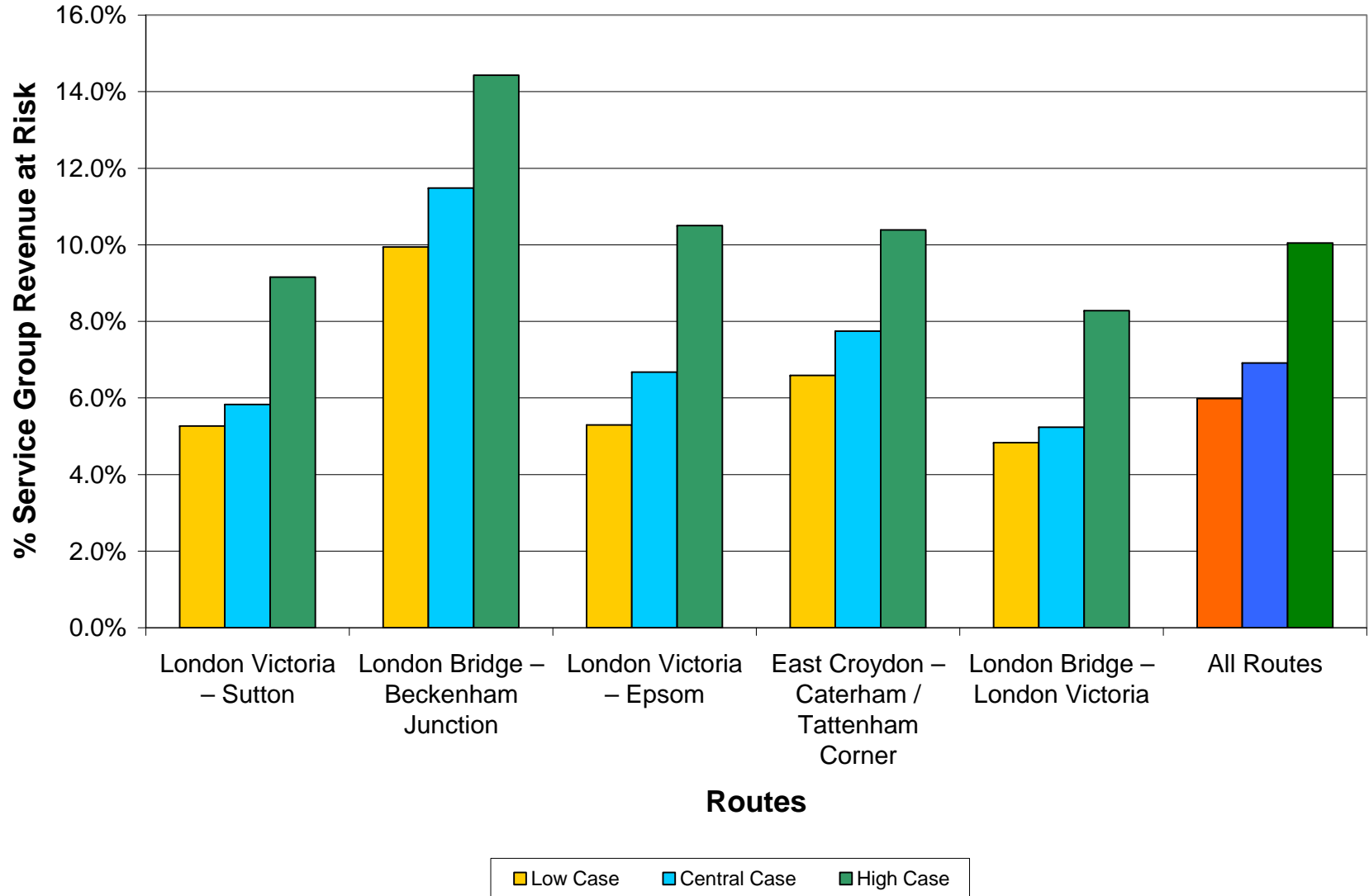
Total Fare Evasion Journeys (Central Case)



Total Fare Evasion Proportions (High, Central, Low Cases)

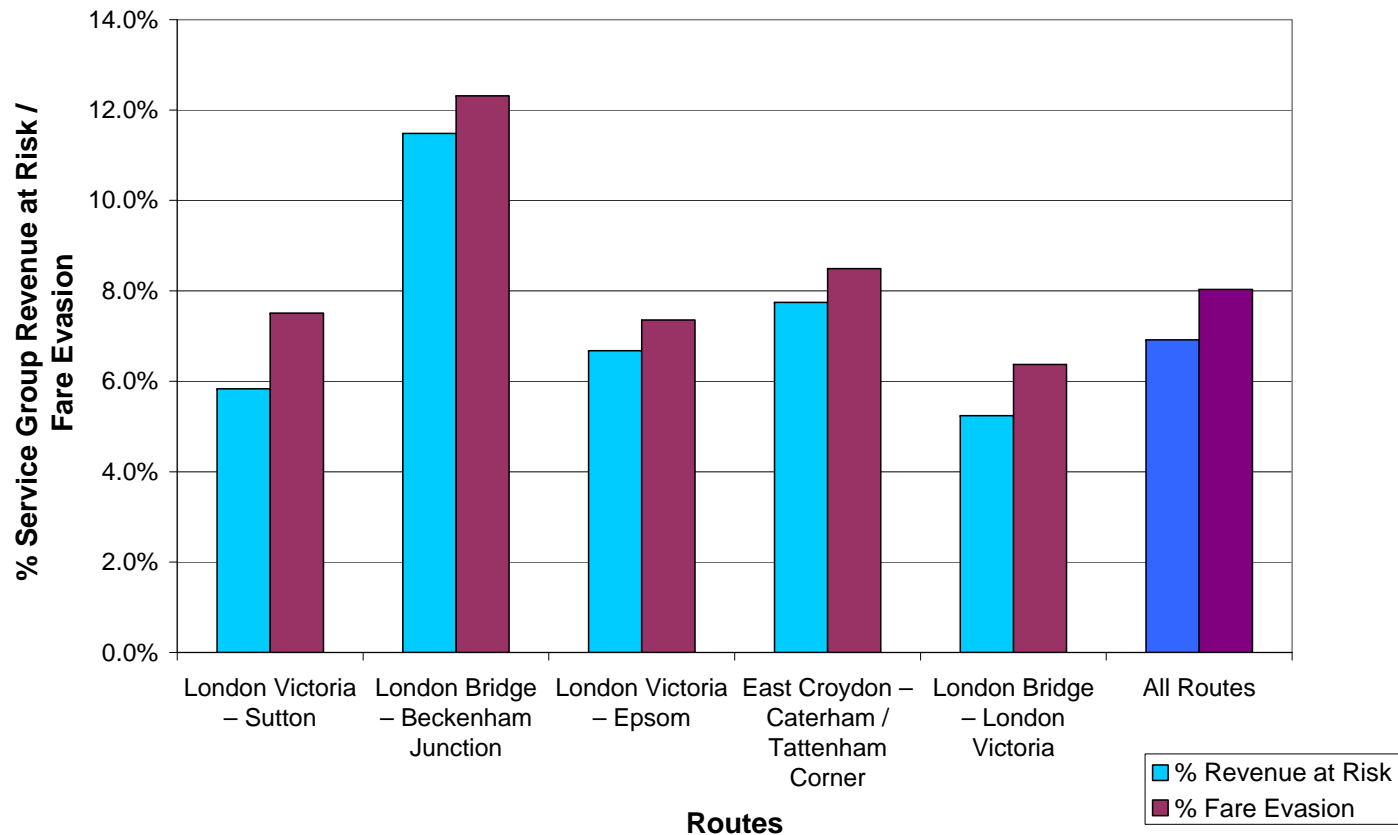


% Service Group Revenue at Risk: (Low, Central, High Cases)



Comparison of % Service Group Revenue at Risk and % Fare Evasion: (Low, Central, High Cases)

- % Fare Evasion is lower than % Revenue at Risk, since for some types of ticket irregularity the revenue lost is assumed to be < 100% of average yield (e.g. Child impersonation 50% average yield lost)
- For other types of irregularity, including passengers with no ticket, the revenue lost is assumed to be 100% average yield.



Conclusions

Revenue Protection Considerations

- Passengers usually have a choice about whether to fare evade or not
- They may weigh up the decision to fare evade based on the probability of getting caught and the generalised penalty if they do get caught (money paid, time taken, hassle, embarrassment).
- This is the so called 'Utility Theory of Rational Thief':
 - Decision to fare evade = $f^n(\text{Probability of being caught, Penalty if caught})$
- Several revenue protection considerations can influence a passenger's decision to fare evade:
 - Gating at stations
 - RPI (Revenue Protection Inspector) deployment
 - Penalty fares: at present £20 on Southern network
- Increasing the levels of these revenue protection methods will increase the probability of getting caught or increase the penalty, and therefore reduce the number of decisions made to fare evade.

Gated Stations on Southern Network

- Some routes surveyed have more gated stations than others:
 - Victoria - Epsom: 4 gated stations
 - Victoria - Sutton: 4 gated stations
 - London Bridge - Victoria: 2 gated stations
 - London Bridge - Beckenham Junction: 1 gated station
 - East Croydon - Caterham / Tattenham Corner: 1 gated station

- Other gated stations on Southern network:
 - Brighton
 - Hove
 - Eastbourne
 - Redhill
 - Lewes
 - Worthing
 - Chichester
 - Horsham

Gated Station	Surveyed Route
Victoria	<ul style="list-style-type: none"> ■ Victoria - Epsom ■ Victoria - Sutton ■ London Bridge - Victoria
London Bridge	<ul style="list-style-type: none"> ■ London Bridge - Victoria ■ London Bridge - Beckenham Junction
Balham	<ul style="list-style-type: none"> ■ Victoria - Epsom ■ Victoria - Sutton
Sutton	<ul style="list-style-type: none"> ■ Victoria - Epsom ■ Victoria - Sutton
West Croydon	<ul style="list-style-type: none"> ■ Victoria - Sutton
Epsom	<ul style="list-style-type: none"> ■ Victoria - Epsom
East Croydon	<ul style="list-style-type: none"> ■ East Croydon - Caterham / Tattenham Corner

Conclusions

- **Weighted total fare evasion** is estimated at 8.0% for Southern suburban service groups (Central Case assumptions)
 - This proportion is consistent with results from other rail fare evasion surveys
- **Weighted results by Service Group**
 - Similar level of fare evasion across service groups, except London Bridge - Beckenham Junction which has a higher level of fare evasion (12.2%)
- **Weighted results by Day and Time of Day**
 - Slightly higher level of fare evasion at weekends compared to weekdays
 - Higher level of fare evasion during 0600-1000 and 1900-2400
 - This is partly due to restrictions on tickets in the morning peak and perhaps levels of RPI coverage in the evening
- The Central Case assumptions on alighters (same as average fare evasion) and refusals (50% fare evaders) are our best estimate on levels of fare evasion.
- This survey contained a large proportion of alighters, therefore results are sensitive to assumptions made about alighters, as in the High Case fare evasion assumptions (25% alighters fare evaders, 75% refusals fare evaders).

Conclusions

- Fare evasion levels and therefore revenue at risk is influenced by different revenue protection decisions made by the train operator
 - More gating at stations, greater RPI deployment, and higher penalty fares will all act to reduce the level of fare evasion and revenue at risk.
- Issues may exist with regard to ticket purchasing
 - The provision of ticket windows/machines and other methods of purchasing tickets must be considered

| End