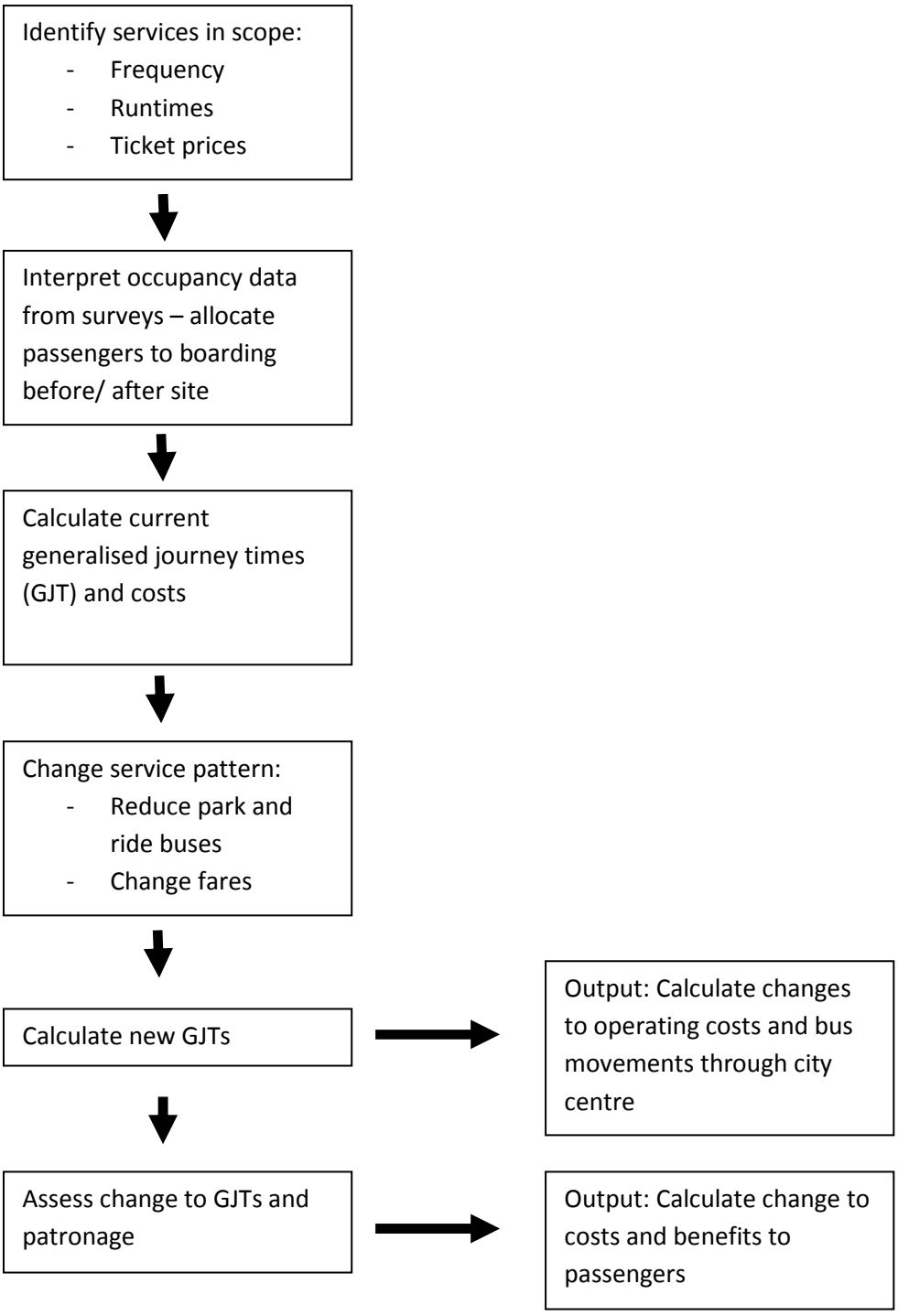
Appendix C: Worked example of integrating services: Tadcaster Road/ Askham Bar Corridor.

Methodology

Figure C.1 shows the methodology used for this test

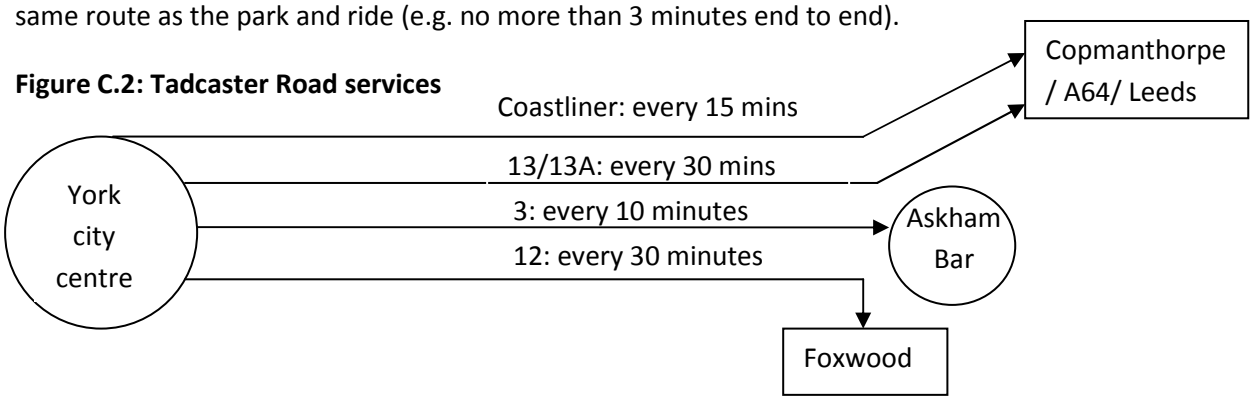


Discussing each stage in turn for a worked example of Tadcaster Road.

Identifying Services in scope

Figure C.2 shows the services in scope for the exercise. For a service to be considered "in-scope" it has to follow the route of the existing park and ride service between the city centre and park and ride site. In some cases, services might make small diversions off the main route, but have to be broadly parallel and not suffer a significant journey time penalty in comparison to services on the same route as the park and ride (e.g. no more than 3 minutes end to end).

Figure C.2: Tadcaster Road services



As can be seen, services considered in-scope are the 12, 13/ 13A and Coastliner services, as well as Service 3 (park and ride). Services which operate on Tadcaster Road but are not considered in-scope are:

- Service 4 (turns off Tad Rd short of the park and ride site)
- Services 20, 21, 37, 40, 113, 124 (infrequent)
- Service 26 (travels to park and ride site but not via Tadcaster Road)

The in-scope services and their characteristics are shown in table A.1 below:

Table C.1: Current services on Tadcaster Road (as at March 2012)

Service	Route	Type	Operator	Frequency (mins)	Ticket price (adult[1])
3	City - Askham Bar	P&R	First	10	£2.40
12	Haxby – city – Foxwood	Stage	First	30	£3.70
13/ 13A	Monks Cross – city - Copmanthorpe	Stage	First	30	£3.70
Coastliner	Leeds – York – various	Stage	Transdev	15	£3.70[2]

Although there are only two operators, there are three ticketing schemes in use on the corridor. Firstbus tickets are valid on the 3, 12 and 13, whilst the 3 issues park and ride specific tickets, which cannot be used on the 12 and 13, and the Coastliner tickets are only valid on Coastliner services. Effective frequency of service for the holders of each ticket type is shown in table C.2.

[1] It is assumed that most passengers are making a return trip, therefore the ticket price given here is for an adult return ticket (as at March 2012) divided by two trips. In cases where a day ticket price is less than the return price then the day ticket price/2 has been used. In the generalised cost equations it is assumed that one-third of passengers are using concessionary passes and do not pay a fare (or pay 50p to use the park and ride service).

[2] Assumed value

Table C.2: Current Effective Service Frequencies

Ticket type	Valid on	Buses per hour	Effective frequency
First ticket	12, 13/13A	4	15 mins
Park and ride ticket	3	6	10 mins
Coastliner	various	4	15 mins

Consequently, someone holding a First ticket can catch a bus every 6 mins[3], as long as their ultimate destination is within comfortable walking distance of Askham Bar (e.g. York College). However, if their ultimate destination is at an intermediate point on the route (e.g. the shops at Dringhouses) then their effective frequency is only every 15 minutes because the more frequent park and ride service does not stop at intermediate points. Someone with a park and ride ticket can catch a bus every 10 minutes, whilst someone with a Coastliner ticket can catch a bus every 15 minutes. When the multi-operator ticket is introduced, effective service frequency for holders of this ticket will be a bus every 5 minutes to destinations within walking distance of Askham Bar, and every 7.5 minutes for intermediate destinations, but only if bus passengers believe the current premium price for the ticket is worth paying for the reduction in waiting time they will receive.

Occupancy data and allocating passengers

The bus occupancy data collected during March suggest the following average occupancy levels for the in scope services as they enter/ leave the city centre at Queen Street, which is assessed to be the location of highest passenger occupancy:

- Service 3 – 25 passengers per bus
- Service 12/ 13/ 13A – 14 passengers per bus
- Coastliner services – 20 passengers per bus

Passengers then had board locations assigned to them. It was assumed that passengers boarded at a uniform rate along all routes, according to their journey times therefore:

- For Coastliner services it was assumed that 25% of passengers (5) boarded between the park and ride site and centre of York and 75% of passengers (15) boarded between the park and ride site and Leeds;
- For the 12/ 13/ 13A 9 passengers joined between the city centre and park and ride site and 4 outward of the park and ride site; and
- For the park and ride it was assumed that all the passengers joined at the site (no intermediate stops on this service).

Calculating generalised costs for travel

[3] In practice, services do not operate at a regular 6 minute clockface interval. The park and ride service operates every 10 minutes with the 12 and 13 each operating every 30 minutes. However, service frequency is aggregated over the hour here to simplify the calculation.

The excel model then calculates a generalised journey time for the journeys under the different ticketing schemes, between the park and ride site and the city centre, and for passengers joining the service outward of the park and ride site for the 12/ 13 and 13A and Coastliner services. Table C.3 shows this.

Table C.3: Current Generalised Journey Times (holders of adult return tickets)

Ticket type	Effective frequency (mins)	Journey time (average)	Fare	TOTAL GJT[4]
Passengers joining between the park and ride site and city centre				
12/ 13/ 13A	15	12[5]	£1.85	36.7
Park and ride ticket	10	15	£1.20	26.1
Coastliner	15	13	£1.85	38.0
Passengers joining outward of the park and ride site				
12/ 13/ 13A	30[6]	23	£1.85	92.6
Coastliner	15	40	£2.50	82.7

As can be seen, the highest GJT is born by passengers using the 12/ 13/ 13A (joining outward of the park and ride site), with the lowest borne by park and ride users. There are several implications of these findings:

- Users of the 12/13/13A have very high generalised costs of travel in absolute terms. For example, the generalised cost of using the 12 to get from Acomb Wood into the centre of York is more than 3 times as much as the cost of using the park and ride service from Askham Bar. The same is true of using the 13 from Copmanthorpe. The principal driver of these high GJTs is the low service frequencies. The difference between GJT for the service buses and park and ride also has the implication that, for many users on these routes, their lowest GJT for travel will be achieved by travelling to the park and ride site by car/ foot or cycle and then travelling into town on the park and ride bus;
- Users of the 12/ 13/ 13A and Coastliner services experience very similar GJTs for trips where the services run in parallel (in practice anywhere between the city centre and Askham Bar). For trips ending anywhere between Askham Bar and Copmanthorpe the Coastliner service has a considerable advantage because of its higher frequency on this section.
- The park and ride service has a much lower GJT than the parallel stage services. This is because, between destinations within comfortable walking distance of the park and ride site and the city centre, the park and ride service offers the highest frequency, lowest prices and fastest journey speeds. As many users also see it as having higher quality too (see Appendix

[4] Expressed in minutes. Weighting of 2 applied to wait times except for park and ride where wait time is on vehicle and is therefore counted as unweighted in-vehicle time. Fares information has been deflated to 2002 values and converted to minutes by applying the webtag leisure value of time of £5.93 per hour, then reduced by 33% to compensate for ENCTS passengers who do not pay a fare.

[5] This journey time (and the Coastliner journey time) have been calculated by assuming that on average passengers' journeys are two-thirds the time for the trip between the city centre and park and ride site (because not all passengers on these services travel all the way to the park and ride site).

[6] Because the service divides into the 12 to Woodthorpe and 13 to Copmanthorpe adjacent to the park and ride site, passengers for each leg of the service experience a 30 minute service frequency rather than the 15 minute frequency on the trunk route between the city centre and Askham Bar.

B and D of the main report) it can therefore be concluded that the park and ride service is better in every sense than parallel stage services.

Changing Service Patterns and Fares

Service patterns were then changed to maintain the highest service frequency currently experienced by the group of users who currently experience the highest effective frequency. In the case of Tadcaster Road, the group of users with the highest frequency is the park and ride users who experience a bus every 10 minutes. Given that eight buses per hour on the corridor must be retained in order to maintain the existing frequencies on the 12/13/13A and Coastliner services, it is possible to provide a service every 7.5 minutes from the park and ride to the city centre without a dedicated park and ride service at all[7], therefore the entire operating cost for the service between Askham Bar and the city centre is saved. Park and ride users also see their journey times to the site increase by 3 minutes as their services stop at intermediate stops. This brings park and ride users' journey times into line with stage service journey times. Stage passengers do not see a difference.

It has been assumed that part of the integration process would include a new multi-operator fare. It is assumed that this fare would be midway between the current stage fares on the corridor and the park and ride fare, rounded up to the nearest 5p. It is therefore assumed that a typical single fare would be £1.55. This means that park and ride passenger fares increase (by 35p) whilst stage passengers' fares fall by 30p.

It is assumed that the new services would be co-ordinated to provide regular interval services between the city centre and park and ride site if they do not already do so.

It is assumed that passengers boarding services 12, 13, 13A and Coastliner services outward of the park and ride site would suffer a 2 minute journey time penalty as the services now divert into the park and ride site to pick up and set down passengers, instead of travelling straight past it on the Tadcaster Road. Fares for these passengers would not change.

New generalised journey times

New generalised journey times were then calculated for each travel market. These are shown in Table C.4.

Table C.4: Current Generalised Journey Times (holders of adult return tickets)

Ticket type	Old GJT	New GJT	Change	Comment
Passengers joining between the park and ride site and city centre				
12/ 13/ 13A	36.7	27.4	-9.3	Gain
Park and ride ticket	26.1	33.4	+7.3	Lose
Coastliner	38.0	27.4	-10.7	Gain
Passengers joining outward of the park and ride site				
12/ 13/ 13A	92.6	94.6	+2	Lose
Coastliner	82.7	84.7	+2	Lose

[7] It should be noted that this is only possible on the Tadcaster Road corridor. On the other corridors, some element of the park and ride service is needed to maintain frequencies – for example a bus every 20 minutes for the Designer Outlet and RAwcliffe Bar and one bus per hour for Grimston Bar.

As can be seen, the service pattern which is delivered is not a win-win. Passengers travelling from destinations inward of the park and ride site to the city centre benefit substantially, whilst those travelling on the park and ride service lose. Passengers travelling into town from outward of the park and ride site also lose (as a result of the 2 minute access penalty). If a standard bus elasticity of demand[8] is applied to these figures it suggests:

- The number of park and ride users would fall by approximately 25%
- The number of stage passengers (inward of park and ride) would increase by 25%
- The number of stage passengers (outward of park and ride) would fall by approximately 2%

Fewer passengers are carried on the stage services, therefore the increase in these passengers is insufficient to offset the loss of park and ride passengers. Therefore, the net effect of integrating the park and ride and stage services on the Tadcaster Road corridor would be an increase in overall generalised costs on the corridor of 2%, equating to an overall loss of demand of approximately 1.8%.

Change in operating costs

The potential for saving operating costs should be considered against this. Assuming the current park and ride service could be dispensed with makes an operating cost saving of approximately £600,000 pa[9]. If users' costs are monetarised as they would be in a conventional cost:benefit appraisal, then these stand at around £100,000 pa[10], although this figure doesn't capture other costs such as changes in congestion and reductions in carbon emitted by buses which no longer operate.

Conclusion

The test shows that is possible to make significant operating cost savings by integrating park and ride and stage services, but at substantial time costs to users, most of which are born by people currently using the park and ride service. This carries the implication that some of the users displaced from travelling by park and ride will switch modes to driving, which would worsen congestion levels in the city centre. As such, the option of fully integrating the park and ride service with stage services performs far worse than the option of retaining current service levels but implementing an integrated ticket.

[8] In this case, an elasticity of -0.9 is used. This represents a long term elasticity, so any changes would be enacted over a 3 to 5 year period.

[9] Assuming a cost per bus of £40 per hour of operation and a 3,000 hour bus year (and 5 buses in use on the Askham Bar service).

[10] Rule of a half applied to scoped benefits of £194,000 pa

Appendix C2: Home to School and Stage Services.

General

The emerging trend is that school bus routes do have sections along which they cross with everyday bus services, however the school routes cross between different bus routes in order to achieve a more circular route, often passing along sections of road which are not covered by regular bus routes (e.g. sections of the outer Ring Road).

St. Wilfrid's RC Primary School

Operator: Pullman
Service: W3

Does appear to overlap with routes 1, 6, and 12, and these routes are all operated by First. However the routes are distinctly separate. The school bus route takes a circular route from New Earswick to Clifton, there is no direct bus route link between the two and the existing high frequency bus routes follow separate corridors into the city centre. There is a higher degree of correlation with First's 112 service, however this service only operates on Sundays.

Bishopthorpe Infant School; and Archbishop of York's CE Junior School.

Operator: Pullman
Service: B1

There appears to be some overlap with First's route 11, however this route does not cross towards Moor Lane as service B1 does. There is also a degree of overlap with First's 112 service but this only operates on Sundays.

Poppleton Ousebank Primary School

Operator: York Pullman
Service: P1

No significant service overlaps, only a minor overlap with service 10. None of the regular bus routes appear to follow the Ring Road between Knapton and Poppelton. Parts of the route are covered by the less frequent 142 and 143 services, operated by Eddie Brown and Harrogate Coach travel.

Manor CE School; York High School; and St. Mary's CE Primary School

Operator: York Pullman
Service: C3

A significant amount of this route appears to be covered by service routes 26 and 24, both operated by Transdev, changing to a service 10 line beyond the A59. However the route from Askham Bryan, service 36, operated by North Yorkshire County Council has a less than 2 hourly frequency.

Manor CE School

Operator: York Pullman
Service: C3

There is a minimal coverage of bus services along this route. The only services which overlap are low frequency (less than a 2-hourly rate).

Tadcaster Grammer School

Operator: York Pullman

Service: T7, T9, T11, T12, T13.

There is a strong correlation between this service and the Coastliner (Cl & CLX) services from Copmanthorpe across to Tadcaster. However the line from Acaster Melbis to Askham Richard and Askham Bryan is not covered by one regular bus route. This does not apply to services T12 and T13 as they go directly from Copmanthorpe, therefore it could be argued that the school service from Copmanthorpe to Tadcaster is covered by everyday bus services, as there appear to be reasonably regular Coastliner buses through Tadcaster during morning and early-evening periods.

Fulford School

Operator: York Pullman

Service: F21 & F22 & F29 - Dunnington

There is an overlap with First's 10/10A service into York, and there are also regular bus services which lead to Fulford School. However this would entail changing services and taking a less direct route to Fulford School.

Service: F23 – Bishopthorpe

Part of this route is covered by First's number 11 service, and several other routes also cover roads closer to Fulford School. However the frequent bus services do not extend as far as Acaster Malbis, and pupils would have to change bus services in the city centre in the absence of a school bus service.

Service: F24 – Bishopthorpe and Naburn

A section of the route overlaps with that of First's number 7 service along with Transdev's 24 and 26 services. However the only route which extends out towards Naburn is that of Arriva's 42 service which is not especially frequent during the day, and is infrequent in the evenings with a less than 2-hourly service.

Service: F25 & F26 – Wheldrake

There does appear to be a level of overlap with Transdev's 35 and X35 services, however ther route does not follow the same pick-up points and the Transdev service finishes at Fulford Church, which would entail either a fairly long walk for pupils or them changing service to reach the school.

Service: F27 – Elvington / F28 – Elvington and Wheldrake

EYMS operate the 195 and 196 services through Elvington, however these are low frequency and the 196 does not operate every day. Transdev also have their 36 and X36 services passing through Wheldrake during the mornings and evenings, however these services are relatively infrequent and the routes may also have to be altered slightly if pupils were to be able to stop within comfortable walking distance of Fulford School.

<u>Huntington</u>

Operator: Stephensons of Easingwold Ltd.

Service: H21-H27

These services overlap considerably with First's number 5 service, in that they all pass down Strensall Road and Huntington Road. However the various services serve streets outside of Strensall where the everyday bus services do not go. So the regular bus service would have to branch out much more around Strensall if it was to replace the school bus service.